Missouri

Assessment Program

Grade-Level Assessments

English Language Arts and Mathematics Grades 3-8 and Science Grades 5 and 8

Technical Report 2019

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DRC
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EXECUTIVE SUMMARY

This report is a technical summary of the 2019 administration of the Missouri Assessment Program (MAP) in English Language Arts (ELA) and Mathematics, administered in Grades 3 through 8, and Science, administered in Grades 5 and 8.

The ELA and Mathematics tests are grade-level tests that are designed to measure students' knowledge of ELA and Mathematics and are aligned with Missouri Learning Standards. The Spring 2019 test forms were developed by Data Recognition Corporation (DRC) using DRC's college- and career-ready item bank as well as Missouri-owned items, which were written by Missouri educators.

The Science tests are grade-span assessments. These tests are designed to measure students' knowledge of Science, and they are aligned with Missouri Learning Standards. The Grade 5 Science test measures students' knowledge of Science concepts taught in Grades 3 through 5. The Grade 8 Science test measures students' knowledge of Science concepts taught in Grades 6 through 8. The Spring 2019 Science test forms were developed by DRC using all Missouri-owned items, written by Missouri educators.

All assessments except for Braille, Large Print, and accommodated paper-based forms were administered online. This section provides a summary of the *Spring 2019 Technical Report* for ELA, Mathematics, and Science.

E.1 Overview of the MAP

The MAP is designed to measure Missouri's Learning Standards (MLS). MLS define the knowledge and skills students need in each grade level to succeed later in college, other post-secondary training, and careers. These expectations are aligned to the Show-Me Standards, originally adopted by the Missouri State Board of Education in 1996, which define what all Missouri high school graduates should know and be able to do. These standards were revised and updated several times since then, first to comply with the requirements of No Child Left Behind legislation and later to reflect the essential knowledge and skills that enable students to be ready for college or a career.

The MAP ELA and Mathematics grade-level tests have undergone multiple alignment changes since their first administration in the 2005–06 school year, with the latest changes in the 2017–18 administration. The 2017–18 ELA and Mathematics assessments are aligned to the Revised MLS. The new reporting scales for the ELA and Mathematics tests were established after the Spring 2018 test administration, and the new performance level cut scores were set for these assessments in Summer 2018. The ELA and Mathematics 2017–18 results are considered a new baseline for year-to-year student performance comparisons. The 2018–19 ELA and Mathematics assessments are statistically linked to the 2017–18 assessments allowing for year-to-year test score comparability. The students were classified into performance levels based on the cut scores established in Summer 2018.

Science tests were administered starting in 2008 and were aligned to MLS Grade-Level Expectations (GLEs) for Science until the Spring 2017 test administration, which marked the last

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administration of the Science tests aligned to these standards. There was no operational test administration for Science in Spring 2018. Instead, a census field test of items measuring new Science content standards was conducted. The 2018–19 Science assessments were developed using all new items (from the Spring 2018 field test) aligned to the new Missouri Learning Standards for Science. The new reporting scales for the Science tests were established after the Spring 2019 test administration, and the new performance level cut scores were set for these assessments in Summer 2019.

All Missouri assessments are administered online and contain various item types, including multiple-choice (MC), multi-select (MS), technology-enhanced (TE), evidence-based selected-response (EBSR), short-answer (SA), constructed-response (CR) and writing prompt items (in ELA Grades 4 and 8).

E.2 Administration

In Spring 2019, Missouri administered summative assessments in English Language Arts and Mathematics to students in Grades 3 through 8. The Science assessment were administered to students in Grades 5 and 8. The MAP was administered from April 1 to May 31, 2019. Test administration is discussed in Chapter 5 of this report.

There were 557 districts, including charter schools, that administered MAP tests in Grades 3 through 8. Table E.1 shows test participation rates based on Missouri student census data.[1] For the purposes of this report, participation rate is defined as the percentage of students who received a scale score given the total number of students eligible to take the online test or receive a test book. The 'Accountable' columns show the total number of students eligible to take the online test or receive a test book. The 'Percent Reportable' columns show the percentage of students who received a scale score on the MAP. Further analysis of participation rates is provided in Chapter 5 of this report.

E.3 Student Performance

This is the second year of the ELA and Mathematics MAP scores being reported on new scales with new performance level cut scores. Spring 2019 also marks the first year of the Science assessments measuring new MLS. Tables E.2 and E.3 present the percentage of students classified as *Proficient* or *Advanced* in 2018 and 2019 in English Language Arts and Mathematics, respectively. Table E.4 shows the percentage of students classified as *Proficient* or *Advanced* in 2019 in Science. Except for Grade 7, the percentage of students classified as *Proficient* or *Advanced* in ELA was similar for all other grade levels and ranged from approximately 46% for Grade 6 to approximately 49% for Grade 4. Approximately 44% of students were classified as *Proficient* or *Advanced* in ELA Grade 7. The year-to-year change in the percentage of students classified as *Proficient* or *Advanced* for ELA Grades 3, 4, 5, and 7 was less than 1%. The percentage of students classified as *Proficient* or *Advanced* decreased by approximately 2% in ELA Grades 6 and 8. The percentage of students classified as *Proficient* or *Advanced* in Mathematics was found to be higher in lower grade levels compared to the higher grade levels in the Spring 2019 test administration and ranged from

[1] The census data used in this report include public and charter school students and do not reflect additional cleaning steps that DESE staff implements once DRC releases data to DESE; therefore, the numbers in this report may differ from those in DESE reports using their cleaned data.

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approximately 47% for Grade 4 to approximately 29% for Grade 8. It should be noted that approximately 20% of Grade 8 students took the Algebra I End-of-Course assessment instead of the Grade 8 Mathematics assessment which affected the student population composition for this grade and content area. The year-to-year change in the percentage of students classified as *Proficient* or *Advanced* was approximately 1% or less for all Mathematics grades. The percentage of students classified as *Proficient* or *Advanced* in Science was approximately 43% for Grade 5 and approximately 44% for Grade 8. More details on student performance are provided in Chapters 9 and 10.

Due to setting new performance cut scores for ELA and Mathematics after the Spring 2018 test administration, student performances in these two content areas are not directly comparable between the Spring 2018 and previous administrations. Student performances are comparable between the Spring 2019 and Spring 2018 administrations for ELA and Mathematics.

New performance level cut scores were established for Science after the 2018–19 test administration. Therefore, student performance in Science in the Spring 2019 administration cannot be directly compared with any of the previous administrations.

E.4 Validity of Intended Interpretation of Test Scores

Most sections of this Technical Report are designed to provide validity evidence to support the use and intended interpretation of the MAP ELA, Mathematics, and Science test scores. MAP scores are used to identify strengths and areas for improvement in Missouri's student performance; to inform stakeholders (teachers, school administrators, district administrators, DESE staff members, parents, and the public) about the status of the progress toward meeting academic performance standards of the state; and to meet the requirements of the state's accountability program. Chapter 2 of this Technical Report provides the validity framework and a summary of the validity evidence for MAP assessments.

Evidence of validity based on test content was supported by the test specifications, including the test design and test blueprint. Missouri Grades 3–8 assessments were developed in alignment with Missouri Learning Standards. A rigorous item review and test form development process was implemented to select items from DRC's College- and Career-Ready item pool (for ELA and Mathematics) and the Missouri-owned pool of items that were written by Missouri educators (for ELA, Mathematics, and Science). More details on test content and test development are provided in Chapters 3 and 4 of this report.

With the exceptions of Braille, Large Print, and a limited number of paper-based test forms, MAP assessments were administered online in a standardized manner, further supporting validity of the intended score interpretation. Universal tools were available for all students to use, and accommodations were available to students for whom such aids were deemed appropriate and indicated in their Individualized Education Programs. More details on test administration and use of accommodations or universal tools are provided in Chapter 5 of this report.

Scoring of technology-enhanced, short-answer, multi-select, evidence-based selected-response, constructed-response, and writing prompt (in ELA Grades 4 and 8) items followed predefined scoring criteria. The multiple-choice, multi-select, technology-enhanced, short-answer, and

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evidence-based selected-response items were autoscored. ELA writing prompts and constructed-response items in Mathematics and Science assessments were scored by human readers. The inter-rater reliability statistics demonstrated that the writing prompt items were scored reliably (refer to Chapter 6 for details).

The test scaling and equating was conducted using item response theory (IRT) methodology. Students' scale scores were derived using item parameters estimated after the Spring 2019 test administration. The IRT models used for MAP test scaling were appropriate for the test data supporting the operational data analysis and ensuring that the test items, as well as the overall tests, were functioning appropriately. For details on test scaling and equating, refer to Chapter 7. The cut scores used for classification of students into different performance levels and associated performance level descriptors were established during the Summer 2018 performance level setting for ELA and Mathematics, and in the Summer 2019 performance level setting for Science, in a collaborative and participatory process, further supporting the validity and interpretation of the MAP scores (refer to Chapter 8 for details).

Evidence of construct-related validity—supporting the intended interpretation of test scores and their use—was provided through studies of test reliability, evaluation of internal test structure, and evaluation of the relationship of test scores with external variables. The reliability analysis results indicated that the MAP tests produce scores that would be relatively stable if the tests were administered repeatedly under similar conditions. The assumption that the content area MAP tests were unidimensional (that is, each grade-level test measured one primary dimension) was confirmed through principal component analysis. The evidence of the validity of the intended interpretation of the MAP test scores based on the relationships with other variables was evaluated through the correlations computed between the ELA, Mathematics, and Science scale scores. The student scores were found to be highly, but not perfectly, related to each other, suggesting that while different constructs are being measured, the two assessments may also be tapping into a similar knowledge base or general underlying ability. When considering the Missouri Learning Standards and the percentage of students classified in *Proficient* or above levels, based on MAP cut scores for ELA and Mathematics, the MAP assessments are in alignment with the National Assessment of Educational Progress (NAEP), supporting the evidence of the relationship between the state and the national assessments in these content areas. In addition, test fairness was evaluated through differential item functioning analysis and analysis of differences in test performance among subgroups (refer to Chapter 9 for details).

Finally, the test results are presented in the context of score reports that aid the user in understanding the meaning of the test scores in Chapter 10. Interpretation of the scale scores and performance level scores is discussed in this chapter. The longitudinal test results are also presented in Chapter 10. Monitoring group performance is possible if the test content and the construct measured by the test are comparable from year to year and if the scores are reported on the same scale in multiple years.

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Table E.1: Test Participation Rates: All Students

Grade	Accountable in ELA	Percentage Reportable in ELA	Accountable in Mathematics	Percentage Reportable in Mathematics	Accountable in Science	Percentage Reportable in Science
3	66,476	99.77	66,508	99.93		
4	68,162	99.83	68,220	99.95		
5	69,863	99.82	69,909	99.94	69,900	99.93
6	70,152	99.82	70,153	99.90		
7	68,167	99.78	67,320	99.90		
8	67,010	99.72	55,513*	99.81	66,991	99.81

Note: Grade 8 students had the option of taking Algebra I EOC instead of MAP Mathematics.

Table E.2: Percentage of Students Classified as *Proficient* or *Advanced* in 2018 and 2019 Using Census Data: English Language Arts

Grade	English Language Arts	
	2018	**2019**
3	48.6	48.8
4	50.1	49.3
5	48.0	47.1
6	48.3	46.1
7	43.7	43.8
8	49.0	47.4

Table E.3: Percentage of Students Classified as *Proficient* or *Advanced* in 2018 and 2019 Using Census Data: Mathematics

Grade	Mathematics	
	2018	**2019**
3	47.2	46.2
4	46.1	47.0
5	41.2	40.5
6	41.5	42.8
7	38.2	38.2
8	29.8	29.2

Table E.4: Percentage of Students Classified as *Proficient* or *Advanced* in 2019 Using Census Data: Science

Grade	Science
	2019
5	42.8
8	43.8

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CHAPTER 1: OVERVIEW OF THE MISSOURI ASSESSMENT PROGRAM

This chapter of the Technical Report serves to provide an overview of the Missouri Assessment Program. It describes the program's historical background, purpose, and the uses of the assessment scores. It also includes an overview of the remaining chapters of the current report.

1.1 Overview of the Missouri Assessment Program

The 2019 Missouri Assessment Program (MAP) marked the second administration of the grade-level English Language Arts (ELA) and Mathematics assessments aligned to the Revised MLS and the first year of the Science MAP tests aligned to the new Missouri Science standards. The MAP assessments are designed to measure students' knowledge of English Language Arts, Mathematics, and Science. This report provides a technical overview of the English Language Arts, Mathematics, and Science assessments for the 2018–19 MAP. As such, it presents evidence for the validity of the intended interpretation of the 2018–19 MAP scores.

The Spring 2019 MAP ELA Grades 3, 5, 6, and 7 assessments included two online operational test forms; multiple test forms were administered in ELA Grades 4 and 8, each containing a different writing prompt. Mathematics assessments in Grades 3 through 8 and Science assessments in Grades 5 and 8 included two online operational test forms per grade. In addition, Braille and Large Print test forms were constructed for each grade and content area to enable visually impaired students to participate in MAP testing. Table 1.1 provides an overview of the number of 2018–19 MAP ELA, Mathematics, and Science test forms per grade.

1.2 Historical Background

The MAP traces its origin to the 1993 Outstanding Schools Act. This act required that Missouri create a statewide assessment system that measured challenging academic standards. From this act, grade-span assessments were created that measured Missouri's Show-Me Standards, approved by the Missouri State Board of Education in 1996. Originally, the MAP was designed to be a grade-span test: Grades 3, 7, and 11 in Communication Arts; Grades 4, 8, and 10 in Mathematics; and Grades 3, 7, and 10 in Science. The grade-span assessments were administered from the 1997–98 school year through the 2004–05 school year.

Starting in the 2005–06 test administration and in compliance with the federal No Child Left Behind (NCLB) legislation, the MAP was expanded to include grade-level testing for Communication Arts and Mathematics and grade-span testing for Science. The Communication Arts and Mathematics assessments were administered in Grades 3 through 8 from 2005–06 through 2013–14. The Science assessments were administered in Grades 5 and 8 from 2007–08 through 2016–17. During these administration years, the test scale scores were reported on Missouri custom scales and students were classified into performance levels based on the cut scores set in 2005 for Communication Arts and Mathematics and in 2008 for Science.

New ELA and Mathematics assessments for Grades 3 through 8, aligned to the new Missouri Learning Standards, were developed for the 2014–15 administration. These assessments were built as fixed forms using Smarter Balanced Assessment Consortium's (SBAC) computer-adaptive item

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bank. The 2014–15 test scores were reported on new scales, and students were classified into performance levels based on the cut scores established by SBAC on their computer-adaptive item bank.

The MAP tests underwent another change in the 2015–16 administration for ELA and Mathematics Grades 3–8. These assessments were developed using DRC's College- and Career-Ready item pools. These assessments were not statistically linked to the previous scales. Instead, new reporting scales for the ELA and Mathematics tests were established after the Spring 2016 test administration, and the new performance level cut scores were set for these assessments in Summer 2016. The test forms administered in Spring 2016 were reused in Spring 2017, and no changes were made to the test scales or performance level cut scores. These scales were discontinued after two administration years.

The revised MLS were approved in Spring 2016 for implementation in the 2016–17 academic year and for assessment beginning in the 2017–18 school year. New ELA and Mathematics assessments aligned to the revised MLS were developed for the 2017–18 administration year. These assessments were constructed using items from the previous MAP assessments (from DRC's College- and Career-Ready item pools) and items owned by Missouri, which were written by Missouri educators and field-tested in Missouri in Spring 2017. New reporting scales were developed for ELA and Mathematics after the Spring 2018 test administration, and new performance level cut scores were set for these tests in Summer 2018.

The 2018–19 ELA and Mathematics tests were developed using items from the Spring 2018 assessments (from DRC's College- and Career-Ready item pools) and Missouri-owned items, written by Missouri educators and field-tested in Missouri in Spring 2018. The items from the Spring 2018 test administration served as the linking items to place the Spring 2019 test forms onto the Missouri reporting scales, which were developed after the Spring 2018 administration. The set of cut scores used in Spring 2018 reporting was also used to classify students into performance levels after the Spring 2019 test administration. As such, the Spring 2019 ELA and Mathematics scale scores and performance level scores are directly comparable to the scores from the Spring 2018 administration.

New MLS Grade Level Expectations (GLE) for Science were approved for implementation in the 2017–18 academic year and for assessment beginning in the 2018–19 school year. New Science assessments aligned to the new MLS GLE were developed for the 2018–19 administration year. These assessments were constructed using Missouri-owned items, written by Missouri educators and field-tested in Missouri in Spring 2018. New reporting scales were developed for Science after the Spring 2019 test administration and new performance level cut scores were set for these tests in Summer 2019.

Table 1.2 shows a high-level time line of the ELA, Mathematics, and Science operational test administration history, including the transition from grade-span to grade-level assessment. Additional information on the past MAP assessments may be found in previous Missouri grade-level assessment technical reports at http://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials.

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1.3 Purpose of the Missouri Assessment Program

The MAP ELA, Mathematics, and Science tests are designed to measure how well students acquire the skills and knowledge described in the Missouri Learning Standards. The assessments yield information on academic achievement at the student, class, school, district, and state levels. This information is used to diagnose individual student knowledge and skills in relation to the instruction and to gauge the overall quality of education throughout Missouri.

1.4 Uses of the Assessment

The validity of an interpretation of a test score ultimately rests on how that assessment and test score is used and the information that supports such uses. To understand whether a test score is being used properly, it is necessary to first understand the purpose of the test. The intended uses of the MAP ELA, Mathematics, and Science scores include the following:

- evaluating students' academic achievement
- communicating expectations for all students
- evaluating school-, district-, and state-level programs
- informing stakeholders (teachers, school administrators, district administrators, DESE staff members, parents, and the public) about the status of the progress toward meeting the academic achievement standards of the state
- meeting the requirements of the state's accountability program, the Missouri School Improvement Program

This Technical Report refers to the use of the test-level scores: scale scores, performance levels, as well as reporting category scale scores.

1.4.1 Test-Level Scores

At the test level, an overall scale score that is based on student performance on the entire test is reported. In addition, an associated level of performance is reported. These scores indicate, in varying ways, a student's achievement in ELA, Mathematics, or Science. Test-level scores are reported at four levels: the state, the school district, the school, and the student.

The following sections discuss two types of test-level scores that are reported in order to indicate a student's achievement on the ELA, Mathematics, and Science MAP: (1) the scale score and (2) the performance level, which is derived from the scale score.

Scale Scores

A scale score indicating a student's total performance is determined for ELA, Mathematics, and Science on the MAP. The overall scale score for a content area quantifies the achievement being measured by the test in a given content area. In other words, the scale score represents the student's degree of performance, where higher scale scores indicate higher performance levels on the test and lower scale scores indicate lower performance levels.

Performance Levels

A student's performance on the ELA, Mathematics, or Science MAP is reported in one of four performance levels: *Below Basic*, *Basic*, *Proficient*, or *Advanced*. The cut scores for the ELA and

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Mathematics performance levels were recommended by Missouri educators at the performance level setting workshop in July 2018, after the Spring 2018 test administration. The cut scores for the Science performance levels were recommended by Missouri educators during the performance level setting in July 2019, after the Spring 2019 test administration.

The cut scores reflect the expectations of Missouri educators and citizens regarding what Missouri students should know and be able to do in ELA, Mathematics, and Science. (See Chapter 8 of this report for a discussion of the MAP performance level settings.)

Therefore, the MAP performance levels reflect the performance standards and abilities intended by the Missouri legislature, Missouri teachers, Missouri citizens, and DESE. Descriptions of each performance level, in terms of what a student should know and be able to do, are provided with the *Guide to Interpreting Results* (see also Chapter 10).

Use of Test-Level Scores

The MAP scale scores and performance levels provide summary evidence of student performance in ELA, Mathematics, and Science. Classroom teachers may use these scores as evidence of student performance in these content areas. At the aggregate level, district and school administrators may use this information for activities such as curriculum planning. The results presented in this Technical Report provide evidence that the scale scores are valid and reliable indicators of student performance in ELA, Mathematics, and Science.

1.4.2 Reporting Category Scale Scores

The reporting category subscores indicate student performance on a content domain (or a reporting category) and can be interpreted in the same way as the total test scores. That is, these scores represent student performance on the set of items measuring a given domain (or combined domains) of ELA, Mathematics, and Science. Higher scale scores indicate higher performance on the items measuring a reporting category, and lower scale scores indicate lower performance. The scale scores are computed for content domains measured by at least 6 items, yielding a minimum of 8 raw score points. Because the reporting category scale scores are on the same scale as the total test scores, the reporting category scale score and a student's performance on the items included in that reporting category can be evaluated against the total test *Proficient* cut score value.

Use of the Reporting Category Scale Scores

The purpose of reporting category scale scores is to show the relationship between the overall performance being measured (represented by the total test score) and the skills within each of the reporting categories associated with the content area. While the reporting category scores should be interpreted with caution due to the relatively small number of items measuring each category, teachers may use these scores as indicators of individual student strengths and needs. It is recommended that these scores be used in conjunction with other evidence of student achievement, such as homework, class participation, other diagnostic test scores, or observation. Chapters 3 and 4 of this Technical Report provide evidence of content validity that supports the use of the reporting category scores. Chapter 9 of this Technical Report provides evidence of construct validity that further supports the use of these scores.

District and school administrators may compare their results by reporting category and grade level with the state results to better understand student performance within a particular content area and

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grade level. Caution should be exercised when comparing reporting category scores across years because of the relatively small number of items measuring each category, which may result in lower reliability of these scores as compared to the total test scores.

1.5 Overview of the Report

This Technical Report documents in the subsequent chapters the major activities of the testing cycle. This report provides comprehensive details confirming that the processes and procedures applied in the ELA, Mathematics, and Science MAP adhere to appropriate professional standards and practices of educational assessment. Ultimately, this report serves to document evidence that valid inferences about Missouri student performance can be derived from the MAP. An overview of major activities documented within this report is provided below.

Validity Framework (Chapter 2)

Chapter 2 of the Technical Report discusses the concept of validity evidence. This Technical Report is composed of evidence that supports the use of the MAP ELA, Mathematics, and Science scores. In Chapter 2, some of the uses of the MAP scores are discussed.

The Content (Chapter 3)

Chapter 3 of the Technical Report provides a high-level description of the content standards being measured by MAP ELA, Mathematics, and Science assessments and detailed descriptions, in the form of a test blueprint, of how the content is being measured. This chapter also provides a rationale for how blueprints were constructed and the construct being measured by each blueprint.

Test Development (Chapter 4)

Chapter 4 of the Technical Report provides an overview of the test design and a summary of the test development activities that occurred to create the Spring 2019 operational test forms. This chapter also addresses how item alignment was measured and reports the results of the item alignment study.

Test Administration (Chapter 5)

Chapter 5 of the Technical Report provides a description of the target student population of the students who were eligible to participate in the test. It includes information on the testing calendar, test session structure, test security, and accommodations use. This chapter also serves to describe the processes and activities implemented and information disseminated to help ensure standardized test administration procedures and, thus, uniform test administration conditions for students.

Scoring (Chapter 6)

Chapter 6 of the Technical Report describes the processes and activities for autoscoring technology-enhanced, short-answer, multi-select, and evidence-based selected-response items and for hand-scoring constructed-response items and writing prompts. This chapter also discusses the measures for training raters and for ensuring consistency among scorers. Finally, this chapter presents the results of the inter-rater reliability studies.

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Psychometric Analyses (Chapter 7)

Chapter 7 of the Technical Report includes a detailed description of the operational analyses of the Spring 2019 ELA, Mathematics, and Science MAP, which are composed of three major parts: the classical item analysis; calibration, equating, and scaling using item response theory (IRT) models; and student scoring. This chapter also describes the demographics of the calibration samples and compares them to the state census data. It reports the results of the classical item analysis as well as the results of the calibration, equating, and scaling.

Performance Level Setting (Chapter 8)

Chapter 8 of the Technical Report provides an overview of the performance level setting procedures and the setting of cut scores used to classify students into performance levels for ELA, Mathematics, and Science.

Studies of Reliability and Construct-Related Validity (Chapter 9)

Chapter 9 of the Technical Report provides evidence of the reliability and validity of the intended interpretation of the ELA, Mathematics, and Science scores. This chapter provides detailed results of the reliability of the tests, including classical measures of test reliability for the total population and by subgroup, standard error of measurement for the total population and by subgroup, conditional standard error of measurement, and classification accuracy and consistency for the total population and by subgroup. This chapter also includes a test dimensionality analysis; analyses by reporting category, including the reporting category reliability and standard error of measurement; analysis of the relationship between the total test scores for the students who took more than one MAP test; and analysis of the relationship between the reporting category scores. In addition, the results of differential item functioning are presented and discussed in Chapter 9. Last but not least, the comparability of scale scores and impact data for different subgroups is examined to determine whether large differences exist between demographic groups in Missouri.

Reporting and Results (Chapter 10)

Chapter 10 of the Technical Report includes descriptions of reports provided to end users, including individual student reports and aggregate reports. It also contains information on the results of the Spring 2019 MAP administration. Detailed summary statistics of the total scale scores and performance levels and the reporting category scale scores are provided. Longitudinal results are also presented in this chapter.

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Table 1.1: Spring 2019 Missouri Grade-Level Assessment Program Design

Form Type	Number of Test Forms				
	English Language Arts			Mathematics	Science
	Grades 3, 5, 6, and 7	Grade 4	Grade 8	All Grades	Grades 5 and 8
Regular Operational Form (online)	2	11*	10*	2	2
Braille	1	1	1	1	1
Large Print	1	1	1	1	1
Paper Print-on-Demand	1	1	1	1	1

*Each of the writing prompts in Grades 4 and 8 was administered with either Form A or B. The number of forms in these grades reflects the number of combinations of core forms A or B and the writing prompt.

Table 1.2: Time Line of the ELA, Mathematics, and Science MAP Test Administrations

Year	Event
1996	Show-Me Standards approved
1998	First operational administration of Mathematics MAP (Grades 4, 8, and 10)
1999	First operational administration of Communication Arts MAP (Grades 3, 7, and 11) and Science MAP (Grades 4, 8, and 11)
2005	Last year of grade-span MAP
2006	First operational administration of NCLB-compliant Grade-Level Communication Arts and Mathematics MAP (Grades 3 through 8). Standard setting conducted in 2005.
2008	First operational administration of and performance level setting for Science MAP (Grades 5 and 8)
2015	First and last operational administration of MAP based on Common Core State Standards for ELA and Mathematics Grades 3 through 8 under SBAC patronage
2016	First operational administration of and performance level setting for ELA and Mathematics Grades 3 through 8 based on Missouri Learning Standards
2017	Last operational administration of ELA and Mathematics Grades 3 through 8 and Science Grades 5 and 8 based on Missouri Learning Standards
2018	First operational administration of and performance level setting for ELA and Mathematics Grades 3 through 8 based on Revised Missouri Learning Standards
2019	First operational administration of and performance level setting for Science Grades 5 and 8 based on new Missouri Learning Standards for Science

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CHAPTER 2: VALIDITY FRAMEWORK

Validity is the overarching component of the ELA, Mathematics, and Science MAP. The following excerpt is from the *Standards for Educational and Psychological Testing* (hereafter the *Standards*) (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014):

> Ultimately, the validity of an intended interpretation of test scores relies on all the available evidence relevant to the technical quality of a testing system. Different components of validity evidence . . . include evidence of careful test construction; adequate score reliability; appropriate test administration and scoring; accurate score scaling, equating, and standard setting; and careful attention to fairness for all test takers, as appropriate to the test interpretation in question. (p. 22)

As stated by the *Standards,* the validity of a testing program hinges on the interpretation of the test scores. Validity evidence that supports the uses of the MAP test scores is provided in this Technical Report.

The purpose of test score validation is not to validate the test itself, but to validate interpretations of the test scores for particular purposes or actions. Test score validation is not a quantifiable property but an ongoing process, beginning at initial conceptualization and continuing throughout the entire assessment process. Every aspect of an assessment provides evidence in support of (or challenge to) the validity of an intended interpretation of test scores, including design, content specifications, item development, psychometric quality, and inferences made from the results.

2.1 Sources of Validity Evidence

The sources of validity evidence described in the *Standards* (AERA et al. 2014, pp. 26–31) include evidence based on test content, evidence based on response processes, evidence based on internal test structure, evidence based on relationship with other variables, and evidence based on consequences of testing. These sources of validity evidence are briefly described below.

Validity evidence based on test content can be obtained from an analysis of the relationship between the content of a test and the construct it is intended to measure (AERA et al. 2014, p.14). It refers to traditional forms of content validity evidence and is supported by a correspondence between test content and a specification of the content domain. This type of evidence can be demonstrated through consistent adherence to test blueprints, through a high-quality test development process that includes review of items for accessibility to English language learners and students using testing accommodations, and through alignment studies.

Validity evidence based on response process relies to large degree on the evaluation of the cognitive processes of examinees responding to various types of items and the relationship between these processes and the construct being measured. Direct evidence based on response processes typically comes from analyses of individual responses or from test takers from various groups making up the intended test-taking population about their performance strategies or responses to specific items (AERA et al. 2014, p.15). Such evidence can be gathered through cognitive labs conducted as part

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of the field test data analysis. Validity evidence based on response process is also supported by a relationship between the item type, format, and content and the construct being measured. For example, if a test is intended to measure a certain set of skills, it is important to determine whether the items included in the test are, in fact, designed to measure these skills or knowledge. This determination can be made by the content experts through the item review targeted do the actions related to test construct. In addition, evaluation of student written responses (e.g., essays) by test scorers further contributes to the validity evidence based on response processes. In such cases, validity evidence includes the extent to which the processes of item response scorers are consistent with the intended interpretation of scores. For example, scorers are expected to apply particular criteria in scoring students' responses and not be influenced by factors that are irrelevant to the intended interpretation of the scores (AERA et al., 2014, pp. 15–16). Recruitment and training of scorer as well as monitoring the scoring process, contribute to the validity evidence based on response processes.

Validity evidence based on internal test structure refers to the fact that "analyses of the internal structure of a test can indicate the degree to which the relationships among test items and test components conform to the construct on which the proposed test score interpretations are based" (AERA et al., 2014, p. 16). Such analyses may include statistical analyses of items and subscores conducted to investigate the dimensionality of an assessment. Procedures for gathering such evidence may include factor analysis for single assessments and evaluation of the continuity of the construct across grades for vertically scaled assessments. Internal test structure can also be evaluated using indices of measurement precision such as test reliability, decision accuracy and consistency, generalizability coefficients, and standard errors of measurement. Evaluation of the correlation coefficients that measure the relationship between the content strand (domain) scores and studies of whether test items may function differently for different subgroups of students are additional sources of validity evidence based on internal test structure.

Validity evidence based on relationships to other variables refers to "evidence about the degree to which these relationships are consistent with the construct underlying the proposed test score interpretations" (AERA et al., 2014, p. 16). In educational testing, such evidence is often gathered through studies of correlations between the test scores and measures of different or similar constructs. As stated in the Standards (AERA et al., 2014, pp. 16–17), relationships between test scores and other measures intended to assess the same or similar constructs provide convergent evidence, whereas relationships between test scores and measures of different constructs provide discriminant evidence.

Validity evidence based on the consequences of testing is ultimately determined by the stakeholders. Stakeholders decide the purpose and interpretation of scores within their system of reporting and accountability. DRC provides information about test content and technical quality but does not decide the use of test scores. As such, the validity evidence based on consequences of testing is not addressed in this report.

2.2 Summary of Validity Evidence for MAP

In this Technical Report, we present validity evidence related to test content, response processes, internal test structure, and relationship with other variables. Gathering validity evidence related to test consequences is beyond the scope of this Technical Report.

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Chapters 3 through 10 of this Technical Report provide evidence for the uses as well as technical support for some of the interpretations and uses of test scores. As the Technical Report progresses chapter by chapter, it moves through the phases of the testing cycle. Each part of the Technical Report details the procedures and processes applied in the Missouri Assessment Program as well as the test results. Each chapter highlights the meaning and significance of the procedures, processes, and results in terms of validity evidence or a relationship to the *Standards*. A summary of MAP validity evidence as documented in Chapters 3 through 10 is presented here.

Chapter 3 of the Technical Report provides a high-level description of the content standards being measured and a description of how the content is being measured on the MAP English Language Arts, Mathematics, and Science tests. This chapter documents evidence of the content-related validity demonstrated through each MAP assessment's consistent adherence to the assessment blueprints, which were constructed by Missouri educators based on the Missouri Learning Standards.

Chapter 4 of this report presents the test design and describes the key development tasks related to creating the Spring 2019 Missouri ELA, Mathematics, and Science operational test forms. This chapter documents the involvement of Missouri educators, DESE, and DRC in the test development process. The test development process and the involvement of Missouri educators in that process forms an important part of the validity of the entire Missouri Assessment Program. The knowledge, expertise, and professional judgment offered by Missouri educators ultimately ensures that the content of the MAP forms an adequate and representative sample of appropriate content and that the content forms a legitimate basis upon which to derive valid conclusions about student achievement. The test content and blueprint, described in Chapter 3, as well as the item and test development activities, described in Chapter 4, explain how specific development processes provide evidence in support of the validity of an intended interpretation of test scores, primarily based on the test content and through the use of expert professional judgment from Missouri educators and from DRC test development specialists. The foundational documents—test blueprints and test designs—developed and approved during the initial phases of test development served as critical guides throughout the development and field-testing of items. These documents contributed to ensuring that each form of the test accurately measured the content in consistent and stable ways, thus providing evidence supporting the test's score use as an indicator of student achievement of state standards.

Chapters 3 and 4 together provide evidence to support the validity of an intended interpretation of test scores based on test content of the Missouri Assessment Program and address AERA, APA, & NCME (2014) Standards 3.1, 3.2, 3.9, 4.0, 4.1, 4.7, and 4.12.

Chapter 5 of the Technical Report describes the Missouri student population as well as the processes, procedures, and policies that guided the administration of the MAP, including accommodations, security, and written procedures provided to test administrators and school personnel. The following AERA, APA, & NCME (2014) Standards are addressed: 4.15, 4.16, 6.1, 6.2, 6.4, 6.6, 6.7, and 7.2. The process, procedures, and policies detailed in this section contribute to the validity of an intended interpretation of test scores by reducing the impact of construct-irrelevant variables (e.g., nonstandard administration methods, limitations associated with student disabilities, security breaches) on test performance.

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Chapter 6 of the Technical Report demonstrates adherence to AERA, APA, & NCME (2014) Standards 4.18, 4.20, 6.8, and 6.9. It describes how MC, MS, EBSR, SA, and TE items were autoscored, and how constructed-response and writing prompt items were scored by human readers. The handscoring process, the training and selection of readers, and the validation process used to monitor scoring accuracy are discussed and support the validity of an intended interpretation of test scores based on the response processes. The procedures described in this section contribute to the evidence of the validity of an intended interpretation of test scores of the Missouri Assessment Program by preventing hardware- or software-related errors in machine scoring and reducing construct-irrelevant score variance associated with variations in readers' interpretation and application of scoring rubrics for handscored items.

Chapter 7 describes the test data used for the classical and Item Response Theory (IRT) item and test analysis, including item calibration, test equating, and test scaling. The calibration, equating, and scaling methods as well as the processes and procedures for deriving scale scores from response patterns are also described in this chapter of the Technical Report. Some references to introductory and advanced discussions of IRT are provided. Several axes upon which to evaluate the calibration, equating, and scaling procedures, such as the models and data used, the software applied, the vertical relationship across grades, the estimation of parameters, the fit, the standard error of measurement, and the IRT scoring method, are discussed. Chapter 7 of this report addresses AERA, APA, & NCME (2014) Standards 1.8, 4.14, 5.2, 5.13, and 5.15. These processes and procedures contribute to the validity of an intended interpretation of test scores of the ELA, Mathematics, and Science assessments by providing the opportunity to evaluate items contributing to the accurate and reliable measurement of the intended constructs and by ensuring the stability of the Missouri assessments. The results of the psychometric analyses contribute to the validity evidence based on the internal test structure.

Chapter 8 of the Technical Report provides a summary of the MAP performance level setting for ELA and Mathematics, conducted in July 2018, and for Science, conducted in July 2019, during which the cut scores were set for the three content areas. The process of the performance level setting adhered to AERA, APA, & NCME (2014) Standards 5.21 and 5.22, providing evidence of the procedural validity of the standard setting process, methodology, and outcomes.

Chapter 9 demonstrates adherence to AERA, APA, & NCME (2014) standards through the analyses of the reliability of the Spring 2019 ELA, Mathematics, and Science assessments. It presents a reliability analysis using Cronbach's alpha, standard error of measurement and conditional standard error of measurement results, and a detailed analysis of classification consistency and classification accuracy for the total student population and by subgroup. These analyses address AERA, APA, & NCME (2014) Standards 2.0, 2.3, 2.11, 2.13, 2.14, 2.16, and 2.19. The results of the reliability studies indicate that the MAP tests produce scores that would be relatively stable if the test were administered repeatedly under similar conditions. Reliability is a prerequisite to score validity, and the analyses in that chapter contribute to the evidence of the validity of an intended interpretation of test scores based on the internal test structure by establishing the reliability of the ELA, Mathematics, and Science scores and proficiency classifications.

Additional evidence of the construct-related validity based on the internal test structure was gathered through the analysis of the relationships among test items and test components that conform to the test construct, which in turn provide a basis for test score interpretation. The

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assumption that the content area MAP tests were unidimensional (that is, each grade-level test measured one primary dimension) was confirmed through principal component analysis. In addition, the relationship between the content area reporting category subscores was explored and validated through the measures of correlations between the reporting category scores within a content area. These analyses addressed AERA, APA, & NCME (2014) Standards 1.13 and 1.21.

The relationship between the MAP scale scores and other variables was examined to provide evidence of the construct validity based on the relationships with other variables. These analyses included measures of cross-content correlations of the ELA, Mathematics, and Science scores for the total population and by subgroups, cross-content correlations of the ELA, Mathematics, and Science subcategory scores, comparisons of student performance on the MAP with student performance on the National Assessment of Educational Progress (NAEP), and evaluation of the student performance on ELA and MAP Mathematics assessments in relation to the Lexile and Quantile measures. These analyses are in alignment with multiple best practices of the testing industry (AERA et al., 2014).

Additional metrics with which the validity of an intended interpretation of test scores of the ELA, Mathematics, and Science assessments was examined included evaluation of the performance of subgroups of students on the test and on the individual test items. As described in Chapter 9, the issue of item and test fairness is considered during the item development, item review, and test form construction processes and is formally assessed through an analysis of differential item functioning. It is possible for items to function differently across different population groups, and it is also possible that results for an item do not reflect student ability but instead reflect irrelevant information influenced by demographic factors. The DIF analysis serves to determine whether that possibility occurred and, if so, to what degree, item by item, for each of the categories of gender and race/ethnicity as well as for students using testing accommodations. The evaluation of item and test fairness addresses AERA, APA, & NCME (2014) Standards 3.1 through 3.6.

The last chapter of the Technical Report contains information on the results of the Spring 2019 administration and longitudinal data trends for all content areas. Chapter 10 also provides descriptions of the score reports and interpretive guide. AERA, APA, & NCME (2014) Standards 5.1, 6.10, 7.0, and 12.18 are addressed in Chapter 10.

Taken together, the sound process for the test development, standardized test administration, reliable scoring of test items, performance level setting, and the results of the psychometric analyses provide substantial evidence of the validity of the MAP test scores. However, it should be noted that while the information in Chapters 3 through 10 provides a firm foundation of evidence that the MAP tests measure what they are intended to measure, this Technical Report cannot anticipate all possible interpretations and uses of the MAP ELA, Mathematics, and Science scores. It is recommended that policy and program evaluation studies, in accordance with the *Standards* (AERA et al., 2014), be conducted to support some of the uses of the ELA, Mathematics, and Science scores.

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CHAPTER 3: THE CONTENT

This chapter of the Report provides a high-level description of the Missouri content standards and a description of how those content standards are being measured on the MAP English Language Arts, Mathematics, and Science tests. Content-related evidence of the validity of the intended score interpretations in MAP testing is supported by the degree of correspondence or alignment between the assessments and the specifications of the standards that are assessed (i.e., what students should know and be able to do at a given grade and content area). In this chapter, evidence of content-related validity is demonstrated through each MAP assessment's consistent adherence to the assessment blueprints, which were constructed by Missouri educators based on the Missouri Learning Standards (MLS).

According to the most recent edition of the *Standards for Educational and Psychological Testing* (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014), "validity refers to the degree to which evidence and theory support the interpretations of test scores for proposed uses of tests" (p. 11). As stated above, essential validity evidence supporting the development of the MAP Grade-Level assessments is well documented through the item and test development process, including the review of the assessment items for alignment to the MLS that the MAP measures.

The information found in this chapter provides an overview of the MLS and the process used for the development of the blueprints for ELA and Mathematics assessments in Grades 3–8 and Science Grades 5 and 8. This chapter also includes a description of the involvement of educators, which serves to demonstrate adherence to AERA, APA, & NCME (2014) Standards 4.1 and 4.12.

3.1 Missouri Learning Standards

The MAP Grade-Level assessments are summative assessments that measure students' progress toward mastery of the Missouri Learning Standards (MLS) in ELA and Mathematics in Grades 3–8 and Science Grades 5 and 8. The MLS focus on ensuring that students learn basic and higher-order skills, including problem-solving and critical thinking. The standards are relevant to the real world and reflect the knowledge and skills students need to achieve their goals.

In 2014, Missouri legislators passed House Bill 1490, which mandated the development of the Missouri Learning Standards. In April 2016, the latest iteration of expectations aligned to the Show-Me Standards was adopted by the State Board of Education. These Missouri Learning Standards, as measured by MAP Grade-Level Assessments, are generally defined as the knowledge and skills that are identified within the Grade-Level Expectations (GLE) that provide grade-by-grade targets for instruction for educators. These targets are based on prior consensus among leading Missouri educators, including postsecondary faculty, curriculum experts, experienced subject-matter experts, and other stakeholders, as to what is important for teachers to teach as outlined by the Show-Me Standards (1996). As such, the standards measured in MAP Grade-Level Assessments are designed to help prepare students with the knowledge and skills they need to succeed in their future education and/or training after high school. A summary of the current Missouri Learning Standards measured in each MAP Grade-Level Assessment is provided for ELA, Mathematics, and Science in Tables

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3.1, 3.2, and 3.3, respectively. Detailed information on the Missouri Learning Standards can also be found at https://dese.mo.gov/college-career-readiness/curriculum/missouri-learning-standards.

3.2 Development of Test Blueprint and Specifications

AERA, APA, & NCME (2014) Standard 4.1 states the following:

> Test specifications should describe the purpose(s) of the test, the definition of the construct or domain measured, the intended examinee population, and interpretations for intended uses. The specifications should include a rationale supporting the interpretations and uses of test results for the intended purpose(s). (p. 85)

The key structural aspect of the MAP Grade-Level Assessments for ELA, Math and Science is the assessment blueprint that specifies the target score points for each grade and content strand or domain. These assessment blueprints were developed by a team of Missouri educators (eighteen educators per content area) selected by DESE. In August 2016, this team scrutinized the GLEs and made recommendations for the test content blueprint for each grade and content area, seeking to ensure optimal content coverage of the Missouri Learning Standards. For each content area, two panels of approximately nine participants reviewed a set of blueprints for each relevant grade band or grade level. Each group made recommendations, shared those with the larger content area group, and made refinements to improve the articulation across all grades. A follow-up meeting was held with DESE and DRC to discuss each blueprint. The purpose of the meeting was to review the committees' recommendations and refine the blueprints and high-level test designs for ELA, Mathematics, and Science. In general, each blueprint represents content sampling proportions that reflect the intended emphasis in instruction and mastery at each content area and grade level. Specifications for a range of items by standard and item type demonstrated the desired proportions within the summative assessment. In summary, the MAP assessment blueprint at a given grade and content area provides guidance on how the standards are measured. Tables 3.5 to 3.10 show the MAP Grade-Level blueprint for ELA, Tables 3.11 to 3.16 show the blueprint for Mathematics, and Tables 3.17 and 3.18 present the MAP blueprint for Science Grades 5 and 8, respectively. A description of item types included in MAP is presented in Table 3.4.

The degree to which the 2019 MAP operational forms matched the test blueprints can be assessed by comparing the targeted score point distributions defined in the test blueprints in Tables 3.5 through 3.18 with the actual point distributions displayed in Table 3.19 for ELA, Table 3.20 for Mathematics, and Table 3.21 for Science. Actual point distributions on the 2019 MAP operational forms matched blueprint targets within ten percent, which was the tolerance for variation approved by DESE.

3.3 Development Item Specifications

AERA, APA, & NCME (2014) Standard 4.12 states the following:

> Test developers should document the extent to which the content domain of a test represents the domain defined in the test specifications. (p. 89)

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The MAP item specifications are designed to ensure that the assessment items measure the assessment's domains. The purpose of the item specifications is to define the characteristics of the items that will provide the evidence to support one or more domains. To do this, the item specifications delineate the types of evidence that should be elicited for each strand within a grade level. Then, they provide explicit guidance on how to write items in order to elicit the desired evidence.

In doing this, the item specifications provide guidance on how to measure the standards. The item specifications also provide guidelines on how to create items that are specific to each assessment domain or strand. In ELA, Mathematics, and Science, item specifications describe the knowledge, skills, and processes being measured by each of the item types aligned to particular MLS Expectations. These item specifications were developed for each grade level and standard in order to delineate the expectations of the knowledge and skills measured by the items on the MAP tests at each grade.

Missouri educators worked on creating the item specifications upon the approval of new Missouri Learning Standards. These specifications were then used as the road map to guide the development of the items for inclusion in Missouri assessments. In September 2016, Missouri educators from across the state created item specifications that included all Missouri standards or Grade-Level Expectations (GLEs) arranged by domain or strand. Each content-specific grade-band group consisted of eight to ten Missouri educators and one DRC facilitator. The grade bands spanned Grades 3–5 and Grades 6–8 for each content area. Over the course of two weeks, the committees worked in groups to reach consensus about the specification for each Expectation. After the facilitators lead the groups through initial examples of the item specification template, the grade-bands groups were divided into smaller groups (with a representative from each grade level) to work on the item specification for each Expectation. A table leader for each small group lead the discussion of each expectation. A DRC facilitator led the discussion of the item's specification progression and sequencing across the grade levels within each content area and assisted the participants to become comfortable with the process. At the end of the process, the committees reached consensus for the specifications for each GLE.

The following components were described for each Expectation:

- **Expectation Unwrapped** breaks down a list of clearly delineated content and skills the students are expected to know and be able to do upon mastery of the Expectation.
- **Depth of Knowledge (DOK) Ceiling** indicates the highest level of cognitive complexity that would typically be assessed on a large-scale assessment. The DOK ceiling is not intended to limit the complexity one might reach in classroom instruction.
- **Item Format** indicates the types of test questions used in large-scale assessment. For each Expectation, the item format specifies the item type best suited for that particular Expectation.
- **Content Limits/Assessment Boundaries** are parameters that item writers should consider when developing items for a large-scale assessment. For example, some Expectations should not be assessed on a large-scale assessment but are better suited for local assessment.
- **Sample Stems** are examples that address the specific elements of each Expectation and address varying DOK levels. The sample stems provided are in no way intended to limit the

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depth and breadth of possible item stems. The expectation should be assessed in a variety of ways.

As noted in the item specifications, each MAP Grade-Level English Language Arts and Mathematics assessment in Grades 3–8 and Science Grades 5 and 8 included several types of items (see Table 3.4). Additional information regarding item development can be found in Chapter 4, Section 4.3, "Item Development Process."

3.4 Summary

In summary, the overall purpose of this chapter is to provide a high-level description of the content standards being measured and detailed descriptions of how the content is being measured (i.e., test blueprints). This chapter provides the rationale for how blueprints were constructed and an overview of the constructs being measured by each blueprint. The efforts by DESE and DRC in developing the MAP are in alignment with multiple best practices of the test industry but, in particular, support the following AERA, APA, & NCME (2014) standards:

- Standard 4.1—Test specifications should describe the purpose(s) of the test, the definition of the construct or domain measured, the intended examinee population, and interpretations for intended uses. The specifications should include a rationale supporting the interpretations and uses of test results for the intended purpose(s).
- Standard 4.12—Test developers should document the extent to which the content domain of a test represents the domain defined in the test specifications.

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Table 3.1: English Language Arts Standards

Grade 3	
Strand/Domain	**Theme/Big Idea Description**
Reading	Develop and apply skills to the reading process.
	Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama from a variety of cultures and times.
	Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction (e.g., narrative, information/explanatory, opinion, persuasive, argumentative) from a variety of cultures and times.
Writing	Apply a writing process to develop a text for audience and purpose.
	Compose well-developed writing texts for audience and purpose.
	Gather, analyze, evaluate, and use information from a variety of sources.
Language	Communicate using conventions of English language.
Speaking and Listening	Listen for a purpose.
Grade 4	
Strand/Domain	**Theme/Big Idea Description**
Reading	Develop and apply skills to the reading process.
	Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama from a variety of cultures and times.
	Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction (e.g., narrative, information/explanatory, opinion, persuasive, argumentative) from a variety of cultures and times.
Writing	Apply a writing process to develop a text for audience and purpose.
	Compose well-developed writing texts for audience and purpose.
	Gather, analyze, evaluate, and use information from a variety of sources.
Language	Communicate using conventions of English language.
Speaking and Listening	Listen for a purpose.
Grade 5	
Strand/Domain	**Theme/Big Idea Description**
Reading	Develop and apply skills to the reading process.
	Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama from a variety of cultures and times.
	Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction (e.g., narrative, information/explanatory, opinion, persuasive, argumentative) from a variety of cultures and times.
	Comprehend and analyze words, images, graphics, and sounds in various media and digital forms to impact meaning.
Writing	Apply a writing process to develop a text for audience and purpose.
	Compose well-developed writing texts for audience and purpose.
	Gather, analyze, evaluate, and use information from a variety of sources.
Language	Communicate using conventions of English language.
Speaking and Listening	Listen for a purpose.

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Table 3.1: English Language Arts Standards (cont.)

Grade 6	
Strand/Domain	**Theme/Big Idea Description**
Reading Literary Text	Comprehend and Interpret Texts (Approaching Texts as a Reader)
	Analyze Craft and Structure (Approaching Texts as a Writer)
	Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)
Reading Informational Text	Comprehend and Interpret Texts (Approaching Texts as a Reader)
	Analyze Craft and Structure (Approaching Texts as a Writer)
	Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)
Writing	Approaching the Task as a Researcher
	Approaching the Task as a Writer
	Approaching the Task as a Reader
Speaking and Listening	Collaborating
Grade 7	
Strand/Domain Description	**Theme/Big Idea Description**
Reading Literary Text	Comprehend and Interpret Texts (Approaching Texts as a Reader)
	Analyze Craft and Structure (Approaching Texts as a Writer)
	Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)
Reading Informational Text	Comprehend and Interpret Texts (Approaching Texts as a Reader)
	Analyze Craft and Structure (Approaching Texts as a Writer)
	Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)
Writing	Approaching the Task as a Researcher
	Approaching the Task as a Writer
	Approaching the Task as a Reader
Speaking and Listening	Collaborating
Grade 8	
Strand/Domain Description	**Theme/Big Idea Description**
Reading Literary Text	Comprehend and Interpret Texts (Approaching Texts as a Reader)
	Analyze Craft and Structure (Approaching Texts as a Writer)
	Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)
Reading Informational Text	Comprehend and Interpret Texts (Approaching Texts as a Reader)
	Analyze Craft and Structure (Approaching Texts as a Writer)
	Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)
Writing	Approaching the Task as a Researcher
	Approaching the Task as a Writer
	Approaching the Task as a Reader
Speaking and Listening	Collaborating

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Table 3.2: Mathematics Standards

Grade 3	
Domain	**Cluster Description**
Number Sense and Operations in Base Ten	NBT.A. Use place value understanding and properties of operations to perform multi-digit arithmetic.
Number Sense and Operations in Fractions	NF.A. Develop understanding of fractions as numbers.
Relationships and Algebraic Thinking	RA.A. Represent and solve problems involving multiplication and division.
	RA.B. Understand properties of multiplication and the relationship between multiplication and division.
	RA.C. Multiply and divide within 100.
	RA.D. Use the four operations to solve word problems.
	RA.E. Identify and explain arithmetic patterns.
Geometry and Measurement	GM.A. Reason with shapes and their attributes.
	GM.B. Solve problems involving the measurement of time, liquid volumes and weights of objects.
	GM.C. Understand concepts of area.
	GM.D. Understand concepts of perimeter.
Data and Statistics	DS.A. Represent and analyze data.

Grade 4	
Domain	**Cluster Description**
Number Sense and Operations in Base Ten	NBT.A. Use place value understanding and properties of operations to perform multi-digit arithmetic with numbers up to one million.
Number Sense and Operations in Fractions	NF.A. Extend understanding of fraction equivalence and ordering. (Limit denominators to 2, 3, 4, 5, 6, 8, 10, 12 and 100.)
	NF.B. Extend understanding of operations on whole numbers to fraction operations.
	NF.C. Understand decimal notation for fractions, and compare decimal fractions. (Denominators of 10 or 100.)
Relationships and Algebraic Thinking	RA.A. Use the four operations with whole numbers to solve problems.
	RA.B. Work with factors and multiples.
	RA.C. Generate and analyze patterns.
Geometry and Measurement	GM.A. Classify 2-dimensional shapes by properties of their lines and angles.
	GM.B. Understand the concepts of angle and measure angles.
	GM.C. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Data and Statistics	DS.A. Represent and analyze data.

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Table 3.2: Mathematics Standards (cont.)

Grade 5	
Domain	**Cluster Description**
Number Sense and Operations in Base Ten	NBT.A. Use place value system understanding to perform operations with multi-digit whole numbers to billions and decimals to thousandths.
Number Sense and Operations in Fractions	NF.A. Understand the relationship between fractions and decimals (denominators that are factors of 100.)
	NF.B. Perform operations and solve problems with fractions and decimals.
Relationships and Algebraic Thinking	RA.A. Represent and analyze patterns and relationships.
	RA.B. Write and interpret numerical expressions.
	RA.C. Use the four operations to represent and solve problems.
Geometry and Measurement	GM.A. Classify two- and three-dimensional geometric shapes.
	GM.B. Understand and compute volume.
	GM.C. Graph points on the Cartesian coordinate plane within the first quadrant to solve problems.
	GM.D. Solve problems involving measurement and conversions within a measurement system.
Data and Statistics	DS.A. Represent and analyze data.
Grade 6	
Domain	**Cluster Description**
Ratios and Proportional Relationships	RP.A. Understand and use ratios to solve problems.
Number Sense and Operations	NS.A. Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
	NS.B. Compute with non-negative multi-digit numbers, and find common factors and multiples.
	NS.C. Apply and extend previous understandings of numbers to the system of rational numbers.
Expressions, Equations and Inequalities	EEI.A. Apply and extend previous understandings of arithmetic to algebraic expressions.
	EEI.B. Reason about and solve one-variable equations and inequalities.
	EEI.C. Represent and analyze quantitative relationships between dependent and independent variables.
Geometry and Measurement	GM.A. Solve problems involving area, surface area and volume.
Data Analysis, Statistics and Probability	DSP.A. Develop understanding of statistical variability.
	DSP.B. Summarize and describe distributions.

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Table 3.2: Mathematics Standards (cont.)

Grade 7	
Domain	**Cluster Description**
Ratios and Proportional Relationships	RP.A. Analyze proportional relationships and use them to solve problems.
Number Sense and Operations	NS.A. Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.
Expressions, Equations and Inequalities	EEI.A. Use properties of operations to generate equivalent expressions.
	EEI.B. Solve problems using numerical and algebraic expressions and equations.
Geometry and Measurement	GM.A. Draw and describe geometrical figures and describe the relationships between them.
	GM.B. Apply and extend previous understanding of angle measure, area and volume.
Data Analysis, Statistics and Probability	DSP.A. Use random sampling to draw inferences about a population.
	DSP.B. Draw informal comparative inferences about two populations.
	DSP.C. Develop, use and evaluate probability models.

Grade 8	
Domain	**Cluster Description**
Number Sense and Operations	NS.A. Know that there are numbers that are not rational, and approximate them by rational numbers.
Expressions, Equations and Inequalities	EEI.A. Work with radicals and integer exponents.
	EEI.B. Understand the connections between proportional relationships, lines and linear equations.
	EEI.C. Analyze and solve linear equations and inequalities and pairs of simultaneous linear equations.
Geometry and Measurement	GM.A. Understand congruence and similarity using physical models, transparencies or geometry software.
	GM.B. Understand and apply the Pythagorean Theorem.
	GM.C. Solve problems involving volume of cones, pyramids and spheres.
Data Analysis, Statistics and Probability	DSP.A. Investigate patterns of association in bivariate data.
Functions	F.A. Define, evaluate and compare functions.
	F.B. Use functions to model relationships between quantities.

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Table 3.3: Science Standards

Grade 5	
Domain	**Cluster Description**
Physical Science	Matter and Its Interactions
	Motion and Stability: Forces and Interactions
	Energy
	Waves and Their Applications in Technologies for Information Transfer
Life Science	From Molecules to Organisms: Structure and Processes
	Ecosystems: Interactions, Energy, and Dynamics
	Heredity: Inheritance and Variation of Traits
Earth Science	Earth's Place in the Universe
	Earth's Systems
	Earth and Human Activity
Grade 8	
Domain Description	**Cluster Description**
Physical Science	Matter and Its Interactions
	Motion and Stability: Forces and Interactions
	Energy
	Waves and Their Applications in Technologies for Information Transfer
Life Science	From Molecules to Organisms: Structure and Processes
	Ecosystems: Interactions, Energy, and Dynamics
	Biological Evolution: Unity and Diversity
Earth Science	Earth's Place in the Universe
	Earth's Systems
	Earth and Human Activity

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Table 3.4: Item Type Descriptions for Items on the MAP Grade-Level Assessment

Item Type	Name	Description
CR	Constructed Response	Each constructed-response item requires the student to generate the content of his/her response to the problem or question provided in the item rather than selecting the response from options supplied within the item. These items are human-scored. These items are worth two or three points depending on the content area and grade level.
EBSR	Evidence-Based Selected-Response	Each evidence-based selected-response item has two parts and is designed to elicit an evidence-based response from a student. In part one, which is similar to a multiple-choice item, the student shows understanding of a skill or concept by choosing the best answer from four response options. In part two, the student selects one or more answers that provide evidence for the response to part one. Each of these items is worth one or two points.
MC	Multiple Choice	Each multiple-choice item has four response options, only one of which is correct. Multiple-choice items are used to assess a variety of skill levels, from short-term recall of information to inference and problem solving. Each of these items is worth one point.
MS	Multiple Select	Each multiple-select item requires a student to evaluate information presented and respond by choosing two or more correct responses. Multiple-select items can be used to assess multiple skills and concepts in a given content area.
PE	Performance Event	Each performance event requires a student to demonstrate the ability to apply his/her knowledge and higher-order thinking skills to explore and analyze a complex scenario. This type of item is on the mathematic assessment and is worth 3 or 4 points, depending on the grade level. This item type is human-scored.
SA	Short Answer	Each short-answer item requires a student to enter a short numeric or algebraic response. These items are designed to assess a student's ability to formulate a solution to a pure or applied math problem without the assistance of response options. The short-answer items are scored on a 0–1-point scale using item-specific autoscoring rules.
TE	Technology Enhanced	Each technology-enhanced item is designed to elicit evidence of a broad range of student understanding. A student interacts with the enhanced features of these computer-delivered, autoscorable test items to show understanding of skills and concepts. Item types such as drag-and-drop, hot-spot, number line and coordinate graphing, data displays, matching interaction, and drop-down menus are just some of the technology-enhanced items presented to a student. The technology-enhanced items are scored on a 0–2-point scale using item-specific scoring rules.
WP	Writing Prompt	Each writing prompt is a passage-based analysis based on a passage or a multiple-passage set that each student has read during the assessment. Both literature and informational texts are addressed through this item type. Students must draw on basic writing skills while inferring and synthesizing information from the passage in order to develop a comprehensive, holistic essay response. The writing prompts are scored using a holistic scoring guideline on a 1–10-point scale. This item type is human-scored.

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Table 3.5: Blueprint for English Language Arts Grade 3

Reporting Category	Strand/ Domain	Literacy	Theme/Big Idea	Item Type	Point Range	Range of Emphasis
Reading	Reading	Literacy	Develop and apply skills to the reading process	MC, MS, EBSR, TE	12-14	21%-25%
			Develop and apply skills and strategies to comprehend, analyze and evaluate fiction, poetry and drama from a variety of cultures and times			
			Comprehend and analyze words, images, graphics, and sounds in various media and digital forms to impact meaning			
		Informational	Develop and apply skills to the reading process	MC, MS, EBSR, TE	12-14	21%-25%
			Develop and apply skills and strategies to comprehend, analyze and evaluate nonfiction (e.g., narrative, information/explanatory, opinion, persuasive, argumentative) from a variety of cultures and times			
			Comprehend and analyze words, images, graphics, and sounds in various media and digital forms to impact meaning			
Research	Writing	Gather, analyze, evaluate and use information from a variety of sources		MC, MS, EBSR, TE	7-9	13%-16%
Writing	Writing	Apply a writing process to develop a text for audience and purpose		MC, MS, EBSR, TE	7-9	13%-16%
	Language	Communicate using conventions of English language		MC, MS, EBSR, TE, WP	5-7	9%-13%
Speaking and Listening	Speaking and Listening	Listen for a purpose		MC, MS, EBSR, TE	7-9	13%-16%
		Listen for entertainment				
		Speak effectively in collaborative discussions				
		Speak effectively when presenting				
Total					56	100%

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Table 3.6: Blueprint for English Language Arts Grade 4

Reporting Category	Strand/ Domain	Literacy	Theme/Big Idea	Item Type	Point Range	Range of Emphasis
Reading	Reading	Literacy	Develop and apply skills to the reading process	MC, MS, EBSR, TE	12-14	21%-25%
			Develop and apply skills and strategies to comprehend, analyze and evaluate fiction, poetry and drama from a variety of cultures and times			
			Comprehend and analyze words, images, graphics, and sounds in various media and digital forms to impact meaning			
		Informational	Develop and apply skills to the reading process	MC, MS, EBSR, TE	12-14	21%-25%
			Develop and apply skills and strategies to comprehend, analyze and evaluate nonfiction (e.g., narrative, information/explanatory, opinion, persuasive, argumentative) from a variety of cultures and times			
			Comprehend and analyze words, images, graphics, and sounds in various media and digital forms to impact meaning			
Research	Writing	Gather, analyze, evaluate and use information from a variety of sources		MC, MS, EBSR, TE	7-9	13%-16%
Writing	Writing	Apply a writing process to develop a text for audience and purpose		MC, MS, EBSR, TE	2	4%
		Compose well-developed writing texts for audience and purpose		WP	8	14%
	Language	Communicate using conventions of English language		MC, MS, EBSR, TE, WP	4	7%
Speaking and Listening	Speaking and Listening	Listen for a purpose		MC, MS, EBSR, TE	7-9	13%-16%
		Listen for entertainment				
		Speak effectively in collaborative discussions				
		Speak effectively when presenting				
Total					56	100%

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Table 3.7: Blueprint for English Language Arts Grade 5

Reporting Category	Strand/ Domain	Literacy	Theme/Big Idea	Item Type	Point Range	Range of Emphasis
Reading	Reading	Literacy	Develop and apply skills to the reading process	MC, MS, EBSR, TE	12-14	21%-25%
			Develop and apply skills and strategies to comprehend, analyze and evaluate fiction, poetry and drama from a variety of cultures and times			
			Comprehend and analyze words, images, graphics, and sounds in various media and digital forms to impact meaning			
		Informational	Develop and apply skills to the reading process	MC, MS, EBSR, TE	12-14	21%-25%
			Develop and apply skills and strategies to comprehend, analyze and evaluate nonfiction (e.g., narrative, information/explanatory, opinion, persuasive, argumentative) from a variety of cultures and times			
			Comprehend and analyze words, images, graphics, and sounds in various media and digital forms to impact meaning			
Research	Writing	Gather, analyze, evaluate and use information from a variety of sources		MC, MS, EBSR, TE	7-9	13%-16%
Writing	Writing	Apply a writing process to develop a text for audience and purpose		MC, MS, EBSR, TE	7-9	13%-16%
	Language	Communicate using conventions of English language		MC, MS, EBSR, TE, WP	5-7	9%-13%
Speaking and Listening	Speaking and Listening	Listen for a purpose		MC, MS, EBSR, TE	7-9	13%-16%
		Listen for entertainment				
		Speak effectively in collaborative discussions				
		Speak effectively when presenting				
Total					56	100%

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Table 3.8: Blueprint for English Language Arts Grade 6

Reporting Category	Strand/ Domain	Literacy	Theme/Big Idea	Item Type	Point Range	Range of Emphasis
Reading	Reading	Literacy	Comprehend and Interpret Texts (Approaching Texts as a Reader)	MC, MS, EBSR, TE	13-15	23%-27%
			Analyze Craft and Structure (Approaching Texts as a Writer)			
			Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)			
		Informational	Comprehend and Interpret Texts (Approaching Texts as a Reader)	MC, MS, EBSR, TE	13-15	23%-27%
			Analyze Craft and Structure (Approaching Texts as a Writer)			
			Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)			
Research	Writing	Approaching the Task as a Researcher		MC, MS, EBSR, TE	7-9	13%-16%
Writing	Writing	Approaching the Task as a Reader		MC, MS, EBSR, TE, WP	8	15%
Speaking and Listening	Speaking and Listening	Collaborating		MC, MS, EBSR, TE	7-9	13%-16%
		Presenting				
Total					56	100%

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Table 3.9: Blueprint for English Language Arts Grade 7

Reporting Category	Strand/ Domain	Literacy	Theme/Big Idea	Item Type	Point Range	Range of Emphasis
Reading	Reading	Literacy	Comprehend and Interpret Texts (Approaching Texts as a Reader)	MC, MS, EBSR, TE	13-15	25%-29%
			Analyze Craft and Structure (Approaching Texts as a Writer)			
			Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)			
		Informational	Comprehend and Interpret Texts (Approaching Texts as a Reader)	MC, MS, EBSR, TE	13-15	25%-29%
			Analyze Craft and Structure (Approaching Texts as a Writer)			
			Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)			
Research	Writing	Approaching the Task as a Researcher		MC, MS, EBSR, TE	7-9	13%-17%
Writing	Writing	Approaching the Task as a Reader		MC, MS, EBSR, TE, WP	7-9	13%-17%
Speaking and Listening	Speaking and Listening	Collaborating		MC, MS, EBSR, TE	7-9	13%-17%
		Presenting				
Total					52	100%

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Table 3.10: Blueprint for English Language Arts Grade 8

Reporting Category	Strand/ Domain	Literacy	Theme/Big Idea	Item Type	Point Range	Range of Emphasis
Reading	Reading	Literacy	Comprehend and Interpret Texts (Approaching Texts as a Reader)	MC, MS, EBSR, TE	13-15	23%-27%
			Analyze Craft and Structure (Approaching Texts as a Writer)			
			Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)			
		Informational	Comprehend and Interpret Texts (Approaching Texts as a Reader)	MC, MS, EBSR, TE	13-15	23%-27%
			Analyze Craft and Structure (Approaching Texts as a Writer)			
			Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)			
Research	Writing	Approaching the Task as a Researcher		MC, MS, EBSR, TE	7-9	13%-16%
Writing	Writing	Approaching the Task as a Writer		WP	8	14%
		Approaching the Task as a Reader		MC, MS, EBSR, TE, WP	4	7%
Speaking and Listening	Speaking and Listening	Collaborating		MC, MS, EBSR, TE	7-9	13%-16%
		Presenting				
Total					56	100%

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Table 3.11: Blueprint for Mathematics Grade 3

Reporting Category	Domain	Cluster	Item Type	Point Range	Range of Emphasis
NBT	Number Sense and Operations in Base Ten	Use place value understanding and properties of operations to perform multi-digit arithmetic	MC, MS, SA, TE	8-10	17%-21%
NF	Number Sense and Operations in Fractions	Develop understanding of fractions as numbers	MC, MS, SA, TE	8-10	17%-21%
RA	Relationships and Algebraic Thinking	Represent and solve problems involving multiplication and division	MC, MS, SA, TE	8-18	17%-36%
		Understand properties of multiplication and the relationship between multiplication and division			
		Multiply and divide within 100			
		Use the four operations to solve word problems			
		Identify and explain arithmetic patterns			
GM & DS	Geometry and Measurement	Reason with shapes and their attributes	MC, MS, SA, TE	7-16	14%-32%
		Solve problems involving the measurement of time, liquid volumes and weights of objects			
		Understand concepts of area			
		Understand concepts of perimeter			
	Data and Statistics	Represent and analyze data			
Performance Event: Each year the performance event (PE) may align to any specific reporting category. The Grade 3 PE contains multiple SR and/or TE items.			PE	6	13%
Total				48	100%

Performance Event (PE): Each year the operational PE may align to any specific Domain or to a group of Domains, so the number of points coming from each Domain (and therefore each Reporting Category) may change from year to year.
The Grade 3 OP PE in 2019 contains multiple MC, MS, SA, and/or TE items and is worth 6 operational points.
The Grade 3 OP PE in 2020 will be a single handscored PE item and will be worth 3 operational points, so 2 OP PEs will be needed per form.

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Table 3.12: Blueprint for Mathematics Grade 4

Reporting Category	Domain	Cluster	Item Type	Point Range	Range of Emphasis
NBT	Number Sense and Operations in Base Ten	Use place value understanding and properties of operations to perform multi-digit arithmetic with numbers up to one million	MC, MS, SA, TE	9-11	19%-23%
NF	Number Sense and Operations in Fractions	Extend understanding of fraction equivalence and ordering (Limit denominators to 2, 3, 4, 5, 6, 8, 10, 12 and 100)	MC, MS, SA, TE	8-14	16%-29%
		Extend understanding of operations on whole numbers to fraction operations			
		Understand decimal notation for fractions, and compare decimal fractions (Denominators of 10 or 100)			
RA	Relationships and Algebraic Thinking	Use the four operations with whole numbers to solve problems	MC, MS, SA, TE	5-11	10%-22%
		Work with factors and multiples			
		Generate and analyze patterns			
GM & DS	Geometry and Measurement	Classify 2-dimensional shapes by properties of their lines and angles	MC, MS, SA, TE	7-13	14%-27%
		Understand the concepts of angle and measure angles			
		Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit			
	Data and Statistics	Represent and analyze data	MC, MS, SA, TE	3-5	6%-10%
Performance Event: Each year the performance event (PE) may align to any specific reporting category. The Grade 4 PE contains multiple SR and/or TE items.			PE	6	13%
Total				48	100%

Performance Event (PE): Each year the operational PE may align to any specific Domain or to a group of Domains, so the number of points coming from each Domain (and therefore each Reporting Category) may change from year to year.
The Grade 4 OP PE in 2019 contains multiple MC, MS, SA, and/or TE items and is worth 6 operational points.
The Grade 4 OP PE in 2020 will be a single handscored PE item and will be worth 3 operational points, so 2 OP PEs will be needed per form.

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Table 3.13: Blueprint for Mathematics Grade 5

Reporting Category	Domain	Cluster	Item Type	Point Range	Range of Emphasis
NBT	Number Sense and Operations in Base Ten	Use place value system understanding to perform operations with multi-digit whole numbers to billions and decimals to thousandths	MC, MS, SA, TE	7-9	15%-19%
NF	Number Sense and Operations in Fractions	Understand the relationship between fractions and decimals (denominators that are factors of 100)	MC, MS, SA, TE	11-15	23%-31%
		Perform operations and solve problems with fractions and decimals and decimals			
RA	Relationships and Algebraic Thinking	Represent and analyze patterns and relationships	MC, MS, SA, TE	5-11	10%-22%
		Write and interpret numerical expressions			
		Use the four operations to represent and solve problems			
GM & DS	Geometry and Measurement	Classify two- and three-dimensional geometric shapes	MC, MS, SA, TE	6-14	12%-28%
		Understand and compute volume			
		Graph points on the Cartesian coordinate plane within the first quadrant to solve problems			
		Solve problems involving measurement and conversions within a measurement system			
	Data and Statistics	Represent and analyze data	MC, MS, SA, TE	2-4	4%-8%
Performance Event: Each year the performance event (PE) may align to any specific reporting category. The Grade 5 PE contains multiple SR and/or TE items.			PE	6	13%
Total				48	100%

Performance Event (PE): Each year the operational PE may align to any specific Domain or to a group of Domains, so the number of points coming from each Domain (and therefore each Reporting Category) may change from year to year.
The Grade 5 OP PE in 2019 contains multiple MC, MS, SA, and/or TE items and is worth 6 operational points.
The Grade 5 OP PE in 2020 will be a single handscored PE item and will be worth 3 operational points, so 2 OP PEs will be needed per form.

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Table 3.14: Blueprint for Mathematics Grade 6

Reporting Category	Domain	Cluster	Item Type	Point Range	Range of Emphasis
RP	Ratios and Proportional Relationship	Understand and use ratios to solve problems	MC, MS, SA, TE	7-9	13%-17%
NS	Number Sense and Operations	Apply and extend previous understandings of multiplication and division to divide fractions by fractions	MC, MS, SA, TE	9-14	17%-26%
		Compute with non-negative multi-digit numbers, and find common factors and multiples			
		Apply and extend previous understandings of numbers to the system of rational numbers			
EEI	Expressions, Equations and Inequalities	Apply and extend previous understandings of arithmetic to algebraic expressions	MC, MS, SA, TE	12-18	22%-34%
		Reason about and solve one-variable equations and inequalities			
		Represent and analyze quantitative relationships between dependent and independent variables			
GM & DSP	Geometry and Measurement	Solve problems involving area, surface area and volume	MC, MS, SA, TE	10-15	19%-28%
	Data Analysis, Statistics and Probability	Develop understanding of statistical variability			
		Summarize and describe distributions			
Performance Event: Each year the performance event (PE) may align to any specific reporting category. The Grade 6 PE contains multiple SR and/or TE items.			PE	8	15%
Total				54	100%

Performance Event (PE): Each year the operational PE may align to any specific Domain or to a group of Domains, so the number of points coming from each Domain (and therefore each Reporting Category) may change from year to year.
The Grade 6 OP PE in 2019 contains multiple MC, MS, SA, TE, and/or CR items and is worth 8 operational points.
The Grade 6 OP PE in 2020 will be a single handscored PE item and will be worth 4 operational points, so 2 OP PEs will be needed per form.

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Table 3.15: Blueprint for Mathematics Grade 7

Reporting Category	Domain	Cluster	Item Type	Point Range	Range of Emphasis
RP	Ratios and Proportional Relationship	Analyze proportional relationships and use them to solve problems	MC, MS, SA, TE	10-12	19%-22%
NS	Number Sense and Operations	Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers	MC, MS, SA, TE	8-10	15%-19%
EEI	Expressions, Equations and Inequalities	Use properties of operations to generate equivalent expressions	MC, MS, SA, TE	11-15	20%-28%
		Solve problems using numerical and algebraic expressions and equations			
GM & DSP	Geometry and Measurement	Draw and describe geometrical figures and describe the relationships between them	MC, MS, SA, TE	4-8	8%-14%
		Apply and extend previous understanding of angle measure, area and volume			
	Data Analysis, Statistics and Probability	Use random sampling to draw inferences about a population	MC, MS, SA, TE	5-10	10%-19%
		Draw informal comparative inferences about two populations			
		Develop, use and evaluate probability models			
Performance Event: Each year the performance event (PE) may align to any specific reporting category. The Grade 7 PE contains multiple SR and/or TE items.			PE	8	15%
Total				54	100%

Performance Event (PE): Each year the operational PE may align to any specific Domain or to a group of Domains, so the number of points coming from each Domain (and therefore each Reporting Category) may change from year to year.
The Grade 7 OP PE in 2019 contains multiple MC, MS, SA, TE, and/or CR items and is worth 8 operational points.
The Grade 7 OP PE in 2020 will be a single handscored PE item and will be worth 4 operational points, so 2 OP PEs will be needed per form.

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Table 3.16: Blueprint for Mathematics Grade 8

Reporting Category	Domain	Cluster	Item Type	Point Range	Range of Emphasis
NS & EEI	Number Sense and Operations	Know that there are numbers that are not rational, and approximate them by rational numbers	MC, MS, SA, TE	2-4	4%-7%
	Expressions, Equations and Inequalities	Work with radicals and integer exponents	MC, MS, SA, TE	15-21	28%-39%
		Understand the connections between proportional relationships, lines and linear equations			
		Analyze and solve linear equations and inequalities and pairs of simultaneous linear equations			
GM & DSP	Geometry and Measurement	Understand congruence and similarity using physical models, transparencies or geometry software	MC, MS, SA, TE	9-15	17%-28%
		Understand and apply the Pythagorean Theorem			
		Solve problems involving volume of cones, pyramids and spheres			
	Data Analysis, Statistics and Probability	Investigate patterns of association in bivariate data	MC, MS, SA, TE	3-5	6%-9%
F	Functions	Define, evaluate and compare functions	MC, MS, SA, TE	7-11	13%-20%
		Use functions to model relationships between quantities			
Performance Event: Each year the performance event (PE) may align to any specific reporting category. The Grade 8 PE contains multiple SR and/or TE items.			PE	8	15%
Total				54	100%

Performance Event (PE): Each year the operational PE may align to any specific Domain or to a group of Domains, so the number of points coming from each Domain (and therefore each Reporting Category) may change from year to year.
The Grade 8 OP PE in 2019 contains multiple MC, MS, SA, TE, and/or CR items and is worth 8 operational points.
The Grade 8 OP PE in 2020 will be a single handscored PE item and will be worth 4 operational points, so 2 OP PEs will be needed per form.

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Table 3.17: Blueprint for Science Grade 5

Reporting Category	Domain	Cluster	Item Type	Point Range	Range of Emphasis
PS	Physical Science	Matter and Its Interactions	MC, MS, TE, CR	17-26	33%-40%
		Motion and Stability: Forces and Interactions			
		Energy			
		Waves and Their Applications in Technologies for Information Transfer			
LS	Life Science	From Molecules to Organisms: Structure and Processes	MC, MS, TE, CR	15-22	30%-33%
		Ecosystems: Interactions, Energy, and Dynamics			
		Heredity: Inheritance and Variation of Traits			
ESS	Earth and Space Sciences	Earth's Place in the Universe	MC, MS, TE, CR	15-22	30%-33%
		Earth's Systems			
		Earth and Human Activity			
Total				60	100%

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Table 3.18: Blueprint for Science Grade 8

Reporting Category	Domain	Cluster	Item Type	Point Range	Range of Emphasis
PS	Physical Science	Matter and Its Interactions	MC, MS, TE, CR	15-23	30%-35%
		Motion and Stability: Forces and Interactions			
		Energy			
		Waves and Their Applications in Technologies for Information Transfer			
LS	Life Science	From Molecules to Organisms: Structure and Processes	MC, MS, TE, CR	15-23	30%-35%
		Ecosystems: Interactions, Energy, and Dynamics			
		Heredity: Inheritance and Variation of Traits			
		Biological Evolution; Unity and Diversity			
ESS	Earth and Space Sciences	Earth's Place in the Universe	MC, MS, TE, CR	15-23	30%-35%
		Earth's Systems			
		Earth and Human Activity			
Total				60	100%

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Table 3.19: Actual Item/Point Distributions by Domain and Reporting Category, English Language Arts

Grade	Domain/ Reporting Category	SR/TE Items by Core Form		WP Items	Total Items by Core Form		SR/TE Points	WP Points	Total Points		% of Total Points
		A	B		A	B			A	B	
3	Reading	23	24		23	24	26		26	26	46%
	Research	7	6		7	6	8		8	8	14%
	Writing	12	11		12	11	14		14	14	25%
	Speaking/Listening	8	8		8	8	8		8	8	14%
	Total	50	49	0	50	49	56	0	56	56	100%
4	Reading	20	21		20	21	26		26	26	46%
	Research	7	7		7	7	8		8	8	14%
	Writing	4	4	1	5	5	4	10	14	14	25%
	Speaking/Listening	8	7		8	7	8		8	8	14%
	Total	39	39	1	40	40	46	10	56	56	100%
5	Reading	20	19		20	19	26		26	26	46%
	Research	5	5		5	5	8–9		8	9	14%–16%
	Writing	13	14		13	14	14		14	14	25%
	Speaking/Listening	7	8		7	8	8		8	8	14%
	Total	45	46	0	45	46	56–57	0	56	57	100%
6	Reading	22	23		22	23	28		28	28	54%
	Research	8	6		8	6	8		8	8	15%
	Writing	7	7		7	7	8		8	8	15%
	Speaking/Listening	7	8		7	8	8		8	8	15%
	Total	44	44	0	44	44	52	0	52	52	100%
7	Reading	22	22		22	22	28		28	28	54%
	Research	6	6		6	6	8		8	8	15%
	Writing	7	7		7	7	8		8	8	15%
	Speaking/Listening	7	7		7	7	8		8	8	15%
	Total	42	42	0	42	42	52	0	52	52	100%
8	Reading	22	23		22	23	28		28	28	50%
	Research	7	7		7	7	8		8	8	14%
	Writing	2	2	1	3	3	2	10	12	12	21%
	Speaking/Listening	8	8		8	8	8		8	8	14%
	Total	39	40	1	40	41	46	10	56	56	100%

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Table 3.20: Actual Item/Point Distributions, Mathematics

Grade	Domain / Reporting Category	Standalone SR/TE Items & Points	PE Items	PE Points	Total Items	Total Points	% of Total Points
3	Relationships and Algebraic Thinking	13	1	1	14	14	29%
	Number Sense and Operations in Base Ten	9	1	1	10	10	21%
	Number Sense and Operations in Fractions	9	0	0	9	9	19%
	Geometry and Measurement*	8	0	0	8	8	17%
	Data and Statistics*	3	3	4	6	7	15%
	Total	42	5	6	47	48	100%
4	Relationships and Algebraic Thinking	8	1	1	9	9	19%
	Number Sense and Operations in Base Ten	10	4	5	14	15	31%
	Number Sense and Operations in Fractions	11	0	0	11	11	23%
	Geometry and Measurement*	10	0	0	10	10	21%
	Data and Statistics*	3	0	0	3	3	6%
	Total	42	5	6	47	48	100%
5	Relationships and Algebraic Thinking	8	1	1	9	9	19%
	Number Sense and Operations in Base Ten	8	1	1	9	9	19%
	Number Sense and Operations in Fractions	13	0	0	13	13	27%
	Geometry and Measurement*	10	4	4	14	14	29%
	Data and Statistics*	3	0	0	3	3	6%
	Total	42	6	6	48	48	100%
6	Ratios and Proportional Relationships	8	2	3	10	11	20%
	Number Sense and Operations	11	3	3	14	14	26%
	Expressions, Equations and Inequalities	15	1	2	16	17	31%
	Geometry and Measurement*	7	0	0	7	7	13%
	Data Analysis, Statistics and Probability*	5	0	0	5	5	9%
	Total	46	6	8	52	54	100%
7	Ratios and Proportional Relationships	11	0	0	11	11	20%
	Number Sense and Operations	9	1	1	10	10	19%
	Expressions, Equations and Inequalities	13	0	0	13	13	24%
	Geometry and Measurement*	6	1	1	7	7	13%
	Data Analysis, Statistics and Probability*	7	4	6	11	13	24%
	Total	46	6	8	52	54	100%
8	Number Sense and Operations**	3	0	0	3	3	6%
	Expressions, Equations and Inequalities**	18	3	4	21	22	41%
	Geometry and Measurement*	12	0	0	12	12	22%
	Data Analysis, Statistics and Probability*	4	0	0	4	4	7%
	Functions	9	3	4	12	13	24%
	Total	46	6	8	52	54	100%

*Mathematics domains combined into a single Reporting Category in all grades.
**Mathematics domains combined into a single Reporting Category in Grade 8 only.
Note: Mathematics operational test forms A and B had identical item and point distribution across domains.
Note: All stand-alone Mathematics items are worth 1 point each.

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Table 3.21: Domain Item/Point Distributions, Science

Grade	Domain/ Reporting Category	SR/TE Items by Core Form		CR Items by Core Form		Total Items by Core Form		SR/TE Points by Core Form		CR Points by Core Form		Total Points		% of Total Points
		A	B	A	B	A	B	A	B	A	B	A	B	
5	Physical Science	14	10	3	5	17	15	17	12	6	11	23	23	38%
	Life Science	9	12	4	2	13	14	11	14	8	4	19	18	30%–31%
	Earth and Space Science	8	10	2	3	10	13	14	13	5	6	19	19	31%–32%
	Total	31	32	9	10	40	42	42	39	19	21	61	60	100%
8	Physical Science	11	10	3	4	14	14	15	13	6	9	21	22	33%–35%
	Life Science	9	9	5	4	14	13	12	12	11	9	23	21	34%–37%
	Earth and Space Science	10	11	4	4	14	15	11	11	8	8	19	19	30%–31%
	Total	30	20	12	12	42	42	38	36	25	26	63	62	100%

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CHAPTER 4: TEST DEVELOPMENT

Content-related evidence of the validity of the intended test score interpretation in achievement testing is supported by a correspondence between test content and a specification of the content domain. Evidence of content-related validity can be demonstrated through consistent adherence to test blueprints and a high-quality test development process that includes a review of items for accessibility to English Learners (EL) and students with disabilities. See Chapter 3 for more detailed information about the development of the blueprints and item specifications. In this chapter, we will provide a detailed discussion of the test development cycle. This section will show what procedures were followed in the construction of ELA, Mathematics, and Science tests that reflect the full range of content that the MAP is expected to cover.

This chapter is particularly relevant to AERA, APA, & NCME (2014) Standards 4.0, 4.1, and 4.7. It also addresses Standards 3.1, 3.2, 3.9, and 12.4, which will be discussed in pertinent sections of this chapter. Each of these standards and the way each standard is addressed will be presented in this chapter. AERA, APA, & NCME (2014) Standard 4.0 states the following:

> Tests and testing programs should be designed and developed in a way that supports the validity of interpretations of the test scores for their intended uses. Test developers and publishers should document steps taken during the design and development process to provide evidence of fairness, reliability, and validity for intended uses for individuals in the intended examinee population. (p. 85)

The purpose of this chapter is to document the test development process used for the MAP ELA, Mathematics, and Science tests. Section 4.1 describes the test designs used for the 2019 Spring administration of the Grade-Level MAP. Section 4.2 describes how Universal Design and Accommodations were addressed for the assessments. Sections 4.3 and 4.4 of this chapter describe the development and field-testing of DRC's item bank, of which the operational anchors were used for ELA and Math as well as the development and field-testing of the Missouri-owned item bank. Section 4.5 of the chapter describes the test construction process for Missouri ELA, Mathematics, and Science tests. Section 4.6 presents a summary of the ELA and Mathematics alignment study.

4.1 Test Design

AERA, APA, & NCME (2014) Standard 4.1 states the following:

> Test specifications should describe the purpose(s) of the test, the definition of the construct or domain measured, the intended examinee population, and interpretations for intended uses. The specifications should include a rationale supporting the interpretations and uses of test results for the intended purpose(s). (p. 85)

The MAP ELA, Mathematics, Science domains are generally defined as the knowledge and skills that are identified within the Missouri Learning Standards for ELA, Mathematics, and Science. The framework of Missouri Learning Standards, in turn, is based on prior consensus among DESE, Missouri educators, and experienced subject-matter experts that the framework represents what is important for teachers to teach and students to learn.

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Evidence of validity based on test content includes information about the test specifications, including the test design and test blueprint. Test development involves creating a design framework from the statement of the construct to be measured. The primary consideration in the development of the MAP ELA and Mathematics test specifications was the assessment alignment with the Missouri Learning Standards. Constraints of the assessment program and the state policy decisions were also taken into consideration in development of the test specifications.

The MAP 2019 test specifications consist of a test blueprint and a test design for each grade level and content area. In partnership with DRC, DESE created test blueprints and test designs. DRC and DESE content experts scrutinized each blueprint to ensure optimal content coverage and efficient use of time and resources. As shown in Chapter 3, the blueprints represent content sampling proportions that reflect intended emphasis in instruction and mastery at each grade level.

The test design for the 2019 operational assessments included the use of items written, reviewed and approved by Missouri educators and DESE. Information concerning the item development process can be found in Section 4.3. In the 2017–18 school year, the newly developed items measuring Missouri Learning Standards were field-tested in Missouri in spring of 2018. ELA and Mathematics used an embedded field-test model and Science used a standalone field-test model. These field-test items constituted an item pool from which items were then selected for operational use in Spring 2019. As a result, the Spring 2019 administration was the first test administration that included Missouri-owned operational test items. The Missouri-owned item bank is aligned to the Missouri Learning Standards adopted in 2016. For ELA and Mathematics assessments, the DRC College-and-Career-Ready items (previously administered operationally in Spring 2018) that were aligned to the MLS were used as anchors to facilitate statistical linking of the 2018 and 2019 test forms. The target test designs for the Spring 2019 assessments are provided in Tables 4.1, 4.2, and 4.3 for ELA, Mathematics, and Science, respectively. The test designs for ELA, Mathematics, and Science were reviewed and approved by DESE in November 2018.

4.2 Universal Design

Grade-level assessments that are universally designed allow for the participation of the widest possible range of students, resulting in more valid inferences about student performance. Universally designed grade-level assessments may reduce the need for accommodations by reducing or eliminating access barriers associated with the tests themselves. Table 4.4 presents the elements of universal design that were implemented on the Grade-Level MAP (Thompson & Thurlow, 2002).

These elements of universal design are relevant to both item development and form construction. This section addresses how the elements of universal design were addressed in the construction of the Spring 2019 test forms in compliance with AERA, APA, & NCME (2014) Standard 3.1, which states the following:

> Those responsible for test development, revision, and administration should design all steps of the testing process to promote valid score interpretations for intended score uses for the widest possible range of individuals and relevant subgroups in the intended population. (p. 63)

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A goal of universal design is to measure the performance of students with a wide range of abilities and skills, ensuring that students with diverse learning needs receive opportunities to demonstrate competence on the same content. To accommodate the greatest number of students for the MAP tests, the assessments include simple, clear, and intuitive instructions and procedures; maximum readability and comprehensibility; and maximum legibility. These design components are addressed primarily through the physical layout and formatting of the online test forms as well as the paper-based test forms used for accommodations. The page specifications define how directions and test items are placed on the pages, the location and appearance of headers and footers, the spacing between an item stem and the answer choices, and other page elements to ensure a consistent, legible appearance of online forms and paper-based test forms. Written instructions at the beginning of each test session are clearly and simply stated, and the wording of such instructions is standardized as much as possible across content areas and grade levels to ensure clarity and consistency.

4.2.1 Accommodations

AERA, APA, & NCME (2014) Standard 3.9 states the following:

> Test developers and/or test users are responsible for developing and providing test accommodations, when appropriate and feasible, to remove construct-irrelevant barriers that otherwise would interfere with examinees' ability to demonstrate their standing on the target constructs. (p. 67)

Students with disabilities or students who are English Learners may be provided with test administration accommodations based on their Individualized Education Plans (IEPs). Accommodation code definitions can be found in the *Test Coordinator's Manual* and in the *Examiner's Manual*.

Braille and Large Print test versions were constructed for each grade and content area to enable students who are blind or visually impaired to participate in the MAP testing. Braille and Large Print forms for ELA, Mathematics, and Science were created by DRC test developers and consisted of items currently or previously included in the regular operational online test forms. Specific recommendations on how to transcribe items into Braille were provided by an independent Braille expert who collaborated with the Braille publisher to produce the Braille version of the MAP assessment and teacher's notes that accompany the Braille forms. DESE conducted a review meeting with a committee of Missouri teachers on February 6–8, 2019, to ensure that both the Braille and Large Print versions of the 2019 MAP assessment would be accessible to Missouri's blind or visually impaired students. DESE and the teacher committee made recommendations, as needed, for how to further revise the transcription to best serve the needs of blind or visually impaired students. All items on The Spring 2019 assessments were accessible to blind or visually impaired students.

4.3 Item Development Process

The item and test development process requires a cohesive development approach, blending what may appear to be discrete processes into a single development cycle. The development steps, including development of test designs, blueprints, and item specifications; passage/stimulus creation, item writing and editing; item reviews by groups of Missouri educators and DESE; item

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selection for field-testing and data review; and eventually item selection for operational testing, must be considered holistically to understand the relationships of the parts. The model or process used by DRC for item and test development follows the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 2014) since items are developed to reflect the range of cognitive ability inherent in the standards, resulting in a pool of items that are available for operational testing. In addition, the item development process also adheres to the Principles of Universal Design, and it reflects an understanding of how items and tests must lend themselves to accessibility for diverse groups of students and function appropriately across a broad range of test administration accommodations. The detailed process for the development of the MAP Grade-Level assessments for ELA, Mathematics, and Science is provided below.

4.3.1 Missouri-Leased College- and Career-Ready Items and Passages

In 2015, it was determined that Missouri DESE would license ELA and Mathematics items from DRC's College- and Career-Ready (CCR) item bank. These items would be used until a Missouri-owned item bank could be developed and the CCR items could be phased out. The CCR items, from the previous administration of Missouri tests, were used as anchors in the Spring 2019 ELA and Mathematics operational assessments. This section of the document provides a high-level overview of the development of DRC's CCR item bank, from which the Spring 2019 MAP ELA and Mathematics anchor items were selected.

The CCR item bank contains nationally field-tested items that support the next generation of standards and assessments. It is aligned to the CCR standards in Mathematics and English Language Arts in Grades 3–8.

Alignment to the CCR standards, grade-level appropriateness, depth of knowledge (DOK), item/task level of complexity, estimated difficulty level, relevancy of context, rationale for distractors, style, accuracy, and correct terminology were major considerations in the item development process. DRC's item development processes for the CCR item bank followed the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 2014). DRC's item development work was and continues to be designed to produce reliable and instructionally valid tests that adhere to the guidelines articulated in the AERA, APA, & NCME (2014) *Standards*. In particular, the item development process discussed in this section is in compliance with AERA, APA, & NCME (2014) Standard 4.7, which states the following:

> The procedures used to develop, review, and try out items and to select items from the item pool should be documented. (p. 87)

CCR Item Bias and Fairness Considerations

DRC developed bias and sensitivity guidelines to help ensure that the CCR items are fair for all groups of test takers, despite differences in characteristics, including, but not limited to, disability status, ethnic group, gender, regional background, native language, race, religion, sexual orientation, and socioeconomic status. DRC strongly relied on the bias and sensitivity guidelines in the development of the items and assessments, particularly in item writing and review. Items were required to comply with the guidelines in order to be included in the assessments. DRC also commissioned an external item bias and fairness review. The group of external bias, fairness, and sensitivity reviewers included experts who had a vast array of experience in education, which

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provided them with diverse perspectives. All reviewers were experienced in the review of passage sets and items in English Language Arts and Mathematics for bias, fairness, and sensitivity issues. See the section called *CCR Item Reviews* for more information about the external item reviewers.

AERA, APA, & NCME (2014) Standard 3.2 is particularly relevant to fairness in item development:

> Test developers are responsible for developing tests that measure the intended construct and for minimizing the potential for tests' being affected by construct-irrelevant characteristics, such as linguistic, communicative, cognitive, cultural, physical, or other characteristics. (p. 64)

CCR Item Development

DRC's CCR item development occurred from 2013 to 2015. DRC worked with qualified item writers throughout the test development cycle to develop items. The item writers were trained on DRC's CCR content specifications and item and stimulus specifications. In addition, DRC test development experts held regular meetings to provide direction and feedback to the item writers. Using an item development plan, the number and distribution of items to be written were specified for item writing teams. Items were written to support a variety of item types and standards for future operational use.

To ensure that the items produced were sufficient in number and adequately distributed across subcategories and levels of difficulty, item writers were informed of the required quantities of items. An item authoring card was completed for each item. It contained information about the item, such as grade level, content category, and subcategories. Based on the item writer's classroom teaching experience, knowledge of the content area curriculum, and the cognitive demands required by the item, estimates were recorded for level of cognitive complexity and difficulty level. Items were written to provide for a range of difficulty. Item types developed for the CCR item bank included multiple-choice, multi-select, evidence-based selected-response, technology enhanced, and short answer items.

CCR Item Writer Training

Item writers were selected and trained for the content areas of ELA and Mathematics. All DRC item writers were experienced writers, teachers, or former teachers who had broad knowledge in the subject area of their expertise. Only qualified individuals possessing both content expertise and good technical writing skills were selected to write items for ELA and Mathematics. The qualifications DRC used to select item writers included the following:

- A bachelor's degree or higher in Reading, English Language Arts, Mathematics, Curriculum and Instruction, and/or related fields
- In-depth understanding and knowledge of the special considerations involving the following: the writing of standards-based multiple-choice items, including writing distractor rationales for each answer option; an understanding of depth-of-knowledge levels, estimated difficulty levels, grade-level appropriateness, readability, and bias considerations; the development of technology-enhanced and open-ended items, including developing item-specific scoring guidelines for each item; and the writing of unique, independent items for passages that do not clue or contradict each other

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- Participation in DRC's assessment-specific training workshop

The writers were trained individually and had previous experience in writing evidence-based selected-response, technology-enhanced, and constructed-response items. Prior to developing items for the CCR item bank, the item writers were trained with regard to the following:

- College- and Career-Ready standards (Mathematics and ELA)
- Webb's Four Levels of Cognitive Complexity: Recall, Basic Application of Skill/Concept, Strategic Thinking, and Extended Thinking
- General scoring guidelines for each content area
- Specific and general guidelines for item writing
- Bias, fairness, and sensitivity guidelines
- Principles of universal design
- Item quality technical style guidelines
- Reference information
- Sample items

CCR Reading Passage Development

The task of writing passages was conducted by DRC content experts with classroom experience in Reading/Language Arts as well as experience in writing informational and literary passages. These content experts also underwent specialized training (provided by DRC) in the characteristics of acceptable passages. Guidelines for passage writing included appropriate length, text structure, density, and vocabulary for the grade level. A judgment was also made about whether the reading level required by a particular passage was at the independent level—that is, the level at which the average student should be able to read 90% of words in the text independently. Passage writers were required to write a specified number of passages for each genre. In some cases, public domain passages were acquired to address authentic works. Approval to reprint was secured from the publishers as necessary. Passages underwent an internal review by several test development content editors who evaluated their merit with regard to the following criteria:

- Passages have interest value for students.
- Passages are grade-appropriate in terms of text complexity, vocabulary, and language characteristics.
- Passages are free of bias, fairness, and sensitivity issues.
- Passages represent different cultures.
- Passages are from a variety of sources.
- Passages can stand the test of time.
- Passages are sufficiently rich to generate a variety of item types.
- Passages are complete with all necessary permissions documentation.
- Passages avoid dated subject matter, unless a relevant historical context is provided.
- Passages do not require students to have extensive background knowledge in a certain discipline or area to understand a text.

After completion of the internal review process, the passages deemed potentially acceptable were reviewed by external reviewers for content and bias, fairness, and sensitivity. Items were then developed for the approved passages before being placed on the field test.

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CCR Pilot Tests

The online pilot test administrations in Spring and Fall 2014 were designed to collect preliminary data to determine the quality of the item pool's content and format. The pilot tests were conducted on relatively small volunteer student samples. The Spring pilot included Mathematics items only and was conducted in Alaska. The Fall pilot included both ELA and Mathematics items and was conducted in the following fourteen states: Texas, Oregon, Montana, Nebraska, Arkansas, Wisconsin, Alabama, Vermont, Oklahoma, California, Ohio, New Hampshire, Minnesota, and South Dakota. The items were administered using a fully randomized design for each content area and grade. One of the main goals was to try out a variety of new technology-enhanced item types to determine their best use when assessing the ELA and Mathematics standards. The content and item specifications were adjusted after the pilot tests but prior to the development of new items for the field tests.

CCR Item Reviews

As part of the item construction process, each item was reviewed by content specialists and editors at DRC. Content specialists and editors evaluated each item to make sure that it measured the intended College- and Career-Ready standards. They also assessed each item for grade-level appropriateness and verified that the items had only one correct answer (multiple-choice and some technology-enhanced items). In addition, the difficulty level, depth of knowledge, graphics, language demand, and distractors were evaluated. Other elements considered in this process included, but were not limited to, universal design, bias, grammar/punctuation, and CCR item bank style.

Upon completion of the internal reviews, DRC commissioned an external review for both content and bias. DRC utilized qualified professionals to provide a review of the College- and Career-Ready items. The external reviewers had a broad range of experience in the educational field. All the reviewers had bachelor-level, master-level, or doctoral-level degrees as well as teaching experience in their specific area of expertise. The reviewers' professions included classroom teachers (i.e., regular education, special education, and gifted/talented education), curriculum specialists, content area instructional specialists, test development editors, university professors, state department of education ELA and Mathematics specialists, members of the Smarter Balanced Assessment Consortium Item Development Team, and disability rights advocates. The reviewers resided in various parts of the United States and were able to provide national as well as regional perspectives and an understanding of the items.

The twelve English Language Arts content reviewers had backgrounds in at least one of the following fields: English; Reading; Writing; Curriculum; English Learners (EL), Teachers of English to Speakers of Other Languages; Talented and Gifted; Elementary, Middle, and Secondary Education; Collegiate Education; and Applied Linguistics. They represented all levels in the field of teaching, from kindergarten through college, and had experience teaching talented and gifted, ESL, Title I, Chapter I, and special education students.

The ten Mathematics content reviewers were current or former teachers that had a range of experiences in the field of education. All reviewers had experience teaching in K–12 classrooms, and more than half of them taught at the undergraduate and/or graduate level, preparing future

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teachers as well as providing professional development for current teachers. All reviewers had extensive experience with College- and Career-Ready standards.

The ten reviewers tasked with reviewing passage sets and items for issues of bias, fairness, and sensitivity had prior experience with these types of reviews. Their perspectives and experiences included knowledge of populations such as EL, special education students, students with disabilities, highly capable students, and ethnically and culturally diverse populations.

Overall, the knowledge and educational experience of the item and passage writers as well as the item reviewers met the requirements of the following AERA, APA, & NCME (2014) standards:

> **Standard 3.1** Those responsible for test development, revision, and administration should design all steps of the testing process to promote valid score interpretations for intended score uses for the widest possible range of individuals and relevant subgroups in the intended population. (p. 63)
>
> **Standard 3.2** Test developers are responsible for developing tests that measure the intended construct and for minimizing the potential for tests' being affected by construct-irrelevant characteristics, such as linguistic, communicative, cognitive, cultural, physical, or other characteristics. (p. 64)

CCR Field Test Selection and Administration

Based on the recommendations made by the external reviewers, DRC's test development content editors determined which items were to be included in DRC's final online field test administration, held from October 2015 to December 2015. The field test was conducted in the following ten states: Nebraska, Louisiana, Ohio, Texas, California, Michigan, Minnesota, Kentucky, Alabama, and Oregon. Between approximately 150 and 200 students responded to each item depending on the grade level, content area, and item type. The major purposes of the field test were to administer a sufficiently large number of items that could be used in future summative assessments, to obtain classical item statistics and conduct differential item functioning (DIF) analyses to inform item data reviews, to evaluate the protocols for the test administration and computer delivery system (technology infrastructure), and to implement targeted test accommodations and elements of universal design. In total, over 5,000 items were field-tested for ELA and Mathematics across all grade levels.

Summary of CCR Item Development

DRC's CCR item development occurred from 2013 to 2015. DRC worked with qualified item writers throughout the test development cycle to develop items and passages for ELA and items for Mathematics. In addition, DRC sought the expertise of external reviewers to ensure item quality. External reviewers, under DRC patronage, reviewed all CCR items and item stimuli for content, accessibility, bias, sensitivity, and fairness. (Item stimuli included the reading passages used on the ELA assessments and the figures and graphics used on the Mathematics assessments.) Prior to the Fall 2015 field test, twelve ELA experts, ten Mathematics experts, and ten bias, fairness, and sensitivity experts reviewed items for accessibility and bias and sensitivity. During the accessibility reviews, experts identified issues that could potentially negatively affect a student's ability to access stimuli and items. During the bias and sensitivity review, experts identified content in stimuli and items that could potentially unfairly affect a student's response because of his or her background.

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The content review focused on developmental appropriateness and the alignment of stimuli and items to the CCR content specifications. The content review experts also checked the accuracy of the content, answer keys, and scoring materials. Items flagged for accessibility, bias and sensitivity, and/or content concerns were either revised to address the issues identified by the experts or removed from the item pool. Items approved by external panels and DRC's internal content specialists became DRC's item bank and, after field-testing, were used to select items for inclusion in the MAP ELA and Mathematics test forms. A high-level summary of the sequence of activities that occurred in the development of the CCR item bank is presented in Table 4.5.

4.3.2 Missouri-Owned Item Development

The items developed for the Missouri-owned item bank included performance event items for Mathematics Grades 3 through 8 in Phase 1, passage-based writing prompts for ELA Grades 4 and 8 in Phase 2, and all item types for ELA, Mathematics, and Science in Phases 3 and 4.

Mathematics Performance Event Development—Phase 1

In 2016, the Missouri Department of Elementary and Secondary Education decided to include performance events in the Mathematics assessments for Grades 3–8. A performance event (PE) is a set of items based around a common stimulus and contains a variety of item types. Performance events are designed to provide students with an opportunity to demonstrate their ability to apply their knowledge and higher-order thinking skills to explore and analyze a complex, real-world scenario. DESE and DRC determined the item development plan and adjusted the test blueprint and test design accordingly. The goal was to write at least ten Mathematics performance events aligned to the newly adopted Missouri Learning Standards (MLS) per grade. Each performance event contained a stimulus, corresponding items, and rubric(s). Missouri educators wrote the items at an Item Writing Workshop. DESE selected five item writers for each grade based on the following criteria: educational role, geographic location, and experience with the Missouri Learning Standards. The item writers came from 28 different districts and included teachers, curriculum coordinators, academic and instructional coaches, and content leaders. The item writers worked in two grade-band committees (one for Grades 3–5 and one for Grades 6–8). DRC content-area test development specialists facilitated the meeting on behalf of DESE. In addition, DRC content specialists provided committee members with training on the process of writing performance events.

The Item Writing Workshop was held in Columbia, Missouri, on September 20 and 21, 2016. All committee members participated in an opening session held at the beginning of the first day. The meeting began with introductions, and DESE assessment staff provided an overview of the Missouri Assessment Program and the newly approved MLS. After the DESE presentation, training on performance event item writing was provided by DRC. The item writing training began with a statement on the goals of the meeting and a clarification about the role of Missouri educators in the item development process.

The item writer training included the following:

- Overview of item development process
- Alignment to the Missouri Learning Standards, competencies, and objectives
- Overview of the Item Specifications and how to use them
- Writing skill-specific and balanced test items for all grades

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- Item-writing technical quality guidelines
- Bias, fairness, and sensitivity considerations
- Addressing DOK cognitive levels
- Providing contextual relevance
- Universal Design considerations
- Inclusiveness
- Using developmentally appropriate structure and content
- Item Writing Workshop process and procedures

The training addressed AERA, APA, & NCME (2014) Standard 3.2, which is relevant to fairness in item development:

> Test developers are responsible for developing tests that measure the intended construct and for minimizing the potential for tests' being affected by construct-irrelevant characteristics, such as linguistic, communicative, cognitive, cultural, physical, or other characteristics. (p. 64)

In addition, DRC's item writer training provided participants with training on how to apply the Principles of Universal Design and the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 2014) to ensure that each item developed is fair, reliable, and educationally sound.

After the training, item writers moved into two grade-band committees (i.e., Grades 3–5 and Grades 6–8). Each committee member was given the goal of writing two performance events as well as reviewing at least two of his or her peers' performance events.

Upon completion of the in-depth review of the MLS and the review of the criteria used for developing performance events, the DRC facilitators presented the template that outlined the required information to be included within each stimulus and item. Each writer then began to draft one PE and accompanying scoring rubric(s). After completing the PE, he or she proceeded to peer review at least one PE.

On day two of the meeting, item writers revised their first PE based on their colleagues' and the DRC facilitators' suggestions. Then they drafted a second PE and participated in a second round of peer reviews of another writer's PE. Again, item writers revised their PEs based on the suggestions they received. Upon completion of the item writing workshop, the performance events were reviewed internally by DRC content area item and test development specialists and editorial specialists.

DRC's content development and editorial teams, including two additional independent editors, reviewed all performance events to ensure that they possessed the following characteristics:

- Content alignment or congruence with the knowledge and skills specified in the standards
- A range of estimated difficulty levels
- Appropriate grade-level vocabulary, content matter, and assumed student knowledge

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- Freedom from issues or concerns about bias, sensitivity, or fairness
- Accessibility, following the Principles of Universal Design
- Correct grammar, usage, and structure/format

The aim for this team approach was to conduct a multitiered internal review of all performance events prior to submission to the content and bias review committees to ensure that all items aligned with the MLS and adhered to DESE's standards for high-quality items.

As part of DRC's internal review of the performance events, item and test development team members and graphics specialists ensured that item art could be reproduced clearly and accurately when items were electronically displayed.

Item art was produced using vector graphics that allow for scalar adjustments without the breakdown of image clarity that is common with lower-quality bitmap formats. DRC's multitiered quality assurance process made certain that converted item art was compared to the original format throughout the item and test development and production process.

DRC's Item Development and Educational Assessment System (IDEAS) was used for all item and passage authoring for the performance events. After an item was submitted, the appropriate style was applied to the item. The system then allowed for editing of the item by appropriate DRC personnel. The system maintained the item exactly as it would be presented on the test form. As part of the item writing process, the facilitators asked each item writer to document specific information to define the content and characteristics (metadata) of each item. This information was provided on an item-writer/passage-writer template and was entered electronically into DRC's item bank, where each item or passage was assigned a unique identifier. Items and passage were also linked to associated artwork and other item attributes. These identifiers allowed IDEAS to be used to track items electronically and securely throughout the item development process and subsequent forms development process.

Between eleven and eighteen performance events with corresponding items and rubrics were written for each grade level during the PE item writing workshop. At the completion of DRC's content expert and editorial reviews, ten PEs per grade were presented to DESE and selected Missouri educators for review at the content and bias review held from October 31 to November 2, 2016. (See Section 4.3.3.) Upon completion of the review, all sixty PEs (ten per grade) were either accepted or accepted with revisions for field-testing and potential operational test use.

Development of Passage-Based Writing Prompts—Phase 2

In 2017, DESE decided to develop new passage-based writing prompts (WPs) aligned to the new Missouri Learning Standards. Each passage-based WP was part of a reading passage set. Six additional items that assess reading standards were included in each set of items. The passage-based WPs were developed for administration in Grades 4, 6, and 8. The goal was to develop two to four WPs per mode (Narrative, Informational/Expository, Opinion/Argumentative) at each grade, for a total of eight WPs per grade, or twenty-four WPs total. Due to time constraints, the item writing was completed by DRC's item writers and content experts rather than Missouri educators.

In collaboration with DESE, DRC's test development team followed a series of steps uniformly recognized as industry standards, which align with the *Standards for Educational and*

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Psychological Testing (AERA, APA, & NCME 2014), assuring that the passage-based WPs were appropriate for each grade.

The steps of the WP development process included the following:

- Review and/or develop guiding documents such as the item specifications.
- Develop item writing training materials.
- Recruit qualified, experienced passage writers.
- Write and prepare passages.
- Provide passages to DESE for review and approval.
- Train item writers to write passage-based WPs sets.
- Conduct internal review of items to ensure proper alignment to the appropriate standard and adherence to item specifications.
- Conduct and monitor internal content/bias reviews and quality control processes.
- Conduct a content and bias review with Missouri educators.
- Revise items based on committee feedback and DESE approval.
- Pilot passage-based item sets with a writing prompt.
- Review student responses and adjust items and/or rubrics.
- Select and assemble items for operational field test forms (test construction).

As previously stated, the task of passage writing and finding was conducted by DRC content experts with classroom experience in Reading and Language Arts and experience in writing informational and literary passages. These content experts underwent specialized training (provided by DRC) in the characteristics of acceptable passages. Guidelines for passage writing and finding included appropriate length, text structure, density, and vocabulary for the grade level. A judgment was also made about whether the reading level required by a particular passage was at the independent level—that is, the level at which the average student should be able to read 90% of the words in the text independently. Passage writers were required to write and/or find a specified number of passages for each genre. In some cases, public domain passages were acquired to address authentic works. Approval to reprint was secured from the publishers as necessary. Passages underwent an internal review by several test development content editors who evaluated their merit. (See the section titled "CCR Reading Passage Development" for a list of DRC's criteria.)

After the completion of the internal review process, the passages deemed potentially acceptable were reviewed by DESE for approval. Once the passages were approved, they were sent to DRC item writers. Item writers were selected and trained to Missouri specifications. All DRC item writers were experienced writers, teachers, or former teachers who had broad knowledge in the subject area of their expertise. Only qualified individuals possessing both content expertise and good technical writing skills were selected to write items. (See the section titled "CCR Item Writer Training" for a list of DRC's item writer qualifications.)

The writers were trained individually and had previous experience in writing selected-response, technology-enhanced, and passage-based writing prompt items. Prior to developing items, the item writers were trained with regard to the following:

- Missouri Learning Standards Grade-Level Expectations

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- Webb's Four Levels of Cognitive Complexity: Recall, Basic Application of Skill/Concept, Strategic Thinking, and Extended Thinking
- General scoring guidelines for each of the writing prompt modes
- Specific and general guidelines for item writing
- Bias, fairness, and sensitivity guidelines
- Principles of universal design
- Item quality technical style guidelines
- Reference information
- Sample items

The newly developed items were loaded into DRC's Item Development and Educational Assessment System (IDEAS), processed through DRC's internal review cycle and prepared for the content and bias review that was conducted with Missouri educators on June 19 and 20, 2017. (See Section 4.3.3, "Content and Bias Review of Phase 1 and 2 Missouri-Owned Items.")

All Item Type Development for All Content Areas—Phase 3

In 2017, DRC and DESE began the development of the Missouri-owned item bank for all content areas based on the newly adopted Missouri Learning Standards (MLS). These newly developed passages and items were field-tested in Spring 2018 for potential operational use in Spring 2019. DESE required that Missouri educators, recruited by DESE, write the items. The sections below provide details associated with each major task in the item development process that provides for technical quality, alignment, validity, reliability, and adherence to assessment principles such as the Principles of Universal Design.

Prior to initiating the new item development effort in June 2017, DRC item and test development specialists conducted an in-depth review of the MLS and item specifications for ELA and Mathematics Grades 3–8 and Science Grades 5 and 8. DRC item and test development staff then developed an item development plan and overview. The plan was reviewed and approved by DESE before DRC developed the ELA reading and listening passages and science task stimulus starters in preparation for the item writing workshop. Developing passages and task stimulus starters that are accessible to the diverse MO student population and consistent with the MLS was key to the successful implementation of the assessments.

ELA Reading and Listening Passage Development

The task of finding and/or writing passages was conducted by DRC professionals who have classroom experience in Reading/Language Arts as well as experience in finding and/or writing informational and literary passages. Guidelines for passage writing or finding include appropriate length, text structure, density, and vocabulary for the grade level. Passage writers and finders were given a specified number of passages to write or find for each genre and standard per grade. Public domain passages were also included to address authentic works. Passages were reviewed internally by several test development reading and English language content specialists to judge the merit of passages/stimuli. (See the "CCR Reading Passage Development" section for a list of DRC's required criteria.)

DRC performed a readability analysis and provided readability statistics for each passage created. The process that DRC's English Language Arts team used to determine readability and text

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complexity involved (1) the quantitative evaluation of the text and (2) the qualitative evaluation of the text. A third component, matching reader to text and task, was also taken into consideration during passage evaluation and internal reviews.

Science Task Stimulus Starters Development

DRC also developed the Science task stimulus starters in preparation for the item writer workshop. In training its writers to develop stimuli as needed, a multifaceted strategy was employed by DRC to ensure a sufficient and appropriate sample of potential stimuli as determined by the item development plan. Item writers, along with DRC item and test development specialists, examined a wide array of primary source materials for a range of authentic topic areas, searching for and prioritizing themes directly related to the intent of the standards (i.e., aligned to the range of difficulties and content and amenable to a wide range of item types as required by the task set). In addition, DRC trained stimulus writers to consider the following criteria when evaluating content for its appropriateness for inclusion in a given assessment:

- **Alignment—**Does the content of the task stimulus starter for a given task set align with at least two dimensions noted within the standards? Writers were trained to consider the degree to which the stimulus, in fact, aligned with the given dimension(s) and would yield the necessary item(s) to measure the assigned standards.
- **Grade-level Appropriateness—**Is the content of the stimulus for a given task set grade-level appropriate? Is the content consistent with the common experiences of a student at the grade level assessed?
- **Source of Challenge—**Is the source of challenge appropriately targeted to the content and to the item(s)? Writers were trained to understand that a stimulus for a given task set should not include a reading level that is too high or a graphic that is flawed or excessively complex.
- **Engaging Stimulus—**Is the stimulus for a given task set rich enough to measure students' depth of understanding, as defined by the MLS? Does the stimulus for a given task set lend itself well to items that will require the students to reason based on evidence?
- **Cognitive Complexity[2]—**Does the stimulus for a given task set lend itself well to the development of items appropriately aligned to the MLS at the required cognitive level? In addition, each science stimulus should support a blending of science practices and content related to an appropriate scientific phenomenon.
- **Universal Design—**Does the stimulus for a given task set attend appropriately to the following elements of Universal Design?
    - **Language Demand:** Writers are trained to ask the following questions: Is the language clear, well formatted, and precise? Does the stimulus for a given task set use correct terminology for the content area?
    - **Vocabulary and Sentence Structure:** Is the vocabulary and sentence structure appropriate? Vocabulary and sentence structure should not hinder students' understanding of the stimulus.

[2] Missouri classifies items using Dr. Norman Webb's depth-of-knowledge framework (Webb, N.L. 1997, 1999, 2007), and the methodology Dr. Webb (1999) developed offers a comprehensive model that can be applied to a wide variety of contexts. The four levels of cognitive complexity (i.e., depths of knowledge) are as follows: Level 1: Recall, Level 2: Application of a Skill/Concept, Level 3 Strategic Thinking, and Level 4: Extended Thinking.

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Upon completion of the ELA passages and Science task stimulus starters, DRC provided them to DESE for review and approval. DRC and DESE met and discussed any changes and revisions. The passages and task stimulus starters were then revised and prepared for the item writing workshop.

Item Writing Workshops

The item writing workshops were held in June 2017 in Columbia and Blue Springs, Missouri. During these workshops, 36 Missouri educators (6 per grade) worked on development of items for English Language Arts, 30 educators (5 per grade) developed items for Mathematics, and a total of 71 educators (35 or 36 per grade) worked to develop items for Science Grades 5 and 8. All participants were recruited by DESE and represented more than a hundred school districts and organizations. Items written during these workshops were later field-tested in Spring 2018. The item writers were asked to write items to the newly approved Missouri Learning Standards (MLS). The item types were based on the recommendations provided in the Missouri Item Specifications. (See Chapter 3, Section 3.1 for more information about the development of the Missouri Item Specifications.) A total of 36 ELA passages were developed by DRC and brought to the item writing workshop, during which the educators wrote 364 ELA items. A total of 360 Mathematics standalone items for all grades and 15 Performance Events for Grades 6–8 were written during the Spring 2017 item writing workshop. DRC developed 36 Science task stimulus starters that were given to Missouri educators during the item writing workshops, and the educators wrote approximately 1,000 Science items.

In each of the item writing workshops, all item writers participated in an opening session held at the beginning of the first day. The meeting began with introductions, and DESE assessment staff provided an overview of the Missouri Assessment Program and the newly approved MLS. After DESE's presentation, content-based training on item writing was provided by DRC. The training began with stating the goals of the workshop and clarifying the role of the Missouri educators in the item and test development processes. (See Section 4.3.2, "Mathematics Performance Event Development—Phase 1," for what was covered in the training.)

After the training, item writers moved into grade-band or grade-level committees. The DRC facilitators presented item writing templates that outlined the information to be included within each stimulus and item. Additional training was provided throughout the workshop to address the various item types assigned for item writing and review any areas of the item writing process as needed. Each writer drafted their item assignments with feedback from the DRC facilitator and their peers throughout the workshop. Upon completion of the item writing workshop, DRC produced the items with high fidelity as authored and intended by the Missouri educators in preparation for the content and bias review. (See Section 4.3.3, "Content and Bias Reviews.")

As with the items in Phases 1 and 2, DRC's Item Development and Educational Assessment System (IDEAS) was used for all item and passage authoring for the Missouri-owned items.

All Item Type Development for All Content Areas—Phase 4

A Phase 4 item writing workshop was held in in St. Louis, Missouri, in March 2018. During this workshop, Missouri educators developed new items of different types for all grades and content areas. A total of 47 ELA educators (7 or 8 per grade), 48 Mathematics educators (8 per grade), and 33 Science educators (18 for Grade 5 and 15 for Grade 8) participated in the item writing workshop. The educators represented more than seventy school districts and educational organizations and

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included teachers, curriculum coordinators, reading specialists, content-specific consultants, instructional coaches, intervention teachers, special education teachers, school principals, a director of Curriculum and Instruction, and a district assessment director. The educators were asked to write items based on the recommendations provided in the Missouri Item Specifications. (See Chapter 3, Section 3.3, for more information about the development of the Missouri Item Specifications.)

Prior to initiating the new item development effort, DRC item and test development specialists conducted an in-depth review of the MLS and item specifications for all grades and content areas. DRC item and test development staff then developed an item development plan. The plan was reviewed and approved by DESE. DRC developed the ELA reading passages and Science task stimuli in preparation for the item writing workshop. Developing passages and task stimulus starters that are accessible to the diverse Missouri student population and consistent with the MLS was key to the successful implementation of the assessments. (See the section titled "All Item Type Development for All Content Areas—Phase 3" for more information on the process for developing passages as well as how the item writing workshops were conducted with Missouri educators.)

Writing Prompt Development

During the March 2018 item writing workshop, Grade 4 and Grade 8 educators were also asked to write passage-based sets that included writing prompts aligned to the Missouri Learning Standards (MLS). A total of 24 ELA passages were developed by DRC and brought to the item writing workshop during which the educators wrote 22 ELA passage-based writing prompt sets for ELA Grades 4 and 8 for inclusion in the Spring 2019 operational tests. The goal was to develop at least ten passage-based sets that included a writing prompt per grade. The WPs developed during this workshop were used operationally, without prior field-testing, in the Spring 2019 test administration.

Overall, a total of 1,065 ELA items, 927 Mathematics items (including 6–8 PEs in each grade) and 656 Science items were developed during the item writing workshop in March 2018.

4.3.3 Content and Bias Reviews

The Spring 2019 ELA and Mathematics assessments consisted of both Missouri-owned items and DRC's CCR items as anchors. The Spring 2019 Science assessment consisted of only Missouri-owned items. This section of the report describes the content and bias reviews of the items used in the Spring 2019 ELA, Mathematics, and Science assessments.

Content and Bias Review of Missouri-Leased CCR Items

CCR items were used in MAP ELA and Mathematics assessments as anchors in Spring 2019. These items were selected from the previous Missouri operational tests that were comprised entirely of DRC's CCR items. These items were originally reviewed for content and bias before their inclusion in the Spring 2016, Spring 2017, and Spring 2018 Missouri assessments. The review committees consisted of Missouri educators from school districts throughout the state. The primary responsibility of the committee was to evaluate items with regard to quality and content classification, including grade-level appropriateness, estimated difficulty, as well as bias, fairness, and sensitivity issues. Due to the leasing agreement of the CCR items, the committee members were asked to note items as either accepted without edits or rejected. The committee also reviewed the items for adherence to the principles of universal design, including language demand.

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The content and bias reviews of CCR items were held in Missouri in Fall 2015 and again in Fall 2016 for both ELA and Mathematics. Committee members were recruited by DESE. DESE, along with DRC, also provided training on the procedures and forms to be used for item content and bias review. Committee members, grouped by grade level and content area, reviewed the items for quality and content as well as for the following properties:

- Missouri Learning Standard alignment
- Grade-level appropriateness
- Depth of knowledge
- Correct answer
- Quality of distractors
- Appropriate language demand
- Bias, fairness, and sensitivity considerations
- Recommendation for use on the Large Print accommodation form
- Recommendation for use on the Braille accommodation form

The members of the review committees were asked to reach a consensus to either accept or reject each item. Committee facilitators recorded the committee decisions on the item review rating forms provided by DRC. Items accepted for use on ELA and Mathematics assessments constituted the pools of items from which subsequent test forms for the Spring 2016, 2017, and 2018 test administrations were selected. For more information on the CCR item bias and content reviews, please refer to the *Missouri Assessment Program Grades 3–8 English Language Arts and Mathematics Technical Report* 2018 posted at https://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials.

The content and bias training in both years addressed AERA, APA, & NCME (2014) Standard 3.2, which is relevant to fairness in item development:

> Test developers are responsible for developing tests that measure the intended construct and for minimizing the potential for tests' being affected by construct-irrelevant characteristics, such as linguistic, communicative, cognitive, cultural, physical, or other characteristics. (p. 64)

In addition, DRC provided participants with training on how to apply the Principles of Universal Design and the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 2014) to ensure that each item developed was fair, reliable, and educationally sound.

Content and Bias Review of Phase 1 and 2 Missouri-Owned Items

The Missouri-owned Mathematics PE items developed in Phase 1 were included in the content and bias reviews held in Lake of the Ozarks, Missouri, from October 31 to November 2, 2016. The participants represented school districts and educational organizations throughout the state and included teachers, Mathematics curriculum coordinators, academic coaches, and Mathematics consultants. Since the items were owned by Missouri, the Mathematics educators had the opportunity to revise them as needed and accept them with revisions.

The ELA writing prompts developed in Phase 2 were reviewed during a content and bias review meeting conducted on June 19 and 20, 2017, in Lee Summit, Missouri. DESE invited six Missouri

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educators per grade level (from Grades 4, 6, and 8) to participate in the meeting. The participants represented 15 school districts throughout the state and 3 educational organizations and included teachers, ELA curriculum coordinators, academic coaches, a district Literacy coordinator, and ELA consultants.

DRC content-area test development specialists facilitated the meeting on behalf of DESE and provided committee members with training on the process of reviewing items for content and bias. Missouri educators were asked to provide expert reviews of the writing prompts and the corresponding Reading items that were candidates for inclusion on future ELA Grade-Level assessments. The main goals in reviewing these items were to evaluate the WP item content alignment as well as to ensure that bias and sensitivity considerations had been addressed. Upon completion of the WP content and bias review, eight passage-based writing-prompt sets were identified for subsequent piloting in each grade level (4, 6, and 8). (For additional information, see Section 3.4.2 "Pilot Testing of ELA Writing Prompts" of the *Missouri Assessment Program Grades 3–8 English Language Arts and Mathematics Spring 2018 Technical Report*, posted at https://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials.

Content and Bias Review of Phase 3 Missouri-Owned Items

Additional content and bias reviews were held in 2017 to review items for inclusion in the Spring 2018 field test administration. The goal of this meeting was for committees of Missouri educators to provide expert reviews of assessment items, passages, listening presentations, writing prompts and other corresponding stimulus materials that would become candidates for inclusion on future English Language Arts (ELA), Math, and Science Missouri Grade-Level test administrations. The main goals in reviewing these materials were to ensure content alignment as well as to ensure that the items were free from any bias and sensitivity issues.

The meeting was held in St. Louis, Missouri, in October 2017 with Missouri educators, including 24 ELA participants, 24 Mathematics participants, and 33 Science participants, to review the ELA, Mathematics, and Science items. The participants represented more than 70 school districts and included teachers, content-specific curriculum coordinators, instructional coaches, district coordinators, curriculum directors, department heads, ELL specialists, and content specific consultants. DRC content-area test development specialists facilitated the meeting on behalf of DESE and provided committee members with training on the process of reviewing passages, task stimulus starters, and items. All committee members participated in an opening session held at the beginning of the first day. The general training included explanations of the following:

- Steps in the development process
- Item types
- Key terms
- How to use the item rating sheet
- The content and bias review process
    - Alignment to MLS
    - Content
    - Bias, fairness, and sensitivity considerations
    - Technical design
    - Universal design

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- Collection of committee recommendations
- Roles and responsibilities of the committee members

The training addressed AERA, APA, & NCME (2014) Standard 3.2, which is relevant to fairness in item development:

> Test developers are responsible for developing tests that measure the intended construct and for minimizing the potential for tests' being affected by construct-irrelevant characteristics, such as linguistic, communicative, cognitive, cultural, physical, or other characteristics. (64)

In addition, DRC provided participants with training on how to apply the Principles of Universal Design and the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 2014) to ensure that each item developed was fair, reliable, and educationally sound.

After the large-group training session, participants were divided into content-area and grade-level committee meeting rooms. The DRC facilitator instructed each committee member on where to find the items online via a laptop computer and item rating sheet. The committee members were assigned a set of items to review independently while keeping notes on their electronic Committee Member Item Rating Sheets. When everyone finished reviewing the assigned set of items, the facilitator led a discussion about each item reviewed and guided the committee to reach consensus. The DRC facilitator captured the outcomes electronically on the facilitator rating sheet as well as in the facilitator binder. At the end of each day, all secure materials were collected.

At the end of the content and bias review meeting, the facilitator's binder and electronic rating sheet and the committee members' electronic rating sheets were provided to DESE. DRC kept a copy of the facilitators' binder for each grade and content area as well as an electronic copy of the facilitators' rating sheets. The content and bias reviews resulted in the approval of a total of 490 ELA items, 562 Mathematics items, and 880 Science items that could be field-tested in Spring 2018 or later. DRC followed the recommendations provided by the committees and approved by DESE and continued to develop the items to ensure they were of the highest quality. This included a final content expert review, an editorial review to ensure clarity of language, as well as the production of any revised art. Items were updated in DRC's item banking system to reflect the final usage of the items.

Content and Bias Review of Phase 4 Missouri-Owned Items

Items developed in Phase 4 of item development were reviewed for content and bias during a content and bias review meeting that was held in Columbia, Missouri, in June 2018. During this meeting, the passage-based sets that included writing prompts for inclusion in the Spring 2019 operational test administration as well as other new items written as part of Phase 4 item writing were reviewed by Missouri educators. DESE invited 30 ELA participants, 30 Mathematics participants, and 37 Science participants to review the ELA, Mathematics, and Science items. The participants represented more than 90 school districts and educational organizations and included teachers, special education teachers, content-specific curriculum coordinators, reading interventionists, academic coaches, district Literacy and Mathematics coordinators, and content specific consultants.

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The goal of this meeting was for committees of Missouri educators to provide expert reviews of items that would become candidates for inclusion on future Missouri Grade-Level tests. The main goals in reviewing these items were to ensure content alignment as well as to ensure that the items were free from any bias and sensitivity issues. (See the section "Content and Bias Review of Phase 3 Missouri-Owned Items" for more information on how the content and bias review was conducted.)

Missouri educators participating in this content and bias review approved eleven passage-based sets that included writing prompts for Grade 4 and Grade 8. Of those approved items, ten writing prompts were then used operationally (without prior field-testing) in Grade 4 and in Grade 8 in Spring 2019. Overall, a total of 1,044 ELA items, 911 Mathematics items, and 615 Science items developed in Phase 4 of item writing were accepted or accepted with revisions for subsequent field-testing during the content and bias review meeting. Prior to the WP operational administration and other item field test administration, DRC followed the recommendations provided by the committees and approved by DESE and edited the items to enhance their quality. This included a final content expert review, an editorial review to ensure clarity of language, as well as the production of any revised art.

4.4 Field-Testing

This section of the report describes the timeline and process of field-testing Missouri-owned ELA, Mathematics, and Science items for future use on Missouri operational tests.

The Missouri-owned Mathematics PE items accepted during the 2016 content and bias reviews were field-tested during the Spring 2017 test administrations along with DRC's CCR items. The field test items administered in Spring 2017 were embedded in several test forms administered in each grade and content area. Each test form contained the same operational test items but unique field test items. The test forms were spiraled at the student level within a grade and content area.

ELA and Mathematics Missouri-owned items accepted during the 2017 content and bias reviews were field-tested during the Spring 2018 test administrations. The field test items were embedded within the operational assessments that were administered online. A total of 512 items (between 78 and 95 per grade) were field-tested for ELA in Spring 2018. A total of 443 items (between 63 and 94 items per grade) were field-tested for Mathematics. The Mathematics field-test administration included 15 performance event sets in grades 6–8 (five per grade). Each performance event consisted of 5-6 items.

For Science, a census standalone field test was conducted in Spring 2018. For both Grades 5 and 8, twenty forms were used to field-test all Missouri-owned items. The field test forms were linked by unique item blocks included in two forms. For example, unique item Block 2 appeared in Form 1 in Session 2 and in Form 2 in Session 1, while unique item Block 3 appeared in Form 3 in Session 1 and in Form 2 in Session 2, and so on. The linking design for the Science field test is presented in Figure 4.1. A total of 391 Grade 5 items and a total of 420 Grade 8 items were field-tested for Science in the Spring 2018 administration.

ELA, Mathematics, and Science Missouri-owned items accepted during the 2018 content and bias reviews were field-tested in the Spring 2019 test administration. The field test items were embedded

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within the operational assessments that were administered on-line for all three content areas. A total of 998 ELA items, 701 Mathematics items (including 110 performance event items), and 545 Science items were field-tested in Spring 2019.

Following each field test data acquisition, the field test data analyses were conducted, with the most recent field test analysis conducted after the Spring 2019 test administration. The analyses included classical item analysis, differential item functioning (DIF) analysis, and item response theory (IRT) analysis. The classical item analysis included the computation and evaluation of the following statistics: item *p*-values (difficulty), item-total test correlation, percentage of students selecting incorrect responses, point-biserial correlation for incorrect responses for the multiple-choice (MC) items, score point distribution for items worth more than one point, and omit rates for all items. More details on classical item analysis methodology are provided in Chapter 7 of this report.

Differential item functioning (DIF) analysis was conducted for all field test items to examine potential item bias and to determine whether item performance differences between identifiable subgroups were due to factors other than student ability, making the items unfairly difficult for a particular subgroup in the student population. DIF analyses were conducted based on gender, race/ethnicity, and accommodation use. More details on the DIF methodology are provided in Chapter 9 of this report.

As the last step of the field test data analysis, the ELA and Mathematics field test items were calibrated and equated to their respective operational test scales using the horizontal on grade-level equating process (explained in detail in Chapter 7 of this report).

Science items were calibrated in a concurrent calibration process within each grade level and the Science item parameters estimated during the calibration were placed on temporary field test scales after the Spring 2018 census field test administration. After new operational test scales were established for Science in Spring 2019, the remaining Science field test items from the Spring 2018 census field test administration were recalibrated and equated to the new Science scales.

Item statistics are used as a means of detecting items that deserve closer scrutiny, rather than as mechanisms for automatic retention or rejection. To this end, a set of criteria was used as a screening tool to identify items that needed a closer review. The criteria for an item to be flagged for an additional review included the following:

- *p*-value <0.20 or >0.90
- item-total test correlation (point biserial for MC items) <0.15
- positive point biserial on a distractor for an MC item
- omit rate >3%
- item flagged for differential item functioning (DIF)
- item with poor fit
- item that did not converge in calibration

Items flagged for any of the above reasons were reviewed by the content-area specialists prior to their review by DESE. The intent was to capture all items requiring additional review based on their

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statistical properties; thus, the criteria employed for item flagging tended to over-identify rather than under-identify potential item issues.

4.4.1 Data Reviews

The review of the Spring 2018 field test item data was conducted by DESE staff and facilitated by DRC staff. The data review occurred in August 2018 and was conducted online. DESE reviewers were first trained by a representative from DRC's staff with regard to the statistical indices used in item evaluation. This was followed by a discussion, with examples, concerning reasons that an item might be retained regardless of the statistics. The review process involved a brief exploration of possible reasons for the statistical profile of an item (e.g., possible bias, grade inappropriateness, instructional issues) and a decision regarding the acceptance or rejection of that item. DRC content area test development specialists facilitated the review of the items. DESE content area experts reviewed the pool of field-tested items and made recommendations on each item and/or scenario/passage. Items accepted for subsequent use in the MAP ELA, Mathematics, and Science assessments were included in the pool of items for Spring 2019 operational test form selection. A total of 501 ELA items (98% of all field-tested ELA items), 378 Mathematics items (85% of all field-tested Mathematics items), and 744 Science items (92% of all field-tested Science items) were accepted for future use. It should be noted that a lower overall item acceptance rate for Mathematics was due to low acceptance rate of the performance event sets. While the acceptance rate of the standalone Mathematics items was approximately 93% (336 items accepted out of 354 standalone items field-tested), only 7 out of 15 field-tested performance event sets were accepted (47% acceptance rate) for future use.

4.5 Form Construction Process

As a first step in building the Spring 2019 online assessments, the DRC team prepared all items that could be considered for operational test selection in IDEAS, DRC's item banking system. The form, format, extent, and organization of items in their respective test sessions were determined in consultation with DESE.

Two core operational test forms were built for ELA, Mathematics, and Science for the Spring 2019 online test administration. The ELA and Mathematics forms contained anchor items that were administered operationally in Spring 2018. These anchor items were DRC's CCR items. The remaining (non-anchor) items on the ELA and Mathematics forms were Missouri-owned items. Science test forms were built using Missouri-owned items field-tested in Spring 2018.

The construction of the test forms themselves was a collaborative effort between DRC's integrated development team of assessment specialists, a psychometrician, and scoring specialists. Before operational test forms were created, passages and items/performance events were selected. The content and psychometric criteria used for item selection included the following:

- Test length and item types adhered to the DESE-approved test design.
- Content coverage adhered to the DESE-approved test blueprint.
- Items were evaluated for technical quality, including that each item
    - had one clearly correct answer (or answers if multi-select or technology-enhanced),
    - used clear and concise wording,

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  - was grammatically correct,
  - had an appropriate range of difficulty,
  - was free of any offensive, inappropriate, or biased content, and
  - met the Principles of Universal Design and maximum accessibility.
- Recommended psychometric properties of the items included
  - a *p*-value between 0.20 and 0.90,
  - an item-total test correlation >0.15,
  - omit rates ≤ 3%,
  - acceptable item fit (no misfit flag), and
  - no DIF flag (If an item with DIF had to be included in the test to maintain blueprint coverage, the item was examined to determine whether any content reason exists for the DIF flag—sometimes items demonstrate statistical bias but no content reason can be determined for the bias.)

The ELA, Mathematics, and Science operational form selection was conducted in two phases.

In the first phase, the anchor (linking) items were selected from the Spring 2018 operational test items for ELA and Mathematics and from the Spring 2018 field test item pool for Science. These anchor items were common for the two operational core forms, A and B, in each grade level and content area and were selected to provide the link between the two forms. In addition, the ELA and Mathematics anchor items provided the link between the Spring 2019 and Spring 2018 test forms for test equating purposes.

The anchor set was selected as a "mini" version of the full operational test for each grade level and content area in regard to its length, content coverage, and psychometric properties. The length of each anchor set was at least one-third the length of the total test. The items included in the anchor sets met the same blueprint specifications as the full test in regard to the percentage of score points measuring each content standard. Anchor selections were reviewed and approved by a DRC psychometrician and DESE.

In the second phase of the ELA, Mathematics, and Science item selection, non-anchor operational items from the Missouri-owned item bank were selected for each of the two forms in each grade level and content area. The non-anchor items were unique in each test form, except for a few non-anchor items that were repeated on both ELA and Mathematics forms in order to meet the test blueprint.

With the exception of the ELA Grades 4 and 8 writing prompt items, the non-anchor operational items had been field-tested on the MAP Spring 2018 test administration in Missouri. The writing prompt items selected for the Spring 2019 test administration did not have prior item statistics. Full form selections met the criteria for statistical equivalence within each grade level and content area and for statistical alignment with the Spring 2018 operational test forms for ELA and Mathematics.

In addition to the core online operational test forms, breach forms and paper-pencil accommodated forms, including Braille and Large Print forms, were available for administration in Spring 2019. The breach, Braille, and Large Print forms for ELA and Mathematics were entirely reused or reused with a few item replacements from Spring 2018. New breach, Braille, and Large Print forms were

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developed for Science. Each Braille and Large Print Science test form matched one of the core operational test forms but did not include any field test items. Breach forms in all content areas contained a mixture of operational items from core forms A and B. DESE reviewed the items placed on the operational test forms during the forms construction process.

In addition to the operational test items selected for the Spring 2019 test administration, new field test items were embedded in the test forms. ELA test forms had 10 field test item positions in Grades 3, 5, 6, and 7 and 13 field test item positions in Grades 4 and 8. Mathematics test forms had 6 field test item positions per grade, and Science test forms had 21 field test item positions in each grade (see Tables 4.1, 4.2, and 4.3 for detailed information about test design). The field test items embedded in the field test positions were Missouri-owned items written by Missouri educators and accepted for field-testing during the content and bias review in June 2018.

In addition to Missouri-owned operational and field test items, items from MetaMetrics were also administered to Missouri students in Spring 2019. Similar to field test items, MetaMetrics items were embedded in the operational ELA and Mathematics test forms. These multiple-choice items were inserted into the same positions on the forms as the field test items and served the purpose of linking the Missouri ELA scale to the MetaMetrics Lexile scale and linking the Missouri Mathematics scale to the MetaMetrics Quantile scale. Between 26 and 28 Lexile items per grade were administered in four ELA test forms per grade. Between 20 and 30 Quantile items per grade were administered in four to six Mathematics test forms per grade. The test forms with Lexile and Quantile items were spiraled together with all other forms within a grade and a content area. The item data for the Lexile and Quantile items acquired during the Spring 2019 test administration were delivered to MetaMetrics for the linking analyses. The MetaMetrics item data were not processed by DRC and are not discussed in this report. Instead, separate reports concerning Lexile and Quantile data analysis and the linking of the Missouri assessments to the Lexile or Quantile scales were developed by MetaMetrics and delivered to DESE. Student performance on Lexile and Quantile items did not count toward their ELA or Mathematics scores.

Prior to the opening of the testing window, all online forms were made accessible to DESE for review in DRC's secure INSIGHT testing engine. During this review, DESE was provided the test maps and a checklist of form review criteria, presented in Table 4.6, to aid in the review of the forms. Upon receipt of DESE feedback, DRC test development specialists adjusted the ELA, Mathematics, and Science forms as needed. A subsequent review in DRC's secure testing engine, INSIGHT, was also provided to ensure that all changes were made and to complete a final rendering check in the final production environment. Any changes requested at this late stage were made prior to the test forms being administered to students.

4.6 Alignment Study for English Language Arts and Mathematics

An alignment study, conducted for DESE by the Center for Curriculum Analysis and reported in the *Missouri Independent Alignment Study: Report on Mathematics and English Language Arts* (CCA, 2018), demonstrated the degree to which (a) the MAP ELA and Mathematics test specifications captured the Missouri Learning Standards and (b) the ELA and Mathematics items adequately represented the reporting categories/strands delineated in the test specifications. The study utilized the Survey of Enacted Curriculum methodology for conducting content and alignment analyses.

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The alignment study addressed AERA, APA, & NCME (2014) Standard 12.4, which is relevant to the alignment of the Missouri assessments to Missouri Learning Standards:

> When a test is used as an indicator of achievement in an instructional domain or with respect to specified content standards, evidence of the extent to which the test samples the range of knowledge and elicits the processes reflected in the target domain should be provided. Both the tested and the target domains should be described in sufficient detail for their relationship to be evaluated. The analyses should make explicit those aspects of the target domain that the test represents, as well as those aspects that the test fails to represent. (p. 196)

The alignment study discussed the three dimensions of alignment among elements of content: topic coverage, cognitive demand, and balance of representation. The alignment study for ELA showed good alignment results for all measures and grades except for balance of representation. Results for topic coverage and cognitive demand indicated strong alignment across measures and grades. The balance of representation measures was somewhat lower due to the emphasis on reading comprehension and lack of emphasis on topics assessing knowledge and skills associated with writing components and writing process within the blueprint. The alignment study for the Mathematics assessments revealed strong alignment results across all grades. In general, the results show strong alignment between the assessment item pools and the relevant learning standards for Mathematics for all three dimensions.

The overall results of the study indicated that the MAP ELA and Mathematics summative tests met or exceeded the average degree of alignment the CCA has found across the many assessments they have analyzed. The analysis was completed with test blueprints and both operational and field test assessments that were administered in Spring 2018 and newly written items that were to be field-tested in 2019.

4.7 Summary

In summary, the overall purpose of this chapter is to explicate the procedures used in the development of the MAP grade-level assessments. The efforts by DESE and DRC in developing the MAP assessments are in alignment with multiple best practices of the assessment industry but, in particular, support the following AERA, APA, & NCME (2014) standards:

- Standard 3.1—Those responsible for test development, revision, and administration should design all steps of the testing process to promote valid score interpretations for intended score uses for the widest possible range of individuals and relevant subgroups in the intended population.
- Standard 3.2—Test developers are responsible for developing tests that measure the intended construct and for minimizing the potential for tests' being affected by construct-irrelevant characteristics, such as linguistic, communicative, cognitive, cultural, physical, or other characteristics.
- Standard 3.9—Test developers and/or test users are responsible for developing and providing test accommodations, when appropriate and feasible, to remove construct-irrelevant barriers that otherwise would interfere with examinees' ability to demonstrate their standing on the target constructs.

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- Standard 4.0—Tests and testing programs should be designed and developed in a way that supports the validity of interpretations of the test scores for their intended uses. Test developers and publishers should document steps taken during the design and development process to provide evidence of fairness, reliability, and validity for intended uses for individuals in the intended examinee population.
- Standard 4.1—Test specifications should describe the purpose(s) of the test, the definition of the construct or domain measured, the intended examinee population, and interpretations for intended uses. The specifications should include a rationale supporting the interpretations and uses of test results for the intended purpose(s).
- Standard 4.7—The procedures used to develop, review, and try out items and to select items from the item pool should be documented.
- Standard 12.4—When a test is used as an indicator of achievement in an instructional domain or with respect to specified content standards, evidence of the extent to which the test samples the range of knowledge and elicits the processes reflected in the target domain should be provided. Both the tested and the target domains should be described in sufficient detail for their relationship to be evaluated. The analyses should make explicit those aspects of the target domain that the test represents, as well as those aspects that the test fails to represent.

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Table 4.1: Test Design for English Language Arts

ELA Grade 3–8—Test Design					
Grade	**Number of OP Items**	**Number of OP Points (includes WP in Grades 4 and 8)**	**Number of FT Items**	**Number of FT-OP (WP) Items**	**Number of FT Points**
3	43	56	10	0	14
4	37	56	13	1	16
5	43	56	10	0	13
6	41	52	10	0	13
7	41	52	10	0	13
8	38	56	13	1	17

Forms and Item Types for ELA Grades 3–8	
Number of Print/Accommodated Forms with embedded FT items	1 per grade
Number of Print/Accommodated Forms without FT items	1 per grade
Number of Online Forms with FT or Lexile items	24 forms per grade
Item Types	MC, MS, EBSR, TE, and WP

Table 4.2: Test Design for Mathematics

Mathematics Grade 3–8—Test Design				
Grade	**Number of OP Items**	**Number of OP Points**	**Number of FT Items**	**Number of FT Points**
3	46–48	48	6	8-9
4	46–48	48	6	8-9
5	46–48	48	6	8-9
6	50–54	54	6	8-9
7	50–54	54	6	8-9
8	50–54	54	6	8-9

Forms and Item Types for Mathematics Grades 3–8	
Number of Print/Accommodated Forms with embedded FT items	1 per grade
Number of Print/Accommodated Forms without FT items	1 per grade
Number of Online Forms with FT or Quantile items	20 forms per grade
Item Types	MC, MS, SA, TE, CR, and PE

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Table 4.3: Test Design for Science

Science Grades 5 and 8—Test Design				
Grade	**Number of OP Items**	**Number of OP Points**	**Number of FT Items**	**Number of FT Points**
5	42	60	21	27
8	42	60	21	27

Forms and Item Types for Science Grades 5 and 8	
Number of Print/Accommodated Forms with embedded FT items	1 per grade
Number of Print/Accommodated Forms without FT items	1 per grade
Number of Online Forms with FT items	13 forms per grade
Item Types	MC, MS, TE, and CR

Table 4.4: Elements of Universal Design

Element	Explanation
Inclusive Assessment Population	Tests designed for state, district, or school accountability must include every student except those in the alternate assessment, and this is reflected in assessment design and field-testing procedures.
Precisely Defined Constructs	The specific constructs tested must be clearly defined so that all construct-irrelevant cognitive, sensory, emotional, and physical barriers can be removed.
Accessible, Unbiased Items	Accessibility is built into items from the beginning, and bias review procedures ensure that quality is retained in all items.
Amenable to Accommodations	The test design facilitates the use of needed accommodations.
Simple, Clear, and Intuitive Instructions and Procedures	All instructions and procedures are simple, clear, and presented in understandable language.
Maximum Readability and Comprehensibility	Readability and plain language guidelines are followed (e.g., sentence length and number of difficult words are kept to a minimum) to produce readable and comprehensible text.
Maximum Legibility	Characteristics that ensure easy decipherability are applied to text, tables, figures, illustrations, and response formats.

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Table 4.5: College- and Career-Ready Item Bank Development Activities

College- and Career-Ready Item Bank Development Activities
Establish item/passage development specifications and style guides and prepare item writer training manuals.
Determine item development plans.
Train item writers and/or passage developers in the project requirements and specifications.
Develop passages and write items.
Review, edit, code, and track items and produce graphics.
Produce review forms for content and bias/fairness/sensitivity reviews by external reviewers.
Modify items based on external reviewers' recommendations.
Review and approve field test ready items and passages.
Develop field test forms and administer field test.
Review field test item data.
Approve items to be included in the item bank.

Table 4.6: MAP Test Form Review Criteria

Test Map Criteria
❑ Confirm that all test design/blueprint requirements/criteria are met for this form.
❑ Confirm the correct key(s) is provided.
❑ Confirm the correct number of points for each item.
Overall Form Criteria
❑ No item clues another item.
❑ Verify that there are unique contexts within sessions (no similar art, scenarios, etc.).
❑ Verify that items are distributed across the form appropriately.
❑ Correct answers in multiple-choice items should be appropriately distributed.
❑ Forms should target a balanced representation of gender and ethnic groups in terms of illustrations and names.
❑ There are NOT more than 4 MC items in a row with the same answer.
❑ Verify that the audio is functioning correctly in the audio form.
❑ Verify that NO egregious errors are present (e.g., typos, grammar errors, line breaks).
❑ Confirm that all items function as expected.
❑ Each passage/scenario/task has an appropriate number of items associated with it.
❑ Items associated with each passage/scenario/task are listed in an appropriate order.
Content Specific Criteria
❑ **Mathematics and Science:** Confirm the correct calculator is provided (or no calculator is provided) depending on the grade and session.
❑ **Mathematics and Science:** Verify that size/placement/formatting of symbols is correct.
❑ **Mathematics:** Confirm the correct formula sheet is provided.
❑ **Science:** Confirm the Periodic Table of Elements is provided on all items.

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Figure 4.1 Science Field Test Linking Design

Field Test Forms	Unique Item Blocks (B1–B20) in the Spring 2018 Standalone Field Test Administration																			
	B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**B9**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**	**B16**	**B17**	**B18**	**B19**	**B20**
Form 1	S1.B1	S2.B2																		
Form 2		S1.B2	S2.B3																	
Form 3			S1.B3	S2.B4																
Form 4				S1.B4	S2.B5															
Form 5					S1.B5	S2.B6														
Form 6						S1.B6	S2.B7													
Form 7							S1.B7	S2.B8												
Form 8								S1.B8	S2.B9											
Form 9									S1.B9	S2.B10										
Form 10										S1.B10	S2.B11									
Form 11											S1.B11	S2.B12								
Form 12												S1.B12	S2.B13							
Form 13													S1.B13	S2.B14						
Form 14														S1.B14	S2.B15					
Form 15															S1.B15	S2.B16				
Form 16																S1.B16	S2.B17			
Form 17																	S1.B17	S2.B18		
Form 18																		S1.B18	S2.B19	
Form 19																			S1.B19	S2.B20
Form 20	S2.B1																			S1.B20

Note: S1 and S2 indicate the test session. B1 through B20 indicate unique item blocks. Each item block was administered in S1 and S2 on different test forms.

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CHAPTER 5: TEST ADMINISTRATION

Chapter 5 of the Technical Report describes the Missouri student population and provides information on student participation in the English Language Arts, Mathematics, and Science assessments. This chapter also includes a description of the processes and activities implemented and the information disseminated to help ensure standardized test administration procedures and, thus, uniform test administration conditions for students. According to the AERA, APA, & NCME (2014) *Standards*, "The usefulness and interpretability of test scores require that a test be administered and scored according to the developer's instructions" (p. 111). Chapter 5 examines how test administration procedures implemented for the MAP strengthen and support the intended score interpretations and reduce construct-irrelevant variance, which could threaten the validity of score interpretations.

Chapter 5 describes how the MAP demonstrates adherence to AERA, APA, & NCME (2014) Standards 4.15, 4.16, 6.1, 6.2, 6.4, 6.6, 6.7, and 7.2. Each standard will be explicated within the relevant section of this chapter.

5.1 Description of Target Student Population

Standard 7.2 provides general guidance that is relevant to this chapter:

> The population for whom a test is intended and specifications for the test should be documented. (p. 126).

For the purpose of this report, the Missouri student population is defined as all students in public and charter schools who were eligible to take the MAP Grade-Level assessments. The population demographic characteristics were computed based on the MAP General Research File (GRF) and include all records in this file, except for records with dummy student identification numbers, which are not valid student records. Homeschooled and private school students can participate in the MAP testing but their records are not included in the GRF. The characteristics of the public and charter school students who were eligible to participate in the MAP Grade-Level assessments in Spring 2019 are presented in Table 5.1. The number of students ranged from approximately 66,000 to approximately 70,000 per grade level for all grades and content areas except Grade 8 Mathematics. The population of Grade 8 students who were eligible to take the Mathematics Grade 8 assessment was approximately 55,500 and was limited to the students who were scheduled to participate in the Mathematics Grade 8 assessment. This population did not include Grade 8 students who were scheduled to take the Algebra I test. Approximately 49% of Missouri students who were eligible to participate in the MAP Grade-Level assessments in Spring 2019 were females, and about 51% of students were males. Looking at the student ethnicity percentages, approximately 70% of students were White, about 16% of students were Black (not Hispanic), approximately 7% of students were Hispanic, just over 2% of students were Asians or Pacific Islanders, and less than 1% of students were American Indians. In addition, approximately 4%–5% of students (depending on grade level) identified themselves as Multi-racial (or Other). The numbers and percentages of students using testing accommodations varied depending on the grade level and content area. Less than 0.5% of students used testing accommodations in ELA Grades 3–5, and about 8% of students used testing accommodations in ELA Grades 6–8, in which more accommodations were available to students. While less than 0.5% of students used testing accommodations in Mathematics Grade 3, the

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percentages of students using testing accommodations in Mathematics Grades 4–8 ranged from approximately 5% (in Grade 4) to approximately 9% (in Grade 8). More accommodations were available for students to use in Mathematics Grades 4–8 compared to Grade 3. In Science, less than 3% of Grade 5 students and less than 2% of Grade 8 students used testing accommodations in the Spring 2019 test administration.

5.2 Student Participation

For the purposes of this report, the test participation rate is defined as the percentage of students who received a valid scale score given the total number of students who were eligible to take the online test or receive a test book. These test participation rates for the total population are provided in Table 5.2. This table shows both the percentages of students classified as reportable and the numbers of students classified as accountable. Reportable students include all students with a valid scale score (teacher-invalidated students are excluded). The Accountable columns show the total numbers of students who were eligible to take an online test or receive a test book. This includes students who should have received a MAP scale score but who did not take the test and could not be assigned a scale score. It should be noted that approximately 20% of Grade 8 students took the Algebra I assessment instead of the MAP Mathematics assessment. Exclusion of these students from the Mathematics assessment may affect the state-level student performance rate in Mathematics. The overall test participation rates in Spring 2019 were over 99.7% across all grades and content areas.

The following are subgroups reported during the administration of the MAP tests:

- Gender: Female and Male
- Race/Ethnicity: White, Black, Hispanic, Asian or Pacific Islander, American Indian, and Other
- Accommodations: Students receiving testing accommodations

The test participation rates by subgroup are summarized in Tables 5.3 through 5.11.

5.3 MAP Testing Calendar

The 2019 MAP tests were administered to students within the 9-week state testing window of April 1–May 31, 2019. (The original 8-week testing window was extended by one week due to a large number of snow days during which students were absent from school in the 2018–19 school year.) Schools and districts chose when and how to administer the MAP within this window. Students did not have to complete an entire assessment in a given content area in one day (or one sitting), but each session within each content area of the MAP was required to be administered in one block of time.

5.4 Administration Procedures and Guidelines

Test administration procedures and guidelines for the MAP are included in ancillary materials and contribute to the body of evidence of the validity of score interpretation. This section examines how the test materials address the AERA, APA, & NCME (2014) *Standards* related to test administration procedures.

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For the Spring 2019 test administration, DRC produced two types of administration manuals: the *Test Coordinator's Manual* and the *Examiner's Manual* (presented in Appendix A and Appendix B, respectively). DESE Curriculum and Assessment staff review, provide feedback on, and give final approval for each manual.

The *Test Coordinator's Manual* is common to all grades and content areas. It provides an overview of the MAP and any changes made to the MAP for 2019. It gives guidelines for testing, such as the inclusion of special populations, the use of translators, and the invalidation procedures. It also details the Test Coordinator's role in the testing process by outlining steps the Test Coordinator should follow. Information included in the *Test Coordinator's Manual* is listed below.

1.0 Table of Contents
2.0 Change Log
3.0 Introduction
    3.1 Purpose of Manual
    3.2 Sections of Manual
    3.3 Glossary of Terms
    3.4 About the Assessment
    3.5 New DTC Process
4.0 Important Dates
    4.1 Schedule of Important Dates for Spring 2019
    4.2 Checklist of Responsibilities
5.0 Timing Guidelines
    5.1 Scheduling the Assessment
    5.2 Special Populations
6.0 Assessments
    6.1 Item Types
    6.2 Online
    6.3 Paper/Pencil Materials
    6.4 Large Print and Braille Materials
7.0 Universal Tools and Accommodations
    7.1 Universal Tools
    7.2 Accommodations
    7.3 Read Aloud
    7.4 Translation
8.0 Administration Portal
    8.1 Login/Username/Password
    8.2 Home Page
    8.3 User Accounts
    8.4 Student Management
    8.5 Sessions
    8.6 Materials
    8.7 Additional Features
    8.8 Tracking Student Progress
    8.9 Reports
9.0 Training/Test Preparation
    9.1 Assessment Plan

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9.2 Required/Allowed/Prohibited Materials
9.3 Tools/Accommodations
9.4 Transcribers
9.5 Translators
9.6 Physical Materials
9.7 Student Practice Tests/Videos
9.8 Additional Resources
10.0 Test Delivery System
10.1 System Overview
10.2 Getting Students Logged In
10.3 Pausing
10.4 Moving Students
10.5 Unlocking Tests
10.6 Test Submission
10.7 Transcribed Tests
10.8 Common Technology Issues
11.0 Special Circumstances
11.1 Student Transfers
11.2 Avoiding Common Quality Assurance Issues
11.3 Resets
11.4 Test Invalidation
11.5 Medical Waiver
11.6 How to Handle Student Absences
12.0 After Testing
12.1 Arrange for the Return Shipment of Test Materials to DRC
12.2 Organize Materials
12.3 Package and Ship Testing Materials
Appendix A: Frequently Asked Questions (FAQ)
Appendix B: Reference Sheets
Appendix C: Writer's Checklists
Appendix D: Sample Student Tools/Accommodations Tracking Form
Appendix E: Sample Test Schedule Form
Appendix F: Quality Assurance Form

The *Examiner's Manual* is specific to each grade. The MAP *Examiner's Manual* also outlines steps that should be followed when administering the MAP. Information included in each *Examiner's Manual* is listed below:

1.0 Overview of Important Information for the MAP Grade-Level Assessments
1.1 This Examiner's Manual
1.2 Glossary of Terms
1.3 About the Tests
1.4 Test Administration Policies
1.5 Scheduling the Tests
1.6 Accommodations and Special Populations
1.7 Online Tools Training and Tutorials

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2.0 Before Online Testing
- 2.1 Advance Announcements and Preparation
- 2.2 User Roles
- 2.3 Test Security
- 2.4 Assessment Materials for Students/Administrators

3.0 During Online Testing
- 3.1 Specific Administration Information—Before Testing
- 3.2 Specific Administration Information—Testing
- 3.3 Testing Over Multiple Sessions or Days
- 3.4 Moving a Student During an Assessment

4.0 After Online Testing
- 4.1 Reporting Test Invalidations
- 4.2 Student Absences

5.0 Large Print, Braille, and Paper/Pencil Editions
- 5.1 Before Testing
- 5.2 During Testing
- 5.3 After Testing

Appendix A: Item Types
Appendix B: INSIGHT Keyboard Shortcuts and Icons
Appendix C: Mathematics Reference Sheet Grades 3—5 (Grades 3—5 manuals only)
Appendix C: Mathematics Reference Sheet Grades 6—8 (Grades 6—8 manuals only)
Appendix D: Writer's Checklist (Grade 4 manual only)
Appendix D: Sample Student Tools/Accommodations Tracking Form
Appendix D: Periodic Table of the Elements (Grade 8 manual only)
Appendix E: Writer's Checklist (Grade 8 manual only)
Appendix F: Sample Student Tools/Accommodations Tracking Form (Grade 8 manual only)

This section presents the AERA, APA, & NCME (2014) standards that are relevant to test administration and how the information in the MAP *Examiner's Manual* addresses these standards.

Standard 4.15 The directions for test administration should be presented with sufficient clarity so that it is possible for others to replicate the administration conditions under which the data on reliability, validity, and (where appropriate) norms were obtained. Allowable variations in administration procedures should be clearly described. The process for reviewing requests for additional testing variations should also be documented. (p. 90)

The MAP *Examiner's Manual* provides instructions for before-, during-, and after-testing activities with sufficient detail and clarity to support reliable test administrations by qualified test administrators. To ensure uniform administration conditions throughout the state, instructions in the *Examiner's Manual* describe the following: general rules of online testing; pause rules; scheduling requirements for the tests; recommended order of test administration; classroom activity information; assessment duration, timing, and sequencing information; and materials that the examiner and students need for testing.

Standard 4.16 The instructions presented to test takers should contain sufficient detail so that test takers can respond to a task in the manner that the test developer intended. When appropriate,

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sample materials, practice or sample questions, criteria for scoring, and a representative item identified with each item format or major area in the test's specification or domain should be provided to the test takers prior to the administration of the test, or should be included in the testing material as part of the standard administration instructions. (p. 90)

To ensure clarity of instructions to students, the manuals include scripts that the examiners are instructed to read verbatim to students. Examiners are instructed to follow the scripts and to repeat any part of the directions as many times as needed but to not modify the words used. Examiners may use professional judgment to respond to student questions, but they may not reword test items, suggest answers, or evaluate student work during the testing session. A sample of a script is presented in Sections 3.1 and 3.2 of the *Examiner's Manual*.

Online Tools Training tutorials and practice tests are provided in each content area to familiarize students/users with the navigation of the online systems, functionality of the testing environment, and different item types. Districts have the following options for training students on interacting with the INSIGHT testing platform and using the tools contained within INSIGHT:

- Online Tools Training (OTT)—OTT gives students/users the ability to use the tools available in the INSIGHT testing platform on a variety of item types that will be used in the operational assessments. Using the OTT allows students/users to become comfortable with using the built-in system tools prior to the summative assessment. There is no limit to the amount of times a student/user can access the OTT.

- Online Tutorials—Online Tutorials give students/users the ability to watch recorded videos that demonstrate the features of INSIGHT and the tools that will be used for the operational assessments.

These options are made available several months in advance of the summative assessments.

Standard 6.1 Test administrators should follow carefully the standardized procedures for administration and scoring specified by the test developer and any instructions from the test user. (p. 114)

To ensure the usefulness and interpretability of test scores and to minimize sources of construct-irrelevant variance, it is essential that the MAP is administered according to the prescribed test schedule. The *Test Coordinator's Manual* includes instructions for scheduling the test within the state testing window of April 1–May 31, 2019. The *Examiner's Manual* contains the schedule for timing each test session and indicates whether timing should be enforced.

Standard 6.4 The testing environment should furnish reasonable comfort with minimal distractions to avoid construct-irrelevant variance. (p. 116)

Section 2.0 in the *Examiner's Manual* overviews the steps that teachers should take to prepare for administering the MAP online test. These include the following:

- Determine the layout of the physical computer lab.

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- Plan seating arrangements. Allow enough space between students to prevent the sharing of answers.
- Eliminate distractions such as bells or telephones.
- Use a Do Not Disturb sign on the door of the testing room.
- Make sure classroom maps, charts, and any other materials that relate to the content and processes of the test are covered, removed, or placed out of the students' view.

Standard 6.6 Reasonable efforts should be made to ensure the integrity of test scores by eliminating opportunities for test takers to attain scores by fraudulent or deceptive means. (p. 116)

The *Examiner's Manual* and the *Test Coordinator's Manual* present instructions for post-test activities to ensure that online tests are submitted and printed test materials are handled properly, ensuring the integrity of student information and test scores. Detailed instructions guide test examiners in submitting all online test records. For students who are administered a Large Print or Braille version of the MAP, examiners are instructed to transcribe students' responses from the Large Print test or Braille test book into the online testing system (INSIGHT) exactly as the students responded in the Large Print or Braille test book.

Test administrators are expected to report testing concerns involving a wide range of improper activities that may occur during testing, including the following: copying and reviewing Grade-Level Assessment questions with students; cueing students during testing either verbally or with written materials on the classroom walls; cueing students nonverbally, such as tapping fingers or nodding the head; allowing students to use a calculator on parts of the test where it is not allowed; allowing students to correct or complete answers after tests have been submitted; splitting sessions into two parts; ignoring the standardized directions in the online assessment; reading the ELA assessment to students; paraphrasing parts of the test to students; changing or completing (or allowing other school personnel to change or complete) student answers; allowing accommodations that are not written in the Individualized Education Program (IEP); allowing accommodations for students who do not have an IEP; allowing students to use dictionaries on parts of the Grade-Level Assessment other than the writing prompt; or defining terms on the test.

Testing concerns are gathered from school officials, students, parents, and other interested parties who call DESE to state their issues. A narrative of the conversation is written and read back to them. The superintendent of the district in which the allegation is made is then contacted and read the narrative. A letter is sent to confirm the conversation and to ask the superintendent to investigate the claim. A Quality Assurance—Grade-Level Assessment—Self-Monitoring Report is sent for the superintendent to use when replying to the allegation. A sample district report form is included in the *Test Coordinator's Manual*.

Standard 6.7 Test users have the responsibility of protecting the security of test materials at all times. (p. 117)

Throughout the manuals, Test Coordinators and examiners are reminded of test security requirements and procedures to maintain test security. Specific actions that are direct violations of test security are so noted. Detailed information about test security procedures are presented in Section 5.8 of this Technical Report.

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5.4.1 Return Material Forms and Guidelines

The *Test Coordinator's Manual* instructs Test Coordinators in procedures for organizing and packing materials and returning them to DRC for secure inventory purposes. DESE Curriculum and Assessment staff have opportunities to review, provide feedback on, and give final approval for the manual. The purpose of the instructions is to ensure that secure test materials are properly accounted for and organized properly for return shipment. Since the test is administered online, except for special cases, only the Large Print, Braille, and paper-based printed test books are packed and returned to DRC.

5.5 Administrative Support and Training

To ensure that the MAP's Grade-Level assessments are administered and scored in accordance with DESE's mandates, DESE takes a primary role in communicating with and training district personnel. The development of the Grade-Level Assessments is a collaborative effort between DESE and DRC. DESE conveys to districts the purpose of the Grade-Level Assessments and the importance of test administration being consistent with test industry standards. The tests and the consistent standards of administration must also meet the State Board of Education policies and the mandates of both state and federal legislation.

To accomplish these goals, DESE provides train-the-trainer opportunities for the District Test Coordinators, who, in turn, convey test administration training to schools within their districts. DESE conducts quality assurance visits during testing to ensure district adherence to the standardized administration of the tests.

The District Test Coordinators are responsible for the schools within their districts. They disseminate information to each school, offer assistance with test administration, and serve as the liaisons between DESE and their districts. DESE also provides assistance with and interpretation of Grade-Level Assessment data and test results.

DESE's Assistant Director of Assessment trained the District Test Coordinators in the following components of Grade-Level Assessment administration: the *Test Coordinator's Manual*, the *Examiner's Manual*, the dates for testing, appropriate protocols for test administration and security, guidance on the timing and administration of tests, and changes made to the test since the last administration in Spring 2018.

During the recorded webinar for the Test Coordinator training, the Assistant Director of Assessment walked the District Test Coordinators and other DESE staff through an annotated version of the *Test Coordinator's Manual*. The District Test Coordinators, in turn, used this information to train staff within their districts.

5.6 Test Session Structure

MAP assessments are divided into test sessions. As stated previously, students did not have to complete an entire assessment in each content area in one day (or one sitting), but each session within each content area of the MAP was required to be administered in one block of time.
The test session structures for Spring 2019 ELA, Mathematics, and Science assessments, including the number of passages and number of items per session, are provided in Tables 5.12 to 5.14. In

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addition to the total number of items per session, these tables also include the number of operational and field-test items as well as the number of score points obtained from the operational and field-test items.

5.7 Test Time

The MAP tests are not timed, and sufficient time for students to attempt all items is provided. Nevertheless, the *Examiner's Manual* provided examiners with timing guidelines for the assessments. For the MAP's sessions, examiners were instructed to allow students to complete the assessment if they were making adequate progress. The timing guidelines of the MAP are presented in Table 5.15.

To verify the appropriateness of the timing guidelines, actual test time summaries were computed for MAP tests by test session, grade, and content. These summaries are presented in Tables 5.16 through 5.18 for ELA, Mathematics, and Science, respectively. The summaries include the number of students, mean and standard deviation of the session test time, and the session test times at selected percentiles. The number of students included in this analysis is lower than the total population of Missouri students who took the MAP tests. The records excluded from this analysis were the ones in which 1) the test time was not captured properly, 2) the number of times the test was logged on to was not equal to the number of times the test was logged out of, and 3) the test was force-submitted by the system at the end of the testing window. In addition, data records for students who took a Transcription form (i.e., a form in which student responses were transcribed from a print form into the online system by a teacher) were not included in the computation of the session times. Between 8% and 14% of the records were excluded for ELA, and between 9% and 14% of the records were excluded for Mathematics. Approximately 20% of the records were excluded for Science Grade 5, and about 15% of the records were excluded for Science Grade 8 in the computation of session times. When the test time guidelines are compared to actual test times, it was observed that, for ELA, at least 75% of students completed all test sessions well within the suggested times and 90% of students completed most testing sessions within the suggested times. For Mathematics, at least 50% of students completed all sessions within the suggested times and 75% of students completed most testing sessions within the suggested time guidelines across all grade levels. At least 50% of Grade 5 students completed both Science test sessions within the suggested times, and at least 75% of Grade 8 students completed Science test sessions within the suggested time guidelines.

In addition, in each case, the mean session time was higher than the median (the 50th percentile) session time, indicating a somewhat positively skewed distribution. The session time means are affected by extreme cases of students with significant test times. The median is the midpoint of the frequency distribution of session time with an equal proportion of students (50%) falling above or below it. The median is not affected by the extreme values and accurately reflects the middle of the data set.

5.8 Test Security

Maintaining the security of all test materials is crucial to preventing the possibility of random or systematic errors, such as unauthorized exposure of test items that would affect the valid interpretation of test scores. Several test security measures are implemented for the MAP. Test

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security procedures are discussed throughout the *Examiner's Manual* and the *Test Coordinator's Manual*.

Test Coordinators and examiners are instructed to keep all test materials in locked storage, except during actual test administration, and access to secure materials must be restricted to authorized individuals only (e.g., test examiners and the School Test Coordinator). During the testing sessions, test examiners are directly responsible for the security of the MAP and must account for all test materials at all times. The test examiners must supervise the test administrations at all times.

With computer-based testing, test security is maintained by providing individual test tickets for student testing. Test tickets provide the secure log-in credentials (i.e., username and password) required for a student to use the testing software. Once students have started their tests, the test examiner is responsible for circulating through the room to ensure that all conditions of test security are maintained.

5.9 Security Forms

Security (accountability) forms are developed for Large Print, Braille, and print-on-demand test forms. As soon as these test books are received by a district, the District Test Coordinator ensures that the first and last security barcodes on the tests match the packing list the district received. The District Test Coordinator then packages the tests to be sent to schools. Upon returning test books to DRC, School and District Test Coordinators are required to complete and submit an electronic *Accountability Form* via DRC's eDIRECT portal. This form is pre-populated with the number of each type of material originally sent to each school. The Test Coordinators then enter the number of materials returned and provide space for districts/schools to document nonstandard situations, including lost, damaged, destroyed, extra, or missing test books. A sample *Accountability Form* is shown in Figure 5.1.

5.10 Accommodations and Universal Tools

Universal tools and accommodations are allowed on the MAP. These types of student aids are described below.

- Universal tools are available to all students based on student preference and selection. Some tools, such as a ruler and a digital notepad, are embedded in the online system, while others, such as a physical thesaurus and scratch paper, are not embedded in the system. The availability of universal tools varies by item.
- Accommodations are changes in procedures or materials that increase equitable access during the MAP Grade-Level Assessments. Assessment accommodations allow students to access assessment content to show what they know and can do. Accommodations are available for students with documented IEPs or 504 Plans and for students with limited English proficiency.

Accommodations may be used by students who qualify under the Individuals with Disabilities Education Act (IDEA) and have an IEP, who qualify under Section 504 of the Americans with Disabilities Act and have a Section 504 plan, or who are identified as English Language Learner (ELL) students. Accommodations must be specified in the qualifying student's individual plan and

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must be consistent with accommodations used during daily classroom instruction and testing. The use of any accommodation must be indicated on the student information sheet at the time of test administration. AERA, APA, & NCME (2014) Standard 6.2 states the following:

> When formal procedures have been established for requesting and receiving accommodations, test takers should be informed of these procedures in advance of testing. (p. 115)

In compliance with this standard, the grade-specific MAP *Examiner's Manual* contains the list of universal tools and accommodations permissible for the MAP assessments. The tables of tools and accommodations are presented in both the *Examiner's Manual* and the *Test Coordinator's Manual*. If a specific accommodation is not on the list of accommodations in the *Examiner's Manual,* the accommodation may still be permitted. However, for accountability purposes, there are some accommodations that will invalidate a student's test results, such as an oral administration of the ELA test or a paraphrase of any of the tests. Detailed information regarding testing accommodations can be found on the DESE website: http://dese.mo.gov/college-career-readiness/ assessment. Short descriptions of the universal tools and accommodations are presented in Tables 5.19 and 5.20 of this Chapter.

Braille and Large Print forms are provided for blind or visually impaired students.

Tables 5.21 through 5.26 summarizes the numbers of reportable students in Grades 3 through 8 for whom accommodations or universal tools were indicated by a teacher for the 2019 MAP. The information in Tables 5.21 through 5.26 is based on reportable data and includes students who used universal tools or accommodations and received a scale score on the ELA, Mathematics, or Science MAP. It should be noted that additional ELA accommodations are available to students in Grades 6 through 8 only, resulting in an increased total number of students using ELA accommodations in these grades compared to the total number of students using ELA accommodations in Grades 3 through 5. For Mathematics, additional accommodations are available for Grades 4 through 8, resulting in an increased total number of students using Mathematics accommodations in these grades compared to the total number of students using Mathematics accommodations in Grade 3.

In 2019, the most commonly used accommodations were read aloud (text-to-speech or human reader) for ELA reading passages in Grades 6–8, calculator use for items that do not allow calculator use for Mathematics in Grades 4–8, and multiplication table use for Mathematics in Grades 4–8. Separate setting and read aloud (text-to-speech or human reader) were the most frequently used universal tools for all three assessments.

5.11 Summary

In summary, the overall purpose of each of the test administration training and the ancillary materials is to keep districts informed about policies and procedures related to testing in general and the MAP in particular. The information imparted is clearly related to standardizing the administration of the MAP, maintaining the security of the assessment, allowing access to the assessments for special populations by clearly delineating appropriate universal tools or accommodations, and providing guidance on appropriate interpretations of the test results. These communication and training efforts by DESE and the ancillary information developed by DRC are

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in alignment with multiple best practices of the testing industry and support the following AERA, APA, & NCME (2014) standards:

- Standard 4.15—The directions for test administration should be presented with sufficient clarity so that it is possible for others to replicate the administration conditions under which the data on reliability, validity, and (where appropriate) norms were obtained. Allowable variations in administration procedures should be clearly described. The process for reviewing requests for additional testing variations should also be documented.
- Standard 4.16—The instructions presented to test takers should contain sufficient detail so that test takers can respond to a task in the manner that the test developer intended. When appropriate, sample materials, practice or sample questions, criteria for scoring, and a representative item identified with each item format or major area in the test's specification or domain should be provided to the test takers prior to the administration of the test, or should be included in the testing material as part of the standard administration instructions.
- Standard 6.1—Test administrators should follow carefully the standardized procedures for administration and scoring specified by the test developer and any instructions from the test user.
- Standard 6.2—When formal procedures have been established for requesting and receiving accommodations, test takers should be informed of these procedures in advance of testing.
- Standard 6.4—The testing environment should furnish reasonable comfort with minimal distractions to avoid construct-irrelevant variance.
- Standard 6.6—Reasonable efforts should be made to ensure the integrity of test scores by eliminating opportunities for test takers to attain scores by fraudulent or deceptive means.
- Standard 6.7—Test users have the responsibility of protecting the security of test materials at all times.
- Standard 7.2—The population for whom a test is intended and specifications for the test should be documented. If normative data are provided, the procedures used to gather the data should be explained; the norming population should be described in terms of relevant demographic variables; and the year(s) in which the data were collected should be reported.

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Table 5.1: Demographic Characteristics of Missouri Students in Grades 3 through 8

Grade	Demographic Category	ELA		Mathematics		Science	
		N-Count	Percent	N-Count	Percent	N-Count	Percent
3	All Students	66,476	100.00	66,508	100.00		
	Gender						
	Male	34,296	51.59	34,306	51.58		
	Female	32,180	48.41	32,202	48.42		
	Race/Ethnicity						
	White	46,103	69.35	46,088	69.30		
	Black (not Hispanic)	10,768	16.20	10,764	16.18		
	Hispanic	4,642	6.98	4,670	7.02		
	Asian/Pacific Islander	1,531	2.30	1,557	2.34		
	American Indian	204	0.31	205	0.31		
	Other	3,228	4.86	3,224	4.85		
	Accommodations						
	Yes	238	0.36	244	0.37		
	No	66,238	99.64	66,264	99.63		
4	All Students	68,162	100.00	68,220	100.00		
	Gender						
	Male	35,060	51.44	35,080	51.42		
	Female	33,102	48.56	33,140	48.58		
	Race/Ethnicity						
	White	47,289	69.38	47,282	69.31		
	Black (not Hispanic)	11,168	16.38	11,161	16.36		
	Hispanic	4,617	6.77	4,655	6.82		
	Asian/Pacific Islander	1,567	2.30	1,598	2.34		
	American Indian	215	0.32	215	0.32		
	Other	3,306	4.85	3,309	4.85		
	Accommodations						
	Yes	279	0.41	3,308	4.85		
	No	67,883	99.59	64,912	95.15		
5	All Students	69,863	100.00	69,909	100.00	69,900	100.00
	Gender						
	Male	35,704	51.11	35,723	51.10	35,716	51.10
	Female	34,159	48.89	34,186	48.90	34,184	48.90
	Race/Ethnicity						
	White	48,599	69.56	48,597	69.51	48,586	69.51
	Black (not Hispanic)	11,340	16.23	11,348	16.23	11,350	16.24
	Hispanic	4,851	6.94	4,875	6.97	4,874	6.97
	Asian/Pacific Islander	1,558	2.23	1,579	2.26	1,579	2.26
	American Indian	267	0.38	266	0.38	266	0.38
	Other	3,248	4.65	3,244	4.64	3,245	4.64
	Accommodations						
	Yes	287	0.41	4,283	6.13	1,860	2.66
	No	69,576	99.59	65,626	93.87	68,040	97.34

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Table 5.1: Demographic Characteristics of Missouri Students in Grades 3 through 8 (cont.)

Grade	Demographic Category	ELA		Mathematics		Science	
		N-Count	Percent	N-Count	Percent	N-Count	Percent
6	All Students	70,152	100.00	70,153	100.00		
	Gender						
	Male	35,740	50.95	35,730	50.93		
	Female	34,412	49.05	34,423	49.07		
	Race/Ethnicity						
	White	49,105	70.00	49,072	69.95		
	Black (not Hispanic)	11,328	16.15	11,340	16.16		
	Hispanic	4,832	6.89	4,852	6.92		
	Asian/Pacific Islander	1,567	2.23	1,571	2.24		
	American Indian	295	0.42	295	0.42		
	Other	3,025	4.31	3,023	4.31		
	Accommodations						
	Yes	5,934	8.46	5,045	7.19		
	No	64,218	91.54	65,108	92.81		
7	All Students	68,167	100.00	67,320	100.00		
	Gender						
	Male	35,023	51.38	34,527	51.29		
	Female	33,144	48.62	32,793	48.71		
	Race/Ethnicity						
	White	48,289	70.84	47,632	70.75		
	Black (not Hispanic)	10,814	15.86	10,776	16.01		
	Hispanic	4,596	6.74	4,586	6.81		
	Asian/Pacific Islander	1,558	2.29	1,446	2.15		
	American Indian	261	0.38	259	0.38		
	Other	2,649	3.89	2,621	3.89		
	Accommodations						
	Yes	5,605	8.22	5,196	7.72		
	No	62,562	91.78	62,124	92.28		
8	All Students	67,010	100.00	55,513	100.00	66,991	100.00
	Gender						
	Male	34,288	51.17	28,843	51.96	34,267	51.15
	Female	32,722	48.83	26,670	48.04	32,724	48.85
	Race/Ethnicity						
	White	47,863	71.43	39,138	70.50	47,835	71.41
	Black (not Hispanic)	10,236	15.28	9,216	16.60	10,228	15.27
	Hispanic	4,524	6.75	3,822	6.88	4,539	6.78
	Asian/Pacific Islander	1,519	2.27	953	1.72	1,525	2.28
	American Indian	283	0.42	262	0.47	283	0.42
	Other	2,585	3.86	2,122	3.82	2,581	3.85
	Accommodations						
	Yes	5,301	7.91	4,968	8.95	972	1.45
	No	61,709	92.09	50,545	91.05	66,019	98.55

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Table 5.2: Test Participation Rates: All Students

Grade	Number Accountable in ELA	Percentage Reportable in ELA	Number Accountable in Mathematics	Percentage Reportable in Mathematics	Number Accountable in Science	Percentage Reportable in Science
3	66,476	99.77	66,508	99.93		
4	68,162	99.83	68,220	99.95		
5	69,863	99.82	69,909	99.94	69,900	99.93
6	70,152	99.82	70,153	99.90		
7	68,167	99.78	67,320	99.90		
8	67,010	99.72	55,513	99.81	66,991	99.81

*Students in Grade 8 had the option of taking Algebra I instead of the MAP Grade 8 Mathematics test.

Table 5.3: Test Participation Rates: Males

Grade	Number Accountable in ELA	Percentage Reportable in ELA	Number Accountable in Mathematics	Percentage Reportable in Mathematics	Number Accountable in Science	Percentage Reportable in Science
3	34,296	99.72	34,306	99.92		
4	35,060	99.83	35,080	99.94		
5	35,704	99.82	35,723	99.93	35,716	99.92
6	35,740	99.78	35,730	99.88		
7	35,023	99.77	34,527	99.91		
8	34,288	99.70	28,843	99.80	34,267	99.80

*Students in Grade 8 had the option of taking Algebra I instead of the MAP Grade 8 Mathematics test.

Table 5.4: Test Participation Rates: Females

Grade	Number Accountable in ELA	Percentage Reportable in ELA	Number Accountable in Mathematics	Percentage Reportable in Mathematics	Number Accountable in Science	Percentage Reportable in Science
3	32,180	99.82	32,202	99.94		
4	33,102	99.83	33,140	99.97		
5	34,159	99.82	34,186	99.95	34,184	99.93
6	34,412	99.85	34,423	99.92		
7	33,144	99.80	32,793	99.88		
8	32,722	99.74	26,670	99.82	32,724	99.83

* Students in Grade 8 had the option of taking Algebra I instead of the MAP Grade 8 Mathematics test.

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Table 5.5: Test Participation Rates: White

Grade	Number Accountable in ELA	Percentage Reportable in ELA	Number Accountable in Mathematics	Percentage Reportable in Mathematics	Number Accountable in Science	Percentage Reportable in Science
3	46,103	99.92	46,088	99.93		
4	47,289	99.95	47,282	99.96		
5	48,599	99.94	48,597	99.95	48,586	99.93
6	49,105	99.91	49,072	99.91		
7	48,289	99.91	47,632	99.92		
8	47,863	99.86	39,138	99.83	47,835	99.82

* Students in Grade 8 had the option of taking Algebra I instead of the MAP Grade 8 Mathematics test.

Table 5.6: Test Participation Rates: Black

Grade	Number Accountable in ELA	Percentage Reportable in ELA	Number Accountable in Mathematics	Percentage Reportable in Mathematics	Number Accountable in Science	Percentage Reportable in Science
3	10,768	99.81	10,764	99.90		
4	11,168	99.88	11,161	99.96		
5	11,340	99.88	11,348	99.89	11,350	99.89
6	11,328	99.84	11,340	99.81		
7	10,814	99.74	10,776	99.76		
8	10,236	99.70	9,216	99.78	10,228	99.79

* Students in Grade 8 had the option of taking Algebra I instead of the MAP Grade 8 Mathematics test.

Table 5.7: Test Participation Rates: Hispanic

Grade	Number Accountable in ELA	Percentage Reportable in ELA	Number Accountable in Mathematics	Percentage Reportable in Mathematics	Number Accountable in Science	Percentage Reportable in Science
3	4,642	98.75	4,670	100.00		
4	4,617	98.85	4,655	99.89		
5	4,851	98.72	4,875	99.96	4,874	99.94
6	4,832	99.01	4,852	99.94		
7	4,596	98.61	4,586	99.93		
8	4,524	98.39	3,822	99.79	4,539	99.80

* Students in Grade 8 had the option of taking Algebra I instead of the MAP Grade 8 Mathematics test.

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Table 5.8: Test Participation Rates: Asian/Pacific Islander

Grade	Number Accountable in ELA	Percentage Reportable in ELA	Number Accountable in Mathematics	Percentage Reportable in Mathematics	Number Accountable in Science	Percentage Reportable in Science
3	1,531	97.71	1,557	99.87		
4	1,567	98.72	1,598	99.94		
5	1,558	98.59	1,579	100.00	1,579	100.00
6	1,567	98.92	1,571	99.87		
7	1,558	99.23	1,446	100.00		
8	1,519	99.14	953	99.58	1,525	99.67

* Students in Grade 8 had the option of taking Algebra I instead of the MAP Grade 8 Mathematics test.

Table 5.9: Test Participation Rates: American Indian

Grade	Number Accountable in ELA	Percentage Reportable in ELA	Number Accountable in Mathematics	Percentage Reportable in Mathematics	Number Accountable in Science	Percentage Reportable in Science
3	204	99.51	205	99.51		
4	215	100.00	215	100.00		
5	267	100.00	266	100.00	266	100.00
6	295	100.00	295	100.00		
7	261	99.62	259	99.61		
8	283	100.00	262	100.00	283	100.00

* Students in Grade 8 had the option of taking Algebra I instead of the MAP Grade 8 Mathematics test.

Table 5.10: Test Participation Rates: Other Race/Ethnicity

Grade	Number Accountable in ELA	Percentage Reportable in ELA	Number Accountable in Mathematics	Percentage Reportable in Mathematics	Number Accountable in Science	Percentage Reportable in Science
3	3,228	99.91	3,224	99.97		
4	3,306	99.85	3,309	99.88		
5	3,248	99.97	3,244	99.94	3,245	99.97
6	3,025	99.87	3,023	99.87		
7	2,649	100.00	2,621	99.96		
8	2,585	99.85	2,122	99.76	2,581	99.88

* Students in Grade 8 had the option of taking Algebra I instead of the MAP Grade 8 Mathematics test.

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Table 5.11: Test Participation Rates: Students Receiving Accommodations

Grade	Number Accountable in ELA	Percentage Reportable in ELA	Number Accountable in Mathematics	Percentage Reportable in Mathematics	Number Accountable in Science	Percentage Reportable in Science
3	238	99.16	244	100.00		
4	279	99.64	3,308	99.88		
5	287	99.30	4,283	99.86	1,860	99.73
6	5,934	99.83	5,045	99.82		
7	5,605	99.84	5,196	99.87		
8	5,301	99.81	4,968	99.74	972	99.59

* Students in Grade 8 had the option of taking Algebra I instead of the MAP Grade 8 Mathematics test.

Table 5.2: Test Session Structure, English Language Arts

Grade	Session Description	Session Number	Number of Passages	Total Number of Items	Total Points	Number of OP Items	OP Points	Number of FT Items	FT Points
3	Reading	1	5	27–28	30–32	23–24	26	4	4–6
	Research/ Writing	2	0	20–22	25–27	17–19	22	3	3–5
	Listening	3	3	11	12–13	8	8	3	4–5
4	Reading/ Writing	1	1	4	13–15	1	10	3	3–5
	Reading	2	5	24–25	30–33	20–21	26	4	4–7
	Research/ Writing	3	0	14	15–16	11	12	3	3–4
	Listening	4	3	10–11	12–13	7–8	8	3	4–5
5	Reading	1	5	23–24	30–32	19–20	26	4	4–6
	Research/ Writing	2	0	21–22	25–27	18–19	22–23	3	3–5
	Listening	3	3	10–11	11–13	7–8	8	3	3–5
6	Reading	1	5	26–27	32–34	22–23	28	4	4–6
	Research/ Writing	2	0	16–18	19–21	13–15	16	3	3–5
	Listening	3	3	10–11	12–13	7–8	8	3	4–5
7	Reading	1	5	26	32–34	22	28	4	4–6
	Research/ Writing	2	0	16	19–21	13	16	3	3–5
	Listening	3	3	10	11–12	7	8	3	3–4
8	Reading/ Writing	1	1	4	13–16	1	10	3	3–6
	Reading	2	5	26–27	32–35	22–23	28	4	4–7
	Research/ Writing	3	0	12	13–15	9	10	3	3–5
	Listening	4	3	11	11–13	8	8	3	3–5

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Table 5.3: Test Session Structure, Mathematics

Grade	Session Description	Session Number	Number of Passages	Total Number of Items	Total Points	Number of OP Items	OP Points	Number of FT Items	FT Points
3	Non-calculator	1	0	24	24	21	21	3	3
	Non-calculator	2	0	23	23	21	21	2	2
	Performance Event, Non-calculator	3	1	6	9	5	6	1	3
4	Non-calculator	1	0	24	24	21	21	3	3
	Non-calculator	2	0	23	23	21	21	2	2
	Performance Event, Non-calculator	3	1	6	9	5	6	1	3
5	Non-calculator	1	0	24	24	21	21	3	3
	Non-calculator	2	0	23	23	21	21	2	2
	Performance Event, Non-calculator	3	1	7	9	6	6	1	3
6	Non-calculator	1	0	11	11	10	10	1	1
	Calculator Allowed	2	0	40	40	36	36	4	4
	Performance Event, Calculator Allowed	3	1	7	12	6	8	1	4
7	Non-calculator	1	0	15	15	13	13	2	2
	Calculator Allowed	2	0	36	36	33	33	3	3
	Performance Event, Calculator Allowed	3	1	7	12	6	8	1	4
8	Non-calculator	1	0	11	11	10	10	1	1
	Calculator Allowed	2	0	40	40	36	36	4	4
	Performance Event, Calculator Allowed	3	1	7	12	6	8	1	4

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Table 5.4: Test Session Structure, Science

Grade	Session Number	Number of Passages	Total Number of Items	Total Points	Number of OP Items	OP Points	Number of FT Items	FT Points
5	1	3	32	41–45	21	29	11	12–16
	2	3	31	42–45	21	31–32	10	11–13
5	1	3	32	43–46	21	29	11	14–17
	2	3	31	43–48	21	33–34	10	10–15

Note: Calculator was allowed in all Science test sessions.

Table 5.5: MAP Administration Schedule Timing Guidelines by Session (Time in Minutes)

Grade	Session	English Language Arts	Mathematics	Science
3	1	45–105	30–55	
	2	25–55	30–55	
	3	15–35	15–30	
4	1	100–130	30–55	
	2	40–90	30–55	
	3	15–40	15–30	
	4	15–35		
5	1	45–95	35–60	60–80
	2	25–50	35–60	60–80
	3	15–35	15–30	
6	1	40–95	15–25	
	2	20–40	45–70	
	3	15–30	30–40	
7	1	40–80	20–30	
	2	20–40	40–65	
	3	15–25	30–40	
8	1	100–130	15–25	55–75
	2	35–75	45–70	55–75
	3	15–30	30–40	
	4	15–25		

Note: All times are estimates and all sessions are untimed.

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Table 5.6: Test Time Summary by Session, English Language Arts

Grade	Session	N Students	Average Test Time in Minutes		Test Time in Minutes at Selected Percentiles						
			Mean	SD	5	25	50	75	90	95	99
3	1	54,182	65	30	29	45	59	77	101	119	166
	2	56,972	34	16	17	24	30	39	51	61	92
	3	55,254	24	13	12	17	21	28	38	47	74
4	1	54,274	63	41	18	35	54	82	115	140	205
	2	56,119	61	29	27	43	56	73	94	111	162
	3	59,457	24	13	11	16	21	28	37	46	72
	4	57,456	24	13	13	17	21	27	37	45	74
5	1	58,841	62	29	29	44	57	73	94	110	160
	2	60,813	35	16	18	25	32	41	52	62	91
	3	60,105	20	11	10	14	18	23	31	40	63
6	1	61,203	59	38	28	43	55	69	87	102	140
	2	63,107	28	11	14	21	26	32	41	48	67
	3	61,692	20	9	10	15	18	22	29	34	53
7	1	60,521	54	25	27	40	50	63	78	91	129
	2	61,949	24	10	13	19	23	28	35	41	58
	3	60,438	17	7	9	13	15	19	23	28	42
8	1	59,610	49	30	14	28	42	63	87	104	143
	2	59,810	48	19	23	36	46	57	70	80	112
	3	61,503	18	7	8	14	17	22	27	31	43
	4	59,835	16	6	9	12	15	18	22	25	38

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Table 5.7: Test Time Summary by Session, Mathematics

Grade	Session	N Students	Average Test Time in Minutes		Test Time in Minutes at Selected Percentiles						
			Mean	SD	5	25	50	75	90	95	99
3	1	55,594	44	23	20	29	39	53	73	88	125
	2	55,916	42	22	18	27	37	51	69	84	120
	3	57,020	27	15	11	17	24	33	46	56	81
4	1	57,046	47	24	21	32	42	57	77	92	134
	2	57,426	46	23	20	31	41	55	74	88	126
	3	58,697	29	17	10	18	25	35	49	59	89
5	1	59,684	50	23	24	35	45	59	78	93	132
	2	59,887	47	24	20	32	42	56	75	92	132
	3	61,698	21	13	7	13	18	26	37	46	67
6	1	63,080	28	13	13	20	26	34	43	51	70
	2	60,604	59	26	29	43	55	70	89	105	146
	3	63,091	27	15	9	17	24	34	44	53	76
7	1	60,763	29	13	13	20	26	34	43	52	71
	2	59,399	51	21	25	37	47	60	75	87	123
	3	61,033	23	12	9	15	21	28	37	44	65
8	1	50,323	17	8	7	12	16	21	27	32	46
	2	48,396	57	24	25	42	53	68	84	98	135
	3	50,251	22	13	8	14	20	27	35	42	61

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Table 5.8: Test Time Summary by Session, Science

Grade	Session	N Students	Average Test Time in Minutes		Test Time in Minutes at Selected Percentiles						
			Mean	SD	5	25	50	75	90	95	99
5	1	54,061	78	34	38	57	72	92	117	138	194
	2	54,912	70	31	33	50	64	83	106	125	174
8	1	56,436	61	25	30	45	57	72	90	105	142
	2	56,695	52	22	23	38	49	61	77	90	125

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Table 5.9: MAP Universal Tools

Tool	Description	Code
Bilingual Dictionary	**EL students** may have access to a physical Bilingual Dictionary for use **ONLY** on the ELA Writing Prompts. If the Bilingual Dictionary is electronic, it may not connect to the internet.	S431
Break (Pause)	**All students** may take breaks of up to 20 minutes as needed. There is no limit to how many times a student may take a break during an assessment.	N/A
Calculator	**All students** may have access to a physical calculator for all science assessments and on mathematics items in grades 6–8, where calculator use is allowed. The memory of the physical calculator must be cleared before and after testing by the test examiner.	N/A
Color Contrast—Online Testing	**All students** can adjust background or font color based on student needs or preferences.	N/A
Color Contrast—Paper Testing	**All students** taking the paper-based assessment may have the test printed in different colors based on student needs or preferences.	S102
Color Overlay	**All students** taking the paper-based assessment may have a color transparency placed over the test presented to them based on student needs or preferences.	S103
English Dictionary	**All students** may have access to a physical English Dictionary for use **ONLY** on the ELA Writing Prompts. If the English Dictionary is electronic, it may not connect to the internet.	N/A
Grammar Handbook	**All students** may have access to a physical Grammar Handbook for use **ONLY** on the ELA Writing Prompts. If the Grammar Handbook is electronic, it may not connect to the internet.	N/A
Graphing Tool	**All students** can use an embedded tool to graph functions.	N/A
Highlighter	**All students can** access an embedded highlighter for marking desired text. **All students** may have access to a physical highlighter.	N/A
Keyboard Navigation	**All students** can navigate through the text by using the keyboard.	N/A
Line Guide	**All students** can use an embedded line guide that brings focus to a single line of text.	N/A
Magnification	**All students** can magnify the screen by 1.5 or 2 times the original size. **All students** taking the paper-based or Large Print assessments may have access to a physical magnifying device.	N/A
Magnification—Assistive Technology	**Students with visual impairments** may use assistive technology software that magnifies the screen beyond the built-in capabilities of the embedded magnifier.	S105
Mark for Review	**All students** can mark an item for review.	N/A
Masking—Online Testing	**All students** can access to an embedded masking tool to block off content that is not of immediate need or that may be distracting.	N/A
Masking—Paper Testing	**All students** taking the paper-based or Large Print assessments may use a masking tool to block off content that is not of immediate need or that may be distracting.	S107

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Table 5.19: MAP Universal Tools (cont.)

Tool	Description	Code
Non-accommodation Paper-Based Assessment	This tool is available for the following scenarios: • For students that need to test off-site in a non-district building (e.g. hospital, juvenile facility, etc.) • For **EL students** who are using the Translation tool (S109) or Read Aloud—Native Language (S111), for which the translator needs access to the assessment prior to administration to conduct translation services. Please see the section on ***Translation*** that follows the Tools/Accommodations lists for more information. • For students using Read Aloud—Human Reader (S043), for which the examiner needs a paper copy to read from. Please see the section on ***Read Aloud*** that follows the Tools and Accommodations lists for more information.	S112
Protractor	**All students** can use an embedded protractor on specific items where appropriate. **All students** taking the paper-based, Large Print, or Braille assessments may have access to a physical protractor for use on specific items where appropriate.	N/A
Read Aloud Test to Self	**All students** may read aloud the test to themselves, either in a one-on-one setting or by using a device (such as a whisper phone) that does not disturb other students or allow other students to hear what is being said.	N/A
Read Aloud: Text Directions and Items	Read Aloud (Not Including ELA Reading Passages)—Text-To-Speech	S041
	Read Aloud (Not Including ELA Reading Passages)—Human Reader	S043
	Read Aloud (Not Including ELA Reading Passages)—Assistive Technology	S042
	Read Aloud (Not Including ELA Reading Passages)—Native Language	S111
Reference Sheet	**All students** can use an embedded reference sheet on applicable assessments. Not all assessments have a reference sheet.	N/A
Ruler	**All students** can use an embedded ruler on specific items where appropriate. **All students** taking the paper-based, Large Print, or Braille assessments may have access to a physical ruler for use on specific items where appropriate.	N/A
Scratch Paper (Sticky Notes)	**All students** can use an embedded notepad (called Sticky Notes) to make notes about an item. **All students** taking the online, paper-based, Large Print, or Braille assessments may have access to physical scratch paper to make notes about an item. Scratch paper can be blank, ruled, graphed, or gridded.	N/A
Scribe	**Students with physical disabilities or students who obtain a physical injury prior to testing** that may prevent them from responding themselves may dictate their responses to a scribe, who must follow the scribing guidelines (http://dese.mo.gov/sites/default/files/asmt-scribing-guidelines.pdf).	S351

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Table 5.19: MAP Universal Tools (cont.)

Tool	Description	Code
Separate Setting	**All students** may be allowed to test in a separate setting from other students. This includes testing individually or testing as part of a smaller group.	S501
Strikethrough (Cross Off)	**All students** can cross out answer options.	N/A
Thesaurus	**All students** may have access to a physical Thesaurus for use **ONLY** on the ELA Writing Prompts. If the Thesaurus is electronic, it may not connect to the internet.	N/A
Translation	**Translation** for statewide testing should only be used with students who truly need it. **Any English Learner (EL)** taking the online, paper-based, Large Print, or Braille assessments may have the test directions and items in English Language Arts, Mathematics, and Science read aloud to them in their native language without an IEP/504 plan. In order to have reading passages in English Language Arts read aloud in their native language, a student would need to have that accommodation listed in their IEP/504 plan.	S109
Writing Tools	**All students** can use writing tools on specific items where appropriate. The tools include the ability to bold, italicize and underline text, create bullet points, undo/redo typing, and copy/paste text the student has typed.	N/A

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Table 5.20: MAP Accommodations for Students with Disabilities

Accommodation	Description	Code
Abacus	**Students with this accommodation in their IEP/504 plan** may have access to an abacus.	A391
Alternate Response Options	**Students with this accommodation in their IEP/504 plan** may respond to items using an alternate option, including but not limited to the following: Adapted Keyboards, StickyKeys, MouseKeys, FilterKeys, Adapted Mouse, Touch Screen, Head Wand, and Switches.	A441
Braille	**Students with visual impairments with this accommodation in their IEP/504 plan** may access the assessment via a Braille version. Tactile overlays and graphics tools may be used to assist the student in accessing the content.	A012
***INVALIDATION* Calculator (For Non-Calculator Allowed Items in Grade 3)**	**Students in Grade 3 with this accommodation in their IEP/504 plan** may have access to a physical calculator on mathematics items where calculator use is not allowed. The memory of the physical calculator must be cleared before and after testing by the test examiner.	A392
Calculator (For Non-Calculator Allowed Items in Grades 4–8)	**Students in Grades 4–8 with this accommodation in their IEP/504 plan** may have access to a physical calculator on mathematics items where calculator use is not allowed. The memory of the physical calculator must be cleared before and after testing by the test examiner.	A393
Large Print	**Students with visual impairments with this accommodation in their IEP/504 plan** may access the assessment via a Large Print version.	A021
Closed Captioning	**Hearing Impaired students with this accommodation in their IEP/504 plan** may have Closed Captioning available for ELA listening items.	A053
***INVALIDATION* Multiplication Table (Grade 3)**	**Students in Grade 3 with this accommodation in their IEP/504 plan** may have access to a single digit multiplication table.	A394
Multiplication Table (Grades 4–8)	**Students in Grades 4–8 with this accommodation in their IEP/504 plan** may have access to a single digit multiplication table.	A395
Paper-Based Assessment	**Students with this accommodation in their IEP/504 plan** may take the assessment using the paper-based format.	A102
Read Aloud: ELA Reading Passages Grades 3–5	Read Aloud (ELA Reading Passages)—Text-To-Speech (Grades 3–5)	A040
	Read Aloud (ELA Reading Passages)—Human Reader (Grades 3–5)	A041
	Read Aloud (ELA Reading Passages)—Assistive Technology (Grades 3–5)	A042
	Read Aloud (ELA Reading Passages)—Native Language (Grades 3–5)	A111

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Table 5.20: MAP Accommodations for Students with Disabilities (cont.)

Accommodation	Description	Code
Read Aloud: ELA Reading Passages Grades 6–8	Read Aloud (ELA Reading Passages)—Text-To-Speech (Grades 6–8)	A043
	Read Aloud (ELA Reading Passages)—Human Reader (Grades 6–8)	A045
	Read Aloud (ELA Reading Passages)—Assistive Technology (Grades 6–8)	A044
	Read Aloud (ELA Reading Passages)—Native Language (Grades 6–8)	A112
Read Aloud: ELA Reading Passages All Grades	Read Aloud (ELA Reading Passages)—Blind Students (All Grades)	A046
Sign Language	**Hearing Impaired students with this accommodation in their IEP/504 plan** may have ELA listening items translated into American Sign Language (ASL), Signing Exact English (SEE), or any other form of sign language.	A052
Specialized Calculator (For Calculator Allowed Items Only)	**Students with this accommodation in their IEP/504 plan** may have access to a specialized calculator on items where calculator use is allowed. The specialized calculator can include a talking calculator or Braille calculator among others. The memory of the physical calculator must be cleared before and after testing by the test examiner.	A396
Speech-To-Text—Assistive Technology	**Students with this accommodation in their IEP/504 plan** may use that technology in conjunction with the INSIGHT testing platform.	A352

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Table 5.10: Number and Percentage of Students Using Accommodations or Universal Tools Grade 3

Grade	Accommodations	English Language Arts		Mathematics	
		N-Count	Percent	N-Count	Percent
3	Braille	3	0	3	0
	Large Print	27	0.04	28	0.04
	Read Aloud - ELA Reading Passages - Text-To-Speech -GRADES 3-5 ONLY-INVALIDATION ELA	55	0.08		
	Read-Aloud - ELA Reading Passages - Human Reader -GRADES 3-5 ONLY-INVALIDATION ELA	54	0.08		
	Read-Aloud - ELA Reading Passages -Blind Students	3	0.00		
	Sign Language	14	0.02		
	Accommodation Closed Captioning	3	0.00		
	Paper Based Assessment	101	0.15	104	0.16
	Speech-To-Text - Assistive Technology	34	0.05	32	0.05
	Abacus			56	0.08
	Calculator - For Non-Calculator Allowed Items Only-GRADE 3 ONLY-INVALIDATION MATH			44	0.07
	Multiplication Table -GRADE 3 ONLY-INVALIDATION MATH			76	0.11
	Specialized Calculator			5	0.01
	Alternate Response Options	2	0	6	0.01
	Universal Tools	**N-Count**	**Percent**	**N-Count**	**Percent**
3	Read-Aloud - Text-To-Speech	27,921	42	28,758	43.24
	Read-Aloud - Assistive Technology	22	0.03	19	0.03
	Read-Aloud - Human Reader	3,731	5.61	3,864	5.81
	Color Contrast - Paper	3	0.00	3	0.00
	Color Overlay	16	0.02	16	0.02
	Magnification - Assistive Technology	91	0.14	91	0.14
	Masking - Paper	9	0.01	9	0.01
	Translation	27	0.04	79	0.12
	Read-Aloud - Native Language	55	0.08	128	0.19
	Non-Accommodation Paper Based Assessment	83	0.12	84	0.13
	Scribe	1,301	1.96	1,239	1.86
	Bilingual Dictionary	35	0.05		
	Separate Setting	12,073	18.16	12,083	18.17

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Table 5.22: Number and Percentage of Students Using Accommodations or Universal Tools Grade 4

Grade	Accommodations	English Language Arts		Mathematics	
		N-Count	Percent	N-Count	Percent
4	Braille	9	0.01	10	0.01
	Large Print	28	0.04	28	0.04
	Read Aloud - ELA Reading Passages - Text-To-Speech -GRADES 3-5 ONLY-INVALIDATION ELA	66	0.10		
	Read-Aloud - ELA Reading Passages - Human Reader -GRADES 3-5 ONLY-INVALIDATION ELA	41	0.06		
	Read-Aloud - ELA Reading Passages - Assistive Technology - GRADES 3-5 ONLY-INVALIDATION ELA	1	0.00		
	Read-Aloud - ELA Reading Passages -Blind Students	7	0.01		
	Sign Language	12	0.02		
	Accommodation Closed Captioning	5	0.01		
	Paper Based Assessment	122	0.18	132	0.19
	Read-Aloud - ELA Reading Passages - Native Language-GRADES 3-5 ONLY-INVALIDATION ELA	4	0.01		
	Speech-To-Text - Assistive Technology	33	0.05	29	0.04
	Abacus			11	0.02
	Calculator - For Non-Calculator Allowed Items Only-GRADES 4-8			2,022	2.96
	Multiplication Table-GRADES 4-8			2,831	4.15
	Specialized Calculator			24	0.04
	Alternate Response Options	9	0.01	9	0.01
	Universal Tools	**N-Count**	**Percent**	**N-Count**	**Percent**
4	Read-Aloud - Text-To-Speech	27,603	40.5	28,155	41.27
	Read-Aloud - Assistive Technology	26	0.04	24	0.04
	Read-Aloud - Human Reader	3,601	5.28	3,762	5.51
	Color Contrast - Paper	5	0.01	5	0.01
	Color Overlay	10	0.01	10	0.01
	Magnification - Assistive Technology	79	0.12	78	0.11
	Masking - Paper	8	0.01	8	0.01
	Translation	35	0.05	90	0.13
	Read-Aloud - Native Language	55	0.08	141	0.21
	Non-Accommodation Paper Based Assessment	71	0.10	78	0.11
	Scribe	1,760	2.58	1,574	2.31
	Bilingual Dictionary	186	0.27		
	Separate Setting	12,556	18.42	12,602	18.47

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Table 5.23: Number and Percentage of Students Using Accommodations or Universal Tools Grade 5

Grade	Accommodations	English Language Arts		Mathematics		Science	
		N-Count	Percent	N-Count	Percent	N-Count	Percent
5	Braille	2	0	2	0	2	0
	Large Print	37	0.05	35	0.05	34	0.05
	Read Aloud - ELA Reading Passages - Text-To-Speech -GRADES 3-5 ONLY-INVALIDATION ELA	92	0.13				
	Read-Aloud - ELA Reading Passages - Human Reader -GRADES 3-5 ONLY-INVALIDATION ELA	44	0.06				
	Read-Aloud - ELA Reading Passages - Assistive Technology - GRADES 3-5 ONLY-INVALIDATION ELA	2	0.00				
	Read-Aloud - ELA Reading Passages - Blind Students	8	0.01				
	Sign Language	12	0.02				
	Accommodation Closed Captioning	2	0.00				
	Paper Based Assessment	94	0.13	107	0.15	101	0.14
	Speech-To-Text - Assistive Technology	44	0.06	44	0.06	44	0.06
	Abacus			3	0.00	3	0.00
	Calculator - For Non-Calculator Allowed Items Only-GRADES 4-8			3,005	4.30		
	Multiplication Table-GRADES 4-8			3,628	5.19	1,691	2.42
	Specialized Calculator			51	0.07	38	0.05
	Alternate Response Options	5	0.01	4	0.01	4	0.01
	Universal Tools	**N-Count**	**Percent**	**N-Count**	**Percent**	**N-Count**	**Percent**
5	Read-Aloud - Text-To-Speech	27,342	39.14	27,952	39.98	27,849	39.84
	Read-Aloud - Assistive Technology	24	0.03	26	0.04	27	0.04
	Read-Aloud - Human Reader	3,141	4.50	3,318	4.75	3,240	4.64
	Color Contrast - Paper	4	0.01	4	0.01	4	0.01
	Color Overlay	7	0.01	7	0.01	7	0.01
	Magnification - Assistive Technology	83	0.12	88	0.13	83	0.12
	Masking - Paper	7	0.01	7	0.01	6	0.01
	Translation	74	0.11	135	0.19	128	0.18
	Read-Aloud - Native Language	105	0.15	179	0.26	170	0.24
	Non-Accommodation Paper Based Assessment	60	0.09	63	0.09	63	0.09
	Scribe	1,467	2.10	1,418	2.03	1,477	2.11
	Bilingual Dictionary	106	0.15				
	Separate Setting	1,1910	17.05	1,1967	17.12	11,629	16.64

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Table 5.24: Number and Percentage of Students Using Accommodations or Universal Tools Grade 6

Grade	Accommodations	English Language Arts		Mathematics	
		N-Count	Percent	N-Count	Percent
6	Braille	6	0.01	6	0.01
	Large Print	33	0.05	33	0.05
	Read Aloud - ELA Reading Passages - Text-To-Speech -GRADES 6-8	4,454	6.35		
	Read-Aloud - ELA Reading Passages - Assistive Technology-GRADES 6-8	23	0.03		
	Read-Aloud - ELA Reading Passages - Human Reader-GRADES 6-8	1,376	1.96		
	Read-Aloud - ELA Reading Passages - Blind Students	9	0.01		
	Sign Language	11	0.02		
	Accommodation Closed Captioning	7	0.01		
	Paper Based Assessment	89	0.13	103	0.15
	Read-Aloud - ELA Reading Passages - Native Language-GRADES 6-8	10	0.01		
	Speech-To-Text - Assistive Technology	48	0.07	46	0.07
	Abacus			3	0.00
	Calculator - For Non-Calculator Allowed Items Only-GRADES 4-8			4,371	6.23
	Multiplication Table-GRADES 4-8			3,355	4.78
	Specialized Calculator			69	0.10
	Alternate Response Options	6	0.01	6	0.01
	Universal Tools	**N-Count**	**Percent**	**N-Count**	**Percent**
6	Read-Aloud - Text-To-Speech	21,664	30.88	24,049	34.28
	Read-Aloud - Assistive Technology	20	0.03	38	0.05
	Read-Aloud - Human Reader	1,161	1.66	1,918	2.73
	Color Contrast - Paper	2	0.00	2	0.00
	Color Overlay	2	0.00	2	0.00
	Magnification - Assistive Technology	82	0.12	83	0.12
	Masking - Paper	2	0.00	2	0.00
	Translation	40	0.06	79	0.11
	Read-Aloud - Native Language	60	0.09	109	0.16
	Non-Accommodation Paper Based Assessment	64	0.09	68	0.10
	Scribe	825	1.18	804	1.15
	Bilingual Dictionary	101	0.14		
	Separate Setting	9,529	13.58	9,521	13.57

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Table 5.25: Number and Percentage of Students Using Accommodations or Universal Tools Grade 7

Grade	Accommodations	English Language Arts		Mathematics	
		N-Count	Percent	N-Count	Percent
7	Braille	9	0.01	9	0.01
	Large Print	36	0.05	36	0.05
	Read Aloud - ELA Reading Passages - Text-To-Speech -GRADES 6-8	4,319	6.34		
	Read-Aloud - ELA Reading Passages - Assistive Technology-GRADES 6-8	20	0.03		
	Read-Aloud - ELA Reading Passages - Human Reader-GRADES 6-8	1,165	1.71		
	Read-Aloud - ELA Reading Passages - Blind Students	3	0.00		
	Sign Language	12	0.02		
	Accommodation Closed Captioning	4	0.01		
	Paper Based Assessment	89	0.13	101	0.15
	Read-Aloud - ELA Reading Passages - Native Language-GRADES 6-8	3	0.00		
	Speech-To-Text - Assistive Technology	65	0.1	54	0.08
	Abacus			7	0.01
	Calculator - For Non-Calculator Allowed Items Only-GRADES 4-8			4,825	7.17
	Multiplication Table-GRADES 4-8			2,510	3.73
	Specialized Calculator			55	0.08
	Alternate Response Options	6	0.01	6	0.01
	Universal Tools	**N-Count**	**Percent**	**N-Count**	**Percent**
7	Read-Aloud - Text-To-Speech	18,559	27.23	20,707	30.76
	Read-Aloud - Assistive Technology	21	0.03	42	0.06
	Read-Aloud - Human Reader	832	1.22	1,456	2.16
	Color Overlay	3	0.00	3	0.00
	Magnification - Assistive Technology	16	0.02	17	0.03
	Masking - Paper	4	0.01	4	0.01
	Translation	13	0.02	42	0.06
	Read-Aloud - Native Language	81	0.12	125	0.19
	Non-Accommodation Paper Based Assessment	65	0.10	68	0.10
	Scribe	512	0.75	486	0.72
	Bilingual Dictionary	96	0.14		
	Separate Setting	8,544	12.53	8,544	12.69

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Table 5.26: Number and Percentage of Students Using Accommodations or Universal Tools Grade 8

Grade	Accommodations	English Language Arts		Mathematics		Science	
		N-Count	Percent	N-Count	Percent	N-Count	Percent
8	Braille	9	0.01	9	0.02	9	0.01
	Large Print	32	0.05	30	0.05	32	0.05
	Read Aloud - ELA Reading Passages - Text-To-Speech -GRADES 6-8	4,154	6.2				
	Read-Aloud - ELA Reading Passages - Assistive Technology-GRADES 6-8	23	0.03				
	Read-Aloud - ELA Reading Passages - Human Reader-GRADES 6-8	1,029	1.54				
	Read-Aloud - ELA Reading Passages - Blind Students	5	0.01				
	Sign Language	15	0.02				
	Accommodation Closed Captioning	4	0.01				
	Paper Based Assessment	86	0.13	93	0.17	82	0.12
	Read-Aloud - ELA Reading Passages - Native Language-GRADES 6-8	6	0.01				
	Speech-To-Text - Assistive Technology	48	0.07	38	0.07	43	0.06
	Abacus			3	0.01	3	0.00
	Calculator - For Non-Calculator Allowed Items Only-GRADES 4-8			4,676	8.42		
	Multiplication Table-GRADES 4-8			1,891	3.41	802	1.2
	Specialized Calculator			80	0.14	33	0.05
	Alternate Response Options	9	0.01	8	0.01	9	0.01
	Universal Tools	**N-Count**	**Percent**	**N-Count**	**Percent**	**N-Count**	**Percent**
8	Read-Aloud - Text-To-Speech	18,266	27.26	17,229	31.04	19,903	29.71
	Read-Aloud - Assistive Technology	10	0.01	24	0.04	24	0.04
	Read-Aloud - Human Reader	870	1.30	1,359	2.45	1,372	2.05
	Color Contrast - Paper	1	0.00	1	0.00	1	0.00
	Color Overlay	4	0.01	4	0.01	4	0.01
	Magnification - Assistive Technology	18	0.03	17	0.03	18	0.03
	Masking - Paper	1	0.00	1	0.00	1	0.00
	Translation	22	0.03	49	0.09	53	0.08
	Read-Aloud - Native Language	91	0.14	130	0.23	133	0.20
	Non-Accommodation Paper Based Assessment	60	0.09	60	0.11	66	0.10
	Scribe	454	0.68	429	0.77	437	0.65
	Bilingual Dictionary	214	0.32				
	Separate Setting	7,803	11.64	7,612	13.71	7,578	11.31

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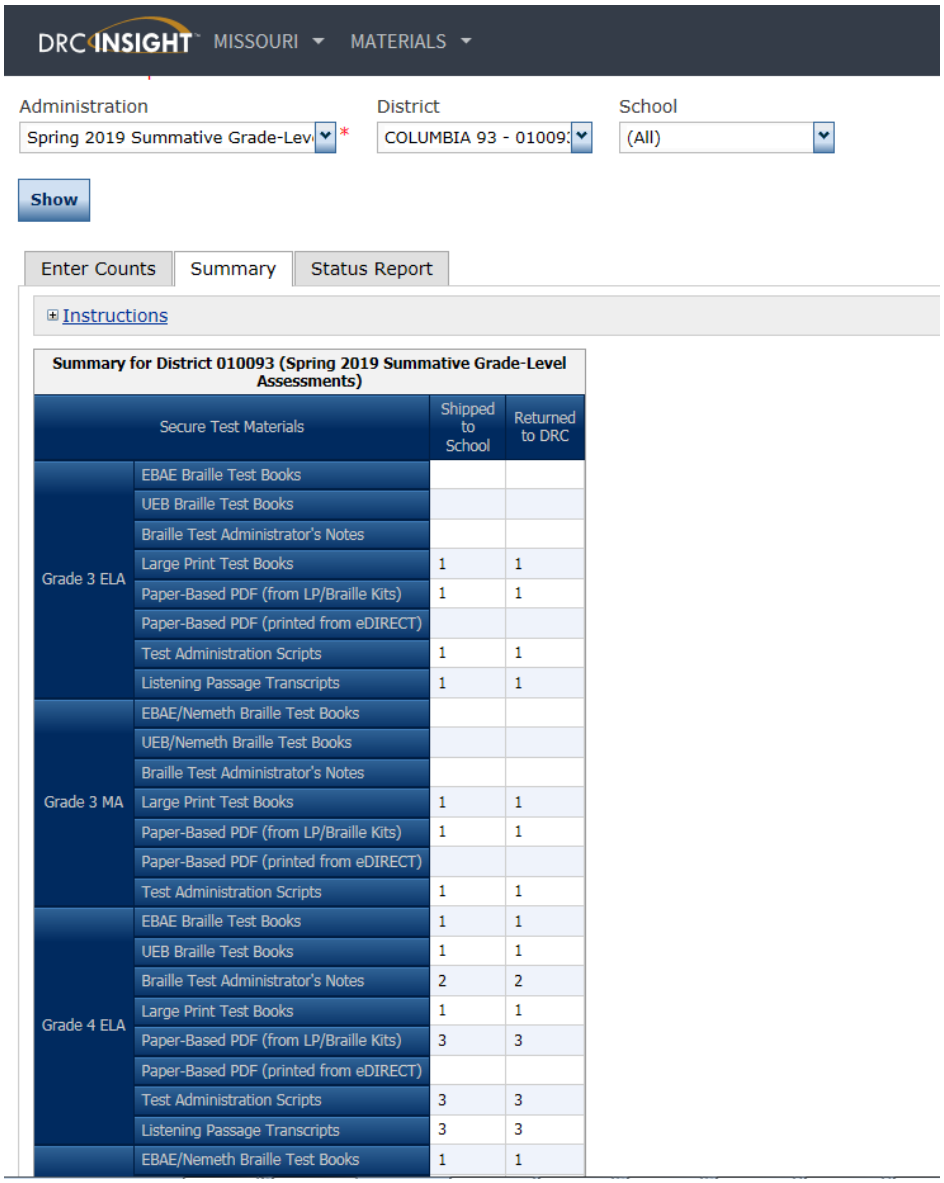
Figure 5.1: Sample Test Book Accountability Form via eDIRECT



Summary for District 010093 (Spring 2019 Summative Grade-Level Assessments)

	Secure Test Materials	Shipped to School	Returned to DRC
Grade 3 ELA	EBAE Braille Test Books		
	UEB Braille Test Books		
	Braille Test Administrator's Notes		
	Large Print Test Books	1	1
	Paper-Based PDF (from LP/Braille Kits)	1	1
	Paper-Based PDF (printed from eDIRECT)		
	Test Administration Scripts	1	1
	Listening Passage Transcripts	1	1
Grade 3 MA	EBAE/Nemeth Braille Test Books		
	UEB/Nemeth Braille Test Books		
	Braille Test Administrator's Notes		
	Large Print Test Books	1	1
	Paper-Based PDF (from LP/Braille Kits)	1	1
	Paper-Based PDF (printed from eDIRECT)		
	Test Administration Scripts	1	1
Grade 4 ELA	EBAE Braille Test Books	1	1
	UEB Braille Test Books	1	1
	Braille Test Administrator's Notes	2	2
	Large Print Test Books	1	1
	Paper-Based PDF (from LP/Braille Kits)	3	3
	Paper-Based PDF (printed from eDIRECT)		
	Test Administration Scripts	3	3
	Listening Passage Transcripts	3	3
	EBAE/Nemeth Braille Test Books	1	1

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CHAPTER 6: SCORING

In this chapter, we first describe the scoring process used for the MAP. In particular, we focus on the PAS (Performance Assessment Services) process of handscoring English Language Arts writing prompts, Mathematics performance event items, and Science constructed-response items and of autoscoring multiple-choice, multi-select, technology-enhanced, evidence-based selected-response, and short-answer items. At the end of this section, we describe and report the results of the inter-rater reliability study conducted on the handscoring of the MAP writing-prompt items.

Chapter 6 describes how the MAP adheres to AERA, APA, & NCME Standards 4.18, 4.20, 6.8, and 6.9. Each of these standards will be presented in the pertinent section of this chapter. Standard 4.18 provides some general guidance for Chapter 6:

> Procedures for scoring and, if relevant, scoring criteria, should be presented by the test developer with sufficient detail and clarity to maximize the accuracy of scoring. Instructions for using rating scales or for deriving scores obtained by coding, scaling, or classifying constructed responses should be clear. This is especially critical for extended-response items such as performance tasks, portfolios, and essays. (p. 91)

To preserve the integrity of the items for future use, the scoring criteria used for each item are not presented in this chapter. Procedures related to recruitment and training of human readers and monitoring scoring process contribute to the validity evidence based on response processes.

6.1 Handscoring Process

Writing prompts in ELA Grades 4 and 8, Mathematics performance event items in Grades 6 through 8, and constructed-response items in Science Grades 5 and 8 were scored by human readers who were trained by DRC. Student responses were captured online for all students. Braille, Large Print, or paper-based non-accommodated form student responses were transcribed (entered) into the online system by a test examiner.

6.1.1 Selection of Readers

AERA, APA, & NCME (2014) Standard 4.20 specifies the following:

> The process for selecting, training, qualifying, and monitoring scorers should be specified by the test developer. The training materials, such as the scoring rubrics and examples of test takers' responses that illustrate the levels on the rubric score scale, and the procedures for training readers should result in a degree of accuracy and agreement among scorers that allows the scores to be interpreted as originally intended by the test developer. Specifications should also describe processes for assessing scorer consistency and potential drift over time in raters' scoring. (p. 92)

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Sections 6.1.1 and 6.1.2 explain how readers were selected and trained for the MAP handscoring process. Section 5.1.3 describes how the scorers were monitored throughout the MAP handscoring process.

DRC strived to develop a highly qualified, experienced core of readers so that the integrity of all projects was appropriately maintained.

Recruitment

The MAP 2019 was staffed with a large number of readers and team leaders who had previous experience with DRC PAS projects. In addition, DRC worked with Stafforward (a company specializing in staffing practice areas, such as clerical and administrative areas, call centers, accounting areas, healthcare areas, scientific areas, and light industry) to recruit new team leaders and readers for employment. Recruitment sources included advertisements online and in newspapers in Indianapolis, Indiana, and nearby areas.

DRC required that all readers and team leaders possess a bachelor's degree or higher. Stafforward screened all new applicants and required them to produce either a transcript or a copy of the degree. Stafforward also required a one- to two-hour interview/screening process. Individuals who did not present proper documentation or had less than desirable work records were eliminated from the program during this process. Stafforward verified that 100% of all potential readers met the degree requirement. All experienced readers and team leaders had already successfully completed the screening process.

The Interview Process

All potential readers completed a pre-interview activity. For some parts of the pre-interview activity, applicants were shown sample Mathematics items and a writing prompt and were required to respond correctly to the Mathematics items and write an original essay. The applicant's responses were scored and used for discussion during the interview process to determine the applicant's ability to correctly solve mathematics problems and to construct a well-developed essay with correct use of standard conventions.

Stafforward interviewed each applicant and determined the applicant's suitability for scoring Missouri items. Applicants with strong leadership skills were questioned further to determine whether they were qualified to be team leaders.

When Stafforward determined that applicants were qualified, the applicants were recommended for employment. Before being hired, all employees were required to read, agree to, and sign a nondisclosure agreement outlining DRC's business ethics and security procedures.

6.1.2 PAS Training Process

AERA, APA, & NCME (2014) Standard 6.9 specifies the following:

> Those responsible for test scoring should establish and document quality control processes and criteria. Adequate training should be provided. The quality of

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scoring should be monitored and documented. Any systematic source of scoring errors should be documented and corrected. (p. 118)

Training Material Development

All materials necessary for scoring were developed by DRC. These materials included the scoring guides and training papers used to complete the handscoring of writing prompts, Mathematics performance events, and Science constructed-response items.

A total of ten writing prompts were administered in Grade 4, and ten writing prompts were administered in Grade 8. A total of five Mathematics operational constructed response items were administered in Grades 6 through 8: one in Grade 6 and two in both Grades 7 and 8. A total of eighteen unique operational constructed response items were administered in Grade 5 Science, and twenty unique constructed response items were administered in Grade 8 Science.

For the writing prompts, after acquiring 500–700 student responses per prompt, Scoring Directors assembled materials based on the rubrics and presented the materials and annotations to DESE participants in an on-site Rangefinding review.

For Mathematics and Science, scoring directors assembled previously approved anchor, training, and qualifying material from the 2018 Mathematics and Science field test item scoring. All responses and annotations were reviewed and reapproved by DESE in a series of online meetings in January and February 2019.

Rangefinding Activities

The rangefinding for ELA writing prompts took place at DRC's scoring facilities in Indianapolis, Indiana, from May 1 to May 9, 2019. A total of eleven participants (two from DESE and eleven from DRC) reviewed all writing prompts to ensure consistency between prompt scoring. Sets of annotated student responses were presented to the committee one prompt at a time. Discussions of student responses were conducted in a manner that emphasized the use of rubric and scoring guideline language. DRC PAS staff recorded the score point decisions made by the DESE representatives to include the information in final material preparation. The reasoning and scoring philosophies utilized in arriving at the final scores were also noted in order to provide this information during reader training and scoring. After all papers for a prompt were reviewed, the DRC scoring directors and DESE staff collaboratively identified responses that would be utilized as anchors during rater training and scoring. Anchor packets for each prompt consisted of nineteen or twenty papers. All score points and examples of responses within each score point were represented in the anchor papers. The anchor papers were used in the training and qualifying of the readers.

Rangefinding for the constructed response Mathematics and Science items included in the Spring 2019 operational tests occurred after these items were field-tested in Spring 2018. Mathematics rangefinding occurred from May 15 to May 17, 2018, with two DESE representatives and five DRC staff participating. Science rangefinding occurred from May 14 to June 4, 2018, with two DESE staff and thirteen DRC PAS and TD staff

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participating. Both activities took place at DRC's scoring facilities in Indianapolis, Indiana. The rangefinding process was the same for Mathematics and Science. Each participating group reviewed sets of annotated student responses one item at a time. DESE staff selected an anchor packet for each item; typically, a 0–2-point constructed-response item had an anchor set of 3 responses, one for each score point. A total of thirty-five to fifty papers (responses) per item were reviewed and assigned scores. DRC PAS staff recorded the scores as well as the philosophies utilized in determining scores in order to communicate this information during reader training and scoring. The anchor papers and the rubric became the scoring guide all readers referred to during training and scoring.

Training and Qualifying Procedures

Handscoring involves training and qualifying team leaders and readers, monitoring scoring accuracy and production, and ensuring security of both the test materials and the scoring facilities. An explanation of the training and qualifying procedures follows.

All readers were trained and qualified on specific writing prompts to be scored. Readers were trained using the following steps:

- Reviewing items to be scored (writing prompts for ELA and constructed response items for Mathematics and Science)
- Reviewing rubrics
- Reviewing anchor papers
- Explaining scoring strategies, followed by a question and answer session
- Scoring training set 1, followed by sharing established scores
- Scoring training set 2, followed by sharing established scores
- Qualifying Round 1
- Qualifying Round 2
- Explaining condition codes and sensitive paper procedures

All readers were trained and qualified using the same procedures and criteria. Qualification standards for every writing prompt were predetermined by DESE. In order to score a writing prompt, readers must have met the specific standards for that prompt. Missouri writing prompts were scored using a 4-point rubric for the Evidence/Elaboration and Organization/Purpose components and a 2-point rubric for the Conventions component. Mathematics and Science constructed response items were scored using rubrics developed during rangefinding.

The qualification standards were the following:

- 4-point rubric: 80% exact agreement qualification
- 3-point rubric: 85% exact agreement qualification
- 2-point rubric: 90% exact agreement qualification
- 1-point rubric: 95% exact agreement qualification

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Qualification rounds for each constructed response or writing prompt consisted of ten papers. Readers were given two attempts to qualify on an item. If a reader did not achieve the targeted exact percentage on the first qualification attempt (or had a nonadjacent score), he or she retrained and was allowed to attempt a second qualification round. Readers failing both qualification attempts were not allowed to score that particular item but may have been allowed to train and qualify for scoring a different item.

6.1.3 Monitoring the Scoring Process

AERA, APA, & NCME (2014) Standard 6.8 states the following:

> Those responsible for test scoring should establish scoring protocols. Test scoring that involves human judgment should include rubrics, procedures, and criteria for scoring. When scoring of complex responses is done by computer, the accuracy of the algorithm and processes should be documented. (p. 118)

This section explains the monitoring procedures that DRC uses to ensure that readers follow established scoring criteria while items are being scored. Detailed scoring rubrics are available for all handscored items, which specify the criteria for scoring those items.

Daily Accuracy Checks

Throughout the course of handscoring, calibration sets of pre-scored papers (validity papers) were administered daily to each reader to monitor scoring accuracy and to maintain a consistent focus on the established rubrics and guidelines. Validity papers were selected from live student responses in the Spring 2018 field test administration for Mathematics and Science and from live student responses in the 2019 operational administration of ELA writing prompts. Scoring directors determined the true scores based on papers previously approved by DESE. Readers received approximately ten validity papers per day. The predetermined validity paper score was compared to the score the reader assigned. Readers whose daily validity agreement fell below qualification thresholds were counselled and retrained as needed. The scoring platform was designed to allow for routing of these selected responses without readers being able to identify which papers were the validity papers. In other words, validity responses were "blind"—readers were not able to distinguish validity responses from live responses.

In addition to the validity process, DRC's protocol included the use of read-behinds. Team leaders reviewed readers' scored responses daily to identify a possible reader effect. If team leaders did not agree with any of the scores, they changed the student score to the correct one. Feedback was provided to the readers to rectify any scoring inconsistencies found during the read-behind process. Read-behind monitoring rates were higher during the initial weeks of scoring and were adjusted according to each individual reader's performance throughout the project. Read-behind monitoring rates typically ranged from 1:5 to 1:20.

Approximately 15% of all responses were scored by a second reader to establish inter-rater reliability statistics for all handscored items. This procedure is called a "double-

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blind read" because the second reader does not know the first reader's score. Individual reader data, including the number of responses scored and exact, adjacent, and nonadjacent agreement rates were reviewed by the scoring directors. Any issues were investigated and resolved by scoring directors in consultation with the scoring project manager.

6.1.4 Security

Security guards were on-site whenever employees were present in the building. All employees were issued identification badges and were required to wear them in plain view at all times. Visitors and employees who forgot their badges were issued visitors' badges and were required to wear them in plain view. All employees and visitors were subject to inspection of their personal effects.

6.2 Technology-Enhanced Item Scoring Process

All technology-enhanced, evidence-based selected-response, and short-answer items were processed through DRC's autoscoring engine and scored according to the assigned scoring rules. DRC ensured that all rubrics and scoring rules were verified for accuracy before scoring any of these items. DRC established an adjudication process for technology-enhanced, evidence-based selected-response, and short-answer items to verify that correct answers were identified. DRC's autoscoring quality assurance process included the following:

- A scoring rubric was created for each autoscored item. It was as simple as describing the one and only correct answer for dichotomously scored items (scored as either right or wrong).
- The information from the scoring rubric was entered into the scoring system within the item banking system so that the information resided in one place, along with the item image and other metadata. This scoring information designated specific information that varied by item type. For example, for a drag-and-drop item, the information included which objects are to be placed in which drop region to receive credit.
- The information was then verified by another autoscoring expert.
- After testing started, reports were generated that showed every response, how many students gave that response, and the score the scoring system provided.
- The scoring was then checked against the scoring rubric.
- If any discrepancies were found, the scoring information was modified and verified again. Scoring was then rerun. This checking and modification process continued until no other issues were found.
- As a final check, a final report was run that showed all student responses, along with their frequencies and received scores.

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In case of Braille, Large Print, or paper-based non-accommodated form administration, student responses were transcribed (entered) into the online system by a test examiner.

6.3 Multiple-Choice and Multi-select Item Scoring Process

Responses to multiple-choice and multi-select items were captured during the online test administration or transcribed into the online system for Braille, Large Print, or paper-based non-accommodated test forms. Responses to multiple-choice and multi-select items were scored using a predefined answer key.

6.4 Inter-rater Reliability

Approximately 15% of the handscored responses in ELA, Mathematics, and Science were scored independently by a second reader. The statistics for the inter-rater reliability were calculated for all handscored items at all grades. To determine the reliability of scoring, the percentage of exact agreement and adjacent agreement between the scores from two readers was examined. Non-scorable responses were not included in the inter-rater agreement analysis.

For each item, a quadratic weighted kappa statistic was calculated to reflect the level of improvement beyond the chance level in the consistency of scoring. These quadratic weighted kappa values and the rater agreement statistics are presented in Table 6.1 for ELA, Table 6.2 for Mathematics, and Table 6.3 for Science. To aid in the interpretation of the kappa statistic, the following cutoffs have been suggested (Landis & Koch, 1977; Altman, 1991):

Kappa Value	Strength of Agreement
0	None
<0.20	Poor
0.21–0.40	Fair
0.41–0.60	Moderate
0.61–0.80	Good
0.81–1.00	Very Good

A total of ten writing prompts for Grade 4 and ten writing prompts for Grade 8 were scored by human readers across all test forms. Each writing prompt was scored on three components: Organization/Purpose (1–4 points), Evidence/Elaboration (1–4 points), and Conventions (0–2 points). A total of 30 item components were scored for Grade 4 and for Grade 8.

A total of five constructed-response operational test items were scored for Mathematics: one in Grade 6 and two items in both Grade 7 and Grade 8. A total of eighteen constructed-response operational test items were scored for Science Grade 5, and twenty constructed-response operational test items were scored for Science Grade 8.

As shown in Table 6.1, raters demonstrated at least 99% exact and adjacent agreement for the writing-prompt component scoring in both ELA grades and across all components.

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The exact agreement ranged from 72.49% to 90.10% for components scored using a 1–4-point rubric and from 84.90% to 99.21% for components scored using a 0–2-point rubric. The quadratic weighted kappa values ranged from 0.78 to 0.94 for components scored using a 1–4-point rubric, indicating good or very good inter-rater agreement for these components. Likely due to lower score variability, lower kappa values were obtained for the writing components scored using a 0–2-point rubric compared to the components scored using a 1–4-point rubric. The quadratic weighted kappa values ranged from 0.41 to 0.80 for components scored using a 0–2-point rubric, indicating moderate or good inter-rater agreement for these components.

Raters demonstrated at least 96% exact agreement for the handscored operational Mathematics items in Grades 6 through 8 (see Table 6.2). The exact and adjacent agreement was over 99% for each item. The quadratic weighted kappa values ranged from 0.89 to 0.97, indicating very good agreement between raters for all Mathematics items.

As shown in Table 6.3, the exact and adjacent agreement for all operational handscored Science items was at least 99%. The exact agreement ranged from 84.38% to 96.45% across all Science items in Grades 5 and 8. The quadratic weighted kappa values ranged from 0.85 to 0.98, indicating very good inter-rater agreement for all Science items.

6.5 Summary

The information presented in this chapter summarizes the scoring procedures for different types of items and steps taken by DRC to ensure accuracy in the handscoring and autoscoring processes. The inter-rater reliability statistics presented in Section 6.4 demonstrate that the handscored items are scored reliably. These efforts by DRC follow multiple best practices of the testing industry and support AERA, APA, & NCME (2014) Standards 4.18, 4.20, 6.8, and 6.9:

- Standard 4.18—Procedures for scoring and, if relevant, scoring criteria, should be presented by the test developer with sufficient detail and clarity to maximize the accuracy of scoring. Instructions for using rating scales or for deriving scores obtained by coding, scaling, or classifying constructed responses should be clear. This is especially critical for extended-response items such as performance tasks, portfolios, and essays.
- Standard 4.20—The process for selecting, training, qualifying, and monitoring scorers should be specified by the test developer. The training materials, such as the scoring rubrics and examples of test takers' responses that illustrate the levels on the rubric score scale, and the procedures for training scorers should result in a degree of accuracy and agreement among scorers that allows the scores to be interpreted as originally intended by the test developer. Specifications should also describe processes for assessing scorer consistency and potential drift over time in raters' scoring.
- Standard 6.8—Those responsible for test scoring should establish scoring protocols. Test scoring that involves human judgment should include rubrics,

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procedures, and criteria for scoring. When scoring of complex responses is done by computer, the accuracy of the algorithm and processes should be documented.

- Standard 6.9—Those responsible for test scoring should establish and document quality control processes and criteria. Adequate training should be provided. The quality of scoring should be monitored and documented. Any systematic source of scoring errors should be documented and corrected.

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Table 6.1: Inter-rater Reliability, English Language Arts

Grade	Form	Component	Item #	Score Range	% Exact	% Adjacent	% Exact and Adjacent*	Quadratic Weighted Kappa
4	1 (A)	Organization/Purpose	4	1–4	79.56	19.89	99.45	0.87
		Evidence/Elaboration		1–4	81.54	18.46	100.00	0.89
		Conventions		0–2	92.86	7.14	100.00	0.63
	5 (A)	Organization/Purpose	4	1–4	84.59	15.41	100.00	0.84
		Evidence/Elaboration		1–4	84.59	15.41	100.00	0.85
		Conventions		0–2	88.93	11.07	100.00	0.54
	9 (A)	Organization/Purpose	4	1–4	79.74	20.11	99.85	0.82
		Evidence/Elaboration		1–4	78.60	21.10	99.70	0.82
		Conventions		0–2	87.74	12.26	100.00	0.67
	13 (A)	Organization/Purpose	4	1–4	90.10	9.90	100.00	0.89
		Evidence/Elaboration		1–4	89.77	10.17	99.93	0.89
		Conventions		0–2	93.33	6.67	100.00	0.73
	17 (A)	Organization/Purpose	4	1–4	88.88	10.89	99.77	0.90
		Evidence/Elaboration		1–4	88.64	11.07	99.71	0.89
		Conventions		0–2	96.91	3.09	100.00	0.71
	4 (B)	Organization/Purpose	4	1–4	80.85	18.78	99.63	0.79
		Evidence/Elaboration		1–4	79.54	19.90	99.44	0.78
		Conventions		0–2	84.90	15.03	99.94	0.67
	6 (B)	Organization/Purpose	4	1–4	80.95	19.05	100.00	0.82
		Evidence/Elaboration		1–4	79.79	20.21	100.00	0.82
		Conventions		0–2	86.72	13.28	100.00	0.57
	10 (B)	Organization/Purpose	4	1–4	88.68	11.32	100.00	0.87
		Evidence/Elaboration		1–4	88.23	11.77	100.00	0.88
		Conventions		0–2	88.45	11.55	100.00	0.65
	14 (B)	Organization/Purpose	4	1–4	88.17	11.83	100.00	0.89
		Evidence/Elaboration		1–4	88.28	11.72	100.00	0.90
		Conventions		0–2	94.85	5.15	100.00	0.62
	18 (B)	Organization/Purpose	4	1–4	86.09	13.84	99.93	0.89
		Evidence/Elaboration		1–4	85.07	14.86	99.93	0.88
		Conventions		0–2	96.65	3.35	100.00	0.64

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Table 6.1: Inter-rater Reliability, English Language Arts (cont.)

Grade	Form	Component	Item #	Score Range	% Exact	% Adjacent	% Exact and Adjacent*	Quadratic Weighted Kappa
8	1 (A)	Organization/Purpose	4	1–4	85.67	14.33	100.00	0.90
		Evidence/Elaboration		1–4	84.71	15.29	100.00	0.90
		Conventions		0–2	95.52	4.48	100.00	0.74
	5 (A)	Organization/Purpose	4	1–4	85.66	14.34	100.00	0.89
		Evidence/Elaboration		1–4	84.33	15.67	100.00	0.90
		Conventions		0–2	94.05	5.95	100.00	0.56
	9 (A)	Organization/Purpose	4	1–4	87.76	11.76	99.52	0.90
		Evidence/Elaboration		1–4	87.60	11.92	99.52	0.90
		Conventions		0–2	99.21	0.79	100.00	0.80
	13 (A)	Organization/Purpose	4	1–4	80.67	18.76	99.42	0.83
		Evidence/Elaboration		1–4	78.60	20.60	99.19	0.82
		Conventions		0–2	94.82	5.18	100.00	0.64
	17 (A)	Organization/Purpose	4	1–4	72.98	26.06	99.04	0.83
		Evidence/Elaboration		1–4	72.49	26.70	99.20	0.83
		Conventions		0–2	97.59	2.41	100.00	0.41
	4 (B)	Organization/Purpose	4	1–4	77.38	22.04	99.42	0.81
		Evidence/Elaboration		1–4	74.92	24.01	98.93	0.79
		Conventions		0–2	96.71	3.29	100.00	0.59
	6 (B)	Organization/Purpose	4	1–4	76.70	22.69	99.39	0.80
		Evidence/Elaboration		1–4	77.46	22.01	99.47	0.80
		Conventions		0–2	94.78	5.22	100.00	0.41
	10 (B)	Organization/Purpose	4	1–4	86.36	13.52	99.88	0.94
		Evidence/Elaboration		1–4	87.19	12.81	100.00	0.93
		Conventions		0–2	97.39	2.61	100.00	0.61
	14 (B)	Organization/Purpose	4	1–4	82.21	17.79	100.00	0.84
		Evidence/Elaboration		1–4	80.28	19.72	100.00	0.83
		Conventions		0–2	98.22	1.78	100.00	0.59
	18 (B)	Organization/Purpose	4	1–4	80.18	19.40	99.59	0.87
		Evidence/Elaboration		1–4	79.88	19.40	99.28	0.88
		Conventions		0–2	95.07	4.93	100.00	0.57

* The percentage of exact and adjacent may not add up to 100 due to the percent discrepant (the cases where the assigned score varied by more than 1 point).

Table 6.2: Inter-rater Reliability, Mathematics

Grade	Form	Item #	Score Range	% Exact	% Adjacent	% Exact and Adjacent*	Quadratic Weighted Kappa
6	A and B	53	0–2	97.45	2.54	99.98	0.97
7	A and B	53	0–2	97.00	2.76	99.76	0.93
	A and B	56	0–1	95.79	4.21	100.00	0.89
8	A and B	54	0–1	97.17	2.83	100.00	0.89
	A and B	57	0–2	95.87	4.11	99.98	0.96

* The percent exact and adjacent may not add up to 100 due to the percent discrepant (the cases where the assigned score varied by more than 1 point).

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Table 6.3: Inter-rater Reliability, Science

Grade	Form	Item #	Score Range	% Exact	% Adjacent	% Exact and Adjacent*	Quadratic Weighted Kappa
	A	9	0–2	94.64	5.36	100.00	0.93
	A	18	0–2	95.61	4.39	100.00	0.95
	A	41	0–2	92.18	7.77	99.95	0.93
	A	43	0–2	91.13	8.85	99.98	0.89
	A	53	0–2	90.89	9.09	99.98	0.90
	A	56	0–2	89.48	10.50	99.98	0.90
	A	59	0–2	91.69	8.24	99.93	0.90
	A	60	0–3	96.41	3.59	100.00	0.98
5	A and B	4	0–2	96.45	3.55	100.00	0.95
	B	9	0–2	94.52	5.48	100.00	0.96
	B	18	0–3	92.85	7.00	99.86	0.96
	B	25	0–2	94.70	5.29	99.98	0.92
	B	33	0–2	94.65	5.34	99.98	0.92
	B	41	0–2	93.22	6.78	100.00	0.95
	B	53	0–2	90.50	9.50	100.00	0.91
	B	58	0–2	91.74	8.13	99.87	0.93
	B	60	0–2	91.14	8.83	99.97	0.93
	B	63	0–2	94.02	5.98	100.00	0.92
	A	2	0–2	87.12	12.67	99.79	0.90
	A	8	0–2	92.21	7.72	99.93	0.92
	A	11	0–2	94.03	5.92	99.95	0.93
	A	32	0–2	85.88	14.01	99.89	0.88
	A	41	0–2	93.71	6.25	99.96	0.94
	A	48	0–2	89.79	10.18	99.96	0.90
	A	50	0–2	93.10	6.90	100.00	0.93
8	A	63	0–3	91.71	8.27	99.98	0.95
	A and B	12	0–2	91.86	8.13	99.99	0.87
	A and B	17	0–2	89.89	10.08	99.96	0.92
	A and B	44	0–2	91.44	8.49	99.93	0.93
	A and B	62	0–2	91.90	8.10	100.00	0.85
	B	2	0–2	86.29	13.50	99.79	0.87
	B	7	0–2	90.86	9.14	100.00	0.92
	B	10	0–2	88.63	11.29	99.92	0.86
	B	34	0–3	84.38	15.62	100.00	0.93
	B	41	0–3	87.13	12.58	99.71	0.92
	B	43	0–2	88.88	11.12	100.00	0.90
	B	50	0–2	92.03	7.95	99.98	0.93
	B	52	0–2	91.87	8.09	99.96	0.93

* The percent exact and adjacent may not add up to 100 due to the percent discrepant (the cases where the assigned score varied by more than 1 point).

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CHAPTER 7: PSYCHOMETRIC ANALYSES

This chapter of the MAP Technical Report describes the analyses that occurred on the ELA, Mathematics, and Science operational data. These analyses included a classical item analysis and examination of the raw scores and an item response theory (IRT) analysis involving test calibration, scaling, and equating. These analyses were conducted using the calibration samples.

7.1 Overview of the Operational Test Data Analysis

In this section, we first present the classical item statistics, including aggregate raw score statistics and individual item-level statistics. Next, we discuss the IRT models used for calibrating the data and address the purpose of data calibration and scaling for each content area. The calibration samples are presented next, followed by the data calibration results, including the model-data fit for the Missouri data. If the IRT models fit the empirical item response distributions for the population (i.e., Missouri students) for which generalizations are made, then the claim is strengthened that the scores are valid indicators of an underlying ability. The lowest obtainable scale score (LOSS) and highest obtainable scale score (HOSS) for the MAP tests are presented.

Chapter 7 describes how the MAP demonstrates adherence to AERA, APA, & NCME (2014) Standards 1.8, 4.14, 5.2, 5.13, and 5.15. Each standard will be explicated within the appropriate section of this chapter.

7.2 Test and Item Classical Statistics

In this section, we present summary test statistics for ELA, Mathematics, and Science. This is followed by item-level statistics for each grade/content area of MAP. These statistics were produced using sample data.

7.2.1 Test-Level Statistics

Tables 7.1, 7.2, and 7.3 present the number of operational items and score points on each test, the mean and standard deviation of the raw scores, *p*-values, and the mean and standard deviation of the item-total test correlations for each test form at each grade level of ELA, Mathematics, and Science, respectively. The mean *p*-value is the average of all item *p*-values of a specific grade/content area, and it is explained in the next section. The mean item-total test correlation is the average of item-total test correlations for all items of a specific grade/content area.

In terms of *p*-values, test scores tend to be more precise when their average *p*-values are in the mid-0.50s to low 0.70s. However, in building a criterion-referenced test, it is important to select items on the basis of content rather than on purely statistical criteria. As shown in Tables 7.1, the average *p*-values associated with the ELA forms range from 0.57 (Grade 6, Form A) to 0.63 (Grade 4, Form A01). The average *p*-values associated with the Mathematics forms range from 0.40 (Grade 8, Form B) to 0.55 (Grade 3, Form

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A), as presented in Table 7.2. As seen in Table 7.2, the trend of higher mean *p*-values for lower grade levels and lower mean *p*-values for higher grade levels was observed for Mathematics. The average *p*-values associated with the Science forms range from 0.52 (Grade 5, Form B, and Grade 8, Form B) to 0.55 (Grade 8, Form A) (refer to Table 7.3).

7.2.2 Item-Level Statistics

Tables 7.4 through 7.9 present the item statistics for each operational item by grade for ELA. The data for Grades 4 and 8 ELA writing prompts are shown for the three components that were scored separately. Tables 7.10 through 7.15 show the operational item statistics for each item by grade for Mathematics. Tables 7.16 and 7.17 include the item statistics for Science items. The tables include form number, session number, item number on the test, item type, *p*-value, item-total correlation (R_{it}), omit rate, and adjusted student count for each item by grade and content area. Note that the item numbers in these tables are not always consecutive because statistics for the field test items that were embedded in the ELA, Mathematics, and Science tests are not included in the tables.

p-*value*: The *p*-value is a measure of item difficulty. For a dichotomous item, the *p*-value is calculated from the number of students who correctly responded to an item divided by the total number of students who attempted the item. The value is reported as a proportion. For a constructed-response item, the *p*-value is calculated from the average score for the item divided by the maximum points possible and is also reported as a proportion.

It is important that one examines the range of *p*-values and not just the average *p*-value to determine whether a test measures well. It is desirable for the test to measure well throughout the range of skills present at a given grade. That is, it is important that the items measure the performance of both low-scoring and high-scoring students as well as the performance of students in the center of the distribution. Having a range of *p*-values also helps to prevent floor and ceiling effects so that the test does not have large numbers of students at the minimum or maximum possible scores. The ELA forms have items with *p*-values ranging from 0.12 to 0.98 (see Tables 7.4 through 7.9) across all grade levels. The *p*-values on the Mathematics forms range from 0.06 to 0.91 (see Tables 7.10 through 7.15). The *p*-values on the Science forms range from 0.17 to 0.89 (see Tables 7.16 and 7.17). Items with low *p*-values were reviewed by test development experts after the test administration to confirm that the items function as intended. Overall, this broad range of *p*-values indicates that the items measure well throughout the range of skills and abilities at a given grade.

Item-Total Correlations: An item-total correlation is the correlation between an item and the total test score, where the item score is excluded from the total score. It indicates how well an item differentiates between low- and high-achieving students. In general, items with correlations below 0.15 are said to be poorly discriminating. No ELA item (across all grades) had the item-total test correlation below the threshold of 0.15. Two Mathematics items (one in Grade 6 and one in Grade 7) and one Science item (in Grade 5) had item-test correlations below 0.15. These items were reviewed by DRC content specialists to confirm that they functioned properly.

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Distractor Analysis: For MC items, the point-biserial correlation between each distractor and the total score was also calculated. In most cases, items will have negative correlations between each distractor and the total score. However, a weak positive correlation for a distractor does not necessarily mean that the item is defective if the distractor correlation is substantially smaller than the item-total correlation for the correct response. In some cases, it may simply mean that the distractor is attractive to moderate-ability students and unattractive to low-ability students. A detailed item analysis report, including distractor statistics for MC items and score point distribution for non-MC items, can be provided to DESE in a secure document upon request. Distractor statistics are not presented in this report due to fact that the item key can be potentially identified from the item option statistics.

Omit Rates: The omit rate for each item indicates the percentage of students who did not answer the item. Omit rates can be used to examine possible speededness issues on tests. A test may be speeded if students do not have adequate time to answer all questions on the test. As a rule of thumb, an item is said to have a high omit rate if more than 5% of students failed to respond to the item.

This examination of omit rates complies with Standard 4.14 of the AERA, APA, & NCME (2014) *Standards for Educational and Psychological Testing*. This standard is concerned with the speededness of a test:

> For a test that has a time limit, test development research should examine the degree to which scores include a speed component and should evaluate the appropriateness of that component, given the domain the test is designed to measure. (p. 90)

The results presented in Tables 7.4 through 7.9 show that except for two items in Grade 3, with omit rates of approximately 3%, and one WP item in Grade 8, with an omit rate of approximately 2.4%, all other ELA items had omit rates under 2%. As presented in Tables 7.10 to 7.15, the omit rates for Mathematics were typically under 1.5%, except for one item in Grade 6 (omit rate of 2%), two items in Grade 7 (omit rates of approximately 4%), and one item in Grade 8 (omit rate of approximately 4%). Mathematics items with the highest omit rates were performance event items. For Science, the omit rates ranged from less than 0.5% to over 5% (see Tables 7.16 and 7.17). Science items with the highest omit rates were constructed-response items in Grade 8.

7.3 Item Response Theory Methodology

Item parameters for items contained in ELA, Mathematics, and Science tests were estimated using a marginal maximum-likelihood procedure to simultaneously estimate the item parameters for multiple-choice (MC) and constructed-response (CR) items using the 3-parameter logistic (3PL) model and 2-parameter partial credit (2PPC) IRT model (Bock & Aitkin, 1981; Thissen, 1982). All non-MC items were treated as CR items in the calibration. Under the 3PL model, the probability that a student with a trait or scale score Θ will respond correctly to multiple-choice item j is

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$$P_j(\theta) = c_j + (1 - c_j)/[1 + \exp(-1.7a_j(\theta - b_j))].$$

In the equation, a_j is the item discrimination, b_j is the item difficulty, and c_j is the probability of a correct response by a very low-ability student. Under the 2PPC model, the probability that a student with a trait or scale score θ will respond in category *k* to partial-credit item *j* is

$$P_{jk}(\theta) = \exp(z_{jk}) / \sum_{i=1}^{m_j} \exp(z_{ji}),$$

where $z_{jk} = (k-1)f_j - \sum_{i=0}^{k-1} g_{ji}$, and $g_{j0} = 0$ for all *j*.

The summary output of the 3PL and 2PPC models is in two different metrics. The location and discrimination parameters for the MC items are in the traditional 3PL metric and are labeled *b* and *a*, respectively. In the 2PPC model, *f* (alpha) and *g* (gamma) are analogous to *b* and *a*, where alpha is the discrimination parameter and gamma over alpha (*g*/*f*) is the location where adjacent trace lines cross on the ability scale. Because of the different metrics used, the 3PL parameters *b* and *a* are not directly comparable to the 2PPC parameters *f* and *g*; however, they can be converted to a common metric. The two metrics are related by $b = g/f$ and $a = f/-1.7$ (Burket, 2002). As a result of this procedure, the MC and CR items are placed on the same scale. Note that for the 2PPC model, there are m_j–1 (where m_j is a score level *j*) independent *g*'s and one *f*, for a total of m_j independent parameters estimated for each item, while there is one *a* and one *b* per item in the 3PL model.

Using the 3PL/2PPC model for estimation of item parameters for all content areas was consistent with the past methodology (except for the 2014–15 administration for ELA and Mathematics) implemented for the MAP tests. Item parameters estimated after the 2018–19 ELA, Mathematics, and Science test administration were used to score Missouri students who took these tests.

7.3.1 Calibration Sample

In this section, we describe the calibration sample in adherence to Standard 1.8 of the AERA, APA, & NCME (2014) *Standards*:

> The composition of any sample of test takers from which validity evidence is obtained should be described in as much detail as is practical and permissible, including major relevant socio-demographic and developmental characteristics. (p. 25)

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ELA, Mathematics, and Science test data were analyzed using calibration samples. The samples were acquired after the testing window ended and contained close to 100% of the student data for each grade.

7.3.2 Item Calibration

The purpose of scaling a test is to enhance the validity of the test score interpretation by increasing the comparability of test takers' scores. In this section, we explicate the way in which the MAP scales are produced to comply with Standard 5.2 of the AERA, APA, & NCME (2014) *Standards*, which states the following:

> The procedures for constructing scales used for reporting scores and the rationale for these procedures should be described clearly. (p. 102)

The MAP scores are produced using the 3PL/2PPC IRT models (explained previously), which assume that each of the items and tasks is an independent indicator of the underlying ability governing the propensity for students to answer an item correctly (or with greater correctness, in the case of the multilevel constructed-response items).

Calibration of ELA, Mathematics, and Science data were performed using PARDUX software (Burket, 2002). PARDUX is designed to produce a single scale by jointly analyzing data resulting from students' responses to both MC items and CR items. In PARDUX, items are calibrated based on IRT, using the 3PL model (Lord & Novick, 1968) for MC items and the 2PPC model (Yen, 1993) for CR (or non-MC) items.

In the process of item calibration, the number of estimation cycles was set to 99 with a convergence criterion of 0.001 for all content areas. The maximum value of the a-parameter was set to 5.0, and the range for the b-parameter was set between –7.5 and 7.5. For all items, the estimated a- and b-parameters were within the prescribed parameter ranges. It should be noted that there was a small number of items with the default value for the c-parameter on the ELA, Mathematics, and Science tests. When the PARDUX program encounters difficulty estimating the c-parameter, it assigns a default c-parameter value of 0.20.

All calibrations were performed separately for each grade and content. The test forms in a given grade and content area shared common items and were calibrated concurrently at that grade and content level.

Model Fit

A procedure developed by Yen (1981) was used to assess model-to-data fit for all test items. In this procedure, students are rank ordered based on their $\hat{\theta}$ values and sorted into ten cells, with 10% of the sample in each cell. Each item j in each decile i has a response from N_{ij} examinees. The fitted IRT models are used to calculate an expected proportion E_{ijk} of examinees who respond to item j in category k. The observed proportion O_{ijk} is also tabulated for each decile.

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The fit index for item *i* is

$$Q_{1j} = \sum_{i=1}^{10} \sum_{k=1}^{m_j} \frac{N_{ij}(O_{ijk} - E_{ijk})^2}{E_{ijk}}.$$

Q_{1j} should be approximately chi-square distributed with degrees of freedom (*DF*) equal to the number of "independent" cells, $10(m_j - 1)$, minus the number of estimated parameters. For the 3PL model, $m_j = 2$, so $DF = 10(2 - 1) - 3 = 7$. For the 2PPC model, $DF = 10(m_j - 1) - m_j = 9m_j - 10$. Since *DF* differs between MC and CR items and between CR items with different score levels, m_j, Q_{1j} is transformed, yielding the test statistic

$$Z_j = \frac{Q_{1j} - DF}{\sqrt{2DF}}.$$

This statistic is useful for flagging items that fit relatively poorly. Z_j is sensitive to sample size, and cutoff values for flagging an item based on Z_j have been developed and were used to identify items for the item review. The cutoff value is (N/1500 x 4) for a given test, where N is the sample size.

A total of forty-one ELA items (across all grades) were flagged for poor fit in the calibration. Eight Mathematics items and nine Science items were flagged for poor fit. Table 7.18 shows chi-square statistic and the *Z*-statistic for the flagged items. The average percentage correct across ten cells of observed percentage correct and predicted percentage correct is also provided. The difference between the observed and predicted percentages provides an indication of how well the modeled response curves reflect the empirical curves.

The flagged item was examined more closely by studying its item characteristic curve (ICC) at each nonzero score point. The ICC models the relationship between the examinees' performance on an item and the examinees' underlying ability. Often when model misfit occurs, relatively few students occupy the scale score ranges at the lower and upper tails of the distribution. Poor fit may occur in one of these regions of the underlying ability distribution where there are relatively few students. The model tends to show good model-data fit for the flagged items in the middle of the theta distribution, where the majority of students perform. It was determined that the poor fit for the flagged items occurred mostly at the lower and the upper ends of the ability scale.

It is important to notice that while items may be flagged for misfit, these flags may not be of practical importance. Misfitting items that have content validity are often retained for use in one assessment and monitored over a period of usage. Only a large number of misfitting items in an assessment would indicate that caution should be exercised in the interpretation of the overall score.

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7.3.3 Test Equating

Test equating is a statistical process of placing scores from two or more parallel assessments onto a common scale, resulting in direct comparability of scores from two different test forms. A common-item design was used to link the assessments from 2019 to the established MAP ELA and Mathematics scales. Sets of items that were administered to Missouri students in previous operational test administrations and that were included in the Spring 2019 assessments served as the anchor sets in each ELA and Mathematics grade. All anchor items were selected from Spring 2018 operational test assessments. The anchor sets constituted at least 25% of the Spring 2019 assessments and were representative of the Spring 2019 test content. After the item calibration, item parameters were linked to the MAP scales using the Stocking & Lord (1983) equating procedure.

Standard 5.13 of the AERA, APA, & NCME (2014) *Standards* states the following:

> When claims of form-to-form score equivalence are based on equating procedures, detailed technical information should be provided on the method by which equating functions were established and on the accuracy of the equating functions. (105)

The Stocking & Lord (1983) procedure minimizes the mean squared difference between the two test characteristic curves (TCCs), one based on estimates from the previous calibration and the other on transformed estimates from the current calibration. Let $\hat{\psi}_j$ be the TCC based on estimates from a previous calibration and $\hat{\psi}_j^*$ be the TCC based on transformed estimates from the current calibration.

$$\hat{\psi}_j = \hat{\psi}(\theta_j) = \sum_{i=1}^{n} P_i(\theta_j; a_i, b_i, c_i),$$

$$\hat{\psi}_j^* = \hat{\psi}(\theta_j) = \sum_{i=1}^{n} P_i(\theta_j; \frac{a_i}{M_1}, M_1 b_i + M_2, c_i)$$

The TCC method determines the equating constants (M_1 and M_2) by minimizing the following quadratic loss function (F):

$$F = \frac{1}{N}\sum_{a=1}^{N}(\hat{\psi}_j - \hat{\psi}_j^*)^2.$$

The standard error of the equating (SEE) is difficult and cumbersome to estimate for IRT equating procedures like the Stocking & Lord procedure (Kolen & Brennan, 1995; Michaelides & Haertel, 2004). The estimation of the SEE is beyond the scope of this report.

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Evaluation of Anchor Items

AERA, APA, & NCME (2014) Standard 5.15 requires information about the anchors, stating the following:

> In equating studies that employ an anchor test design, the characteristics of the anchor test and its similarity to the forms being equated should be presented, including both content specifications and empirically determined relationships among test scores. If anchor items are used in the equating study, the representativeness and psychometric characteristics of the anchor items should be presented. (105)

Two statistical methods are used to evaluate anchor items: (1) iterative linking (Candell & Drasgow, 1988) using Stocking & Lord's (1983) test characteristic curve method and (2) differences between the item-ability regression curves.

Test Characteristic Curve Method

The Stocking & Lord (1983) procedure, also called the test characteristic curve method, minimizes the mean squared difference between the two TCCs, one based on estimates from the previous calibration and the other on transformed estimates from the current calibration. Differential item functioning was evaluated by examining previous (input) and transformed (estimated) item parameters. Items with an absolute difference of parameters greater than two times the root mean square deviation were flagged. These differences were also monitored by plotting input and estimated item parameters.

Item Response Theory Item–Ability Regression Curves

Differences between the item-ability regression curves of the anchor items in the current ELA and Mathematics test administration and the previous test administration were computed and evaluated using the following statistics:

- UnWtd Mean = Average signed difference in estimated probability
- UnWtd Mean Abs = Average Absolute (unsigned) difference in estimated probability
- UnWtd RMSD = Root mean squared difference
- Wtd Mean = Weighted average signed difference in estimated probability
- Wtd Mean Abs = Weighted average Absolute (unsigned) difference in estimated probability
- Wtd RMSD = Weighted Root mean squared difference

Both unweighted and weighted versions of these statistics were calculated. Unweighted differences give equal weight to differences across the ability spectrum. Weighted differences assign weights according to the number of test takers that are impacted (i.e., the frequency distribution of estimated student abilities during the calibration).

For the six statistics listed above, differences greater than +/- 0.10 are considered large and differences between +/- 0.07 and +/- 0.10 are considered moderate.

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Additionally, the Maximum Absolute difference (MaxAbs) was identified. For MaxAbs, large differences are those greater than +/- 0.15 and moderate differences are all differences between +/- 0.125 and +/- 0.15.

Criteria for Removal of Anchor Items

One of the key requirements of anchor items in deriving valid reliable linking results is that the anchor items form a miniature of the test in terms of content coverage or test blueprint. While dropping an anchor item flagged based solely on statistical criteria has its simplicity, this option may change the content coverage and invalidate results. Before an anchor item may be dropped from an anchor set, the item characteristics, adequacy of the content coverage, and impact to the size of the anchor set must be evaluated.

As stated above, an item is removed from the anchor set only if it adversely affects the quality of scaling, not the desirability of the results. As such, DRC does not consider how the removal of an item affects the overall mean scale score or the impact data (percentage of students in each achievement level) when recommending items for removal.

Items removed from the anchor set are still scored as part of the whole test. Anchor items are considered for exclusion from the MAP equating set under the following conditions:

- An item may be a candidate for removal when it is flagged for large differences on four of the seven statistics (listed above) considered when examining the differences between the IRT regression curves.
- Removal of the item will only be considered after alternative explanations have been considered that may explain shifts in performance. For example, performance on the anchor item may improve because of a statewide initiative emphasizing instruction on a particular set of skills. In this case, improved performance on the item represents true growth in that area. Removing the anchor item may artificially lower test scores.
- Removal of the item may not significantly alter the content distribution of the anchor set. The distribution of the anchor items across the content standards must remain within 10% of the MAP test blueprint, though within 5% is preferred.
- The number of remaining items will remain at an acceptable level of anchor set reliability. Operationally, this means the anchor set will still be representative of the total test blueprint and may not be less than 20% of the total test length.

Equating Results

Table 7.19 provides equating results for the TCC method. This table summarizes the following information for each grade content area: grade, number of anchors, number of iterations, quadratic loss function (F), correlation between the *a*-parameter input and estimates, correlation between the *b*-parameter input and estimates, number of *a*- and *b*-parameter outliers as indicated by the root mean square deviation method, and equating constants (A and B).

The correlations between the *a*-parameter input and estimates were 0.98 or higher for all ELA grades. One anchor item in each grade, except for Grade 6, was flagged as an *a*-

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parameter outlier. There were no *a*-parameter anchor outliers in Grade 6. The correlations between the *b*-parameter input and estimates were either 0.99 or 1.00 for all ELA grades. One anchor item in each grade, except for Grade 5, was flagged as a *b*-parameter outlier. There were no *b*-parameter anchor outliers in Grade 5, as indicated by the root mean square deviation method.

For Mathematics, the correlations between the *a*-parameter input and estimates ranged between 0.96 and 0.99, depending on grade level. One anchor item in Grade 7 and one anchor item in Grade 8 were flagged as *a*-parameter anchor outliers. The correlations between the *b*-parameter input and estimates ranged from 0.96 to 1.00 for all Mathematics grades. One anchor item in each grade, except for Grade 3, was flagged as a *b*-parameter outlier. There were no *b*-parameter anchor outliers in Grade 3, as indicated by the root mean square deviation method.

In addition, a visual inspection of the overall alignment of the anchor input and estimate TCCs, presented in Figure 7.1 for ELA and Figure 7.2 for Mathematics, revealed that the curve alignment was very good for all grades and content areas. In these figures, the input anchor set TCC (before equating) is indicated by the dashed red line and the new anchor estimate TCC (after equating) is indicated by the solid blue line.

No anchor items were flagged using the item-ability regression statistics described in an earlier section of this chapter. Subsequently, no anchor items were considered for removal from the anchor sets.

7.3.4 Scaling and Scale Evaluation

The purpose of scaling a test is to enhance its validity by increasing the comparability of test takers' scores. This section explicates the way in which the MAP ELA, Mathematics, and Science scales are produced to comply with Standard 5.2 of the AERA, APA, & NCME (2014) *Standards*, which states the following:

> The procedures for constructing scales used for reporting scores and the rationale for these procedures should be described clearly. (p. 102)

New MAP scales were established for ELA and Mathematics after the Spring 2018 test administration. New scales were established for Science assessments after the Spring 2019 test administration. In this section, the results of the test scaling of the MAP tests are described and evaluated.

Scaling of ELA and Mathematics

Following the test equating for ELA and Mathematics, the equated item parameter estimates in the theta metric were transformed into the scale score metric for the purpose of the evaluation of the scale properties. The scale evaluation included:

- evaluation of the TCCs,
- evaluation of the standard error (SE) curves, and
- examination of the growth at quartiles.

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The scaling constants, *M1* and *M2,* used to transform equated item parameter estimates and student ability estimates in the theta metric into the scale score metric for ELA and Mathematics are the same as the scaling constants used in the Spring 2018 scale development. They are presented in Table 7.20.

Scaling of Science

New scales were established for Science Grades 5 and 8 after the 2018–19 test administration. The mean and standard deviation of ability estimates for each grade were used to identify transformation constants that allowed transformation of both item parameter estimates (from calibration) and student ability estimated in theta metric into a scale score metric and to produce student scale score distribution with a target mean and a standard deviation for each grade. In order to differentiate the new Science scales from the previous ones, a scale score mean of 300 and a standard deviation of 40 were set for Grade 5 and a scale score mean of 500 and a standard deviation of 40 were set for Grade 8.

The following formulae were used to compute transformation constants for the transformation of the student ability estimates from the theta metric to the scale score metric:

$$M1 = \frac{SD_{ss,G}}{SD_{\theta,G}}, \text{ and}$$

$$M2 = \overline{X}_G - (\overline{\theta}_G * M1),$$

where
$M1$ and $M2$ are the transformation constants,
$SD_{ss,\,G}$ is the target standard deviation in the scale score metric for a given grade G,
$SD_{\theta,\,G}$ is the estimated standard deviation in the theta metric for a given grade G,
$\overline{\theta}_G$ is the estimated population mean in the theta metric for a given grade G, and
$\overline{X}_G$ is the target mean in the scale score metric for a given grade G.

Table 7.21 presents the population mean and standard deviation estimates and the transformation constants used for scale transformation of both Science grades.

ELA Scale Evaluation

Table 7.22 shows the scale score means, standard deviations, and change in mean from the previous grade for ELA. As seen in Table 7.22, the ELA scale score means increase as grade level increases. The standard deviations range from 36.06 for Grade 6 to 42.80 for Grade 3 and show a pattern of slightly larger standard deviations for the lowest and the highest grades compared to the “middle grades.” The mean difference between grades is nonuniform across grade levels. Most growth across grades is observed between

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Grades 3 and 4, followed by growth between Grades 6 and 7, between Grades 4 and 5, and between Grades 7 and 8. Less growth is observed between Grades 5 and 6.

In addition to the evaluation of grade-to-grade growth using scale score mean changes across grades, the pattern of scale scores at the 10th, 25th, 50th, 75th, and 90th percentiles was examined across grades. Ideally, the scale score associated with each percentile will increase from grade to grade. Table 7.23 summarizes this information for ELA. The data in Table 7.23 show that the scale scores increase as the percentile and grade level increase, showing continuous progress upward from Grades 3 through 8 at all selected percentiles. The between-grade growth is nonuniform, with less growth observed between Grades 5 and 6, particularly at the 50th, 75th and 90th percentiles, compared to other grades.

Figures 7.3 and 7.4 show the TCCs and SE curves for ELA tests. In these figures, in order to maintain the graph clarity, Grade 4 and Grade 8 TCCs and SE curves were generated without writing prompts. Thus, Figures 7.3 and 7.4 show two forms: A and B per grade level. As shown in Figure 7.3, the ELA test TCCs are generally ordinal across grades, indicating that the test difficulty increases as the grade level increases. Grade 5 TCCs were found to be less well aligned with each other compared to TCCs for other ELA grades. In Grade 5, Form B was found to be a little easier than Form A for middle ability students, as indicated by the Form B TCC, which was shifted to the left in relation to the Form A TCC on the ability scale. However, it should be noted that Grade 5 Form B was still more difficult than Grade 4 Forms A and B, maintaining the ordinality of the test difficulty as the grade level increases.

The standard error curves presented in Figure 7.4 are U-shaped (as expected), indicating smaller errors around ability estimates roughly in the middle of the scale score distribution. The SE is expected to be higher at the top and bottom ends of the ability scale, where fewer items measuring very high- and very low-achieving students are found. The SE curves are comparable for Forms A and B at each grade level, indicating similar reliability of the comparable scale scores obtained from either Form A or B. Overall, the standard errors around the scale score were found to be reasonable for ELA tests.

Eleven operational test forms, each containing a different combination of Form A or B core items and one of ten writing prompts, were administered to Grade 4 students. The Grade 4 TCCs for these forms, presented in Figure 7.5, demonstrate good alignment of form difficulty. The standard error curves for the Grade 4 test forms, presented in Figure 7.6, are also aligned with each other for the part the scale.

Ten forms, each containing a different combination of Form A or B core items and one of ten writing prompts, were administered to Grade 8 students. The Grade 8 TCCs for these test forms, presented in Figure 7.7, show good alignment of form difficulty. The standard error curves for the Grade 8 test forms, presented in Figure 7.8, are also aligned.

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In summary, the increasing scale score means as the grade level increases, the upward progression of scale scores at selected percentiles, and the increasing form difficulty across grade levels provide evidence of the validity of the MAP ELA vertical scale.

Mathematics Scale Evaluation

A growth pattern similar to the one described in ELA is observed for Mathematics from Grade 3 to Grade 8. As presented in Table 7.24, the scale score means increase as the grade increases and most growth is observed between Grades 3 and 4, followed by growth between Grades 7 and 8 and between Grades 4 and 5. Less growth is observed between Grades 5 and 6 and between Grades 6 and 7. The standard deviations ranged from 37.51 for Grade 6 to 50.23 for Grade 8. Similar to the pattern of standard deviations observed for ELA, higher standard deviations were observed for the lowest and highest grades compared to the "middle" grades in Mathematics.

As shown in Table 7.25, with one exception, there is an upward progression of scale scores from Grades 3 through 8 and across all percentiles. The data in Table 7.26 show that the scale scores increase as the percentile and grade level increase between all grades except for Grades 6 and 7 at the 10th percentile, where the scale score for students in Grade 6 was higher by 5 scale score points than the scale score at the same percentile rank for students in Grade 7. Similar to ELA, the between-grade growth is nonuniform, with less growth observed between Grades 5 and 6, across all ability levels, and between Grades 6 and 7 at the 10th percentile (no growth) and 25th percentiles (little growth).

Figures 7.9 and 7.10 show the TCCs and SE curves for the Mathematics tests. As observed in Figure 7.9, the TCCs for Mathematics are ordinal, indicating increasing difficulty of the assessment as the grade level increases. An exception was noted for Grades 6 and 7 TCCs, which were found to be crossing at the lower end of the ability scale, indicating that the Grade 6 tests may be more difficult for lower-ability students compared to Grade 7 tests. The TCCs for Form A and Form B were found to be well aligned at each grade level, indicating statistical comparability of the two forms.

The standard error curves presented in Figure 7.10 are U-shaped (as expected), indicating smaller errors around ability estimates roughly in the middle of the scale score distribution. The SE is expected to be higher at the top and bottom ends of the ability scale, where fewer items measuring these students are found. The SE curves are comparable for Forms A and B at each grade level, indicating similar reliability of the comparable scale scores obtained from either Form A or B. Overall, the standard errors around the scale score were found to be reasonable for Mathematics tests.

The increasing scale score means as the grade level increases, the upward progression of scale scores at selected percentiles, and the increasing form difficulty across grade levels provide evidence of the validity of the MAP Mathematics vertical scale.

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Science Scale Evaluation

The Science assessments were not established on vertical scales. Instead, they were established in such a way that the scale score means for higher grades are higher than the scale score means for lower grades.

Table 7.26 shows the scale score means and standard deviations for Science, and Table 7.27 presents the scale score distribution at selected percentiles for Science Grades 5 and 8. The Grade 5 scale score mean is approximately 300, and the Grade 8 scale score mean is approximately 500. The standard deviation is about 40 scale score points for each grade. As expected, the scale scores increase as the percentile rank increases, showing increasing student ability along the scale for both grade levels.

The TCC and SE curves for Science Grade 5 are presented in Figures 7.11 and 7.12, respectively. The TCC and SE curves for Science Grades 8 are presented in Figures 7.13 and 7.14. The TCCs are S-shaped, indicating increasing probability of a higher test score as a student's ability increases in both grades. The TCCs of the two operational forms in each grade level are well aligned, indicating similar overall test difficult and discrimination of the two forms in that grade.

The SE curves for Science test forms are U-shaped, indicating smaller errors around ability estimates approximately in the middle of the scale score distribution. The SE is expected to be higher at the top and bottom ends of the ability scale, where fewer items measuring these students are found. Overall, the standard errors around the scale score were found to be reasonable for the new Science assessments.

7.3.5 Derivation of Scale Scores

A scale score can be interpreted as a highly probable estimate of a student's ability in a given content area. Scale scores are based on the student's responses to all items on a given test and account for the characteristics of the items that are on the test (such as item difficulty).

Scale scores in the MAP are based on the theoretical models of the item response process described in Section 7.3.2. The essential idea behind these models is that the probability of a correct response to a given item is a function of examinee ability and the characteristics of the item, such as the difficulty and discrimination of the item. It is expected that as examinee ability increases, the probability of a correct response to a given item also increases, given certain conditions and assumptions.

A detailed description of the scale score derivation, provided below, applies specifically to MC items; non-MC items are treated as CR items and are handled slightly differently, but they follow a logic that is essentially the same.

Whether looking at an individual item or at a group of items that make up a complete test, IRT uses probability models to describe the relationship between a student's ability and his or her observed scores. As described in Section 7.3.2, the 3PL model is used to

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estimate the probability of a correct response for each of the MC items. The equation for this model is provided here again because its components are reviewed in the following paragraphs.

$$P(u_i = 1 \mid \theta) = c_i + \frac{1 - c_i}{1 + e^{-1.7a_i(\theta - b_i)}}$$

In this model, θ denotes a measured ability (e.g., ELA ability) and u_i represents an observed score on a particular item. For MC items, the observed score u_i is either 0 or 1, indicating either an incorrect or correct response, respectively. For an MC item, the probability model can be denoted as $P(u_i = 1|\theta)$. That is, P is an estimation of the probability that a student with an ability value θ would answer item i correctly.

The terms on the right side of the equation above (a_i, b_i, c_i) represent the parameters in the model: discrimination, difficulty (or location), and a pseudo-guessing factor. Discrimination refers to how well an item differentiates students by ability level; difficulty represents the difficulty of the item or its location on an ability continuum; and the guessing factor represents the probability of a low-ability student guessing the correct response.

Given any particular response pattern ($u_1 u_2 \Lambda\ u_n$) on a test with some number of items (n items), the "likelihood function," or the probability that a student with a given ability value (θ) would produce this particular response pattern, is given by

$$P(u_1 u_2 \Lambda\ u_n \mid \theta) = \prod_{i=1}^{n} P(u_i \mid \theta).$$

The formula indicates that the "estimated maximum likelihood" IRT item-pattern scoring method searches for the ability estimate (θ) that maximizes the probability function and assigns an ability estimate (θ) as the test score for the student with the response pattern ($u_1 u_2 \Lambda\ u_n$). In other words, the scale score is the most likely, or most probable, estimate of student ability, produced in a context where item parameters are known and based on all the items in a given test.

There are two IRT-based scoring methods generally used for large-scale assessments: number-correct scoring and item-pattern scoring. Item-pattern scoring is often recommended over number-correct scoring because of its greater accuracy and reliability, as compared to the number-correct scoring.

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Item Pattern Scoring

Item-pattern scoring generally produces more accurate scores for individual students. Specifically, it produces a smaller CSEM across the scale score range for a given test compared to number-correct scoring. The smaller the CSEM, the more confident one can be in the accuracy of the test results. The increase in accuracy provided by item-pattern scoring is equivalent, on average, to approximately a 15% to 20% increase in test length (Yen & Candell, 1991).

In addition, reliability tends to be higher using item-pattern scoring, which means (a) fewer items are needed to achieve a given level of reliability and (b) a given test with a given number of items will have higher reliability than it would when using number-correct scoring. Yen (1984) has demonstrated that an equivalent level of reliability for a 20-item test scored by the number-correct scoring method could be obtained with a 16- or 17-item test scored by the item-pattern scoring method.

The MAP scale scores are derived using item-pattern scoring; thus, these scale scores are based on the student's responses to all items on a given test, and scale scores account for the characteristics, such as item difficulty, of the items that are in the test. Each item uses optimal item weights in terms of item information, meaning that items do not contribute equally to the overall scale score. Students with the same raw score may be assigned to different scale scores, depending on which items they answered correctly.

A simplified outline of IRT procedure is presented in this section of the report. Additional introductory technical information on IRT methodology may be found in *Educational Measurement* (Brennan, 2006). More advanced discussions of partial-credit models may be found in Muraki (1990, 1992), Yen (1993), and van der Linden & Hambleton (1997). For additional information on the technical details of item-pattern scoring, readers can also refer to Yen & Candell (1991).

7.3.6 Lowest and Highest Obtainable Scores

A maximum likelihood procedure cannot produce scale score estimates for students with perfect scores or scores below the level expected by guessing. In addition, although maximum likelihood estimates are available for students with extreme scores other than zero or perfect, occasionally these estimates have standard errors of measurement that are very large, and differences between these extreme values have little meaning. Therefore, scores are established for these students based on a rational but necessarily non-maximum likelihood procedure. These values, which are set separately by grade, are called the lowest obtainable scale score (LOSS) and the highest obtainable scale score (HOSS). The LOSS and HOSS for ELA and Mathematics were set during the vertical scale development process after the Spring 2018 test administration. The LOSS and HOSS for Science were set as part of the new scale development process after the Spring 2019 test administration. Table 7.28 shows the LOSS and HOSS values used for each grade of the ELA, Mathematics, and Science MAP tests.

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7.4 Summary

In summary, the overall purpose of the operational data analyses is to ensure that the test items, as well as the overall test, are functioning appropriately. It also helps maintain the test scale across years so that test results may be appropriately compared across years. The data analyses undertaken by DRC are in alignment with multiple best practices of the testing industry and, in particular, support the following AERA, APA, & NCME (2014) *Standards*:

- Standard 1.8—The composition of any sample of test takers from which validity evidence is obtained should be described in as much detail as is practical and permissible, including major relevant socio-demographic and developmental characteristics.
- Standard 4.14—For a test that has a time limit, test development research should examine the degree to which scores include a speed component and should evaluate the appropriateness of that component, given the domain the test is designed to measure.
- Standard 5.2—The procedures for constructing scales used for reporting scores and the rationale for these procedures should be described clearly.
- Standard 5.13—When claims of form-to-form score equivalence are based on equating procedures, detailed technical information should be provided on the method by which equating functions were established and on the accuracy of the equating functions.
- Standard 5.15—In equating studies that employ an anchor test design, the characteristics of the anchor test and its similarity to the forms being equated should be presented, including both content specifications and empirically determined relationships among test scores. If anchor items are used in the equating study, the representativeness and psychometric characteristics of the anchor items should be presented.

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Table 7.1: Test Form Raw Score Summary Statistics, English Language Arts

Grade	Form	Total # of Items	Total # of Points	Mean Raw Score	Raw Score SD	Mean *p*-Value	p-Value SD	Mean R_{it}	R_{it} SD
3	A	50	56	33.68	11.17	0.60	0.17	0.41	0.08
3	B	49	56	32.92	10.64	0.59	0.17	0.39	0.10
4	A01	42	56	34.02	10.57	0.63	0.17	0.43	0.09
4	A05	42	56	34.00	10.14	0.62	0.17	0.43	0.08
4	A09	42	56	33.31	10.28	0.62	0.17	0.43	0.08
4	A13	42	56	33.51	10.09	0.62	0.17	0.42	0.08
4	A17	42	56	33.89	10.16	0.62	0.17	0.42	0.08
4	B04	42	56	30.31	10.61	0.61	0.17	0.42	0.10
4	B06	42	56	33.15	10.36	0.61	0.17	0.42	0.10
4	B10	42	56	34.12	10.34	0.62	0.16	0.42	0.10
4	B14	42	56	34.02	10.38	0.62	0.17	0.42	0.09
4	B18	42	56	34.05	10.45	0.62	0.17	0.42	0.10
4	BM4	42	56	33.55	10.52	0.61	0.17	0.42	0.10
5	A	45	56	34.90	10.59	0.62	0.14	0.41	0.09
5	B	46	57	35.40	10.42	0.62	0.18	0.40	0.10
6	A	44	52	29.16	9.83	0.57	0.13	0.37	0.09
6	B	44	52	29.97	9.36	0.58	0.14	0.36	0.09
7	A	42	52	30.45	10.76	0.59	0.12	0.42	0.09
7	B	42	52	31.76	9.87	0.60	0.14	0.40	0.08
8	A01	42	56	28.88	11.33	0.58	0.16	0.43	0.11
8	A05	42	56	34.61	10.28	0.58	0.16	0.43	0.11
8	A09	42	56	34.81	10.10	0.58	0.17	0.43	0.11
8	A13	42	56	34.31	10.14	0.58	0.16	0.43	0.10
8	A17	42	56	35.24	10.45	0.59	0.17	0.43	0.11
8	B04	43	56	30.89	11.33	0.58	0.16	0.42	0.11
8	B06	43	56	33.50	10.43	0.58	0.16	0.42	0.11
8	B10	43	56	34.54	10.59	0.58	0.16	0.42	0.11
8	B14	43	56	33.74	10.33	0.58	0.16	0.41	0.11
8	B18	43	56	34.46	10.56	0.58	0.16	0.42	0.11

Note that Form B (B04 in Grades 4 and 8), in addition to being spiraled with other forms, was a transcription form for students who used a printed test from. Students who took the printed form had their responses transcribed into the online Form B (B04 in ELA Grades 4 and 8) by the test examiners. Form numbers in Grades 4 and 8 reflect unique combinations of "core" item sets (A or B) and writing prompts.

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Table 7.2: Test Form Raw Score Summary Statistics, Mathematics

Grade	Form	Total # of Items	Total # of Points	Mean Raw Score	Raw Score SD	Mean *p*-Value	*p*-Value SD	Mean R_{it}	R_{it} SD
3	A	47	48	26.31	10.47	0.55	0.18	0.44	0.10
3	B	47	48	25.55	10.51	0.54	0.18	0.44	0.10
4	A	47	48	24.07	11.36	0.50	0.16	0.46	0.09
4	B	47	48	23.19	11.53	0.49	0.15	0.47	0.09
5	A	48	48	22.51	10.77	0.46	0.16	0.44	0.11
5	B	48	48	21.94	10.78	0.46	0.16	0.44	0.11
6	A	52	54	24.35	12.21	0.46	0.19	0.46	0.12
6	B	52	54	23.57	12.29	0.45	0.19	0.47	0.12
7	A	52	54	23.72	11.45	0.44	0.16	0.42	0.13
7	B	52	54	23.30	11.32	0.44	0.16	0.42	0.12
8	A	52	54	21.70	10.60	0.41	0.16	0.39	0.11
8	B	52	54	21.26	10.67	0.40	0.15	0.39	0.11

Note that Form B, in addition to being spiraled with other forms, was a transcription form for students who used a printed test from. Students who took the printed form had their responses transcribed into the online Form B by the test examiners.

Table 7.3: Test Form Raw Score Summary Statistics, Science

Grade	Form	Total # of Items	Total # of Points	Mean Raw Score	Raw Score SD	Mean *p*-Value	*p*-Value SD	Mean R_{it}	R_{it} SD
5	A	42	61	32.66	10.97	0.54	0.15	0.39	0.10
5	B	42	60	30.24	11.27	0.52	0.18	0.41	0.10
8	A	42	63	32.73	12.36	0.55	0.16	0.44	0.11
8	B	42	62	31.23	12.54	0.52	0.15	0.45	0.10

Note that Form B, in addition to being spiraled with other forms, was a transcription form for students who used a printed test from. Students who took the printed form had their responses transcribed into the online Form B by the test examiners.

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Table 7.4: Item Statistics, English Language Arts Grade 3

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	1	1	MC	0.64	0.44	0.41	30,838
A	1	2	MC	0.74	0.46	0.55	30,793
A	1	3	MS	0.65	0.48	0.50	30,809
A	1	4	MC	0.88	0.45	0.05	30,950
A	1	5	MC	0.53	0.41	0.08	30,940
A	1	6	MC	0.80	0.47	0.11	30,931
A	1	7	TE	0.36	0.48	0.08	30,938
A	1	8	MC	0.43	0.38	0.20	30,901
A	1	9	TE	0.23	0.15	0.16	30,914
A	1	10	MC	0.50	0.45	0.16	30,914
A	1	11	MC	0.47	0.38	0.47	30,820
A	1	12	MC	0.49	0.49	0.66	30,761
A	1	13	MS	0.66	0.58	0.42	30,833
A	1	14	MC	0.54	0.30	0.12	30,926
A,B	1	15	MC	0.52	0.43	0.09	66,099
A,B	1	16	TE	0.27	0.35	0.72	65,683
A,B	1	17	TE	0.71	0.52	0.13	66,074
A,B	1	18	EBSR	0.30	0.44	0.06	66,118
A,B	1	19	MC	0.36	0.21	0.17	66,046
A,B	1	20	EBSR	0.28	0.40	0.19	66,035
A,B	1	21	TE	0.83	0.24	1.70	65,033
A,B	1	22	MC	0.52	0.40	0.40	65,895
A,B	1	23	MC	0.53	0.34	0.15	66,063
A,B	2	28	MC	0.68	0.35	0.04	66,122
A,B	2	29	MC	0.68	0.37	0.08	66,093
A	2	30	MC	0.53	0.35	0.05	30,942
A	2	31	TE	0.69	0.59	0.21	30,893
A,B	2	32	MC	0.83	0.45	0.09	66,092
A	2	33	MC	0.77	0.40	0.07	30,936
A	2	34	MC	0.59	0.45	0.09	30,929
A	2	38	TE	0.39	0.35	0.06	30,937
A	2	39	TE	0.52	0.34	0.06	30,937
A	2	40	MS	0.77	0.49	0.05	30,943
A	2	41	MC	0.43	0.31	0.04	30,946
A,B	2	42	MC	0.52	0.36	0.05	66,115
A,B	2	43	TE	0.78	0.53	0.41	65,880
A	2	44	TE	0.82	0.47	0.17	30,904
A,B	2	45	TE	0.84	0.37	0.07	66,100
A,B	2	46	MC	0.63	0.36	0.06	66,108
A,B	2	47	TE	0.86	0.42	0.06	66,109

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Table 7.4: Item Statistics, English Language Arts Grade 3 (cont.)

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	2	48	TE	0.59	0.44	0.17	30,904
A	2	49	MC	0.84	0.38	0.05	30,943
A	3	50	MC	0.47	0.38	0.05	30,938
A	3	51	MC	0.70	0.35	0.12	30,918
A	3	52	MC	0.67	0.38	0.08	30,930
A	3	53	MC	0.60	0.42	0.12	30,918
A,B	3	54	MC	0.71	0.49	0.10	66,080
A,B	3	55	MC	0.71	0.42	0.13	66,059
A,B	3	56	MS	0.58	0.47	0.06	66,103
A,B	3	57	EBSR	0.59	0.49	0.02	66,127
B	1	1	TE	0.71	0.41	3.37	34,009
B	1	2	MC	0.48	0.17	0.63	34,976
B	1	3	MC	0.58	0.43	0.47	35,031
B	1	4	MC	0.80	0.33	0.45	35,038
B	1	5	TE	0.64	0.58	0.10	35,161
B	1	6	MC	0.53	0.38	0.09	35,163
B	1	7	EBSR	0.63	0.39	0.03	35,187
B	1	8	MC	0.49	0.18	0.13	35,152
B	1	9	TE	0.45	0.41	0.21	35,121
B	1	10	MC	0.67	0.47	0.14	35,145
B	1	11	TE	0.49	0.42	3.09	34,110
B	1	12	TE	0.29	0.47	0.41	35,051
B	1	13	MC	0.46	0.33	0.59	34,987
B	1	14	MC	0.59	0.44	0.65	34,967
B	1	15	MC	0.77	0.46	0.11	35,158
B	2	31	MS	0.49	0.23	0.02	35,184
B	2	32	TE	0.51	0.61	0.06	35,170
B	2	34	MC	0.25	0.25	0.09	35,160
B	2	38	MC	0.61	0.24	0.08	35,163
B	2	39	MS	0.88	0.46	0.04	35,179
B	2	40	TE	0.83	0.49	0.09	35,159
B	2	41	TE	0.45	0.46	0.19	35,124
B	2	44	TE	0.31	0.28	0.12	35,149
B	2	48	TE	0.81	0.34	0.07	35,167
B	3	49	MC	0.78	0.42	0.06	35,168
B	3	50	MC	0.61	0.27	0.12	35,148
B	3	51	MC	0.48	0.33	0.11	35,149
B	3	52	MC	0.67	0.34	0.10	35,154

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Table 7.5: Item Statistics, English Language Arts Grade 4

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A01	1	4A	WP	0.49	0.63	0.92	5,336
A01	1	4B	WP	0.54	0.65	0.92	5,336
A01	1	4C	WP	0.92	0.43	0.92	5,336
A05	1	4A	WP	0.48	0.59	0.30	5,280
A05	1	4B	WP	0.49	0.59	0.30	5,280
A05	1	4C	WP	0.92	0.45	0.30	5,280
A13	1	4A	WP	0.47	0.59	0.24	7,948
A13	1	4B	WP	0.48	0.58	0.24	7,948
A13	1	4C	WP	0.92	0.39	0.24	7,948
A17	1	4A	WP	0.48	0.57	0.20	7,984
A17	1	4B	WP	0.49	0.56	0.20	7,984
A17	1	4C	WP	0.95	0.36	0.20	7,984
A09/BM4	1	4A	WP	0.44	0.60	0.45	7,956
A09/BM4	1	4B	WP	0.44	0.60	0.45	7,956
A09/BM4	1	4C	WP	0.87	0.46	0.45	7,956
A,B	2	5	MC	0.82	0.47	0.18	67,745
A,B	2	6	TE	0.58	0.58	0.20	67,734
A,B	2	7	TE	0.34	0.49	0.60	67,465
A,B	2	8	MC	0.54	0.40	0.09	67,810
A	2	9	MC	0.83	0.37	0.14	31,820
A	2	10	MS	0.53	0.35	0.15	31,817
A	2	11	TE	0.48	0.50	0.09	31,837
A	2	12	MC	0.48	0.29	0.17	31,811
A	2	13	EBSR	0.42	0.30	0.09	31,838
A	2	14	MC	0.84	0.44	0.47	31,715
A	2	15	MC	0.88	0.46	0.13	31,826
A	2	16	TE	0.62	0.39	0.32	31,764
A	2	17	EBSR	0.41	0.46	0.05	31,851
A	2	18	MC	0.59	0.48	0.11	31,832
A	2	19	MS	0.49	0.41	0.10	31,835
A,B	2	20	MC	0.75	0.41	0.23	67,715
A,B	2	21	MC	0.77	0.48	0.35	67,629
A,B	2	22	MC	0.53	0.42	0.48	67,540
A,B	2	23	EBSR	0.27	0.44	0.08	67,816
A,B	2	24	MC	0.77	0.49	0.13	67,782
A,B	3	29	MC	0.93	0.31	0.03	67,836
A,B	3	30	MS	0.31	0.34	0.04	67,829
A,B	3	31	MC	0.46	0.25	0.08	67,807
A,B	3	32	MC	0.76	0.46	0.11	67,782
A	3	33	MC	0.56	0.48	0.06	31,843

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Table 7.5: Item Statistics, English Language Arts Grade 4 (cont.)

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	3	34	MS	0.71	0.46	0.04	31,847
A	3	35	MC	0.72	0.35	0.07	31,838
A,B	3	39	MC	0.66	0.37	0.05	67,823
A,B	3	40	MC	0.72	0.38	0.07	67,813
A	3	41	MC	0.69	0.39	0.08	31,837
A	3	42	TE	0.66	0.52	0.07	31,838
A,B	4	43	MC	0.58	0.27	0.05	67,821
A,B	4	44	MS	0.45	0.47	0.09	67,789
A,B	4	45	EBSR	0.62	0.52	0.02	67,839
A,B	4	46	MC	0.65	0.36	0.12	67,770
A	4	47	MC	0.77	0.47	0.13	31,817
A	4	48	MC	0.72	0.41	0.12	31,819
A	4	49	MC	0.84	0.50	0.11	31,823
A	4	50	MC	0.58	0.35	0.06	31,838
B04	1	4A	WP	0.36	0.59	0.53	9,569
B04	1	4B	WP	0.36	0.58	0.53	9,569
B04	1	4C	WP	0.83	0.47	0.53	9,569
B06	1	4A	WP	0.41	0.58	0.32	5,298
B06	1	4B	WP	0.41	0.57	0.32	5,298
B06	1	4C	WP	0.89	0.44	0.32	5,298
B10	1	4A	WP	0.51	0.58	0.30	5,286
B10	1	4B	WP	0.52	0.58	0.30	5,286
B10	1	4C	WP	0.88	0.45	0.30	5,286
B14	1	4A	WP	0.48	0.56	0.51	5,298
B14	1	4B	WP	0.49	0.57	0.51	5,298
B14	1	4C	WP	0.92	0.38	0.51	5,298
B18	1	4A	WP	0.49	0.58	0.42	7,921
B18	1	4B	WP	0.51	0.59	0.42	7,921
B18	1	4C	WP	0.97	0.27	0.42	7,921
B	2	9	TE	0.54	0.37	0.34	35,879
B	2	10	MS	0.60	0.53	0.13	35,955
B	2	11	MC	0.53	0.37	0.12	35,960
B	2	12	MC	0.74	0.50	0.14	35,954
B	2	13	EBSR	0.46	0.48	0.05	35,984
B	2	14	MC	0.72	0.34	0.40	35,858
B	2	15	EBSR	0.44	0.42	0.14	35,952
B	2	16	TE	0.53	0.43	0.24	35,916

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Table 7.5: Item Statistics, English Language Arts Grade 4 (cont.)

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
B	2	17	MC	0.68	0.45	0.10	35,966
B	2	18	MC	0.51	0.36	0.12	35,960
B	2	19	MC	0.44	0.38	0.11	35,963
B	2	20	MS	0.60	0.59	0.08	35,974
B	3	34	MC	0.73	0.25	0.06	35,977
B	3	35	MS	0.74	0.49	0.04	35,985
B	3	36	MC	0.82	0.28	0.06	35,978
B	3	42	TE	0.71	0.44	0.13	35,953
B	3	43	MC	0.88	0.30	0.03	35,986
B	4	48	MC	0.86	0.22	0.07	35,968
B	4	49	EBSR	0.41	0.53	0.04	35,980
B	4	50	MC	0.50	0.40	0.12	35,950

Note: Writing prompt statistics are presented separately for the three traits: A—Organization/Purpose, B—Evidence/Elaboration, and C—Conventions. The omit rates for the writing prompts are computed at the item level and are the same for the three traits.

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Table 7.6: Item Statistics, English Language Arts Grade 5

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	1	1	EBSR	0.55	0.49	0.02	69,513
A,B	1	2	TE	0.73	0.49	0.07	69,478
A,B	1	3	MC	0.63	0.44	0.09	69,464
A	1	4	TE	0.55	0.32	0.19	32,919
A	1	5	MC	0.63	0.34	0.10	32,948
A	1	6	TE	0.65	0.46	0.10	32,949
A	1	7	MC	0.73	0.49	0.10	32,950
A	1	8	MS	0.80	0.48	0.17	32,926
A	1	9	EBSR	0.79	0.57	0.03	32,972
A	1	10	MC	0.65	0.43	0.15	32,932
A	1	11	MC	0.77	0.49	0.12	32,942
A	1	12	MC	0.72	0.49	0.09	32,953
A	1	13	MC	0.51	0.43	0.08	32,954
A	1	14	TE	0.54	0.41	0.14	32,935
A	1	15	MC	0.60	0.46	0.10	32,950
A	1	16	EBSR	0.52	0.44	0.03	32,971
A,B	1	17	MC	0.32	0.26	0.49	69,189
A,B	1	18	TE	0.56	0.63	0.29	69,330
A,B	1	19	MC	0.59	0.55	0.13	69,438
A,B	1	20	MC	0.56	0.34	0.16	69,415
A	2	25	TE	0.72	0.29	0.07	32,957
A,B	2	26	MC	0.86	0.37	0.04	69,491
A	2	27	MC	0.45	0.35	0.06	32,961
A,B	2	28	MS	0.65	0.44	0.06	69,481
A,B	2	29	TE	0.58	0.41	0.15	69,418
A,B	2	33	MC	0.78	0.43	0.05	69,483
A,B	2	34	MC	0.71	0.41	0.09	69,461
A	2	35	MC	0.67	0.34	0.06	32,961
A,B	2	36	MC	0.53	0.35	0.09	69,459
A	2	37	MS	0.49	0.34	0.06	32,960
A,B	2	38	TE	0.84	0.20	0.05	69,489
A,B	2	39	MC	0.59	0.40	0.06	69,476
A,B	2	40	MC	0.55	0.47	0.14	69,426
A,B	2	41	TE	0.26	0.21	0.12	69,441
A,B	2	42	TE	0.47	0.40	0.13	69,432
A	2	43	TE	0.65	0.46	0.08	32,955
A,B	2	44	TE	0.52	0.49	0.05	69,485
A,B	2	45	MC	0.62	0.33	0.05	69,488
A	3	46	MC	0.61	0.31	0.05	32,962
A	3	47	MS	0.44	0.40	0.06	32,956

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Table 7.6: Item Statistics, English Language Arts Grade 5 (cont.)

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	3	48	MC	0.57	0.40	0.07	32,953
A,B	3	49	MC	0.51	0.28	0.08	69,454
A,B	3	50	MC	0.84	0.43	0.11	69,432
A,B	3	51	MC	0.77	0.40	0.08	69,455
A,B	3	52	MC	0.88	0.46	0.04	69,481
B	1	4	EBSR	0.63	0.48	0.04	36,532
B	1	5	MC	0.66	0.43	0.13	36,499
B	1	6	MS	0.64	0.41	0.10	36,509
B	1	7	TE	0.65	0.41	0.37	36,411
B	1	8	MC	0.67	0.52	0.22	36,465
B	1	9	TE	0.40	0.46	0.15	36,493
B	1	10	TE	0.49	0.33	0.27	36,449
B	1	11	MC	0.89	0.45	0.11	36,507
B	1	12	MS	0.67	0.50	0.13	36,498
B	1	13	MC	0.59	0.46	0.15	36,493
B	1	14	TE	0.78	0.51	0.12	36,504
B	1	15	EBSR	0.30	0.27	0.08	36,519
B	2	24	MS	0.82	0.53	0.02	36,535
B	2	26	TE	0.79	0.50	0.05	36,524
B	2	34	MC	0.61	0.33	0.06	36,519
B	2	36	TE	0.12	0.30	0.05	36,523
B	2	42	TE	0.30	0.28	0.15	36,488
B	2	45	MC	0.80	0.42	0.04	36,525
B	3	46	MC	0.89	0.32	0.06	36,512
B	3	47	MC	0.75	0.27	0.07	36,506
B	3	48	MC	0.80	0.44	0.05	36,516
B	3	49	MC	0.47	0.15	0.04	36,518

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Table 7.7: Item Statistics, English Language Arts Grade 6

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	1	1	TE	0.70	0.52	0.75	69,429
A,B	1	2	TE	0.65	0.34	0.27	69,764
A,B	1	3	MC	0.82	0.36	0.26	69,775
A,B	1	4	MC	0.72	0.34	0.26	69,775
A,B	1	5	MC	0.57	0.33	0.10	69,887
A,B	1	6	EBSR	0.51	0.47	0.03	69,936
A	1	7	TE	0.64	0.47	0.44	35,712
A	1	8	MC	0.49	0.35	0.14	35,817
A	1	9	MC	0.67	0.32	0.14	35,818
A	1	10	MC	0.40	0.33	0.38	35,734
A	1	11	EBSR	0.53	0.51	0.10	35,832
A	1	12	MS	0.52	0.29	0.22	35,789
A	1	13	EBSR	0.42	0.33	0.04	35,856
A	1	14	MC	0.39	0.30	0.11	35,830
A	1	15	MS	0.56	0.32	0.21	35,794
A	1	16	MC	0.47	0.41	0.15	35,815
A	1	17	TE	0.59	0.41	0.25	35,781
A	1	18	TE	0.37	0.42	0.24	35,783
A,B	1	19	MC	0.55	0.36	0.47	69,625
A,B	1	20	EBSR	0.41	0.49	0.09	69,891
A,B	1	21	MC	0.62	0.49	0.33	69,724
A,B	1	22	MC	0.48	0.24	0.19	69,821
A,B	2	27	MC	0.68	0.28	0.03	69,916
A,B	2	28	TE	0.69	0.20	0.09	69,874
A	2	29	MC	0.61	0.40	0.07	35,837
A,B	2	30	TE	0.56	0.38	0.13	69,847
A	2	31	MC	0.69	0.38	0.09	35,832
A	2	32	MC	0.50	0.25	0.06	35,841
A	2	33	TE	0.57	0.45	0.18	35,797
A	2	34	MC	0.64	0.34	0.14	35,812
A	2	38	MC	0.65	0.42	0.06	35,843
A,B	2	39	TE	0.39	0.24	0.06	69,895
A,B	2	40	MS	0.51	0.39	0.09	69,877
A,B	2	41	TE	0.31	0.22	0.09	69,875
A,B	2	42	TE	0.51	0.26	0.09	69,874
A	2	43	MC	0.49	0.28	0.03	35,852
A	2	44	TE	0.66	0.52	0.02	35,855
A	3	45	MC	0.86	0.39	0.04	35,844
A	3	46	MC	0.77	0.46	0.13	35,811
A	3	47	MS	0.59	0.32	0.09	35,827

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Table 7.7: Item Statistics, English Language Arts Grade 6 (cont.)

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	3	48	MC	0.67	0.49	0.10	69,863
A,B	3	49	MS	0.30	0.46	0.12	69,847
A,B	3	50	EBSR	0.63	0.34	0.02	69,919
A,B	3	51	MC	0.76	0.48	0.06	69,889
B	1	7	MC	0.63	0.36	0.18	34,024
B	1	8	MC	0.81	0.42	0.13	34,043
B	1	9	EBSR	0.41	0.32	0.06	34,067
B	1	10	MC	0.79	0.40	0.25	34,000
B	1	11	MC	0.45	0.38	0.41	33,945
B	1	12	MS	0.59	0.26	0.34	33,969
B	1	13	TE	0.27	0.24	0.59	33,886
B	1	14	EBSR	0.45	0.38	0.07	34,063
B	1	15	MC	0.47	0.37	0.18	34,026
B	1	16	MS	0.43	0.18	0.18	34,023
B	1	17	MS	0.60	0.44	0.18	34,025
B	1	18	MC	0.78	0.39	0.11	34,049
B	1	19	MC	0.47	0.34	0.11	34,049
B	2	30	MC	0.60	0.45	0.07	34,050
B	2	32	MS	0.62	0.49	0.06	34,055
B	2	33	TE	0.74	0.34	0.06	34,054
B	2	37	TE	0.57	0.37	0.07	34,050
B	2	38	TE	0.45	0.48	0.09	34,044
B	2	39	MC	0.65	0.30	0.03	34,063
B	3	44	MC	0.62	0.30	0.04	34,059
B	3	45	MC	0.72	0.45	0.15	34,023
B	3	46	MC	0.63	0.33	0.11	34,037
B	3	47	MC	0.65	0.35	0.12	34,034

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Table 7.8: Item Statistics, English Language Arts Grade 7

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	1	1	MC	0.53	0.43	0.14	35,079
A	1	2	MC	0.70	0.48	0.42	34,980
A	1	3	EBSR	0.49	0.54	0.07	35,106
A	1	4	MC	0.50	0.31	0.19	35,064
A	1	5	MC	0.49	0.35	0.20	35,059
A	1	6	TE	0.67	0.51	0.15	35,075
A,B	1	7	MC	0.78	0.42	0.22	67,796
A,B	1	8	MC	0.64	0.30	0.18	67,823
A,B	1	9	EBSR	0.57	0.53	0.04	67,923
A,B	1	10	TE	0.69	0.46	1.41	66,989
A,B	1	11	MC	0.58	0.33	0.51	67,601
A,B	1	12	MC	0.69	0.46	0.31	67,740
A,B	1	13	MS	0.29	0.37	0.36	67,706
A,B	1	14	MC	0.44	0.29	0.17	67,833
A,B	1	15	EBSR	0.47	0.48	0.06	67,909
A,B	1	16	MC	0.58	0.42	0.17	67,832
A	1	17	EBSR	0.78	0.56	0.08	35,102
A	1	18	MS	0.71	0.48	0.32	35,016
A	1	19	TE	0.50	0.55	0.89	34,817
A	1	20	MC	0.69	0.52	0.25	35,042
A	1	21	MC	0.66	0.41	0.20	35,057
A	1	22	TE	0.41	0.56	0.20	35,059
A	2	27	MS	0.66	0.46	0.02	35,113
A,B	2	28	TE	0.42	0.57	0.10	67,861
A	2	29	TE	0.52	0.48	0.18	35,058
A,B	2	30	MC	0.68	0.45	0.16	67,820
A	2	31	MS	0.71	0.50	0.10	35,085
A,B	2	32	MC	0.52	0.32	0.10	67,862
A	2	36	TE	0.57	0.30	0.07	35,094
A,B	2	37	MC	0.51	0.31	0.07	67,884
A	2	38	MC	0.57	0.36	0.07	35,095
A,B	2	39	MC	0.57	0.34	0.14	67,838
A,B	2	40	TE	0.65	0.33	0.13	67,840
A,B	2	41	TE	0.39	0.37	0.10	67,861
A	2	42	TE	0.83	0.40	0.08	35,093
A	3	43	MS	0.60	0.44	0.03	35,100
A	3	44	MC	0.61	0.32	0.17	35,053
A	3	45	MC	0.65	0.24	0.15	35,060
A,B	3	46	TE	0.67	0.34	0.11	67,845
A,B	3	47	EBSR	0.53	0.52	0.03	67,897

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Table 7.8: Item Statistics, English Language Arts Grade 7 (cont.)

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	3	48	MS	0.42	0.47	0.08	67,860
A,B	3	49	MC	0.72	0.35	0.06	67,879
B	1	1	MC	0.66	0.40	0.09	32,789
B	1	2	MS	0.58	0.37	0.19	32,758
B	1	3	TE	0.62	0.34	0.57	32,631
B	1	4	TE	0.74	0.49	0.22	32,748
B	1	5	TE	0.79	0.55	0.09	32,791
B	1	16	MC	0.47	0.27	0.22	32,747
B	1	17	MC	0.63	0.34	0.13	32,775
B	1	18	MS	0.68	0.40	0.10	32,787
B	1	19	MC	0.71	0.40	0.41	32,686
B	1	20	MC	0.71	0.54	0.35	32,703
B	1	21	TE	0.83	0.52	0.33	32,711
B	1	22	EBSR	0.58	0.47	0.08	32,794
B	2	27	MS	0.80	0.45	0.02	32,804
B	2	29	TE	0.43	0.41	0.12	32,772
B	2	31	MC	0.70	0.45	0.08	32,784
B	2	36	TE	0.32	0.34	0.08	32,784
B	2	38	MC	0.43	0.23	0.07	32,786
B	2	42	TE	0.39	0.37	0.08	32,783
B	3	43	MS	0.75	0.32	0.03	32,795
B	3	44	MC	0.72	0.34	0.18	32,747
B	3	45	MC	0.73	0.34	0.10	32,773

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Table 7.9: Item Statistics, English Language Arts Grade 8

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A01	1	4A	WP	0.49	0.68	2.42	9,211
A01	1	4B	WP	0.50	0.68	2.42	9,211
A01	1	4C	WP	0.90	0.42	2.42	9,211
A05	1	4A	WP	0.60	0.63	0.50	5,030
A05	1	4B	WP	0.61	0.63	0.50	5,030
A05	1	4C	WP	0.95	0.39	0.50	5,030
A09	1	4A	WP	0.61	0.60	1.10	7,576
A09	1	4B	WP	0.62	0.60	1.10	7,576
A09	1	4C	WP	0.97	0.31	1.10	7,576
A13	1	4A	WP	0.56	0.59	0.53	5,067
A13	1	4B	WP	0.57	0.59	0.53	5,067
A13	1	4C	WP	0.94	0.38	0.53	5,067
A17	1	4A	WP	0.67	0.62	1.70	7,580
A17	1	4B	WP	0.68	0.62	1.70	7,580
A17	1	4C	WP	0.95	0.31	1.70	7,580
A,B	2	5	MC	0.85	0.37	0.14	66,624
A,B	2	6	EBSR	0.46	0.30	0.06	66,674
A,B	2	7	MS	0.45	0.39	0.19	66,588
A,B	2	8	MC	0.57	0.36	0.15	66,620
A	2	9	MC	0.59	0.48	0.19	34,391
A	2	10	TE	0.49	0.36	0.21	34,387
A	2	11	EBSR	0.75	0.60	0.05	34,442
A	2	12	MC	0.74	0.50	0.17	34,401
A	2	13	MC	0.74	0.49	0.37	34,330
A	2	14	MC	0.41	0.40	0.37	34,332
A	2	15	EBSR	0.58	0.52	0.07	34,435
A	2	16	TE	0.79	0.48	0.21	34,387
A	2	17	MC	0.67	0.38	0.19	34,391
A	2	18	MS	0.78	0.62	0.14	34,409
A	2	19	MC	0.39	0.25	0.20	34,389
A	2	20	TE	0.45	0.51	0.22	34,382
A,B	2	21	MC	0.58	0.55	0.21	66,574
A,B	2	22	MC	0.38	0.21	0.37	66,472
A,B	2	23	TE	0.54	0.39	0.70	66,250
A,B	2	24	MS	0.20	0.41	0.32	66,505
A,B	2	25	MC	0.45	0.53	0.28	66,528
A,B	2	26	TE	0.53	0.62	0.23	66,561
A,B	3	31	MC	0.47	0.35	0.04	66,678
A	3	32	TE	0.64	0.52	0.10	34,415
A	3	33	MC	0.61	0.35	0.06	34,429

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Table 7.9: Item Statistics, English Language Arts Grade 8 (cont.)

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	3	34	TE	0.26	0.46	0.15	66,606
A	3	35	MS	0.68	0.37	0.11	34,412
A	3	36	MC	0.44	0.35	0.17	34,393
A,B	3	37	TE	0.46	0.34	0.15	66,602
A	3	41	MC	0.62	0.50	0.07	34,426
A,B	3	42	MS	0.35	0.44	0.05	66,668
A,B	4	43	MC	0.59	0.26	0.07	66,649
A,B	4	44	MC	0.86	0.43	0.14	66,602
A,B	4	45	MC	0.61	0.24	0.11	66,619
A,B	4	46	MS	0.55	0.43	0.09	66,634
A	4	47	MC	0.71	0.38	0.16	34,392
A	4	48	MC	0.79	0.52	0.21	34,372
A	4	49	MC	0.75	0.39	0.08	34,417
A	4	50	MC	0.54	0.44	0.08	34,420
B04	1	4A	WP	0.51	0.67	1.27	6,913
B04	1	4B	WP	0.50	0.67	1.27	6,913
B04	1	4C	WP	0.92	0.38	1.27	6,913
B06	1	4A	WP	0.54	0.61	0.78	7,571
B06	1	4B	WP	0.54	0.61	0.78	7,571
B06	1	4C	WP	0.96	0.35	0.78	7,571
B10	1	4A	WP	0.66	0.62	0.63	5,096
B10	1	4B	WP	0.69	0.62	0.63	5,096
B10	1	4C	WP	0.97	0.32	0.63	5,096
B14	1	4A	WP	0.58	0.55	0.71	7,607
B14	1	4B	WP	0.59	0.55	0.71	7,607
B14	1	4C	WP	0.98	0.26	0.71	7,607
B18	1	4A	WP	0.61	0.65	0.51	5,077
B18	1	4B	WP	0.64	0.65	0.51	5,077
B18	1	4C	WP	0.96	0.36	0.51	5,077
B	2	9	MC	0.78	0.55	0.25	32,178
B	2	10	MS	0.65	0.39	0.21	32,191
B	2	11	MC	0.59	0.34	0.27	32,173
B	2	12	MC	0.57	0.42	0.23	32,185
B	2	13	EBSR	0.54	0.54	0.06	32,241
B	2	14	TE	0.70	0.51	0.35	32,147
B	2	15	MC	0.62	0.28	0.40	32,131
B	2	16	MC	0.72	0.43	0.30	32,163
B	2	17	MC	0.59	0.33	0.30	32,163
B	2	18	MS	0.61	0.54	0.22	32,187

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Table 7.9: Item Statistics, English Language Arts Grade 8 (cont.)

English Language Arts							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
B	2	19	MC	0.48	0.41	0.23	32,186
B	2	20	TE	0.69	0.46	0.18	32,201
B	2	21	EBSR	0.72	0.65	0.09	32,230
B	3	34	MC	0.74	0.48	0.09	32,224
B	3	36	MC	0.69	0.39	0.11	32,216
B	3	37	MS	0.65	0.38	0.08	32,227
B	3	38	TE	0.34	0.31	0.16	32,202
B	3	42	MC	0.41	0.24	0.07	32,228
B	4	48	MC	0.71	0.43	0.12	32,209
B	4	49	MC	0.47	0.34	0.14	32,201
B	4	50	MC	0.58	0.35	0.09	32,217
B	4	51	MC	0.78	0.48	0.09	32,218

Note: See note about omit rates under Table 7.5.

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Table 7.10: Item Statistics, Mathematics Grade 3

Mathematics							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	1	1	MC	0.47	0.36	0.21	32,082
A,B	1	2	MC	0.76	0.45	0.05	66,290
A,B	1	3	SA	0.56	0.58	0.05	66,289
A	1	4	MC	0.82	0.37	0.08	32,124
A,B	1	6	SA	0.91	0.30	0.06	66,286
A,B	1	7	TE	0.79	0.45	0.24	66,167
A,B	1	8	MC	0.44	0.41	0.19	66,197
A,B	1	9	TE	0.14	0.34	0.16	66,219
A	1	11	MC	0.52	0.47	0.12	32,114
A,B	1	12	MC	0.75	0.35	0.14	66,235
A,B	1	13	MS	0.60	0.54	0.07	66,278
A	1	14	MC	0.23	0.29	0.15	32,102
A,B	1	16	MC	0.41	0.39	0.13	66,236
A,B	1	17	MC	0.50	0.29	0.39	66,069
A,B	1	18	MC	0.48	0.39	0.14	66,230
A	1	19	MC	0.66	0.49	0.09	32,121
A,B	1	20	MC	0.39	0.44	0.10	66,258
A	1	21	MS	0.29	0.47	0.07	32,127
A,B	1	22	MC	0.75	0.49	0.09	66,263
A,B	1	23	MC	0.49	0.52	0.08	66,272
A,B	1	24	MC	0.47	0.43	0.11	66,249
A,B	2	25	TE	0.53	0.64	0.03	66,293
A	2	26	MC	0.89	0.20	0.07	32,120
A,B	2	27	MC	0.65	0.46	0.09	66,252
A	2	28	SA	0.41	0.57	0.11	32,109
A	2	29	TE	0.55	0.39	0.20	32,078
A,B	2	30	SA	0.65	0.53	0.09	66,251
A,B	2	31	MC	0.82	0.44	0.08	66,258
A	2	32	MC	0.83	0.39	0.33	32,037
A,B	2	33	MC	0.43	0.23	0.11	66,242
A,B	2	34	MC	0.76	0.49	0.13	66,228
A,B	2	35	TE	0.46	0.49	0.09	66,251
A,B	2	36	MC	0.71	0.49	0.14	66,222

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Table 7.10: Item Statistics, Mathematics Grade 3 (cont.)

Mathematics							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	2	37	MC	0.53	0.37	0.09	32,114
A	2	38	SA	0.60	0.59	0.07	32,119
A,B	2	40	MC	0.53	0.22	0.59	65,923
A,B	2	41	SA	0.35	0.54	0.15	66,214
A,B	2	42	MC	0.30	0.46	0.10	66,248
A	2	43	MC	0.70	0.49	0.09	32,113
A,B	2	45	MS	0.33	0.55	0.09	66,252
A,B	2	46	TE	0.30	0.39	1.02	65,635
A,B	2	47	MC	0.48	0.43	0.08	66,258
A,B	3	48	MC	0.57	0.55	0.04	66,280
A,B	3	49	SA	0.51	0.57	0.04	66,277
A,B	3	50	TE	0.63	0.47	0.08	66,252
A,B	3	51	TE	0.60	0.41	0.31	66,099
A,B	3	52	SA	0.27	0.49	0.11	66,234
B	1	1	SA	0.44	0.52	0.30	34,073
B	1	4	MC	0.35	0.29	0.05	34,157
B	1	11	MC	0.40	0.32	0.09	34,143
B	1	14	TE	0.57	0.54	1.03	33,823
B	1	19	MC	0.81	0.25	0.11	34,135
B	1	21	MS	0.30	0.54	0.10	34,141
B	2	26	MC	0.75	0.33	0.08	34,142
B	2	28	MC	0.43	0.42	0.13	34,125
B	2	29	MC	0.67	0.46	0.08	34,143
B	2	32	MC	0.71	0.46	0.36	34,046
B	2	37	SA	0.40	0.47	0.08	34,141
B	2	38	MC	0.54	0.28	0.10	34,136
B	2	43	MC	0.82	0.49	0.08	34,143

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Table 7.11: Item Statistics, Mathematics Grade 4

Mathematics							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	1	1	MC	0.39	0.49	0.15	68,028
A,B	1	2	MC	0.54	0.52	0.06	68,087
A,B	1	3	TE	0.58	0.37	0.07	68,084
A	1	4	SA	0.51	0.49	0.09	31,785
A,B	1	6	MC	0.76	0.45	0.12	68,051
A,B	1	7	MC	0.62	0.53	0.06	68,089
A,B	1	8	SA	0.56	0.55	0.15	68,027
A	1	9	MC	0.54	0.37	0.37	31,696
A	1	11	MS	0.27	0.32	0.03	31,805
A,B	1	12	SA	0.34	0.55	0.11	68,053
A,B	1	13	MC	0.43	0.31	0.12	68,051
A,B	1	14	MC	0.44	0.37	0.15	68,029
A,B	1	16	SA	0.35	0.50	0.10	68,061
A,B	1	17	MC	0.53	0.61	0.30	67,927
A	1	18	MC	0.60	0.46	0.09	31,785
A,B	1	19	TE	0.37	0.65	0.16	68,019
A,B	1	20	MS	0.61	0.51	0.09	68,069
A,B	1	21	MC	0.61	0.34	0.11	68,056
A,B	1	22	TE	0.25	0.43	0.09	68,067
A,B	1	23	MC	0.69	0.44	0.09	68,072
A,B	1	24	MC	0.48	0.50	0.10	68,065
A	2	25	MC	0.54	0.30	0.05	31,788
A	2	26	TE	0.42	0.60	0.04	31,790
A,B	2	27	MC	0.48	0.51	0.09	68,056
A	2	28	MS	0.54	0.54	0.09	31,774
A,B	2	29	MC	0.72	0.45	0.08	68,062
A,B	2	30	SA	0.30	0.60	0.14	68,022
A,B	2	31	MC	0.27	0.23	0.08	68,057
A,B	2	32	MC	0.40	0.31	0.39	67,845
A,B	2	33	MC	0.53	0.59	0.12	68,033
A,B	2	34	TE	0.29	0.49	0.11	68,040
A,B	2	35	MC	0.79	0.43	0.14	68,020
A	2	36	SA	0.38	0.59	0.17	31,749
A,B	2	37	SA	0.38	0.39	0.10	68,044
A,B	2	38	TE	0.56	0.41	0.10	68,044
A	2	40	MC	0.75	0.44	0.36	31,689

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Table 7.11: Item Statistics, Mathematics Grade 4 (cont.)

Mathematics							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	2	41	SA	0.32	0.48	0.09	31,776
A	2	42	MC	0.78	0.48	0.13	31,764
A	2	43	MS	0.20	0.37	0.05	31,789
A	2	45	MC	0.46	0.35	0.08	31,780
A,B	2	46	TE	0.56	0.41	0.32	67,896
A	2	47	MC	0.79	0.45	0.06	31,786
A,B	3	48	MC	0.63	0.49	0.05	68,077
A,B	3	49	TE	0.73	0.43	0.05	68,074
A,B	3	50	TE	0.35	0.57	0.08	68,055
A,B	3	51	SA	0.33	0.56	0.09	68,049
A,B	3	52	TE	0.50	0.48	0.03	68,087
B	1	4	SA	0.37	0.50	0.11	36,276
B	1	9	MC	0.69	0.38	0.30	36,208
B	1	11	MS	0.33	0.49	0.04	36,303
B	1	18	MC	0.46	0.27	0.14	36,265
B	2	25	MC	0.80	0.35	0.06	36,289
B	2	26	SA	0.32	0.47	0.08	36,280
B	2	28	MS	0.57	0.53	0.08	36,281
B	2	36	MC	0.50	0.48	0.09	36,279
B	2	40	MC	0.53	0.49	0.50	36,128
B	2	41	TE	0.44	0.52	0.39	36,168
B	2	42	MC	0.43	0.44	0.15	36,254
B	2	43	MC	0.40	0.35	0.11	36,269
B	2	45	SA	0.31	0.59	0.14	36,258
B	2	47	MC	0.61	0.50	0.09	36,278

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Table 7.12: Item Statistics, Mathematics Grade 5

Mathematics							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	1	1	MC	0.43	0.38	0.18	69,687
A,B	1	2	MS	0.38	0.59	0.05	69,776
A,B	1	3	SA	0.31	0.53	0.08	69,758
A,B	1	4	MC	0.39	0.40	0.09	69,746
A,B	1	6	SA	0.27	0.57	0.15	69,704
A,B	1	7	MC	0.65	0.42	0.06	69,767
A,B	1	8	TE	0.52	0.47	0.07	69,764
A,B	1	9	MC	0.64	0.37	0.15	69,705
A	1	11	MS	0.44	0.59	0.07	32,919
A	1	12	MC	0.50	0.40	0.13	32,899
A,B	1	13	TE	0.32	0.61	0.10	69,741
A	1	14	TE	0.70	0.39	0.21	32,872
A	1	16	MC	0.40	0.35	0.10	32,907
A	1	17	MC	0.60	0.45	0.18	32,882
A	1	18	SA	0.34	0.54	0.08	32,915
A,B	1	19	MC	0.47	0.59	0.10	69,739
A,B	1	20	TE	0.73	0.34	0.24	69,642
A	1	21	MC	0.64	0.50	0.05	32,923
A,B	1	22	MS	0.36	0.51	0.07	69,764
A,B	1	23	MC	0.47	0.30	0.08	69,757
A	1	24	SA	0.37	0.64	0.11	32,906
A,B	2	25	MC	0.57	0.36	0.04	69,771
A	2	26	MC	0.65	0.41	0.11	32,900
A	2	27	MC	0.58	0.48	0.07	32,913
A,B	2	28	MC	0.34	0.19	0.14	69,702
A,B	2	29	SA	0.13	0.46	0.09	69,732
A	2	30	MC	0.51	0.33	0.13	32,893
A,B	2	31	MS	0.41	0.48	0.05	69,764
A,B	2	32	MC	0.54	0.30	0.34	69,562
A,B	2	33	MC	0.54	0.46	0.12	69,715
A	2	34	MC	0.84	0.27	0.09	32,905
A,B	2	35	TE	0.22	0.49	0.44	69,491
A,B	2	36	MC	0.73	0.36	0.11	69,720
A,B	2	37	MC	0.50	0.52	0.10	69,730
A,B	2	38	MS	0.36	0.46	0.06	69,758
A	2	40	MC	0.46	0.23	0.22	32,863

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Table 7.12: Item Statistics, Mathematics Grade 5 (cont.)

Mathematics							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	2	41	TE	0.32	0.32	0.18	69,674
A	2	42	SA	0.20	0.27	0.08	32,911
A,B	2	43	MC	0.33	0.42	0.10	69,728
A,B	2	45	TE	0.11	0.41	0.11	69,721
A,B	2	46	MC	0.50	0.39	0.06	69,755
A,B	2	47	MC	0.43	0.21	0.07	69,749
A,B	3	48	MC	0.63	0.48	0.04	69,775
A,B	3	49	SA	0.60	0.58	0.06	69,755
A,B	3	50	MC	0.46	0.53	0.07	69,753
A,B	3	51	MS	0.34	0.41	0.04	69,773
A,B	3	52	MS	0.50	0.56	0.05	69,768
A,B	3	53	TE	0.44	0.63	0.07	69,750
B	1	11	MC	0.51	0.44	0.11	36,831
B	1	12	SA	0.25	0.63	0.15	36,817
B	1	14	MC	0.69	0.38	0.14	36,820
B	1	16	MC	0.56	0.46	0.14	36,818
B	1	17	TE	0.70	0.36	0.83	36,566
B	1	18	MC	0.39	0.34	0.08	36,840
B	1	21	MC	0.68	0.34	0.07	36,844
B	1	24	MC	0.58	0.50	0.10	36,834
B	2	26	SA	0.56	0.49	0.15	36,807
B	2	27	MS	0.49	0.58	0.04	36,846
B	2	30	MC	0.56	0.39	0.10	36,825
B	2	34	SA	0.78	0.38	0.13	36,814
B	2	40	MC	0.40	0.21	0.36	36,729
B	2	42	TE	0.17	0.57	0.09	36,828

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Table 7.13: Item Statistics, Mathematics Grade 6

Mathematics							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	1	1	MC	0.50	0.43	0.04	33,688
A,B	1	2	MS	0.54	0.60	0.05	69,992
A	1	3	MC	0.53	0.42	0.04	33,687
A,B	1	4	MC	0.49	0.32	0.03	70,000
A,B	1	5	MS	0.60	0.54	0.03	70,000
A,B	1	6	TE	0.53	0.53	0.25	69,852
A,B	1	7	MC	0.57	0.28	0.05	69,991
A,B	1	8	MS	0.34	0.60	0.02	70,007
A,B	1	9	MC	0.70	0.45	0.07	69,972
A,B	1	11	SA	0.19	0.49	0.04	69,993
A,B	2	12	MC	0.70	0.38	0.10	69,948
A,B	2	13	MC	0.42	0.31	0.22	69,860
A,B	2	14	MC	0.32	0.49	0.23	69,856
A,B	2	15	MC	0.75	0.31	0.28	69,823
A,B	2	16	SA	0.50	0.62	0.73	69,504
A,B	2	17	MS	0.53	0.45	0.20	69,877
A,B	2	18	MC	0.41	0.45	0.26	69,835
A,B	2	19	TE	0.65	0.61	0.24	69,848
A,B	2	20	MC	0.41	0.51	0.12	69,933
A,B	2	21	SA	0.59	0.53	0.22	69,863
A,B	2	22	MC	0.38	0.36	0.13	69,925
A,B	2	23	TE	0.36	0.64	0.17	69,895
A	2	24	MC	0.46	0.51	0.13	33,650
A,B	2	25	MC	0.70	0.50	0.13	69,924
A,B	2	27	SA	0.22	0.37	0.53	69,649
A,B	2	28	MC	0.35	0.39	0.26	69,833
A	2	29	TE	0.69	0.44	0.33	33,584
A,B	2	30	MS	0.61	0.59	0.26	69,833
A	2	32	MC	0.49	0.40	0.25	33,609
A,B	2	33	SA	0.22	0.59	0.23	69,856
A,B	2	34	MC	0.33	0.53	0.18	69,889
A,B	2	35	SA	0.26	0.57	0.30	69,805
A,B	2	37	MC	0.63	0.39	0.17	69,898
A,B	2	38	TE	0.46	0.38	0.12	69,932
A,B	2	39	MC	0.55	0.38	0.13	69,924
A,B	2	40	MC	0.52	0.37	0.30	69,806

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Table 7.13: Item Statistics, Mathematics Grade 6 (cont.)

Mathematics							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	2	42	SA	0.31	0.61	0.40	69,734
A	2	43	MC	0.52	0.25	0.33	33,583
A,B	2	44	MC	0.84	0.45	0.30	69,806
A,B	2	45	MS	0.55	0.61	0.26	69,833
A,B	2	46	MC	0.87	0.30	0.19	69,883
A,B	2	47	SA	0.20	0.50	0.26	69,836
A,B	2	48	MC	0.56	0.48	0.16	69,903
A,B	2	49	SA	0.17	0.50	0.22	69,861
A,B	2	50	MS	0.10	0.32	0.13	69,928
A,B	2	51	MC	0.43	0.28	0.11	69,937
A,B	3	52	TE	0.06	0.10	0.03	69,990
A,B	3	53	CR	0.21	0.64	2.16	67,946
A,B	3	54	MC	0.66	0.54	0.11	69,934
A,B	3	55	SA	0.38	0.58	0.12	69,923
A,B	3	56	TE	0.20	0.64	0.21	69,858
A,B	3	57	MS	0.22	0.51	0.09	69,944
B	1	1	MC	0.40	0.28	0.03	36,310
B	1	3	SA	0.39	0.53	0.08	36,293
B	2	24	MC	0.58	0.56	0.15	36,267
B	2	29	MC	0.47	0.48	0.42	36,172
B	2	32	MC	0.60	0.31	0.31	36,212
B	2	43	TE	0.36	0.48	0.41	36,175

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Table 7.14: Item Statistics, Mathematics Grade 7

Mathematics							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	1	1	MC	0.47	0.40	0.04	67,159
A,B	1	2	SA	0.44	0.57	0.16	67,078
A,B	1	3	MC	0.75	0.44	0.07	67,142
A,B	1	4	MC	0.39	0.16	0.12	67,106
A,B	1	5	MC	0.47	0.40	0.07	67,141
A,B	1	6	SA	0.37	0.35	0.14	67,094
A,B	1	7	MC	0.47	0.37	0.12	67,105
A,B	1	8	SA	0.38	0.65	0.19	67,063
A,B	1	9	MC	0.40	0.42	0.09	67,130
A,B	1	11	MC	0.51	0.36	0.11	67,111
A,B	1	12	MC	0.43	0.38	0.17	67,074
A	1	13	SA	0.19	0.51	0.14	32,572
A	1	14	MC	0.43	0.32	0.09	32,590
A,B	2	16	MC	0.43	0.41	0.08	67,129
A,B	2	17	TE	0.29	0.34	0.16	67,073
A,B	2	18	MC	0.34	0.44	0.29	66,987
A,B	2	19	MC	0.61	0.51	0.31	66,971
A,B	2	20	MC	0.23	0.45	0.29	66,986
A	2	21	SA	0.37	0.52	0.20	32,552
A,B	2	22	MS	0.60	0.32	0.11	67,108
A	2	23	MC	0.67	0.43	0.16	32,566
A,B	2	24	MC	0.49	0.43	0.21	67,041
A,B	2	25	MC	0.78	0.46	0.19	67,053
A,B	2	26	MC	0.32	0.27	0.16	67,076
A	2	27	TE	0.23	0.56	0.13	32,575
A,B	2	28	MC	0.47	0.46	0.28	66,991
A	2	29	MS	0.34	0.39	0.24	32,540
A	2	30	MC	0.61	0.55	0.32	32,512
A,B	2	31	SA	0.41	0.66	0.61	66,775
A,B	2	32	MC	0.25	0.34	0.31	66,973
A,B	2	33	MC	0.55	0.55	0.13	67,097
A,B	2	34	TE	0.32	0.45	0.33	66,957
A,B	2	36	MC	0.55	0.48	0.18	67,060

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Table 7.14: Item Statistics, Mathematics Grade 7 (cont.)

Mathematics							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	2	37	MC	0.45	0.25	0.29	66,988
A,B	2	38	MC	0.45	0.51	0.18	67,058
A,B	2	39	TE	0.60	0.23	0.16	67,074
A,B	2	41	MC	0.31	0.45	0.34	66,955
A,B	2	42	MC	0.52	0.26	0.30	66,980
A,B	2	43	SA	0.57	0.56	0.61	66,773
A,B	2	44	MS	0.28	0.50	0.31	66,976
A,B	2	46	MC	0.71	0.45	0.16	67,076
A,B	2	47	TE	0.66	0.36	0.28	66,994
A,B	2	48	MC	0.60	0.26	0.19	67,054
A,B	2	49	SA	0.26	0.62	0.30	66,979
A,B	2	50	MC	0.49	0.52	0.21	67,039
A	2	51	MC	0.33	0.47	0.14	32,570
A,B	3	52	SA	0.50	0.59	0.10	67,096
A,B	3	53	CR	0.09	0.49	4.00	63,746
A,B	3	54	MC	0.42	0.06	0.08	67,105
A,B	3	55	MC	0.21	0.15	0.11	67,091
A,B	3	56	CR	0.25	0.38	4.05	63,746
A,B	3	57	TE	0.76	0.41	0.12	67,081
B	1	13	SA	0.19	0.48	0.17	34,510
B	1	14	MC	0.33	0.42	0.11	34,533
B	2	21	SA	0.64	0.57	0.35	34,443
B	2	23	MC	0.50	0.40	0.19	34,500
B	2	27	TE	0.16	0.52	0.38	34,435
B	2	29	MS	0.30	0.33	0.20	34,496
B	2	30	MC	0.61	0.46	0.38	34,435
B	2	51	MC	0.47	0.36	0.19	34,501

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Table 7.15: Item Statistics, Mathematics Grade 8

Mathematics							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	1	1	MS	0.30	0.58	0.03	26,746
A,B	1	2	TE	0.31	0.53	0.06	55,298
A,B	1	3	MC	0.44	0.41	0.06	55,300
A,B	1	4	MC	0.33	0.52	0.07	55,294
A	1	5	MC	0.30	0.34	0.09	26,729
A,B	1	6	MC	0.50	0.29	0.10	55,277
A,B	1	7	MC	0.41	0.41	0.06	55,301
A,B	1	8	SA	0.34	0.60	0.32	55,157
A,B	1	9	MC	0.43	0.34	0.10	55,278
A,B	1	11	MC	0.46	0.35	0.06	55,300
A,B	2	12	MC	0.72	0.39	0.14	55,243
A,B	2	13	MC	0.51	0.20	0.25	55,183
A,B	2	14	SA	0.44	0.57	0.66	54,955
A,B	2	15	TE	0.54	0.46	1.43	54,530
A,B	2	16	MC	0.44	0.38	0.34	55,130
A,B	2	17	MC	0.53	0.36	0.34	55,131
A	2	18	MC	0.40	0.46	0.33	26,660
A	2	19	MC	0.72	0.41	0.16	26,705
A	2	20	MC	0.52	0.44	0.13	26,712
A,B	2	21	MC	0.35	0.30	0.16	55,228
A,B	2	22	MS	0.30	0.35	0.24	55,188
A,B	2	23	MC	0.28	0.37	0.26	55,174
A,B	2	24	SA	0.10	0.46	0.58	54,999
A,B	2	25	MC	0.42	0.35	0.18	55,220
A	2	27	MC	0.37	0.20	0.25	26,679
A	2	28	MC	0.47	0.38	0.30	26,668
A,B	2	29	MC	0.32	0.17	0.38	55,108
A,B	2	30	SA	0.60	0.34	0.56	55,011
A,B	2	32	MC	0.26	0.24	0.33	55,139
A,B	2	33	MC	0.63	0.27	0.21	55,202
A,B	2	34	MS	0.29	0.42	0.22	55,197
A,B	2	35	MC	0.37	0.25	0.24	55,184
A	2	37	MS	0.21	0.40	0.18	26,698

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Table 7.15: Item Statistics, Mathematics Grade 8 (cont.)

Mathematics							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	2	38	MC	0.61	0.47	0.16	55,232
A,B	2	39	SA	0.22	0.56	0.53	55,024
A	2	40	MC	0.80	0.37	0.36	26,651
A,B	2	42	MC	0.45	0.20	0.32	55,141
A,B	2	43	MC	0.41	0.35	0.29	55,161
A,B	2	44	SA	0.50	0.52	0.65	54,962
A,B	2	45	MC	0.75	0.42	0.30	55,151
A,B	2	46	MC	0.39	0.31	0.30	55,151
A,B	2	47	TE	0.30	0.45	0.36	55,119
A	2	48	MC	0.37	0.17	0.19	26,695
A,B	2	49	TE	0.21	0.55	0.97	54,784
A,B	2	50	MC	0.63	0.38	0.20	55,206
A,B	2	51	MC	0.20	0.32	0.19	55,214
A,B	3	52	SA	0.36	0.54	0.17	55,213
A,B	3	53	MC	0.40	0.32	0.12	55,237
A,B	3	54	CR	0.14	0.47	4.14	52,228
A,B	3	55	TE	0.12	0.55	0.55	55,000
A,B	3	56	MS	0.23	0.44	0.09	55,257
A,B	3	57	CR	0.40	0.54	0.06	55,260
B	1	1	MC	0.31	0.49	0.03	28,569
B	1	5	MS	0.44	0.50	0.06	28,561
B	2	18	MC	0.50	0.33	0.41	28,455
B	2	19	MC	0.44	0.37	0.20	28,514
B	2	20	MC	0.38	0.33	0.17	28,522
B	2	27	TE	0.29	0.24	0.37	28,465
B	2	28	MC	0.38	0.32	0.32	28,481
B	2	37	MC	0.48	0.46	0.23	28,506
B	2	40	MC	0.73	0.36	0.30	28,485
B	2	48	MC	0.39	0.27	0.22	28,508

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Table 7.16: Item Statistics, Science Grade 5

Science							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	1	1	MC	0.78	0.43	0.10	35,423
A	1	2	TE	0.63	0.50	0.10	35,423
A,B	1	3	TE	0.23	0.25	0.34	69,417
A,B	1	4	CR	0.23	0.45	0.64	68,748
A,B	1	5	MC	0.81	0.14	0.12	69,567
A,B	1	6	MC	0.42	0.43	0.08	69,598
A,B	1	7	TE	0.78	0.40	0.03	69,632
A	1	9	CR	0.38	0.52	0.85	34,845
A	1	11	TE	0.59	0.35	0.08	35,430
A	1	18	CR	0.36	0.42	0.49	34,978
A,B	1	19	MC	0.74	0.41	0.12	69,572
A,B	1	21	TE	0.72	0.41	0.08	69,595
A	1	22	MS	0.53	0.37	0.21	35,386
A	1	23	MC	0.58	0.38	0.22	35,383
A	1	24	TE	0.67	0.36	0.25	35,370
A	1	25	TE	0.53	0.31	0.20	35,390
A	1	26	TE	0.69	0.43	0.13	35,413
A	1	27	TE	0.28	0.27	0.07	35,434
A,B	1	30	MS	0.63	0.50	0.09	69,591
A,B	1	31	TE	0.42	0.31	0.13	69,564
A	1	32	TE	0.51	0.38	0.05	35,441
A	2	33	MC	0.72	0.34	0.11	35,415
A,B	2	34	MC	0.50	0.21	0.18	69,507
A,B	2	36	TE	0.43	0.29	0.28	69,440
A,B	2	37	TE	0.67	0.41	0.12	69,553
A,B	2	38	MC	0.55	0.44	0.11	69,557
A,B	2	39	MC	0.46	0.36	0.08	69,578
A,B	2	40	TE	0.60	0.19	0.05	69,599
A	2	41	CR	0.47	0.52	1.50	34,340
A,B	2	42	TE	0.51	0.33	0.08	69,578
A	2	43	CR	0.29	0.29	0.51	34,664
A	2	44	TE	0.67	0.30	0.17	35,393
A	2	53	CR	0.40	0.49	0.96	34,534
A,B	2	54	TE	0.46	0.52	0.09	69,573
A	2	55	MC	0.53	0.38	0.16	35,396
A	2	56	CR	0.53	0.39	1.42	34,199
A	2	57	TE	0.60	0.44	0.26	35,362
A	2	58	TE	0.75	0.46	0.13	35,408
A	2	59	CR	0.30	0.46	1.94	33,585

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Table 7.16: Item Statistics, Science Grade 5 (cont.)

Science							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	2	60	CR	0.65	0.60	1.13	34,534
A,B	2	62	TE	0.62	0.54	0.08	69,577
A	2	63	MC	0.51	0.30	0.10	35,418
B	1	1	MC	0.85	0.35	0.11	34,157
B	1	2	TE	0.87	0.22	0.08	34,165
B	1	9	CR	0.67	0.55	0.66	33,583
B	1	11	TE	0.50	0.47	0.25	34,106
B	1	18	CR	0.48	0.50	1.56	32,697
B	1	22	MC	0.62	0.42	0.18	34,130
B	1	23	TE	0.29	0.38	0.21	34,122
B	1	24	MC	0.47	0.30	0.32	34,085
B	1	25	CR	0.17	0.50	1.35	32,896
B	1	26	TE	0.59	0.40	0.27	34,100
B	1	27	TE	0.61	0.40	0.16	34,138
B	1	32	TE	0.69	0.45	0.13	34,149
B	2	33	CR	0.19	0.31	1.08	33,160
B	2	41	CR	0.49	0.58	1.00	33,357
B	2	43	TE	0.50	0.40	0.10	34,148
B	2	44	MC	0.55	0.44	0.21	34,111
B	2	53	CR	0.30	0.42	1.10	33,352
B	2	55	TE	0.62	0.42	0.36	34,058
B	2	56	MC	0.75	0.51	0.31	34,077
B	2	57	MC	0.42	0.37	0.31	34,075
B	2	58	CR	0.32	0.50	2.03	32,537
B	2	59	MC	0.59	0.50	0.15	34,132
B	2	60	CR	0.51	0.53	0.82	33,386
B	2	63	CR	0.21	0.49	2.00	32,784

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Table 7.17: Item Statistics, Science Grade 8

Science							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A	1	1	MC	0.89	0.36	0.09	34,942
A	1	2	CR	0.37	0.46	0.62	34,654
A	1	3	TE	0.68	0.27	0.47	34,810
A	1	4	TE	0.59	0.34	0.45	34,815
A	1	5	TE	0.61	0.34	0.11	34,934
A	1	6	MC	0.68	0.24	0.09	34,943
A	1	7	MC	0.58	0.27	0.14	34,925
A	1	8	CR	0.31	0.49	4.72	32,885
A	1	9	MC	0.78	0.50	0.11	34,933
A	1	10	MC	0.76	0.36	0.10	34,939
A	1	11	CR	0.40	0.54	2.39	33,455
A,B	1	12	CR	0.30	0.55	2.67	63,988
A,B	1	13	MC	0.63	0.47	0.32	66,493
A,B	1	14	MC	0.49	0.49	0.43	66,416
A,B	1	15	MC	0.57	0.39	0.33	66,481
A,B	1	16	MC	0.34	0.23	0.27	66,526
A,B	1	17	CR	0.44	0.57	2.34	64,074
A,B	1	18	MC	0.65	0.57	0.19	66,577
A	1	19	TE	0.67	0.49	0.23	34,894
A,B	1	31	TE	0.40	0.44	0.19	66,578
A	1	32	CR	0.54	0.61	2.42	33,390
A	2	33	MC	0.37	0.32	0.12	34,922
A	2	34	MC	0.75	0.43	0.13	34,919
A	2	36	MS	0.71	0.46	0.21	34,888
A,B	2	37	MS	0.54	0.33	0.26	66,505
A,B	2	38	MC	0.38	0.25	0.19	66,556
A,B	2	39	MS	0.53	0.40	0.20	66,545
A,B	2	40	MC	0.42	0.41	0.18	66,560
A	2	41	CR	0.63	0.57	1.34	34,130
A	2	43	MC	0.74	0.43	0.16	34,908
A,B	2	44	CR	0.65	0.59	1.65	64,775
A	2	45	MC	0.49	0.58	0.39	34,828
A	2	46	MC	0.60	0.44	0.29	34,862
A	2	47	TE	0.64	0.55	0.38	34,830
A	2	48	CR	0.45	0.56	2.83	33,453
A	2	49	MC	0.56	0.33	0.22	34,887
A	2	50	CR	0.34	0.54	4.26	32,714
A,B	2	51	MS	0.64	0.45	0.17	66,569
A	2	52	MS	0.63	0.52	0.18	34,900

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Table 7.17: Item Statistics, Science Grade 8 (cont.)

Science							
Form	**Session**	**Item #**	**Item Type**	***p*-Value**	**R_{it}**	**Omit Rate**	**Adj. *N***
A,B	2	61	MC	0.68	0.43	0.19	66,555
A,B	2	62	CR	0.28	0.50	3.95	62,219
A	2	63	CR	0.24	0.52	3.43	32,822
B	1	1	MC	0.80	0.44	0.10	31,698
B	1	2	CR	0.68	0.57	0.99	31,248
B	1	3	TE	0.42	0.32	0.47	31,583
B	1	4	MC	0.70	0.46	0.38	31,610
B	1	5	TE	0.59	0.53	0.23	31,657
B	1	6	MC	0.48	0.37	0.21	31,665
B	1	7	CR	0.33	0.56	1.50	30,974
B	1	8	TE	0.53	0.38	0.12	31,694
B	1	9	MC	0.48	0.41	0.07	31,708
B	1	10	CR	0.36	0.53	2.72	30,512
B	1	11	TE	0.76	0.45	0.15	31,684
B	1	19	MC	0.66	0.49	0.25	31,653
B	1	32	TE	0.70	0.47	0.21	31,664
B	2	33	MC	0.83	0.41	0.12	31,680
B	2	34	CR	0.49	0.50	1.90	30,638
B	2	36	TE	0.64	0.48	0.16	31,667
B	2	41	CR	0.52	0.56	2.04	30,689
B	2	43	CR	0.35	0.53	2.19	30,477
B	2	45	MC	0.41	0.39	0.34	31,611
B	2	46	MC	0.44	0.21	0.28	31,628
B	2	47	MC	0.68	0.50	0.19	31,658
B	2	48	TE	0.20	0.26	0.19	31,657
B	2	49	TE	0.69	0.56	0.20	31,654
B	2	50	CR	0.59	0.49	2.34	30,464
B	2	52	CR	0.30	0.52	5.71	29,061
B	2	63	MC	0.42	0.26	0.22	31,647

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Table 7.18: Items Flagged for Poor Fit

Content Area and Grade	Item Position in Calib.	Item Type	Model	ChiSqr	Chi DF	Total N	Z Score	Z Obsd	Z Pred	Obsd-Pred
ELA 3	13	MS	2PPC	1,259.77	17	30,950	213.13	0.6597	0.6597	0.0001
	20	EBSR	2PPC	916.59	8	66,127	227.15	0.2779	0.2838	-0.0058
	57	EBSR	2PPC	904.11	17	35,177	152.14	0.6299	0.6285	0.0014
	66	MS	2PPC	1,041.03	17	35,177	175.62	0.4907	0.491	-0.0002
	73	TE	2PPC	731.45	8	35,177	180.86	0.3061	0.3088	-0.0027
	74	TE	2PPC	397.21	8	35,177	97.30	0.8109	0.8062	0.0046
ELA 4	5	MC	3PL	790.37	7	31,849	209.37	0.8293	0.8291	0.0001
	6	MS	2PPC	827.72	17	31,849	139.04	0.5273	0.5288	-0.0016
	9	EBSR	2PPC	1,243.36	17	31,849	210.32	0.4202	0.4231	-0.003
	26	MS	2PPC	887.81	17	31,849	149.34	0.7145	0.7139	0.0006
	56	MS	2PPC	960.40	17	35,979	161.79	0.6021	0.6005	0.0017
	61	EBSR	2PPC	1,212.51	17	35,979	205.03	0.4382	0.4396	-0.0014
	66	MS	2PPC	824.36	17	35,979	138.46	0.5968	0.5953	0.0016
ELA 5	4	TE	2PPC	882.80	17	32,962	148.48	0.5459	0.5477	-0.0018
	16	EBSR	2PPC	945.22	17	32,962	159.19	0.5207	0.5232	-0.0025
	21	TE	2PPC	1,857.08	17	32,962	315.57	0.7213	0.7212	0.0002
	46	EBSR	2PPC	1,403.54	17	36,528	237.79	0.6313	0.6308	0.0005
	54	MS	2PPC	653.07	17	36,528	109.08	0.6736	0.6729	0.0007
ELA 6	13	EBSR	2PPC	2,121.48	17	35,857	360.92	0.42	0.4218	-0.0018
	18	TE	2PPC	1,603.56	17	35,857	272.09	0.369	0.3723	-0.0033
	52	EBSR	2PPC	2,341.46	17	34,064	398.64	0.4533	0.4571	-0.0038
	54	MS	2PPC	617.11	17	34,064	102.92	0.4298	0.4312	-0.0015
	55	MS	2PPC	889.27	17	34,064	149.59	0.5976	0.5987	-0.0011
ELA 7	17	EBSR	2PPC	849.48	17	35,103	142.77	0.7759	0.7667	0.0093
	19	TE	2PPC	845.00	17	35,103	142.00	0.4955	0.4961	-0.0006
	36	MS	2PPC	1,369.44	17	35,103	231.94	0.6029	0.6026	0.0003
	54	EBSR	2PPC	2,271.38	17	32,792	386.62	0.5845	0.5852	-0.0008
ELA 8	7	EBSR	2PPC	1,380.57	17	34,437	233.85	0.7538	0.7478	0.0059
	11	EBSR	2PPC	576.06	17	34,437	95.88	0.5767	0.576	0.0007
	12	TE	2PPC	1,004.98	17	34,437	169.44	0.7878	0.7847	0.0031
	14	MS	2PPC	1,365.12	17	34,437	231.20	0.7794	0.776	0.0034
	22	TE	2PPC	1,161.00	8	66,666	288.25	0.5286	0.5306	-0.0019
	40	WP-A	2PPC	335.65	35	9,202	35.93	0.4933	0.4881	0.0052
	41	WP-B	2PPC	335.99	35	9,202	35.98	0.4995	0.4942	0.0053

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Table 7.18: Items Flagged for Poor Fit (cont.)

Content Area and Grade	Item Position in Calib.	Item Type	Model	ChiSqr	Chi DF	Total *N*	Z Score	Z Obsd	Z Pred	Obsd-Pred
ELA 8	52	WP-A	2PPC	218.45	35	7,574	21.93	0.6678	0.6687	-0.0009
	53	WP-B	2PPC	237.67	35	7,574	24.22	0.6849	0.6854	-0.0005
	67	EBSR	2PPC	615.05	17	32,229	102.56	0.7164	0.7132	0.0032
	71	TE	2PPC	398.98	8	32,229	97.75	0.3416	0.3452	-0.0036
	77	WP-A	2PPC	224.57	35	6,907	22.66	0.5059	0.5046	0.0014
	78	WP-B	2PPC	208.10	35	6,907	20.69	0.5007	0.4997	0.001
	79	WP-C	2PPC	137.34	17	6,907	20.64	0.9249	0.9158	0.009
Math 3	26	TE	2PPC	363.05	8	32,118	88.76	0.5448	0.5437	0.0011
	32	TE	2PPC	1,024.31	8	66,267	254.08	0.4614	0.4624	-0.001
Math 5	32	TE	2PPC	1,005.06	8	69,723	249.27	0.2178	0.2214	-0.0037
Math 6	25	SA	2PPC	1,604.98	8	69,980	399.25	0.2201	0.2212	-0.0011
Math 8	28	SA	2PPC	1,038.41	8	55,253	257.6	0.5991	0.5923	0.0068
	33	MS	2PPC	397.96	8	26,713	97.49	0.2083	0.2103	-0.002
	45	MC	3PL	573.92	7	55,253	151.51	0.6245	0.6242	0.0003
	52	CR	2PPC	3,567.13	17	55,253	608.84	0.3964	0.3946	0.0018
Science 5	3	TE	2PPC	997.14	8	69,779	247.29	0.2263	0.2284	-0.0021
	4	CR	2PPC	1,246.93	17	69,779	210.93	0.2302	0.2338	-0.0036
	17	TE	2PPC	1,059.71	17	35,525	178.82	0.6922	0.6892	0.003
	44	TE	2PPC	2,814.15	17	34,254	479.71	0.8651	0.8613	0.0039
	47	CR	2PPC	1,048.54	26	34,254	141.8	0.4551	0.4542	0.0008
Science 8	27	MS	2PPC	1,196.10	17	66,765	202.21	0.5328	0.5316	0.0013
	34	TE	2PPC	642.09	17	35,007	107.2	0.6354	0.6329	0.0024
	45	TE	2PPC	1,634.91	17	31,758	277.47	0.4225	0.4223	0.0002
	48	MC	3PL	330.46	7	31,758	86.45	0.4751	0.4858	-0.0107

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Table 7.19: Test Equating Results

Content Area	Grade	Number of Anchors	Stocking and Lord TCC Method Results						Equating Constants	
			TCC Results		Parameter Comparison Statistics					
					a-Parameter		*b*-Parameter			
			# of Iterations	F Value	Corr	# of RMSD Outliers	Corr	# of RMSD Outliers	A	B
ELA	3	21	7	0.1111	0.98	1	1.00	1	1.2017	-1.4376
	4	19	8	0.1350	0.98	1	1.00	1	1.1695	-0.6951
	5	19	11	0.1108	0.99	1	1.00	0	1.1380	-0.2748
	6	21	9	0.0471	1.00	0	0.99	1	1.0035	0.0049
	7	21	4	0.0373	0.99	1	0.99	1	1.1649	0.5486
	8	18	5	0.0761	1.00	1	1.00	1	1.1804	1.0076
Math	3	17	8	0.2383	0.97	0	1.00	0	1.3559	-1.7217
	4	16	9	0.1257	0.99	0	1.00	1	1.2641	-0.8468
	5	16	17	0.0195	0.99	0	1.00	1	1.1149	-0.2031
	6	25	11	0.0423	0.99	0	0.99	1	1.0467	0.0981
	7	20	22	0.0399	0.97	1	0.99	1	1.3298	0.4761
	8	18	45	0.0919	0.96	1	0.96	1	1.4832	1.2529

Note: No anchor items were removed from equating.

Table 7.20: Scaling Constants for English Language Arts and Mathematics

Content	Grades	Transformation Constants	
		***M*1**	***M*2**
ELA	3–8	31.8992	409.4045
Mathematics	3–8	29.9667	406.6254

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Table 7.21: Transformation Constants for Science

Grade	Target Scale Properties in Scale Score Metric		Estimated Population Ability in Theta Metric		Transformation Constants	
	Mean	SD	Mean	SD	*M*1	M2
5	300	40	-0.01	1.086	36.8324	300.3683
8	500	40	-0.05	1.092	36.6300	501.8315

Table 7.22: Scale Score Means and Standard Deviations, English Language Arts

Grade	Scale Statistics		Mean Difference between Grades (Scale Score Points)
	Mean	SD	
3	360.89	42.80	
4	385.57	40.99	24.68
5	399.27	40.31	13.70
6	408.25	36.06	8.98
7	425.90	40.62	17.65
8	438.39	41.44	12.49

Table 7.23: Scale Scores at Selected Percentiles across Grades, English Language Arts

Grade	Percentile				
	10th	25th	50th	75th	90th
3	306	333	362	390	413
4	333	358	387	414	436
5	347	371	400	427	450
6	361	384	409	433	453
7	371	397	428	455	476
8	384	410	440	467	490

Table 7.24: Scale Score Means and Standard Deviations, Mathematics

Grade	Scale Statistics		Mean Difference between Grades (Scale Score Points)
	Mean	SD	
3	353.72	46.91	
4	378.53	46.36	24.81
5	398.70	39.91	20.17
6	407.61	37.51	8.91
7	417.37	47.32	9.76
8	440.00	50.23	22.63

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Table 7.25: Scale Scores at Selected Percentiles across Grades, Mathematics

Grade	Percentile				
	10th	25th	50th	75th	90th
3	295	326	358	386	408
4	323	354	384	409	430
5	352	376	401	425	446
6	364	386	410	433	451
7	359	391	422	450	473
8	376	408	441	474	502

Table 7.26: Scale Score Means and Standard Deviations, Science

Grade	Scale Statistics	
	Mean	SD
5	299.94	40.07
8	499.86	40.19

Table 7.27: Scale Scores at Selected Percentiles across Grades, Science

Grade	Percentile				
	10th	25th	50th	75th	90th
5	246	273	302	328	350
8	446	475	503	528	548

Table 7.28: Lowest and Highest Obtainable Scores

Grade	ELA		Mathematics		Science	
	LOSS	HOSS	LOSS	HOSS	LOSS	HOSS
3	160	560	185	520		
4	170	570	210	540		
5	210	600	250	570	100	540
6	230	620	260	580		
7	240	630	270	600		
8	250	650	310	660	285	710

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Figure 7.1: Anchor Set Test Characteristic Curves, English Language Arts

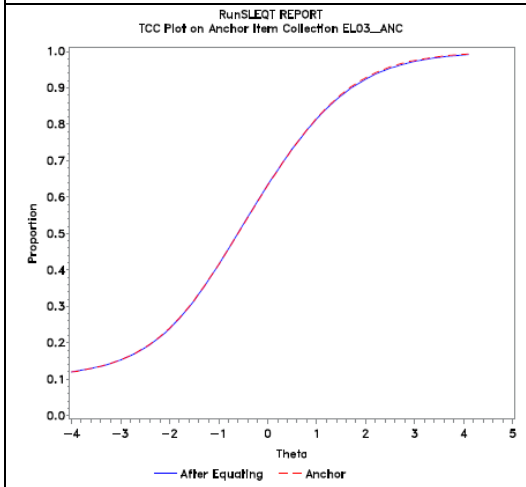
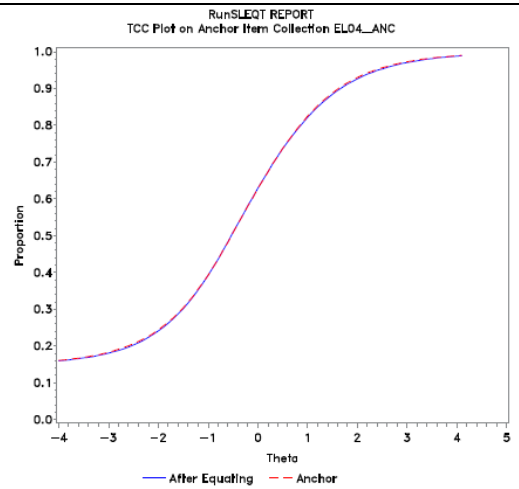
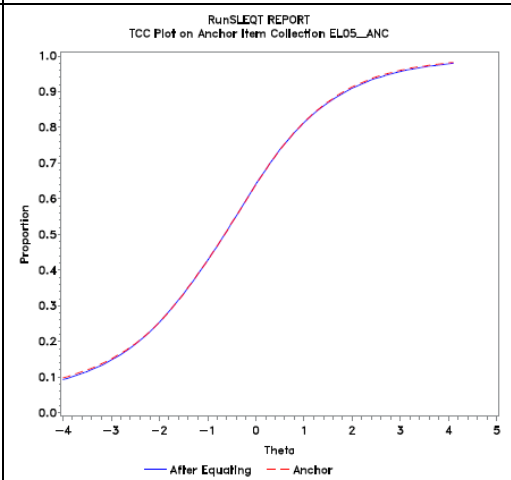
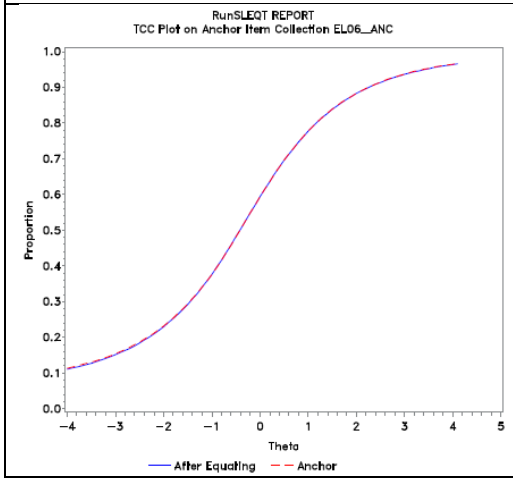
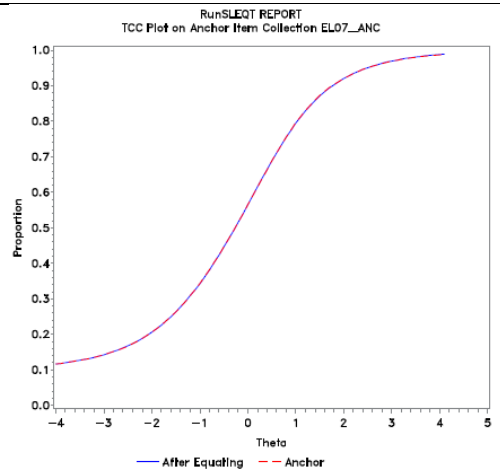
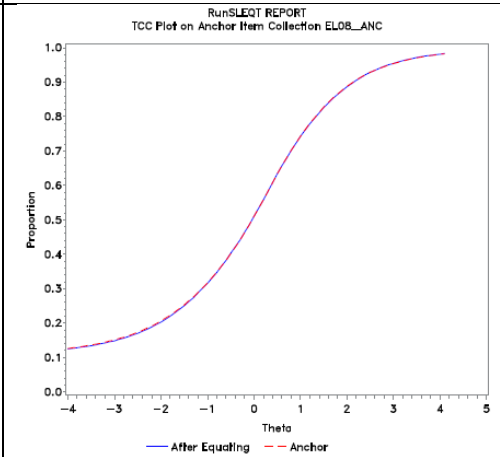
Grade 3	Grade 4	Grade 5
		
Grade 6	**Grade 7**	**Grade 8**
		

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Figure 7.2: Anchor Set Test Characteristic Curves, Mathematics

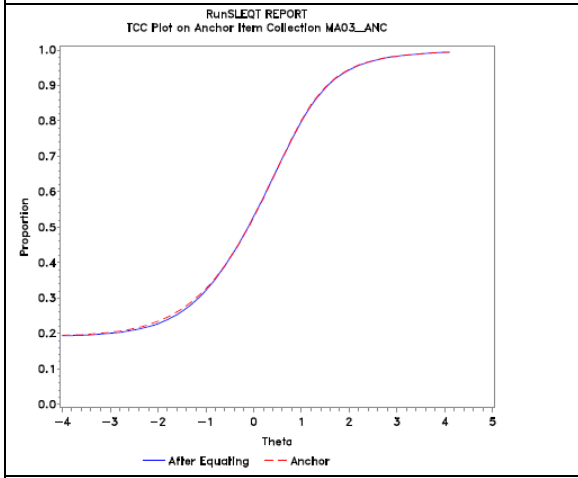
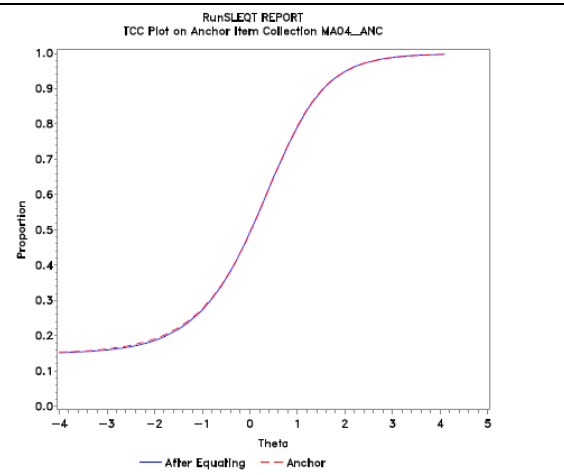
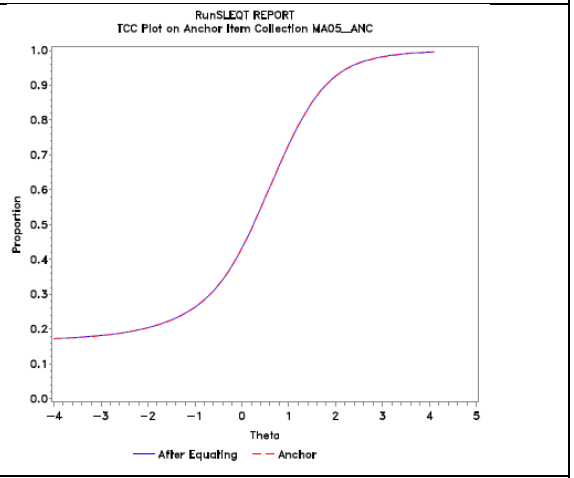
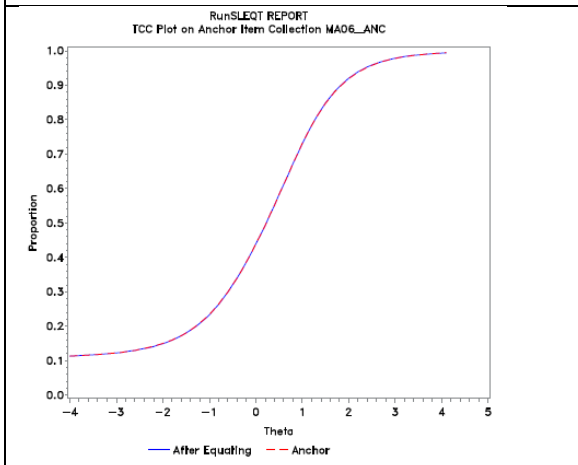
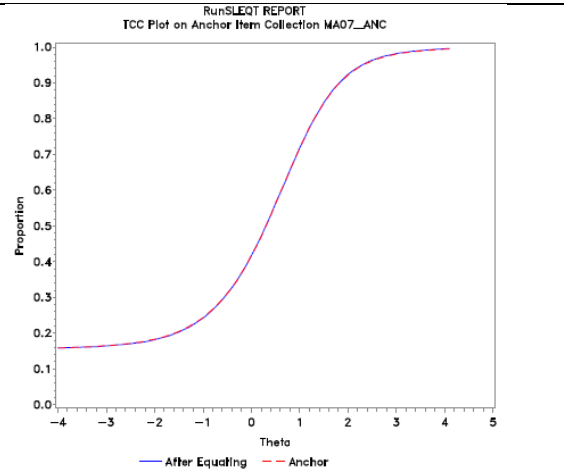
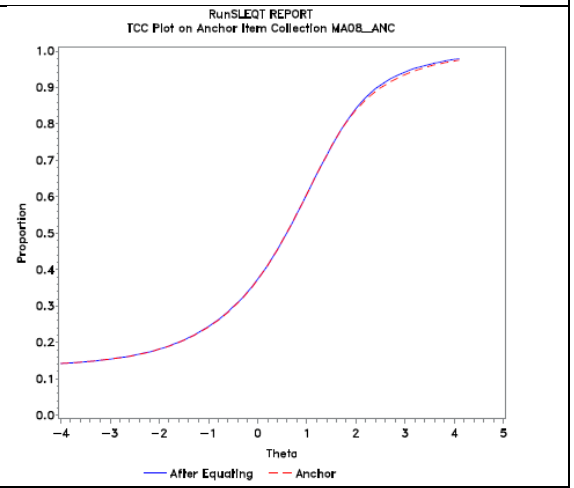
Grade 3	Grade 4	Grade 5
		
Grade 6	**Grade 7**	**Grade 8**
		

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Figure 7.3: Test Characteristic Curves, English Language Arts

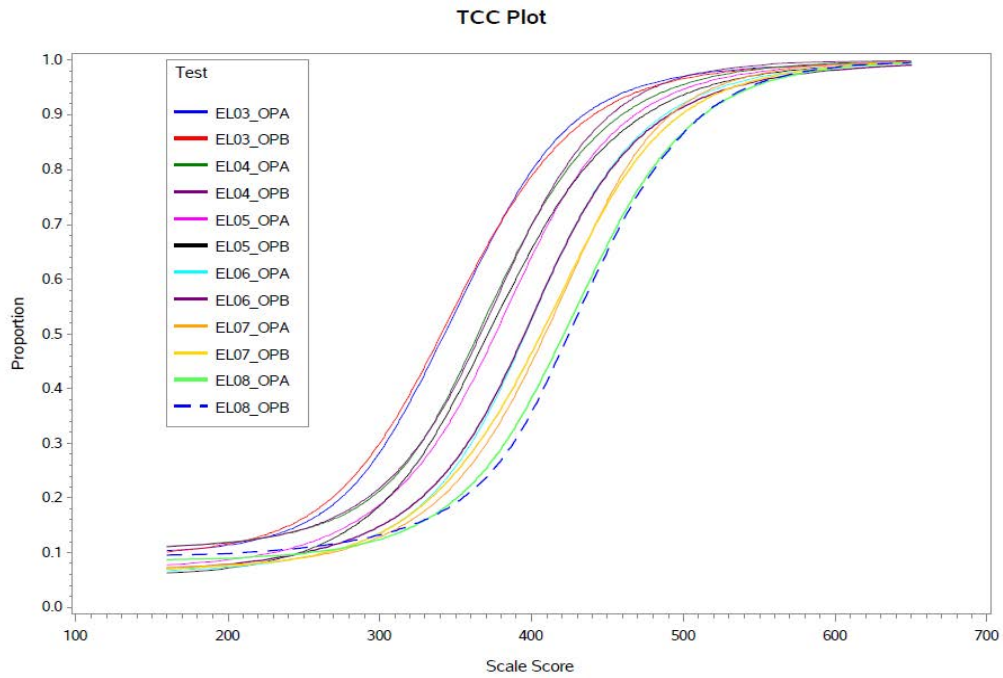

Figure 7.4: Standard Error Curves, English Language Arts

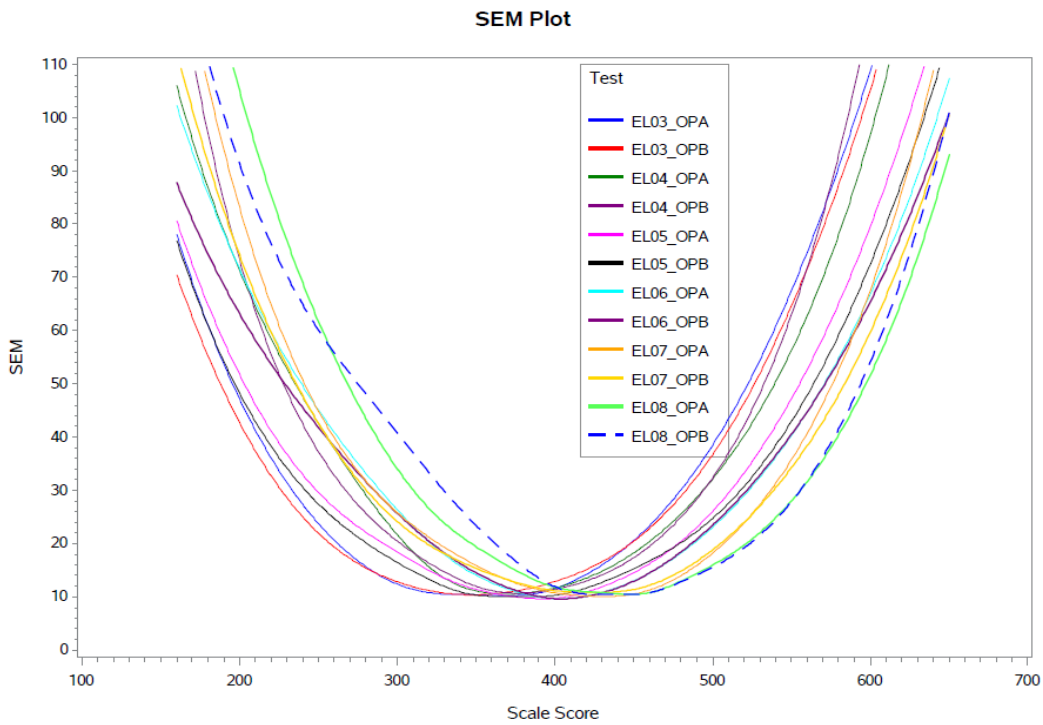

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Figure 7.5: Test Characteristic Curves, English Language Arts Grade 4 Forms

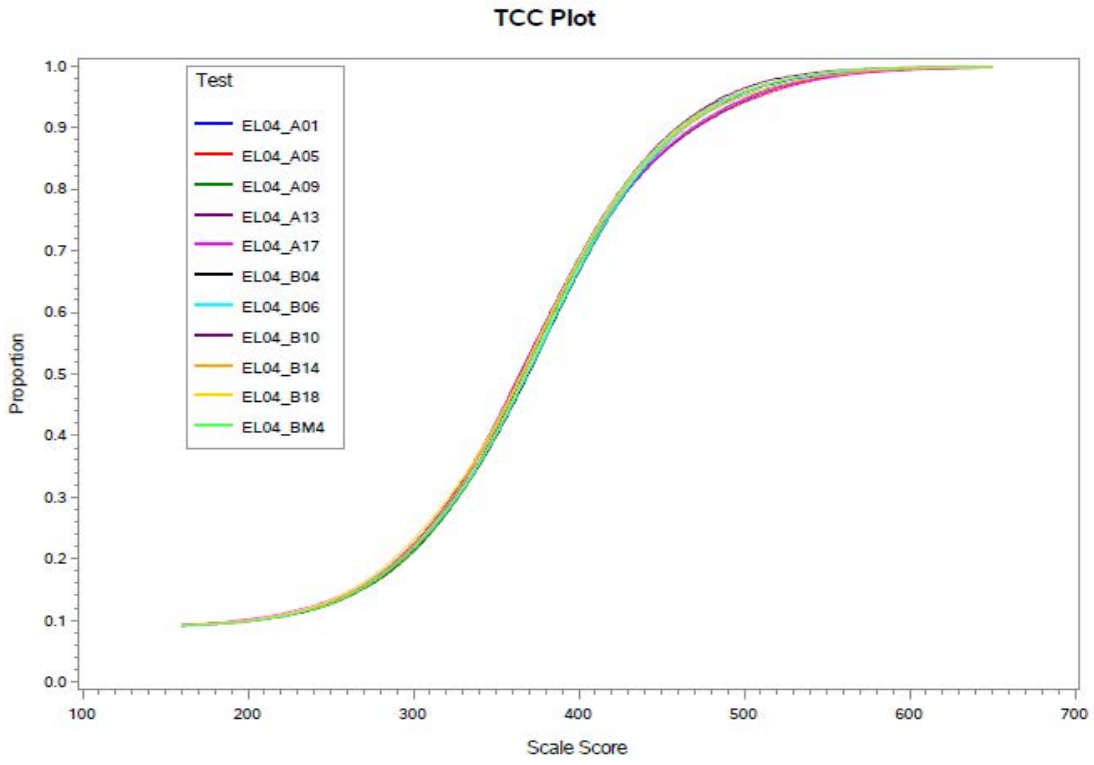

Figure 7.6: Standard Error Curves, English Language Arts Grade 4 Forms

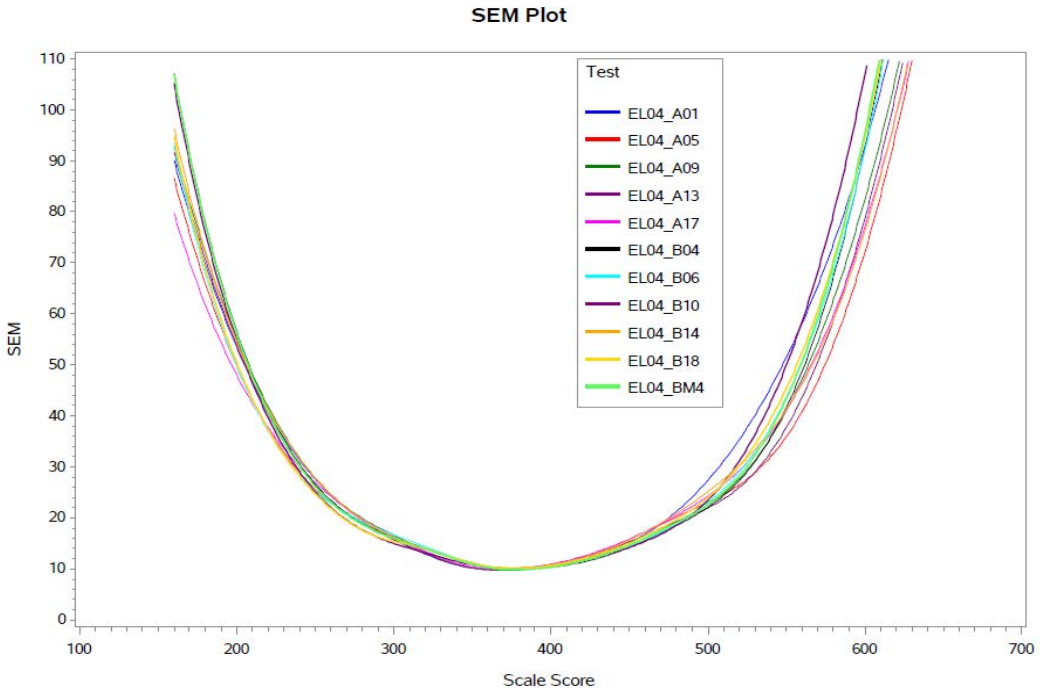

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Figure 7.7: Test Characteristic Curves, English Language Arts Grade 8 Forms

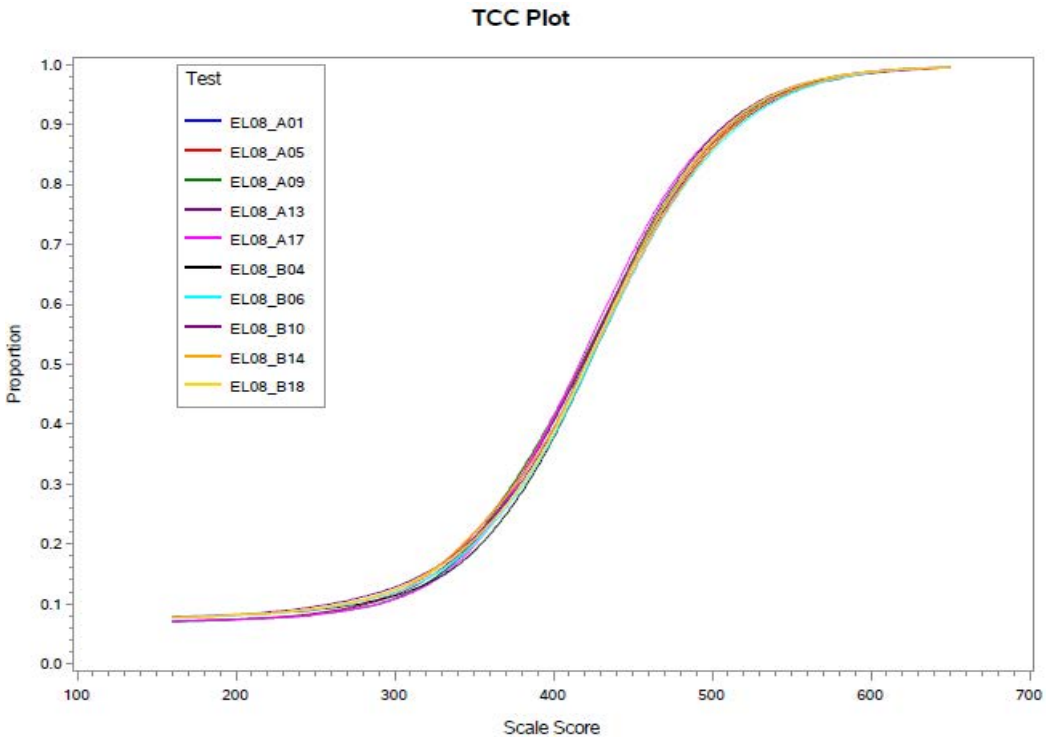

Figure 7.8: Standard Error Curves, English Language Arts Grade 8 Forms

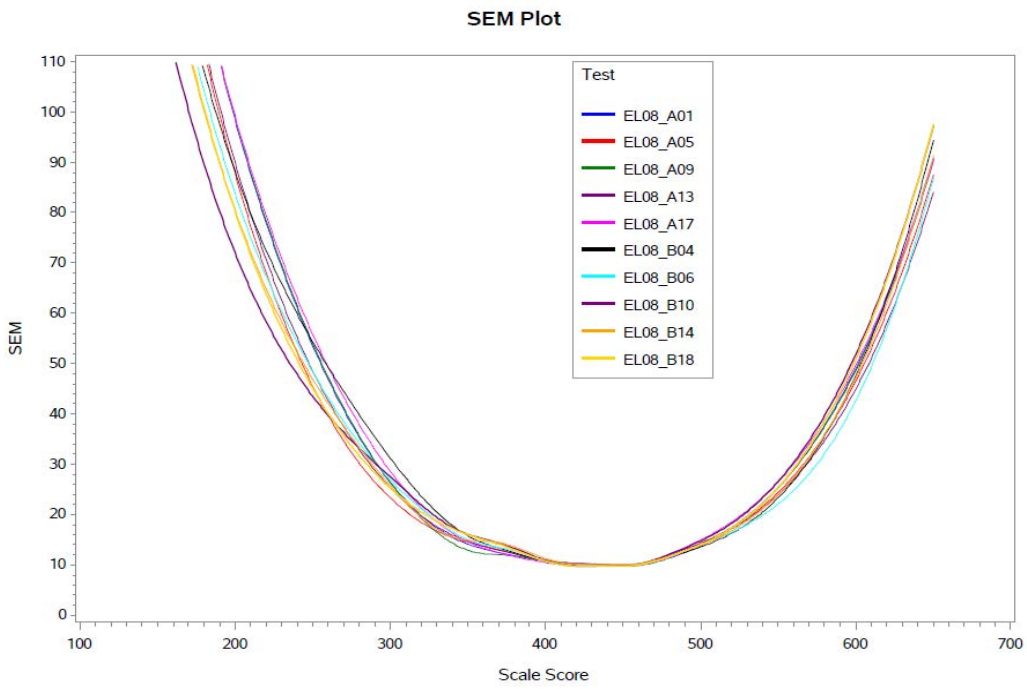

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Figure 7.9: Test Characteristic Curves, Mathematics

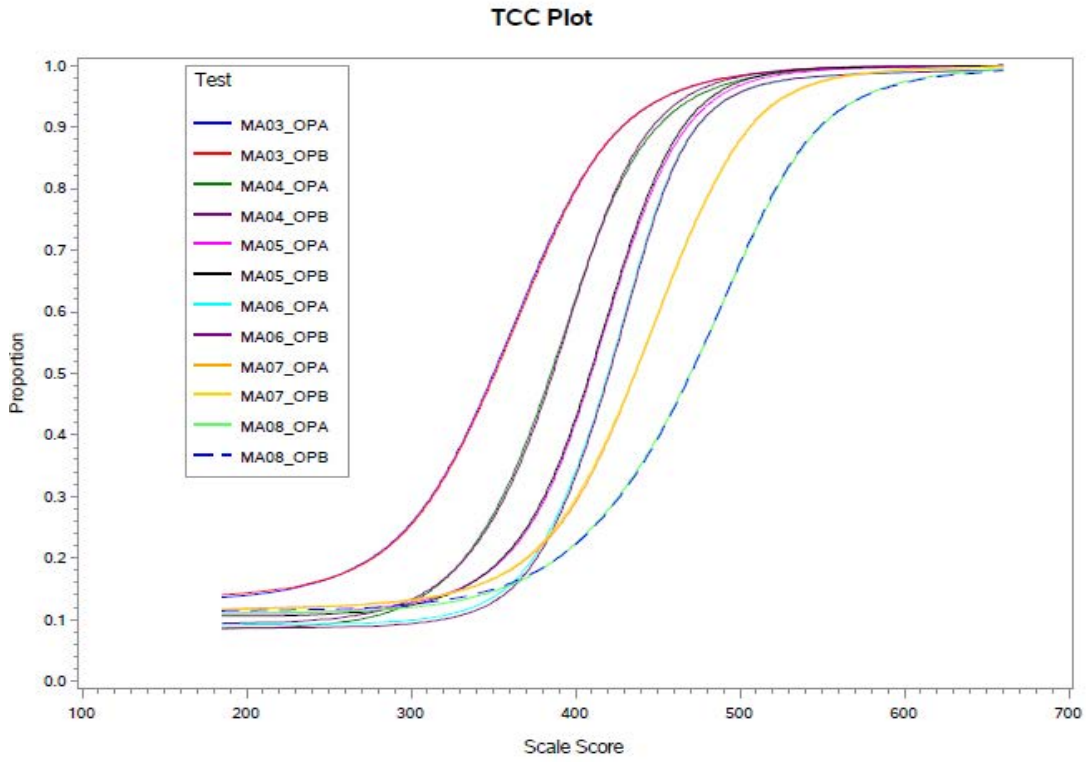

Figure 7.10: Standard Error Curves, Mathematics

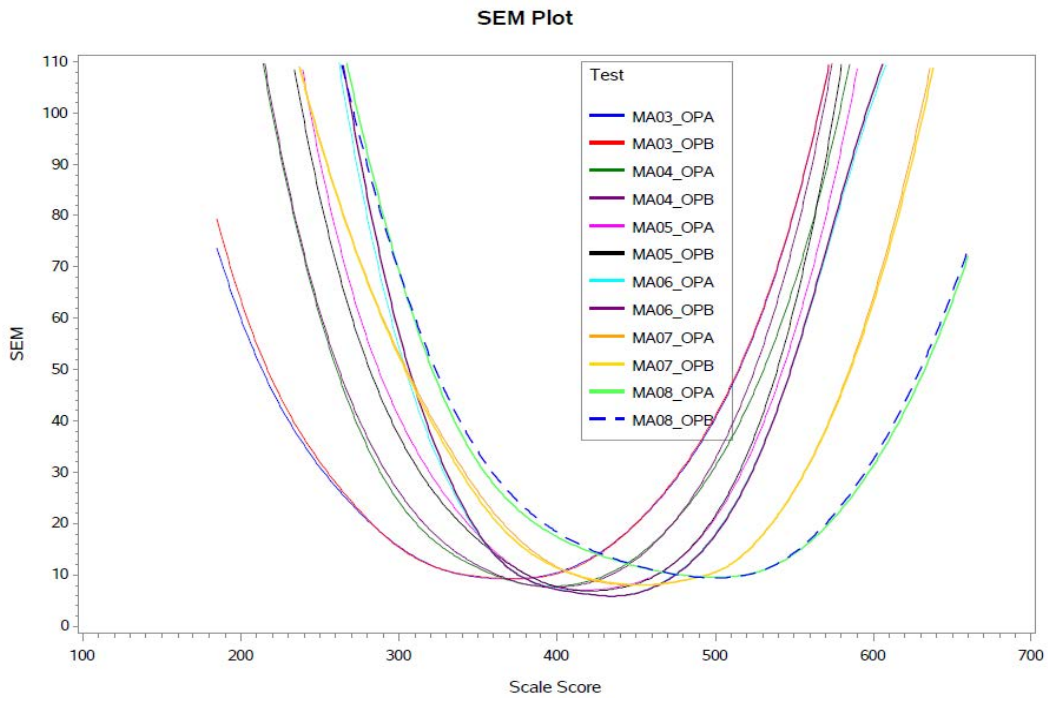

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Figure 7.11: Test Characteristic Curves, Science Grade 5

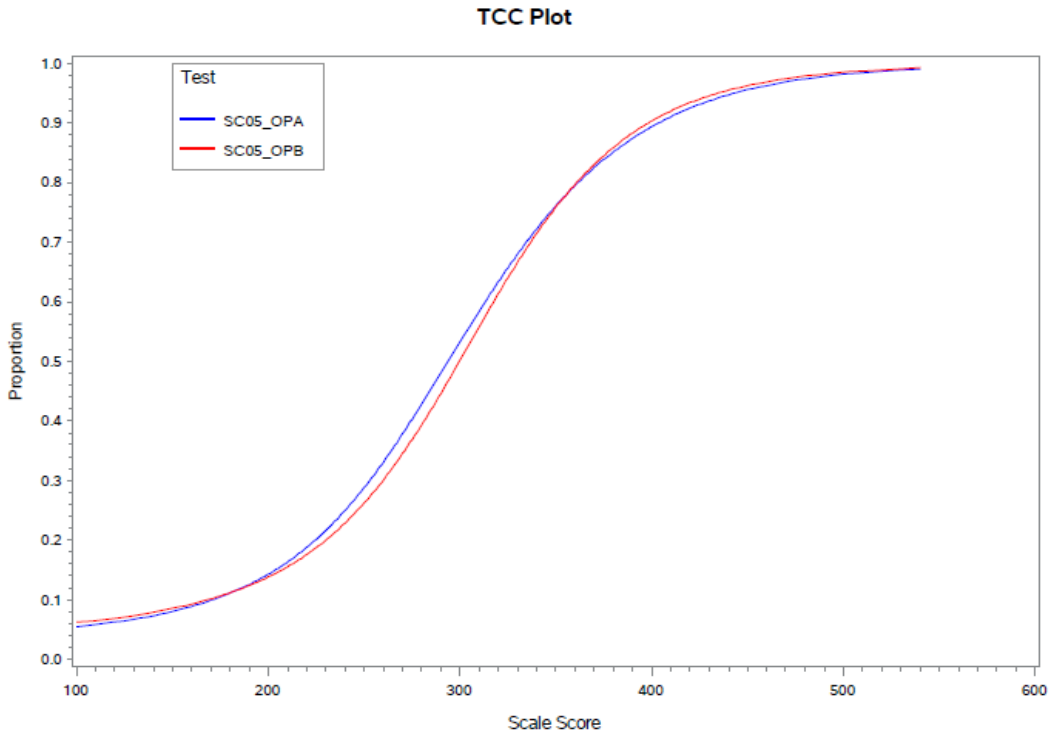

Figure 7.12: Standard Error Curves, Science Grade 5

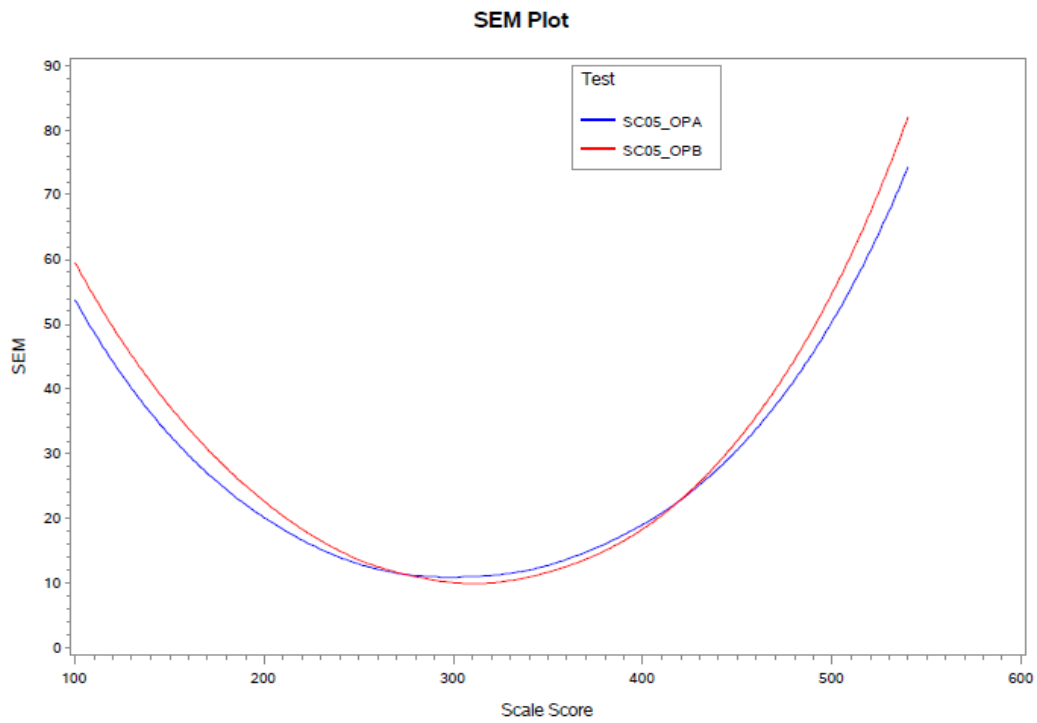

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Figure 7.13: Test Characteristic Curves, Science Grade 8

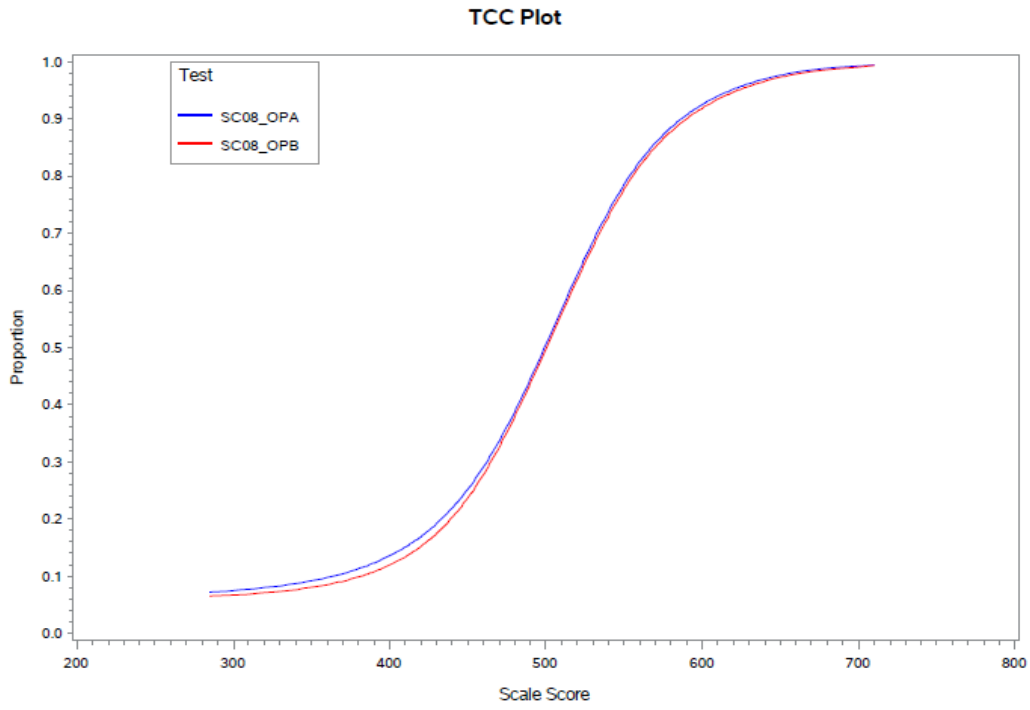
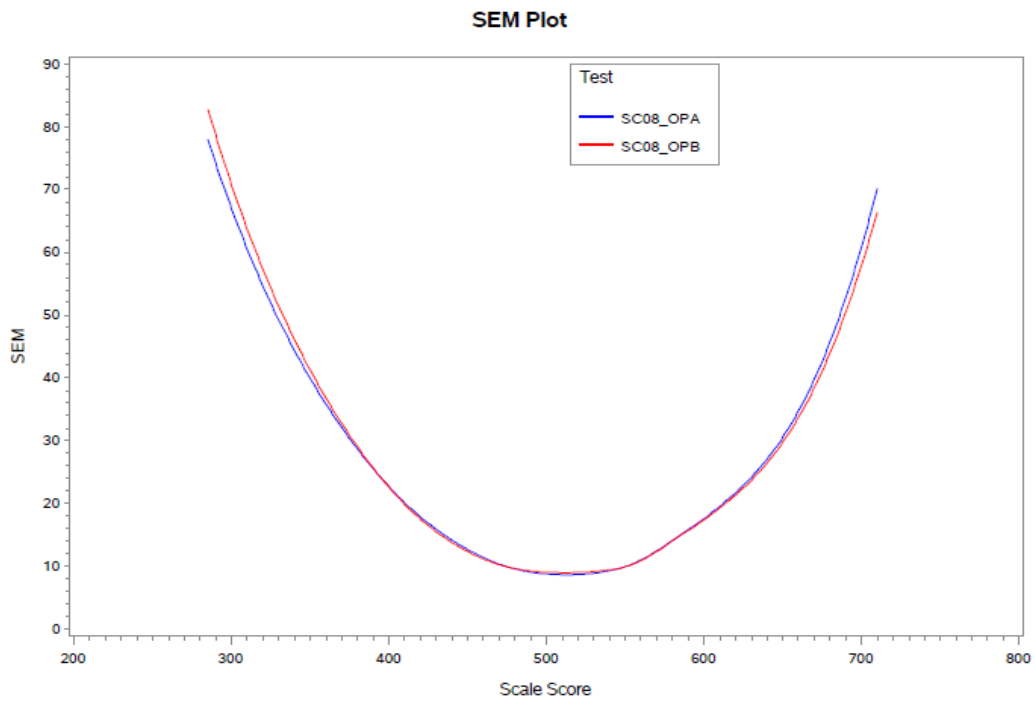


Figure 7.14: Standard Error Curves, Science Grade 8



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CHAPTER 8: PERFORMANCE LEVEL SETTING

In this chapter, we briefly describe the MAP ELA, Mathematics, and Science performance level setting (also called standard setting), and we present the cut scores established and the performance level descriptors derived from the performance level setting.

The Missouri State Board of Education approved new Missouri Learning Standards for ELA and Mathematics in April 2016, and these standards were implemented in the 2016–17 school year. The MAP began assessing these standards in 2017–18. The new reporting scales for the ELA and Mathematics tests were established after the Spring 2018 test administration, and the new performance level cut scores were set for these assessments in Summer 2018.

The new Science standards were implemented in the 2017–18 school year and the MAP started assessing these standards in 2018–19. The new reporting scales for the Science tests were established after the Spring 2019 test administration, and the new performance level cut scores were set for Science assessments in Summer 2019.

The process of the performance level settings for all content areas adhered to the following AERA, APA, & NCME (2014) standards:

> **Standard 5.21** When proposed score interpretations involve one or more cut scores, the rationale and procedures used for establishing cut scores should be documented clearly. (p. 107)
>
> **Standard 5.22** When cut scores defining pass-fail or proficiency levels are based on direct judgments about the adequacy of item or test performances, the judgmental process should be designed so that the participants providing the judgments can bring their knowledge and experience to bear in a reasonable way. (p. 108)

8.1 Performance Level Setting for English Language Arts and Mathematics

The Missouri Department of Elementary and Secondary Education (DESE) and Data Recognition Corporation (DRC) conducted the MAP performance level setting for Grades 3–8 in ELA and Mathematics from July 16 to 18, 2018. The purpose of this workshop was to develop performance standards for ELA and Mathematics, including the development of *cut points*, which divide students into four performance levels: *Below Basic*, *Basic*, *Proficient*, and *Advanced*.

A total of 120 Missouri educators participated in the performance level setting process. Participants were divided into 12 groups of approximately 10 participants each, and each group focused on a single grade and content area combination (e.g., Grade 3 Mathematics, Grade 4 ELA). Participants worked individually and in concert to consider

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the test items and student data from the Spring 2018 administration of the MAP, the Missouri Learning Standards, and information from Missouri students' performance on the National Assessment of Education Progress (NAEP) Reading and Mathematics assessments.

8.1.1 Methodology

Prior to the performance level setting workshop, DESE worked in collaboration with DRC and Missouri TAC to select the methodology to be used at the workshop. DESE selected the Bookmark Standard Setting Procedure (BSSP) for the MAP ELA and Mathematics tests, the standard setting method that was used in Missouri previously and had also a widespread use across the country (Lewis, Mitzel, & Green, 1996). The BSSP is well suited for standard setting for these assessments because (a) the tests are composed of both multiple-choice and non-multiple-choice items, (b) the items are scaled and can be mapped using item-mapping techniques, and (c) the BSSP allows participants to focus on the knowledge, skills, and abilities expected of students in each performance level. The BSSP has been well documented in standard setting literature. Developed in 1996, the BSSP has been implemented abroad and in over half of the states in the United States by DRC and by other major testing firms, making it the most widely used standard setting procedure in K–12 education (Karantonis & Sireci, 2006; Cizek & Bunch, 2007; Lewis, Mitzel, Mercado, & Schulz, 2012).

8.1.2 Workshop

During the performance level setting workshop, participants studied the updated Missouri performance level descriptors (PLDs) and Missouri Learning Standards to review the knowledge, skills, and abilities expected of students in each performance level. Each performance level is associated with a level of mastery of the Missouri Learning Standards. Participants then discussed the content-based expectations for students at the threshold of each performance level (e.g., a student who is "just *Proficient*").

Participants studied ordered item booklets (OIBs) that comprised collections of operational test items that were ordered by difficulty. A separate OIB was created for each test, and items' difficulty values were based on students' performance on the test items. Participants studied the OIBs to understand the knowledge and skills measured by the tests.

Benchmarks based on NAEP were presented for participants' consideration as they recommended their *Proficient* cut scores. The benchmarked cut scores, when applied to Missouri students' scores, categorized approximately the same percentages of students in the *Proficient* or above performance levels on the MAP and the NAEP. A band of ±1 conditional standard error of measurement (CSEM) was used to create a band referred to as the *Proficient* range, and this range was reflected in participants' OIBs. Participants were told that if they recommended cut scores in the *Proficient* range, the percentage of students classified as *Proficient* or above on the MAP would be similar to that on the NAEP. Participants were encouraged to focus their attention on this range in the OIB and

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were told that it was anticipated (but not compulsory) that their *Proficient* cut scores would be within this range.

Participants engaged in three rounds of individual judgments and group discussions. In each round, participants recommended cut scores by considering the content-based expectations for students in each performance level and then identifying the sets of items in their OIBs that best represented these expectations. By placing bookmarks, participants recommended cut scores on the test scale.

Between rounds, participants were shown feedback (e.g., median bookmarks, impact data). The committees' median judgments were taken as their recommendations. After the third round of recommendations, table leaders convened to examine the recommendations. As needed, table leaders recommended adjustments to promote articulation among the performance standards across grades.

After the workshop, it was noted that one cut score, *Basic*, for Grade 7 ELA was marginally higher than that for Grade 8. One typically expects cut scores to rise across grades on the vertical test scale, mirroring students' acquisition of content knowledge. To promote cut score articulation, the Grade 7 *Basic* cut was lowered by 1 CSEM.

The cut scores, recommended by the performance level setting participants, were reviewed by another committee of eight Missouri administrators and stakeholders on August 21, 2018, during the policy review meeting, which was facilitated by a member of the Technical Advisory Committee. The final review of the cut scores was conducted by the Missouri Board of Education on October 23, 2018, after which DESE leadership approved the cut scores for use on the MAP tests.

8.2 Performance Level Setting for Science

On July 16–18, 2019, the Missouri Department of Elementary and Secondary Education (DESE) partnered with Data Recognition Corporation (DRC), Questar Assessment Inc. (QAI), and ACS Ventures to conduct a performance level setting, commonly referred to as a standard setting, for the Missouri Assessment Program (MAP) tests of Grades 5 and 8 Science, Physical Science, and Biology. The purpose of this workshop was to develop performance standards for the three content areas, including the development of cut points, which divide students into four performance levels: *Below Basic*, *Basic*, *Proficient*, and *Advanced*. In this section of the report, a brief description of the performance level setting for Science Grades 5 and 8 is presented.

8.2.1 Methodology

There were 13 Missouri educators participating in the Bookmark Standard Setting Procedure (BSSP) (Lewis, Mitzel, & Green, 1996; Lewis, Mitzel, Mercado, & Schulz, 2012) for the Grade 5 Science assessment and 11 for Grade 8. In the BSSP, these educators recommended cut scores for the new Science assessments. The BSSP, selected for the MAP Science tests, is the standard setting method that was used in Missouri previously (e.g. ELA and Mathematics performance level setting in Summer 2018).

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8.2.2 Workshop

During the performance level setting, participants studied the updated Missouri performance level descriptors (PLDs) and Missouri Learning Standards for Science to review the knowledge, skills, and abilities expected of students in each performance level. Each performance level was associated with a level of mastery of the Missouri Learning Standards. Participants then discussed the content-based expectations for students at the threshold of each performance level (e.g., a student who is just *Proficient*). Participants studied ordered item booklets (OIBs) that comprised collections of operational test items that were ordered by difficulty. A separate OIB was created for each test, and items' difficulty values were based on students' performance on the test items. Participants studied the OIBs to understand the knowledge and skills measured by the tests.

Benchmarks based on NAEP were presented for participants' consideration as they recommended their *Proficient* cut scores. These benchmarks were selected before the performance level setting by a panel of Missouri educators and stakeholders. This panel also provided contextual information to accompany the benchmarks when they were used at the performance level setting workshop.

The benchmarked cut scores, when applied to Missouri students' Science scores, categorized approximately the same percentages of students as *Proficient* or above on Science MAP and on NAEP in Science. A band of ±1 conditional standard error of measurement (CSEM) was used to create a band that was reflected in participants' OIBs. Participants were told that if they recommended cut scores in this range, the percentage of students classified as *Proficient* or above on MAP would be similar to that on NAEP. Participants were encouraged to focus their attention on this range in the OIB and told that it was likely (but not compulsory) that their *Proficient* cut scores would be within this range.

Participants engaged in three rounds of individual judgments and group discussions. In each round, participants recommended cut scores by considering the content-based expectations for students in each performance level and then identifying the sets of items in their OIBs that best represented these expectations. By placing bookmarks, participants recommended cut scores on the test scale. Between rounds, participants were shown feedback (e.g., median bookmarks, impact data). The committees' median judgments were taken as their recommendations. For rounds 1 and 2, feedback was provided to each individual panel and each panel was shown only the results for their specific grade. After round 3 ratings were completed, all participants were shown the results across all grade levels and end-of-course subjects to allow the entire panel to discuss the results and evaluate the consistency of their specific results with the results from other Science assessments.

After the round 3 discussion, Science Grades 5 and 8, Physical Science, and Biology table leaders convened to examine the recommendations. As needed, table leaders recommended adjustments to promote articulation among the performance standards across grades. When examining the cut scores, the table leaders recommended upward

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adjustments to two cut scores to improve the articulation of the entire system of performance standards: the *Basic* cut score in Science Grade 8 and the *Advanced* cut score in Biology. An additional cut score adjustment was performed for the Grade 8 Science *Proficient* cut score after the performance level setting. This cut score was also adjusted upward by one conditional standard error of measurement (CSEM) value. The CSEM quantifies the amount of statistical noise around a point on the test scale. This adjustment was made to promote articulation across grades while still honoring the judgments of Missouri educators at the performance level setting. Detailed information on the rationale for the cut score adjustments can be found in the *Missouri Assessment Program Grades 5 and 8 Science, Physical Science, and Biology Performance Level Setting 2019 Technical Report*, which was submitted to Missouri DESE. The recommended cut scores for Science were reviewed by the Missouri State Board of Education on September 17, 2019, after which DESE leadership approved the cut scores for use on the Science MAP tests.

8.3 Performance Level Descriptors

In terms of the validity of the intended interpretation of the MAP scores, it is essential to understand that descriptors and cut scores are established in a collaborative and participatory process. The descriptors clearly establish, in plain language, the proper frame of reference for understanding how to interpret test scores, particularly cut scores. Performance level descriptors (PLDs) summarize the knowledge, skills, and abilities expected of students in each performance level. These descriptors, presented in the *Guide to Interpreting Results* (see Appendix C), reflect a combination of DESE's vision for each performance level and the input from the performance level setting participants. At all performance level settings, Missouri educators used the PLDs in conjunction with the content standards to consider the content-based expectations for students in each performance level on each MAP test.

8.4 Cut Scores

In this section, we present the cut scores for each grade for ELA, Mathematics, and Science. Tables 8.1, 8.2, and 8.3 show the cut scores for all grades of the three content areas.

8.5 Summary

This chapter presented a brief overview of the performance level setting process used for establishing the ELA and Mathematics cut scores after the 2017–18 test administration and for establishing the Science cut scores after the 2018–19 test administration. These procedures are addressed in more detail in the *Missouri Assessment Program Grades 3–8 English Language Arts and Mathematics Standard Setting 2018 Technical Report* and in the *Missouri Assessment Program Grades 5 and 8 Science, Physical Science, and Biology Performance Level Setting 2019 Technical Report*, which was submitted to Missouri DESE.

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The performance level setting process undertaken by DESE and facilitated by DRC supports the following standards from the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 2014):

- Standard 5.21—When proposed score interpretations involve one or more cut scores, the rationale and procedures used for establishing cut scores should be documented clearly.
- Standard 5.22—When cut scores defining pass-fail or proficiency levels are based on direct judgments about the adequacy of item or test performances, the judgmental process should be designed so that the participants providing the judgments can bring their knowledge and experience to bear in a reasonable way.

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Table 8.1: Cut Scores, English Language Arts

Grade	Cut Scores		
	Basic	***Proficient***	***Advanced***
3	331	364	395
4	337	388	419
5	351	403	431
6	371	413	438
7	384	435	456
8	393	443	476

Table 8.2: Cut Scores, Mathematics

Grade	Cut Scores		
	Basic	***Proficient***	***Advanced***
3	326	362	390
4	358	387	413
5	377	410	435
6	388	417	438
7	394	435	462
8	420	468	506

Table 8.3: Cut Scores, Science

Grade	Cut Scores		
	Basic	***Proficient***	***Advanced***
5	275	310	344
8	468	510	537

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CHAPTER 9: STUDIES OF RELIABILITY AND CONSTRUCT-RELATED VALIDITY

Evidence of construct-related validity—supporting the intended interpretation of test scores and their use—is the central concept underlying the MAP ELA, Mathematics, and Science validation process. In this chapter, DRC presents evidence of construct-related validity through studies of test reliability, evaluation of internal test structure, and evaluation of the relationship between test scores and external variables.

In addition, in Chapter 9, we examine fairness as it relates to minimizing bias on a test. We then look at test performance among varying subgroups assessed by ELA, Mathematics, and Science MAP. It should be noted that differences in test performance among subgroups do not mean that a test is unfair—they simply mean that groups perform differently on the test. Even when a test is carefully and properly constructed, differences may exist among subgroups as a result of differences in curriculum or learning by students in the subgroup.

Chapter 9 of this report describes how the MAP demonstrates adherence to AERA, APA, & NCME (2014) Standards 1.13, 1.21, 2.0, 2.3, 2.13, 2.14, 2.16, 2.19, and 3.1 through 3.6. Each standard will be discussed in the pertinent section of this chapter.

9.1 Minimization of Construct-Irrelevant Variance and Construct Underrepresentation

Minimization of construct-irrelevant variance and construct underrepresentation is addressed throughout test development, test administration and scoring, and psychometric data analysis.

Construct-irrelevant variance refers to error variance that is caused by factors that are unrelated to the constructs measured by the test. The first steps in minimizing construct-irrelevant variance are taken during the test development stage and include domain specification, item writing, item review, field-testing, and test construction (see Chapters 3 and 4 for more information). Standardized testing administration and scoring (as described in Chapters 5 and 6) further contribute to the minimization of construct-irrelevant variance. Results of statistical analyses, including item calibration, provide additional empirical evidence used to evaluate potential construct irrelevance (for more information on psychometric analyses, refer to Chapter 7).

Construct underrepresentation occurs when the content of the assessment does not reflect the full range of content that the assessment is expected to cover. Specification and review, in which test blueprints are developed and reviewed (refer to Chapter 3), as well as the alignment analysis are primary steps in the development process, which is designed to ensure that content is appropriately represented.

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9.2 Reliability

Reliability refers to the consistency of students' test scores on parallel forms of a test. A reliable test is one that produces scores that are expected to be relatively stable if the test is administered repeatedly under similar conditions. Often, however, it is impractical to administer multiple forms of the test, so reliability is estimated on a single administration of the test. This type of reliability, known as internal consistency, provides an estimate of how consistently examinees perform across items within a test during a single test administration (Crocker & Algina, 1986). Reliability is a necessary, but insufficient, condition for validity.

The AERA, APA, & NCME (2014) *Standards* indicates the following:

> The term *reliability* has been used in two ways in the measurement literature. First, the term has been used to refer to the reliability coefficients of classical test theory, defined as the correlation between scores on two equivalent forms of the test, presuming that taking one form has no effect on performance on the second form. Second, the term has been used in a more general sense, to refer to the consistency of scores across replications of a testing procedure, regardless of how this consistency is estimated or reported (e.g., in terms of standard errors, reliability coefficients per se, generalizability coefficients, error/tolerance ratios, item response theory (IRT) information functions, or various indices of classification consistency). (p. 33)

In accordance with the AERA, APA, & NCME (2014) *Standards* and in developing and maintaining tests of the highest quality, the reliability of each MAP test was calculated in a variety of ways: reliability of raw scores, overall standard error of measurement, IRT-based conditional standard error of measurement, and decision consistency of performance level classifications. There are several specific AERA, APA, & NCME (2014) standards that this chapter addresses:

Standard 2.0 Appropriate evidence of reliability/precision should be provided for the interpretation for each intended score use. (p. 42)

Standard 2.3 For each total score, subscore, or combination of scores that is to be interpreted, estimates of relevant indices of reliability/precision should be reported. (p. 43)

The total test score reliabilities are discussed in Section 9.2.1 of this chapter. The standard error of measurement (SEM) and the conditional standard error of measurement (CSEM) are discussed in Sections 9.2.2 and 9.2.3, respectively. The subscore reliabilities and SEMs are presented in Section 9.3.2.

Standard 2.13 The standard error of measurement, both overall and conditional (if reported), should be provided in units of each reported score. (p. 45)

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The raw score–based SEM is discussed in Section 9.2.2 and is presented in raw score units in Tables 9.1 through 9.3. The conditional SEM is discussed in Section 9.2.3 and is presented in scale score units in Tables 9.4 through 9.6.

Standard 2.19 Each method of quantifying the reliability/precision of scores should be described clearly and expressed in terms of statistics appropriate to the method. The sampling procedures used to select test takers for reliability/precision analyses and the descriptive statistics on these samples, subject to privacy obligations where applicable, should be reported. (p. 47)

Section 9.2 discusses different ways of measuring test reliability, including reliability of raw scores and test form SEM, IRT-based conditional SEM, and decision consistency of performance level classifications. These statistics were computed using Spring 2019 calibration data.

9.2.1 Test Reliability

The reliability of raw scores by test form was evaluated using Cronbach's (1951) coefficient alpha, which is a lower-bound estimate of test reliability. The reliability coefficient is a ratio of the variance of true test scores to the variance of the total observed scores, with the values ranging from 0 to 1. The closer the value of the reliability coefficient is to 1, the more consistent the scores are, where 1 refers to a perfectly consistent test. As a rule of thumb, reliability coefficients that are equal to or greater than 0.8 are considered acceptable for tests of moderate lengths.

Cronbach's coefficient alpha was computed using the following formula:

$$\alpha = \frac{n}{n-1}\left[1 - \frac{\sum_{i=1}^{n} \sigma_i^2}{\sigma_X^2}\right],$$

where n is the number of items on the test, σ_i^2 is the variance of item i, and σ_X^2 is the variance of the total test score.

Total test reliability measures, such as Cronbach's coefficient alpha and SEM, consider the consistency (reliability) of performance over all test questions in a given form, the results of which imply how well the questions measure the content domain and could continue to do so over repeated administrations. The number of items in the test influences these statistics; a longer test can be expected to be more reliable than a shorter test.

The reliability coefficients for the MAP are reported in Tables 9.1 through 9.3 for ELA, Mathematics, and Science respectively. Except for ELA Grade 6, the reliability statistics ranged from 0.90 to 0.94 for all ELA, Mathematics, and Science forms. The reliability

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coefficients for ELA Grade 6 forms were 0.89 for Form A and 0.88 for Form B. These results indicate acceptable reliability coefficients for MAP tests.

The reliability statistics by subgroup are reported and discussed in Section 9.5.3 ("Test Reliability by Subgroup").

9.2.2 Standard Error of Measurement

The reliability of reported test scores can be characterized by the standard errors associated with the scores. The SEM may be used to determine the range within which a student's true score is likely to fall. An observed score should be regarded not as a student's true score but as an estimate of a student's true score. It is expected that 68% of the time, a student's score obtained from a single test administration would fall within one SEM of the student's true score and that 95% of the time, the obtained score would fall within approximately two standard errors of the true score. The SEM is an index of the random variability in test scores and is defined as follows:

$$\text{SEM} = SD\sqrt{1 - R_{xx'}} \ ,$$

where *SD* represents standard deviation of the raw score distribution and $R_{xx'}$ is estimated by $\hat{\alpha}$, as expressed in Cronbach's coefficient alpha formula, which is presented in Section 9.2.1.

The SEM at the test level was computed in the raw score metric and is presented in Tables 9.1 through 9.3 for ELA, Mathematics, and Science, respectively.

9.2.3 Conditional Standard Error of Measurement

In contrast to the SEM, the conditional standard error of measurement (CSEM) expresses the degree of measurement error in scale score units and is conditioned on the ability of the student. The CSEM is reported in support of AERA, APA, & NCME (2014) Standard 2.14, which states the following:

> When possible and appropriate, conditional standard errors of measurement should be reported at several score levels unless there is evidence that the standard error is constant across score levels. Where cut scores are specified for selection or classification, the standard errors of measurement should be reported in the vicinity of each cut score. (p. 46)

The CSEM of each cut score is reported in Tables 9.4 through 9.6.

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The CSEMs are defined as the reciprocal of the square root of the test information function and can be estimated across all points of the ability continuum (Hambleton & Swaminathan, 1985)

$$\text{CSEM}(\theta_i) = \frac{1}{\sqrt{I(\theta_i)}},$$

where $I(\theta_i)$ is the test information function, as a sum of item information function 2, obtained as

$$I(\theta_i) = \sum_j \frac{p'_{ij}(\theta_i)^2}{p_{ij}(\theta_i)q_{ij}(\theta_i)},$$

where $p'_{ij}(\theta_i)$ is the derivative of $p_{ij}(\theta_i)$ and $q_{ij}(\theta_i) = 1 - p_{ij}(\theta_i)$.

Note that the CSEMs vary in magnitude across the entire range of student ability estimates (i.e., scale scores) and are lower in the middle of the score distribution and higher at the tails. This pattern is seen for all MAP CSEMs and is to be expected when IRT methods are used. The CSEMs at the three cut scores that define the performance levels are presented in Table 9.4 for ELA, Table 9.5 for Mathematics, and Table 9.6 for Science. For ELA across all grades and test forms, the CSEM at the *Basic* cut score ranged from 10 to 12 points, the CSEM at the *Proficient* cut was 10 or 11 points, and the CSEM at the *Advanced* cut ranged from 11 to 13 points. For Mathematics, the CSEM at the *Basic* cut ranged from 8 to 15 points, the CSEM at the *Proficient* cut ranged from 6 to 11 points, and the CSEM at the *Advanced* cut ranged from 6 to 10 points across all test forms for Grades 3 through 8. The CSEM for Mathematics Grade 8 was higher at the *Basic* and *Proficient* cut scores, compared to other grades. For Science, the CSEM at the *Basic* cut score was 10 or 11 points, the CSEM at the *Proficient* cut ranged from 9 to 11 points, and the CSEM at the *Advanced* cut ranged from 9 to 12 points across both grades and both forms.

The CSEM curves, with cut scores indicated, for all ELA, Mathematics, and Science test forms are presented in Figures D1 through D45 in Appendix D. As can be seen in all figures, the estimates of measurement error tend to be higher at the low and high ends of the scale score range. The measurement error increases when there are few observations at a particular ability level. Generally, there are few students with extreme scores, and these score levels cannot be estimated as accurately as levels toward the middle of the ability range. Figures D1 through D45 demonstrate that the measurement error is minimized at the cut scores and in the middle of the scale range, where the majority of students are located.

9.2.4 Classification Accuracy and Consistency

Classification Consistency: Classification consistency (also known as decision consistency) is defined as the extent to which the classifications of students agree on the basis of two independent administrations of the test or one administration of two parallel

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test forms. It is difficult, however, to obtain data from repeated administrations of the same form because of cost, time, and students' recall of the first administration. Also, it is difficult to construct two parallel forms. A common practice, therefore, is to estimate decision consistency from one administration of a test. These analyses directly address AERA, APA, & NCME (2014) Standard 2.16:

> When a test or combination of measures is used to make classification decisions, estimates should be provided of the percentage of test takers who would be classified in the same way on two replications of the procedure. (p. 46)

Classification Accuracy: Classification accuracy is defined as the extent to which the actual classifications of test takers agree with classifications that would be made on the basis of the test takers' true scores (Livingston & Lewis, 1995). It is common to estimate classification accuracy by utilizing a psychometric model to find true scores corresponding to observed scores.

In other words, classification *consistency* refers to the agreement between two observed scores, while classification *accuracy* refers to the agreement between the observed score and the true score. A straightforward approach to classification consistency estimation can be expressed in terms of a contingency table representing the probability of a particular classification outcome under specific scenarios. For example, the following table is a contingency table of (H + 1) × (H + 1), where H is the number of cut scores such that two cut scores yield a 3×3 contingency table.

Example of Contingency Table with Two Cut Scores

	Level 1	**Level 2**	**Level 3**	**Sum**
Level 1	P_{11}	P_{21}	P_{31}	$P_{.1}$
Level 2	P_{12}	P_{22}	P_{32}	$P_{.2}$
Level 3	P_{13}	P_{23}	P_{33}	$P_{.3}$
Sum	$P_{1.}$	$P_{2.}$	$P_{3.}$	1.0

DRC used a method suggested by Kolen and Kim (2005) for estimating consistency and accuracy that involves the generation of item responses using item parameters based on the IRT model (see also Kim, Choi, Um, & Kim, 2006; Kim, Barton, & Kim, 2007). Two sets of item responses are generated using a set of item parameters and an examinee's ability distribution from a single test administration. These two sets of item responses are considered as an examinee's responses on two administrations of the same form. The procedure is described below and is implemented with KKCLASS software (Kim, 2005).

- Step 1: Obtain item parameters (I) and ability distribution weight ($\hat{g}(\theta)$) at each quadrature point from a single test.
- Step 2: Compute two raw scores at each quadrature point. At a given quadrature point θ_i, generate two sets of item responses using the item

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parameters from a test form, assuming that the same test form was administered twice to an examinee with the true ability θ_i.

- Step 3: Construct a classification matrix at each quadrature point. Determine the joint event for the cells in the table above using the raw scores obtained from Step 2.
- Step 4: Repeat Steps 2 and 3 *R* times and get average values from *R* replications.
- Step 5: Multiply ability distribution weight ($\hat{g}(\theta)$) by average values in Step 4 for each quadrature point, and sum across all quadrature points. From this final contingency table, decision consistency indices, such as consistency agreement and kappa, can be computed.
- Step 6: Because examinee ability is estimated at each quadrature point, this quadrature point can be considered the true score. Therefore, decision accuracy is computed using both examinee estimated ability (observed score) and quadrature point (true score).

Classification consistency and classification accuracy conditioned on performance level are presented in Tables 9.7 through 9.9 for ELA, Mathematics, and Science tests, respectively. As shown in Table 9.7, classification accuracy conditioned on performance level ranges from 0.57 to 0.98 and classification consistency conditioned on performance level ranges from 0.47 to 0.86 for all ELA performance levels. The lowest classification consistency and accuracy values were found for students classified in the *Proficient* levels in Grade 7 (classification accuracy of 0.63 for Form A and 0.57 for Form B; classification consistency of 0.53 for Form A and 0.47 for Form B). For Mathematics, classification accuracy conditioned on performance level ranges from 0.73 to 0.98 and classification consistency conditioned on performance level ranges from 0.64 to 0.86 (see Table 9.8). As shown in Table 9.9, classification accuracy conditioned on performance level ranges from 0.73 to 0.89 and classification consistency conditioned on performance level ranges from 0.63 to 0.85 for Science assessments.

The magnitude of classification consistency and accuracy measures is influenced by key features of the test design, including the number of items, number of cut scores, test reliability and associated SEM, and student score distribution. When the distribution of test item properties along the ability scale was examined, it was found that relatively few test items effectively measured students classified as *Proficient* on Grade 7 ELA tests, likely contributing to the lower classification consistency at this performance level. Consequently, it is recommended that more items effectively measuring students in the middle and upper part of the ability scale be included in future ELA Grade 7 forms.

Perhaps the most important indices for accountability systems are those for the accuracy and consistency of classification decisions made at specific cut points. To evaluate decisions at specific cut points, the joint distribution of all the performance levels is collapsed into a dichotomized distribution around that specific cut point. As an example, the dichotomization at the cut point between the *Basic* and *Proficient* classifications was

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formed. The proportion of correct classifications below this particular cut point is equal to the sum of all the cells at the levels *Below Basic* and *Basic*, and the proportion of correct classifications above that particular cut point is equal to the sum of all the cells at the levels *Proficient* and *Advanced*. Classification consistency and classification accuracy conditioned on cut scores are presented in Tables 9.10 through 9.12 for ELA, Mathematics, and Science tests, respectively. The classification accuracy and consistency statistics were at or above 0.88 for all test forms and all cut points for ELA. The classification accuracy and consistency statistics were at or above 0.89 for all test forms and all cut points for Mathematics and Science. These results suggest that consistent and accurate performance level classifications are being made for students in Missouri based on the MAP.

In addition, the indices for classification consistency and classification accuracy were computed for the subgroups of students. These data are presented in Appendix E. For ELA, the classification accuracy conditioned on performance level ranged from 0.44 to 0.99 for all grades, test forms, and groups. The classification consistency conditioned on performance level ranged from 0.42 to 0.90 for all ELA grades, test forms, and groups (see Table E1). The lowest classification accuracy index (0.44) was found for Asian/Pacific Islander group at the *Proficient* level in Grade 4, Form A13, and the lowest classification consistency index (0.42) was observed for American Indian group at the Proficient level in Grade 7, Form B. In addition, lower indices of the classification accuracy and consistency conditioned on performance level were found for all subgroups at Grade 7, compared to other ELA grades. This pattern was also observed when the classification consistency and accuracy was computed for the total population of students.

As shown in Table E2, the classification accuracy conditioned on the cut scores ranged from 0.80 to 0.99 and the classification consistency conditioned on the cut scores ranged from 0.83 to 0.99 for all ELA grades, test forms, and groups.

For Mathematics, the classification accuracy conditioned on performance level ranged from 0.59 to 0.99 for all grades, test forms, and groups. The classification consistency conditioned on performance level ranged from 0.56 to 0.95 for all Mathematics grades, test forms, and groups of students (see Table E3). Also for Mathematics, the classification accuracy conditioned on the cut scores ranged from 0.90 to 1.00 and the classification consistency conditioned on the cut scores ranged from 0.86 to 1.00 for all grades, test forms, and groups (refer to Table E4).

For Science, the classification accuracy conditioned on performance level ranged from 0.67 to 0.95 across both grades, all test forms, and all groups. The classification consistency conditioned on performance level ranged from 0.57 to 0.93 for both Science grades, all test forms, and all groups of students (see Table E5). Also for Science, the classification accuracy conditioned on the cut scores ranged from 0.91 to 0.99 and the classification consistency conditioned on the cut scores ranged from 0.86 to 0.99 for both grades, all test forms, and all groups (refer to Table E6).

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Overall, the classification consistency and accuracy results by subgroup were found to be acceptable, indicating consistent and accurate performance level classifications for all groups of students on the MAP assessments. It should be noted that the classification consistency and accuracy indices were not computed for groups of students with fewer than 50 members.

9.3 Construct-Related Validity Evidence

This section summarizes additional statistics that contribute to the evidence of construct-related validity, including the validity evidence based on the internal test structure and the validity evidence based on the relationship with other variables. Recall that Cronbach's coefficient alpha (reported previously in this section) and item fit (reported in Chapter 7) have already been discussed as part of the evaluation of the test internal structure. The internal consistency coefficient (Cronbach's alpha) is a measure of item homogeneity. In order for a group of items to be homogeneous, they must measure the same construct or represent the same content domain. Because IRT models were used to calibrate test items and to report student scores, item fit is also relevant to construct-related validity. The extent to which test items function as the IRT model prescribes is relevant to the validation of the test score interpretation. As shown in Chapter 7, only a small proportion of items was flagged for poor model-data fit across all grade levels and content areas. The results of additional statistical analyses presented in the sections below provide additional evidence of construct-related validity.

9.3.1 Validity Evidence Based on Internal Test Structure

Analyses of the internal structure of a test can indicate the extent to which the relationships among test items conform to the construct the test purports to measure. For example, the MAP Mathematics test is designed to measure a single overall construct—Mathematics achievement; therefore, the items comprising the Mathematics MAP test should only measure Mathematics, not Science, Language, or Reading.

Principal Components Analysis

As another measure of the test internal structure, DRC examined the unidimensionality of each grade-level MAP test. One of the underlying assumptions of the IRT models used to scale MAP is that the tests being calibrated are unidimensional. That is, items composing MAP in each grade/content area measure a single content domain. For example, Mathematics items should measure Mathematics ability and not Reading skills. Standard 1.13 of the AERA, APA, & NCME (2014) *Standards* states the following:

> If the rationale for a test score interpretation for a given use depends on premises about the relationships among test items or among parts of the test, evidence concerning the internal structure of the test should be provided. (pp. 26 and 27)

In this section, we examine the internal structure by evaluating the unidimensionality assumption through Principal Components Analysis (PCA). This analysis seeks evidence that there exists a single primary factor, the first principal component, which accounts for much of the relationship between items. The presence of

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a single or dominant factor suggests that a test is sufficiently unidimensional (i.e., measures one underlying construct).

A PCA was conducted on each test form in each grade and content area. A large first principal component is evident in each analysis. While data are generally considered to be unidimensional if the second eigenvalue is less than or equal to 1.0, it is common to have additional eigenvalues greater than 1.0, which may suggest the presence of other factors. The PCA results are presented in Tables 9.13, 9.14, and 9.15 for ELA, Mathematics, and Science, respectively. The values of the first eigenvalue ranged from 7.89 to 10.55 and the values of the second eigenvalue ranged from 1.14 to 1.68 across all ELA test forms (see Table 9.13). The values of the first eigenvalue ranged from 10.24 to 13.61 and the values of the second eigenvalue ranged from 1.40 to 1.93 across all Mathematics test forms (refer to Table 9.14). For Science, the values of the first eigenvalue ranged from 8.45 to 10.65 and the values of the second eigenvalue ranged from 1.13 to 1.38 across all test forms (see Table 9.15).

For all grades of ELA, Mathematics, and Science, the ratio of the variance accounted for by the first factor to the second and third is sufficiently large to support the claim that these tests are unidimensional (Cattell, 1952). All tests exhibit first principal components accounting for at least 18% or more of the test variance for ELA, Mathematics, and Science. To further investigate the unidimensionality of the MAP tests, the ratio of the first eigenvalue to the second eigenvalue was explored. Previous research shows that the examination of the ratio of the first two (i.e., the two largest) eigenvalues can be useful in determining the existence of dominant factors. Specifically, where large ratios exist between the first and second eigenvalues, a single dominant factor can be said to exist. Although the definition of "large" in the present context is somewhat subjective, the results in Tables 9.13, 9.14, and 9.15 show that the eigenvalue of the first factor is at least five times as large as the eigenvalue of the second factor for all test forms in all content areas. This substantial difference in magnitude indicates that one factor appears to be dominant and that the ELA, Mathematics, and Science tests are essentially unidimensional.

This evidence supports the claim that there is a dominant dimension underlying the items/tasks in each test and that scores from each test represent performance that is primarily determined by that ability. Construct-irrelevant variance, such as factual knowledge that is irrelevant to doing well in a subject, does not appear to create significant nuisance factors.

9.3.2 Analyses by Reporting Categories

Three sets of analyses were conducted at the reporting category level for ELA, Mathematics, and Science in another attempt to assess the internal structure of MAP. The reporting categories are content categories and consist of items measuring similar sets of skills or knowledge. Each category was measured by at least 6 items and at least 8 raw score points. In cases where the content category was not measured by at least 6 items and at least 8 raw score points, that category was combined with another content category to form a reporting category with a larger number of items.

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In order to assess the internal structure of MAP, correlation coefficients that measure the relationship between the reporting category scores within a grade and content area were first computed. Second, the reliability of each category was computed. Finally, the SEM was computed for each reporting category.

Correlations among Reporting Category Scores

In this section, we report the strength of the interrelationships among the reporting categories by computing correlations between them. Tables 9.16, 9.17, and 9.18 report the uncorrected Pearson product-moment (PPM) correlation coefficients and the PPM corrected for attenuation (CAPPM) for the three content area tests. The PPM among the reporting category subscores is presented below the diagonal portion of the matrix, and the CAPPM is presented above the diagonal portion of the matrix.

The uncorrected PPM in Tables 9.16 through 9.18 should be interpreted in the context of the reliability coefficient. In general, we expect to see lower PPM coefficients between variables that are less reliable. In most cases, the PPM coefficients show that performance on one reporting category is moderately to strongly related to performance on another reporting category within the same grade and content area. For ELA, correlations ranged from 0.46 to 0.74 for all pairs of content strands. The lowest correlations were observed between Research, Writing, and Speaking and Listening reporting categories in Grades 4, 5, and 8. These categories were measured by the relatively low number of items. In Grades 4 and 8, the forms were administered to lower numbers of students compared to other ELA grades. The highest correlations were between the Reading strand, which has the largest number of items, and any other content strand in all ELA grades. For Mathematics, the correlations ranged from 0.67 to 0.82 for all pairs of reporting categories. For Science, the correlations ranged from 0.73 to 0.82 for all pairs of reporting categories across both grades. It should be noted that, in general, the value of the correlation coefficients was affected by the number of items measuring each reporting category in all content areas. So, caution should be used when comparing the PPM coefficients measuring the relationships between reporting categories within a content area to those measuring the relationships between content areas (See Table 9.22). We expect to see a more modest relationship reported between the reporting categories because of the lower number of items measuring each of the reporting categories. The PPM between two reporting category subscores may be artificially low because of measurement error.

AERA, APA, & NCME (2014) Standard 1.21 states the following:

> When statistical adjustments, such as those for restriction of range or attenuation, are made, both adjusted and unadjusted coefficients, as well as the specific procedure used, and all statistics used in the adjustment, should be reported. Estimates of the construct-criterion relationship that remove the effects of measurement error on the test should be clearly reported as adjusted estimates. (p. 29)

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We can correct for the attenuation of the PPM statistically using Spearman's formula:

$$CAPPM = \frac{r_{xy}}{\sqrt{r_{xx} r_{yy}}},$$

where r_{xy} is the PPM between two content strands, r_{xx} is the reliability of one of those content strands, and r_{yy} is the reliability for the other content strand.

In Tables 9.16 through 9.18, the CAPPMs indicate strong relationships between the content strands. In some cases, the CAPPM is 1.00. "Disattenuated values of or greater than 1.00 indicate that measurement error is not randomly distributed" (Schumacker & Muchinsky, 1996). The strong relationships suggested by the CAPPM in Tables 9.16 through 9.18 are further evidence of the validity based on the test internal structure. Since the overall content area comprises the content strand subscores and the content area is expected to measure a single dimension, we would expect that these subscores are also highly related.

Reliability and Standard Error of Measurement of Reporting Categories

Raw score summary statistics (mean and standard deviation), Cronbach's (1951) coefficient alpha, and SEM were computed for each of the content strands by grade and content area using the calibration sample. These statistics are presented in Tables 9.19 through 9.21 for ELA, Mathematics, and Science, respectively. Reliability indices, such as Cronbach's coefficient alpha (and resulting SEM), are a function of the number of test items. It is expected that coefficient alpha would be lower for a content strand assessed by a small number of items compared to a content strand assessed by a larger number of items.

9.3.3 Validity Evidence Based on Relationship with Other Variables

The MAP test score relationship with other variables was examined to further support the validity of the intended score interpretation. This was done using four measures: evaluation of correlations between the MAP content area scores, evaluation of correlations between the MAP cross-content area reporting category scale scores, comparisons of the percentages of students classified in different proficiency levels (impact data) on the state assessment and on the NAEP assessment, and comparison of MAP ELA and Mathematics scale scores with the Lexile and Quantile measures.

Correlations between Content Area Test Scores

Measures of different constructs should not be highly correlated with each other. The relationship between the scores from tests measuring different constructs can be assessed by the extent to which measures of constructs that theoretically should not be related to each other are, in fact, observed as not related to each other. Typically, correlation coefficients among measures of unrelated or distantly related constructs are examined in support of divergent evidence.

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To assess the relationship between the MAP content area scores, the correlations between the ELA, Mathematics, and Science scale scores for students who took two or three subject area tests in 2019 were computed and examined for the total student population and by subgroup. These correlations were based on the reportable census data, and the results are shown in Table 9.22. For the total population of students, the correlation coefficients ranged from 0.73 to 0.78 between ELA and Mathematics scale scores and from 0.83 to 0.84 between ELA and Science scores. The correlation coefficient was 0.77 between Mathematics and Science scores. The correlations between ELA and Science test scores were higher than the correlations between ELA and Mathematics scores or the correlations between Mathematics and Science scores for the total population of students.

This pattern of correlations was also observed for the subgroups of students. When the correlation coefficients between ELA and Science test scores were examined, it was observed that, with one exception, all correlation coefficients for all subgroups were at least 0.81 or higher. The exception was a correlation of 0.78, which is still high, between ELA and Science test scores for Black students in Grade 8.

The correlations between the ELA and Mathematics scores for male or female groups ranged from 0.72 to 0.79 and were comparable for the two gender groups at each grade level. The correlations between the ELA and Mathematics scores for different ethnic groups ranged from 0.68 to 0.82. The highest correlations by ethnic group were generally observed for Asian/Pacific Islander students, followed by the correlations for White students. Correlations between the ELA and Mathematics scores for the Black student subgroup were lower than the correlations for other subgroups.

The correlations between Mathematics and Science scores ranged from 0.76 to 0.78 for male or female groups and were comparable for the two genders in Grades 5 and 8. The correlations between the Mathematics and Science scores for different ethnic groups ranged from 0.69 (for Black students in Grade 5) to 0.85 (for Asian/Pacific Islander students in Grade 8).

The correlation coefficients between the content area scores were not computed by accommodation use because the accommodation use status is not consistent across ELA, Mathematics, and Science for the same students (for example, students who used accommodations in one content area did not necessarily use accommodations in another content area).

The correlation coefficients suggest that individual student scores for ELA, Mathematics, and Science are highly related. Despite high correlations, the tests are not perfectly related to each other, suggesting that different constructs are being tapped; however, the test scores do appear to be highly related to one another, suggesting they may be tapping into a similar knowledge base or general underlying ability.

Correlations between Content Area Reporting Category Scores

In addition to evaluation of the relationship between the content area total test scores, the relationship between the reporting category scale scores from tests measuring different

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constructs (e.g., ELA and Mathematics) was assessed. The correlation coefficients between the ELA and Mathematics reporting category scale scores were computed for students who took both tests and these results are presented in Table 9.23. The correlation coefficients between the ELA and Science reporting category scale scores are presented in Table 9.24. The correlation coefficients between the Mathematics and Science reporting category scale scores are shown in Table 9.25.

The cross-content correlations between the ELA and Mathematics reporting categories were found to be moderate, ranging from 0.40 to 0.65 across all grades. Stronger relationship was found between ELA Reading scale scores and any Mathematics reporting category scale score (correlation coefficients ranging from 0.55 to 0.65), compared to the relationship between ELA Research, Writing, or Speaking and Listening scale scores and any Mathematics reporting category (correlation coefficients ranging from 0.40 to 0.60). It is hypothesized that the stronger relationship between the ELA Reading scores and Mathematics reporting category scores may be to some degree related to an underlying trait of reading comprehension. In addition, it was found that the cross-content reporting category scores were correlated with each other more strongly when they were measured by a larger number of items, compared to the cross-content reporting categories measured by fewer items.

The cross-content correlations between the ELA and Science reporting categories were also found to be moderate, ranging from 0.51 to 0.68 across Grades 5 and 8. The correlations between the Mathematics and Science reporting categories ranged from 0.52 to 0.66 across Grades 5 and 8 and all reporting categories.

As expected, the cross-content reporting category correlations were found to be generally lower than the within-content reporting category correlations (discussed in section 9.3.2). The cross-content correlations coefficients suggest that the ELA, Mathematics, and Science content categories are moderately related. This, in turn, indicates that the specific ELA, Mathematics, and Science skills measured by the tests are different in the three content areas, supporting the evidence that the three assessments measure different constructs.

Comparison of the MAP and Missouri NAEP Impact Data

The NAEP is the largest nationally representative and continuing assessment of what America's students know and can do in various subject areas. Assessments in several content areas, including Reading, Mathematics, and Science, are administered to students in Grades 4, 8, and 12 and are conducted periodically. Representative samples of students from different states, including Missouri, participated in the latest NAEP assessments, which occurred in Spring 2019 for Reading and Mathematics and in Spring 2015 for Science.

The main NAEP assessments are constructed using detailed frameworks that result from a comprehensive national process in which teachers, curriculum experts, policymakers, and members of the public work to create a unified vision of how each subject should be assessed. This vision is based on current educational research on achievement and its

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measurement; it is also based on good educational practices. These frameworks are updated about every decade to keep them current (for details, refer to https://nces.ed.gov).

The NAEP results are reported for all assessed content areas and for all participating grades at the national level. At the state level, the results for Reading, Mathematics, Science, and Writing are reported for Grades 4 and 8. The results may also be reported at the district level (within a state) for these four content areas. No results are reported at the student level.

Missouri students participated in the latest Reading and Mathematics NAEP assessments in Spring 2019 and in the Science assessment in Spring 2015. The MAP state assessment results are compared to the NAEP results in Grades 4 and 8. The percentages of Missouri students classified in different proficiency levels on the MAP ELA, Mathematics, and Science assessments and the corresponding NAEP assessments are presented in Table 9.26.

As presented in Table 9.26, the percentages of students classified in the *Proficient* performance level on the NAEP Reading assessment and on the MAP ELA were comparable, within 2% or less for both grades. Higher percentages of students were classified in the *Advanced* performance level on the MAP ELA compared to the NAEP Reading, with differences of 13% for Grade 4 and close to 16% for Grade 8. Conversely, lower percentages of students were classified in the *Below Basic* performance level on the MAP ELA compared to NAEP Reading for both grades (with differences of approximately 24% for Grade 4 and 12% for Grade 8).

Higher percentages of students were classified as *Proficient* or above on the MAP ELA in both grades compared to the NAEP Reading (differences of 15% for Grade 4 and 14% for Grade 8).

For Mathematics, higher percentages of students were classified in the *Basic* and *Proficient* levels and lower percentages of students were classified in the *Below Basic* and *Advanced* levels on the NAEP assessments compared to the MAP Mathematics assessments (differences of 7% and 15%) for Grade 4. The percentages of students classified in all four performance levels on the NAEP Mathematics assessment and on the MAP Mathematics were comparable, within 4% or less, for Grade 8.

The percentage of students classified as *Proficient* or above was higher on MAP Mathematics compared to the NAEP Mathematics for Grade 4 (a difference of 8%) and lower on MAP Mathematics compared the NAEP for Grade 8 (a difference of 3%).

For Science, higher percentages of students were classified in the *Proficient* level in NAEP Grades 4 and 8 compared to MAP Grades 5 and 8. The difference was approximately 9% for Grade 5 and about 12% for Grade 8. On the other hand, lower percentages of students were classified in the *Advanced* level in NAEP Grades 4 and 8 compared to MAP Grades 5 and 8. The difference was approximately 13% for Grade 5 and about 16% for Grade 8. When the *Proficient* or above levels were considered

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together, the NAEP and MAP Science impact data were comparable (a difference of less than 4%) for both grades. Similarly, the percentages of students classified as *Basic* or above were comparable between NAEP and MAP Science, within 5% for both grades.

It should be noted that the Spring 2017 Reading and Mathematics NAEP *Proficient* cut scores were used as benchmarks during the Missouri ELA and Mathematics performance level setting in Summer 2018. Similarly, the Spring 2015 Science *Proficient* cut scores were used as benchmarks during the Science performance level setting in Summer 2019. The benchmarked cut scores, when applied to Missouri students' scores, categorized approximately the same percentages of students as *Proficient* or above on MAP and on NAEP (for details, refer to Chapter 8).

The Missouri impact data (i.e., the percentage of students at or above the *Proficient* cut score) achieved after the performance level setting were generally aligned, within one CSEM, with the Missouri state-level *Proficient* or above NAEP data. When considering Missouri Learning Standards, and the impact data articulation across grades, the MAP cut scores for ELA, Mathematics, and Science remained in alignment with the *Proficient* benchmarks, further supporting the evidence of the relationship between the state and the national assessments in these content areas. Both MAP impact data for ELA and Mathematics and Missouri NAEP impact data for Reading and Mathematics were stable between the last two assessment administrations. Changes in the percentage of students in any of the proficiency level categories were no greater than 3%, except for a 5% increase in the *Below Basic* level between 2017 and 2019 assessments for NAEP Reading in Grade 4.

Comparison of MAP Scale Scores with Lexile and Quantile Measures

MetaMetrics Lexile and Quantile items were embedded in the MAP ELA and Mathematics test forms in the Spring 2019 test administration (see also Section 4.5) for a purpose of linking MAP ELA scale to the Lexile scale and linking MAP Mathematics scale to the Quantile scale.

Linking of MAP ELA assessments to the Lexile scale allowed for expressing MAP ELA scale scores in the Lexile metric and estimating Missouri students' Lexile scores. The Lexile score, in turn, is an estimation of a student's reading ability given a reading text complexity. The Lexile measure (also called the Lexile Framework for Reading) is a tool that helps teachers, parents, and students locate appropriate reading materials.

The comparison of MAP ELA scale scores (expressed in the Lexile metric) and the Lexile reading national norms (developed by MetaMetrics) showed that the Missouri student scores are slightly higher than the Lexile reading norms in Grade 3 and slightly lower than the Lexile reading user norms in all other grades.

In addition, MAP ELA student scores and MAP ELA performance level cut scores (both expressed in the Lexile metric) were explored by MetaMetrics in relation to the established college- and career-ready reading text complexity ranges. The Missouri ELA *Proficient* level performance range was at or above the college- and career-ready reading

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text complexity ranges for each grade, indicating that students classified as *Proficient* are expected to be able to read and comprehend text that they are likely to encounter as they prepare for college and careers. For more detail on the Lexile Reading Framework and linking of the MAP ELA scale to the Lexile scale, refer to the *Linking the Missouri Assessment Program ELA with the Lexile Framework for Reading* report (MetaMetrics, 2019).

Linking of MAP Mathematics assessments to the Quantile scale allowed for expressing MAP Mathematics scale scores in the Quantile metric and estimating Missouri students' Quantile scores. The Quantile scores are indicators of which Mathematics skills and concepts a student has likely learned and which require further instruction.

When MAP Mathematics scale scores, expressed in the Quantile metric, were compared to the Quantile national norms (developed by MetaMetrics), it was observed that the The MAP Mathematics scale scores were higher than the Quantile norms at selected 25th, 50th, and 75th percentiles in Grades 3 through 6. In Grade 7, the MAP Mathematics Quantile measures were approximately equal to the Quantile user norms at each selected percentile; in Grade 8, the MAP Mathematics Quantile measures fell below the Quantile user norms, which may be partially explained by higher-achieving Grade 8 students not being included in this study due to the fact that they did not participate in the Spring 2019 Grade 8 Mathematics assessment (and took the Algebra I end-of-course test instead).

Finally, MAP Mathematics scale scores and MAP Mathematics performance level cut scores (both expressed in the Quantile metric) were examined in relation to mathematical lesson complexity ranges of the next grade or course. All grades showed that the MAP Mathematics *Proficient* cut point was within the range of the mathematical demands of the following school year's Mathematics content, which indicates that Missouri students are likely well prepared for the Mathematics content at the next grade level or course. For more detail on the Quantile Framework and linking of the MAP Mathematics scale to the Quantile scale, refer to the *Linking the Missouri Assessment Program Mathematics with the Quantile Framework for Mathematics* report (MetaMetrics, 2019).

In summary, the results of the MAP ELA and Mathematics scale linking to the respective Lexile and Quantile scales provide additional evidence in support of the validity of the intended score interpretation based on the relationship between the Missouri summative assessments and other measures in these content areas.

9.4 Differential Item Functioning

As noted in the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 2014), there are varying definitions of fairness. In this chapter, we examine fairness as it relates to minimizing bias on a test. We then look at test performance among varying subgroups assessed by ELA, Mathematics, and Science tests. It should be noted that differences in test performance among subgroups do not mean that a test is unfair—they simply mean that groups perform differently on the test. Even when a test is

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carefully and properly constructed, differences may exist among subgroups as a result of differences in curriculum or learning by students in the subgroup.

This section is particularly relevant to AERA, APA, & NCME (2014) Standards 3.1 through 3.6. These standards are from Chapter 3 of the AERA, APA, & NCME (2014) *Standards*, "Fairness in Testing." Each of these standards will be presented, as will the way the standard is addressed, in this chapter. Standard 3.6 states the following:

> **Standard 3.6** Where credible evidence indicates that test scores may differ in meaning for relevant subgroups in the intended examinee population, test developers and/or users are responsible for examining the evidence for validity of score interpretations for intended uses for individuals from those subgroups. What constitutes a significant difference in subgroup scores and what actions are taken in response to such differences may be defined by applicable laws. (p. 65)

There is no particular research on MAP showing that the test scores of examinee subgroups differ in meaning; however, this is an ongoing concern in any large-scale testing program. To lessen the possibility of differences in test score meaning, DRC has several steps that are followed in the item development and selection processes, as are explained in Section 9.4.1 of this chapter. In addition, DESE conducts content and bias reviews on items, as explained in Chapter 4. These practices adhere to Standard 3.3:

> **Standard 3.3** Those responsible for test development should include relevant subgroups in validity, reliability/precision, and other preliminary studies used when constructing the test. (p. 64)

DRC conducts differential item functioning (DIF) studies following the operational administration of MAP. Typically, items are evaluated for possible DIF in the field test phase of the test development, and items flagged for DIF are typically further examined for possible bias. During the ELA, Mathematics, and Science test development, DRC content experts avoided including items that may potentially favor one demographic group over another. Section 9.4.2 of this chapter explains the steps taken to evaluate MAP items through the use of DIF in order to adhere to Standard 3.3.

In addition, standardized test administration and the training of test readers for MAP comply with Standards 3.4 and 3.5:

> **Standard 3.4** Test takers should receive comparable treatment during the test administration and scoring process. (p. 65)
>
> **Standard 3.5** Test developers should specify and document provisions that have been made to test administration and scoring procedures to remove construct-irrelevant barriers for all relevant subgroups in the test-taker population. (p. 65)

Section 9.4.1 of this chapter is directly relevant to Standards 3.1 and 3.2:

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> **Standard 3.1** Those responsible for test development, revision, and administration should design all steps of the testing process to promote valid score interpretations for intended score uses for the widest possible range of individuals and relevant subgroups in the intended population. (p. 63)
>
> **Standard 3.2** Test developers are responsible for developing tests that measure the intended construct and for minimizing the potential for tests' being affected by construct-irrelevant characteristics, such as linguistic, communicative, cognitive, cultural, physical, or other characteristics. (p. 64)

In this section, we describe the steps taken by DRC to minimize words, phrases, and content that may be regarded as offensive by members of particular demographic subgroups. Chapter 4 discusses content considerations during item development and item reviews for items included in MAP. These reviews are also critical in fulfilling the guidelines established in Standards 3.1 and 3.2.

9.4.1 Minimizing Bias through Test Development

The development of a test that is fair for all examinees begins in the early stages of planning and development. The item and test development processes that were used to minimize bias are summarized below.

First, careful attention was paid to content-related validity during the item development and item selection processes. Bias can occur only if the test is measuring different things for different groups. By eliminating irrelevant skills or knowledge that may be tested in the items, the possibility of bias is reduced.

Second, DRC and Missouri item writers followed DRC's internal bias and sensitivity guidelines to help ensure that the items are fair for all groups of test takers, despite differences in characteristics, including, but not limited to, disability status, ethnic group, gender, regional background, native language, race, religion, sexual orientation, and socioeconomic status. Test developers reviewed all items included in MAP assessments and other testing materials with these guidelines in mind.

Finally, careful attention is typically given to item statistics (if available) throughout the test development process. As part of the test assembly process, attempts are made to avoid using or reusing items with poor statistical fit or distractors with positive point biserial correlations, since poor statistics may indicate that an item is tapping an ability that is irrelevant to the construct being measured. Additional steps to reduce bias, including the use of content and bias committees comprising Missouri participants, are described in more detail in Chapter 4 of this report.

9.4.2 Evaluating Bias through Differential Item Functioning Statistics

After administering the test, an empirical approach known as DIF was used to examine the items. The DIF statistics indicate the degree to which members of a particular subgroup perform better or worse than expected on each item as compared to the

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members of reference group. The DIF procedures used and the results of these analyses are detailed in this section. It should be noted, though, that all items included on the MAP ELA, Mathematics, and Science assessments have been thoroughly reviewed for content and bias issues by Missouri educators and DRC content experts to ensure that they do not tap knowledge or specific abilities irrelevant to the construct the test intends to measure. Therefore, DIF flags do not necessarily indicate that an item is biased; rather, DIF flags indicate that the item functions differently for equally able members of different groups (Camilli & Shepard, 1994). Items are not necessarily suppressed from operational scoring if they are flagged for DIF.

The position of DRC concerning test bias is based on two general propositions. First, students may differ in their background knowledge, cognitive and academic skills, language, attitudes, and values. To the degree that these differences are large, no one curriculum and no one set of instructional materials will be equally suitable for all. Therefore, no one test will be equally appropriate for all. Furthermore, it is difficult to specify what amount of difference can be called large and to determine how these differences will affect the outcome of a particular test. Second, schools have been assigned the tasks of developing certain basic cognitive skills and supporting development of these skills equitably among all students. Therefore, there is a need for tests that measure the common skills and bodies of knowledge that are common to all learners. The test publisher's task is to develop assessments that measure these key cognitive skills without introducing extraneous or construct-irrelevant elements into the performances on which the measurement is based. If these tests require that students have culturally specific knowledge and skills not taught in school, differences in performance among students can occur because of differences in student background and out-of-school learning. Such tests are measuring different things for different groups and can be called biased (Camilli & Shepard, 1994; Green, 1975).

In order to lessen such biases, DRC strives to minimize the role of extraneous elements, thereby increasing the number of students for whom the test is appropriate. As discussed above and in Chapter 4 of this report, careful attention is given during the test development and test construction processes to lessen the influence of these elements for large numbers of students. Content and bias review committees are used to detect these elements and lessen their influence on students. Unfortunately, in some cases, these elements may continue to play a substantial role. To assess the extent to which items may be performing differently for various subgroups of interest, DIF analyses are conducted after each operational test administration.

DIF statistics are used to quantify differences in item performance between two groups after controlling for examinees' overall achievement level. Two DIF statistics that are commonly used for this purpose are the Mantel-Haenszel (MH) statistic (1959) and the standardized mean difference (SMD) between the reference and focal groups, proposed by Dorans and Schmitt (1991).

The MH statistic is computed as follows (Zwick, Donoghue, & Grima, 1993):

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$$\text{Mantel } \chi^2 = \frac{\left(\sum_k F_k - \sum_k E(F_k)\right)^2}{\sum_k \text{Var}(F_k)},$$

where F_k is the sum of scores for the focal group at the kth level of the matching variable. Note that the MH statistic is sensitive to the case count such that larger sample sizes increase the value of chi-square.

In addition to the MH chi-square statistic, the delta statistic (MH-D DIF) was computed for all items. The Educational Testing Service first developed the MH-D DIF statistic.

To compute delta, alpha (the odds ratio) is first computed:

$$\alpha_{MH} = \frac{\sum_{k=1}^{K} N_{r1k} N_{f0k} / N_k}{\sum_{k=1}^{K} N_{f1k} N_{r0k} / N_k},$$

where N_{r1k} is the number of correct responses in the reference group at ability level k, N_{f0k} is the number of incorrect responses in the focal group at ability level k, N_k is the total number of responses, N_{f1k} is the number of correct responses in the focal group at ability level k, and N_{r0k} is the number of incorrect responses in the reference group at ability level k. MH-D DIF is then computed:

$$\text{MH-D DIF} = -2.35 \ln(\alpha_{MH})$$

For selected-response items, the MH (χ^2_{MH}) statistic was used to evaluate potential DIF items. In the MH procedure, subgroups are matched by their raw total test score, using a contingency table with k ability levels. When applying the MH procedure, the log-odds ratio α is assumed to be constant across the K matched levels. The χ^2_{MH}, then, estimates a pooled common-odds ratio. Taking the natural logarithm of the common-odds ratio and its confidence limits and multiplying these by the constant −2.35 allows the resulting values to then be placed on the MH delta metric (Δ_{MH}) for interpretive purposes. Items were flagged for DIF using the following criteria:

- Moderate DIF: significant MH chi-square statistic ($p < 0.05$) and $1.0 \leq |\text{MH D-DIF}| < 1.5$
- Large DIF: significant MH chi-square statistic ($p < 0.05$) and $|\text{MH D-DIF}| \geq 1.5$

For constructed-response items, an effect size (ES) statistic based on the MH chi-square is used. The ES is obtained by dividing the SMD statistics by the standard deviation of the item. The SMD is an effect size index of DIF, which is relatively easy to interpret

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(Zwick et al., 1993). The SMD compares the mean of the reference and focal group, adjusting for the distribution of reference and focal group members on the conditioning variable (Zwick et al., 1993), which for these analyses is the MAP raw score. SMD is computed as follows (Zwick et al., 1993):

$$SMD = p_{Fk}\left(\sum_k m_{Fk} - \sum_k m_{Rk}\right),$$

where p_{Fk} is the proportion of the focal group members at the kth level of the matching variable, m_{Fk} is $1/N_{F1k}$, and m_{Rk} is $1/N_{R1k}$. Items are flagged using the same rules that are used in the National Assessment of Educational Progress:

- Moderate DIF: If the MH statistic is significant ($p < .05$) and $|ES|$ is between 0.17 and 0.25
- Large DIF: If the MH statistic is significant ($p < .05$) and $|ES| \geq 0.25$

A positive DIF value indicates that the item favors the focal group, while a negative value indicates that the item disadvantages the focal group. DIF statistics were computed for the following subgroups:

- ***Gender:*** The focal group is females; the reference group is males.
- ***Race/Ethnicity:*** The focal groups are students whose race/ethnicity is reported as Black, Hispanic, Asian/Pacific Islander, American Indian, or Other; the reference group is students whose race/ethnicity is reported as White.
- ***Accommodations:*** The focal group is students who had one or more testing accommodation; the reference group is all others.

A negative SMD value implies that the focal group has a lower mean item score than the reference group, whereas a positive value implies that the focal group has a higher mean item score than the reference group, conditioned on the matching test score.

The minimum case count for the focal group was set at 200, and the minimum case count for the reference group was set at 400. The DIF analyses are not performed for subgroups of fewer than 200 students. In these cases, the statistical procedures do not have sufficient power to detect differences, should they exist.

Tables 9.27 through 9.29 summarize the number of moderate and large DIF flags by grade for each focal group that included at least 200 students for ELA, Mathematics, and Science, respectively. For example, consider Grade 3 ELA. In this grade, one item was flagged for DIF in favor of the Asian/Pacific Islander group (moderate DIF) and one item was flagged against the Asian/Pacific Islander subgroup (large DIF). In addition, and one item was flagged against Black students (moderate DIF). No DIF was computed for a group of students using testing accommodations because of insufficient case count in the focal group.

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Overall, the number of items flagged for DIF in MAP Spring 2019 tests was small. The exceptions were ELA Grades 4 and 8, in which several writing prompts (or rather writing prompt components) were flagged for either moderate or large DIF. The writing prompts were typically flagged for DIF in favor of female students in Grades 4 and 8 and against Black students and students using testing accommodations in Grade 8.

Again, any items included on the MAP (including those items flagged for DIF) have been thoroughly reviewed for content and bias issues by Missouri teachers, DESE staff, and DRC test development experts.

9.5 Impact Analysis

The impact of testing on subgroups of students can be determined and reported in the form of average scores, percentages of students in different proficiency levels, and test score reliability.

9.5.1 Comparison of Scale Score Means by Subgroup

One way to evaluate the magnitude of the differences between mean scale scores is to calculate the effect size. Cohen's *d* was used to calculate the effect size. Cohen's *d* is given by the formula

$$d = \frac{\overline{x_a} - \overline{x_b}}{\sqrt{\frac{(n_a - 1)s_a^2 + (n_b - 1)s_b^2}{(n_a + n_b) - 2}}},$$

where $\overline{x_a}$ is the mean score of group A, $\overline{x_b}$ is the mean score of group B, s_a^2 is the variance of group A, s_b^2 is the variance of group B, n_a is the number of students in group A, and n_b is the number of students in group B.

Cohen's *d,* then, expresses the difference in group means in terms of the standard deviation. For example, if $d = 0.34$ for two groups, then it may be interpreted that the mean difference between the two groups is 0.34 of the pooled standard deviation. Cohen (1988) offered guidelines for interpreting the meaning of the *d* statistic: $d \geq 0.20$ is a small effect size, $d \geq 0.50$ is a medium effect size, and $d \geq 0.80$ is a large effect size.

The mean scale score and the mean scale score differences for subgroups of students are reported in Table 9.30 for ELA, in Table 9.31 for Mathematics, and in Table 9.32 for Science. Using Cohen's (1988) guidelines, certain data trends become apparent.

In English Language Arts (see Table 9.30), there are small differences between the mean test scores of female students and male students, with female students outperforming male students in Grades 4, 5, 7, and 8 (no difference in Grades 3 and 6).

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There is a medium difference in mean English Language Arts test scores of Black students compared to White students in all ELA grades, with Black students underperforming White students. There is a small difference between the mean test scores of Hispanic and White students, with Hispanic students underperforming White students in English Language Arts in all grades. There is a small difference between the mean test scores of American Indian and White students, with American Indian students underperforming White students in English Language Arts in all grades except for Grade 6. There is also a small difference between the mean English Language Arts test scores of Asian/Pacific Islander students and White students, with Asian/Pacific Islander students outperforming White students in Grades 5 through 8 (no difference in Grades 3 and 4). There is a large difference between the mean English Language Arts test scores of students using testing accommodations compared to students not using testing accommodations in all grades, with students not using testing accommodations outperforming their peers who use accommodations in all grade levels.

In Mathematics (refer to Table 9.31), there is no significant difference between the mean test scores of female students and male students in any grade.

Also, in Mathematics, there is a medium difference between the mean test scores of Black students compared to White students, with Black students underperforming White students in Grades 5, 6, and 8. There is a large difference between the mean test scores of Black and White students, with Black students underperforming White students in Grades 3, 4, and 7. There is a small difference between the mean Mathematics test scores of Hispanic students compared to White students, with Hispanic students underperforming White students in all grades. There is a small difference between the mean test scores of American Indian students compared to White students, with American Indian students underperforming White students in all grades. Finally, there is a small difference between the mean Mathematics test scores of Asian/Pacific Islander students and White students, with Asian/Pacific Islander students outperforming White students in all grades.

There is a large difference between the mean Mathematics test scores of students not using testing accommodations and students using testing accommodations, with students not using testing accommodations outperforming students using testing accommodations in all grades.

In Science (see Table 9.32), there is no difference between the mean test scores of female students and male students in either of the two testing grades.

There is a large difference between the mean Science test scores of Black students and White students in both grades, with Black students underperforming White students. There is a small difference between the mean Science test scores of Hispanic students and White students in both grades, with Hispanic students underperforming White students. There is also a small difference between the mean Science test scores of American Indian students and White students in both grades, with American Indian students underperforming White students. There is a small difference between the mean Science

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test scores of Asian/Pacific Islander students and White students in Grade 8, with Asian/Pacific Islander students outperforming White students.

In addition, there is a large difference between the mean Science test scores of students who do not use testing accommodations and students who use testing accommodations in both grades, with students who do not use testing accommodations outperforming students who use testing accommodations.

The trends observed in the Spring 2019 ELA and Mathematics data for mean scale score differences are similar to the trends observed in the Spring 2018 data. The trends observed in the Spring 2019 Science data for mean scale score differences are similar to the trends observed in the Spring 2017 data.

9.5.2 Comparison of Student Performance Level Classification by Subgroup

Tables 9.33 through 9.35 show the percentages of students in different proficiency levels by student race/ethnicity, student gender, and testing accommodation use for ELA, Mathematics, and Science, respectively. Although no statistical test was conducted on the performance level data by subgroup, the student classification into performance levels trend follows that of the scale score difference by subgroup trend (described in Section 9.5.1).

In terms of gender, more female students than male students were classified as *Proficient* or above (with the differences between genders ranging from approximately 8% to 11%) in all ELA grades. The percentages of female and male students were generally similar in *Proficient* or above performance levels for Mathematics (with differences of less than 4%) across all grade levels. For Science, the percentages of female and male students were comparable (with a difference of 2% or less) in *Proficient* or above performance levels.

There were some consistent patterns in performance by ethnicity across grades and content areas. In terms of the *Proficient* or above categories, the prevailing tendency was that there were higher percentages of Asian/Pacific Islander students as a group, followed by White students, American Indian students and Hispanic students, and Black students in all grades and both content areas. The inverse sequence was found at the *Below Basic* performance level.

Performance level results showed that there much were higher percentages of students not using testing accommodations who were classified as *Proficient* or above compared to students using testing accommodations. These differences ranged from approximately 34% to 43% for ELA, depending on the grade level. For Mathematics, these differences ranged from 28% to 41%, depending on the grade level. For Science, the difference was approximately 34% in Grade 5 and 36% in Grade 8.

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9.5.3 Test Reliability by Subgroup

AERA, APA, & NCME (2014) Standard 2.11 states the following:

> Test publishers should provide estimates of reliability/precision as soon as feasible for each relevant subgroup for which the test is recommended. (p. 45)

Tables 9.36 through 9.49 show the test form reliability coefficients and standard error of measurement by content area and grade for student race/ethnicity, student gender, and whether or not students used any testing accommodations.

The reliability coefficients for English Language Arts forms ranged from 0.84 to 0.94 (see Tables 9.36 through 9.41) across all grades and subgroups. For Mathematics, the reliability coefficients ranged from 0.76 to 0.95 (refer to Tables 9.42 through 9.47) across all grades, forms, and subgroups. As shown in Tables 9.48 and 9.49, the reliability coefficients for subgroups of students ranged from 0.84 to 0.94 for Science.

The lowest reliability coefficients (lower than 0.80) were observed for students using testing accommodations in Mathematics Grades 5, 7, and 8. Based on the evaluation of the distributions of the test scores for students using testing accommodations in these grades, it was found that the score ranges for these groups of students were more restricted than for other groups, with proportionally fewer students using testing accommodations obtaining higher test scores. The variance of the test scores for these groups of students was lower than the variance of the scores for other groups, potentially leading to lower test reliability for these groups. Except for the groups of students using testing accommodations, the analysis of the test reliability by subgroup shows that the test reliability is of acceptable magnitude for all subgroups. Note that the reliability coefficients are not reported for subgroups smaller than 50 students.

9.6 Summary

In summary, the analyses of the internal structure of the test can indicate the degree to which the relationships among test items and test components conform to the test construct, which in turn provide a basis for test score interpretation. This chapter of the report includes reliability analysis results, indicating that the MAP tests produce scores that would be relatively stable if the test were administered repeatedly under similar conditions. The assumption that the content area MAP tests were unidimensional (that is, each grade level test measured one primary dimension) was confirmed through PCA. The relationship between the MAP scale scores and other variables was explored and validated through the measures of correlations of the ELA, Mathematics, and Science scores for the total population and for subgroups; comparisons of student performance on the MAP with performance on the NAEP; and examination of the results of linking MAP ELA and Mathematics scales to MetaMetrics Lexile and Quantile scales. The test fairness concerns that are relevant to the administration of MAP were also addressed in this chapter. In addition, student performance by subgroups was presented and discussed. The information in this chapter supports multiple best practices of the testing industry and, in particular, is related to the following AERA, APA, & NCME (2014) standards:

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- Standard 1.13—If the rationale for a test score interpretation for a given use depends on premises about the relationships among test items or among parts of the test, evidence concerning the internal structure of the test should be provided.
- Standard 1.21—When statistical adjustments, such as those for restriction of range or attenuation, are made, both adjusted and unadjusted coefficients, as well as the specific procedure used, and all statistics used in the adjustment, should be reported. Estimates of the construct-criterion relationship that remove the effects of measurement error on the test should be clearly reported as adjusted estimates.
- Standard 2.0—Appropriate evidence of reliability/precision should be provided for the interpretation for each intended score use.
- Standard 2.3—For each total score, subscore, or combination of scores that is to be interpreted, estimates of relevant indices of reliability/precision should be reported.
- Standard 2.11—Test publishers should provide estimates of reliability/precision as soon as feasible for each relevant subgroup for which the test is recommended.
- Standard 2.13—The standard error of measurement, both overall and conditional (if reported), should be provided in units of each reported score.
- Standard 2.14—When possible and appropriate, conditional standard errors of measurement should be reported at several score levels unless there is evidence that the standard error is constant across score levels. Where cut scores are specified for selection or classification, the standard errors of measurement should be reported in the vicinity of each cut score.
- Standard 2.16—When a test or combination of measures is used to make classification decisions, estimates should be provided of the percentage of test takers who would be classified in the same way on two replications of the procedure.
- Standard 2.19—Each method of quantifying the reliability/precision of scores should be described clearly and expressed in terms of statistics appropriate to the method. The sampling procedures used to select test takers for reliability/precision analyses and the descriptive statistics on these samples, subject to privacy obligations where applicable, should be reported.
- Standard 3.1—Those responsible for test development, revision, and administration should design all steps of the testing process to promote valid score interpretations for intended score uses for the widest possible range of individuals and relevant subgroups in the intended population.
- Standard 3.2—Test developers are responsible for developing tests that measure the intended construct and for minimizing the potential for tests being affected by construct-irrelevant characteristics, such as linguistic, communicative, cognitive, cultural, physical, or other characteristics.
- Standard 3.3—Those responsible for test development should include relevant subgroups in validity, reliability/precision, and other preliminary studies used when constructing the test.
- Standard 3.4—Test takers should receive comparable treatment during the test administration and scoring process.

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- Standard 3.5—Test developers should specify and document provisions that have been made to test administration and scoring procedures to remove construct-irrelevant barriers for all relevant subgroups in the test-taker population.
- Standard 3.6—Where credible evidence indicates that test scores may differ in meaning for relevant subgroups in the intended examinee population, test developers and/or users are responsible for examining the evidence for validity of score interpretations for intended uses for individuals from those subgroups. What constitutes a significant difference in subgroup scores and what actions are taken in response to such differences may be defined by applicable laws.

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Table 9.1: Test Reliability, English Language Arts

Grade	Form	Number of Items	Number of Score Points	Cronbach's Alpha	SEM	N-Count
3	A	50	56	0.92	3.18	30,964
	B	49	56	0.91	3.27	35,192
4	A01	42	56	0.91	3.17	5,332
	A05	42	56	0.91	3.07	5,280
	A09	42	56	0.91	3.12	5,323
	A13	42	56	0.91	3.08	7,950
	A17	42	56	0.91	3.11	7,981
	B04	42	56	0.91	3.19	9,570
	B06	42	56	0.91	3.17	5,298
	B10	42	56	0.91	3.13	5,285
	B14	42	56	0.91	3.18	5,298
	B18	42	56	0.91	3.15	7,921
	BM4	42	56	0.91	3.19	2,631
5	A	45	56	0.91	3.24	32,976
	B	46	57	0.91	3.17	36,544
6	A	44	52	0.89	3.27	35,864
	B	44	52	0.88	3.22	34,080
7	A	42	52	0.91	3.17	35,128
	B	42	52	0.90	3.14	32,816
8	A01	42	56	0.92	3.19	9,206
	A05	42	56	0.91	3.07	5,030
	A09	42	56	0.91	3.08	7,577
	A13	42	56	0.91	3.09	5,065
	A17	42	56	0.91	3.19	7,579
	B04	43	56	0.92	3.25	6,911
	B06	43	56	0.91	3.15	7,571
	B10	43	56	0.90	3.27	5,093
	B14	43	56	0.91	3.14	7,607
	B18	43	56	0.91	3.21	5,077

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Table 9.2: Test Reliability, Mathematics

Grade	Form	Number of Items	Number of Score Points	Cronbach's Alpha	SEM	N-Count
3	A	47	48	0.93	2.85	32,148
	B	47	48	0.93	2.87	34,168
4	A	47	48	0.93	2.94	31,812
	B	47	48	0.93	2.96	36,312
5	A	48	48	0.93	2.92	32,936
	B	48	48	0.93	2.91	36,864
6	A	52	54	0.94	3.00	33,696
	B	52	54	0.94	2.98	36,320
7	A	52	54	0.92	3.15	32,616
	B	52	54	0.92	3.15	34,568
8	A	52	54	0.91	3.14	26,752
	B	52	54	0.91	3.16	28,576

Table 9.3: Test Reliability, Science

Grade	Form	Number of Items	Number of Score Points	Cronbach's Alpha	SEM	N-Count
5	A	42	61	0.90	3.51	35,456
	B	42	60	0.90	3.48	34,192
8	A	42	63	0.92	3.49	34,968
	B	42	62	0.92	3.50	31,728

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Table 9.4: Conditional Standard Error of Measurement at Proficiency Cut Scores, English Language Arts

Grade	Form	*Basic*		*Proficient*		*Advanced*	
		Cut Score	CSEM	Cut Score	CSEM	Cut Score	CSEM
3	A	331	10	364	10	395	11
	B		11		11		12
4	A01	337	11	388	10	419	12
	A05		11		10		12
	A09		11		10		12
	A13		11		10		12
	A17		11		10		12
	B04		12		10		11
	B06		12		10		12
	B10		12		10		12
	B14		12		10		12
	B18		12		10		12
	BM4		12		10		11
5	A	351	11	403	10	431	12
	B		10		10		13
6	A	371	11	413	10	438	12
	B		12		10		11
7	A	384	12	435	10	456	11
	B		12		11		12
8	A01	393	11	443	10	476	11
	A05		11		10		11
	A09		11		10		11
	A13		11		10		12
	A17		11		10		12
	B04		11		10		11
	B06		11		10		11
	B10		12		10		12
	B14		12		10		11
	B18		11		10		11

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Table 9.5: Conditional Standard Error of Measurement at Proficiency Cut Scores, Mathematics

Grade	Form	*Basic*		*Proficient*		*Advanced*	
		Cut Score	CSEM	Cut Score	CSEM	Cut Score	CSEM
3	A	326	11	362	9	390	10
	B		11		9		10
4	A	358	10	387	8	413	8
	B		11		8		8
5	A	377	11	410	7	435	7
	B		11		7		7
6	A	388	8	417	6	438	6
	B		8		6		6
7	A	394	13	435	8	462	8
	B		12		8		8
8	A	420	15	468	11	506	10
	B		15		10		9

Table 9.6: Conditional Standard Error of Measurement at Proficiency Cut Scores, Science

Grade	Form	*Basic*		*Proficient*		*Advanced*	
		Cut Score	CSEM	Cut Score	CSEM	Cut Score	CSEM
5	A	275	11	310	11	344	12
	B		11		10		11
8	A	468	11	510	9	537	9
	B		10		9		9

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Table 9.7: Classification Accuracy and Consistency Conditioned on Level of Performance, English Language Arts

Grade	Form	Accuracy				Consistency			
		Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
3	A	0.86	0.75	0.73	0.88	0.81	0.64	0.66	0.82
	B	0.88	0.74	0.70	0.87	0.81	0.65	0.61	0.79
4	A01	0.83	0.84	0.72	0.88	0.75	0.81	0.63	0.77
	A05	0.84	0.84	0.72	0.87	0.79	0.79	0.65	0.77
	A09	0.83	0.84	0.71	0.88	0.76	0.80	0.65	0.76
	A13	0.95	0.73	0.58	0.98	0.85	0.80	0.63	0.86
	A17	0.84	0.84	0.71	0.88	0.76	0.80	0.65	0.77
	B04	0.84	0.84	0.71	0.88	0.75	0.78	0.64	0.75
	B06	0.83	0.83	0.71	0.89	0.74	0.78	0.66	0.77
	B10	0.82	0.84	0.71	0.88	0.74	0.78	0.64	0.77
	B14	0.82	0.83	0.70	0.88	0.73	0.77	0.63	0.77
	B18	0.82	0.84	0.71	0.88	0.74	0.78	0.63	0.78
	BM4	0.82	0.83	0.72	0.89	0.73	0.78	0.66	0.79
5	A	0.84	0.86	0.70	0.86	0.71	0.79	0.62	0.78
	B	0.85	0.86	0.69	0.84	0.77	0.80	0.59	0.79
6	A	0.85	0.79	0.69	0.84	0.77	0.75	0.58	0.77
	B	0.83	0.79	0.69	0.84	0.70	0.73	0.57	0.77
7	A	0.84	0.82	0.63	0.86	0.79	0.76	0.53	0.81
	B	0.83	0.81	0.57	0.87	0.79	0.77	0.47	0.80
8	A01	0.88	0.82	0.77	0.84	0.84	0.76	0.67	0.76
	A05	0.87	0.83	0.77	0.85	0.78	0.79	0.67	0.77
	A09	0.85	0.83	0.76	0.86	0.76	0.77	0.66	0.78
	A13	0.85	0.83	0.75	0.86	0.75	0.79	0.65	0.78
	A17	0.86	0.84	0.74	0.85	0.75	0.79	0.65	0.78
	B04	0.86	0.83	0.75	0.86	0.78	0.78	0.66	0.78
	B06	0.85	0.83	0.74	0.84	0.78	0.77	0.66	0.76
	B10	0.85	0.83	0.75	0.84	0.75	0.79	0.64	0.78
	B14	0.86	0.82	0.74	0.84	0.75	0.77	0.65	0.79
	B18	0.84	0.84	0.76	0.84	0.78	0.77	0.65	0.78

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Table 9.8: Classification Accuracy and Consistency Conditioned on Level of Performance, Mathematics

Grade	Form	Accuracy				Consistency			
		Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
3	A	0.88	0.78	0.75	0.89	0.85	0.70	0.64	0.82
	B	0.88	0.78	0.75	0.89	0.84	0.71	0.65	0.82
4	A	0.90	0.74	0.77	0.91	0.84	0.64	0.70	0.86
	B	0.90	0.74	0.75	0.91	0.84	0.65	0.67	0.85
5	A	0.85	0.78	0.79	0.90	0.80	0.74	0.70	0.81
	B	0.92	0.76	0.73	0.98	0.84	0.74	0.71	0.85
6	A	0.90	0.80	0.77	0.91	0.85	0.73	0.66	0.85
	B	0.91	0.79	0.76	0.91	0.86	0.74	0.67	0.85
7	A	0.88	0.80	0.77	0.90	0.82	0.74	0.67	0.81
	B	0.89	0.80	0.78	0.89	0.84	0.73	0.69	0.82
8	A	0.88	0.80	0.80	0.90	0.84	0.73	0.71	0.78
	B	0.88	0.79	0.79	0.90	0.83	0.72	0.69	0.80

Table 9.9: Classification Accuracy and Consistency Conditioned on Level of Performance, Science

Grade	Form	Accuracy				Consistency			
		Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
5	A	0.86	0.77	0.73	0.83	0.80	0.67	0.65	0.72
	B	0.87	0.78	0.77	0.83	0.84	0.68	0.69	0.71
8	A	0.89	0.80	0.74	0.86	0.81	0.75	0.63	0.77
	B	0.89	0.81	0.74	0.87	0.85	0.74	0.63	0.79

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Table 9.10: Classification Accuracy and Consistency Conditioned on Cut Points, English Language Arts

Grade	Form	Accuracy			Consistency		
		Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
3	A	0.94	0.93	0.93	0.92	0.90	0.91
	B	0.94	0.92	0.93	0.91	0.89	0.91
4	A01	0.96	0.92	0.92	0.95	0.90	0.90
	A05	0.97	0.92	0.92	0.95	0.90	0.89
	A09	0.96	0.92	0.92	0.95	0.90	0.90
	A13	0.97	0.91	0.88	0.96	0.92	0.90
	A17	0.96	0.92	0.92	0.95	0.90	0.90
	B04	0.94	0.93	0.94	0.92	0.90	0.92
	B06	0.96	0.93	0.92	0.94	0.90	0.90
	B10	0.96	0.93	0.92	0.94	0.90	0.89
	B14	0.96	0.92	0.92	0.94	0.90	0.89
	B18	0.96	0.93	0.92	0.93	0.90	0.90
	BM4	0.96	0.92	0.93	0.94	0.90	0.90
5	A	0.96	0.93	0.93	0.94	0.89	0.90
	B	0.96	0.93	0.93	0.94	0.89	0.91
6	A	0.94	0.92	0.93	0.92	0.89	0.90
	B	0.94	0.92	0.92	0.91	0.88	0.90
7	A	0.95	0.93	0.93	0.92	0.90	0.90
	B	0.95	0.91	0.92	0.94	0.88	0.89
8	A01	0.93	0.94	0.96	0.90	0.92	0.94
	A05	0.96	0.93	0.93	0.94	0.90	0.90
	A09	0.96	0.92	0.93	0.94	0.89	0.91
	A13	0.96	0.92	0.93	0.94	0.89	0.91
	A17	0.96	0.93	0.93	0.94	0.89	0.90
	B04	0.94	0.93	0.95	0.92	0.91	0.92
	B06	0.96	0.93	0.92	0.94	0.90	0.90
	B10	0.96	0.92	0.93	0.94	0.90	0.90
	B14	0.95	0.92	0.93	0.94	0.90	0.90
	B18	0.96	0.93	0.93	0.95	0.89	0.90

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Table 9.11: Classification Accuracy and Consistency Conditioned on Cut Points, Mathematics

Grade	Form	Accuracy			Consistency		
		Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
3	A	0.95	0.93	0.94	0.92	0.91	0.92
	B	0.94	0.93	0.95	0.92	0.91	0.92
4	A	0.94	0.94	0.95	0.92	0.91	0.93
	B	0.94	0.94	0.95	0.91	0.91	0.93
5	A	0.93	0.94	0.95	0.90	0.91	0.94
	B	0.92	0.96	0.95	0.90	0.94	0.95
6	A	0.94	0.94	0.96	0.92	0.91	0.94
	B	0.94	0.94	0.96	0.92	0.92	0.94
7	A	0.93	0.94	0.96	0.90	0.91	0.94
	B	0.93	0.94	0.96	0.91	0.92	0.94
8	A	0.92	0.94	0.97	0.89	0.91	0.96
	B	0.92	0.94	0.97	0.89	0.91	0.96

Table 9.12: Classification Accuracy and Consistency Conditioned on Cut Points, Science

Grade	Form	Accuracy			Consistency		
		Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
5	A	0.93	0.92	0.94	0.90	0.89	0.92
	B	0.94	0.92	0.95	0.91	0.90	0.92
8	A	0.95	0.93	0.94	0.93	0.89	0.91
	B	0.95	0.93	0.94	0.93	0.89	0.93

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Table 9.13: Principal Component Analysis, English Language Arts

Grade	Form	Components	Eigenvalue	Percentage of Variance Explained	Cumulative Percentage of Variance Explained
3	A	First Component	10.55	21.11	21.11
		Second Component	1.66	3.33	24.43
		Ratio (First/Second)	6.35		
	B	First Component	9.60	19.60	19.60
		Second Component	1.63	3.32	22.92
		Ratio (First/Second)	5.90		
4	A01	First Component	9.82	23.37	23.37
		Second Component	1.43	3.40	26.77
		Ratio (First/Second)	6.88		
	A05	First Component	9.66	23.00	23.00
		Second Component	1.48	3.51	26.52
		Ratio (First/Second)	6.55		
	A09	First Component	9.66	23.00	23.00
		Second Component	1.47	3.49	26.49
		Ratio (First/Second)	6.59		
	A13	First Component	9.53	22.70	22.70
		Second Component	1.49	3.54	26.24
		Ratio (First/Second)	6.40		
	A17	First Component	9.53	22.70	22.70
		Second Component	1.50	3.57	26.28
		Ratio (First/Second)	6.35		
	B04	First Component	9.40	22.38	22.38
		Second Component	1.49	3.55	25.93
		Ratio (First/Second)	6.31		
	B06	First Component	9.24	22.00	22.00
		Second Component	1.46	3.48	25.48
		Ratio (First/Second)	6.33		
	B10	First Component	9.37	22.30	22.30
		Second Component	1.53	3.65	25.95
		Ratio (First/Second)	6.12		
	B14	First Component	9.26	22.04	22.04
		Second Component	1.65	3.92	25.96
		Ratio (First/Second)	5.62		
	B18	First Component	9.40	22.39	22.39
		Second Component	1.49	3.55	25.94
		Ratio (First/Second)	6.31		
	BM4	First Component	9.37	22.30	22.30
		Second Component	1.45	3.45	25.75
		Ratio (First/Second)	6.47		
5	A	First Component	9.50	21.12	21.12
		Second Component	1.29	2.87	23.99
		Ratio (First/Second)	7.35		
	B	First Component	9.66	21.01	21.01
		Second Component	1.40	3.05	24.06
		Ratio (First/Second)	6.89		

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Table 9.13: Principal Component Analysis, English Language Arts (cont.)

Grade	Form	Components	Eigenvalue	Percentage of Variance Explained	Cumulative Percentage of Variance Explained
6	A	First Component	8.26	18.77	18.77
		Second Component	1.14	2.59	21.37
		Ratio (First/Second)	7.24		
	B	First Component	7.89	17.92	17.92
		Second Component	1.17	2.67	20.59
		Ratio (First/Second)	6.73		
7	A	First Component	9.61	22.89	22.89
		Second Component	1.17	2.78	25.66
		Ratio (First/Second)	8.25		
	B	First Component	8.65	20.59	20.59
		Second Component	1.14	2.73	23.31
		Ratio (First/Second)	7.55		
8	A01	First Component	10.40	24.77	24.77
		Second Component	1.62	3.86	28.63
		Ratio (First/Second)	6.42		
	A05	First Component	9.57	22.78	22.78
		Second Component	1.51	3.59	26.37
		Ratio (First/Second)	6.35		
	A09	First Component	9.21	21.93	21.93
		Second Component	1.60	3.80	25.73
		Ratio (First/Second)	5.77		
	A13	First Component	9.29	22.13	22.13
		Second Component	1.61	3.83	25.96
		Ratio (First/Second)	5.78		
	A17	First Component	9.32	22.18	22.18
		Second Component	1.68	4.01	26.19
		Ratio (First/Second)	5.53		
	B04	First Component	10.13	23.56	23.56
		Second Component	1.62	3.76	27.32
		Ratio (First/Second)	6.27		
	B06	First Component	9.43	21.93	21.93
		Second Component	1.56	3.62	25.55
		Ratio (First/Second)	6.06		
	B10	First Component	9.15	21.27	21.27
		Second Component	1.57	3.64	24.91
		Ratio (First/Second)	5.84		
	B14	First Component	9.31	21.65	21.65
		Second Component	1.64	3.80	25.45
		Ratio (First/Second)	5.69		
	B18	First Component	9.36	21.76	21.76
		Second Component	1.51	3.51	25.27
		Ratio (First/Second)	6.19		

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Table 9.14: Principal Component Analysis, Mathematics

Grade	Form	Components	Eigenvalue	Percentage of Variance Explained	Cumulative Percentage of Variance Explained
3	A	First Component	11.10	23.61	23.61
		Second Component	1.49	3.17	26.78
		Ratio (First/Second)	7.44		
	B	First Component	11.07	23.54	23.54
		Second Component	1.58	3.36	26.91
		Ratio (First/Second)	7.00		
4	A	First Component	12.00	25.53	25.53
		Second Component	1.41	3.00	28.53
		Ratio (First/Second)	8.52		
	B	First Component	12.15	25.85	25.85
		Second Component	1.40	2.98	28.83
		Ratio (First/Second)	8.68		
5	A	First Component	11.35	23.65	23.65
		Second Component	1.44	3.00	26.65
		Ratio (First/Second)	7.90		
	B	First Component	11.55	24.06	24.06
		Second Component	1.51	3.16	27.22
		Ratio (First/Second)	7.63		
6	A	First Component	13.38	25.73	25.73
		Second Component	1.92	3.70	29.43
		Ratio (First/Second)	6.96		
	B	First Component	13.61	26.17	26.17
		Second Component	1.93	3.72	29.89
		Ratio (First/Second)	7.04		
7	A	First Component	11.61	22.33	22.33
		Second Component	1.55	2.99	25.31
		Ratio (First/Second)	7.47		
	B	First Component	11.41	21.94	21.94
		Second Component	1.63	3.14	25.07
		Ratio (First/Second)	6.99		
8	A	First Component	10.27	19.75	19.75
		Second Component	1.88	3.61	23.36
		Ratio (First/Second)	5.47		
	B	First Component	10.24	19.69	19.69
		Second Component	1.78	3.42	23.11
		Ratio (First/Second)	5.76		

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Table 9.15: Principal Component Analysis, Science

Grade	Form	Components	Eigenvalue	Percentage of Variance Explained	Cumulative Percentage of Variance Explained
5	A	First Component	8.45	20.11	20.11
		Second Component	1.13	2.68	22.79
		Ratio (First/Second)	7.49		
	B	First Component	9.08	21.62	21.62
		Second Component	1.23	2.94	24.56
		Ratio (First/Second)	7.36		
8	A	First Component	10.46	24.90	24.90
		Second Component	1.26	3.01	27.91
		Ratio (First/Second)	8.28		
	B	First Component	10.65	25.37	25.37
		Second Component	1.38	3.30	28.67
		Ratio (First/Second)	7.69		

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Table 9.16: Uncorrected Correlation Coefficient (below Diagonal) and Corrected Correlation Coefficient (above Diagonal) among Reporting Categories, English Language Arts

Grade	Form	No.	Reporting Category	Number of Items	1	2	3	4
3	A	1	Reading	23	.	0.92	0.92	0.92
		2	Research	7	0.68	.	0.96	0.95
		3	Writing	12	0.72	0.66	.	0.92
		4	Speaking/Listening	8	0.70	0.64	0.66	.
	B	1	Reading	24	.	1.00	0.91	0.91
		2	Research	6	0.65	.	0.98	0.96
		3	Writing	11	0.70	0.59	.	0.88
		4	Speaking/Listening	8	0.67	0.56	0.61	.
4	A01	1	Reading	20	.	0.95	0.86	0.90
		2	Research	7	0.65	.	0.84	0.87
		3	Writing	7	0.68	0.55	.	0.79
		4	Speaking/Listening	8	0.69	0.55	0.57	.
	A05	1	Reading	20	.	1.00	0.84	0.90
		2	Research	7	0.68	.	0.88	0.95
		3	Writing	7	0.67	0.58	.	0.75
		4	Speaking/Listening	8	0.68	0.59	0.55	.
	A09	1	Reading	20	.	0.98	0.84	0.91
		2	Research	7	0.67	.	0.86	0.92
		3	Writing	7	0.67	0.56	.	0.80
		4	Speaking/Listening	8	0.68	0.57	0.58	.
	A13	1	Reading	20	.	0.98	0.85	0.89
		2	Research	7	0.67	.	0.89	0.90
		3	Writing	7	0.67	0.58	.	0.78
		4	Speaking/Listening	8	0.67	0.57	0.56	.
	A17	1	Reading	20	.	0.99	0.83	0.90
		2	Research	7	0.68	.	0.85	0.94
		3	Writing	7	0.65	0.55	.	0.76
		4	Speaking/Listening	8	0.68	0.59	0.54	.
	B04	1	Reading	21	.	0.92	0.81	0.94
		2	Research	7	0.64	.	0.83	0.91
		3	Writing	7	0.64	0.54	.	0.78
		4	Speaking/Listening	7	0.69	0.54	0.54	.
	B06	1	Reading	21	.	0.93	0.82	0.96
		2	Research	7	0.62	.	0.83	0.93
		3	Writing	7	0.65	0.51	.	0.80
		4	Speaking/Listening	7	0.69	0.52	0.53	.
	B10	1	Reading	21	.	0.91	0.80	0.97
		2	Research	7	0.61	.	0.79	0.93
		3	Writing	7	0.64	0.49	.	0.78
		4	Speaking/Listening	7	0.70	0.53	0.53	.
	B14	1	Reading	21	.	0.92	0.78	0.96
		2	Research	7	0.62	.	0.77	0.92
		3	Writing	7	0.62	0.48	.	0.73
		4	Speaking/Listening	7	0.69	0.53	0.49	.

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Table 9.16: Uncorrected Correlation Coefficient (below Diagonal) and Corrected Correlation Coefficient (above Diagonal) among Reporting Categories, English Language Arts (cont.)

Grade	Form	No.	Reporting Category	Number of Items	1	2	3	4
4	B18	1	Reading	21	.	0.94	0.83	0.98
		2	Research	7	0.63	.	0.84	0.95
		3	Writing	7	0.65	0.52	.	0.80
		4	Speaking/Listening	7	0.71	0.54	0.53	.
	BM4	1	Reading	21	.	0.90	0.83	0.96
		2	Research	7	0.60	.	0.83	0.90
		3	Writing	7	0.66	0.52	.	0.75
		4	Speaking/Listening	7	0.69	0.52	0.51	.
5	A	1	Reading	20	.	0.96	0.96	0.93
		2	Research	5	0.60	.	0.98	0.96
		3	Writing	13	0.74	0.56	.	0.95
		4	Speaking/Listening	7	0.65	0.49	0.60	.
	B	1	Reading	19	.	0.92	0.95	0.87
		2	Research	5	0.67	.	0.93	0.90
		3	Writing	14	0.74	0.62	.	0.87
		4	Speaking/Listening	8	0.61	0.54	0.57	.
6	A	1	Reading	22	.	0.90	0.95	0.90
		2	Research	8	0.61	.	0.91	0.85
		3	Writing	7	0.62	0.50	.	0.90
		4	Speaking/Listening	7	0.65	0.52	0.53	.
	B	1	Reading	23	.	0.95	0.97	0.92
		2	Research	6	0.61	.	0.99	0.96
		3	Writing	7	0.61	0.50	.	0.93
		4	Speaking/Listening	8	0.67	0.57	0.53	.
7	A	1	Reading	22	.	0.93	0.93	0.93
		2	Research	6	0.71	.	0.94	0.95
		3	Writing	7	0.62	0.55	.	0.93
		4	Speaking/Listening	7	0.67	0.60	0.52	.
	B	1	Reading	22	.	0.96	0.96	0.90
		2	Research	6	0.69	.	1.00	0.94
		3	Writing	7	0.62	0.55	.	0.92
		4	Speaking/Listening	7	0.64	0.57	0.50	.
8	A01	1	Reading	22	.	0.90	0.72	0.86
		2	Research	7	0.66	.	0.68	0.86
		3	Writing	5	0.60	0.48	.	0.68
		4	Speaking/Listening	8	0.66	0.55	0.49	.
	A05	1	Reading	22	.	0.94	0.83	0.90
		2	Research	7	0.67	.	0.83	0.90
		3	Writing	5	0.66	0.55	.	0.79
		4	Speaking/Listening	8	0.65	0.55	0.53	.

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Table 9.16: Uncorrected Correlation Coefficient (below Diagonal) and Corrected Correlation Coefficient (above Diagonal) among Reporting Categories, English Language Arts (cont.)

Grade	Form	No.	Reporting Category	Number of Items	1	2	3	4
8	A09	1	Reading	22	.	0.91	0.78	0.89
		2	Research	7	0.64	.	0.78	0.87
		3	Writing	5	0.63	0.52	.	0.78
		4	Speaking/Listening	8	0.63	0.52	0.52	.
	A13	1	Reading	22	.	0.94	0.75	0.90
		2	Research	7	0.67	.	0.75	0.89
		3	Writing	5	0.60	0.50	.	0.73
		4	Speaking/Listening	8	0.64	0.53	0.49	.
	A17	1	Reading	22	.	0.92	0.77	0.90
		2	Research	7	0.65	.	0.75	0.92
		3	Writing	5	0.62	0.51	.	0.74
		4	Speaking/Listening	8	0.64	0.55	0.50	.
	B04	1	Reading	23	.	0.93	0.78	0.91
		2	Research	7	0.68	.	0.81	0.92
		3	Writing	5	0.63	0.54	.	0.76
		4	Speaking/Listening	8	0.68	0.57	0.53	.
	B06	1	Reading	23	.	0.92	0.80	0.91
		2	Research	7	0.66	.	0.82	0.93
		3	Writing	5	0.62	0.53	.	0.77
		4	Speaking/Listening	8	0.65	0.55	0.49	.
	B10	1	Reading	23	.	0.92	0.77	0.89
		2	Research	7	0.65	.	0.80	0.92
		3	Writing	5	0.60	0.51	.	0.75
		4	Speaking/Listening	8	0.63	0.53	0.47	.
	B14	1	Reading	23	.	0.92	0.74	0.90
		2	Research	7	0.66	.	0.75	0.90
		3	Writing	5	0.57	0.48	.	0.71
		4	Speaking/Listening	8	0.65	0.54	0.46	.
	B18	1	Reading	23	.	0.91	0.80	0.88
		2	Research	7	0.65	.	0.81	0.90
		3	Writing	5	0.63	0.53	.	0.78
		4	Speaking/Listening	8	0.62	0.53	0.51	.

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Table 9.17: Uncorrected Correlation Coefficient (below Diagonal) and Corrected Correlation Coefficient (above Diagonal) among Reporting Categories, Mathematics

Grade	Form	No.	Reporting Category	Number of Items	1	2	3	4
3	A	1	Number Sense and Operations in Base Ten	10	.	0.91	0.99	0.98
		2	Number Sense and Operations in Fractions	9	0.67	.	0.94	0.95
		3	Relationships and Algebraic Thinking	14	0.80	0.69	.	0.99
		4	Geometry and Measurement & Data and Statistics	14	0.76	0.67	0.77	.
	B	1	Number Sense and Operations in Base Ten	10	.	0.93	1.00	0.98
		2	Number Sense and Operations in Fractions	9	0.70	.	0.95	0.94
		3	Relationships and Algebraic Thinking	14	0.79	0.71	.	0.99
		4	Geometry and Measurement & Data and Statistics	14	0.76	0.69	0.76	.
4	A	1	Number Sense and Operations in Base Ten	14	.	0.97	1.00	0.97
		2	Number Sense and Operations in Fractions	11	0.79	.	0.96	0.98
		3	Relationships and Algebraic Thinking	9	0.77	0.74	.	0.98
		4	Geometry and Measurement & Data and Statistics	13	0.76	0.76	0.73	.
	B	1	Number Sense and Operations in Base Ten	14	.	0.97	1.00	0.97
		2	Number Sense and Operations in Fractions	11	0.78	.	0.97	0.97
		3	Relationships and Algebraic Thinking	9	0.76	0.73	.	0.98
		4	Geometry and Measurement & Data and Statistics	13	0.78	0.77	0.73	.

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Table 9.17: Uncorrected Correlation Coefficient (below Diagonal) and Corrected Correlation Coefficient (above Diagonal) among Reporting Categories, Mathematics (cont.)

Grade	Form	No.	Reporting Category	Number of Items	1	2	3	4
5	A	1	Number Sense and Operations in Base Ten	9	.	0.98	0.97	0.96
		2	Number Sense and Operations in Fractions	13	0.73	.	0.99	0.95
		3	Relationships and Algebraic Thinking	9	0.68	0.71	.	0.99
		4	Geometry and Measurement & Data and Statistics	17	0.75	0.76	0.74	.
	B	1	Number Sense and Operations in Base Ten	9	.	0.97	0.99	0.97
		2	Number Sense and Operations in Fractions	13	0.74	.	0.99	0.95
		3	Relationships and Algebraic Thinking	9	0.68	0.72	.	0.99
		4	Geometry and Measurement & Data and Statistics	17	0.74	0.77	0.73	.
6	A	1	Ratios and Proportional Relationships	10	.	1.02	1.00	0.98
		2	Number Sense and Operations	14	0.81	.	0.98	0.96
		3	Expressions, Equations and Inequalities	16	0.80	0.81	.	0.97
		4	Geometry and Measurement & Data Analysis, Statistics and Probability	12	0.73	0.75	0.76	.
	B	1	Ratios and Proportional Relationships	10	.	1.02	0.99	0.97
		2	Number Sense and Operations	14	0.81	.	0.98	0.96
		3	Expressions, Equations and Inequalities	16	0.80	0.82	.	0.97
		4	Geometry and Measurement & Data Analysis, Statistics and Probability	12	0.74	0.75	0.77	.

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Table 9.17: Uncorrected Correlation Coefficient (below Diagonal) and Corrected Correlation Coefficient (above Diagonal) among Reporting Categories, Mathematics (cont.)

Grade	Form	No.	Reporting Category	Number of Items	1	2	3	4
7	A	1	Ratios and Proportional Relationships	11	.	0.95	0.96	0.95
		2	Number Sense and Operations	10	0.71	.	0.98	0.97
		3	Expressions, Equations and Inequalities	13	0.75	0.72	.	0.96
		4	Geometry and Measurement & Data Analysis, Statistics and Probability	18	0.74	0.71	0.74	.
	B	1	Ratios and Proportional Relationships	11	.	0.96	0.97	0.96
		2	Number Sense and Operations	10	0.71	.	0.99	0.97
		3	Expressions, Equations and Inequalities	13	0.74	0.72	.	0.96
		4	Geometry and Measurement & Data Analysis, Statistics and Probability	18	0.75	0.72	0.74	.
8	A	1	Number Sense and Operations & Expressions, Equations and Inequalities	24	.	0.95	0.98	
		2	Geometry and Measurement & Data Analysis, Statistics and Probability	16	0.75	.	0.97	
		3	Functions	12	0.75	0.69	.	
	B	1	Number Sense and Operations & Expressions, Equations and Inequalities	24	.	0.96	0.97	
		2	Geometry and Measurement & Data Analysis, Statistics and Probability	16	0.75	.	0.97	
		3	Functions	12	0.76	0.71	.	

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Table 9.18: Uncorrected Correlation Coefficient (below Diagonal) and Corrected Correlation Coefficient (above Diagonal) among Reporting Categories, Science

Grade	Form	No.	Reporting Category	Number of Items	1	2	3
5	A	1	Physical Science	17	.	0.99	1.00
		2	Life Science	13	0.73	.	0.99
		3	Earth and Space Science	12	0.75	0.74	.
	B	1	Physical Science	15	.	0.98	1.00
		2	Life Science	14	0.74	.	0.99
		3	Earth and Space Science	13	0.76	0.76	.
8	A	1	Physical Science	14	.	0.97	0.99
		2	Life Science	14	0.74	.	0.99
		3	Earth and Space Science	14	0.76	0.82	.
	B	1	Physical Science	14	.	0.99	1.00
		2	Life Science	13	0.79	.	0.98
		3	Earth and Space Science	15	0.79	0.79	.

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Table 9.19: Reliability and Standard Error of Measurement of Reporting Categories, English Language Arts

Grade	Form	Reporting Category	Number of Items	Number of Score Points	N Count	Mean	Std. Dev.	Cronbach's Alpha	SEM
3	A	1	23	26	30,964	13.92	5.58	0.84	2.23
		2	7	8	30,956	5.47	2.04	0.65	1.20
		3	12	14	30,956	9.20	2.85	0.73	1.47
		4	8	8	30,952	5.10	2.13	0.69	1.18
	B	1	24	26	35,192	13.85	5.37	0.83	2.24
		2	6	8	35,192	4.41	1.89	0.51	1.32
		3	11	14	35,192	9.61	2.88	0.71	1.54
		4	8	8	35,184	5.06	2.08	0.67	1.20
4	A01	1	20	26	5,332	14.94	5.35	0.83	2.22
		2	7	8	5,333	5.19	1.79	0.56	1.18
		3	7	14	5,333	8.70	2.90	0.75	1.44
		4	8	8	5,332	5.22	2.09	0.70	1.15
	A05	1	20	26	5,280	15.06	5.27	0.82	2.23
		2	7	8	5,278	5.20	1.78	0.56	1.18
		3	7	14	5,278	8.46	2.54	0.76	1.23
		4	8	8	5,279	5.28	2.09	0.70	1.15
	A09	1	20	26	5,323	14.82	5.28	0.82	2.23
		2	7	8	5,322	5.19	1.80	0.57	1.19
		3	7	14	5,322	8.04	2.72	0.77	1.30
		4	8	8	5,322	5.27	2.05	0.68	1.16
	A13	1	20	26	7,950	14.79	5.29	0.82	2.23
		2	7	8	7,949	5.16	1.80	0.57	1.18
		3	7	14	7,949	8.35	2.45	0.75	1.22
		4	8	8	7,948	5.21	2.09	0.69	1.16
	A17	1	20	26	7,981	14.95	5.32	0.83	2.22
		2	7	8	7,979	5.19	1.80	0.57	1.18
		3	7	14	7,979	8.49	2.55	0.74	1.30
		4	8	8	7,977	5.26	2.07	0.69	1.15
	B04	1	21	26	9,570	13.70	5.86	0.85	2.29
		2	7	8	9,566	5.25	1.73	0.56	1.14
		3	7	14	9,566	7.34	2.57	0.76	1.27
		4	7	8	9,562	4.04	2.12	0.62	1.30
	B06	1	21	26	5,298	15.05	5.83	0.85	2.27
		2	7	8	5,297	5.54	1.60	0.52	1.12
		3	7	14	5,297	8.04	2.47	0.73	1.28
		4	7	8	5,298	4.54	2.11	0.61	1.32
	B10	1	21	26	5,285	15.05	5.89	0.85	2.26
		2	7	8	5,285	5.58	1.61	0.53	1.10
		3	7	14	5,285	8.91	2.38	0.75	1.19
		4	7	8	5,285	4.58	2.10	0.60	1.32
	B14	1	21	26	5,298	15.08	5.85	0.85	2.26
		2	7	8	5,297	5.54	1.63	0.54	1.11
		3	7	14	5,297	8.77	2.52	0.74	1.30
		4	7	8	5,297	4.64	2.11	0.61	1.32

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Table 9.19: Reliability and Standard Error of Measurement of Reporting Categories, English Language Arts (cont.)

Grade	Form	Reporting Category	Number of Items	Number of Score Points	N Count	Mean	Std. Dev.	Cronbach's Alpha	SEM
4	B18	1	21	26	7,921	15.02	5.93	0.85	2.26
		2	7	8	7,920	5.54	1.61	0.53	1.11
		3	7	14	7,920	8.92	2.37	0.72	1.26
		4	7	8	7,920	4.58	2.13	0.62	1.32
	BM4	1	21	26	2,631	15.10	5.84	0.85	2.27
		2	7	8	2,632	5.58	1.61	0.53	1.11
		3	7	14	2,632	8.30	2.62	0.75	1.30
		4	7	8	2,632	4.57	2.13	0.61	1.32
5	A	1	20	26	32,976	16.37	5.73	0.85	2.23
		2	5	8	32,976	5.23	1.61	0.45	1.19
		3	13	14	32,976	8.22	2.98	0.71	1.61
		4	7	8	32,976	5.09	1.80	0.57	1.18
	B	1	19	26	36,544	15.40	5.45	0.83	2.22
		2	5	9	36,536	6.54	1.81	0.63	1.11
		3	14	14	36,536	7.60	2.95	0.72	1.57
		4	8	8	36,528	5.86	1.69	0.59	1.09
6	A	1	22	28	35,864	14.96	5.64	0.81	2.47
		2	8	8	35,856	4.92	1.93	0.57	1.26
		3	7	8	35,856	4.16	1.90	0.53	1.31
		4	7	8	35,856	5.11	1.86	0.65	1.10
	B	1	23	28	34,080	15.70	5.32	0.80	2.40
		2	6	8	34,072	5.27	1.77	0.52	1.22
		3	7	8	34,072	3.98	1.80	0.49	1.28
		4	8	8	34,072	5.03	2.03	0.66	1.18
7	A	1	22	28	35,128	16.23	6.45	0.86	2.37
		2	6	8	35,120	4.86	1.96	0.67	1.13
		3	7	8	35,120	4.63	1.81	0.52	1.26
		4	7	8	35,112	4.74	1.89	0.60	1.20
	B	1	22	28	32,816	18.03	5.69	0.84	2.26
		2	6	8	32,808	4.79	2.03	0.61	1.27
		3	7	8	32,808	3.60	1.83	0.50	1.30
		4	7	8	32,800	5.35	1.86	0.61	1.17
8	A01	1	22	28	9,206	14.03	6.21	0.87	2.27
		2	7	8	9,204	3.65	1.96	0.62	1.21
		3	5	12	9,204	6.54	2.67	0.79	1.22
		4	8	8	9,204	4.67	2.10	0.66	1.22
	A05	1	22	28	5,030	16.84	5.79	0.85	2.22
		2	7	8	5,028	4.43	1.92	0.60	1.22
		3	5	12	5,028	7.77	2.28	0.74	1.16
		4	8	8	5,026	5.59	1.85	0.62	1.15

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Table 9.19: Reliability and Standard Error of Measurement of Reporting Categories, English Language Arts (cont.)

Grade	Form	Reporting Category	Number of Items	Number of Score Points	N Count	Mean	Std. Dev.	Cronbach's Alpha	SEM
8	A09	1	22	28	7,577	16.85	5.76	0.85	2.21
		2	7	8	7,574	4.45	1.90	0.59	1.21
		3	5	12	7,574	7.87	2.31	0.75	1.16
		4	8	8	7,575	5.65	1.80	0.60	1.15
	A13	1	22	28	5,065	16.82	5.78	0.85	2.22
		2	7	8	5,066	4.45	1.90	0.59	1.21
		3	5	12	5,066	7.46	2.32	0.75	1.15
		4	8	8	5,064	5.60	1.83	0.60	1.15
	A17	1	22	28	7,579	16.82	5.76	0.85	2.21
		2	7	8	7,578	4.46	1.89	0.59	1.22
		3	5	12	7,578	8.35	2.76	0.77	1.33
		4	8	8	7,576	5.62	1.82	0.60	1.15
	B04	1	23	28	6,911	15.50	6.64	0.87	2.38
		2	7	8	6,909	3.98	1.81	0.60	1.14
		3	5	12	6,909	6.59	2.51	0.74	1.27
		4	8	8	6,907	4.84	2.02	0.64	1.21
	B06	1	23	28	7,571	16.88	6.27	0.86	2.34
		2	7	8	7,567	4.32	1.78	0.59	1.14
		3	5	12	7,567	7.01	2.14	0.71	1.15
		4	8	8	7,567	5.30	1.86	0.59	1.19
	B10	1	23	28	5,093	16.88	6.20	0.86	2.34
		2	7	8	5,092	4.31	1.77	0.58	1.14
		3	5	12	5,092	8.09	2.54	0.70	1.40
		4	8	8	5,092	5.28	1.84	0.58	1.20
	B14	1	23	28	7,607	16.75	6.32	0.86	2.35
		2	7	8	7,607	4.34	1.80	0.60	1.14
		3	5	12	7,607	7.38	2.01	0.69	1.13
		4	8	8	7,605	5.29	1.89	0.61	1.19
	B18	1	23	28	5,077	17.03	6.21	0.86	2.34
		2	7	8	5,077	4.40	1.80	0.60	1.14
		3	5	12	5,077	7.70	2.41	0.72	1.27
		4	8	8	5,076	5.35	1.85	0.59	1.19

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Table 9.20: Reliability and Standard Error of Measurement of Reporting Categories, Mathematics

Grade	Form	Reporting Category	Number of Items	Number of Score Points	N Count	Mean	Std. Dev.	Cronbach's Alpha	SEM
3	A	1	10	10	32,148	5.90	2.85	0.80	1.27
		2	9	9	32,148	4.91	2.19	0.67	1.26
		3	14	14	32,148	8.45	3.41	0.81	1.49
		4	14	15	32,148	7.05	3.23	0.75	1.62
	B	1	10	10	34,168	5.81	2.81	0.80	1.26
		2	9	9	34,168	4.84	2.35	0.71	1.27
		3	14	14	34,168	7.99	3.32	0.78	1.55
		4	14	15	34,168	6.91	3.24	0.75	1.61
4	A	1	14	15	31,812	8.08	3.88	0.81	1.68
		2	11	11	31,812	5.76	3.06	0.81	1.33
		3	9	9	31,812	4.13	2.47	0.73	1.28
		4	13	13	31,812	6.10	3.10	0.75	1.53
	B	1	14	15	36,312	7.73	4.00	0.82	1.68
		2	11	11	36,312	5.42	3.03	0.80	1.37
		3	9	9	36,312	3.92	2.40	0.71	1.29
		4	13	13	36,312	6.12	3.27	0.78	1.52
5	A	1	9	9	32,936	4.95	2.46	0.73	1.27
		2	13	13	32,936	5.40	3.17	0.77	1.52
		3	9	9	32,936	4.07	2.25	0.67	1.29
		4	17	17	32,936	8.09	4.11	0.83	1.70
	B	1	9	9	36,864	4.92	2.39	0.71	1.28
		2	13	13	36,864	5.26	3.36	0.81	1.47
		3	9	9	36,864	3.90	2.22	0.66	1.29
		4	17	17	36,864	7.85	4.02	0.82	1.72
6	A	1	10	11	33,696	4.39	2.71	0.77	1.31
		2	14	14	33,696	6.99	3.57	0.82	1.51
		3	16	17	33,688	7.14	4.26	0.84	1.69
		4	12	12	33,688	5.84	2.80	0.73	1.44
	B	1	10	11	36,320	4.44	2.73	0.78	1.30
		2	14	14	36,320	6.42	3.58	0.82	1.52
		3	16	17	36,320	7.00	4.26	0.84	1.69
		4	12	12	36,320	5.72	2.82	0.74	1.43

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Table 9.20: Reliability and Standard Error of Measurement of Reporting Categories, Mathematics (cont.)

Grade	Form	Reporting Category	Number of Items	Number of Score Points	N Count	Mean	Std. Dev.	Cronbach's Alpha	SEM
7	A	1	11	11	32,616	6.08	2.99	0.79	1.36
		2	10	10	32,616	3.75	2.48	0.70	1.36
		3	13	13	32,616	5.81	3.21	0.77	1.52
		4	18	20	32,616	8.08	4.11	0.77	1.95
	B	1	11	11	34,560	5.85	2.95	0.78	1.39
		2	10	10	34,568	3.57	2.47	0.71	1.34
		3	13	13	34,568	5.63	3.10	0.76	1.52
		4	18	20	34,560	8.25	4.12	0.78	1.94
8	A	1	24	25	26,752	10.06	5.47	0.85	2.12
		2	16	16	26,744	6.84	3.32	0.73	1.72
		3	12	13	26,744	4.81	2.80	0.70	1.53
	B	1	24	25	28,576	9.96	5.39	0.84	2.14
		2	16	16	28,572	6.65	3.35	0.74	1.72
		3	12	13	28,572	4.64	2.92	0.72	1.54

Table 9.21: Reliability and Standard Error of Measurement of Reporting Categories, Science

Grade	Form	Reporting Category	Number of Items	Number of Score Points	N Count	Mean	Std. Dev.	Cronbach's Alpha	SEM
5	A	1	17	23	35,456	12.43	4.14	0.74	2.09
		2	13	19	35,456	9.07	3.64	0.73	1.89
		3	12	19	35,456	11.15	4.28	0.77	2.06
	B	1	15	23	34,192	10.52	4.31	0.75	2.16
		2	14	18	34,192	10.57	3.98	0.76	1.93
		3	13	19	34,192	9.15	4.02	0.77	1.92
8	A	1	14	21	34,968	10.40	3.83	0.71	2.06
		2	14	23	34,968	11.92	4.99	0.83	2.08
		3	14	19	34,968	10.42	4.56	0.83	1.88
	B	1	14	22	31,728	10.85	4.39	0.78	2.05
		2	13	21	31,728	11.54	4.70	0.81	2.05
		3	15	19	31,728	8.84	4.43	0.81	1.95

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Table 9.22: Inter-Correlations of English Language Arts, Mathematics, and Science Scale Scores

Grade	Total Population	Gender		Race/Ethnicity					
		Female	Male	White	Asian/ Pacific Islander	Black (not Hispanic)	Hispanic	American Indian	Other
English Language Arts/Mathematics									
3	0.78	0.79	0.79	0.76	0.82	0.75	0.76	0.76	0.79
4	0.76	0.76	0.76	0.74	0.78	0.70	0.73	0.76	0.75
5	0.74	0.74	0.75	0.73	0.75	0.68	0.72	0.74	0.74
6	0.75	0.75	0.76	0.75	0.76	0.68	0.72	0.73	0.74
7	0.76	0.75	0.76	0.74	0.79	0.70	0.73	0.73	0.75
8	0.73	0.72	0.74	0.72	0.80	0.69	0.69	0.71	0.72
English Language Arts/Science									
5	0.83	0.84	0.83	0.82	0.85	0.81	0.83	0.82	0.82
8	0.84	0.82	0.83	0.81	0.87	0.78	0.81	0.81	0.81
Mathematics/Science									
5	0.77	0.76	0.77	0.75	0.79	0.69	0.74	0.76	0.76
8	0.77	0.77	0.78	0.76	0.85	0.72	0.74	0.75	0.76

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Table 9.23: Inter-Correlations of English Language Arts and Mathematics Reporting Category Scale Scores

Grade	Mathematics Reporting Category	English Language Arts Reporting Categories			
		Reading	Research	Writing	Speaking and Listening
3	Number Sense and Operations in Base Ten	0.61	0.49	0.57	0.50
	Number Sense and Operations in Fractions	0.56	0.45	0.52	0.46
	Relationships and Algebraic Thinking	0.64	0.52	0.60	0.52
	Geometry and Measurement & Data and Statistics	0.64	0.51	0.59	0.53
4	Number Sense and Operations in Base Ten	0.62	0.51	0.55	0.51
	Number Sense and Operations in Fractions	0.57	0.47	0.49	0.47
	Relationships and Algebraic Thinking	0.58	0.47	0.51	0.47
	Geometry and Measurement & Data and Statistics	0.59	0.48	0.52	0.49
5	Number Sense and Operations in Base Ten	0.55	0.45	0.52	0.40
	Number Sense and Operations in Fractions	0.55	0.44	0.52	0.40
	Relationships and Algebraic Thinking	0.56	0.46	0.52	0.40
	Geometry and Measurement & Data and Statistics	0.62	0.50	0.59	0.46
6	Ratios and Proportional Relationships	0.62	0.46	0.49	0.48
	Number Sense and Operations	0.61	0.45	0.48	0.47
	Expressions, Equations and Inequalities	0.61	0.46	0.49	0.47
	Geometry and Measurement & Data Analysis, Statistics and Probability	0.59	0.44	0.47	0.46
7	Ratios and Proportional Relationships	0.61	0.52	0.46	0.49
	Number Sense and Operations	0.56	0.48	0.43	0.45
	Expressions, Equations and Inequalities	0.58	0.50	0.44	0.46
	Geometry and Measurement & Data Analysis, Statistics and Probability	0.65	0.55	0.49	0.51
8	Number Sense and Operations & Expressions, Equations and Inequalities	0.62	0.53	0.50	0.48
	Geometry and Measurement & Data Analysis, Statistics and Probability	0.60	0.50	0.47	0.45
	Functions	0.60	0.51	0.47	0.46

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Table 9.24: Inter-Correlations of English Language Arts and Science Reporting Category Scale Scores

Grade	Science Reporting Category	English Language Arts Reporting Categories			
		Reading	Research	Writing	Speaking and Listening
5	Physical Science	0.68	0.52	0.63	0.51
	Life Science	0.67	0.52	0.62	0.51
	Earth and Space Science	0.67	0.52	0.62	0.51
8	Physical Science	0.69	0.59	0.53	0.54
	Life Science	0.72	0.59	0.55	0.55
	Earth and Space Science	0.66	0.55	0.51	0.51

Table 9.25: Inter-Correlations of Mathematics and Science Reporting Category Scale Scores

Grade	Mathematics Reporting Category	Science Reporting Categories		
		Physical Science	Life Science	Earth and Space Science
5	Number Sense and Operations in Base Ten	0.57	0.52	0.55
	Number Sense and Operations in Fractions	0.58	0.52	0.55
	Relationships and Algebraic Thinking	0.58	0.52	0.55
	Geometry and Measurement & Data and Statistics	0.66	0.60	0.62
8	Number Sense and Operations & Expressions, Equations and Inequalities	0.65	0.63	0.60
	Geometry and Measurement & Data Analysis, Statistics and Probability	0.63	0.61	0.58
	Functions	0.62	0.61	0.58

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Table 9.26: Comparison of Most-Recent Missouri NAEP and Spring 2019 MAP Impact Data

Content Area	Grade	Missouri NAEP Percentages of Students							Spring 2019 MAP Percentages of Students					
		NAEP Year	*Below Basic*	*Basic*	*Proficient*	*Advanced*	At or Above *Proficient*	At or Above *Basic*	*Below Basic*	*Basic*	*Proficient*	*Advanced*	At or Above *Proficient*	At or Above *Basic*
Reading/ ELA	4	2019	36	30	26	8	34	64	11.9	38.6	28.1	21.2	49.3	87.9
Reading/ ELA	8	2019	26	41	30	3	33	74	14.4	38.0	28.8	18.6	47.4	85.4
Math	4	2019	20	40	32	7	39	80	27.4	25.6	25.1	21.9	47.0	72.6
Math	8	2019	30	38	24	7	32	70	32.8	37.8	20.5	8.70	29.2	67.0
Science	4 NAEP 5 MAP	2015	22	39	38	1	39	79	26.1	31.1	29.3	13.5	42.8	73.9
Science	8	2015	25	35	38	2	40	75	20.4	35.6	25.8	18.0	43.8	79.4

Note: NAEP assessed student knowledge and skills in Reading, while MAP assessed student knowledge and skills in ELA, which included Reading, Speaking and Listening, Research, and Writing. Also, NAEP addressed Science in Grade 4, while MAP assessed Science in Grade 5.
Note: NAEP data are from https://nces.ed.gov/nationsreportcard/.

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Table 9.27: Number of Items Flagged for DIF, English Language Arts

English Language Arts		Grade	3	4	5	6	7	8
		# of Items	78	89	67	67	63	91
Group	**DIF Magnitude**	**DIF Direction**	**Number of Flagged Items**					
Female	Moderate	Negative	0	0	0	1	1	2
		Positive	0	10	0	0	0	4
	Large	Negative	0	0	0	0	0	0
		Positive	0	12	0	0	0	19
Asian/ Pacific Islander	Moderate	Negative	0	1	2	1	1	1
		Positive	1	2	0	1	0	0
	Large	Negative	1	1	0	0	0	0
		Positive	0	1	0	0	0	0
Black	Moderate	Negative	1	1	0	0	2	19
		Positive	0	0	0	0	0	1
	Large	Negative	0	0	0	1	0	1
		Positive	0	0	0	0	0	0
Hispanic	Moderate	Negative	0	1	1	1	0	0
		Positive	0	0	1	0	0	0
	Large	Negative	0	0	1	0	0	0
		Positive	0	0	0	0	0	0
American Indian	Moderate	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
	Large	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
Ethnicity: Other	Moderate	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
	Large	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
Accommo-dations	Moderate	Negative	n/a	n/a	n/a	0	2	2
		Positive	n/a	n/a	n/a	1	2	1
	Large	Negative	n/a	n/a	n/a	1	1	6
		Positive	n/a	n/a	n/a	1	2	1

Note: For Grades 4 and 8, the three components of the writing prompts were analyzed as separate items.

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Table 9.28: Number of Items Flagged for DIF, Mathematics

Mathematics		Grade	3	4	5	6	7	8
		# of Items	60	61	62	58	60	62
Group	**DIF Magnitude**	**DIF Direction**	**Number of Flagged Items**					
Female	Moderate	Negative	1	1	1	1	1	0
		Positive	0	1	0	0	0	0
	Large	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
Asian/ Pacific Islander	Moderate	Negative	1	2	1	3	1	2
		Positive	1	1	0	2	3	0
	Large	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
Black	Moderate	Negative	0	0	0	0	1	1
		Positive	0	0	0	0	0	0
	Large	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
Hispanic	Moderate	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
	Large	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
American Indian	Moderate	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
	Large	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
Ethnicity: Other	Moderate	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
	Large	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
Accommo-dations	Moderate	Negative	n/a	1	2	1	0	0
		Positive	n/a	1	1	2	1	3
	Large	Negative	n/a	0	0	0	0	1
		Positive	n/a	0	0	0	2	1

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Table 9.29: Number of Items Flagged for DIF, Science

Mathematics		Grade	5	8
		# of Items	66	68
Group	**DIF Magnitude**	**DIF Direction**	**Number of Flagged Items**	
Female	Moderate	Negative	2	1
		Positive	2	1
	Large	Negative	0	0
		Positive	0	0
Asian/ Pacific Islander	Moderate	Negative	1	0
		Positive	1	0
	Large	Negative	0	0
		Positive	0	0
Black	Moderate	Negative	0	1
		Positive	0	0
	Large	Negative	0	0
		Positive	0	0
Hispanic	Moderate	Negative	0	0
		Positive	0	0
	Large	Negative	0	0
		Positive	0	0
American Indian	Moderate	Negative	0	0
		Positive	0	0
	Large	Negative	0	0
		Positive	0	0
Ethnicity: Other	Moderate	Negative	0	0
		Positive	0	0
	Large	Negative	0	0
		Positive	0	0
Accommo-dations	Moderate	Negative	1	0
		Positive	1	1
	Large	Negative	0	0
		Positive	0	0

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Table 9.30: Scale Score Comparison, English Language Arts

Grade	Category	Group	N	Mean	Std. Dev.	Effect Size
3	Race/Ethnicity	White	46,067	367.23	41.54	
		Asian/Pacific Islander	1,496	373.25	45.28	-0.14
		Black (not Hispanic)	10,748	334.17	41.96	0.79
		Hispanic	4,584	349.96	41.69	0.42
		American Indian	203	352.40	41.67	0.36
		Other	3,225	361.56	43.27	0.14
	Gender	Male	34,200	356.92	44.83	
		Female	32,123	364.30	41.94	-0.17
	Accommodations	No	66,087	360.76	43.18	
		Yes	236	284.56	81.84	1.76
4	Race/Ethnicity	White	47,266	391.45	40.20	
		Asian/Pacific Islander	1,547	398.98	43.52	-0.19
		Black (not Hispanic)	11,155	359.98	39.96	0.78
		Hispanic	4,564	376.56	40.02	0.37
		American Indian	215	381.39	40.68	0.25
		Other	3,301	385.54	40.98	0.15
	Gender	Male	35,001	381.05	42.23	
		Female	33,047	389.48	41.27	-0.20
	Accommodations	No	67,770	385.48	41.35	
		Yes	278	303.49	88.14	1.97
5	Race/Ethnicity	White	48,570	404.56	40.06	
		Asian/Pacific Islander	1,536	413.85	44.76	-0.23
		Black (not Hispanic)	11,326	376.27	38.39	0.71
		Hispanic	4,789	389.42	38.92	0.38
		American Indian	267	392.69	39.64	0.30
		Other	3,247	398.55	39.56	0.15
	Gender	Male	35,639	394.66	41.60	
		Female	34,096	403.14	40.41	-0.21
	Accommodations	No	69,450	399.19	40.58	
		Yes	285	306.84	80.22	2.26
6	Race/Ethnicity	White	49,063	413.23	34.99	
		Asian/Pacific Islander	1,550	422.49	38.51	-0.26
		Black (not Hispanic)	11,310	387.10	33.33	0.75
		Hispanic	4,784	400.87	34.54	0.35
		American Indian	295	407.73	35.06	0.16
		Other	3,021	409.14	34.81	0.12
	Gender	Male	35,662	404.91	36.42	
		Female	34,361	411.57	35.55	-0.18
	Accommodations	No	64,099	411.35	34.92	
		Yes	5,924	373.84	31.12	1.08

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Table 9.30: Scale Score Comparison, English Language Arts (cont.)

Grade	Category	Group	N	Mean	Std. Dev.	Effect Size
7	Race/Ethnicity	White	48,246	431.41	39.16	
		Asian/Pacific Islander	1,546	443.29	44.04	-0.30
		Black (not Hispanic)	10,786	401.77	38.09	0.76
		Hispanic	4,532	417.01	39.00	0.37
		American Indian	260	423.24	38.18	0.21
		Other	2,649	426.71	39.53	0.12
	Gender	Male	34,941	421.37	41.63	
		Female	33,078	430.50	39.13	-0.23
	Accommodations	No	62,423	429.47	39.29	
		Yes	5,596	384.95	32.95	1.15
8	Race/Ethnicity	White	47,796	443.54	40.06	
		Asian/Pacific Islander	1,506	458.28	46.19	-0.37
		Black (not Hispanic)	10,205	414.07	38.99	0.74
		Hispanic	4,451	430.38	40.57	0.33
		American Indian	283	430.51	42.13	0.33
		Other	2,581	438.32	40.25	0.13
	Gender	Male	34,186	432.29	42.51	
		Female	32,636	444.46	39.68	-0.30
	Accommodations	No	61,531	441.91	40.19	
		Yes	5,291	395.46	32.93	1.17

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Table 9.31: Scale Score Comparison, Mathematics

Grade	Category	Group	N	Mean	Std. Dev.	Effect Size
3	Race/Ethnicity	White	46,058	360.69	44.26	
		Asian/Pacific Islander	1,555	372.71	50.95	-0.27
		Black (not Hispanic)	10,753	324.00	48.25	0.81
		Hispanic	4,670	343.59	45.50	0.39
		American Indian	204	343.89	50.87	0.38
		Other	3,223	353.09	46.14	0.17
	Gender	Male	34,279	353.65	49.41	
		Female	32,184	353.16	45.08	0.01
	Accommodations	No	66,219	353.56	47.27	
		Yes	244	313.12	56.13	0.85
4	Race/Ethnicity	White	47,265	385.68	42.78	
		Asian/Pacific Islander	1,597	399.34	48.31	-0.32
		Black (not Hispanic)	11,156	348.62	48.98	0.84
		Hispanic	4,650	370.01	45.90	0.36
		American Indian	215	375.18	45.48	0.25
		Other	3,305	377.81	43.85	0.18
	Gender	Male	35,059	379.48	47.82	
		Female	33,129	377.37	44.89	0.05
	Accommodations	No	64,884	381.52	43.84	
		Yes	3,304	318.23	54.18	1.43
5	Race/Ethnicity	White	48,571	404.42	37.40	
		Asian/Pacific Islander	1,579	420.07	45.77	-0.42
		Black (not Hispanic)	11,336	374.51	40.48	0.79
		Hispanic	4,873	391.06	38.26	0.36
		American Indian	266	393.08	40.09	0.30
		Other	3,242	397.90	39.44	0.17
	Gender	Male	35,698	398.56	42.55	
		Female	34,169	398.73	37.11	0.00
	Accommodations	No	65,590	401.66	37.91	
		Yes	4,277	352.42	42.39	1.29
6	Race/Ethnicity	White	49,029	412.90	35.37	
		Asian/Pacific Islander	1,569	427.70	38.57	-0.42
		Black (not Hispanic)	11,319	384.69	38.20	0.79
		Hispanic	4,849	400.91	35.70	0.34
		American Indian	295	402.83	36.69	0.28
		Other	3,019	407.27	36.23	0.16
	Gender	Male	35,686	406.51	38.96	
		Female	34,394	408.65	36.03	-0.06
	Accommodations	No	65,044	411.23	34.62	
		Yes	5,036	360.19	41.69	1.45

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Table 9.31: Scale Score Comparison, Mathematics (cont.)

Grade	Category	Group	N	Mean	Std. Dev.	Effect Size
7	Race/Ethnicity	White	47,593	424.94	43.79	
		Asian/Pacific Islander	1,446	439.68	53.70	-0.33
		Black (not Hispanic)	10,750	385.25	47.90	0.89
		Hispanic	4,583	406.52	45.97	0.42
		American Indian	258	411.90	46.58	0.30
		Other	2,620	416.62	46.86	0.19
	Gender	Male	34,495	415.43	50.28	
		Female	32,755	419.23	44.11	-0.08
	Accommodations	No	62,061	421.87	44.58	
		Yes	5,189	362.38	45.88	1.33
8	Race/Ethnicity	White	39,070	447.09	48.02	
		Asian/Pacific Islander	949	460.69	62.89	-0.28
		Black (not Hispanic)	9,196	411.69	48.51	0.74
		Hispanic	3,814	429.52	47.85	0.37
		American Indian	262	434.48	49.88	0.26
		Other	2,117	438.99	50.57	0.17
	Gender	Male	28,786	436.59	52.80	
		Female	26,622	443.41	47.30	-0.14
	Accommodations	No	50,453	444.74	48.28	
		Yes	4,955	390.28	43.63	1.14

Table 9.32: Scale Score Comparison, Science

Grade	Category	Group	N	Mean	Std. Dev.	Effect Size
5	Race/Ethnicity	White	48,552	306.87	37.67	
		Asian/Pacific Islander	1,579	313.25	43.83	-0.17
		Black (not Hispanic)	11,337	272.94	38.28	0.90
		Hispanic	4,871	289.65	38.66	0.46
		American Indian	266	295.84	38.14	0.29
		Other	3,244	298.77	39.03	0.21
	Gender	Male	35,689	299.75	41.40	
		Female	34,160	300.02	38.78	-0.01
	Accommodations	No	67,994	300.94	39.69	
		Yes	1,855	261.33	37.49	1.00
8	Race/Ethnicity	White	47,748	506.02	37.69	
		Asian/Pacific Islander	1,520	515.85	44.53	-0.26
		Black (not Hispanic)	10,207	472.32	39.79	0.89
		Hispanic	4,530	490.39	39.81	0.41
		American Indian	283	495.06	39.60	0.29
		Other	2,578	499.66	39.01	0.17
	Gender	Male	34,199	497.82	42.40	
		Female	32,667	501.76	38.00	-0.10
	Accommodations	No	65,898	500.39	40.00	
		Yes	968	455.88	40.51	1.11

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Table 9.33: Performance Level Comparison, English Language Arts

Grade	Category	Group	Percentage of Students in Performance Level					
			No Level	*Below Basic*	*Basic*	*Proficient*	*Advanced*	*Prof. & Adv.*
3	Race/Ethnicity	White	0.1	17.4	27.3	30.3	24.8	55.1
		Asian/Pacific Islander	2.3	16.5	21.8	27.0	32.5	59.5
		Black (not Hispanic)	0.2	46.0	29.4	17.5	6.8	24.3
		Hispanic	1.2	30.2	31.5	24.2	12.9	37.1
		American Indian	0.5	21.1	36.3	29.9	12.3	42.2
		Other	0.1	22.6	27.5	28.3	21.4	49.7
	Gender	Male	0.3	26.3	27.9	26.3	19.3	45.6
		Female	0.2	19.9	27.9	29.2	22.9	52.1
	Accommodations	No	0.2	23.0	27.9	27.7	21.1	48.8
		Yes	0.8	62.6	21.4	12.2	2.9	15.1
4	Race/Ethnicity	White	0.0	8.2	35.8	31.0	24.9	55.9
		Asian/Pacific Islander	1.3	8.0	27.2	31.2	32.3	63.5
		Black (not Hispanic)	0.1	27.3	48.4	17.4	6.8	24.2
		Hispanic	1.1	15.0	45.5	24.1	14.3	38.4
		American Indian	0.0	12.1	40.0	28.4	19.5	47.9
		Other	0.2	10.7	40.1	27.9	21.1	49.0
	Gender	Male	0.2	14.0	40.2	27.3	18.4	45.7
		Female	0.2	9.8	36.9	29.0	24.2	53.2
	Accommodations	No	0.2	11.8	38.6	28.2	21.3	49.5
		Yes	0.4	51.3	33.0	12.5	2.9	15.4

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Table 9.33: Performance Level Comparison, English Language Arts (cont.)

Grade	Category	Group	Percentage of Students in Performance Level					
			No Level	*Below Basic*	*Basic*	*Proficient*	*Advanced*	*Prof. & Adv.*
5	Race/Ethnicity	White	0.1	8.8	38.0	27.9	25.3	53.2
		Asian/Pacific Islander	1.4	8.2	30.8	23.6	36.0	59.6
		Black (not Hispanic)	0.1	25.6	49.9	16.3	8.1	24.4
		Hispanic	1.3	15.9	46.3	22.2	14.4	36.6
		American Indian	0.0	14.2	41.2	26.6	18.0	44.6
		Other	0.0	10.6	43.0	26.7	19.6	46.3
	Gender	Male	0.2	14.6	41.5	24.4	19.3	43.7
		Female	0.2	9.4	39.6	26.6	24.3	50.9
	Accommodations	No	0.2	11.9	40.6	25.5	21.8	47.3
		Yes	0.7	63.8	24.0	8.4	3.1	11.5
6	Race/Ethnicity	White	0.1	11.5	36.5	28.0	23.9	51.9
		Asian/Pacific Islander	1.1	8.7	29.6	26.1	34.5	60.6
		Black (not Hispanic)	0.2	31.8	45.5	15.9	6.6	22.5
		Hispanic	1.0	18.6	43.8	22.7	13.8	36.5
		American Indian	0.0	16.6	38.3	26.8	18.3	45.1
		Other	0.1	12.9	40.5	26.9	19.5	46.4
	Gender	Male	0.2	17.9	39.4	24.2	18.3	42.5
		Female	0.1	12.5	37.7	27.0	22.7	49.7
	Accommodations	No	0.2	12.3	38.3	27.2	22.1	49.3
		Yes	0.2	47.9	41.0	8.4	2.5	10.9

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Table 9.33: Performance Level Comparison, English Language Arts (cont.)

Grade	Category	Group	Percentage of Students in Performance Level					
			No Level	*Below Basic*	*Basic*	*Proficient*	*Advanced*	*Prof. & Adv.*
7	Race/Ethnicity	White	0.1	12.4	38.2	21.1	28.2	49.3
		Asian/Pacific Islander	0.8	10.8	27.3	18.5	42.6	61.1
		Black (not Hispanic)	0.3	34.0	45.0	12.3	8.4	20.7
		Hispanic	1.4	20.8	43.8	17.1	16.9	34.0
		American Indian	0.4	16.9	40.6	19.9	22.2	42.1
		Other	0.0	15.3	41.1	18.1	25.4	43.5
	Gender	Male	0.2	20.1	39.8	17.8	22.0	39.8
		Female	0.2	12.7	39.3	20.8	27.1	47.9
	Accommodations	No	0.2	13.3	39.5	20.5	26.5	47.0
		Yes	0.2	52.0	40.3	5.3	2.2	7.5
8	Race/Ethnicity	White	0.1	10.9	36.0	31.5	21.4	52.9
		Asian/Pacific Islander	0.9	9.6	23.6	28.1	37.8	65.9
		Black (not Hispanic)	0.3	29.8	46.3	17.9	5.7	23.6
		Hispanic	1.6	17.6	42.4	26.0	12.5	38.5
		American Indian	0.0	18.0	45.9	22.3	13.8	36.1
		Other	0.2	13.5	40.1	28.5	17.7	46.2
	Gender	Male	0.3	18.6	39.3	26.1	15.7	41.8
		Female	0.3	9.9	36.6	31.7	21.5	53.2
	Accommodations	No	0.3	11.4	37.6	30.7	20.1	50.8
		Yes	0.2	49.2	42.4	7.3	1.0	8.3

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Table 9.34: Performance Level Comparison, Mathematics

Grade	Category	Group	Percentage of Students in Performance Level					
			No Level	*Below Basic*	*Basic*	*Proficient*	*Advanced*	*Prof. & Adv.*
3	Race/Ethnicity	White	0.1	18.7	28.7	26.7	25.7	52.4
		Asian/Pacific Islander	0.1	15.9	20.7	23.4	39.8	63.2
		Black (not Hispanic)	0.1	48.2	30.3	14.5	6.8	21.3
		Hispanic	0.0	30.9	32.2	22.9	14.0	36.9
		American Indian	0.5	27.8	33.7	22.0	16.1	38.1
		Other	0.0	24.6	30.0	24.7	20.7	45.4
	Gender	Male	0.1	24.7	27.9	23.9	23.4	47.3
		Female	0.1	24.5	30.4	24.7	20.4	45.1
	Accommodations	No	0.1	24.5	29.1	24.3	22.0	46.3
		Yes	0.0	57.4	24.6	13.9	4.1	18.0
4	Race/Ethnicity	White	0.0	20.9	25.5	28.0	25.6	53.6
		Asian/Pacific Islander	0.1	15.6	18.3	23.2	42.8	66.0
		Black (not Hispanic)	0.0	53.1	25.8	14.8	6.3	21.1
		Hispanic	0.1	34.5	27.3	22.7	15.4	38.1
		American Indian	0.0	30.7	24.7	23.7	20.9	44.6
		Other	0.1	28.7	27.9	22.9	20.5	43.4
	Gender	Male	0.1	26.9	24.2	25.1	23.7	48.8
		Female	0.0	27.9	27.0	25.1	20.0	45.1
	Accommodations	No	0.0	24.8	26.1	26.1	22.9	49.0
		Yes	0.1	77.1	15.2	5.7	1.9	7.6

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Table 9.34: Performance Level Comparison, Mathematics (cont.)

Grade	Category	Group	Percentage of Students in Performance Level					
			No Level	*Below Basic*	*Basic*	*Proficient*	*Advanced*	*Prof. & Adv.*
5	Race/Ethnicity	White	0.1	19.8	34.0	26.3	19.9	46.2
		Asian/Pacific Islander	0.0	14.0	24.1	23.0	38.9	61.9
		Black (not Hispanic)	0.1	48.5	33.8	12.9	4.7	17.6
		Hispanic	0.0	32.4	35.7	20.2	11.7	31.9
		American Indian	0.0	29.3	35.3	21.4	13.9	35.3
		Other	0.0	26.1	34.6	24.1	15.2	39.3
	Gender	Male	0.1	26.8	31.4	22.7	19.0	41.7
		Female	0.0	24.2	36.5	24.3	14.9	39.2
	Accommodations	No	0.1	22.4	34.7	24.8	18.1	42.9
		Yes	0.1	73.2	21.2	4.4	1.1	5.5
6	Race/Ethnicity	White	0.1	20.9	30.2	24.4	24.4	48.8
		Asian/Pacific Islander	0.1	14.6	21.0	20.8	43.4	64.2
		Black (not Hispanic)	0.2	50.2	31.7	12.4	5.6	18.0
		Hispanic	0.1	32.3	33.5	20.2	13.9	34.1
		American Indian	0.0	30.5	31.5	23.4	14.6	38.0
		Other	0.1	26.6	32.2	21.7	19.4	41.1
	Gender	Male	0.1	28.2	29.1	21.4	21.1	42.5
		Female	0.1	24.8	32.1	22.5	20.5	43.0
	Accommodations	No	0.1	22.6	31.7	23.4	22.3	45.7
		Yes	0.2	78.1	16.6	3.9	1.3	5.2

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Table 9.34: Performance Level Comparison, Mathematics (cont.)

Grade	Category	Group	Percentage of Students in Performance Level					
			No Level	*Below Basic*	*Basic*	*Proficient*	*Advanced*	*Prof. & Adv.*
7	Race/Ethnicity	White	0.1	20.4	35.3	24.9	19.3	44.2
		Asian/Pacific Islander	0.0	17.5	23.2	21.4	37.8	59.2
		Black (not Hispanic)	0.2	53.5	32.5	10.0	3.6	13.6
		Hispanic	0.1	34.7	37.9	17.4	9.8	27.2
		American Indian	0.4	31.3	35.1	20.1	13.1	33.2
		Other	0.0	27.2	35.1	21.3	16.3	37.6
	Gender	Male	0.1	29.3	32.1	21.3	17.2	38.5
		Female	0.1	24.5	37.5	22.3	15.6	37.9
	Accommodations	No	0.1	22.8	36.0	23.4	17.7	41.1
		Yes	0.1	76.4	19.5	2.9	0.9	3.8
8	Race/Ethnicity	White	0.2	26.3	39.9	23.6	10.1	33.7
		Asian/Pacific Islander	0.4	24.4	30.1	23.4	21.6	45.0
		Black (not Hispanic)	0.2	57.6	29.5	9.8	2.9	12.7
		Hispanic	0.2	40.4	38.4	16.2	4.9	21.1
		American Indian	0.0	36.6	38.5	17.9	6.9	24.8
		Other	0.2	33.7	38.6	18.5	8.9	27.4
	Gender	Male	0.2	36.4	35.3	19.0	9.1	28.1
		Female	0.2	28.8	40.6	22.2	8.3	30.5
	Accommodations	No	0.2	28.6	39.5	22.2	9.5	31.7
		Yes	0.3	74.9	20.8	3.6	0.5	4.1

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Table 9.35: Performance Level Comparison, Science

Grade	Category	Group	Percentage of Students in Performance Level					
			No Level	*Below Basic*	*Basic*	*Proficient*	*Advanced*	*Prof. & Adv.*
5	Race/Ethnicity	White	0.1	19.3	31.1	33.3	16.2	49.5
		Asian/Pacific Islander	0.0	19.8	23.6	30.3	26.3	56.6
		Black (not Hispanic)	0.1	52.3	30.0	14.1	3.4	17.5
		Hispanic	0.1	34.0	34.3	24.0	7.6	31.6
		American Indian	0.0	31.2	29.3	27.1	12.4	39.5
		Other	0.0	26.2	33.1	29.2	11.6	40.8
	Gender	Male	0.1	26.8	29.6	29.4	14.2	43.6
		Female	0.1	25.3	32.6	29.1	12.8	41.9
	Accommodations	No	0.1	25.0	31.2	29.8	13.8	43.6
		Yes	0.3	64.3	25.4	8.7	1.4	10.1
8	Race/Ethnicity	White	0.2	15.1	34.8	28.9	21.0	49.9
		Asian/Pacific Islander	0.3	13.8	25.0	26.2	34.6	60.8
		Black (not Hispanic)	0.2	43.3	38.8	13.4	4.3	17.7
		Hispanic	0.2	26.8	39.0	22.6	11.5	34.1
		American Indian	0.0	24.4	37.8	23.7	14.1	37.8
		Other	0.1	20.1	38.3	23.3	18.2	41.5
	Gender	Male	0.2	23.1	33.9	24.4	18.4	42.8
		Female	0.2	17.6	37.4	27.2	17.6	44.8
	Accommodations	No	0.2	19.8	35.7	26.1	18.2	44.3
		Yes	0.4	61.6	29.6	7.1	1.2	8.3

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Table 9.36: Reliability and SEM by Subgroup, English Language Arts Grade 3

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A	Race/Ethnicity	White	21,660	0.91	3.15
		Asian/Pacific Islander	675	0.92	3.03
		Black (not Hispanic)	5,068	0.91	3.29
		Hispanic	2,032	0.91	3.25
		American Indian	88	0.90	3.28
		Other	1,440	0.92	3.17
	Gender	Male	15,794	0.92	3.20
		Female	15,168	0.92	3.16
	Accommodations	No	30,936	0.92	3.18
		Yes	27	-	-
B	Race/Ethnicity	White	24,300	0.90	3.24
		Asian/Pacific Islander	820	0.92	3.17
		Black (not Hispanic)	5,647	0.89	3.35
		Hispanic	2,542	0.90	3.33
		American Indian	113	0.87	3.36
		Other	1,772	0.90	3.28
	Gender	Male	18,288	0.91	3.29
		Female	16,904	0.90	3.25
	Accommodations	No	35,072	0.91	3.27
		Yes	121	0.90	3.53

Note: Reliability and SEM were not computed for groups smaller than 50 students.

Table 9.37: Reliability and SEM by Subgroup, English Language Arts Grade 4

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White	3,720	0.90	3.15
		Asian/Pacific Islander	113	0.92	3.15
		Black (not Hispanic)	843	0.91	3.20
		Hispanic	363	0.91	3.21
		American Indian	19	-	-
		Other	274	0.90	3.15
	Gender	Male	2,690	0.91	3.17
		Female	2,642	0.91	3.15
	Accommodations	No	5,313	0.91	3.17
		Yes	19	-	-
A05	Race/Ethnicity	White	3,712	0.89	3.04
		Asian/Pacific Islander	119	0.89	2.99
		Black (not Hispanic)	861	0.91	3.15
		Hispanic	329	0.89	3.12
		American Indian	14	-	-
		Other	245	0.91	3.11
	Gender	Male	2,667	0.91	3.09
		Female	2,613	0.91	3.04
	Accommodations	No	5,279	0.91	3.07
		Yes	1	-	-

Note: Reliability and SEM were not computed for groups smaller than 50 students.

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Table 9.37: Reliability and SEM by Subgroup, English Language Arts Grade 4 (cont.)

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A09	Race/Ethnicity	White	3,737	0.89	3.10
		Asian/Pacific Islander	122	0.91	2.97
		Black (not Hispanic)	880	0.90	3.16
		Hispanic	310	0.91	3.12
		American Indian	17	-	-
		Other	257	0.91	3.14
	Gender	Male	2,738	0.91	3.13
		Female	2,585	0.91	3.10
	Accommodations	No	5,319	0.91	3.12
		Yes	4	-	-
A13	Race/Ethnicity	White	5,603	0.90	3.05
		Asian/Pacific Islander	185	0.91	2.95
		Black (not Hispanic)	1,283	0.90	3.15
		Hispanic	500	0.90	3.10
		American Indian	26	-	-
		Other	353	0.89	3.11
	Gender	Male	4,056	0.91	3.09
		Female	3,894	0.91	3.05
	Accommodations	No	7,949	0.91	3.07
		Yes	1	-	-
A17	Race/Ethnicity	White	5,573	0.89	3.08
		Asian/Pacific Islander	160	0.92	3.01
		Black (not Hispanic)	1,305	0.90	3.18
		Hispanic	510	0.90	3.14
		American Indian	31	-	-
		Other	402	0.91	3.07
	Gender	Male	4,111	0.91	3.11
		Female	3,870	0.91	3.08
	Accommodations	No	7,979	0.91	3.11
		Yes	2	-	-
B04	Race/Ethnicity	White	6,428	0.91	3.18
		Asian/Pacific Islander	268	0.92	3.17
		Black (not Hispanic)	1,612	0.89	3.18
		Hispanic	779	0.90	3.19
		American Indian	36	-	-
		Other	447	0.91	3.21
	Gender	Male	5,209	0.91	3.18
		Female	4,361	0.91	3.19
	Accommodations	No	9,438	0.91	3.19
		Yes	131	0.89	3.18

Note: Reliability and SEM were not computed for groups smaller than 50 students.

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Table 9.37: Reliability and SEM by Subgroup, English Language Arts Grade 4 (cont.)

Form	Category	Group	N Count	Cronbach's Alpha	SEM
B06	Race/Ethnicity	White	3,722	0.90	3.15
		Asian/Pacific Islander	122	0.89	3.10
		Black (not Hispanic)	868	0.89	3.22
		Hispanic	334	0.90	3.19
		American Indian	11	-	-
		Other	241	0.90	3.17
	Gender	Male	2,693	0.90	3.18
		Female	2,605	0.91	3.15
	Accommodations	No	5,296	0.91	3.17
		Yes	2	-	-
B10	Race/Ethnicity	White	3,658	0.90	3.10
		Asian/Pacific Islander	123	0.90	3.07
		Black (not Hispanic)	881	0.90	3.20
		Hispanic	351	0.90	3.15
		American Indian	12	-	-
		Other	260	0.90	3.12
	Gender	Male	2,665	0.91	3.13
		Female	2,620	0.90	3.11
	Accommodations	No	5,280	0.91	3.13
		Yes	5	-	-
B14	Race/Ethnicity	White	3,664	0.90	3.15
		Asian/Pacific Islander	121	0.90	3.09
		Black (not Hispanic)	849	0.90	3.24
		Hispanic	333	0.91	3.19
		American Indian	15	-	-
		Other	316	0.89	3.19
	Gender	Male	2,724	0.91	3.18
		Female	2,574	0.90	3.16
	Accommodations	No	5,298	0.91	3.18
		Yes	0	-	-
B18	Race/Ethnicity	White	5,491	0.90	3.13
		Asian/Pacific Islander	153	0.90	3.05
		Black (not Hispanic)	1,315	0.90	3.18
		Hispanic	567	0.90	3.20
		American Indian	27	-	-
		Other	368	0.92	3.15
	Gender	Male	3,999	0.91	3.15
		Female	3,922	0.91	3.14
	Accommodations	No	7,918	0.91	3.15
		Yes	3	-	-

Note: Reliability and SEM were not computed for groups smaller than 50 students.

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Table 9.37: Reliability and SEM by Subgroup, English Language Arts Grade 4 (cont.)

Form	Category	Group	N Count	Cronbach's Alpha	SEM
BM4	Race/Ethnicity	White	1,842	0.90	3.17
		Asian/Pacific Islander	55	0.92	3.13
		Black (not Hispanic)	422	0.89	3.22
		Hispanic	176	0.90	3.18
		American Indian	7	-	-
		Other	129	0.90	3.21
	Gender	Male	1,336	0.91	3.20
		Female	1,295	0.91	3.17
	Accommodations	No	2,630	0.91	3.19
		Yes	1	-	-

Note: Reliability and SEM were not computed for groups smaller than 50 students.

Table 9.38: Reliability and SEM by Subgroup, English Language Arts Grade 5

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A	Race/Ethnicity	White	23,124	0.90	3.21
		Asian/Pacific Islander	737	0.91	3.05
		Black (not Hispanic)	5,380	0.89	3.35
		Hispanic	2,122	0.90	3.29
		American Indian	126	0.90	3.35
		Other	1,493	0.90	3.26
	Gender	Male	16,724	0.91	3.28
		Female	16,256	0.90	3.20
	Accommodations	No	32,952	0.91	3.24
		Yes	30	-	-
B	Race/Ethnicity	White	25,316	0.90	3.13
		Asian/Pacific Islander	791	0.92	3.05
		Black (not Hispanic)	5,903	0.90	3.29
		Hispanic	2,651	0.90	3.21
		American Indian	140	0.90	3.20
		Other	1,745	0.90	3.17
	Gender	Male	18,780	0.91	3.20
		Female	17,764	0.90	3.13
	Accommodations	No	36,424	0.91	3.17
		Yes	117	0.91	3.40

Note: Reliability and SEM were not computed for groups smaller than 50 students.

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Table 9.39: Reliability and SEM by Subgroup, English Language Arts Grade 6

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A	Race/Ethnicity	White	25,064	0.88	3.26
		Asian/Pacific Islander	761	0.90	3.16
		Black (not Hispanic)	5,907	0.87	3.30
		Hispanic	2,432	0.88	3.30
		American Indian	138	0.89	3.30
		Other	1,564	0.88	3.28
	Gender	Male	18,424	0.89	3.27
		Female	17,444	0.88	3.27
	Accommodations	No	31,452	0.88	3.27
		Yes	4,414	0.84	3.25
B	Race/Ethnicity	White	23,952	0.87	3.21
		Asian/Pacific Islander	782	0.89	3.13
		Black (not Hispanic)	5,390	0.86	3.27
		Hispanic	2,348	0.87	3.26
		American Indian	157	0.88	3.26
		Other	1,454	0.87	3.23
	Gender	Male	17,196	0.88	3.23
		Female	16,888	0.88	3.22
	Accommodations	No	32,620	0.88	3.22
		Yes	1,466	0.84	3.21

Table 9.40: Reliability and SEM by Subgroup, English Language Arts Grade 7

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A	Race/Ethnicity	White	24,876	0.91	3.15
		Asian/Pacific Islander	740	0.92	3.01
		Black (not Hispanic)	5,707	0.89	3.24
		Hispanic	2,318	0.90	3.22
		American Indian	126	0.90	3.19
		Other	1,361	0.91	3.16
	Gender	Male	18,296	0.91	3.19
		Female	16,832	0.91	3.14
	Accommodations	No	30,832	0.90	3.15
		Yes	4,295	0.84	3.20
B	Race/Ethnicity	White	23,320	0.89	3.12
		Asian/Pacific Islander	803	0.91	2.99
		Black (not Hispanic)	5,065	0.89	3.23
		Hispanic	2,207	0.89	3.20
		American Indian	134	0.89	3.18
		Other	1,287	0.90	3.15
	Gender	Male	16,616	0.90	3.16
		Female	16,202	0.89	3.12
	Accommodations	No	31,568	0.90	3.14
		Yes	1,250	0.86	3.21

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Table 9.41: Reliability and SEM by Subgroup, English Language Arts Grade 8

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White	6,432	0.92	3.17
		Asian/Pacific Islander	148	0.93	3.09
		Black (not Hispanic)	1,593	0.90	3.20
		Hispanic	613	0.92	3.17
		American Indian	43	-	-
		Other	378	0.91	3.17
	Gender	Male	5,189	0.92	3.19
		Female	4,018	0.92	3.15
	Accommodations	No	5,099	0.91	3.09
		Yes	4,108	0.85	3.19
A05	Race/Ethnicity	White	3,545	0.90	3.04
		Asian/Pacific Islander	123	0.92	2.84
		Black (not Hispanic)	755	0.90	3.19
		Hispanic	366	0.90	3.12
		American Indian	24	-	-
		Other	217	0.91	3.06
	Gender	Male	2,524	0.92	3.08
		Female	2,506	0.90	3.04
	Accommodations	No	5,025	0.91	3.07
		Yes	5	-	-
A09	Race/Ethnicity	White	5,431	0.90	3.04
		Asian/Pacific Islander	174	0.93	2.86
		Black (not Hispanic)	1,187	0.90	3.21
		Hispanic	490	0.90	3.15
		American Indian	29	-	-
		Other	266	0.90	3.12
	Gender	Male	3,741	0.91	3.11
		Female	3,836	0.90	3.04
	Accommodations	No	7,568	0.91	3.08
		Yes	9	-	-
A13	Race/Ethnicity	White	3,601	0.90	3.05
		Asian/Pacific Islander	140	0.93	2.88
		Black (not Hispanic)	773	0.90	3.19
		Hispanic	332	0.90	3.16
		American Indian	22	-	-
		Other	197	0.89	3.04
	Gender	Male	2,562	0.91	3.10
		Female	2,503	0.90	3.05
	Accommodations	No	5,059	0.91	3.08
		Yes	6	-	-

Note: Reliability and SEM were not computed for groups smaller than 50 students.

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Table 9.41: Reliability and SEM by Subgroup, English Language Arts Grade 8 (cont.)

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A17	Race/Ethnicity	White	5,446	0.90	3.13
		Asian/Pacific Islander	164	0.93	3.00
		Black (not Hispanic)	1,160	0.90	3.32
		Hispanic	496	0.90	3.27
		American Indian	30	-	-
		Other	283	0.92	3.19
	Gender	Male	3,709	0.91	3.24
		Female	3,870	0.90	3.11
	Accommodations	No	7,572	0.91	3.19
		Yes	7	-	-
B04	Race/Ethnicity	White	4,971	0.92	3.24
		Asian/Pacific Islander	157	0.94	3.15
		Black (not Hispanic)	951	0.90	3.29
		Hispanic	537	0.91	3.24
		American Indian	34	-	-
		Other	261	0.91	3.30
	Gender	Male	3,721	0.92	3.27
		Female	3,190	0.91	3.20
	Accommodations	No	5,828	0.91	3.22
		Yes	1,083	0.87	3.24
B06	Race/Ethnicity	White	5,458	0.90	3.12
		Asian/Pacific Islander	157	0.91	2.84
		Black (not Hispanic)	1,151	0.90	3.25
		Hispanic	460	0.90	3.21
		American Indian	31	-	-
		Other	314	0.91	3.15
	Gender	Male	3,792	0.91	3.17
		Female	3,779	0.90	3.10
	Accommodations	No	7,567	0.91	3.15
		Yes	4	-	-
B10	Race/Ethnicity	White	3,635	0.90	3.25
		Asian/Pacific Islander	127	0.91	3.01
		Black (not Hispanic)	789	0.89	3.36
		Hispanic	325	0.90	3.26
		American Indian	13	-	-
		Other	204	0.90	3.30
	Gender	Male	2,567	0.91	3.32
		Female	2,526	0.90	3.19
	Accommodations	No	5,090	0.90	3.27
		Yes	3	-	-

Note: Reliability and SEM were not computed for groups smaller than 50 students.

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Table 9.41: Reliability and SEM by Subgroup, English Language Arts Grade 8 (cont.)

Form	Category	Group	N Count	Cronbach's Alpha	SEM
B14	Race/Ethnicity	White	5,540	0.90	3.11
		Asian/Pacific Islander	176	0.92	3.02
		Black (not Hispanic)	1,083	0.89	3.22
		Hispanic	497	0.91	3.18
		American Indian	34	-	-
		Other	277	0.90	3.14
	Gender	Male	3,816	0.91	3.16
		Female	3,791	0.90	3.10
	Accommodations	No	7,600	0.91	3.14
		Yes	7	-	-
B18	Race/Ethnicity	White	3,665	0.90	3.17
		Asian/Pacific Islander	137	0.92	3.09
		Black (not Hispanic)	749	0.90	3.31
		Hispanic	322	0.91	3.25
		American Indian	23	-	-
		Other	181	0.91	3.17
	Gender	Male	2,505	0.91	3.24
		Female	2,572	0.90	3.15
	Accommodations	No	5,072	0.91	3.21
		Yes	5	-	-

Note: Reliability and SEM were not computed for groups smaller than 50 students.

Table 9.42: Reliability and SEM by Subgroup, Mathematics Grade 3

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A	Race/Ethnicity	White	22,480	0.92	2.84
		Asian/Pacific Islander	690	0.94	2.68
		Black (not Hispanic)	5,215	0.91	2.87
		Hispanic	2,104	0.91	2.89
		American Indian	99	0.93	2.86
		Other	1,560	0.92	2.86
	Gender	Male	16,412	0.93	2.83
		Female	15,738	0.92	2.86
	Accommodations	No	32,120	0.93	2.85
		Yes	30	-	-
B	Race/Ethnicity	White	23,496	0.92	2.86
		Asian/Pacific Islander	863	0.94	2.73
		Black (not Hispanic)	5,491	0.90	2.89
		Hispanic	2,561	0.92	2.91
		American Indian	103	0.91	2.91
		Other	1,658	0.92	2.88
	Gender	Male	17,768	0.93	2.86
		Female	16,404	0.92	2.88
	Accommodations	No	33,992	0.93	2.87
		Yes	179	0.91	2.92

Note: Reliability and SEM were not computed for groups smaller than 50 students.

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Table 9.43: Reliability and SEM by Subgroup, Mathematics Grade 4

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A	Race/Ethnicity	White	22,052	0.93	2.96
		Asian/Pacific Islander	720	0.94	2.83
		Black (not Hispanic)	5,308	0.92	2.85
		Hispanic	2,083	0.93	2.95
		American Indian	109	0.93	2.97
		Other	1,540	0.93	2.95
	Gender	Male	16,236	0.94	2.92
		Female	15,576	0.93	2.96
	Accommodations	No	30,744	0.93	2.95
		Yes	1,069	0.84	2.57
B	Race/Ethnicity	White	25,172	0.93	2.98
		Asian/Pacific Islander	874	0.95	2.84
		Black (not Hispanic)	5,836	0.91	2.86
		Hispanic	2,565	0.93	2.95
		American Indian	106	0.94	2.94
		Other	1,761	0.93	2.96
	Gender	Male	18,788	0.94	2.94
		Female	17,524	0.93	2.97
	Accommodations	No	34,120	0.93	2.97
		Yes	2,193	0.88	2.71

Table 9.44: Reliability and SEM by Subgroup, Mathematics Grade 5

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A	Race/Ethnicity	White	23,104	0.92	2.94
		Asian/Pacific Islander	720	0.95	2.79
		Black (not Hispanic)	5,345	0.89	2.86
		Hispanic	2,151	0.92	2.92
		American Indian	119	0.92	2.95
		Other	1,499	0.92	2.94
	Gender	Male	16,656	0.93	2.90
		Female	16,284	0.92	2.95
	Accommodations	No	31,412	0.92	2.94
		Yes	1,528	0.77	2.64
B	Race/Ethnicity	White	25,424	0.93	2.92
		Asian/Pacific Islander	855	0.95	2.77
		Black (not Hispanic)	5,981	0.89	2.85
		Hispanic	2,720	0.91	2.91
		American Indian	147	0.93	2.88
		Other	1,741	0.92	2.92
	Gender	Male	19,008	0.93	2.89
		Female	17,860	0.92	2.92
	Accommodations	No	34,160	0.92	2.92
		Yes	2,707	0.84	2.71

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Table 9.45: Reliability and SEM by Subgroup, Mathematics Grade 6

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A	Race/Ethnicity	White	23,576	0.94	3.02
		Asian/Pacific Islander	750	0.95	2.91
		Black (not Hispanic)	5,542	0.91	2.88
		Hispanic	2,249	0.93	2.99
		American Indian	127	0.94	3.02
		Other	1,455	0.94	2.99
	Gender	Male	17,044	0.94	2.98
		Female	16,656	0.94	3.01
	Accommodations	No	31,736	0.94	3.01
		Yes	1,966	0.82	2.68
B	Race/Ethnicity	White	25,412	0.94	3.01
		Asian/Pacific Islander	816	0.95	2.93
		Black (not Hispanic)	5,765	0.91	2.85
		Hispanic	2,599	0.93	2.96
		American Indian	168	0.93	3.02
		Other	1,561	0.94	2.99
	Gender	Male	18,608	0.94	2.97
		Female	17,712	0.94	3.00
	Accommodations	No	33,288	0.94	3.00
		Yes	3,031	0.85	2.66

Table 9.46: Reliability and SEM by Subgroup, Mathematics Grade 7

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A	Race/Ethnicity	White	23,068	0.92	3.17
		Asian/Pacific Islander	696	0.95	3.06
		Black (not Hispanic)	5,249	0.88	3.03
		Hispanic	2,175	0.91	3.14
		American Indian	122	0.92	3.15
		Other	1,306	0.92	3.16
	Gender	Male	16,536	0.93	3.13
		Female	16,078	0.92	3.17
	Accommodations	No	30,536	0.92	3.16
		Yes	2,082	0.77	2.84
B	Race/Ethnicity	White	24,480	0.92	3.17
		Asian/Pacific Islander	748	0.95	3.05
		Black (not Hispanic)	5,489	0.88	3.03
		Hispanic	2,405	0.91	3.14
		American Indian	136	0.91	3.14
		Other	1,311	0.92	3.14
	Gender	Male	17,924	0.93	3.13
		Female	16,640	0.92	3.16
	Accommodations	No	31,508	0.92	3.16
		Yes	3,060	0.79	2.88

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Table 9.47: Reliability and SEM by Subgroup, Mathematics Grade 8

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A	Race/Ethnicity	White	18,812	0.91	3.17
		Asian/Pacific Islander	466	0.95	3.07
		Black (not Hispanic)	4,538	0.88	3.02
		Hispanic	1,771	0.89	3.11
		American Indian	126	0.91	3.10
		Other	1,039	0.91	3.12
	Gender	Male	13,822	0.92	3.12
		Female	12,930	0.90	3.16
	Accommodations	No	24,696	0.91	3.15
		Yes	2,055	0.77	2.88
B	Race/Ethnicity	White	20,196	0.91	3.19
		Asian/Pacific Islander	481	0.95	3.09
		Black (not Hispanic)	4,648	0.88	3.03
		Hispanic	2,041	0.89	3.13
		American Indian	136	0.90	3.15
		Other	1,075	0.92	3.14
	Gender	Male	14,920	0.92	3.13
		Female	13,658	0.91	3.18
	Accommodations	No	25,720	0.91	3.18
		Yes	2,858	0.76	2.91

Table 9.48: Reliability and SEM by Subgroup, Science Grade 5

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A	Race/Ethnicity	White	24,812	0.89	3.48
		Asian/Pacific Islander	784	0.91	3.40
		Black (not Hispanic)	5,786	0.88	3.54
		Hispanic	2,305	0.89	3.56
		American Indian	124	0.88	3.52
		Other	1,647	0.89	3.52
	Gender	Male	17,932	0.90	3.48
		Female	17,524	0.89	3.52
	Accommodations	No	34,768	0.90	3.51
		Yes	685	0.84	3.43
B	Race/Ethnicity	White	23,672	0.90	3.48
		Asian/Pacific Islander	789	0.92	3.44
		Black (not Hispanic)	5,453	0.89	3.41
		Hispanic	2,547	0.90	3.49
		American Indian	142	0.90	3.53
		Other	1,590	0.90	3.50
	Gender	Male	17,652	0.91	3.45
		Female	16,536	0.90	3.50
	Accommodations	No	33,064	0.90	3.48
		Yes	1,126	0.87	3.36

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Table 9.49: Reliability and SEM by Subgroup, Science Grade 8

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A	Race/Ethnicity	White	24,988	0.91	3.48
		Asian/Pacific Islander	800	0.93	3.40
		Black (not Hispanic)	5,386	0.90	3.48
		Hispanic	2,301	0.91	3.53
		American Indian	149	0.92	3.51
		Other	1,346	0.92	3.50
	Gender	Male	17,752	0.93	3.46
		Female	17,216	0.91	3.52
	Accommodations	No	34,592	0.92	3.49
		Yes	377	0.87	3.32
B	Race/Ethnicity	White	22,664	0.92	3.49
		Asian/Pacific Islander	719	0.94	3.40
		Black (not Hispanic)	4,761	0.90	3.48
		Hispanic	2,224	0.92	3.51
		American Indian	134	0.91	3.51
		Other	1,229	0.92	3.51
	Gender	Male	16,346	0.93	3.49
		Female	15,384	0.91	3.51
	Accommodations	No	31,180	0.92	3.50
		Yes	549	0.89	3.29

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CHAPTER 10: REPORTING AND RESULTS

This chapter of the Technical Report provides descriptions of the Missouri Assessment Program score reports and interpretive guide. The AERA, APA, & NCME (2014) standards addressed in Chapter 10 are 5.1, 6.10, 7.0, and 12.18. Each standard will be presented in the pertinent section of this chapter.

This chapter also contains information on the results of the Spring 2019 administration of the ELA, Mathematics, and Science MAP. The scale score and performance level summaries for the total population of Missouri students are presented here. Presenting the results by performance level translates the quantitative scale provided through scale scores into a qualitative description of student performance, using the following terms: *Below Basic*, *Basic*, *Proficient*, and *Advanced.*

While the scale score provides an essential quantitative reference for student performance, the performance level information plainly outlines the meaning of the scores to parents, students, and educators. When combined, scale scores and performance levels provide a comprehensive set of tools to assess Missouri student performance by content and grade level.

In addition, the longitudinal student performance data are maintained in Chapter 10. Scale score and performance level data for multiple administration years are presented and discussed in this chapter.

All results presented in this chapter are based on Missouri student census data as delivered to DESE in the General Research File. The results presented here may differ slightly from the official state summary report of all student populations due to ongoing resolution of test materials and student information. The results in the tables in this chapter are presented as evidence of reliability and validity of the intended interpretation of scores from the MAP assessments and should not be used for state accountability purposes.

10.1 Reports

Score reports are the primary means of communicating test scores to relevant district personnel (i.e., Test Coordinators or superintendents), teachers, and parents. AERA, APA, & NCME (2014) Standard 6.10 states the following:

> When test score information is released, those responsible for testing programs should provide interpretations appropriate to the audience. The interpretations should describe in simple language what the test covers, what scores represent, the precision/reliability of the scores, and how scores are intended to be used. (p. 119)

Standard 5.1 is related in that it states the following:

> Test users should be provided with clear explanations of the characteristics, meaning, and intended interpretation of scale scores, as well as their limitations. (p. 102)

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Interpretations related to the test scores are disseminated in two ways: (1) the individual score report and (2) the *Guide to Interpreting Results* (DRC, 2019).

In addition to providing interpretation, it is important that the information related to the test scores is understandable by the target audience. Standard 7.0 of the AERA, APA, & NCME (2014) *Standards* states the following:

> Information relating to tests should be clearly documented so that those who use tests can make informed decisions regarding which test to use for a specific purpose, how to administer the chosen test, and how to interpret test scores. (p. 125)

In support of Standard 7.0, the *Guide to Interpreting Results* (presented in Appendix C) is accessible to parents, teachers, and laypeople alike.

The individual student report is the primary means for sharing student test results with parents. As such, it should be a stand-alone document, giving parents relevant information so they understand their child's test score. In the 2018–19 administration year, DRC reported the MAP Grade-Level Assessment through the Missouri MAP Online Reporting System, which is a browser-based system designed to deliver online interactive reporting to authorized users at the state and district levels for Missouri public schools.

10.1.1 Description of Each Type of Report

In this section, descriptions of the following reports are provided: Student Roster, Individual Student Report, Student Score Label, Item Summary Report, and Results Summary Report. In addition, the Missouri Comprehensive Data System is briefly discussed.

In compliance with AERA, APA, & NCME (2014) Standard 12.18, the MAP score reports provide clear information about the achievements of individual students and groups of students. Standard 12.18 states the following:

> In educational settings, score reports should be accompanied by a clear presentation of information on how to interpret the scores, including the degree of measurement error associated with each score or classification level, and by supplementary information related to group summary scores. In addition, dates of test administration and relevant norming studies should be included in score reports. (p. 200)

Student Roster

Available from the Missouri Online Reporting System is a Student Roster that displays a list of students based on the specific report filter options selected, such as test administration, grade, school, district, gender, race/ethnicity, and examiner. Total test scale scores and performance level indicators, as well as the reporting category scale scores, are displayed in a table format for the content area chosen. Selecting a student from the roster will open that student's Individual Student Report.

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Individual Student Report

The Individual Student Report (ISR) is another type of report available through the Missouri Online Reporting System. The Individual Student Reports are provided to schools to be sent home to parents. On the upper-left side of the page, the student's identifying information is provided. In the middle of the page, a bar graph and the student's scale score for a given content area are shown, along with the performance level associated with that scale score. This information is followed by a brief explanation of what the performance level means.

On the bottom half of the page, the reporting category scale scores, based on student performance on a subset of test questions measuring each content category (or domain) of English Language Arts, Mathematics, and Science, are provided. These scores represent student performance on the test reporting categories, which are listed below.

The English Language Arts Grades 3 through 8 reporting categories include the following:

- Reading
- Research
- Writing
- Listening

The Mathematics Grades 3, 4, and 5 reporting categories include the following:

- Number Sense and Operations in Base Ten
- Number Sense and Operations in Fractions
- Relationships and Algebraic Thinking
- Geometry and Measurement & Data and Statistics

The Mathematics Grades 6 and 7 reporting categories include the following:

- Ratios and Proportional Relationships
- Number Sense and Operations
- Expressions, Equations and Inequalities
- Geometry and Measurement & Data Analysis, Statistics and Probability

The Mathematics Grade 8 reporting categories include the following:

- Number Sense and Operations & Expressions, Equations and Inequalities
- Geometry and Measurement & Data Analysis, Statistics and Probability
- Functions

The Science Grades 5 and 8

- Physical Science
- Life Science
- Earth and Space Science

The standard error of measurement (SEM) is indicated, in a graphical format, around the total test scale scores and the reporting category scale scores on the ISRs. The SEM represents the amount of variability that can be expected in a student's test or reporting category score due to

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the inherent imprecision of the test. In other words, the SEM represents a range of scale scores in which the student's score would likely fall if the student took the same test again.

When a student does not receive a scale score, then his or her performance level is labeled "Level Not Determined" (LND). Students whose results are invalidated due to inappropriately used testing accommodations are assigned the lowest obtainable scale score (LOSS) for a given content area, and an explanation of why the results were invalidated is provided in lieu of the performance level descriptor. The actual reporting category scores, not the invalidated LOSS reporting categories, are displayed on the ISR for the accommodation-invalidated students. Students whose test results were invalidated by a teacher are assigned the lowest obtainable scale score (LOSS) for the total test and each reporting category and the *Below Basic* performance level. A sample ISR is provided in the *Guide to Interpreting Results* (presented in Appendix C).

Student Score Label

The Student Score Label is designed so that each student's test results can be placed in the student's permanent record. A label is provided for every student who participates in the Spring administration of the MAP. Each label has a self-adhesive backing so that it can be peeled from the sheet and placed in the student's cumulative school record. The label presents a snapshot of the student's results on the MAP. Separate labels are generated for each grade and content area; thus, a student will have multiple labels—one for each content area administered. The label lists the student's scale score and performance level for the content area. DRC provided multiple labels per student submitted for scoring. The labels are provided in print only. A sample Student Score Label report is provided in the *Guide to Interpreting Results* (presented in Appendix C).

Item Summary Report

The Item Summary Reports are available through the Missouri Online Reporting System. The Item Summary Reports provide users with information on test item performance alongside the relevant standards to determine curriculum adjustments for the following year. This report includes the following test item information: content area, reporting category the item belongs to, the Missouri Learning Standard code, depth-of-knowledge category, item type, maximum points possible for the item, percentage of points earned, and the number of students who responded to the item. The item summary reports can be viewed at the state, district, school, and test examiner levels.

Results Summary Report

The Results Summary Reports are also available to districts and schools from the Missouri Online Reporting System. Users can display the Results Summary report to determine district and school testing performance, including both a performance level and a scale score summary. For each subject, the percentage of students in each performance level and average scale scores are presented in both graphical and numerical format.

Missouri Comprehensive Data System

Schools and districts can access summary level reports through the online Missouri Comprehensive Data System (MCDS). The MCDS allows school district personnel with appropriate permissions to access MAP data at a variety of levels and to request customized reports that are configured and disaggregated in ways that best meet their needs for such activities as evaluating programs, revising curriculum, and improving teaching and learning.

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Users access the MCDS from the Data Management tab on DESE's home page (http://dese.mo.gov/). From there, they access the data portal directly through the MCDS link. Each school and/or district is assigned a username and password to access the site.

10.1.2 Interpreting Test Results

The student's correct responses to the assessment questions are used to derive that student's MAP scale score. The scale score describes performance on a continuum that spans the complete range of Grades 3–8 for ELA and Mathematics. These scores range in value from 160 to 650 for English Language Arts and from 185 to 660 for Mathematics. Because ELA and Mathematics assessments are on vertical scales, scores from adjacent grades may be compared within a content area. For example, it is appropriate to compare a student's Grade 5 Mathematics scale score with his or her Grade 6 Mathematics scale score in a subsequent administration year. ELA and Mathematics scale scores can also be compared within a content area across the last two test administrations: Spring 2018 and Spring 2019.

Science scale scores range from 100 to 540 for Grade 5 and from 285 to 710 for Grade 8. Science scores can be compared within a grade level in the Spring 2019 test administration. Because new reporting scales were developed for the Science assessments in Spring 2019, the Science scale scores from the current administration cannot be compared with the scores from previous administrations. Also, because Science assessments are not on a vertical scale, the scale scores cannot be compared across grades.

Scale scores cannot be compared across content areas. For example, it is not appropriate to compare a student's Mathematics and ELA scores as they do not represent comparable achievement.

The MAP scale scores determine a student's performance level. Student performance is reported in terms of four performance levels that describe a pathway to proficiency and college and career readiness. Each performance level represents standards of performance for each assessed content area. Performance level scores provide a description of what students can do in terms of the content and skills assessed, as described in the Missouri Learning Standards.

In addition to the total test score, students receive scale scores in each reporting category of the test taken. The reporting category scale scores are on the same scale as the total test scores. However, caution should be exercised when the reporting category scores are compared with the total test scores because test items in a given reporting category measure only a subset of skills compared to the full set of skills measured by the full test. The scale scores in one reporting category should not be compared with the scale scores in other reporting categories because test items in a given reporting category measure different sets of skills or knowledge than the items in another reporting category. The reporting categories are measured by a minimum of 6 items, yielding a minimum of 8 raw score points. Mathematics domains with fewer than 6 items were combined with other domains to increase the reliability of the reporting category scale scores.

Information on score interpretation is included in the *Guide to Interpreting Results*, which was written for Missouri teachers and administrators who received score reports from the 2018–19 administration of the MAP. This guide has three sections. The first section presents an overview

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of key terms and test-related concepts. The second section discusses assessment terms and the types of scores that will be presented on the score reports and presents the performance level descriptors for all grades/content areas. The third section presents sample score reports. The *Guide to Interpreting Results* was developed collaboratively by DRC and DESE staff.

10.2 Current Administration Results

ELA and Mathematics assessments were administered to students in Grades 3 through 8. Science assessments were given in Grades 5 and 8. Tables 10.1 through 10.3 provide summaries of the total test scale scores based on the state population for the 2019 administration of the ELA, Mathematics, and Science assessments, respectively. Tables 10.4 through 10.6 show summaries of the reporting category scale scores of the ELA, Mathematics, and Science assessments, respectively.

Tables 10.7 through 10.9 present the percentages of students in each performance level in the Spring 2019 test administration. For ELA, the percentage of students classified as *Proficient* or *Advanced* was similar for all grade levels, except for Grade 7, and ranged from approximately 46% for Grade 6 to approximately 49% for Grade 4. Approximately 44% of students were classified as *Proficient* or *Advanced* in ELA Grade 7 (refer to Table 10.7). The percentage of students classified as *Proficient* or *Advanced* in Mathematics was found to be higher in lower grade levels compared to the higher grade levels and ranged from approximately 47% for Grade 4 to approximately 29% for Grade 8[3] (see Table 10.8). For Science, 42.8% of students were classified as *Proficient* or *Advanced* in Grade 5 and 43.8% of students were classified as *Proficient* or *Advanced* in Grade 8 in Spring 2019 (see Table 10.9).

10.3 Longitudinal Comparison of Test Results

It is often desirable to examine the scores of students across time and monitor group performance. This is possible if the test content and the construct measured by the test are comparable from year to year and if the scores are reported on the same scale in multiple years. New scales were developed for both ELA and Mathematics after the 2017–18 test administration, and the Spring 2017–18 impact data are considered a new baseline for ELA and Mathematics Grades 3 through 8. Therefore, the 2018–19 test scores for ELA and Mathematics are directly comparable only with one previous year and the cross-year scale score summary includes only two-year data. The cross-year scale score summary statistics are presented for ELA and Mathematics in Tables 10.10 and 10.11, respectively. As observed in Table 10.10, the overall student performance in ELA was stable across the first two years of the new test administration. The difference in mean scale scores for Grades 3, 4, 5, and 7 between the Spring 2018 and Spring 2019 test administrations was less than one scale score point. The difference in mean scale scores for Grades 6 and 8 between the two administration years was less than two score points, with the mean scale scores being lower in the Spring 2019 administration compared to the Spring 2018 administration.

[3] Approximately 20% of Grade 8 students took the Algebra I End-of-Course assessment instead of the Grade 8 Mathematics assessment.

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Similar to ELA, the largest mean scale score change for Mathematics was less than two scale score points at any grade level between Spring 2018 and Spring 2019 (see Table 10.11). A mean scale score increase of approximately one to two points was observed for Mathematics Grades 3, 4, and 6. A mean scale score decrease of approximately one to one and a half points between the two years was found for Grades 5 and 7. A mean scale score decrease of less than one scale score point was observed for Mathematics Grade 8.

New scales were established for Science after the Spring 2018–19 administration, resulting in a new impact data baseline. The 2018–19 Science test scores are not directly comparable with previous Science scores, and no longitudinal scale score data are presented for Science in this report.

In addition to the scale score longitudinal data for ELA and Mathematics, the cross-year performance level data were examined. Tables 10.12 and 10.13 show the percentages of students in each performance level in the Spring 2018 and Spring 2019 test administrations for ELA and Mathematics, respectively. In these two years, Missouri students were classified into performance levels based on the same set of cut scores set by Missouri educators in a process of performance level setting in Summer 2018.

As seen in Table 10.12, except for Grades 6 and 8, the percentage of students classified as *Proficient* or *Advanced* for ELA changed by less than 1% between the Spring 2018 and Spring 2019 test administrations. A decrease of approximately 2% of students classified as *Proficient* or *Advanced* for ELA Grade 6 and a decrease of less than 2% of students classified as *Proficient* or *Advanced* for ELA Grade 8 was noted. In addition, changes in the percentages of students classified in any performance level were less than 2% between the two administration years for ELA.

As seen in Table 10.13, except for Grade 6, the percentages of students classified as *Proficient* or *Advanced* changed by less than 1% between the Spring 2018 and Spring 2019 test administrations for all Mathematics grades. The percentage of students classified as *Proficient* or *Advanced* increased by just over 1% in Grade 6 between the two administration years. In addition, changes in the percentages of students classified in any performance level were, with one exception, less than 1.5% between the two administration years for Mathematics.

New performance level cut scores were set for Science during the performance level setting in Summer 2019, resulting in a new impact data baseline. As such, the percentages of students in the four performance levels in Spring 2019 are not directly comparable with previous Science data, and no longitudinal impact data are presented for Science in this report. Previous test administration results for all content areas are available in past technical reports posted on the DESE website at https://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials.

10.4 Summary

In summary, the overall purpose of reporting test results is to communicate information on student performance to stakeholders. These results are presented in the context of score reports

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that aid the user in understanding the meaning of the test scores. The reports and ancillary information developed by DRC are in alignment with multiple best practices of the testing industry and, in particular, support the following AERA, APA, & NCME (2014) standards:

- Standard 5.1—Test users should be provided with clear explanations of the characteristics, meaning, and intended interpretation of scale scores, as well as their limitations.
- Standard 6.10—When test score information is released, those responsible for testing programs should provide interpretations appropriate to the audience. The interpretations should describe in simple language what the test covers, what scores represent, the precision/reliability of the scores, and how scores are intended to be used.
- Standard 7.0—Information relating to tests should be clearly documented so that those who use tests can make informed decisions regarding which test to use for a specific purpose, how to administer the chosen test, and how to interpret test scores.
- Standard 12.18—In educational settings, score reports should be accompanied by a clear presentation of information on how to interpret the scores, including the degree of measurement error associated with each score or classification level, and by supplementary information related to group summary scores. In addition, dates of test administration and relevant norming studies should be included in score reports.

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Table 10.1: State-Level Total Test Scale Score Statistics, English Language Arts

Grade	N Count	Mean Scale Score	Scale Score Std. Dev.	Percentile				
				10th	25th	50th	75th	90th
3	66,323	360.49	43.61	305	333	362	390	413
4	68,048	385.14	41.98	332	358	387	414	436
5	69,735	398.81	41.24	346	371	400	426	450
6	70,023	408.17	36.15	361	384	409	432	453
7	68,019	425.81	40.69	371	397	428	455	476
8	66,822	438.24	41.60	384	409	440	467	490

Table 10.2: State-Level Total Test Scale Score Statistics, Mathematics

Grade	N Count	Mean Scale Score	Scale Score Std. Dev.	Percentile				
				10th	25th	50th	75th	90th
3	66,463	353.41	47.37	295	326	357	386	408
4	68,188	378.46	46.43	323	354	384	409	430
5	69,867	398.64	39.98	352	376	401	425	446
6	70,080	407.56	37.57	364	386	410	433	451
7	67,250	417.28	47.41	359	391	422	450	473
8*	55,408	439.87	50.34	375	408	441	474	502

*Grade 8 students had the option of taking Algebra 1 instead of the MAP Grade 8 Mathematics test.

Table 10.3: State-Level Total Test Scale Score Statistics, Science

Grade	N Count	Mean Scale Score	Scale Score Std. Dev.	Percentile				
				10th	25th	50th	75th	90th
5	69,849	299.89	40.14	246	273	302	328	350
8	66,866	499.75	40.36	445	475	503	528	548

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Table 10.4: State-Level Reporting Category Scale Score Statistics, English Language Arts

Grade	Reporting Category	Student Count	Mean Scale Score	Scale Score Std. Dev.	Min. Scale Score	Max. Scale Score
3	Reading	66,323	359.59	50.20	160	560
	Research	66,323	370.87	86.61	160	560
	Writing	66,323	367.66	61.76	160	560
	Speaking and Listening	66,323	369.37	91.91	160	560
4	Reading	68,048	385.57	48.57	170	570
	Research	68,048	394.12	77.78	170	570
	Writing	68,048	385.76	57.63	170	570
	Speaking and Listening	68,048	390.50	85.46	170	570
5	Reading	69,735	400.07	47.94	210	600
	Research	69,735	409.81	72.73	210	600
	Writing	69,735	399.74	55.27	210	600
	Speaking and Listening	69,735	416.38	81.70	210	600
6	Reading	70,023	408.44	40.60	230	620
	Research	70,023	418.10	80.17	230	620
	Writing	70,023	408.89	63.78	230	620
	Speaking and Listening	70,023	416.50	80.08	230	620
7	Reading	68,019	426.56	45.55	240	630
	Research	68,019	436.40	78.36	240	630
	Writing	68,019	425.09	70.73	240	630
	Speaking and Listening	68,019	435.13	80.11	240	630
8	Reading	66,822	438.93	46.15	250	650
	Research	66,822	437.23	71.89	250	650
	Writing	66,822	443.55	69.68	250	650
	Speaking and Listening	66,822	451.34	93.15	250	650

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Table 10.5: State-Level Reporting Category Scale Score Statistics, Mathematics

Grade	Reporting Category	Student Count	Mean Scale Score	Scale Score Std. Dev.	Min. Scale Score	Max. Scale Score
3	Number Sense and Operations in Base Ten	66,463	355.66	78.35	185	520
	Number Sense and Operations in Fractions	66,463	349.26	79.07	185	520
	Relationships and Algebraic Thinking	66,463	356.33	60.23	185	520
	Geometry and Measurement & Data and Statistics	66,463	349.86	59.28	185	520
4	Number Sense and Operations in Base Ten	68,188	379.00	60.10	210	540
	Number Sense and Operations in Fractions	68,188	372.11	77.14	210	540
	Relationships and Algebraic Thinking	68,188	366.40	78.60	210	540
	Geometry and Measurement & Data and Statistics	68,188	373.82	63.07	210	540
5	Number Sense and Operations in Base Ten	69,867	396.34	76.51	250	570
	Number Sense and Operations in Fractions	69,867	385.17	68.50	250	570
	Relationships and Algebraic Thinking	69,867	393.64	62.05	250	570
	Geometry and Measurement & Data and Statistics	69,867	397.79	47.89	250	570
6	Ratios and Proportional Relationships	70,080	402.09	57.21	260	580
	Number Sense and Operations	70,080	404.20	54.19	260	580
	Expressions, Equations and Inequalities	70,080	400.89	55.36	260	580
	Geometry and Measurement & Data Analysis, Statistics and Probability	70,080	406.83	52.12	260	580
7	Ratios and Proportional Relationships	67,250	419.36	69.63	270	600
	Number Sense and Operations	67,250	399.98	78.23	270	600
	Expressions, Equations and Inequalities	67,250	412.45	66.18	270	600
	Geometry and Measurement & Data Analysis, Statistics and Probability	67,250	415.37	53.01	270	600
8	Number Sense and Operations & Expressions, Equations and Inequalities	55,408	439.19	54.49	310	660
	Geometry and Measurement & Data Analysis, Statistics and Probability	55,408	435.91	62.84	310	660
	Functions	55,408	436.43	63.59	310	660

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Table 10.6: State-Level Reporting Category Scale Score Statistics, Science

Grade	Reporting Category	Student Count	Mean Scale Score	Scale Score Std. Dev.	Min. Scale Score	Max. Scale Score
5	Physical Science	69,849	298.84	47.05	100	540
	Life Science	69,849	301.00	51.64	100	540
	Earth and Space Science	69,849	300.78	49.81	100	540
8	Physical Science	66,866	499.26	46.74	285	710
	Life Science	66,866	499.27	48.41	285	710
	Earth and Space Science	66,866	495.70	59.82	285	710

Table 10.7: State-Level Percentages of Students in Each Performance Level, English Language Arts

Grade	N	No Level	*Below Basic*	*Basic*	*Proficient*	*Advanced*	*Prof. & Adv.*
3	66,476	0.2	23.2	27.9	27.7	21.1	48.8
4	68,161	0.2	11.9	38.6	28.1	21.2	49.3
5	69,863	0.2	12.1	40.6	25.4	21.7	47.1
6	70,150	0.2	15.3	38.5	25.6	20.5	46.1
7	68,167	0.2	16.5	39.5	19.3	24.5	43.8
8	67,009	0.3	14.4	38.0	28.8	18.6	47.4

Table 10.8: State-Level Percentages of Students in Each Performance Level, Mathematics

Grade	N	No Level	*Below Basic*	*Basic*	*Proficient*	*Advanced*	*Prof. & Adv.*
3	66,508	0.1	24.6	29.1	24.3	21.9	46.2
4	68,218	0.0	27.4	25.6	25.1	21.9	47.0
5	69,907	0.1	25.5	33.9	23.5	17.0	40.5
6	70,148	0.1	26.5	30.6	22.0	20.8	42.8
7	67,319	0.1	26.9	34.7	21.8	16.4	38.2
8*	55,511	0.2	32.8	37.8	20.5	8.7	29.2

*Grade 8 students had the option of taking Algebra 1 instead of the MAP Grade 8 Mathematics test.

Table 10.9: State-Level Percentages of Students in Each Performance Level, Science

Grade	N	No Level	*Below Basic*	*Basic*	*Proficient*	*Advanced*	*Prof. & Adv.*
5	69,900	0.1	26.1	31.1	29.3	13.5	42.8
8	66,989	0.2	20.4	35.6	25.8	18.0	43.8

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Table 10.10: State-Level Scale Score Means, 2018 and 2019, English Language Arts

Grade	Year	Student Count	Scale Score Mean	Scale Score Standard Deviation
3	2018	67,932	360.47	44.08
	2019	66,323	360.49	43.61
4	2018	69,593	384.77	42.38
	2019	68,048	385.14	41.98
5	2018	69,835	399.65	40.68
	2019	69,735	398.81	41.24
6	2018	67,941	409.89	36.53
	2019	70,023	408.17	36.15
7	2018	66,833	425.91	39.78
	2019	68,019	425.81	40.69
8	2018	66,276	439.58	42.04
	2019	66,822	438.24	41.60

Table 10.11: State-Level Scale Score Means, 2018 and 2019, Mathematics

Grade	Year	Student Count	Scale Score Mean	Scale Score Standard Deviation
3	2018	68,080	352.39	48.79
	2019	66,463	353.41	47.37
4	2018	69,719	376.68	49.15
	2019	68,188	378.46	46.43
5	2018	69,919	399.64	39.79
	2019	69,867	398.64	39.98
6	2018	67,968	405.73	39.17
	2019	70,080	407.56	37.57
7	2018	66,041	418.80	45.81
	2019	67,250	417.28	47.41
8*	2018	54,518	440.62	50.55
	2019	55,408	439.87	50.34

*Grade 8 students had the option of taking Algebra 1 instead of the MAP Grade 8 Mathematics test.

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Table 10.12: Comparison of Percentages of Students in Each Performance Level, 2018 and 2019, English Language Arts

Grade	Year	Student Count	No Level	*Below Basic*	*Basic*	*Proficient*	*Advanced*	*Prof. & Adv.*
3	2018	68,094	0.2	23.3	27.9	27.0	21.6	48.6
	2019	66,476	0.2	23.2	27.9	27.7	21.1	48.8
4	2018	69,734	0.2	12.1	37.5	29.9	20.2	50.1
	2019	68,161	0.2	11.9	38.6	28.1	21.2	49.3
5	2018	69,953	0.2	11.4	40.4	26.2	21.8	48.0
	2019	69,863	0.2	12.1	40.6	25.4	21.7	47.1
6	2018	68,091	0.2	14.3	37.1	26.3	22.0	48.3
	2019	70,150	0.2	15.3	38.5	25.6	20.5	46.1
7	2018	66,995	0.2	15.5	40.5	19.9	23.8	43.7
	2019	68,167	0.2	16.5	39.5	19.3	24.5	43.8
8	2018	66,448	0.3	13.2	37.5	30.0	19.0	49.0
	2019	67,009	0.3	14.4	38.0	28.8	18.6	47.4

Table 10.13: Comparison of Percentages of Students in Each Performance Level, 2018 and 2019, Mathematics

Grade	Year	Student Count	No Level	*Below Basic*	*Basic*	*Proficient*	*Advanced*	*Prof. & Adv.*
3	2018	68,118	0.1	25.1	27.7	25.3	21.9	47.2
	2019	66,508	0.1	24.6	29.1	24.3	21.9	46.2
4	2018	69,754	0.0	27.3	26.6	25.2	20.9	46.1
	2019	68,218	0.0	27.4	25.6	25.1	21.9	47.0
5	2018	69,961	0.1	24.2	34.6	24.1	17.1	41.2
	2019	69,907	0.1	25.5	33.9	23.5	17.0	40.5
6	2018	68,031	0.1	27.7	30.8	21.9	19.6	41.5
	2019	70,148	0.1	26.5	30.6	22.0	20.8	42.8
7	2018	66,120	0.1	25.2	36.5	22.2	16.0	38.2
	2019	67,319	0.1	26.9	34.7	21.8	16.4	38.2
8*	2018	54,610	0.2	32.9	37.1	20.8	9.0	29.8
	2019	55,511	0.2	32.8	37.8	20.5	8.7	29.2

*Grade 8 students had the option of taking Algebra I instead of the MAP Grade 8 Mathematics test.

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Appendix A: Test Coordinator's Manual

Missouri Assessment Program

Grade-Level Assessments Test Coordinator's Manual

English Language Arts
Grades 3, 4, 5, 6, 7, 8

Mathematics
Grades 3, 4, 5, 6, 7, 8

Science
Grades 5, 8

Spring 2019

Missouri Department of Elementary and Secondary Education

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DATA RECOGNITION DRC CORPORATION

This *Test Coordinator's Manual* is NOT a secure document. All administrators should read this manual before administering the test.

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2.0 CHANGE LOG

Date Updated	Description	Version
12/21/2018	Initial Posting	1

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3.0 INTRODUCTION

The Grade-Level Assessments are yearly standards-based tests that measure specific skills defined for each grade by the state of Missouri. All students in grades 3–8 in Missouri public and charter schools take the Grade-Level Assessments.

English Language Arts (ELA) and Mathematics are administered in grades 3–8. Science is administered in grades 5 and 8.

3.1 Purpose of Manual

The purpose of this *Test Coordinator's Manual* is to provide detailed instructions for administering the Missouri Assessment Program Grade-Level Assessments. The manual includes instructions for test preparation and post-test administration procedures. District Test Coordinators (DTCs) and School Test Coordinators (STCs) should thoroughly read the manual and view trainings before administering the tests.

3.2 Sections of Manual

- 3.0 Introduction: Includes the purpose of the manual, glossary of common terms, changes to the assessment, contact information, process for adding new DTCs
- 4.0 Important Dates: Includes all the dates associated with the assessment and the checklist of responsibilities
- 5.0 Timing Guidelines: Includes tips on scheduling the assessment and start/closing times of assessment
- 6.0 Assessments: Includes descriptions of the online, paper, and Large Print/Braille assessments, including special populations
- 7.0 Tools/Accommodations: Includes list and descriptions of accommodations and tools available for the assessment
- 8.0 Administration Portal: Includes information on logging into system, user accounts, students, sessions materials, additional features available, tracking student progress, and reports
- 9.0 Training/Test Preparation: Includes information on assessment plan, required/allowed/prohibited materials, making decisions on tool/accommodation use, transcribers, translators, physical materials, student practice tests/tutorials, and additional resources
- 10.0 Test Delivery System: Includes information about the testing platform, including student login, pausing, moving students, unlocking tests, purging tests, test submission, transcribed tests, and common technology issues
- 11.0 Special Circumstances: Includes information on student transfers, quality assurance issues, resets/reopens, test invalidation, and medical waivers
- 12.0 After Testing: Includes information on returning physical materials and securely destroying materials
- Appendices
- Index

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3.3 Glossary of Terms

Accommodations	Changes in procedures or materials that increase equitable access to the MAP Grade-Level Assessments. Assessment accommodations allow students to access assessment content to show what they know and can do. Accommodations are available for students with documented Individualized Education Programs (IEPs) or 504 Plans.
Break/Pause	Action taken by a student or Test Examiner (TE) to temporarily halt the test at any time, as needed. The online assessment provides an opportunity to pause the test for up to 20 minutes.
Constructed-Response Item Type	Test questions that require students to provide or input their response or responses using a keyboard or keypad. This type includes **short answer/text input, writing prompts,** and **keypad input** items.
eDIRECT	DRC's administrative platform from which district personnel will manage the assessments.
INSIGHT	DRC's INSIGHT is the secure, browser-based test engine for the MAP Grade-Level Assessments.
Item	A test question or stimulus presented to a student to elicit a response.
Online Tools Training (OTTs)	The OTTs allows students to become familiar with testing on a computer/device and allows them to experiment with the features available during an actual test. The OTT is NOT designed to demonstrate complete coverage of the tested content, and it is NOT scored. Rather, items have been chosen to demonstrate online assessment features and uses.
Performance Event	Performance Events (PE) are included in the MAP Grade-Level Mathematics Assessments. The PEs are designed to provide students with an opportunity to demonstrate their ability to apply their knowledge and higher-order thinking skills to explore and analyze a complex scenario. A performance event will contain a variety of item types.
Selected-Response Item Type	Test questions that require students to respond to a stem by selecting an appropriate response or responses, usually from answers provided. This type includes **multiple-choice, matching, multi-select,** and **evidence-based selected-response** items.
Session	A specific part of a test assigned to a specific student, which is grouped by Test Examiner.

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Stimulus/Stimuli	Material or materials used in the test context, which form the basis for assessing the knowledge and skills of students. Many items/tasks for the assessments include a stimulus along with a set of questions to which the student responds. Examples of stimuli include, but are not limited to, traditional reading passages/texts viewed on a computer screen, images with audio presentations, and simulated web pages.
Technology-Enhanced Items	Test questions that capitalize on technology to collect evidence through a non-traditional response type. This item type includes **drag and drop, drop-down menu, matching, hot spots, graphing, bar graphing, line graphing, number lines, line plots, clock input,** and **angle drawing**.
Tutorials	Tutorials use pictures, motion, and sound to present visual and verbal descriptions of the properties and features of the INSIGHT online testing system.
Universal Tools	Universal tools are available to students based on student preference and selection. Some tools, such as a ruler and sticky notes, are embedded in the online system, while others, such as a physical thesaurus and scratch paper, are external to the system. The availability of particular universal tools varies by item.
Writing Prompt	A special type of performance event that appears in the Grades 4 and 8 ELA Assessments; is an open-ended item that requires students to demonstrate their writing proficiency.

3.4 About the Assessment

- The Missouri State Board of Education identified the following purposes for the MAP Grade-Level Assessments:
  - Measuring and reflecting student mastery toward post-secondary readiness
  - Identifying students' strengths and weaknesses
  - Communicating expectations for all students
  - Serving as the basis for state and national accountability plans
  - Evaluating programs
  - Providing professional development for teachers

- The MAP Grade-Level Assessments are designed to adapt testing to the needs of Missouri districts, schools, teachers, and students, while meeting state and federal requirements.

- The MAP Grade-Level Assessments are based on the Missouri Learning Standards. 2019 assessments will include traditional multiple-choice items and innovative technology-enhanced items designed to elicit student knowledge and skills in new ways. English Language Arts assessments will include a writing prompt in grades 4 and 8. Mathematics assessments will include a performance event. The Science assessments also include constructed-response items.

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The Missouri Department of Elementary and Secondary Education (DESE) uses the information obtained through the MAP Grade-Level Assessments to monitor the progress of Missouri's students in meeting the Missouri Learning Standards, to inform the public and the state legislature about students' performance, and to help make informed decisions about educational issues.

- Data Recognition Corporation (DRC) and DESE are collaborating to deliver Missouri's Spring 2019 Grade-Level Assessments. Missouri educators will use DRC's eDIRECT online platform for enrollment and test administration and INSIGHT for test delivery. DRC will also provide handscoring and reporting services. These cooperative efforts and systems comprise a fully integrated assessment platform to meet the needs of school districts, educators, students, and other Missouri stakeholders.

- The Spring 2019 MAP Grade-Level Assessments include the following:
  - English Language Arts Assessment for Grades 3–8
  - Mathematics Assessment for Grades 3–8
  - Science Assessment for Grades 5 and 8

- The English Language Arts Assessments consist of either three sessions (in grades 3, 5, 6, and 7) or four sessions (in grades 4 and 8). At grades 4 and 8, the first session will contain passage-based items. One of the passage sets will also contain a passage-based writing prompt that is scored with a ten-point rubric. All sessions contain selected-response and technology-enhanced items.

- The Mathematics Assessments consist of three sessions. The first and second sessions contain selected-response items and technology-enhanced items. The third session contains a performance event.

- The Science Assessments consist of two sessions. Both sessions contain constructed-response items, multiple-choice items, and technology-enhanced items.

- All MAP Grade-Level Assessments are available only in INSIGHT, the secure online browser, unless a Large Print, Braille, or paper/pencil edition is required by the student as an accommodation. For students needing one of these versions, Test Examiners will be responsible for transcribing student responses into INSIGHT.

3.4.1 Changes to Assessment from Previous Year

The following changes have been made for the 2018–2019 school year:

- New constructed-response Math items in grades 6–8
- Transition from Testing Site Manager (TSM) to Central Office Services (COS) Service Device
- Video Sign Language (American Sign Language) and Closed Captioning for ELA Listening Passages and items
- Students can now move freely throughout all items within a single session including Session 1 in ELA grades 4 and 8.

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3.5 Contact Information

3.5.1 DRC MAP Service Line

- For questions about the test administration or other technical information, please contact DRC's dedicated MAP Service Line at 1-800-544-9868 from 7:00 A.M. to 6:00 P.M. Central Time, Monday–Friday or via email at maphelpdesk@datarecognitioncorp.com.

3.5.2 DESE Assessment Section

- For questions regarding MAP policy and testing procedures contact the DESE Assessment Section at 573-751-3545 or via email at assessment@dese.mo.gov.

3.5.3 DESE Special Education Section

- For questions regarding special populations, contact the DESE Special Education Section at 573-751-5739.

3.6 New DTC Process

To update a DTC for a district, contact the DESE Assessment section with the new DTC information (name, email, phone). DESE Assessment will inform DRC of the change. DRC will update their systems and provide the new DTC with a username and password to access eDIRECT.

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4.0 IMPORTANT DATES

4.1 Schedule of Important Dates for Spring 2019

Precode File Due to DESE	Student Test Setup Available in eDIRECT	MAP Grade-Level Assessment Test Window
Window 1 - February 1, 2019 Window 2 - March 1, 2019 Window 3 - March 15, 2019	Window 1 - February 25, 2019 Window 2 - March 11, 2019 Window 3 - March 25, 2019	April 1, 2019–May 24, 2019

Event	Schedule
eDIRECT test administration portal opens.	January 7, 2019
DTCs provide assessment test windows, purchase order numbers, and Large Print and Braille orders through eDIRECT Enrollments.	January 7, 2019—February 1, 2019. Purchase Orders must be submitted to DRC at maphelpdesk@datarecognitioncorp.com by February 1, 2019.
STCs and District Information Technology Coordinators (DITCs) coordinate the installation of INSIGHT on all student workstations and complete the System Readiness Check for all testing devices.	For more information on installing INSIGHT and the System Readiness Check please see *Using the System Readiness Check* in *Volume IV* of the *INSIGHT Technology User Guide*. The System Readiness Check must be completed for all testing devices before the statewide administration window begins on April 1, 2019.
STCs verify that all student accommodations and status codes are recorded through eDIRECT Test Setup.	February 25, 2019 is when Test Setup can begin. All accommodations and universal tools **must** be marked prior to testing.
DTCs are allowed to update assessment test windows (if needed).	February 25, 2019–March 29, 2019. DTCs update assessment test windows by contacting DRC MAP Service Line. **After March 29, 2019**, by contacting the DRC MAP Service Line, DTCs may: • change a testing window if it has not yet started • extend assessment testing windows
DTCs order additional Large Print and Braille materials through eDIRECT Additional Materials.	March 20, 2019–May 13, 2019 For more information on ordering Large Print and Braille materials, see section 6.4.
DTCs order printed Individual Student Reports (ISRs) and printed Student Report Labels through eDIRECT Enrollments.	April 15, 2019–June 21, 2019 For more information on ordering printed ISRs see section 8.9.2 and on ordering printed Student Labels, see section 8.9.3.

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Event	Schedule
DTCs schedule pickup of Large Print, Braille, and paper/pencil test books.	May 28, 2019 is the deadline to schedule pickups. Materials must be picked up no later than May 31, 2019.

4.2 Checklist of Responsibilities

4.2.1 Overview of Test Coordinator's Responsibilities

The District Test Coordinator (DTC) is responsible for training all School Test Coordinators (STCs) on MAP Grade-Level Assessment processes. If a district does not have STCs, the DTC performs the role of the STC. While the training of Test Examiners can be delegated to each building's STC, the DTC is responsible for ensuring that all Test Examiners are well prepared and trained. Training includes special education teachers, proctors, translators, and Test Examiners who are administering the assessments to homebound or out-of-district students. Building administrators should also receive training, so they can be aware of all that goes into state testing and ensure a proper environment for students to take the assessments.

DTC	STC	Task
X	X	Review all training and manuals.
X		Set the district testing schedule.
	X	Work with examiners and building leadership to set the building testing schedule.
X		Set up accounts for STCs in eDIRECT.
X	X	Determine if Test Examiners will have access to eDIRECT.
X		If necessary, set up accounts for Test Examiners in eDIRECT.
X	X	Assign role/permissions in eDIRECT.
X		Complete student precode process by submitting a file to DESE of students to be tested.
X	X	Place students in testing sessions via eDIRECT.
X	X	Mark tools/accommodations for students in eDIRECT.
X		Ensure STCs are trained on state and district policies, including and especially test security.
	X	Ensure Test Examiners are trained on state and district policies, including and especially test security.
	X	Train any outside staff that will act as a translator or scribe.
X	X	Ensure that staff know who to talk to if questions arise before, during and after testing.
	X	Ensure there is an appropriate space for any physical test materials. The space should have limited access during testing and have the ability to securely store testing materials.

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DTC	STC	Task
	X	Ensure IT staff have installed the student test client on all systems to be used for testing and have run bandwidth checks.
	X	Ensure that distractions are eliminated during testing – announcements, lawn maintenance, fire drills, etc.
X	X	Receive physical test materials.
X	X	Ensure the barcode numbers match the packing list.
X	X	Print test tickets for student use.
X	X	Print roster sheet for Test Examiner.
	X	Prepare all physical testing materials for Test Examiner use.
X	X	Print paper tests for students taking paper/pencil assessments.
X	X	If appropriate, print listening scripts for students taking paper/pencil assessments.
	X	Transcribe answers from physical testing books to the online testing platform.
X	X	Securely destroy all scratch, grid and graph paper.
X	X	Collect all physical testing materials.
X		Return physical test materials to the vendor.

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5.0 TIMING GUIDELINES

The following table lists estimates of the time it will take students to complete each component of the assessment. Some students may complete the assessment in times that vary from the recommended durations. Districts should plan for flexibility in their schedules to accommodate students that may take more time than noted.

There is no time limit for any assessment.

These times do not include time needed to start computers, log in students, go through directions, etc. They also do not include time needed for students to complete the OTTs or view the tutorials.

Spring 2019 Timing Guidelines – MAP Grade-Level

Grade	Session 1	Session 2	Session 3	Session 4	Total
3 ELA	45–105 minutes	25–55 minutes	15–35 minutes Listening Strand – Headphones required		85–195 minutes
3 Math	30–55 minutes Calculators not allowed	30–55 minutes Calculators not allowed	15–30 minutes Performance Event Calculators not allowed		75–140 minutes
4 ELA	100–130 minutes Writing Prompt	40–90 minutes	15–40 minutes	15–35 minutes Listening Strand – Headphones required	170–295 minutes
4 Math	30–55 minutes Calculators not allowed	30–55 minutes Calculators not allowed	15–30 minutes Performance Event Calculators not allowed		75–140 minutes
5 ELA	45–95 minutes	25–50 minutes	15–35 minutes Listening Strand – Headphones required		85–180 minutes
5 Math	35–60 minutes Calculators not allowed	35–60 minutes Calculators not allowed	15–30 minutes Performance Event Calculators not allowed		85–150 minutes
5 Science	60–80 minutes	60–80 minutes			120–160 minutes
6 ELA	40–95 minutes	20–40 minutes	15–30 minutes		75–165 minutes
6 Math	15–25 minutes Calculators not allowed	45–70 minutes Calculators allowed	30–40 minutes Performance Event Calculators allowed		90–135 minutes

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Grade	Session 1	Session 2	Session 3	Session 4	Total
7 ELA	40–80 minutes	20–40 minutes	15–25 minutes Listening Strand – Headphones required		75–145 minutes
7 Math	20–30 minutes Calculators not allowed	40–65 minutes Calculators allowed	30–40 minutes Performance Event Calculators allowed		90–135 minutes
8 ELA	100–130 minutes Writing Prompt	35–75 minutes	15–30 minutes	15–25 minutes Listening Strand – Headphones required	165–260 minutes
8 Math	15–25 minutes Calculators not allowed	45–70 minutes Calculators allowed	30–40 minutes Performance Event Calculators allowed		90–135 minutes
8 Science	55–75 minutes	55–75 minutes			110–150 minutes

5.1 Scheduling the Assessment

When setting the testing schedule, here are some points to remember:

- Ensure the secure browser has been installed properly on all workstations. See the *DRC INSIGHT Technology User Guide, Volumes I–V* for specifics.
- Each content area/grade must be tested within the district test windows defined in eDIRECT.
- Students are not required to take a single session of an assessment on the same day or in the same sitting.
- Although assessments with more than one session can be completed in more than one sitting, the entire assessment **MUST** be completed during the district testing window.

5.1.1 Start and Closing Times of Assessment

Students can start taking assessments in the test window on weekdays between the hours of 6:30 A.M. and 10:00 P.M.

5.2 Special Populations

5.2.1 Home Schooled Students

Home schooled students may take part in the MAP Grade-Level Assessments at the discretion of the district. Home schooled students participating in the MAP Grade-Level Assessments will take the assessment(s) online at the local school with district-approved procedures in place during the school's testing window. When a home schooled student is entered into eDIRECT, the "Home School" box on the Testing Codes screen must be checked. DESE's Missouri Student Information System (MOSIS) ID field should be populated using the prefix "HOME" and six-digits (e.g., HOME987654). Individual Student Reports for home schooled students will be available. See section 8.9 for more information on these reports. District Test Coordinators must collect contact information from the parents of home schooled students so that DTCs can notify the parents when reports become available.

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5.2.2 Missouri Course Access Program (MOCAP)

Districts are required to test **all** public school students enrolled in MOCAP courses. Students taking MOCAP courses must be tested, either at home or at the school, at the discretion of the district. If the student can come to the school, the student may take the test online. If the student cannot come to the school, the student may take the test online using a district-issued device that has a Central Office Services (COS) Service Device installed. If, for any reason, the student cannot take the test online, then the student may take a paper/pencil edition of the test. (See instructions in the Large Print, Braille, and Paper/Pencil Editions section of this manual.) Test Examiners of students taking a MOCAP course should receive training in the administration of the MAP Grade-Level Assessments. Test Examiners are responsible for ensuring the security of the tests and transcribing student responses into INSIGHT for paper/pencil tests.

5.2.3 Foreign Exchange Students

Foreign exchange students are allowed, but not required, to take the MAP Grade-Level Assessments at the discretion of the district.

5.2.4 English Learner (EL) Students

EL students who have been in the United States for less than 12 cumulative months at the time of the test administration may be exempt from ELA assessments. Please indicate this exemption in eDIRECT by going to All Applications > Student Management > Manage Students. Once a student is selected, go to Testing Codes, check "Yes" in the box representing EL in the U.S. less than 12 cumulative months, under GL ELA. School districts will also need to validate their April Core Data to reflect the status of their EL students. EL students must participate in all other required assessments (i.e., Mathematics & Science) regardless of the length of time they have been in the United States.

5.2.5 Homebound Students

Homebound students must be tested, either at home or at the school, at the discretion of the district. If the student can come to the school, the student may take the test online. If the student cannot come to the school, the student may take the test online using a district-issued device that has a Central Office Services (COS) Service Device installed. If, for any reason, the student cannot take the test online, then the student may take a paper/pencil edition of the test. (See instructions in the Large Print, Braille, and Paper/Pencil Editions section of this manual.) Test Examiners of homebound students should receive training in the administration of the MAP Grade-Level Assessments. Test Examiners are responsible for ensuring the security of the tests and transcribing student responses into INSIGHT for paper/pencil tests.

5.2.6 Suspended from Campus

Districts have a few options to test students who have been suspended. Districts may choose to bring the student in after school or when other students aren't around. Districts may also choose to test the student at their residence. If testing the student off campus, districts have the option of testing the student via paper/pencil even without an IEP.

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5.2.7 Off-Campus Facility

Students that are in a hospital, juvenile facility or treatment facility (both in and out of state), or receiving services in off-site placements (other districts, private agencies, correctional facilities, etc.) must be tested. They may be tested in those placements if necessary, or they may come to the school of residence if possible. The DTC from the district where the student resides must make arrangements for the student to test.

If the student can come to the school, the student may take the test online. If the student cannot come to the school, the student may take the test online using a district-issued device that has a Central Office Services (COS) Service Device installed. If, for any reason, the student cannot take the test online, then the student may take a paper/pencil edition of the test. (See instructions in the Large Print, Braille, and Paper/Pencil Editions section of this manual.) Test Examiners of off-campus students should receive training in the administration of the MAP Grade-Level Assessments. Test Examiners are responsible for ensuring the security of the tests and transcribing student responses into INSIGHT for paper/pencil tests.

5.2.8 Private School Students

Private school students may also participate in the MAP Grade-Level Assessments. A representative from the private school must contact the MAP Service Line at 1-800-544-9868. Private schools must uphold the same standardized administration procedures and security measures that Missouri public schools uphold.

5.2.9 Students Taking an Advanced Mathematics Course

Students who are taking an Algebra I, Algebra II or Geometry End-of-Course assessment prior to high school do not have to take the mathematics assessment for their grade-level.

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6.0 ASSESSMENTS

6.1 Item Types

As students engage with the MAP Grade-Level Assessments through INSIGHT, they will be asked test questions that require them to use technology to respond in several ways, some of which may be new to the test-takers. The following table lists the different item types and briefly describes each one. The Online Tools Training (OTT) and Tutorials provide an opportunity to see examples of the item types administered on the assessments.

Type of Item	Brief Description of How to Respond	ELA	Math	Science
Angle Drawing	Select and drag the ray within the response area.		✓	
Bar Graph	Select the height of the bar or bars in the response area.		✓	✓
Clock Input	Use a drop-down menu to indicate the hour or minute hand. Select and drag the hand or hands within the response area.		✓	
Drag and Drop	Click and drag an object to the appropriate location in the response area.	✓	✓	✓
Drop-Down Menu	Select an answer from a drop-down menu.	✓	✓	✓
Evidence-Based Selected-Response (EBSR), multi-part items	This item type has two parts. Each part may consist of one of three item types: Multiple Choice, Multi-select, and Hot Text. See those item types for descriptions of how to respond.	✓		✓
Graphing on Coordinate Grid	Plot points and/or draw lines in the response area. Use the keyboard to enter labels if required.		✓	✓
Hot Spot/Text Highlight	Highlight an option by selecting it. Select one or more options.	✓	✓	✓
Keypad Input	Select buttons representing numbers and mathematic symbols to create a numeric response or equation.		✓	
Line Plot	Respond by marking an X in the response area.		✓	

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Type of Item	Brief Description of How to Respond	ELA	Math	Science
Matching (with connecting lines)	Select an option from the first column and then select the corresponding option from the second column to create a line between them. You can match more than one corresponding option in the second column.		✓	
Matching Table (with a variation True/False or Yes/No)	Select a checkbox corresponding to an option in a table cell.		✓	✓
Multiple Choice	Select the radio button corresponding to one of four options. Select only one option.	✓	✓	✓
Multi-select	Mark a radio button corresponding to an option. Mark one or more options.	✓	✓	✓
Number Lines	Plot points and/or draw lines on the number line.		✓	
Text Input	Respond via keyboard entry. Science and Math items may include an Equation Builder.		✓	✓
Writing Prompt	Respond via keyboard entry using text formatting buttons.	✓		

6.2 Online

INSIGHT is the secure browser-based test engine through which students take the MAP Grade-Level Assessments. DITCs download the INSIGHT client software to the devices that will be used for testing.

Details are provided in the DRC INSIGHT Technology User Guide, which is available on the **Documents** page of eDIRECT.

6.3 Paper/Pencil Materials

For special circumstances that require students to test on paper, a paper/pencil edition is available. To activate the paper/pencil-edition print function, Test Examiners access the Test Setup feature in eDIRECT to mark the applicable accommodation and code for students who require the paper version of the test. Once accommodations are assigned, the Test Examiner will contact the District Test Coordinator to generate a paper version.

eDIRECT will generate a unique barcode number for a paper/pencil edition prior to local printing. Each barcode number will be unique to a student for the purposes of linking the printed form to the student's record in the master database. Barcode numbers will be recorded and associated with each student's record.

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Depending on the printed accommodation needed for a particular student, the unique barcode number will then become embedded into the electronic version on each page of the paper/pencil form. During local printing, the embedded barcode number will print along with each page of the paper/pencil edition.

For specific instructions regarding how to generate and download a paper/pencil edition, see the *eDIRECT User Guide – Test Management*, available on the **Documents** page of eDIRECT, https://mo.drcedirect.com.

Once the PDF downloads, it is available for printing.

The Test Examiner should become familiar with the directions for administering a paper/pencil edition. The paper/pencil edition of the test is secure and should be treated as such.

Reasons for using Paper/Pencil Assessment

Reason	Instructions
Student has IEP/504 Plan that allows use of Paper/Pencil Assessment	Mark code A102 for Paper/Based Assessment
EL student is using the Translation tool (S109) or Read Aloud – Native Language (S111) and the translator needs access to the assessment prior to administration to conduct translation services	Mark code S112. If using this for a group, choose this tool for just ONE student in the group. That student should still take the assessment online. **NOTE:** There is a $15 charge to the district for each printed Paper/Pencil assessment not required by an IEP.
Student is in an off-site non-district building (e.g., hospital, juvenile facility, etc.) and cannot take the assessment online	Mark code S112. **NOTE:** There is a $15 charge to the district for each printed Paper/Pencil assessment not required by an IEP.
Student has Read Aloud – Human Reader and the examiner would like to read from a Paper copy of the assessment	Mark code S112. If using this for a group, choose this tool for just ONE student in the group. That student should still take the assessment online. **NOTE:** There is a $15 charge to the district for each printed Paper/Pencil assessment not required by an IEP.

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6.4 Large Print and Braille Materials

Large Print and Braille forms can be ordered online via eDIRECT. Material orders must be placed between January 7, 2019, and February 1, 2019. DTCs should order all Large Print and Braille materials through the Enrollments tab in eDIRECT. See the *eDIRECT User Guide – User Management* for enrollment instructions.

Test Examiners or Test Coordinators must transcribe students' responses into INSIGHT.

All Large Print and Braille testing materials needed to administer the assessment are included in the shipment. Large Print and Braille kits are packaged by building and shipped to the district's office address.

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7.0 UNIVERSAL TOOLS AND ACCOMMODATIONS

Universal Tools are available to all students unless noted. Accommodations are available only to students with an IEP/504 plan. Please see the sections below for details.

7.1 Universal Tools

UNIVERSAL TOOLS

Universal tools for use on the MAP Grade-Level Assessment are available to ALL STUDENTS unless noted. Please read the full description prior to usage.

Tools with a code (Sxxx) need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).

Tool	Description	Code
Bilingual Dictionary	**EL students** may have access to a physical Bilingual Dictionary for use **ONLY** on the sessions of ELA that have a writing prompt. If the Bilingual Dictionary is electronic, it may not connect to the Internet. This tool must be chosen in eDIRECT under student accommodations prior to testing.	S431
Break (Pause)	**All students** may take breaks of up to 20 minutes as needed. There is no limit to how many times a student may use this during an assessment. The INSIGHT student platform allows **all students** to pause the online assessment for up to 20 minutes. If the test is paused for more than 20 minutes, the student will have to log back in. If the need arises to move a student from one computer to another, pause the test and choose the exit button. The test will remain incomplete until the student logs back in and completes the test.	N/A
Calculator* ***Use of a calculator is allowed on all science assessments and on some sessions of math in grades 6–8**	The INSIGHT student platform features an embedded calculator for **all students** to use on items where calculator use is allowed. **All students** may have access to a physical calculator, on items where calculator use is allowed. The memory of the physical calculator must be cleared before and after testing by the test examiner. *Please Note: Use of a calculator is only for the Science assessments and certain sessions of Math in grades 6–8. Please see the manual to determine which sessions allow calculator use.*	N/A
Color Contrast—Online Testing	The INSIGHT student platform allows **all students** to adjust background or font color based on student needs or preferences.	N/A
Color Contrast—Paper Testing	**All students** taking the paper/pencil assessment may have the test printed in different colors based on student needs or preferences. This tool must be chosen in eDIRECT under student accommodations prior to testing.	S102
Color Overlay	**All students** taking the paper/pencil assessment may have a color transparency placed over the test presented to them based on student needs or preferences. This tool must be chosen in eDIRECT under student accommodations prior to testing.	S103

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Tool	Description	Code
English Dictionary	**All students** may have access to a physical English Dictionary for use **ONLY** on the sessions of ELA that have a writing prompt. If the English Dictionary is electronic, it may not connect to the internet.	N/A
Grammar Handbook	**All students** may have access to a physical Grammar Handbook for use **ONLY** on the sessions of ELA that have a writing prompt. If the Grammar Handbook is electronic, it may not connect to the internet. The Grammar Handbook must be one that is published. It cannot be a district, school or classroom made handbook.	N/A
Graphing Tool	The INSIGHT student platform allows **all students** to use an embedded tool to graph functions.	N/A
Highlighter	The INSIGHT student platform allows **all students** access to a highlighter for marking desired text. **All students** may have access to a physical highlighter.	N/A
Keyboard Navigation	The INSIGHT student platform allows **all students** to navigate through the text by using the keyboard.	N/A
Line Guide	The INSIGHT student platform allows **all students** to use an embedded line guide that brings focus to a single line of text.	N/A
Magnification	The INSIGHT student platform allows **all students** to magnify the screen by 1.5 or 2 times the original size. **All students** taking the paper/pencil or Large Print assessments may have access to a physical magnifying device.	N/A
Magnification—Assistive Technology	**Students with visual impairments** may attempt to use assistive technology software that magnifies the screen beyond the built in capabilities of the embedded magnifier. *Please Note: The use of assistive technology software should be familiar to the student and should be software the student uses in the everyday classroom. While the use of assistive technology software is not directly supported by DRC, the help desk will work with districts needing to use the software. The software must be provided by the district.* This tool must be chosen in eDIRECT under student accommodations prior to testing.	S105
Mark For Review (Flag)	The INSIGHT student platform allows **all students** to mark an item for review.	N/A
Masking—Online Testing	The INSIGHT student platform allows **all students** access to an embedded masking tool to block off content that is not of immediate need or that may be distracting.	N/A

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UNIVERSAL TOOLS

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Tools with a code (Sxxx) need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).

Tool	Description	Code
Masking—Paper Testing	**All students** taking the paper/pencil or Large Print assessments may use a masking tool to block off content that is not of immediate need or that may be distracting. This tool must be chosen in eDIRECT under student accommodations prior to testing.	S107
Non-Accommodation Paper Based Assessment	This tool is available for the following scenarios: For students that need to test off-site in a non-district building (e.g., hospital, juvenile facility, etc.), the student may use the paper/pencil Based Assessment. For **EL students** who are using the Translation tool (S109) or Read Aloud – Native Language (S111), where the translator needs access to the assessment prior to administration to conduct translation services. Please see the section on ***Translation*** that follows the Tools/Accommodations lists for more information. For students using Read Aloud – Human Reader (S043) where the examiner needs a paper copy to read from. Please see the section on ***Read Aloud*** that follows the Tools/Accommodations lists for more information. Answers from students who access the assessment using the paper/pencil format must be entered into INSIGHT prior to shipping the paper assessment back. Please follow the return instructions found in the manual. All the answers given in the online system must be in English. *Please Note: There is a $15 charge to the district for each printed paper/pencil assessment not required by an IEP. If the off-site student does have an IEP that requires using a paper/pencil assessment, use accommodation A102 instead.* *The note above applies only to the Spring Summative Assessment. A paper version of the practice test can be downloaded from the DESE MAP Grade-Level Assessment webpage* (https://dese.mo.gov/college-career-readiness/assessment/grade-level)*.* This tool must be chosen in eDIRECT under student accommodations prior to testing.	S112
Protractor	The INSIGHT student platform allows **all students** to use an embedded protractor on specific items where appropriate. **All students** taking the paper/pencil, Large Print or Braille assessments may have access to a physical protractor for use on specific items where appropriate.	N/A
Read Aloud	***Please see the Read Aloud section after the universal tools/accommodations list.***	

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UNIVERSAL TOOLS

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Tools with a code (Sxxx) need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).

Tool	Description	Code
Read Aloud Test To Self	**All students** may read aloud the test to themselves, either in a one-on-one setting or by using a device (such as a whisper phone) that does not disturb other students or allow other students to hear what is being said. In order to ensure that use of this tool does not disturb other students, the use of this tool may need to be paired with the use of separate setting (S501).	N/A
Reference Sheet	The INSIGHT student platform allows **all students** access to use an embedded reference sheet on applicable assessments. Not all assessments have a reference sheet. Students may have physical copies of the reference sheets during testing. Copies of the reference sheets can be found in the appendices of the manuals.	N/A
Ruler	The INSIGHT student platform allows **all students** to use an embedded ruler on specific items where appropriate. **All students** taking the paper/pencil, Large Print or Braille assessments may have access to a physical ruler for use on specific items where appropriate.	N/A
Scratch Paper (Sticky Notes)	The INSIGHT student platform allows **all students** to use an embedded notepad (called Sticky Notes) to make notes about an item. Electronic notes **DO NOT** carry over from previous sessions. If a student logs off prior to finishing a session, any electronic notes **WILL NOT** carry over when the student logs back in. **All students** taking the online, paper/pencil, Large Print or Braille assessments may have access to physical scratch paper to make notes about an item. Scratch paper can be blank, ruled, graph or grid paper. Physical scratch paper should be collected and destroyed **IMMEDIATELY** upon the conclusion of a testing session.	N/A
Scribe	**Students who obtain a physical injury prior to testing** that prevents them from responding may dictate their responses to a scribe. **OR** **Students with physical disabilities** that may prevent them from responding themselves may dictate their responses to a scribe, who must follow the scribing guidelines (http://dese.mo.gov/sites/default/files/asmt-scribing-guidelines.pdf). *Please Note: DESE does not recommend the use of Scribe for students who do not use it as part of their everyday learning in the classroom. The use of Scribe for some students can prove distracting and become a hindrance to student performance. The scribe should be familiar to the student and have scribing experience with the student in some capacity prior to the state assessment.* This tool must be chosen in eDIRECT under student accommodations prior to testing.	S351

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UNIVERSAL TOOLS

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Tools with a code (Sxxx) need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).

Tool	Description	Code
Separate Setting	**All students** may be allowed to test in a separate setting from other students. This includes testing individually or testing as part of a smaller group. This tool must be chosen in eDIRECT under student accommodations prior to testing.	S501
Strikethrough (Cross Off)	The INSIGHT student platform allows **all students** access to use an embedded tool to cross out answer options.	N/A
Thesaurus	**All students** may have access to a physical Thesaurus for use **ONLY** on the sessions of ELA that have a writing prompt. If the Thesaurus is electronic, it may not connect to the internet.	N/A
Translation	***Please see the Translation section after the universal tools/ accommodations list.***	
Writing Tools	The INSIGHT student platform allows **all students** access to use an embedded set of writing tools on specific items where appropriate. The tools include the ability to bold, italicize and underline text, create bullet points, undo/redo typing, create indents and copy/paste text the student has typed.	N/A

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7.2 Accommodations

ACCOMMODATIONS

Accommodations for use on the MAP Grade-Level Assessment are available only to students with an IEP/504 plan. Please read the full description prior to usage.

All accommodations need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).

Accommodation	Description	Code
Abacus	**Students with this accommodation in their IEP/504 plan** may have access to an abacus. This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A391
Alternate Response Options	**Students with this accommodation in their IEP/504 plan** may respond to items using an alternate option, including but not limited to: Adapted Keyboards, StickyKeys, MouseKeys, FilterKeys, Adapted Mouse, Touch Screen, Head Wand and Switches. *Please Note: While the use of alternate response options is not directly supported by DRC, the help desk will work with districts needing to use one. The option must be provided by the district.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A441
Braille	**Students with visual impairments with this accommodation in their IEP/504 plan** may access the assessment via a Braille version. Tactile overlays and graphics tools may be used to assist the student in accessing the content. *Please Note: Answers from students who access the assessment using the Braille format must be entered into INSIGHT prior to shipping the Braille assessment back. Please follow the instructions found in the Braille kit.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A012
INVALIDATION **Calculator**** **** For Non-Calculator Allowed Items in Grade 3** ***INVALIDATION***	**Students in 3rd grade with this accommodation in their IEP/504 plan** may have access to a physical calculator, on mathematics items where calculator use is not allowed. The memory of the physical calculator must be cleared before and after testing by the test examiner. *Please Note: Use of this accommodation will cause an invalidation for the Mathematics Assessment and the student will receive the Lowest Obtainable Scale Score (LOSS) and an achievement level of Below Basic.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A392
Calculator*** ***** For Non-Calculator Allowed Items in Grades 4–8**	**Students in grades 4–8 with this accommodation in their IEP/504 plan** may have access to a physical calculator, on mathematics items where calculator use is not allowed. The memory of the physical calculator must be cleared before and after testing by the test examiner. This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A393

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ACCOMMODATIONS

Accommodations for use on the MAP Grade-Level Assessment are available only to students with an IEP/504 plan. Please read the full description prior to usage.

All accommodations need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).

Accommodation	Description	Code
Closed Captioning	**Hearing Impaired students** with this accommodation in their IEP/504 plan may have Closed Captioning available for ELA listening items. This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A053
Large Print	**Students with visual impairments with this accommodation in their IEP/504 plan** may access the assessment via a Large Print version. *Please Note: Answers from students who access the assessment using the Large Print format must be entered into INSIGHT prior to shipping the Large Print assessment back. Please follow the instructions found in the Large Print kit.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A021
INVALIDATION **Multiplication Table** **Grade 3** ***INVALIDATION***	**Students in grade 3 with this accommodation in their IEP/504 plan** may have access to a single digit multiplication table. *Please Note: Use of this accommodation will cause an invalidation for the Mathematics Assessment and the student will receive the Lowest Obtainable Scale Score (LOSS) and an achievement level of Below Basic.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A394
Multiplication Table **Grades 4–8**	**Students in grades 4–8 with this accommodation in their IEP/504 plan** may have access to a single digit multiplication table. This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A395
Paper Based Assessment	**Students with this accommodation in their IEP/504 plan** may take the assessment using the paper/pencil format. *Please Note: Answers from students who access the assessment using the paper/pencil format must be entered into INSIGHT prior to shipping the paper assessment back.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A102
Read Aloud **(ELA Reading Passages)**	***Please see the Read Aloud section after the universal tools/ accommodations list.***	

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ACCOMMODATIONS

Accommodations for use on the MAP Grade-Level Assessment are available only to students with an IEP/504 plan. Please read the full description prior to usage.

All accommodations need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).

Accommodation	Description	Code
Sign Language	**Hearing Impaired students** with this accommodation in their IEP/504 plan may have ELA listening items translated into American Sign Language (ASL), Signing Exact English (SEE) or any other form of sign language. *Please Note: The INSIGHT Platform provides video of ASL for these items. If the student uses SEE or another form of sign language or the preference is for a local translation into ASL, the signing of ELA Listening items will require the download of a script. See the manual for more details.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A052
Specialized Calculator**** ******Use of a specialized calculator is allowed on all science assessments and on some sessions of math in grades 6–8**	**Students with this accommodation in their IEP/504 plan** may have access to a specialized calculator. The specialized calculator can include a talking calculator or Braille calculator among others. The memory of the physical calculator must be cleared before and after testing by the test examiner. *Please Note: Use of a calculator is only for the Science assessments and certain sessions of Math in grades 6–8. Please see the manual to determine which sessions allow calculator use.* *To use a specialized calculator on sessions where calculator use is not allowed, this accommodation must be used in conjunction with code A392 (if the student is in grade 3) or A393 (if the student is in grades 4–8).* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A396
Speech-to-Text—Assistive Technology	**Students with this accommodation in their IEP/504 plan** may use that technology in conjunction with INSIGHT. The software must be provided by the district. *Please Note: The use of assistive technology software should be familiar to the student and should be software the student uses in the everyday classroom. While the use of assistive technology software is not directly supported by DRC, the help desk will work with districts needing to use the software. The software must be provided by the district.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A352

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7.3 Read Aloud

Read Aloud for statewide testing should only be used with students who truly need it.

The ***Read Aloud*** tool for statewide testing should only be available to students who can benefit from it. ***Read Aloud*** can be over-used when it is provided to every struggling student including those who can decode but have poor comprehension skills and those who simply have not mastered decoding skills.

Any student taking the online, paper/pencil, Large Print or Braille assessments may have the *test directions* and items (*questions and answer choices*) in all content areas read aloud to them without an IEP/504 plan. In order to have *reading passages in English language arts* read aloud, a student needs that accommodation listed in their IEP/504 plan.

7.3.1 How To Determine If The Student Needs Read Aloud

Providing ***Read Aloud*** to students who do not need it can have negative consequences for instruction and decoding and comprehension skills. For example, some educators might assume that students who receive ***Read Aloud*** no longer need to be instructed on decoding and fluency skills, which is clearly an inappropriate assumption.

Additionally, the use of ***Read Aloud*** for some students can prove distracting and become a hindrance to student performance.

Here are some questions in helping to make a determination:

- Does this student have an identified reading-based disability that affects the student's decoding, fluency or comprehension skills?
- Is there evaluative information indicating that, even after explicit and systematic reading instruction, the student's disability precludes or severely limits the student's ability to decode print?
- Has the student been provided systematic, explicit, research based reading intervention(s) to improve decoding skills?
- Would the student's functioning reading level affect his or her performance on a state test that does not measure reading comprehension?
- Is there evidence that the student's access to, and/or performance on, print-based tasks improves when information is presented to the student in auditory formats?
- Is the student provided instructional materials in auditory formats? Does the student use ***Read Aloud*** during formative assessments or during other assessments? (If a student receives ***Read Aloud*** for instruction but not for formative assessments, it is likely that the student does not need ***Read Aloud*** for the state content assessments.)
- When test items are read aloud for classroom assessments, is every item read aloud or only items requested by the student?
- Does someone (e.g., teacher, paraprofessional, another student, parent) regularly read aloud to the student in school?
- If the student is blind or visually impaired, has it been determined that his or her disability precludes or severely limits the ability to access and/or develop proficiency in Braille?
- If the student is hearing impaired, is there evidence demonstrating that the student's disability precludes or severely limit his or her ability to decode printed text (possibly due to other co-occurring disabilities or long-term language deprivation in early childhood)?

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Additionally, time should be set aside to talk to the student about his or her reading skills and the need for ***Read Aloud***. Asking whether it is easier to read for themselves or to listen to someone read may provide an indication that ***Read Aloud*** may be appropriate. Caution needs to be exercised here, however, because struggling readers may indicate a preference for ***Read Aloud*** even though they do not understand better when the accommodation is provided.

Even if *Read Aloud* is not chosen for the student, the examiner may still read one word per sentence to any student.

For all content areas and subjects, readers may not clarify, elaborate, paraphrase, assist, cue a student through uneven voice inflection, etc.

7.3.2 Choosing The Correct Read Aloud

There are multiple ways to use the ***Read Aloud*** tool and accommodations.

- Embedded **Text-To-Speech** technology – The computer reads to the student.
- **Assistive Technology** – The use of assistive technology software should be familiar to the student and should be software the student uses in the everyday classroom. While the use of assistive technology software is not directly supported by our testing vendors, the appropriate help desk will work with districts needing to use the software. The software must be provided by the district.
- **Native Language** – *Please see the section on Translation that follows this.*
- **Human Reader** – A human reader should:
  - Be trained on the administration, security policies and procedures of the assessment.
  - Have extensive practice in providing read aloud support and must be familiar and comfortable with the process before working directly with a student. Ideally, they are familiar with the student, and are typically responsible for providing this support during educational instruction and assessments.
  - Read each question exactly as written, as clearly as possible.
  - Strive to communicate in a neutral tone and maintain a neutral facial expression and posture.
  - Avoid gestures, head movements, or any verbal or non-verbal emphasis on words not otherwise emphasized in text.
  - Avoid conversing with the student about test questions, as this would be a violation of test security.
  - Not paraphrase, interpret or define any items, words, or instructions, as this would be a violation of test security.
  - Not spell any words requested by the student.

In order to be sure that the student correctly receives *Read Aloud*, the tool MUST be marked in the system AT LEAST 48 HOURS PRIOR TO ADMINISTRATION.

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7.3.3 Choosing The Correct Read Aloud—Codes

For those without an IEP, the **test directions and items** in English Language Arts, Mathematics, Science and Social Studies can read aloud to them via:

READ ALOUD—UNIVERSAL TOOLS	
Tool	**Code**
Read Aloud (Not Including ELA Reading Passages)—Text-To-Speech	S041
Read Aloud (Not Including ELA Reading Passages)—Human Reader	S043
Read Aloud (Not Including ELA Reading Passages)—Assistive Technology	S042
Read Aloud (Not Including ELA Reading Passages)—Native Language	S111

In order to have **reading passages in English Language Arts** read aloud, a student would need that accommodation listed in their IEP/504 plan.

Please Note The Following

- Use of Text-To-Speech, Human Reader, Assistive Technology or Native Language for students in grades 3–5 for the ELA Reading Passages will result in invalidation and the student will receive the Lowest Obtainable Scale Score (LOSS) resulting in an achievement level of below basic. In the chart below, these accommodations are noted with an asterisk. This excludes blind students who do not yet possess adequate Braille skills.
- Marking one of these accommodations only triggers the allowance of ELA Reading Passages. When using one of these accommodations, they need to be marked in conjunction with one of the ***Read Aloud*** universal tools.
- Blind students who do not yet possess adequate Braille skills with this accommodation in their IEP/504 plan may have the ELA Reading Passages read aloud by a human reader.

READ ALOUD—ACCOMMODATIONS		
Accommodation	**Code**	**Use With**
Read Aloud (ELA Reading Passages)—Text-To-Speech (Grades 3–5)*	A040	S041
Read Aloud (ELA Reading Passages)—Text-To-Speech (Grades 6–8)	A043	S041
Read Aloud (ELA Reading Passages)—Human Reader (Grades 3–5)*	A041	S043
Read Aloud (ELA Reading Passages)—Human Reader (Grades 6–8)	A045	S043
Read Aloud (ELA Reading Passages)—Assistive Technology (Grades 3–5)*	A042	S042
Read Aloud (ELA Reading Passages)—Assistive Technology (Grades 6–8)	A044	S042
Read Aloud (ELA Reading Passages)—Native Language (Grades 3–5)*	A111	S111
Read Aloud (ELA Reading Passages)—Native Language (Grades 6–8)	A112	S111
Read Aloud (ELA Reading Passages)—Blind Students (All Grades)	A046	S043

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7.3.4 Read Aloud Scenarios

*** Students testing using Native Language**—*Please see the section on Translation that follows this. **

Text-To-Speech	
Choose code **S041** for the student(s). This can be done individually or in a group setting. Student(s) will need to be provided headsets to listen with. ***NOTE:*** If the student(s) have an IEP/504 plan that allows ELA Reading Passages to be read to them, then also choose code **A040** (For Grades 3–5) or **A043** (For Grades 6–8). Use of Text-To-Speech for students in grades 3–5 for the ELA Reading Passages will result in invalidation and the student will receive the Lowest Obtainable Scale Score (LOSS).	
Assistive Technology	
Choose code **S042** for the student. ***NOTE:*** If the student(s) have an IEP/504 plan that allows ELA Reading Passages to be read to them, then also choose code **A042** (For Grades 3–5) or **A044** (For Grades 6–8). Use of Text-To-Speech for students in grades 3–5 for the ELA Reading Passages will result in invalidation and the student will receive the Lowest Obtainable Scale Score (LOSS). The student should test in a one-on-one setting. Code **S501** should be marked for separate setting.	
Human Reader	
Computer Based Assessment: **Choose Codes:** • **S043** (Human Reader) • **A041** (Grades 3–5) **OR A045** (Grades 6–8) for Human Reader – ELA Reading Passages. Only use if the student(s) have an IEP/504 plan that allows ELA Reading Passages to be read to them. Use of Human Reader for students in grades 3–5 for the ELA Reading Passages will result in invalidation and the student will receive the Lowest Obtainable Scale Score (LOSS).	**Paper Based Assessment:** **Choose Codes:** • **A102** (Paper Based Assessment) • **S043** (Human Reader) • **A041** (Grades 3–5) **OR A045** (Grades 6–8) for Human Reader – ELA Reading Passages. Only use if the student(s) have an IEP/504 plan that allows ELA Reading Passages to be read to them. • **S501** (Separate Setting) Assessing the student can be done either one-on-one or in a small group setting.

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Computer Based Assessment (con't.)	Paper Based Assessment (con't.)
Then, read the items to the student via one of the following methods: • **Option #1:** Read the items and answer choices off the student's screens – either a single student or multiple students. • **Option #2:** Read the items off a second display attached to a system being used by a student. • **Option #3:** Print off a paper copy and read to the student(s) from the paper copy. After testing is complete, mark that copy as an "Examiner Copy" and send it back to the vendor with the other student paper assessments.	After testing is complete, mark that copy as an "Examiner Copy" and send it back to the vendor with the other student paper assessments.

7.4 Translation

Translation for statewide testing should only be used with students who truly need it.

Any English Learner (EL) taking the online, paper/pencil, Large Print or Braille assessments may have the test directions and items (*questions and answer choices*) in English language arts, mathematics, science and social studies read aloud to them in their native language without an IEP/504 plan. In order to have reading passages in English language arts read aloud in their native language, a student would need that accommodation listed in their IEP/504 plan.

Additionally, any EL taking the online, paper/pencil, Large Print or Braille assessments may respond to the assessment in their native language. The answers would need to be translated and transcribed into the system.

7.4.1 How To Determine If The Student Needs Translation

Here are some questions you can ask about the student to help make a determination:

- Does the student have an overall WIDA score of 3 or lower?
- Has the student attended a school where his/her first language is the primary language of instruction?
- Has the student ever received instruction in his/her first language?
- Does the student perform better when class assignments or assessments are translated?

Additionally, time should be set aside to talk to the student about his or her reading skills and the need for ***Translation***. Asking whether it is easier to read for themselves in English or to listen to someone read in their native language may provide an indication that ***Translation*** may be appropriate. Caution needs to be exercised here, however, because struggling readers may indicate a preference for ***Translation*** even though they do not understand better when the accommodation is provided.

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7.4.2 Choosing The Correct Translation – Codes

Read Aloud via Native Language can only be done by a human reader. There is no Native Language Text-To-Speech option.

7.4.2.1 When Using A Translator

- The district must find and contract with the translator on their own. DESE does NOT provide a list of translation services available.
- The district must provide the translator to do the oral reading at their own cost.
- The translator cannot be a family member of the student.
- The district must train the translator just as they would a Test Examiner.
- If the translator is not a district employee, a trained examiner from the district must be a proctor in the room as well.

TRANSLATION		
Accommodation	**Code**	**Use With**
Read Aloud (Not Including ELA Reading Passages)—Native Language	S111	
Read Aloud (ELA Reading Passages)—Native Language (Grades 3–5)	A111	S111
Read Aloud (ELA Reading Passages)—Native Language (Grades 6–8)	A112	S111
Translation	S109	A102

7.4.3 Translation Scenarios

There are multiple factors to consider in using choosing the correct ***Translation*** tools and accommodations.

- How many students are being tested?
- Is the student using the Read Aloud – Native Language tool?
- Does the student's IEP/504 plan allow the use of Read Aloud – Native Language for the ELA Reading Passages? If so what grade is the student in?
- Does the translator doing the Read Aloud need an advance copy of the assessment to translate technical terms?
- Is the student going to respond in their native language?
- Is the student testing online or does the student's IEP/504 plan allow them to test via paper/pencil, Large Print or Braille?

7.4.3.1 Marking Codes

- **S501** (Separate Setting) Assessing the student can be done either one-on-one or in a small group setting.
- **S111** (Read Aloud)
- **A111** (Read Aloud – ELA Reading Passages Grades 3–5) Only use if the student has an IEP/504 plan that allows ELA Reading Passages to be read to them.
- **A112** (Read Aloud – ELA Reading Passages Grades 6–8) Only use if the student has an IEP/504 plan that allows ELA Reading Passages to be read to them.
- **S109** (Native Language) Only use if the student will be responding in their Native Language.

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7.4.3.2 Prior Translation

If the person doing the Read Aloud **DOES** need a copy of the assessment in advance for translation purposes:

- Choose code **A102** (Paper Based Assessment) for one student. Print the paper copy, then go in and unmark the code. This will send the student back to an online assessment. Then choose the appropriate code(s) above.

Then, read and translate the items to the student via one of the following methods:

- **Option #1:** Read the items and answer choices off student's screens – either a single student or multiple students.
- **Option #2:** Attach a second display to a system being used by a single student.
- **Option #3:** Print off a paper copy and read to the student(s) from the paper copy.

After testing is complete, mark that copy as an "Examiner Copy" and send it back to the vendor with the other student paper assessments.

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8.0 ADMINISTRATION PORTAL

eDIRECT hosts the Missouri Assessment Portal. Through this system, Missouri educators are able to:

- Review documentation and training.
- Download secure materials.
- Download software.
- Provide enrollment information, including orders for Large Print and Braille test books.
- View and update student data prior to testing, including indicating any accommodations or universal tools that will be used.
- Place students into test sessions and print Student Test Tickets.

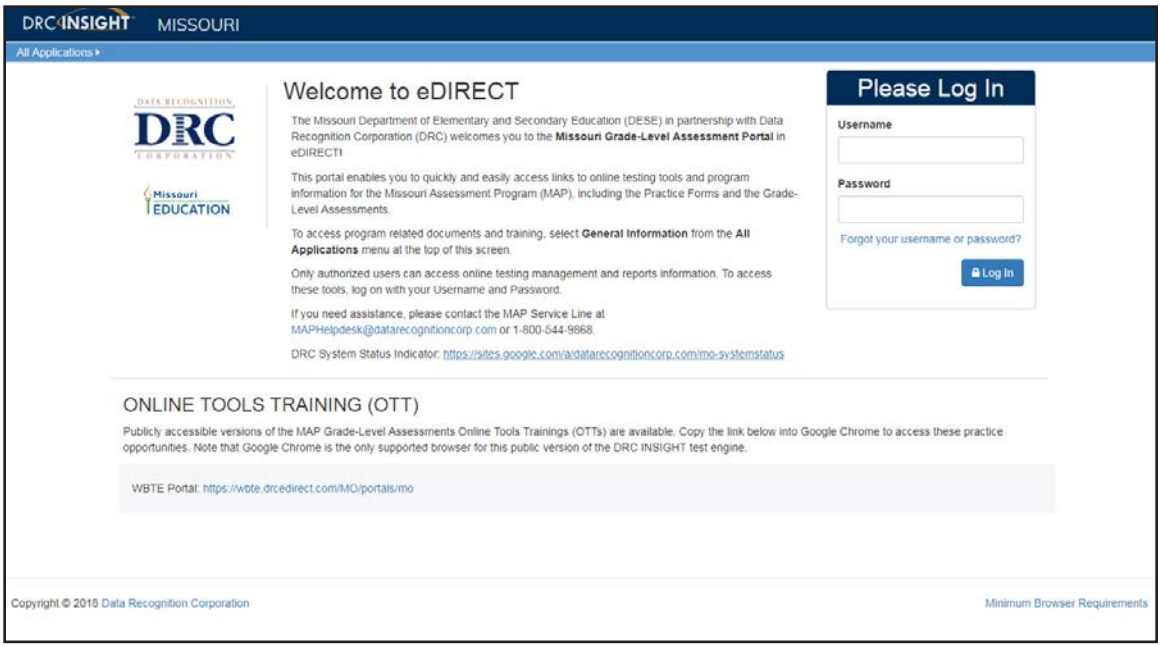
Details are provided in the eDIRECT User Guides, which are available on the **Documents** page of eDIRECT.

8.1 Login/Username/Password

Existing users can use their username and password to log into eDIRECT. New users will receive a system generated email with their username (email address) and a link. Clicking the link displays a screen that allows you to choose your password. If you cannot remember your login information, click on the Forgot your username or password link above the login button. If you continue to have issues, contact the MAP Service Line at MAPHelpdesk@datarecognitioncorp.com or 1-800-544-9868.

8.2 Home Page

The Welcome Page is where you enter your username and password to access the various functions of the portal.



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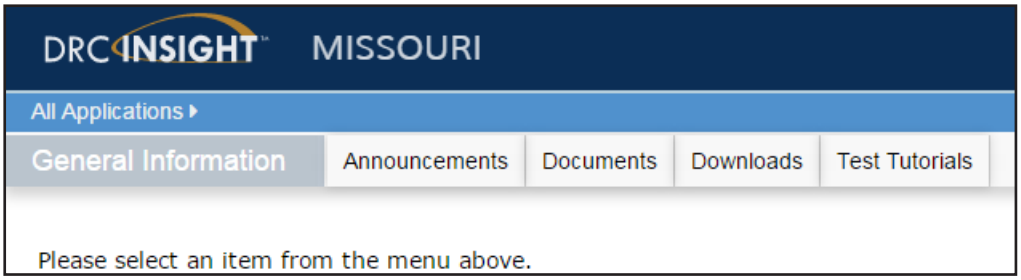
Once logged in, click on the All Applications option to display a menu bar containing various eDIRECT functions that you have permission to use.

Under General Information, Announcements will be posted throughout the year regarding the assessment. Under Documents, is where you will find the eDIRECT User Guides, Training Modules, and various other documents pertaining to the assessment.

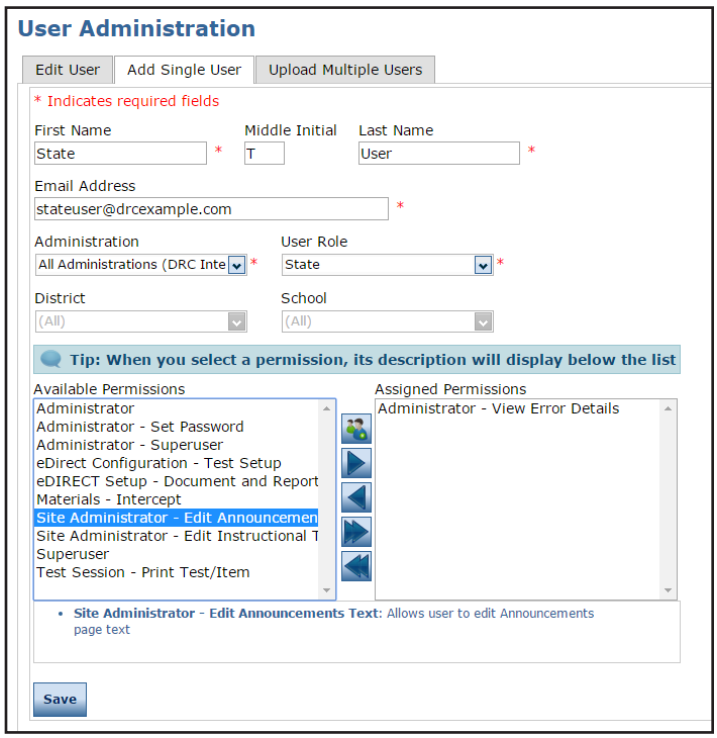


8.3 User Accounts

Below are quick tips on adding and editing users. For more details, please see the *eDIRECT User Guide – User Management* located under Documents in eDIRECT.

8.3.1 Creating

A User can be added under the User Administration option. Select Add Single User tab and fill out the required fields. Select the permissions and save.



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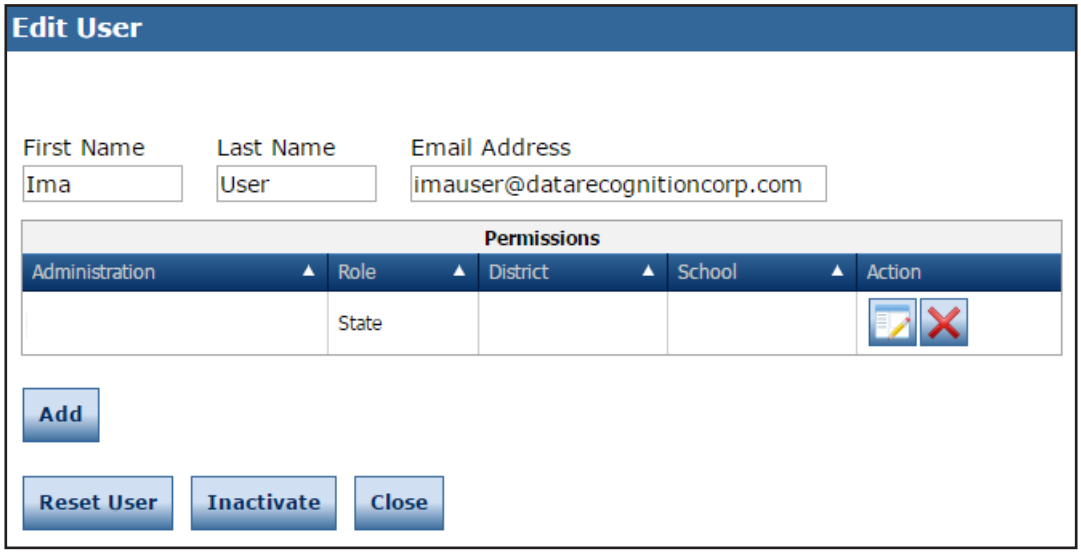
8.3.2 Editing

Select the Edit User tab to edit permissions assigned to a user.



8.3.3 Roles/Permissions

The following table shows the specific permissions to be granted, by role, for the Summative Assessments. DTCs will receive applicable permissions when assigned access to Spring 2019 Summative Grade-Level Assessments in eDIRECT. It is the responsibility of the DTC to assign permissions – individually or using permission sets – to STCs, DITCs, and TEs.

eDIRECT Menu	Permission Name	Allows User To…	Permission Set by Role			
			DTC	STC	DITC	TE
General Information	Documents – View	View manuals, presentations, and other documents	X	X	X	X
	Documents – Upload	Upload Purchase Orders (POs)	X			
	Downloads – Online Testing – Secured Resources	View secure online testing software downloads	X	X	X	
Device Toolkit	Test Setup – Device Toolkit	Configure a computer or approved iPad or Chromebook device for testing	X	X	X	
User Management – User Administration	Administrator	Add/edit user accounts and profiles	X	X	X	
	Administrator – Mass Assign Role	Upgrade multiple User Profiles to a higher role	X	X		
Materials – Enrollments	Enrollment	Identify testing windows; order Braille and large-print materials	X			
	Manage Shipments	Update shipping contact and address information	X			

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eDIRECT Menu	Permission Name	Allows User To…	Permission Set by Role			
			DTC	STC	DITC	TE
Materials – Accountability Form	Materials	Access the Materials Accountability grids	X	X		X *
	Materials – Accountability – User Information Report	Access a report displaying all users who clicked the 'Complete' button	X			
Materials – Additional Materials	Materials – Additional	Access additional materials screens	X			
	Materials – Additional – View/Edit	Enter, view, and modify Additional Materials orders	X			
Test Management	Test Management	Allows users to access Test Management	X	X	X	X*
Test Management – Manage Test Sessions	Test Session – Search/View *Users must have this permission in order to use any other Test Session permissions.	Search and view test sessions and download search results. This permission is required for all other Test Sessions permissions.	X	X		X*
	Test Session – Add/Edit	Add, edit, and delete test sessions	X	X		X*
	Test Session – Status Summary	View testing status information	X	X		X*
	Test Session – Print Test	Print a PDF version of the test for students needing a paper-based assessment	X	X		
	Test Tickets – View/Print	Print student test tickets, rosters, and view individual student testing status	X	X		
	Test Tickets – View Questions Attempted	View the number of items out of the total a student has attempted	X	X		X*
	Test Tickets – Unlock	Unlock a test ticket after the student's test status is Completed or Locked.	X			
Student Management – Manage Students	Students – Search/View **Users must have this permission in order to use any other Student permissions.*	Search and view student data. This permission is required for all other Student permissions.	X	X		X
	Students – Add/Edit	Add and edit student demographic information	X	X		
	Students – Download Students	Download a list of student information	X	X		
	Students – Upload	Upload students and demographic information using a specified file layout	X	X		
Student Management – Student Status Dashboard	Test Setup – View Student Status	View test status by student	X	X		

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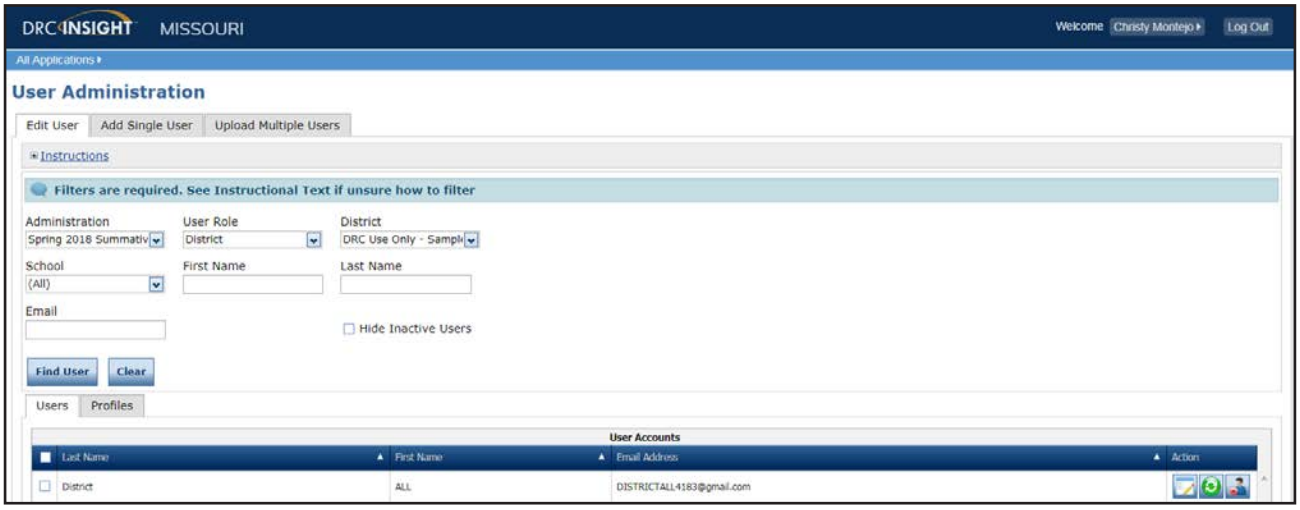
eDIRECT Menu	Permission Name	Allows User To…	Permission Set by Role			
			DTC	STC	DITC	TE
Report Delivery – Status Reports	Status Reports – District Reports	Access reports that display various district- and school-testing activity	X			
Report Delivery – Online Testing Statistics	Online Testing Statistics	Track online testing activity	X	X		
Report Delivery – MAP Grade-Level Reports	Reports – View District Files	Access ISRs and rosters	X			

* Assigning these permissions to Test Examiners is not required.

8.3.4 Inactivate

To inactivate a user, find the user under the Edit User tab. Click the Inactivate icon under the Action column.



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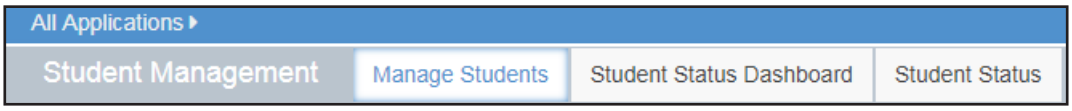
8.4 Student Management

From the Student Management menu, users can search for, add, and edit students. For further details on Student Management, see the *eDIRECT User Guide – Test Management* located under Documents in eDIRECT. Using either the Student Status Dashboard or Student Status tabs, users can view students progress in test sessions.



8.4.1 Precoding

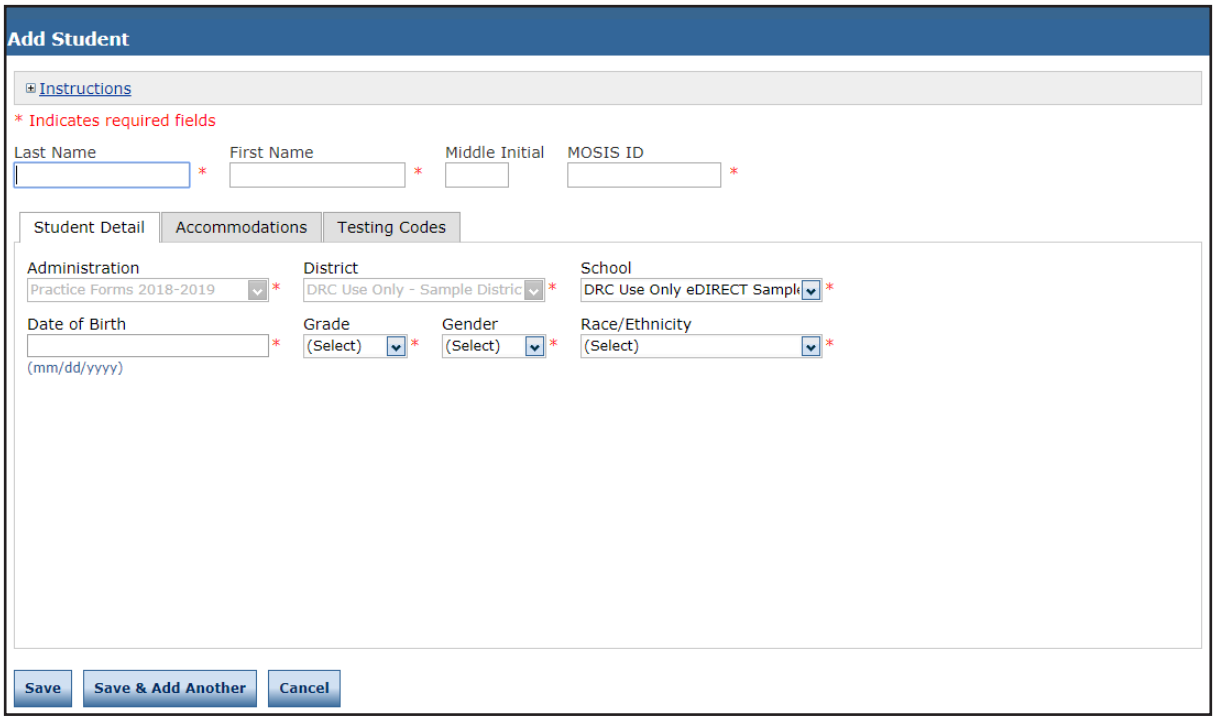
Precoding is handled by the DESE Data section. Below are the dates for submitting precode information to DESE and when it will appear in eDIRECT.

For questions about Precoding, contact Melissa Bardwell at 573-522-3328 or melissa.bardwell@dese.mo.gov.

Precode File Due to DESE	Student Test Setup Available in eDIRECT
Window 1 - February 1, 2019 Window 2 - March 1, 2019 Window 3 - March 15, 2019	Window 1 - February 25, 2019 Window 2 - March 11, 2019 Window 3 - March 25, 2019

8.4.2 Manual Addition – Single Student

Under the Manage Students tab, select the school and click the Add Student button at the bottom of the page to display the Add Student window. Enter the necessary info under each tab and click on Save to add the student.



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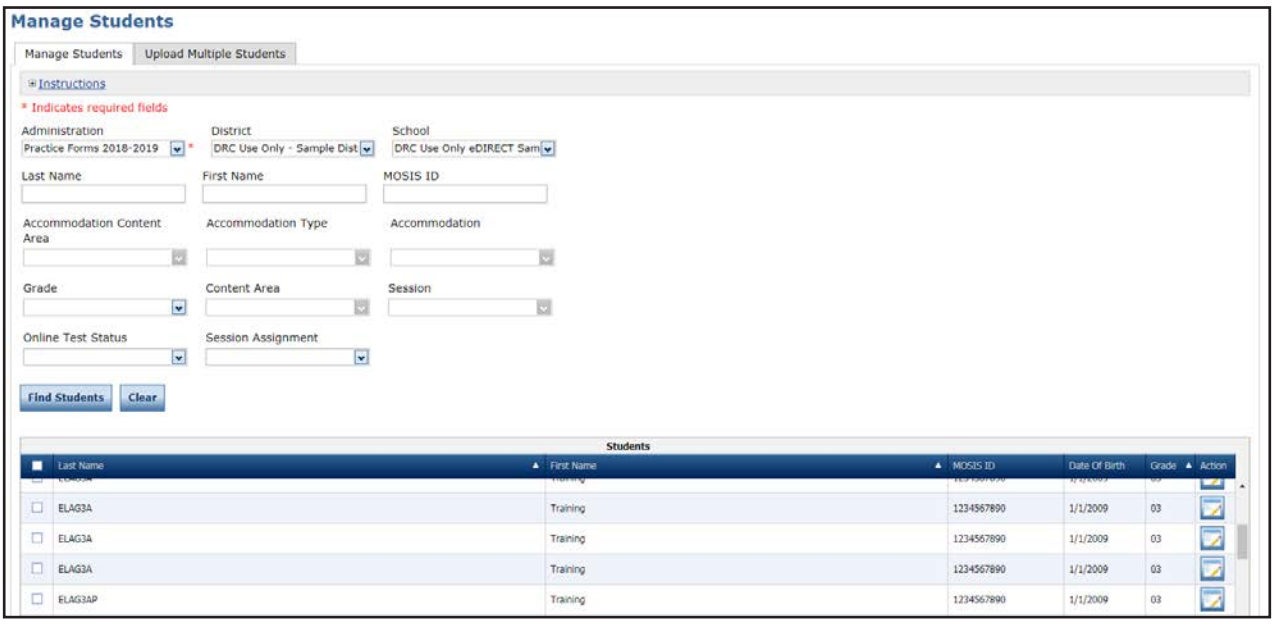
8.4.3 Manual Group Addition

To add multiple students at once, you can upload a file to the Upload Multiple Students tab under Manage Students. Download the file layout and complete it for the students you want to add. Upload the file by clicking on Browse and then select Upload. After the file has been validated and there are no errors, the students will be in the system and can be added to test sessions.

8.4.4 Editing Students

Once students appear under Manage Students, their information can be edited by clicking on the View/Edit icon in the action column for the student you want to edit. This will display the Edit Student window. You can edit the student detail information, edit accommodations, view test sessions they are assigned to, and view test session status information.



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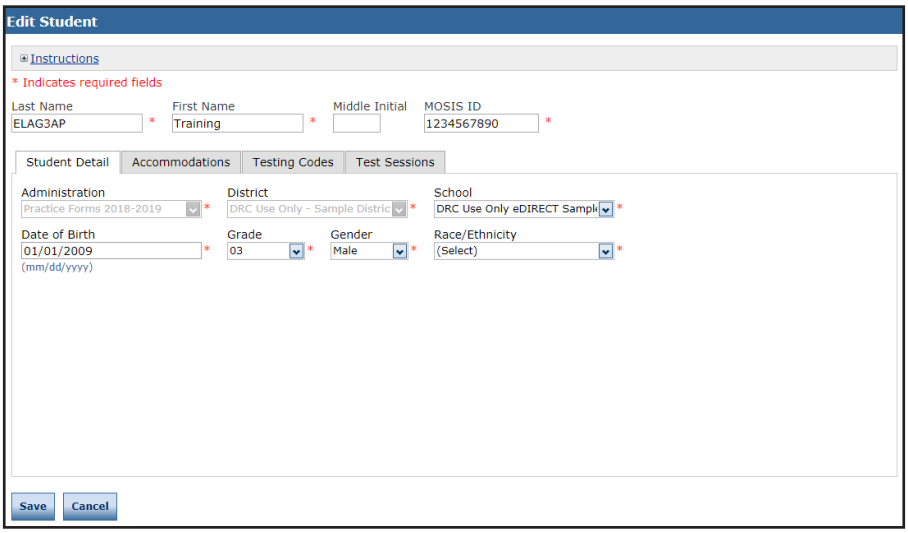
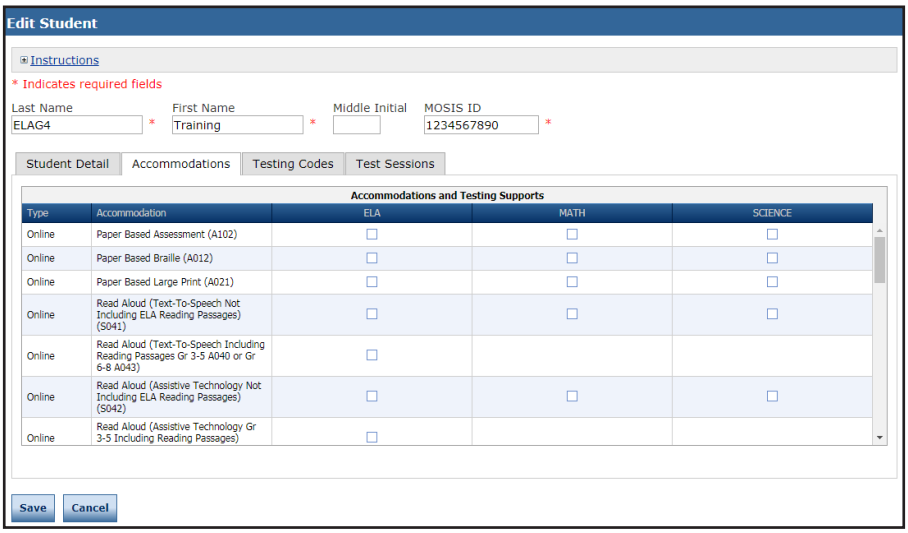


8.4.5 Marking Tools/Accommodations

Under Edit Students, select the Accommodations tab to update accommodations for the student. Click save when complete.



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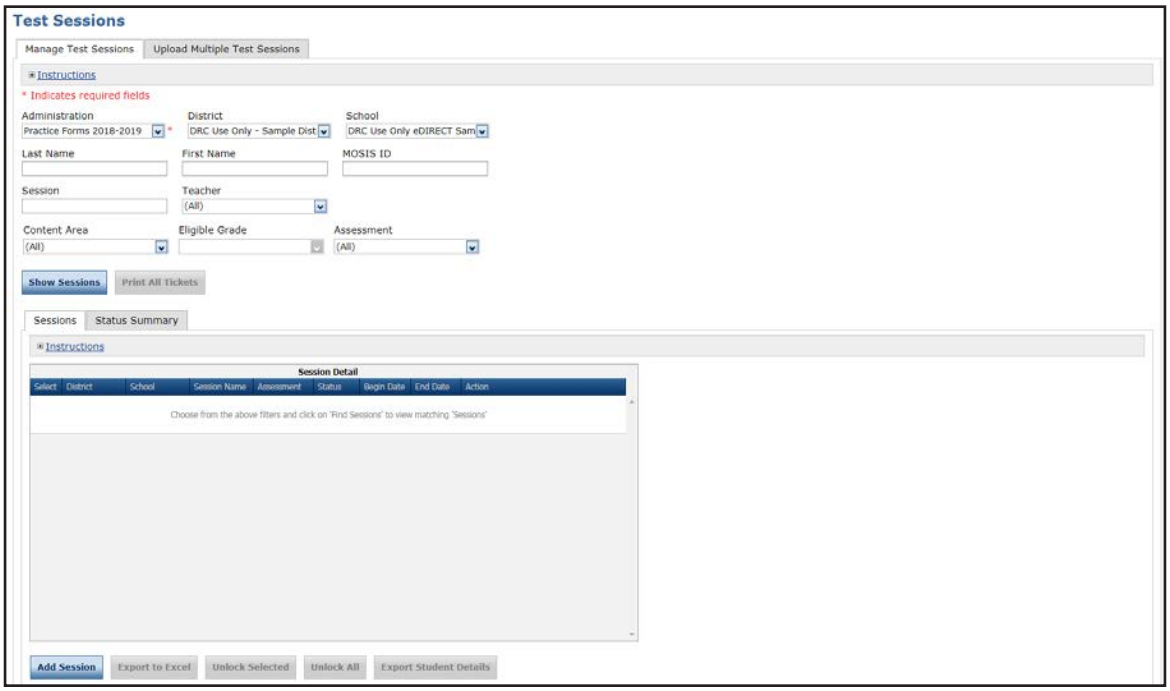
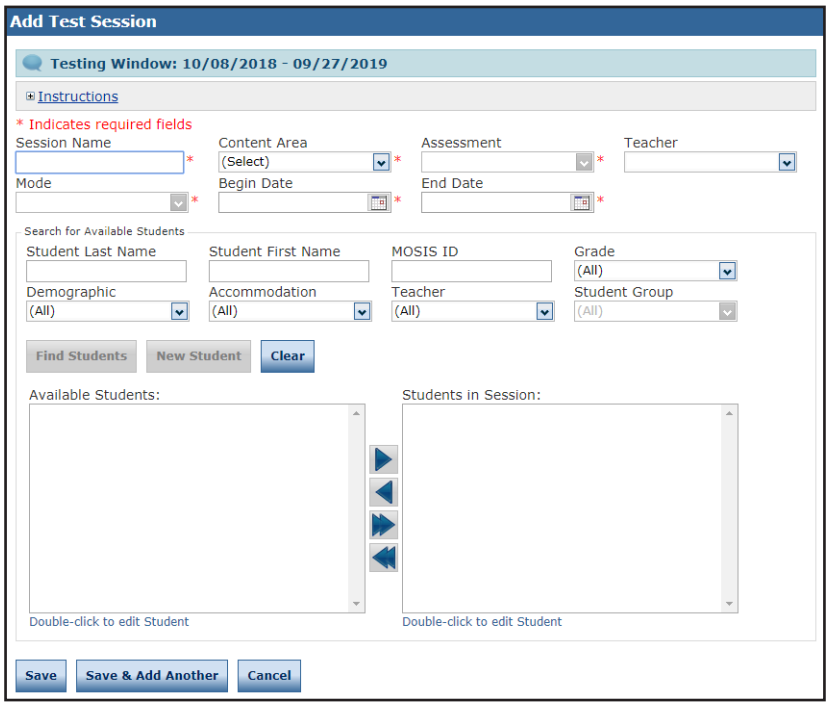
8.5 Sessions

From the Test Management menu in eDIRECT you can create test sessions, print test tickets, and print rosters. A test session is a grouping of students who will take the same assessment. A test session is created to associate students with a particular class/Test Examiner and to generate test tickets/login credentials for the testers.



8.5.1 Populating Sessions

Under Test Management, Select the Manage Test Sessions tab to add a test session. Select the district and school and click on Add Session button at the bottom of the page to display the Add Test Session window. Enter the required information and any other student search criteria and click on Find Students.



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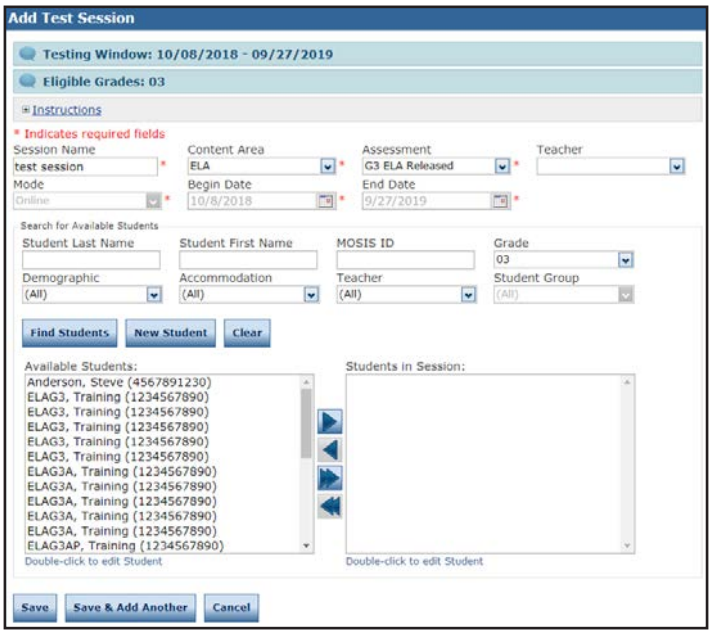
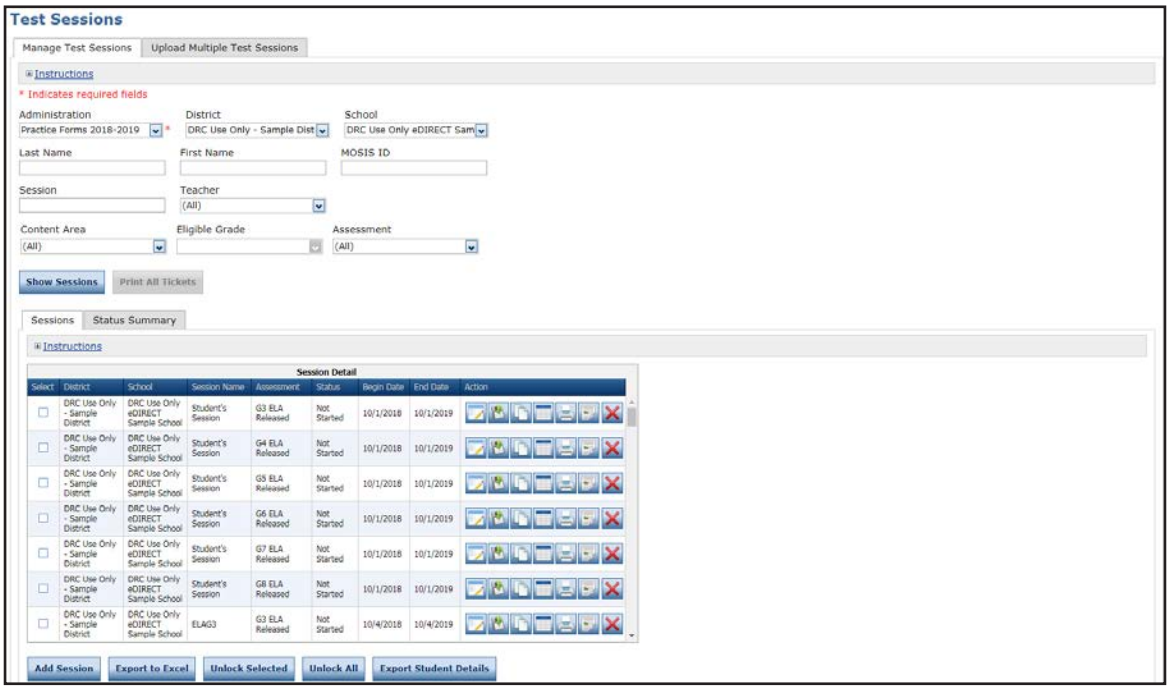
Select the student(s) you want to add to the test session and choose the Add Selected icon to move the student(s) to the test session. Click on Save to complete the process or Save & Add Another to add another session.



8.5.2 Printing Test Tickets

Under the Manage Test Sessions tab, fill in the information of the sessions you want to print test tickets for, then click on Show Sessions. To print all of the tickets for all of the students in a session, click on the Print All icon in the Action column. To print selected test tickets, click the Edit/Print Ticket Status icon in the Action column. A PDF will open that you can view, print, and save.



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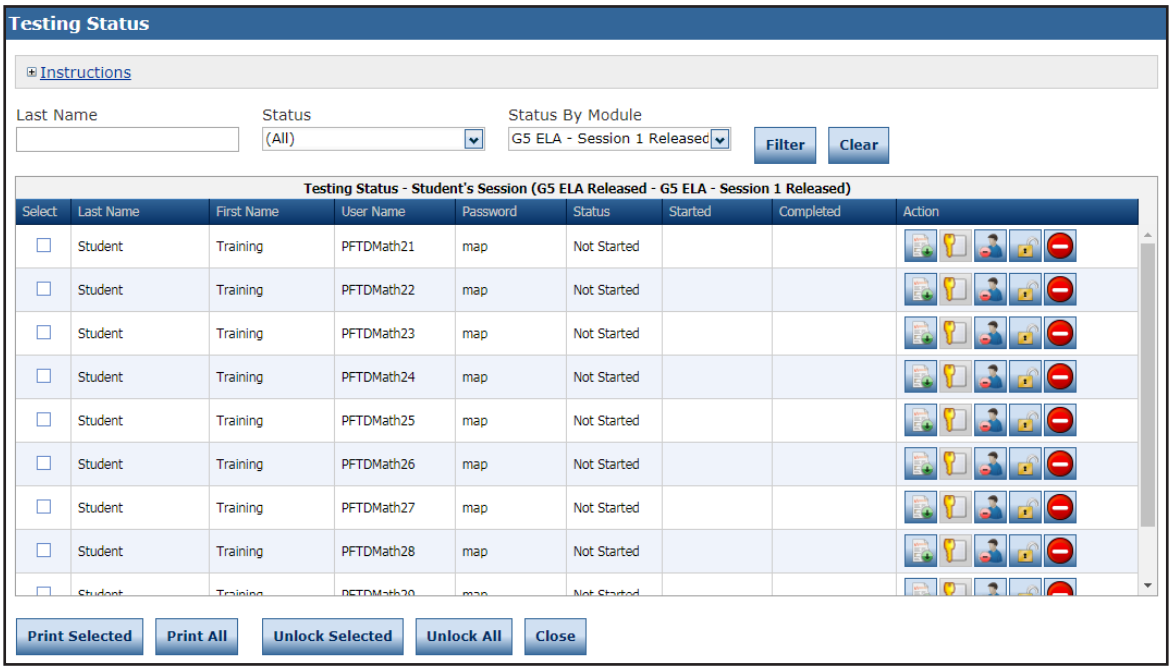
Select the students you want to print test tickets for and click on Print Selected button at the bottom of the screen. A PDF will open that you can view, print and save.



8.5.2.1 Which Tools/Accommodations Appear on Test Tickets

Even when marked in eDIRECT, not all tools/accommodations will be displayed on test tickets. The following are the only tools and accommodations that will appear on a student test ticket. For descriptions of these Tools/Accommodations, see section 7.0.

Tool/Accommodation	Code	Ticket Abbreviation
Braille	A012	Braille
Large Print	A021	LargePrint
Paper Based Assessment	A102	PaperBased
Sign Language	A052	A052
Closed Captioning	A053	A053
Translation	S109	S109
Read Aloud (Not Including ELA Reading Passages)—Text-To-Speech	S041	TTS
Read Aloud (GRADES 3–5 ELA Reading Passages)—Text-To-Speech	A040	TTSPASSAGE
Read Aloud (GRADES 6–8 ELA Reading Passages)—Text-To-Speech	A043	TTSPASSAGE
Read Aloud (Not Including ELA Reading Passages)—Human Reader	S043	S043
Read Aloud (GRADES 3–5) (ELA Reading Passages)—Human Reader	A041	A041

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Even when marked in eDIRECT, not all tools/accommodations will be displayed on test tickets. The following are the only tools and accommodations that will appear on a student test ticket. For descriptions of these Tools/Accommodations, see section 7.0.		
Tool/Accommodation	**Code**	**Ticket Abbreviation**
Read Aloud (GRADES 6–8) (ELA Reading Passages)—Human Reader	A045	A045
Read Aloud (Not Including ELA Reading Passages)—Assistive Technology	S042	S042
Read Aloud (GRADES 3–5) (ELA Reading Passages)—Assistive Technology	A042	A042
Read Aloud (GRADES 6–8) (ELA Reading Passages)—Assistive Technology	A044	A044
Read Aloud (Not Including ELA Reading Passages)—Native Language	S111	S111
Read Aloud (GRADES 3–5) (ELA Reading Passages)—Native Language	A111	A111
Read Aloud (GRADES 6–8) (ELA Reading Passages)—Native Language	A112	A112
Read Aloud (ELA Reading Passages)—Blind Students	A046	A046

8.5.3 Printing Rosters

A Student Test Roster is included with all test ticket PDFs. The Roster begins on page 2 of the test ticket PDF. The Roster provides a list of students, MOSIS IDs, usernames/passwords, and any accommodations listed in chart 8.5.2.1.

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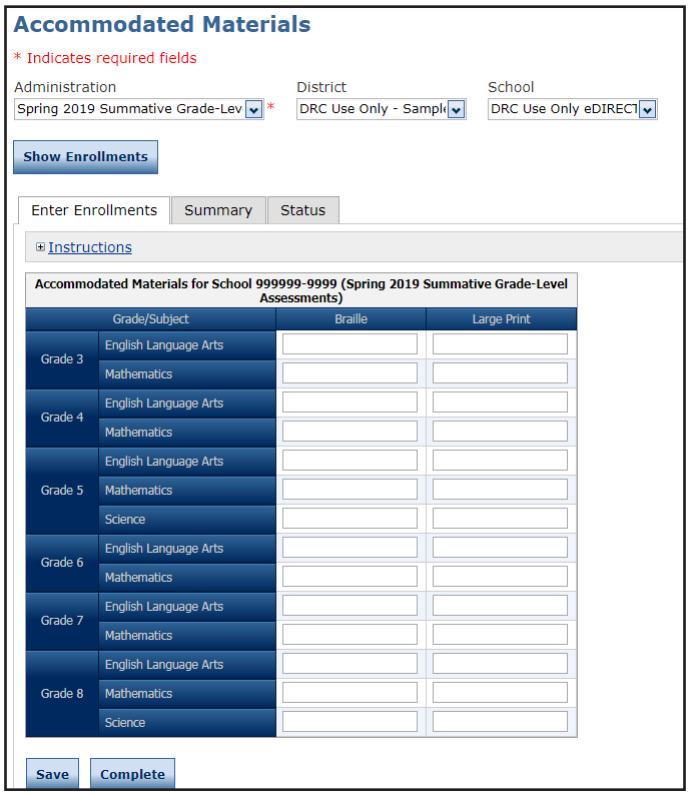
8.6 Materials

Large Print and Braille materials are ordered in eDIRECT during the ordering window between January 7, 2019 to February 1, 2019. DTCs will place their order in Enrollments under the Materials menu. Details on ordering materials is located in the *eDIRECT User Guide – User Management* located under Documents in eDIRECT.



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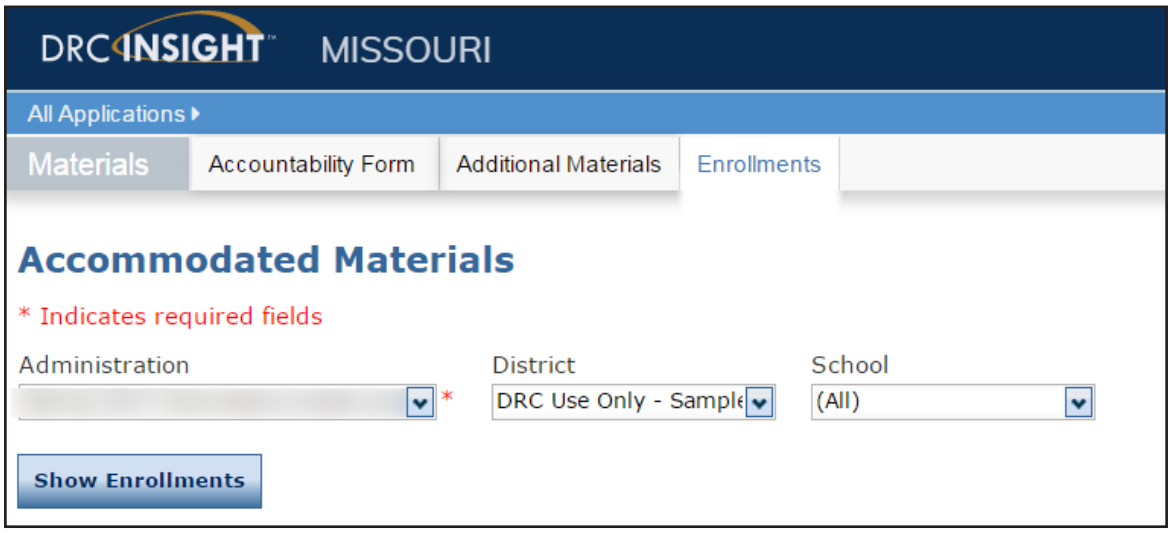
8.7 Additional Features

8.7.1 Setting Test Windows

DTCs submit their district's projected testing window via Enrollments in eDIRECT during the Enrollments window between January 7, 2019 to February 1, 2019. Under the Materials menu, select the Enrollment tab. Select the administration and click on Show Enrollments.



Enter the testing window dates for each grade and content area. Further details on Enrollments are in the *eDIRECT User Guide – User Management* located under the Documents in eDIRECT.

NOTE: If a testing window needs to be changed after February 1, 2019, follow the instructions in Section 10.6 of this manual.

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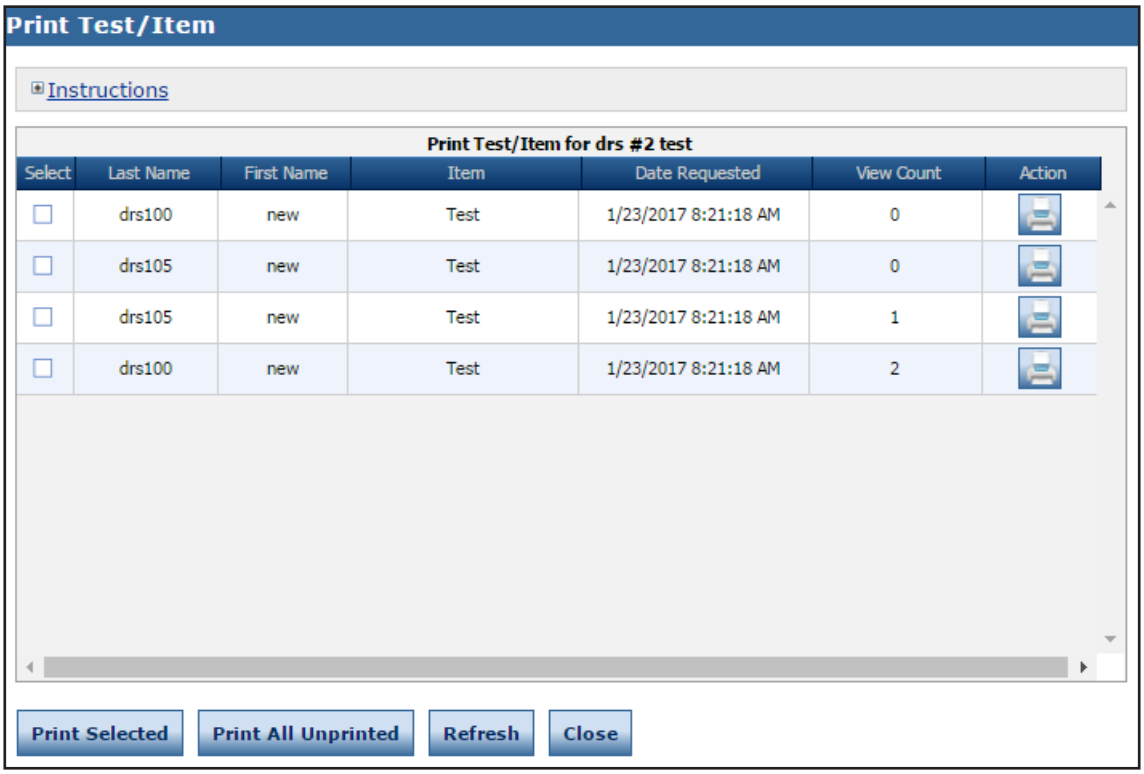
8.7.2 Printing Paper Tests

To activate the paper/pencil edition print function, Test Examiners must first mark the applicable accommodation and code for student who require the paper version of the test. To do this, follow the instructions provided in Section 8.4.5 in this manual. Go to Manage Test Sessions option under the Test Management menu in eDIRECT to find the test session with the students that need a printed test. In the Action column, click the Print Test/Item icon to display the Print Test/item window. In the Action column, click the Print Test/Item icon to print the test for the student. For further details on Printing Paper Tests, see the *eDIRECT User Guide – Test Management* located under Documents in eDIRECT.

NOTE: eDIRECT does not allow Missouri users to print individual items.



8.7.3 Printing Listening Scripts

The use of some tools/accommodations requires access to a printed copy of the listening script for ELA. The script will need to be downloaded and printed at the local level. The scripts are secure; do not allow unauthorized persons to access them. Maintaining the security of all test materials is crucial to obtaining valid and reliable test results. Therefore, test materials including listening scripts must be kept in locked storage, except during actual test administration. It is the responsibility of all individuals who administer the test to follow security procedures.

NOTE: The DTC must contact the MAP Service Line to request access to listening scripts.

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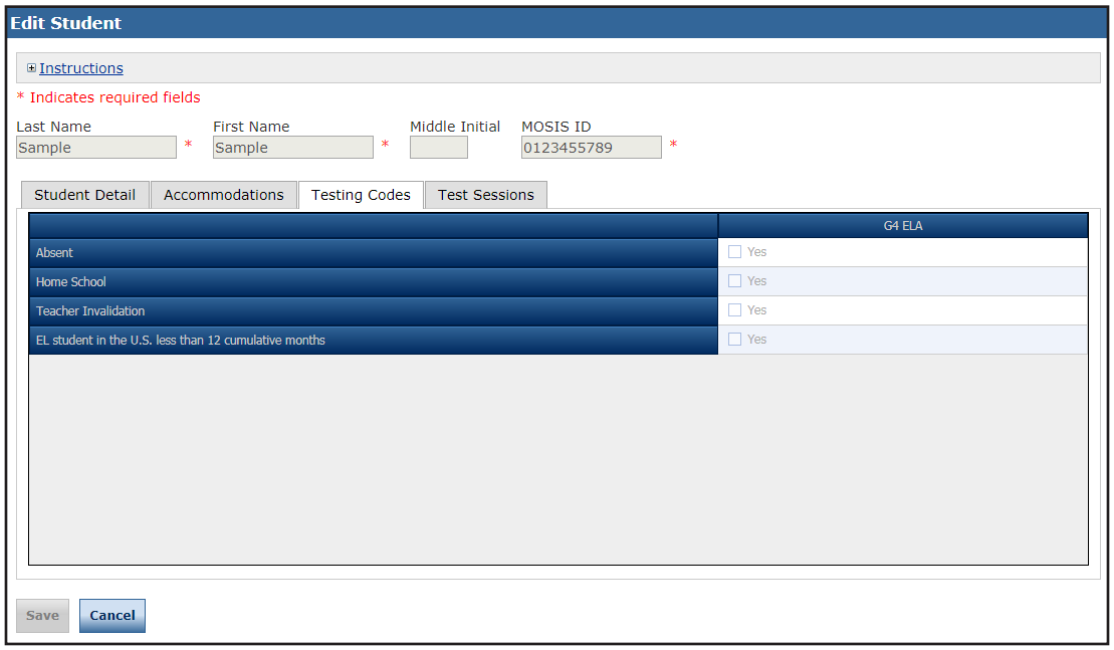
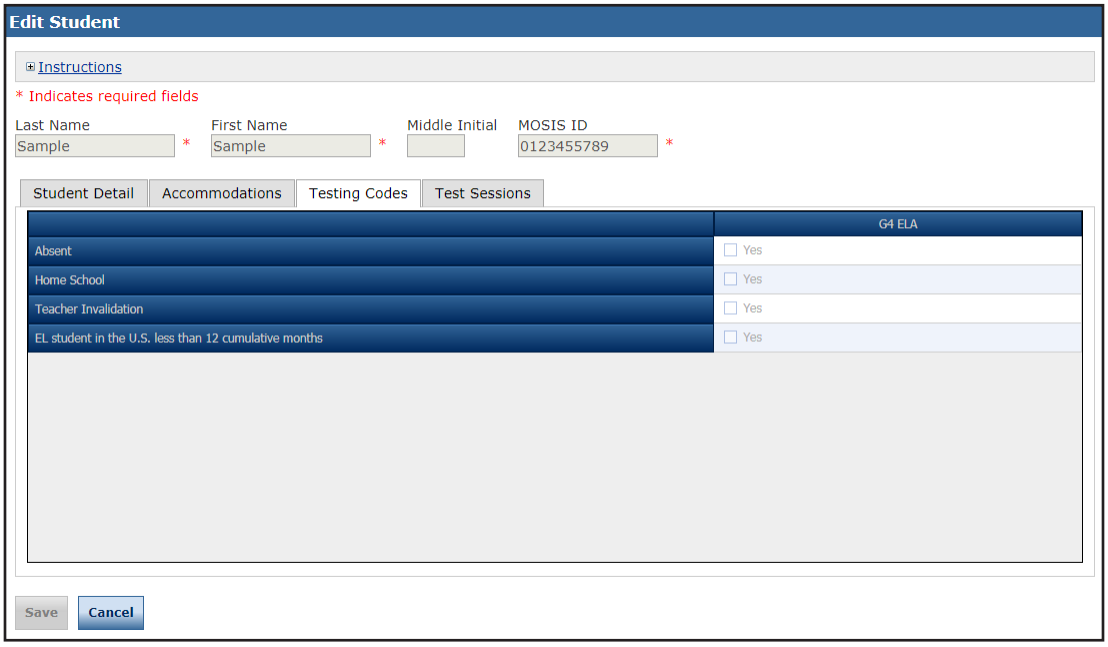
8.7.4 Marking EL Less Than 12 Months

Go to the Manage Students option under the Student Management menu in eDIRECT. Search for the student and select the Edit Student icon under the Action column. Select the Testing Codes tab and click in the Yes box next to EL student in the U.S. less than 12 cumulative months. Click on Save when complete.



8.7.5 Marking Not Testing Codes

Go to the Manage Students option under the Student Management menu in eDIRECT. Search for the student and select the Edit Student icon under the Action column. Select the Testing Codes tab and click in the Yes box next to the appropriate code. Click on Save when complete.



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8.7.6 Test Book Accountability

8.7.6.1 District Test Coordinator

For every building administering a Large Print, Braille, or paper/pencil assessment, the DTC needs to complete the Accountability Form located under the Materials section of eDIRECT. Reference the *eDIRECT User Guide – User Management* for specific instructions. Complete the following steps for each building before distributing materials to the STC:

1. Confirm the box count of the Large Print and Braille testing materials shipment from DRC (e.g., Box 1 of 5 through Box 5 of 5).
2. Verify the security barcode numbers of the test books against the packing list.
3. Record the number of test books listed on the packing list and the number of paper/pencil tests that were downloaded on the Accountability Form.
4. Report any discrepancies to DRC's dedicated MAP Service Line at 1-800-544-9868 between the hours of 7:00 A.M. and 6:00 P.M. Central Time, Monday–Friday.

8.7.6.2 School Test Coordinator

After receiving the testing materials from the DTC, complete the following steps:

1. Verify that security barcode numbers printed on the Large Print and Braille test books match the numbers listed on the packing list (located in Box 1 of the building's shipment).
2. Confirm that the proper accommodation code is marked in eDIRECT.
3. Complete the Accountability Form, following the directions in the *eDIRECT User Guide – User Management*.
4. Document any Large Print and Braille security barcode discrepancies.
5. Notify the DTC of any discrepancies immediately.
6. If any student is taking a MAP Grade-Level Assessment out of district/building, or if the student is homebound, note the barcode number of the test book before delivering it to the testing site to ensure proper accounting of all test books when they are returned to the district.
7. Ensure all test books have been accounted for before they are shipped to DRC.
8. Follow the procedures in the Contaminated Materials section of this manual for any contaminated test materials.
9. Maintain the Accountability Form during the test administration.

8.7.6.3 Test Examiner

Count the number of Large Print and Braille books received and assign each test book to a student. Write the student's name and MOSIS ID on the front of each test book.

Document this information in preparation for returning the test books to the STC.

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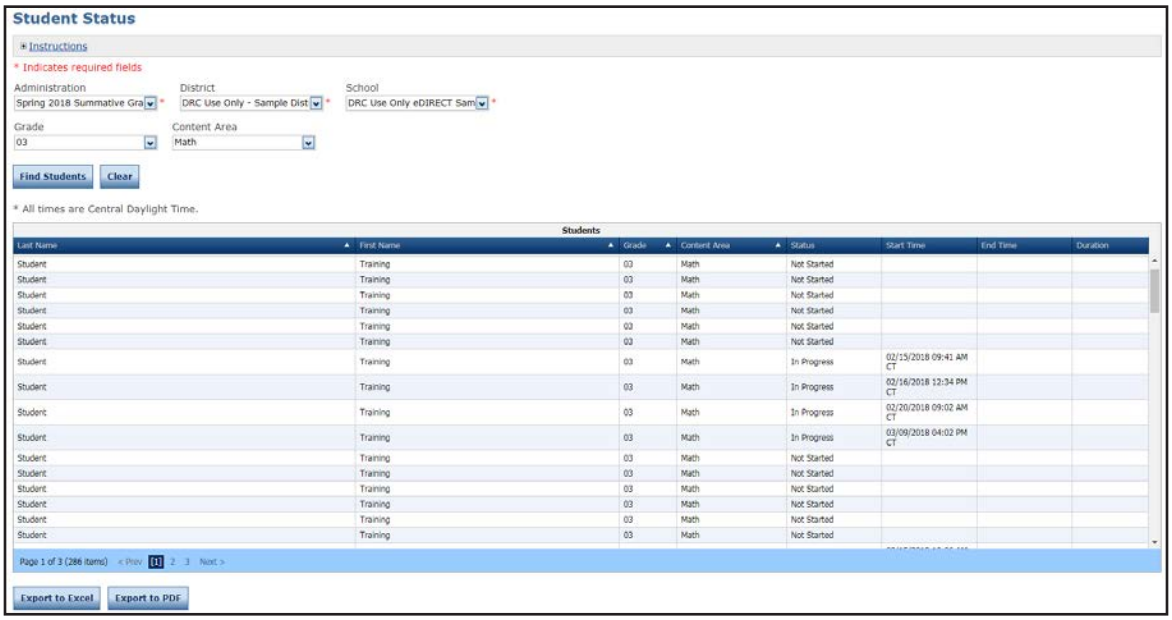
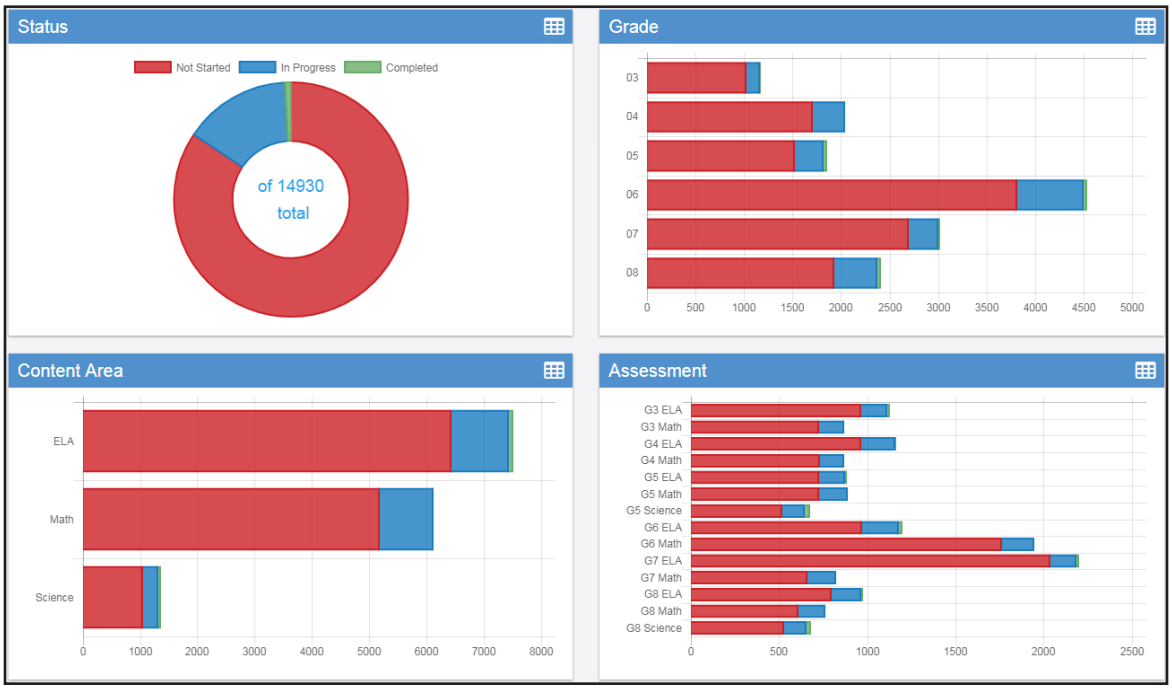
8.8 Tracking Student Progress

To view the test status by student, under the Student Management menu, select the Student Status tab. Complete the required information and click on Find Students. A list of students will display with their Testing Status, Start/End Time, and Duration. Click on Export to Excel or to PDF to download a copy of the list.



To view the test status by school, under the Student Management menu, select the Student Status Dashboard tab. Complete the required information. The Student Status Dashboard will populate. The top half of the report shows the overall school status and status by grade, content area, and assessment. The bottom half of the report provides a list of students with their Testing Status, Start/End Time, and Duration. Click on Export to Excel or to PDF to download a copy of the list.



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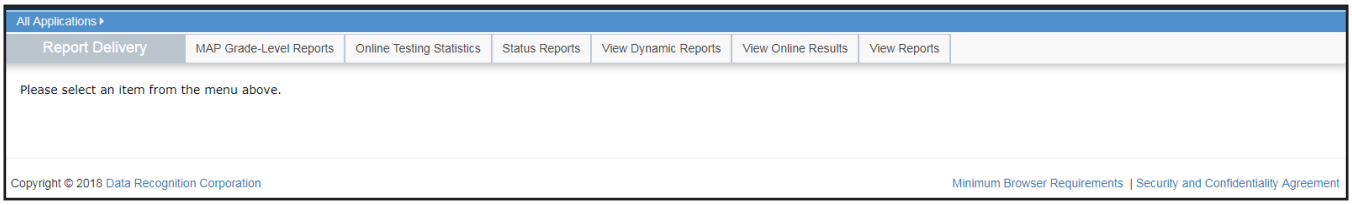
Student Search Results

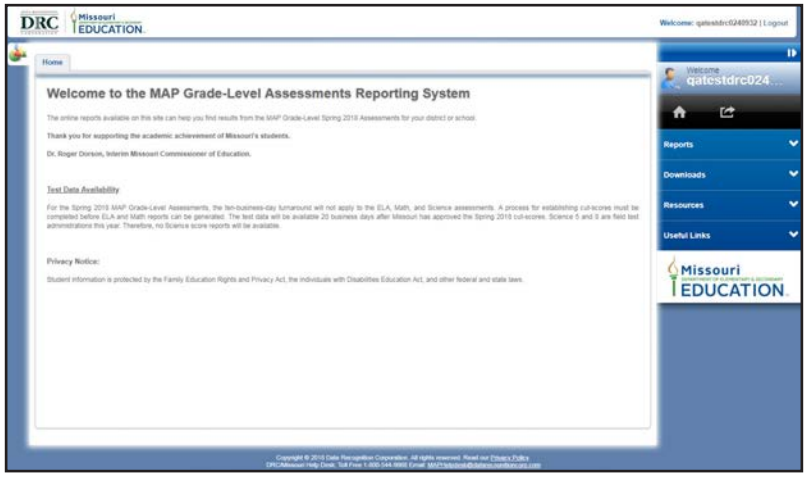
Export to CSV

Last Name	First Name	Grade	Content Area	Module	Assessment	Status	Start Time	End Time	Duration
askamarch	stud	03	ELA	G3 ELA - Sessio...	G3 ELA	Not Started			
askamarch	stud	03	ELA	G3 ELA - Sessio...	G3 ELA	Not Started			
askamarch	stud	03	ELA	G3 ELA - Sessio...	G3 ELA	Not Started			
askbmarch	stud	04	Math	G4 MA - Session 1	G4 Math	Not Started			
askbmarch	stud	04	Math	G4 MA - Session 2	G4 Math	Not Started			
askbmarch	stud	04	Math	G4 MA - Session 3	G4 Math	Not Started			
askcmarch	stud	05	Science	G5 SC - Session 1	G5 Science	Not Started			
askcmarch	stud	05	Science	G5 SC - Session 2	G5 Science	Not Started			
drsa	test	05	Math	G5 MA - Session 1	G5 Math	Not Started			
drsa	test	05	Math	G5 MA - Session 2	G5 Math	Not Started			
drsa	test	05	Math	G5 MA - Session 3	G5 Math	Not Started			
drsg	POD	05	ELA	G5 ELA - Sessio...	G5 ELA	Not Started			
drsg	POD	05	ELA	G5 ELA - Sessio...	G5 ELA	Not Started			
drsg	POD	05	ELA	G5 ELA - Sessio...	G5 ELA	Not Started			

8.9 Reports

The Student Roster, Individual Student Reports (ISRs), and Student Report Labels are found in eDIRECT under the Report Delivery menu. Select the MAP Grade-Level Reports tab and follow the prompts to go to the MAP Grade-Level Assessments Reporting System. For further details on accessing, downloading, and printing the reports, please see the *eDIRECT User Guide – Reporting* located in eDIRECT under Documents and on the Reporting site. Additional reporting tools are available, see *eDIRECT User Guide – Test Management*. The use of View Dynamic Reports and View Online Results is limited to Practice Forms, please see the Practice Forms *eDIRECT User Guide – Reporting* for more information.





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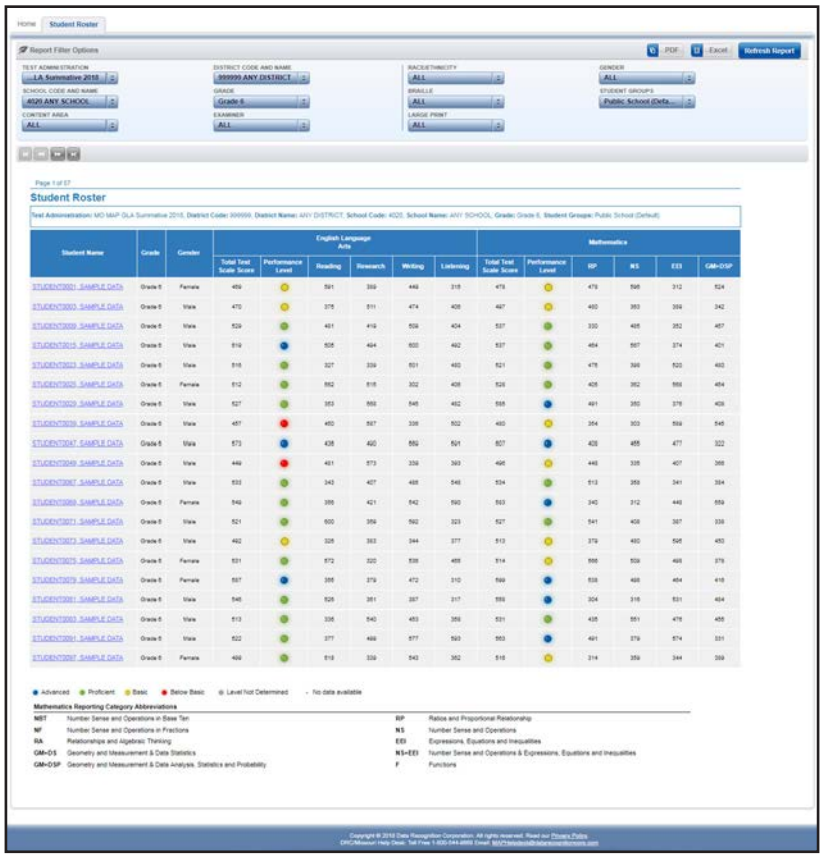
8.9.1 Student Roster

On the right-hand side of the reporting home page, select Reports then Student Roster to display the Student Roster page. The Student Roster page shows scale scores for the overall content area and at the individual reporting category. Click PDF or Excel to export and print the Roster Report.



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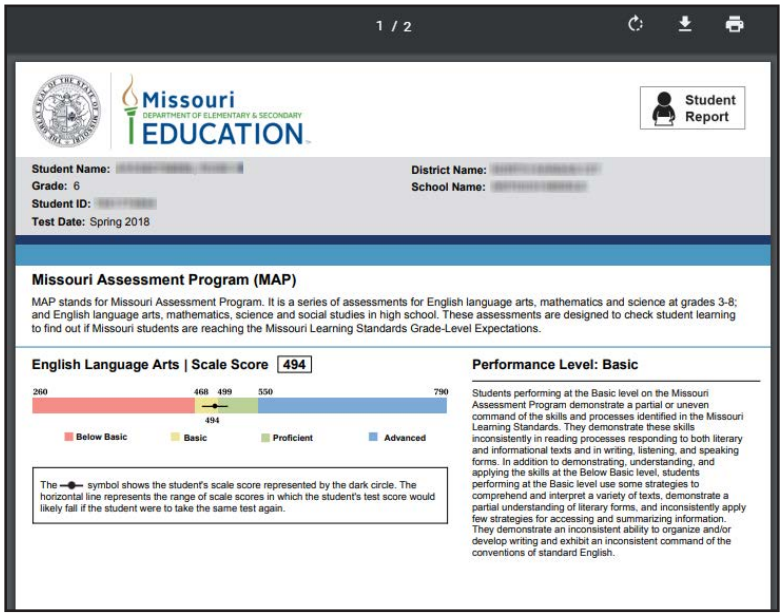
8.9.2 Individual Student Reports (ISRs)

To open the ISR, click on a student name on the Roster Report. You can download or print the ISR once open.


1 / 2

Missouri DEPARTMENT OF ELEMENTARY & SECONDARY EDUCATION

Student Report

Student Name:
Grade: 6
Student ID:
Test Date: Spring 2018

District Name:
School Name:

Missouri Assessment Program (MAP)

MAP stands for Missouri Assessment Program. It is a series of assessments for English language arts, mathematics and science at grades 3-8; and English language arts, mathematics, science and social studies in high school. These assessments are designed to check student learning to find out if Missouri students are reaching the Missouri Learning Standards Grade-Level Expectations.

English Language Arts | Scale Score 494

260 468 499 550 790

494

Below Basic Basic Proficient Advanced

The symbol shows the student's scale score represented by the dark circle. The horizontal line represents the range of scale scores in which the student's test score would likely fall if the student were to take the same test again.

Performance Level: Basic

Students performing at the Basic level on the Missouri Assessment Program demonstrate a partial or uneven command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently in reading processes responding to both literary and informational texts and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Below Basic level, students performing at the Basic level use some strategies to comprehend and interpret a variety of texts, demonstrate a partial understanding of literary forms, and inconsistently apply few strategies for accessing and summarizing information. They demonstrate an inconsistent ability to organize and/or develop writing and exhibit an inconsistent command of the conventions of standard English.

Districts have the option to order printed ISRs for the flat fee of $350. Districts will receive two printed copies of each ISR for all tested students in the district. These are the same ISRs that are available electronically in the reporting system, just in hard copy and color format for easy distribution to parents. ISRs are packaged by school and shipped to the district. Each school package is sorted by grade level and then alphabetically by student for each content area. Orders must be placed in eDIRECT between April 15–June 21, 2019. The ordering page can be accessed in eDIRECT under All Applications > Materials > Enrollments. PO numbers must be entered in the system and POs must be uploaded into the Documents section of eDIRECT. For instructions on uploading the PO, please see the *eDIRECT User Guide – User Management*. ISRs will be delivered to districts three weeks after ISRs and student data become available in eDIRECT. Contact the MAP Service Line at 1-800-544-9868 if you have any questions about ordering printed ISRs.

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9.0 TRAINING/TEST PREPARATION

DTCs must ensure that all STCs, Test Examiners, and other responsible district and/or school staff have been trained. Review the Tutorials and the Online Tools Training (OTT) prior to testing, and ensure that Test Examiners and students have an opportunity to review both the Tutorials and OTT prior to testing.

9.1 Assessment Plan

Parents and guardians should be informed of the district Grade-Level Assessment schedule so they can help ensure their students are present on the day(s) of testing (without scheduled appointments or vacation days during the testing window) and prepared with the proper materials that may not be provided by the district.

In addition to having covered the course content, students should have experience using computers and should know how to use a computer mouse and keyboard before taking the Assessments. Students testing on a tablet device should have experience with the device in an instructional setting prior to testing. Students and teachers should review the OTTs and Tutorials (available at any time) for the Assessment they will be taking. Online Practice Forms are also available through INSIGHT. The Practice Forms are full forms that mirror the structure and function of the summative Grade-Level Assessments. Districts can administer Practice Forms to students at any time during the test window.

9.1.1 Testing Environment

Preparing for computer-based testing includes determining the physical layout of the testing room, training teachers and staff, and preparing students. Although DESE does not provide specific requirements for a testing room, it must be set up with test security in mind. Workstations must have adequate space between them so that students are not able to view one another's screens.

Instructional materials must be removed or covered, including, but not limited to, information that might assist students in answering questions that is displayed on bulletin boards, chalkboards, dry-erase boards, interactive whiteboards, or charts (e.g., wall charts that contain literary definitions, maps, mathematics formulas, etc.).

9.1.2 Test Security

Test security and ethical testing practices continue to be of utmost importance. A test security policy must be in place for each district and charter school. The test security policy should be placed in the District's Assessment Plan, which is locally board approved annually. The accurate assessment of student achievement is a critical component of the educational process in Missouri. It is the responsibility of everyone involved in the assessment process to understand the security measures in place to avoid any intentional or unintentional unethical behavior by students or staff members. Administrators and Test Examiners are responsible for reporting any of these behaviors to district administration and/or to the DESE Assessment Section at 573-751-3545 or assessment@dese.mo.gov.

District and School Test Coordinators, Test Examiners, translators, proctors, and any other district and/or staff who have testing responsibilities must follow test security procedures. The tests **must not** be read, scored, reviewed, photocopied, duplicated, scanned,

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transported by students, photographed, texted, or made accessible to personnel not responsible for testing. **Both written and/or verbal discussion of specific MAP Grade-Level Assessment items breach the security and integrity of the test and may result in an invalidation or loss of scores for accountability purposes.**

Test items or answers must not be discussed with anyone at any time. When hard-copy editions of the test are not in use, they must be stored in a secure, locked location outside of the classroom. **Large Print, Braille, and paper/pencil editions of the tests must be transcribed into INSIGHT and shipped back to DRC following the procedures in section 12.0 once testing is complete.**

Test security and ethics also include standardized training for all District and School Test Coordinators, Test Examiners, translators, proctors, and any district and/or school staff who have responsibilities in testing. Trainings from DRC and manuals (including this manual) are provided at http://dese.mo.gov/college-career-readiness/assessment/grade-level. This *Test Coordinator's Manual* is also available on the **Documents** page of eDIRECT.

9.2 Required/Allowed/Prohibited Materials

This section concerns all materials required, permitted but not provided, or prohibited while taking Grade-Level Online Assessments.

9.2.1 Required Materials

- A workstation with Internet access, a monitor, a mouse, and a keyboard for each student, **OR** a tablet device with Internet access if a student will be testing on a tablet. Devices must have INSIGHT properly loaded and certified.
- Student Test Tickets provide the secure login credentials (i.e., username and password) required for a student to use the testing software.
- The resources in the table below.

Additional Required Resources for ELA, Mathematics, and Science

Content Area	Session 1	Session 2	Session 3	Session 4
ELA	• Headphones are required for students using text-to-speech. • Writing Prompt Grades 4 & 8 only	• Headphones are required for students using text-to-speech.	• Headphones are required for all students taking this session in grades 3, 5, 6, & 7.	• Headphones are required for all students taking this session in grades 4 & 8.
Mathematics	• Headphones are required for students using text-to-speech.	• Headphones are required for students using text-to-speech.	• Headphones are required for students using text-to-speech.	N/A

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Content Area	Session 1	Session 2	Session 3	Session 4
Science	• Headphones are required for students using text-to-speech.	• Headphones are required for students using text-to-speech.	N/A	N/A

9.2.2 Optional Materials

- Scratch paper and grid/graph paper are allowed for all assessments.
- An English dictionary and a thesaurus may be available for the ELA writing prompt sessions (Grades 4 & 8, session 1). EL students may use an English or a bilingual dictionary and thesaurus as needed during these sessions.
- Calculators may be used for certain sessions of Mathematics and all sessions of Science. See section 9.2.4 for more information.
- Mathematics Reference Sheets can be copied from the *Examiner's Manual* or printed from the Documents page of eDIRECT, https://mo.drcedirect.com.
- A Periodic Table of the Elements can be copied from the *Examiner's Manual* or printed from the Documents page of eDIRECT, https://mo.drcedirect.com.

9.2.3 Prohibited Materials

- Electronic devices, including any portable device that can connect to the internet or to anyone inside or outside of the classroom, must not be accessible during the testing sessions. Such items include, but are not limited to:
  - cellular/mobile phones
  - electronic music players
  - digital cameras
  - handheld scanners
  - portable gaming devices
  - any device that can connect to the internet

9.2.3.1 Cell Phone Policy

As a part of your board approved assessment plan, each district shall have a cell phone policy in place that ensures both test security and test validity. Each classroom is expected to follow the district cell phone policy.

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9.2.4 Calculators

A physical calculator can be accessed for calculator-allowed items for the Mathematics and Science assessments.

- For all sessions in grade 5 Science and for sessions 2 and 3 in grade 6 Mathematics assessments, a four-function calculator with square root and percentage functions is permitted. If students in grade 6 use a scientific calculator with exponents, trigonometry, and logarithmic functionalities in the everyday classroom, they may use that same calculator for sessions 2 and 3 of Mathematics.
- For all sessions in grade 8 Science and for sessions 2 and 3 in grades 7 & 8 Mathematics assessments, a scientific calculator with exponents, trigonometry, and logarithmic functionalities is permitted.
- Test Examiners are responsible for ensuring and verifying that any calculator with the ability to store functions and equations, e.g., a scientific calculator, has the memory cleared before and after each Mathematics assessment.
- Calculators cannot have Internet connectivity or be able to connect to anyone inside or outside the classroom during testing.
- Students cannot use a calculator on a laptop or other portable computer, pocket organizer, cell phone, device with a typewriter-style keyboard, electronic writing pad, or pen-input device unless a particular assistive device is required for a student and is specified on his or her IEP.
- No calculators with QWERTY keyboards are allowed.

9.2.5 Other

Ensure Test Examiners are aware of school policies, such as:

- Does the school allow music to be played during the assessment?
- Does the school allow students to read books or do homework after testing?

9.3 Tools/Accommodations

The use of accommodations should be determined by the IEP team. For students with an IEP, DESE Special Education recommends that the IEP team also make the decisions on the use of Universal Tools for the student.

For students without an IEP, the use of some Universal Tools should be made by the classroom teacher and building administration. Ideally, the tool being used is one used in the everyday classroom.

Caution should especially be given in the use of Read Aloud and Translation. For more information, see sections 7.0–7.4.

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9.4 Transcribers

Transcribers must go through the same training as all other Test Examiners.

For more information on the role of the transcriber, please see Guidelines for Use of a Scribe available on the DESE Assessment page.

9.5 Translators

Translators must go through the same training as all other Test Examiners.

If the translator is not a district employee, a Test Examiner should be part of the test administration of the student.

Use of a Translator: EL students may have the assessment read aloud in the student's native language by a human reader. For ELA they may only have the test directions, items, and answer choices read aloud. Read aloud of English reading passages in a student's native language is allowed only if specified in a student's IEP or 504 plan. For all assessments, EL students may give their responses orally or in writing in their native language. Their responses must be translated into English and transcribed into the secure browser.

Refer to section 7.4 for the appropriate codes to use when a test is being translated. The translation and transcription must be an accurate interpretation of the student's responses. Translators must be trained in administering the Assessments. If needed, the translator may have access to printed student test books while in a secure environment to read and review before the test administration.

Please see sections 6.3 and 8.7.2 for instructions regarding downloading and administering the Paper/ Pencil edition of the tests.

9.6 Physical Materials

Physical test materials are to be kept secure at all times. They should not be left out on desks, in a drawer or closet, etc. Follow the school procedure for checking test materials in and out. Anyone handling the physical materials should be aware of the check-in and check-out procedure.

9.6.1 Contaminated Materials

Test materials are considered *contaminated* due to: a) a student health issue that affects the test book itself (blood, fluids, etc.) or b) contact with any potentially hazardous material. If test materials are contaminated, the Test Examiner should notify the School Test Coordinator for instructions for handling the contaminated materials since **all** printed testing material must be accounted for. The DTC, STC, or TE is responsible for transcribing the answers into the online system, and then the contaminated test materials must be securely destroyed at the test site by the DTC or STC. The DTC or STC should fill out the Missing Materials section of the Accountability Form to account for the contaminated test materials located under the Materials section of eDIRECT.

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9.7 Student Practice Tests/Videos

9.7.1 Tutorials

The Tutorials provide step-by-step video instructions on how to navigate the online system and give detailed explanations about the key features of the software. **The Tutorials should be reviewed at least once by Test Examiners who will supervise any of the MAP Grade-Level Assessments and by students in advance of their first test day. Allow students to repeat the Tutorials as often as desired and needed.**

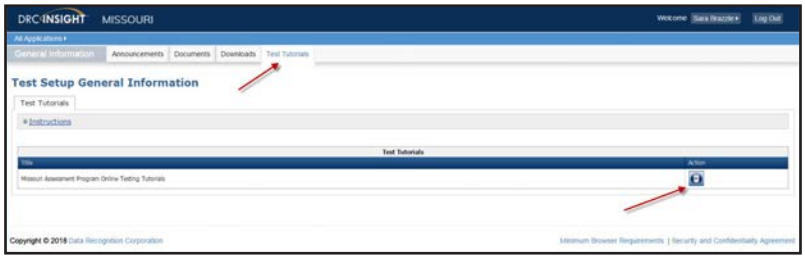
Students should review the Tutorials before completing the Online Tools Training (OTT). It has been proven beneficial for schools to schedule a Tutorial session for students immediately before at least one OTT session.

If computer availability is limited, the Tutorials may be presented to school personnel and students in a classroom using an LCD projector and a single Internet connection.

The Tutorials can be accessed via the Online Tutorials desktop icon once the testing software has been installed. The Tutorials may also be accessed through eDIRECT.

9.7.2 Instructions for Accessing the Tutorials through eDIRECT

1. Navigate to eDIRECT, https://mo.drcedirect.com. (Login is not required.)
2. Under **All Applications** select **General Information**.
3. Select the **Test Tutorials** tab.
4. Select the **Play Tutorial** action button.
5. Select **Play All** or choose from different sections within the tutorial



The Tutorials walk students through the software and tools that are available. In the Tutorial, the student can move forward as directed or jump around if desired. A menu at the left of the page allows the student to select specific sections for review.

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9.7.3 Online Tools Training

In preparation for the test and to expose students to the various item types in each content area (see section 6.1 for item types), it is highly recommended that all students access the Online Tools Training (OTT) for each content area. Each OTT is designed to provide students and educators with an opportunity to quickly familiarize themselves with the software and navigational tools that they will use with the MAP Grade-Level Assessments. The OTT for each content area includes a variety of item types. Even though a student's test form may not include every item type, the OTT provides an opportunity to practice all item types. The OTTs also include a comprehensive reflection of embedded universal tools and accommodations. The OTTs should also be provided to students with any non-embedded universal tools and accommodations as allowed on the operational assessments.

The OTTs can be accessed via the INSIGHT desktop icon once the testing software has been installed. Non-accommodated versions of the OTTs can be publicly accessed using the Google Chrome browser at https://wbte.drcedirect.com/MO/portals/mo. Students should choose Online Tools Training on the right-hand side of the page.

9.7.4 List of INSIGHT Keyboard Shortcuts and Icons

During online testing, all students may have access to a printed list of the keyboard shortcuts and icons available in INSIGHT. The list may be printed from Appendix B or may be accessed on the **Documents** page of eDIRECT, https://mo.drcedirect.com.

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9.7.5 Practice Forms

Missouri Grade-Level Practice Forms aligned to the Missouri Learning Standards are available in the following content areas:

- Mathematics grades 3–8
- English Language Arts grades 3–8
- Science grades 5 and 8

These assessments can be used to measure specific student strengths, areas of need, skills, and knowledge. The assessments can be accessed via the INSIGHT desktop icon once the testing software has been installed. Student results will be available through eDIRECT's View Online Results for all auto-scored items. Scoring materials for the hand-scored items on the practice forms are available through eDIRECT. See the Practice Forms Test Administration Manual for information on roles and procedures, and the *eDIRECT User Guide – Reporting* for more information on accessing reports.

9.8 Additional Resources

All assessment manuals, user guides, training modules, training webinars, etc. are located under the Documents menu in eDIRECT.

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10.0 TEST DELIVERY SYSTEM

DRC INSIGHT is the secure testing interface installed on each testing device. This software communicates with the DRC INSIGHT server to provide online tools training and test questions to the test taker and to send responses to the DRC INSIGHT server, which stores them securely.

10.1 System Overview

When a testing device is successfully registered with INSIGHT, the main testing page appears, as shown below. The image below shows the page that appears when you start INSIGHT. This page contains links to tests, tutorials, and Online Tools Training (OTT).

On the left side of the page, users can access the OTT (see Section 9.7.3) and choose Test Sign In to access the Practice Forms.

On the right side of the page, users can access the same OTT and choose Test Sign In to access the Summative MAP Grade-Level Assessments.

10.2 Getting Students Logged In

Students need their username and password provided on their test ticket in order to log into INSIGHT to start testing. Make sure each student has his/her own test ticket.

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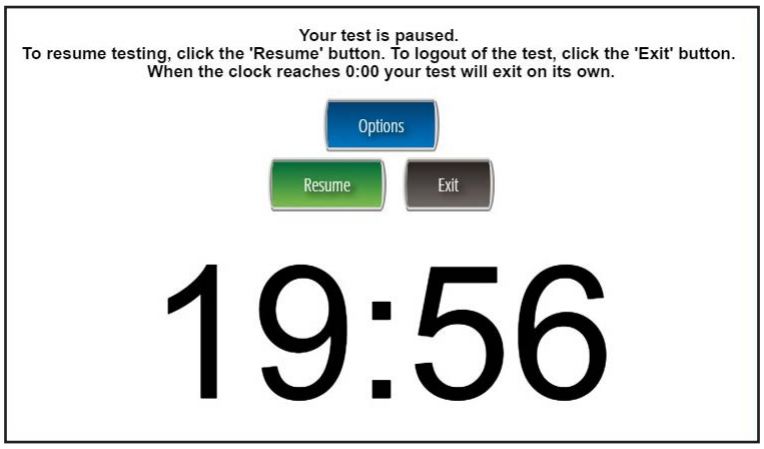
10.3 Pausing

During the test administration, if a student needs to leave the testing room for a short break (e.g., restroom break, office visit) the student should click on the **Pause** button. A countdown appears on the screen notifying the student of the time left before the system automatically exits the test. If the test is not resumed within 20 minutes, the student is exited from the test automatically. The student then must sign back in to the test to finish.



10.4 Moving Students

To move a student to a different device, the student must first be logged out of the test on the current device. To log out of the test, the student will need to select **Pause, Exit**, then **Yes, Exit**. Once this has been done, the student can close INSIGHT on the current device and move to a different device set up for INSIGHT testing and log back into INSIGHT using the same username and password. The screen the student will see is the same screen that is presented in 10.3 Pausing.

10.5 Unlocking Tests

A test will become locked when the student ends a test by selecting **Review/End Test**, **End Test**, **Submit**. If the student accidentally ends the test instead of the **Pause**, **Exit**, **Yes, Exit** to pause the test, the student's test will become locked. The student's test will need to be unlocked before the student can continue testing.

DTCs have the permission to unlock test tickets. Click Manage Students from the Student Management menu in eDIRECT. Enter the required info and the student's MOSIS ID and click on Find Students. Select the student by clicking the View/Edit icon under the Action column. From the Edit Student page, select the Test Sessions tab and click the Unlock icon under the Action column. Click Save to save your changes.

10.6 Test Submission

After all testing for a grade level/content area is completed, the DTC/STC should review the Testing Status for each student in eDIRECT and communicate with Test Examiners to resolve any tests that appear as "In Progress."

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DTCs are allowed to update assessment test windows (if needed) from February 25, 2019, to March 29, 2019, by contacting the DRC MAP Service Line. **After March 29, 2019,** by contacting the DRC MAP Service Line, DTCs may:

- change a testing window if it has not yet started
- extend assessment testing windows

10.7 Transcribed Tests

After testing, student responses for Large Print, Braille, and paper/pencil editions **must** be transcribed into the INSIGHT testing software before the district's test window closes. It is recommended that transcription occur as soon after testing as possible. To transcribe responses requires the Test Examiner or other designated and authorized district or school personnel to log in to INSIGHT using the student's Test Ticket. Follow these steps to transcribe student answers:

1. In eDIRECT Test Setup, ensure that the student has been assigned the appropriate accommodation:
   a. Paper-Based Assessment
   b. Paper-Based Braille
   c. Paper-Based Large Print
2. In eDIRECT Test Setup, assign the student to a test session and print his or her Test Ticket. Retain the Test Ticket rather than distributing it to the student.
3. After the student has completed the test on paper, use a device that has the INSIGHT client software installed and use the student's Test Ticket to log in to the student's test.
4. For security reasons, DESE recommends a second trained staff member be present to verify all transcriptions.
5. Begin transcribing student responses. Once you have finished, select End Test and Submit. The Test Examiner should then return all printed test materials to the STC.

Transcribe the student's responses as faithfully and as completely as possible using the following guidelines:

- Do not transcribe erased or crossed out words or marks.
- If a student's response consists of incomprehensible squiggles, marks, etc., which clearly are not words or word fragments, then leave the item blank.
- If a student's response is wholly or partly illegible, enter "ILLEGIBLE" for the entire response or for the part where applicable.
- If 50% or more of a non EL student's response is written in any language other than English, then note "WRITTEN IN ANOTHER LANGUAGE" where applicable.
- If part of a student's response cannot be entered into INSIGHT, then leave that part blank.
- If no part of a student's response can be entered, then leave the entire item blank.
- Additional clarifying notes may be entered as needed if the item type allows text entry.

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10.8 Common Technology Issues

10.8.1 Loss of Internet Connectivity

Student responses are sent to DRC servers frequently, including after each question is answered. If Internet connectivity is lost during testing the student is unable to continue testing until Internet connectivity is regained. When a student's computer/device loses Internet connectivity during testing, INSIGHT has a pop-up error message that will appear on the student's device/computer. This error message is labeled Network Connectivity Issues, which indicates a loss of internet connection. This error message can indicate other possible issues but is almost always linked to internet connection or configuration issues.

There is also the System Readiness Check (a blue check mark that you can click on the bottom left corner of INSIGHT) that checks several parameters including internet connection. Users are encouraged to check this after the application set up is completed for verification.

If internet connectivity is lost, make sure that appropriate technology personnel are notified prior to contacting the MAP Service Line.

10.8.2 Inactivity

After 20 minutes of inactivity, either with mouse movement or use of keyboard, the INSIGHT application will automatically exit the test. All answers will be saved and the student will be required to sign back in to the test to finish.

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11.0 SPECIAL CIRCUMSTANCES

11.1 Student Transfers

Students Who Move Before or During the MAP Grade-Level Assessment Administration

If . . .	*then . . .*
a new student moves into the district:	Add the new student in eDIRECT. Then assign the student to the appropriate test session(s).* **NOTE:** If the DTC is unable to add the new student, the DTC must contact the MAP Service Line.
a student moves out of the district prior to the district test administration window:	Remove the student from any test session in eDIRECT. Do **not** log into the test and do **not** mark any status code(s) for the student.*
a new student moves into the district after the district is finished testing but before the end of the state window:	The district has the choice of testing this student. If the district chooses to test, add the new student in eDIRECT. Then assign the student to the appropriate test session(s).* **NOTE:** If the DTC is unable to add the new student, the DTC must contact the MAP Service Line.
a student moves into the district and has already taken all of one content area but not the other(s):	Add the new student in eDIRECT. Then assign the student to the appropriate test session(s).* The student should only be assigned to the content area they did not test at the previous district. **NOTE:** If the DTC is unable to add the new student, the DTC must contact the MAP Service Line.
a student moves into the district and has taken at least one session of a content area but did not finish the content area prior to moving:	The district has the choice of testing this student. If the district chooses to test, add the new student in eDIRECT. Then assign the student to the appropriate test session(s).* The student should retake the content area tested at the previous district – this may result in the student taking the same session(s) in more than one district. **NOTE:** If the DTC is unable to add the new student, the DTC must contact the MAP Service Line.
a student moves from one building to another building within the same district **prior** to testing:	The DTC should edit the student's information in eDIRECT before the student begins testing so that the student's scores report to the correct building. The DTC must move the student to a different test session in eDIRECT.*

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If . . .	*then . . .*
a student moves from one building to another building within the same district **after** the student has begun testing:	The DTC should edit the student's information in eDIRECT to update the student's school and put the student in the new test session for the content areas they will test at their new school. **NOTE:** It is recommended that students complete all sessions for a content area at the same school, if possible.

*See the *eDIRECT User Guide – Test Management*, available on the **Documents** page of eDIRECT, https://mo.drcedirect.com.

Please contact the DRC dedicated MAP Service Line at 1-800-544-9868 if there are any questions regarding moving a student within a school or district.

11.2 Avoiding Common Quality Assurance Issues

- Prior to assessing students, schools need to ensure that rooms being used for assessment are appropriate environments.
- The testing room should be free from content/process aides. These need to be either taken off the walls or covered up. If you are questioning if you should cover something up, err on the side of caution and cover it.
- The testing room should be set up to curb cheating. For example, if students are testing close together, dividers may be used between monitors so that students cannot see their neighbor's screen.
- Signage should be placed on the door to indicate that testing is occurring so that disturbances are kept to a minimum.
- Test Examiners should ensure they are aware of which tools/accommodations students have and how those tools/accommodations work. For example, Test Examiners should be aware of which sessions a dictionary or a calculator is allowed on.
- Districts/schools should have a cell phone policy – both for students and for Test Examiners.
- Examiners should ensure that students do not have inappropriate electronics such as video game systems, smart watches and music players.
- Examiners should ensure that if physical calculators are being used that the memory is cleared prior to and immediately after testing.
- Test coordinators should ensure that scratch/grid/graph paper is collected immediately and securely destroyed. Test Examiners should not review student work on scratch/grid/graph paper.

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11.3 Resets

A test may be reset for two reasons—a student logged in as another student and took part of a content area **or** a student was not provided an accommodation prescribed in their IEP.

To reset a test, the DTC must contact the DRC MAP Service Line at 800-544-9868.

Additionally, the district must submit a letter to DESE's Office of Accountability Data by June 3, 2019, adhering to the following process.

1. A district reset letter on district letterhead and signed by the superintendent is faxed to DESE's Office of Accountability Data at 573-526-3045.
2. The district reset fax should include the following information:
   a. Student Name
   b. MOSIS ID
   c. Date of Birth
   d. Grade
   e. School Name
   f. County District Code
   g. District Name
   h. School Code
   i. Content Area
   j. The reason the testing session is being reset/description of the incident
3. The district files a copy of the fax for its records and future reference.

11.4 Test Invalidation

Neither a student's behavior during testing nor the judgment of a student's effort during testing can invalidate a student's test.

A MAP Grade-Level Assessment should be invalidated only if a student is discovered cheating. To do so, select the "Teacher Invalidation" box for the affected content area in eDIRECT. (See section 8.7.5 for instructions.) This box invalidates all sessions of the content area.

If the "Teacher Invalidation" box is used due to cheating, adhere to the following process:

1. The STC and the Test Examiner agree that a particular student's test should be invalidated.
2. A district invalidation letter on district letterhead and signed by the superintendent is faxed to DESE's Office of Accountability Data at 573-526-3045.

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3. The district invalidation fax should include the following information:
   a. Student Name
   b. MOSIS ID
   c. Date of Birth
   d. Grade
   e. School Name
   f. County District Code
   g. District Name
   h. School Code
   i. Content Area
   j. The reason the testing session is being invalidated/description of the incident
4. The district files a copy of the fax for its records and future reference.

11.5 Medical Waiver

Students with serious medical and mental conditions can and do participate in the Missouri statewide assessments. However, there are rare and unique situations in which a student is unable, for medical reasons, to participate in an assessment. Federal regulations allow exceptions to participation in such situations; however, these exceptions must be made with the great care.

To submit a medical waiver, the LEA must have documentation from a licensed medical provider recommending the student be exempt from statewide assessments. Additionally, the LEA must document a parent's consent to a medical waiver request.

For information on medical waiver qualification criteria go to: https://dese.mo.gov/quality-schools/accountability-data/appeals-procedure.

To submit a medical waiver contact DESE Accountability Data at 573-526-4886 or accountabilitydata@dese.mo.gov and ask for the medical waiver form.

11.6 How to Handle Student Absences

If a student is absent for any or all of the MAP Grade-Level Assessments and unable to test in district-determined make-up sessions, then mark the student as absent in eDIRECT. See section 8.7.5 for instructions.

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12.0 AFTER TESTING

12.1 Arrange for the Return Shipment of Test Materials to DRC

DTCs MUST use DRC boxes to return all Paper/Pencil test books and all materials found in the Large Print and Braille kits via UPS. Braille and Large Print Assessments are shipped to the district in a kit that includes boxes and labels necessary for returning testing materials. Paper/Pencil test books may be returned in the same shipping boxes with Braille and Large Print kits.

If the district downloaded Paper/Pencil test books, but did not order any Braille or Large Print test books, the DTC must order DRC boxes and return shipping labels via Additional Materials in eDIRECT. DRC is responsible for all return shipping costs for the Large Print, Braille, and Paper/Pencil test books; however, the DTC must make shipping arrangements at least 24 hours in advance of package pickup. Detailed information about the Additional Materials process can be found in the *eDIRECT User Guide – User Management*.

12.2 Organize Materials

Make sure that all Large Print, Braille, and Paper/Pencil testing materials, including all materials found in the Large Print and Braille kits, are received from each Test Examiner in the school. Contact any Test Examiner who delays returning student testing materials.

Follow these guidelines for packaging testing materials for the DTC:

1. **Obtain Boxes**

   Test materials must be returned in the DRC boxes. Reuse the boxes in which the Large Print and Braille testing materials arrived. If the DTC does not have DRC boxes or needs additional boxes, the DTC can order these via Additional Materials in eDIRECT.

   Prior to packing test materials, securely tape the bottom of each box to prevent breakage. Use three pieces of packing tape and overlap the tape. Make sure it wraps around the sides at least 2 inches.

2. **Package Materials**

   Place the following materials in boxes in the order specified below, with the first items listed on the top in Box 1.

   - Paper/Pencil test books (staple, paper clip, or band pages together to ensure loose pages are not lost)
   - Braille test books
   - Large Print test books
   - Braille Test Administrator notes
   - Test Administration scripts
   - All other materials from Braille/Large Print kits

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3. **Affix Shipping Labels**
   - Affix the green non-scorable shipping labels to the boxes. Green labels should be placed on the top of the box on one of the flaps.
   - Affix the UPS label to the boxes. UPS labels should be placed on the top of the box on the other flap.

   Return shipping labels are scannable and cannot be photocopied. If more return shipping labels are needed, the DTC can order these via Additional Materials in eDIRECT.

4. **Send Materials to the District Test Coordinator**
   - Do not seal the boxes of test books.
   - The DTC will review the contents of each box.

12.3 Package and Ship Testing Materials

Make sure that all testing materials are received from each school in the district.

If a box from an STC is received without a return shipping label on it, affix one of the blank District return shipping labels that were provided in the DTC's Package. Fill out the School information on the label to ensure correct processing.

Do **not** return the following to DRC:

- *Test Coordinator's Manuals*
- scratch, grid, and/or graph paper used for the English Language Arts, Mathematics, and Science Assessments (must be **securely** destroyed by district)
- contaminated test materials (must be **securely** destroyed by district; see section 9.6.1 under Contaminated Materials in this manual)
- unused return shipping labels (destroy at district level)

1. **Add Packing Material**

   To avoid damage caused when materials shift during transit, add sufficient packing material to fill all voids and hold documents firmly in place. We strongly recommend using crumpled, recycled paper for this purpose. Do **not** use foam packing "peanuts" or "popcorn."

2. **Seal Boxes**

   Seal each box securely by overlapping three pieces of packing tape over the top and making sure it wraps around the sides at least 2 inches. This will prevent damage to the boxes and subsequent loss of test materials.

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3. Schedule Testing Material Pickup

The DTC will return MAP Grade-Level Assessment testing materials via UPS. Contact UPS no later than May 28, 2019, to schedule your pickup date. Please allow 1–3 days for pickup of your test materials. All materials must be picked up no later than May 31, 2019.

Test materials must be returned via UPS in order to ensure secure tracking of materials.

Materials must be returned in a single shipment unless prior arrangements are made with DRC.

Instructions for scheduling the pickup of MAP Grade-Level Assessment testing materials:

a. Ensure that each box has a green return shipping label and a UPS-RS label affixed.

b. Keep all boxes for a school together and store the materials in a secure place until UPS arrives.

c. If you do not have a daily scheduled pickup, call UPS at 1-866-857-1501. Tell UPS that you would like to schedule a pickup and that you have return service labels. Give the service representative the tracking number on one UPS return service label. This will let UPS know that DRC will be paying all return charges. Also, tell the service representative what day and time your packages will be ready.

   NOTE: There is a tear-off portion of the UPS-RS label. You can retain the bottom portion of the label for your records, as it will contain the tracking number for the package.

d. For answers to any questions regarding the return procedures described in this manual, call the DRC dedicated MAP Service Line at 1-800-544-9868.

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APPENDIX A: FREQUENTLY ASKED QUESTIONS (FAQ)

Q: Can students use white boards during math?

A: While we don't dis-allow their use, our preference would be that students use paper/pencil. The use of dry erase boards provides a better chance for students to see each other's writing.

Q: Can we play music during testing?

A: DESE has no rule opposing this, however, it should not be done during the listening section or if students are using text-to-speech.

Q: Can students read books after testing?

A: This is a district decision.

Q: What do I do with a student in the system that will not be testing?

A: Remove them from any testing sessions they may be in. As long as the student is not part of any testing session and no one ever logs in, no record is created.

Q: What is the cost for each assessment?

A: Assessments cost $1.80 per student.

Q: Are the practice tests available in paper/pencil format?

A: Yes, they are accessible from eDIRECT and the DESE Assessment site.

Q: What are the qualifications to be a Test Examiner?

A: The examiner must be a district employee, under contract. At a minimum, they must meet the qualifications of a paraprofessional.

Q: Can student teachers act as Test Examiners?

A: No. While student teachers can observe testing, they may not operate as a Test Examiner.

Q: Can you take the sessions out of order?

A: Yes, school districts have the freedom to arrange the testing sessions in any order they choose. The testing sessions are independent and do not reference each other.

Q: Besides practice forms, what other tools are there to help prepare students?

A: DRC provides Online Tools Training (OTTs) and Test Tutorials.

- OTTs give users the ability to use the tools available in the INSIGHT testing platform on a variety of item types. OTTs can be accessed at wbte.drcedirect.com/MO/portals/mo.
- Test Tutorials allow users to watch recorded videos that demonstrate the features of INSIGHT and the tools that will be used for the operational assessments. Test Tutorials can be accessed at www.drcedirect.com/all/eca-portal-ui/welcome/MO.

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APPENDIX B: REFERENCE SHEETS

B.1 Mathematics Reference Sheet Grades 3–5

Standard Units	Metric Units
Conversions – Length	
1 yard (yd) = 3 feet (ft) = 36 inches (in)	1 centimeter (cm) = 10 millimeters (mm)
1 mile (mi) = 1,760 yards (yd) = 5,280 feet (ft)	1 meter (m) = 100 centimeters (cm)
	1 kilometer (km) = 1,000 meters (m)
Conversions – Volume	
1 cup (c) = 8 fluid ounces (fl oz)	1 liter (l) = 1,000 milliliters (ml)
1 pint (pt) = 2 cups (c)	1 liter (l) = 1,000 cubic centimeters (cc)
1 quart (qt) = 2 pints (pt)	
1 gallon (gal) = 4 quarts (qt)	
Conversions – Weight/Mass	
1 pound (lb) = 16 ounces (oz)	1 gram (g) = 1,000 milligrams (mg)
1 ton = 2,000 pounds (lb)	1 kilogram (kg) = 1,000 grams (g)
Conversions – Time	
1 minute (min) = 60 seconds (sec)	
1 hour (hr) = 60 minutes (min)	
1 day = 24 hours (hr)	

Grade Level(s)	Figure	Formula
Area		
3, 4, 5	Rectangle	$A = l \times w$
3, 4, 5	Square	$A = s \times s$
Volume		
5	Rectangular Prism	$V = B \times h$
Note: The volume *V* of all prisms is $V = B \times h$ where *B* is the area of the base and *h* is the height of the prism.		

Appendices

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B.2 Mathematics Reference Sheet Grades 6–8

Standard Units	Metric Units
Conversions – Length	
1 yard (yd) = 3 feet (ft) = 36 inches (in)	1 centimeter (cm) = 10 millimeters (mm)
1 mile (mi) = 1,760 yards (yd) = 5,280 feet (ft)	1 meter (m) = 100 centimeters (cm)
	1 kilometer (km) = 1,000 meters (m)
Conversions – Volume	
1 cup (c) = 8 fluid ounces (fl oz)	1 liter (l) = 1,000 milliliters (ml)
1 pint (pt) = 2 cups (c)	1 liter (l) = 1,000 cubic centimeters (cc)
1 quart (qt) = 2 pints (pt)	
1 gallon (gal) = 4 quarts (qt)	
Conversions – Weight/Mass	
1 pound (lb) = 16 ounces (oz)	1 gram (g) = 1,000 milligrams (mg)
1 ton = 2,000 pounds (lb)	1 kilogram (kg) = 1,000 grams (g)

Grade Level(s)	Figure	Formula
Area		
6, 7, 8	Triangle	$A = \frac{1}{2}bh$
6, 7, 8	Rectangle	$A = lw$
6, 7, 8	Parallelogram	$A = bh$
6, 7, 8	Square	$A = s^2$
7, 8	Circle	$A = \pi r^2$
7, 8	Trapezoid	$A = \frac{1}{2}h(b_1 + b_2)$
Volume		
6, 7, 8	Prism and Cylinder	$V = Bh$
Note: The volume *V* of all prisms and cylinders is *V* = *Bh* where *B* is the area of the base and *h* is the height of the prism or cylinder.		
7, 8	Cone and Pyramid	$V = \frac{1}{3}Bh$
Note: The volume *V* of all cones and pyramids is $V = \frac{1}{3}Bh$ where *B* is the area of the base and *h* is the height of the cone or pyramid.		
8	Sphere	$V = \frac{4}{3}\pi r^3$
Additional Formulas		
7, 8	Circumference of Circle	$C = \pi d$
8	Pythagorean Theorem	$c^2 = a^2 + b^2$
8	Slope-Intercept Form	$y = mx + b$
8	Standard Form	$Ax + By = C$

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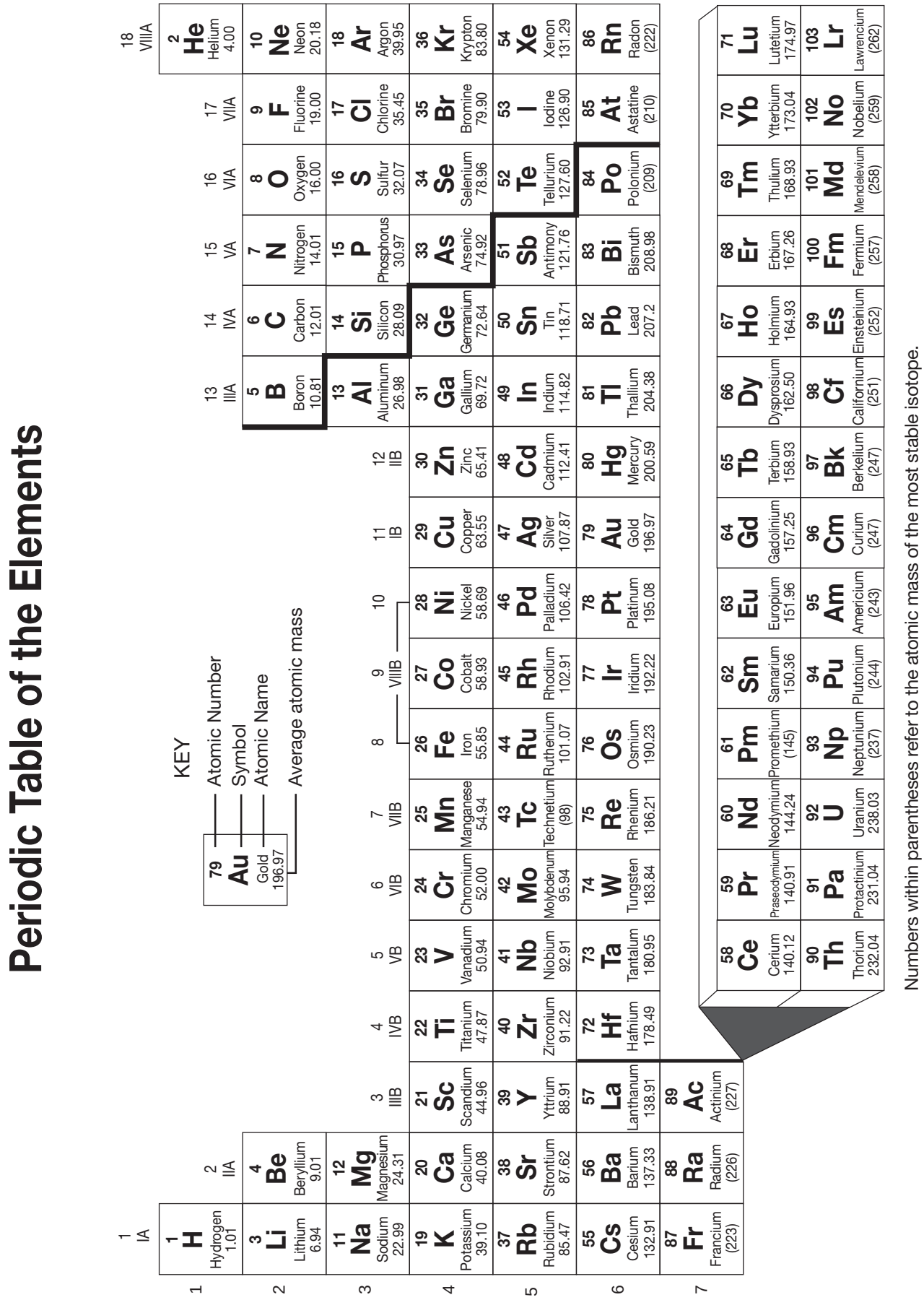
B.3 Periodic Table of the Elements



Numbers within parentheses refer to the atomic mass of the most stable isotope.

Appendices

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APPENDIX C: WRITER'S CHECKLISTS

C.1 Grade 4 Writer's Checklist

- Narrative Writer's Checklist:
  - My narrative has an effective beginning, middle, and end.
  - My narrative flows smoothly from one idea to another.
  - My narrative develops plot, character(s), and setting.
  - My narrative includes specific and relevant details, reasons, and/or examples.
  - My narrative uses precise and vivid language.
  - My narrative contains sentences that are clear and varied in structure.
  - My narrative includes correct grammar, usage, punctuation, capitalization, and spelling.
  - My narrative uses material from the source(s).

- Informational/Explanatory Writer's Checklist:
  - My essay has an effective beginning, middle, and end.
  - My essay flows smoothly from one idea to another.
  - My essay contains a strong controlling idea that stays on topic.
  - My essay includes specific and relevant details, reasons, and/or examples.
  - My essay uses precise and vivid language.
  - My essay contains sentences that are clear and varied in structure.
  - My essay includes correct grammar, usage, punctuation, capitalization, and spelling.
  - My essay uses material from the source(s).

- Opinion Essay Writer's Checklist:
  - My essay has an effective beginning, middle, and end.
  - My essay flows smoothly from one idea to another.
  - My essay contains a strong controlling idea that stays on topic.
  - My essay includes specific and relevant details, reasons, and/or examples.
  - My essay uses precise and vivid language.
  - My essay contains sentences that are clear and varied in structure.
  - My essay includes correct grammar, usage, punctuation, capitalization, and spelling.
  - My essay uses material from the source(s).

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C.2 Grade 8 Writer's Checklist

- Narrative Writer's Checklist:
    - My narrative has an effective beginning, middle, and end.
    - My narrative flows smoothly from one idea to another.
    - My narrative develops plot, character(s), and setting.
    - My narrative includes specific and relevant details, reasons, and/or examples.
    - My narrative uses precise and vivid language.
    - My narrative contains sentences that are clear and varied in structure.
    - My narrative includes correct grammar, usage, punctuation, capitalization, and spelling.
    - My narrative uses material from the source(s).

- Informational/Explanatory Writer's Checklist:
    - My essay has an effective beginning, middle, and end.
    - My essay flows smoothly from one idea to another.
    - My essay contains a strong controlling idea that stays on topic.
    - My essay includes specific and relevant details, reasons, and/or examples.
    - My essay uses precise and vivid language.
    - My essay contains sentences that are clear and varied in structure.
    - My essay includes correct grammar, usage, punctuation, capitalization, and spelling.
    - My essay uses material from the source(s).

- Argumentative Writer's Checklist:
    - My argument has an effective beginning, middle, and end.
    - My argument flows smoothly from one idea to another.
    - My argument contains a clear claim and addresses a counterclaim.
    - My argument includes specific and relevant details, reasons, and/or examples.
    - My argument uses precise and vivid language.
    - My argument contains sentences that are clear and varied in structure.
    - My argument includes correct grammar, usage, punctuation, capitalization, and spelling.
    - My argument uses material from the source(s).

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APPENDIX D: SAMPLE STUDENT TOOLS/ACCOMMODATIONS TRACKING FORM

Student Name:

Class/Content:

Teacher/Instructor:

School:

Approved By:

Date:

Universal Tools – Automatic These tools are available by default and do not need to be marked.	☐ Break (Pause)	☐ Mark For Review
	☐ Calculator	☐ Masking – Online
	☐ Color Contrast – Online	☐ Protractor
	☐ English Dictionary	☐ Read Aloud Test To Self
	☐ Grammar Handbook	☐ Reference Sheet
	☐ Graphing Tool	☐ Ruler
	☐ Highlighter	☐ Scratch Paper (Sticky Notes)
	☐ Keyboard Navigation	☐ Strikethrough (Cross Off)
	☐ Line Guide	☐ Thesaurus
	☐ Magnification	☐ Writing Tools

Universal Tools – To Be Marked These tools need to be marked 48 hours prior to testing in order to use them. *Without ELA Reading Passages	☐ Bilingual Dictionary	☐ *Read Aloud – Human Reader
	☐ Color Contrast – Paper	☐ *Read Aloud – Native Language
	☐ Color Overlay	☐ *Read Aloud – Text-To-Speech
	☐ Magnification – Assistive Tech	☐ Scribe
	☐ Masking – Paper	☐ Separate Setting
	☐ Non-Accommodation Paper Based	☐ Translation
	☐ *Read Aloud – Assistive Tech	

Accommodations Accommodations need to be marked 48 hours prior to testing in order to use them. **With ELA Reading Passages	☐ Abacus (Math)	☐ **Read Aloud – Assistive Tech
	☐ Alternate Response Options	☐ **Read Aloud – Human Reader
	☐ Braille	☐ **Read Aloud – Native Language
	☐ Calculator – Non Calc Items	☐ **Read Aloud – Text-To-Speech
	☐ Closed Captioning	☐ Sign Language
	☐ Large Print	☐ Specialized Calculator (Math/Sci)
	☐ Multiplication Table (Math)	☐ Speech-To-Text
	☐ Paper Based Assessment	

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Assessment Schedule

District/Building Information	
District Name/Code:	Building Name/Code:
District Testing Coordinator/Phone/Email:	
School Testing Coordinator/Phone/Email:	
Building Address:	

Testing Schedule

Date	Start Time	Content/Grade or EOC	Session	Examiner	Room

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APPENDIX F: QUALITY ASSURANCE FORM

MISSOURI DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION
OFFICE OF COLLEGE AND CAREER READINESS – ASSESSMENT SECTION

QUALITY ASSURANCE – GRADE-LEVEL AND END-OF-COURSE ASSESSMENTS
SPRING 2019

INSTRUCTIONS

This form is used both for district self-monitoring purposes and by Department of Elementary and Secondary Education (DESE) employees or designees during an on-site Quality Assurance (QA) visit.

The District Test Coordinator (DTC) completes this form during the spring of 2019. All questions on the form should be completed. Each question asked as part of the QA process has a set of possible follow-up questions. These follow-ups are designed to help generate answers to the main question. It is not required to address every possible follow-up.

Additionally, the DTC should participate in **two** classroom observations - one for the Missouri Assessment Program (MAP) Grade-Level and one for EOC (or two MAP Grade-Level if your district does not give EOC assessments). *Note that if the visit is for EOC, the visit **MUST** be for Algebra I, Biology or English II.*

After the QA process is complete, the District Test Coordinator (Self-Monitoring) **OR** the Department employee/designee (On-Site Visit) will submit their answers electronically at http://tiny.cc/deseqa. Forms must be entered electronically by **June 21, 2019**.

Important: If you have questions, or need to report testing irregularities or concerns, please contact the Assessment Section at 573-751-3545 or assessment@dese.mo.gov.

ABOUT THE VISIT

As part of the Every Student Succeeds Act (ESSA) required monitoring process, the DESE uses this document as a tool to monitor and strengthen statewide administration of the Missouri Assessment Program's Statewide Assessments. The questions are designed to focus attention and help districts examine important areas of assessment training, administration, and test security.

DISTRICT INFORMATION

NAME OF PERSON FILLING OUT THIS FORM
DISTRICT SELF-MONITORING OR DESE ON-SITE VISIT
SCHOOL DISTRICT NAME
COUNTY-DISTRICT CODE
DISTRICT TEST COORDINATOR NAME

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MISSOURI DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION
OFFICE OF COLLEGE AND CAREER READINESS – ASSESSMENT SECTION

QUALITY ASSURANCE — GRADE-LEVEL/END-OF-COURSE CLASSROOM OBSERVATION

CLASSROOM OBSERVATION

- Is there more than one test examiner/proctor?
- What is the ratio of students to examiner/proctor (approximately)?
- Is the room quiet and appropriate for testing?
- Is the room free from content or process aides?
- What is the process for the students to get logged into the system?
- Does the examiner collect logins after the students are in the system or after testing is complete?
- Did the test examiner follow the script from the manual?
- What preventative measures are taken to curb cheating within the testing room?
- If applicable, what is the process for the examiner to get accommodated testing materials (paper/pencil, Braille, or Large Print)?
- Do students have all appropriate physical tools?
- Do students have access to inappropriate items (cell phones, video games, etc.)?
- Is/Are the examiner(s) engaged during testing?
- What process is used by the examiner after testing is complete?

DATE OF VISIT		DATE OF VISIT	
BUILDING NAME/CODE		BUILDING NAME	
TEST EXAMINER NAME		TEST EXAMINER NAME	
GRADE-LEVEL OR EOC ASSESSMENT	GRADE AND/OR CONTENT	GRADE-LEVEL OR EOC ASSESSMENT	GRADE AND/OR CONTENT
OBSERVATION NOTES		**OBSERVATION NOTES**	

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QUALITY ASSURANCE — MISSOURI GRADE-LEVEL/END-OF-COURSE ASSESSMENTS		
NUMBER	**QUESTION**	**ANSWER**
1	Explain the process for training district staff for the Grade-Level and EOC Assessments. Possible Follow-Ups • Who was in charge of training? • Was the training done individually or in a group(s)? • If training is done in a group(s), is there documentation of attendance? • Who is required to be trained? • How does the district ensure that test examiners and other applicable staff are knowledgeable about the administration requirements and have reviewed the current manual(s) and training webinars prior to testing?	
2	Explain how the district's Grade-Level and EOC Assessment schedule was determined. Possible Follow-Ups • When is the schedule planned? • Who is involved in planning? • What role, if any, do test examiners have in setting their schedules? • Is the schedule set to avoid the possibility of testing students outside of the regular school day? • Are bells suspended during testing? • Did any of the following factors play a role in scheduling and if so, explain why? o Amount of available hardware devices o Computer Lab space o Date on which results would be returned o Other	

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QUALITY ASSURANCE — MISSOURI GRADE-LEVEL/END-OF-COURSE ASSESSMENTS		
NUMBER	**QUESTION**	**ANSWER**
3	Explain the district's procedure for scheduling make-up testing and dealing with interrupted testing sessions. Possible Follow-Ups • What method is used to track absences and make up tests? • What process is used for dealing with discipline issues during testing? • What is the procedure for a power outage or fire alarm is activation?	
4	Explain the district's plan for preparing students for the Grade-Level and EOC assessments. Possible Follow-Ups • What resources are used in preparing students for testing (i.e., district curriculum, data from previous testing, district assessments, interim/benchmark assessments, materials, etc.)? • Is there training for examiners on preparing students for statewide assessments, and if so, what does the training involve? • Did the district use the online tools training for the Grade-Level Assessments/tutorial for EOC? If the answer is yes, how many opportunities were they given to use the online tools training/tutorial? • Did the district use the practice tests/pre-tests? If the answer is yes, how many opportunities were they given to take the pre-test and how were the results used?	

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QUALITY ASSURANCE — MISSOURI GRADE-LEVEL/END-OF-COURSE ASSESSMENTS		
NUMBER	**QUESTION**	**ANSWER**
5	Explain the district's process for accommodations used during testing. Possible Follow-Ups • What process is used to determine which accommodations are appropriate for student use on testing? • Are these accommodations being used in the everyday classroom? • Does the district train test examiners on the use of accommodations during testing? • Is there documentation for which accommodations are being used by which students, and if so, how is it documented?	
6	Explain the district's test security plan. Possible Follow-Ups • Does the district have security statements that must be signed by staff prior to testing? • How are test examiners trained on test security? • What preventative measures are taken to discourage cheating within a computer lab or classroom being used for testing? • What is the procedure for dealing with used scratch, grid, or graph paper? • Does the district have a policy on students having electronic devices including cell phones in the testing room?	

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QUALITY ASSURANCE — MISSOURI GRADE-LEVEL/END-OF-COURSE ASSESSMENTS		
NUMBER	**QUESTION**	**ANSWER**
7	Explain the district's process for using translators and transcribers. (Answer N/A if no translator or transcriber was used.) Possible Follow-Ups • Are translators and transcribers required to go through the same training as other test examiners? • Is there additional training for translators or transcribers? • What is the process to choose who will act as a transcriber? • What process was used to determine if a student needed a translator? • How did the district acquire the services of the translator(s)?	
8	Explain the district's technology plan as it relates to the Grade-Level and EOC Assessments. Possible Follow-Ups • How much in advance of the first testing window are devices prepared and checked for Grade-Level and EOC testing? • Who is in charge of preparing machines for Grade-Level and EOC testing? • Are the appropriate technical guides and webinars reviewed prior to software installation? If so, who reviews those? • Were there technical issues getting hardware ready for state assessments? • Are tech staff readily available to help out with technical issues that may occur during testing?	

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QUALITY ASSURANCE — MISSOURI GRADE-LEVEL/END-OF-COURSE ASSESSMENTS		
NUMBER	**QUESTION**	**ANSWER**
9	Explain the district's process for distributing student log-in information to examiners. Possible Follow-Ups • Do examiners print their own test tickets? • If not, who is in charge of printing and distributing log-in information to test examiners? • What process is used by examiners to distribute log-in information to students? • What process is used to ensure the secure destruction of log-in tickets after testing?	
10	Explain the district's process for distributing, tracking, transcribing and returning test materials for Braille, large print, and paper/pencil assessments. Possible Follow-Ups • Does the district make use of sign-in/sign-out sheets, and if so who maintains those? • Are the test materials kept secure with limited access? Who has access to these areas? • What steps are taken if test materials are lost? • What process is taken for contaminated tests? • Who is responsible for transcribing student answers into the system? • What procedures are used for ensuring that all Braille, large print, and paper/pencil testing materials are returned to the vendor within the applicable timeframe?	

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QUALITY ASSURANCE — MISSOURI GRADE-LEVEL/END-OF-COURSE ASSESSMENTS		
NUMBER	**QUESTION**	**ANSWER**
11	Explain the district's process for printing and distributing student score reports? Possible Follow-Ups • Who is involved in this process? • How does the district ensure that parents/guardians either receive score reports or are notified they are available within 15 days of district receipt? • Does the district use EOC scores as part of the final grade of the student, and if so: o How much does it account for? o Does the district use the achievement level or raw score?	
12	Based on your interactions with DESE Assessment staff and our testing vendors when you call, email, use the website, etc., are there ways in which you think DESE Assessment staff/DRC/Questar can improve your experience as the Test Coordinator?	

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QUALITY ASSURANCE— GRADE-LEVEL/END-OF-COURSE (NOTES)

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Grade-Level Assessments
Test Coordinator's Manual

DATA RECOGNITION
DRC
CORPORATION

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Appendix B: Examiner's Manual

Missouri Assessment Program

Examiner's Manual

Grade 5
English Language Arts, Mathematics, and Science Assessments
Spring 2019

Missouri Department of Elementary and Secondary Education

NOTICE OF NON-DISCRIMINATION

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Anyone attending a meeting of the State Board of Education who requires auxiliary aids or services should request such services by contacting the Executive Assistant to the State Board of Education, Jefferson State Office Building, 205 Jefferson Street, Jefferson City, MO 65102-0480; telephone number (573) 751-4446 or TTY (800) 735-2966.

Inquiries or concerns regarding civil rights compliance by school districts or charter schools should be directed to the local school district or charter school Title IX/non-discrimination coordinator. Inquiries and complaints may also be directed to the Office for Civil Rights, Kansas City Office, U.S. Department of Education, One Petticoat Lane, 1010 Walnut Street, 3rd floor, Suite 320, Kansas City, MO 64106; telephone: (816) 268-0550; TDD: (877) 521-2172.

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DATA RECOGNITION DRC CORPORATION

This *Examiner's Manual* is NOT a secure document. All administrators should read this manual before administering the test.

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February 12, 2019: (Version 2) Update
Page 50: Updated the calculator accommodation information.

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1.0 OVERVIEW OF IMPORTANT INFORMATION FOR THE MAP GRADE-LEVEL ASSESSMENTS

1.1 This Examiner's Manual

The purpose of this *Examiner's Manual* is to provide detailed instructions for administering the Missouri Assessment Program (MAP) Grade-Level Assessments. The manual includes instructions for test preparation, scripts for administering the tests, and post-test administration procedures. Test Examiners (TEs) should thoroughly read this manual and view trainings before administering the tests.

1.2 Glossary of Terms

Accommodations	Changes in procedures or materials that increase equitable access to the MAP Grade-Level Assessments. Assessment accommodations allow students to access assessment content to show what they know and can do. Accommodations are available for students with documented Individualized Education Programs (IEPs) or 504 Plans.
Break/Pause	Action taken by a student or Test Examiner (TE) to temporarily halt the test at any time, as needed. The online assessment provides an opportunity to pause the test for up to 20 minutes.
Constructed-Response Item Type	Test questions that require students to provide or input their response or responses using a keyboard or keypad. This type includes **short answer/text input, writing prompts,** and **keypad input** items.
eDIRECT	DRC's administrative platform—the Missouri Assessment Program Portal—from which district personnel will manage the assessments.
INSIGHT	DRC's INSIGHT is the secure, browser-based test engine for the MAP Grade-Level Assessments.
Item	A test question or stimulus presented to a student to elicit a response.
Performance Events	Performance events (PEs) are included in the MAP Grade-Level Mathematics Assessments. The PEs are designed to provide students with an opportunity to demonstrate their ability to apply their knowledge and higher-order thinking skills to explore and analyze a complex scenario. Performance events will contain a variety of item types. See Appendix A: Item Types.
Selected-Response Item Type	Test questions that require students to respond to a stem by selecting an appropriate response or responses, usually from answers provided. This type includes **multiple-choice, matching, multi-select,** and **evidence-based selected-response** items.
Session	A specific part of a test assigned to a specific student, which is grouped by a Test Examiner.

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Stimulus/Stimuli	Material or materials used in the test context, which form the basis for assessing the knowledge and skills of students. Many items/tasks for the assessments include a stimulus along with a set of questions to which the student responds. Examples of stimuli include, but are not limited to, traditional reading passages/texts viewed on a computer screen, images with audio presentations, and simulated web pages.
Tutorials	Tutorials use pictures, motion, and sound to present visual and verbal descriptions of the properties and features of the INSIGHT online testing system.
Technology-Enhanced Items	Test questions that capitalize on technology to collect evidence through a non-traditional response type. This item type includes **drag and drop**, **drop-down menu**, **matching**, **hot spots**, **graphing**, **bar graphing**, **line graphing**, **number lines**, **line plots**, **clock input**, and **angle drawing**.
Universal Tools	Universal tools are available to students based on student preference and selection. Some tools, such as a ruler and sticky notes, are embedded in the online system, while others, such as a physical thesaurus and scratch paper, are external to the system. The availability of particular universal tools varies by item.
Writing Prompt	A special type of performance event that appears in the Grades 4 and 8 ELA Assessment and is an open-ended item that requires students to demonstrate their writing proficiency.

1.3 About the Tests

- The Missouri State Board of Education identified the following purposes for the MAP Grade-Level Assessments:
    - Measuring and reflecting student mastery toward post-secondary readiness
    - Identifying students' strengths and weaknesses
    - Communicating expectations for all students
    - Serving as the basis for state and national accountability plans
    - Evaluating programs
    - Providing professional development for teachers
- The MAP Grade-Level Assessments are designed to adapt testing to the needs of Missouri districts, schools, teachers, and students, while meeting state and federal requirements.
- The MAP Grade-Level Assessments are based on the Missouri Learning Standards. The 2019 assessments will include traditional multiple-choice items and innovative technology-enhanced items designed to elicit student knowledge and skills in new ways. English Language Arts assessments will include a writing prompt in grades 4 and 8. Mathematics assessments will include performance events. The Science assessments also include constructed-response items.

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The Missouri Department of Elementary and Secondary Education (DESE) uses the information obtained through the MAP Grade-Level Assessments to monitor the progress of Missouri's students in meeting the Missouri Learning Standards, to inform the public and the state legislature about students' performance, and to help make informed decisions about educational issues.

- Data Recognition Corporation (DRC) and DESE are collaborating to deliver Missouri's Spring 2019 Grade-Level Assessments. Missouri educators will use DRC's eDIRECT online platform for enrollment and test administration and INSIGHT for test delivery. DRC will also provide handscoring and reporting services. These cooperative efforts and systems comprise a fully integrated assessment platform to meet the needs of school districts, educators, students, and other Missouri stakeholders.

- At grade 5, the Spring 2019 MAP Grade-Level Assessments include the following:

  - English Language Arts Assessment
  - Mathematics Assessment
  - Science Assessment

- The English Language Arts Assessment consists of three sessions. All sessions contain selected-response and technology-enhanced items. See Appendix A: Item Types.

- The Mathematics Assessment consists of three sessions. Both sessions contain selected-response items and technology-enhanced items. The third session contains performance events. See Appendix A: Item Types.

- The Science Assessments consist of two sessions. Both sessions contain constructed-response items, multiple-choice items, and technology-enhanced items. These item types can be stand-alone items or included in sets of questions based on a common task or scenario. See Appendix A: Item Types.

- All MAP Grade-Level Assessments are available only in INSIGHT, the secure online browser, unless a Large Print, Braille, or paper/pencil edition is required by the student as an accommodation. For students needing one of these versions, test examiners will be responsible for transcribing student responses into INSIGHT.

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1.4 Test Administration Policies

General Rules of Online Testing

Students in grade 5 will take online tests for English Language Arts (ELA), Mathematics, and Science. All content-area tests consist of selected-response (SR) and technology-enhanced (TE) items. The Science assessment consists of constructed-response (CR) items. These items types can be found in all sessions. The Mathematics assessments also include performance events. The Mathematics PEs appear in Session 3.

Basic online testing parameters:

- Within each test there are sessions. A student may not return to a session once it has been completed and submitted.
- Some items include multiple parts over more than one page. Students may need to use the vertical scroll bar to view an entire item on a page.
- Students may mark items for review and return to those items within a session.
- If a student starts the test near the end of the testing window, the student must finish before the district administration window officially closes. The assessment will automatically end at 10 P.M. on the last day of the scheduled district administration window, even if the student has not finished.

Pause Rules

The INSIGHT system includes a "Pause" feature that allows a student to pause a test, either to take a short break of up to 20 minutes, or to continue testing at a later time as indicated by the district's testing schedule. While the test is paused, a large count-down timer displays in the INSIGHT system on the student's computer. This allows the Test Examiner to easily monitor which students have activated the feature and how much time remains in their break. If a student does not resume testing before 20 minutes elapses, then the student is logged out of the test and is required to log back in to the test using the login and password from his or her Test Ticket. Students may also choose to exit the test from the Pause screen.

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During the assessments:

- If a test is paused for 20 minutes or more, the student can return to the session and continue entering his or her responses. The student may also review and change previously answered items. The student is not permitted to return to items in a different session.
- Any highlighted text and sticky notes will be saved when a test is paused.
- In the event of a technical issue (e.g., power outage or network failure), students will be logged out and the test will automatically be paused. Student responses will not be lost, and students may move to a different device connected to the same Central Office Services (COS) Service Device as the original device. The students will need to log in again upon resuming the test.

The "Pause" feature allows a student to pause a test, either to take a short break of up to 20 minutes or to continue testing at a later time.

Test Timeout (Due to Inactivity)

As a security measure, students are automatically logged out of the test after 20 minutes of inactivity. Activity is defined as selecting an answer or navigation option in the assessment (e.g., clicking [Next] or [Back] or using the quick navigation drop-down list to move to another item). Moving the mouse or clicking on an empty space on the screen is not considered activity. Test timeout occurs when the test is not paused.

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1.5 Scheduling the Tests

The following tables list estimates of the time it will take students to complete each component of the assessment. Some students may complete the assessment in times that vary from the recommended durations. Districts should plan for flexibility in their schedules to accommodate students that may take more time than noted.

There is no time limit for any assessment.

These times do not include time needed to start computers, log in students, go through directions, etc. They also do not include time needed for students to complete the OTTs, or view the tutorials.

Duration and Timing Information

The scheduling/rules for each assessment are included in tables 1, 2, and 3. Note that the duration, timing, and session recommendations vary for each content area.

Table 1: Assessment Sequence—English Language Arts

ELA	Session 1	Session 2	Session 3
Content and Duration of Sessions	This session assesses the Reading Strand. It contains passage-based selected-response and technology-enhanced items. **Recommendation:** • Session duration ranges from 45–95 minutes.	This session assesses the Research and Writing Strands. It contains selected-response and technology-enhanced items. **Recommendation:** • Session duration ranges from 25–50 minutes.	This session assesses the Listening Strand. It contains passage-based selected-response and technology-enhanced items. Students taking the assessment online will need headphones. **Recommendation:** • Session duration ranges from 15–35 minutes.

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Table 2: Assessment Sequence—Mathematics

Calculators are not allowed on any session of the grade 5 math assessment without an IEP.

Mathematics	Session 1	Session 2	Session 3 (Performance Event)
Content and Duration of Sessions	This session assesses the Mathematics Strands. It contains selected-response and technology-enhanced items. **Recommendation:** • Session duration ranges from 35–60 minutes.	This session assesses the Mathematics Strands. It contains selected-response and technology-enhanced items. **Recommendation:** • Session duration ranges from 35–60 minutes.	This session assesses the Mathematics Strands. It contains a performance event that is comprised of related selected-response and technology-enhanced items. A second hand-scored performance event will be included for each grade. **Recommendation:** • Session duration ranges from 15–30 minutes.

Table 3: Assessment Sequence—Science

Science	Session 1	Session 2
Content and Duration of Sessions	This session assesses the Science Strands. It contains selected-response, technology-enhanced, and constructed-response items. These items can be standalone questions or included in sets of questions based on a common task or scenario. **Recommendation:** • Session duration ranges from 60–80 minutes.	This session assesses the Science Strands. It contains selected-response, technology-enhanced, and constructed-response items. These items can be standalone questions or included in sets of questions based on a common task or scenario. **Recommendation:** • Session duration ranges from 60–80 minutes.

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Additional Administration Recommendations:

- For the performance events, students may be best served by sequential, uninterrupted time that may exceed the time allotted in a student's schedule.
- Minimize the amount of time between beginning and completing each test within a content area.

Important reminders:

- The test can be spread out over multiple days as needed. See the sub-heading *Testing Over Multiple Sessions or Days* within this manual for more guidance within Section 3.1 Specific Administration Information.
- Breaks can be provided during the test session using the software's "Pause" feature. If the test is paused for more than 20 minutes, the student will be able to go back to items on the previous screens in that session.
- Review the test directions in this *Examiner's Manual* in advance. *Examiner's Manuals* are not secure and can be viewed in advance.

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1.6 Accommodations and Special Populations

Updated Accommodations Procedures/Codes

The MAP Grade-Level Assessments provide Universal Tools and Accommodations to help students demonstrate their knowledge of the Missouri Learning Standards.

- Universal Tools are available to all students taking a Grade-Level Assessment, unless otherwise noted.
- Accommodations must appear in a student's Individualized Education Program (IEP)/ 504 Plan.

For Special Education students, the IEP team should choose **all** of the tools and accommodations that a student will receive.

Some tools and accommodations are only for English Learner (EL) students.

Prior to testing, Test Examiners should log in to eDIRECT to check and set tools and accommodations for students from the Edit Student window. See the eDIRECT User Guide for detailed instructions.

Table 4: Universal Tools

UNIVERSAL TOOLS

Universal tools for use on the MAP Grade-Level Assessment are available to ALL STUDENTS unless noted. Please read the full description prior to usage.

Tools with a code (Sxxx) need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).

Tool	Description	Code
Bilingual Dictionary	**EL students** may have access to a physical Bilingual Dictionary for use **ONLY** on the sessions of ELA that have a writing prompt. If the Bilingual Dictionary is electronic, it may not connect to the Internet. This tool must be chosen in eDIRECT under student accommodations prior to testing.	S431
Break (Pause)	**All students** may take breaks of up to 20 minutes as needed. There is no limit to how many times a student may use this during an assessment. The INSIGHT student platform allows **all students** to pause the online assessment for up to 20 minutes. If the test is paused for more than 20 minutes, the student will have to log back in. If the need arises to move a student from one computer to another, pause the test and choose the exit button. The test will remain incomplete until the student logs back in and completes the test.	N/A
Calculator* ***Use of a calculator is allowed on all science assessments and on some sessions of math in grades 6–8**	The INSIGHT student platform features an embedded calculator for **all students** to use on items where calculator use is allowed. **All students** may have access to a physical calculator, on items where calculator use is allowed. The memory of the physical calculator must be cleared before and after testing by the test examiner. *Please Note: Use of a calculator is only for the Science assessments and certain sessions of Math in grades 6–8. Please see the manual to determine which sessions allow calculator use.*	N/A

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Table 4: Universal Tools, continued

UNIVERSAL TOOLS		
Universal tools for use on the MAP Grade-Level Assessment are available to ALL STUDENTS unless noted. Please read the full description prior to usage. Tools with a code (Sxxx) need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).		
Tool	**Description**	**Code**
Color Contrast—Online Testing	The INSIGHT student platform allows **all students** to adjust background or font color based on student needs or preferences.	N/A
Color Contrast—Paper Testing	**All students** taking the paper/pencil assessment may have the test printed in different colors based on student needs or preferences. This tool must be chosen in eDIRECT under student accommodations prior to testing.	S102
Color Overlay	**All students** taking the paper/pencil assessment may have a color transparency placed over the test presented to them based on student needs or preferences. This tool must be chosen in eDIRECT under student accommodations prior to testing.	S103
English Dictionary	**All students** may have access to a physical English Dictionary for use **ONLY** on the sessions of ELA that have a writing prompt. If the English Dictionary is electronic, it may not connect to the internet.	N/A
Grammar Handbook	**All students** may have access to a physical Grammar Handbook for use **ONLY** on the sessions of ELA that have a writing prompt. If the Grammar Handbook is electronic, it may not connect to the internet. The Grammar Handbook must be one that is published. It cannot be a district, school or classroom made handbook.	N/A
Graphing Tool	The INSIGHT student platform allows **all students** to use an embedded tool to graph functions.	N/A
Highlighter	The INSIGHT student platform allows **all students** access to a highlighter for marking desired text. **All students** may have access to a physical highlighter.	N/A
Keyboard Navigation	The INSIGHT student platform allows **all students** to navigate through the text by using the keyboard.	N/A
Line Guide	The INSIGHT student platform allows **all students** to use an embedded line guide that brings focus to a single line of text.	N/A
Magnification	The INSIGHT student platform allows **all students** to magnify the screen by 1.5 or 2 times the original size. **All students** taking the paper/pencil or Large Print assessments may have access to a physical magnifying device.	N/A

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Table 4: Universal Tools, continued

UNIVERSAL TOOLS		
Universal tools for use on the MAP Grade-Level Assessment are available to ALL STUDENTS unless noted. Please read the full description prior to usage. Tools with a code (Sxxx) need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).		
Tool	**Description**	**Code**
Magnification—Assistive Technology	**Students with visual impairments** may attempt to use assistive technology software that magnifies the screen beyond the built in capabilities of the embedded magnifier. *Please Note: The use of assistive technology software should be familiar to the student and should be software the student uses in the everyday classroom. While the use of assistive technology software is not directly supported by DRC, the help desk will work with districts needing to use the software. The software must be provided by the district.* This tool must be chosen in eDIRECT under student accommodations prior to testing.	S105
Mark For Review (Flag)	The INSIGHT student platform allows **all students** to mark an item for review.	N/A
Masking—Online Testing	The INSIGHT student platform allows **all students** access to an embedded masking tool to block off content that is not of immediate need or that may be distracting.	N/A
Masking—Paper Testing	**All students** taking the paper/pencil or Large Print assessments may use a masking tool to block off content that is not of immediate need or that may be distracting. This tool must be chosen in eDIRECT under student accommodations prior to testing.	S107

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Table 4: Universal Tools, continued

UNIVERSAL TOOLS		
Universal tools for use on the MAP Grade-Level Assessment are available to ALL STUDENTS unless noted. Please read the full description prior to usage. Tools with a code (Sxxx) need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).		
Tool	**Description**	**Code**
Non-Accommodation Paper Based Assessment	This tool is available for the following scenarios: For students that need to test off-site in a non-district building (e.g., hospital, juvenile facility, etc.), the student may use the paper/pencil Based Assessment. For **EL students** who are using the Translation tool (S109) or Read Aloud – Native Language (S111), where the translator needs access to the assessment prior to administration to conduct translation services. Please see the section on ***Translation*** that follows the Tools/Accommodations lists for more information. For students using Read Aloud – Human Reader (S043) where the examiner needs a paper copy to read from. Please see the section on ***Read Aloud*** that follows the Tools/Accommodations lists for more information. Answers from students who access the assessment using the paper/pencil format must be entered into INSIGHT prior to shipping the paper assessment back. Please follow the return instructions found in the manual. All the answers given in the online system must be in English. *Please Note: There is a $15 charge to the district for each printed paper/pencil assessment not required by an IEP. If the off-site student does have an IEP that requires using a paper/pencil assessment, use accommodation A102 instead.* *The note above applies only to the Spring Summative Assessment. A paper version of the practice test can be downloaded from the DESE MAP Grade-Level Assessment webpage* (https://dese.mo.gov/college-career-readiness/assessment/grade-level). This tool must be chosen in eDIRECT under student accommodations prior to testing.	S112
Protractor	The INSIGHT student platform allows **all students** to use an embedded protractor on specific items where appropriate. **All students** taking the paper/pencil, Large Print or Braille assessments may have access to a physical protractor for use on specific items where appropriate.	N/A
Read Aloud	***Please see the Read Aloud section after the universal tools/accommodations list.***	
Read Aloud Test To Self	**All students** may read aloud the test to themselves, either in a one-on-one setting or by using a device (such as a whisper phone) that does not disturb other students or allow other students to hear what is being said. In order to ensure that use of this tool does not disturb other students, the use of this tool may need to be paired with the use of separate setting (S501).	N/A

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Table 4: Universal Tools, continued

UNIVERSAL TOOLS		
Universal tools for use on the MAP Grade-Level Assessment are available to ALL STUDENTS unless noted. Please read the full description prior to usage. Tools with a code (Sxxx) need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).		
Tool	**Description**	**Code**
Reference Sheet	The INSIGHT student platform allows **all students** access to use an embedded reference sheet on applicable assessments. Not all assessments have a reference sheet. Students may have physical copies of the reference sheets during testing. Copies of the reference sheets can be found in the appendices of the manuals.	N/A
Ruler	The INSIGHT student platform allows **all students** to use an embedded ruler on specific items where appropriate. **All students** taking the paper/pencil, Large Print or Braille assessments may have access to a physical ruler for use on specific items where appropriate.	N/A
Scratch Paper (Sticky Notes)	The INSIGHT student platform allows **all students** to use an embedded notepad (called Sticky Notes) to make notes about an item. Electronic notes **DO NOT** carry over from previous sessions. If a student logs off prior to finishing a session, any electronic notes **WILL NOT** carry over when the student logs back in. **All students** taking the online, paper/pencil, Large Print or Braille assessments may have access to physical scratch paper to make notes about an item. Scratch paper can be blank, ruled, graph or grid paper. Physical scratch paper should be collected and destroyed **IMMEDIATELY** upon the conclusion of a testing session.	N/A
Scribe	**Students who obtain a physical injury prior to testing** that prevents them from responding may dictate their responses to a scribe. **OR** **Students with physical disabilities** that may prevent them from responding themselves may dictate their responses to a scribe, who must follow the scribing guidelines (http://dese.mo.gov/sites/default/files/asmt-scribing-guidelines.pdf). *Please Note: DESE does not recommend the use of Scribe for students who do not use it as part of their everyday learning in the classroom. The use of Scribe for some students can prove distracting and become a hindrance to student performance. The scribe should be familiar to the student and have scribing experience with the student in some capacity prior to the state assessment.* This tool must be chosen in eDIRECT under student accommodations prior to testing.	S351
Separate Setting	**All students** may be allowed to test in a separate setting from other students. This includes testing individually or testing as part of a smaller group. This tool must be chosen in eDIRECT under student accommodations prior to testing.	S501
Strikethrough (Cross Off)	The INSIGHT student platform allows **all students** access to use an embedded tool to cross out answer options.	N/A

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Table 4: Universal Tools, continued

UNIVERSAL TOOLS		
Universal tools for use on the MAP Grade-Level Assessment are available to ALL STUDENTS unless noted. Please read the full description prior to usage. Tools with a code (Sxxx) need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).		
Tool	**Description**	**Code**
Thesaurus	**All students** may have access to a physical Thesaurus for use **ONLY** on the sessions of ELA that have a writing prompt. If the Thesaurus is electronic, it may not connect to the internet.	N/A
Translation	***Please see the Translation section after the universal tools/accommodations list.***	
Writing Tools	The INSIGHT student platform allows **all students** access to use an embedded set of writing tools on specific items where appropriate. The tools include the ability to bold, italicize and underline text, create bullet points, undo/redo typing, create indents and copy/paste text the student has typed.	N/A

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Table 5: Accommodations

ACCOMMODATIONS

Accommodations for use on the MAP Grade-Level Assessment are available only to students with an IEP/504 plan. Please read the full description prior to usage.

All accommodations need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).

Accommodation	Description	Code
Abacus	**Students with this accommodation in their IEP/504 plan** may have access to an abacus. This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A391
Alternate Response Options	**Students with this accommodation in their IEP/504 plan** may respond to items using an alternate option, including but not limited to: Adapted Keyboards, StickyKeys, MouseKeys, FilterKeys, Adapted Mouse, Touch Screen, Head Wand and Switches. *Please Note: While the use of alternate response options is not directly supported by DRC, the help desk will work with districts needing to use one. The option must be provided by the district.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A441
Braille	**Students with visual impairments with this accommodation in their IEP/504 plan** may access the assessment via a Braille version. Tactile overlays and graphics tools may be used to assist the student in accessing the content. *Please Note: Answers from students who access the assessment using the Braille format must be entered into INSIGHT prior to shipping the Braille assessment back. Please follow the instructions found in the Braille kit.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A012
INVALIDATION **Calculator**** **** For Non-Calculator Allowed Items in Grade 3** ***INVALIDATION***	**Students in 3rd grade with this accommodation in their IEP/504 plan** may have access to a physical calculator, on mathematics items where calculator use is not allowed. The memory of the physical calculator must be cleared before and after testing by the test examiner. *Please Note: Use of this accommodation will cause an invalidation for the Mathematics Assessment and the student will receive the Lowest Obtainable Scale Score (LOSS) and an achievement level of Below Basic.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A392
Calculator*** ***** For Non-Calculator Allowed Items in Grades 4–8**	**Students in grades 4–8 with this accommodation in their IEP/504 plan** may have access to a physical calculator, on mathematics items where calculator use is not allowed. The memory of the physical calculator must be cleared before and after testing by the test examiner. This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A393
Closed Captioning	**Hearing Impaired students** with this accommodation in their IEP/504 plan may have Closed Captioning available for ELA listening items. This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A053

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Table 5: Accommodations, continued

ACCOMMODATIONS		
Accommodations for use on the MAP Grade-Level Assessment are available only to students with an IEP/504 plan. Please read the full description prior to usage. All accommodations need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).		
Accommodation	**Description**	**Code**
Large Print	**Students with visual impairments with this accommodation in their IEP/504 plan** may access the assessment via a Large Print version. *Please Note: Answers from students who access the assessment using the Large Print format must be entered into INSIGHT prior to shipping the Large Print assessment back. Please follow the instructions found in the Large Print kit.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A021
INVALIDATION **Multiplication Table** **Grade 3** ***INVALIDATION***	**Students in grade 3 with this accommodation in their IEP/504 plan** may have access to a single digit multiplication table. *Please Note: Use of this accommodation will cause an invalidation for the Mathematics Assessment and the student will receive the Lowest Obtainable Scale Score (LOSS) and an achievement level of Below Basic.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A394
Multiplication Table **Grades 4–8**	**Students in grades 4–8 with this accommodation in their IEP/504 plan** may have access to a single digit multiplication table. This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A395
Paper Based Assessment	**Students with this accommodation in their IEP/504 plan** may take the assessment using the paper/pencil format. *Please Note: Answers from students who access the assessment using the paper/pencil format must be entered into INSIGHT prior to shipping the paper assessment back.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A102
Read Aloud **(ELA Reading Passages)**	***Please see the Read Aloud section after the universal tools/accommodations list.***	
Sign Language	**Hearing Impaired students** with this accommodation in their IEP/504 plan may have ELA listening items translated into American Sign Language (ASL), Signing Exact English (SEE) or any other form of sign language. *Please Note: The INSIGHT Platform provides video of ASL for these items. If the student uses SEE or another form of sign language or the preference is for a local translation into ASL, the signing of ELA Listening items will require the download of a script. See the manual for more details.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A052

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Table 5: Accommodations, continued

ACCOMMODATIONS		
Accommodations for use on the MAP Grade-Level Assessment are available only to students with an IEP/504 plan. Please read the full description prior to usage. All accommodations need to be marked in eDIRECT prior to administering the assessment. Some tools are only for use by English Learner (EL) students (EL students are those coded LEP_RCV or LEP_NRC in MOSIS).		
Accommodation	**Description**	**Code**
Specialized Calculator**** ******Use of a specialized calculator is allowed on all science assessments and on some sessions of math in grades 6–8**	**Students with this accommodation in their IEP/504 plan** may have access to a specialized calculator. The specialized calculator can include a talking calculator or Braille calculator among others. The memory of the physical calculator must be cleared before and after testing by the test examiner. *Please Note: Use of a calculator is only for the Science assessments and certain sessions of Math in grades 6–8. Please see the manual to determine which sessions allow calculator use.* *To use a specialized calculator on sessions where calculator use is not allowed, this accommodation must be used in conjunction with code A392 (if the student is in grade 3) or A393 (if the student is in grades 4–8).* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A396
Speech-to-Text—Assistive Technology	**Students with this accommodation in their IEP/504 plan** may use that technology in conjunction with INSIGHT. The software must be provided by the district. *Please Note: The use of assistive technology software should be familiar to the student and should be software the student uses in the everyday classroom. While the use of assistive technology software is not directly supported by DRC, the help desk will work with districts needing to use the software. The software must be provided by the district.* This accommodation must be chosen in eDIRECT under student accommodations prior to testing.	A352

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Read Aloud

Read Aloud for statewide testing should only be used with students who truly need it.

The ***Read Aloud*** tool for statewide testing should only be available to students who can benefit from it. ***Read Aloud*** can be over-used when it is provided to every struggling student including those who can decode but have poor comprehension skills and those who simply have not mastered decoding skills.

Any student taking the online, paper/pencil, Large Print or Braille assessments may have the *test directions* and items (*questions and answer choices*) in all content areas read aloud to them without an IEP/504 plan. In order to have *reading passages in English language arts* read aloud, a student needs that accommodation listed in their IEP/504 plan.

How To Determine If The Student Needs Read Aloud

Providing ***Read Aloud*** to students who do not need it can have negative consequences for instruction and decoding and comprehension skills. For example, some educators might assume that students who receive ***Read Aloud*** no longer need to be instructed on decoding and fluency skills, which is clearly an inappropriate assumption.

Additionally, the use of ***Read Aloud*** for some students can prove distracting and become a hindrance to student performance.

Here are some questions in helping to make a determination:

- Does this student have an identified reading-based disability that affects the student's decoding, fluency or comprehension skills?
- Is there evaluative information indicating that, even after explicit and systematic reading instruction, the student's disability precludes or severely limits the student's ability to decode print?
- Has the student been provided systematic, explicit, research based reading intervention(s) to improve decoding skills?
- Would the student's functioning reading level affect his or her performance on a state test that does not measure reading comprehension?
- Is there evidence that the student's access to, and/or performance on, print-based tasks improves when information is presented to the student in auditory formats?
- Is the student provided instructional materials in auditory formats? Does the student use ***Read Aloud*** during formative assessments or during other assessments? (If a student receives ***Read Aloud*** for instruction but not for formative assessments, it is likely that the student does not need ***Read Aloud*** for the state content assessments.)
- When test items are read aloud for classroom assessment, is every item read aloud or only items requested by the student?
- Does someone (e.g., teacher, paraprofessional, another student, parent) regularly read aloud to the student in school?
- If the student is blind or visually impaired, has it been determined that his or her disability precludes or severely limits the ability to access and/or develop proficiency in Braille?
- If the student is hearing impaired, is there evidence demonstrating that the student's disability precludes or severely limit his or her ability to decode printed text (possibly due to other co-occurring disabilities or long-term language deprivation in early childhood)?

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Additionally, time should be set aside to talk to the student about his or her reading skills and the need for ***Read Aloud***. Asking whether it is easier to read for themselves or to listen to someone read may provide an indication that ***Read Aloud*** may be appropriate. Caution needs to be exercised here, however, because struggling readers may indicate a preference for ***Read Aloud*** even though they do not understand better when the accommodation is provided.

Even if *Read Aloud* is not chosen for the student, the examiner may still read one word per sentence to any student.

For all content areas and subjects, readers may not clarify, elaborate, paraphrase, assist, cue a student through uneven voice inflection, etc.

Choosing The Correct Read Aloud

There are multiple ways to use the ***Read Aloud*** tool and accommodations.

- Embedded **Text-To-Speech** technology – The computer reads to the student.
- **Assistive Technology** – The use of assistive technology software should be familiar to the student and should be software the student uses in the everyday classroom. While the use of assistive technology software is not directly supported by our testing vendors, the appropriate help desk will work with districts needing to use the software. The software must be provided by the district.
- **Native Language** – *Please see the section on Translation that follows this.*
- **Human Reader** – A human reader should:
  - Be trained on the administration, security policies and procedures of the assessment.
  - Have extensive practice in providing read aloud support and must be familiar and comfortable with the process before working directly with a student. Ideally, they are familiar with the student, and are typically responsible for providing this support during educational instruction and assessments.
  - Read each question exactly as written, as clearly as possible.
  - Strive to communicate in a neutral tone and maintain a neutral facial expression and posture.
  - Avoid gestures, head movements, or any verbal or non-verbal emphasis on words not otherwise emphasized in text.
  - Avoid conversing with the student about test questions, as this would be a violation of test security.
  - Not paraphrase, interpret or define any items, words, or instructions, as this would be a violation of test security.
  - Not spell any words requested by the student.

In order to be sure that the student correctly receives *Read Aloud*, the tool MUST be marked in the system AT LEAST 48 HOURS PRIOR TO ADMINISTRATION.

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Choosing The Correct Read Aloud—Codes

For those without an IEP, the **test directions and items** in English Language Arts, Mathematics, Science and Social Studies can read aloud to them via:

READ ALOUD—UNIVERSAL TOOLS	
Tool	**Code**
Read Aloud (Not Including ELA Reading Passages)—Text-To-Speech	S041
Read Aloud (Not Including ELA Reading Passages)—Human Reader	S043
Read Aloud (Not Including ELA Reading Passages)—Assistive Technology	S042
Read Aloud (Not Including ELA Reading Passages)—Native Language	S111

In order to have **reading passages in English Language Arts** read aloud, a student would need that accommodation listed in their IEP/504 plan.

Please Note The Following

- Use of Text-To-Speech, Human Reader, Assistive Technology or Native Language for students in grades 3–5 for the ELA Reading Passages will result in invalidation and the student will receive the Lowest Obtainable Scale Score (LOSS) resulting in an achievement level of below basic. In the chart below, these accommodations are noted with an asterisk. This excludes blind students who do not yet possess adequate Braille skills.
- Marking one of these accommodations only triggers the allowance of ELA Reading Passages. When using one of these accommodations, they need to be marked in conjunction with one of the ***Read Aloud*** universal tools.
- Blind students who do not yet possess adequate Braille skills with this accommodation in their IEP/504 plan may have the ELA Reading Passages read aloud by a human reader.

READ ALOUD—ACCOMMODATIONS		
Accommodation	**Code**	**Use With**
Read Aloud (ELA Reading Passages)—Text-To-Speech (Grades 3–5)*	A040	S041
Read Aloud (ELA Reading Passages)—Text-To-Speech (Grades 6–8)	A043	S041
Read Aloud (ELA Reading Passages)—Human Reader (Grades 3–5)*	A041	S043
Read Aloud (ELA Reading Passages)—Human Reader (Grades 6–8)	A045	S043
Read Aloud (ELA Reading Passages)—Assistive Technology (Grades 3–5)*	A042	S042
Read Aloud (ELA Reading Passages)—Assistive Technology (Grades 6–8)	A044	S042
Read Aloud (ELA Reading Passages)—Native Language (Grades 3–5)*	A111	S111
Read Aloud (ELA Reading Passages)—Native Language (Grades 6–8)	A112	S111
Read Aloud (ELA Reading Passages)—Blind Students (All Grades)	A046	S043

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Read Aloud Scenarios

*** Students testing using Native Language**—*Please see the section on Translation that follows this. **

Text-To-Speech	
Choose code **S041** for the student(s). This can be done individually or in a group setting. Student(s) will need to be provided headsets to listen with. ***NOTE:*** If the student(s) have an IEP/504 plan that allows ELA Reading Passages to be read to them, then also choose code **A040** (For Grades 3–5) or **A043** (For Grades 6–8). Use of Text-To-Speech for students in grades 3–5 for the ELA Reading Passages will result in invalidation and the student will receive the Lowest Obtainable Scale Score (LOSS).	
Assistive Technology	
Choose code **S042** for the student. ***NOTE:*** If the student(s) have an IEP/504 plan that allows ELA Reading Passages to be read to them, then also choose code **A042** (For Grades 3–5) or **A044** (For Grades 6–8). Use of Text-To-Speech for students in grades 3–5 for the ELA Reading Passages will result in invalidation and the student will receive the Lowest Obtainable Scale Score (LOSS). The student should test in a one-on-one setting. Code **S501** should be marked for separate setting.	
Human Reader	
Computer Based Assessment: **Choose Codes:** • **S043** (Human Reader) • **A041** (Grades 3–5) **OR A045** (Grades 6–8) for Human Reader – ELA Reading Passages. Only use if the student(s) have an IEP/504 plan that allows ELA Reading Passages to be read to them. Use of Human Reader for students in grades 3–5 for the ELA Reading Passages will result in invalidation and the student will receive the Lowest Obtainable Scale Score (LOSS).	**Paper Based Assessment:** **Choose Codes:** • **A102** (Paper Based Assessment) • **S043** (Human Reader) • **A041** (Grades 3–5) **OR A045** (Grades 6–8) for Human Reader – ELA Reading Passages. Only use if the student(s) have an IEP/504 plan that allows ELA Reading Passages to be read to them. • **S501** (Separate Setting) Assessing the student can be done either one-on-one or in a small group setting.

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Computer Based Assessment (cont.):	Paper Based Assessment (cont.):
Then, read the items to the student via one of the following methods: • **Option #1:** Read the items and answer choices off the student's screens – either a single student or multiple students. • **Option #2:** Read the items off a second display attached to a system being used by a student. • **Option #3:** Print off a paper copy and read to the student(s) from the paper copy. After testing is complete, mark that copy as an "Examiner Copy" and send it back to the vendor with the other student paper assessments.	After testing is complete, mark that copy as an "Examiner Copy" and send it back to the vendor with the other student paper assessments.

Translation

Translation for statewide testing should only be used with students who truly need it.

Any English Learner (EL) taking the online, paper/pencil, Large Print or Braille assessments may have the test directions and items (*questions and answer choices*) in English language arts, mathematics, science and social studies read aloud to them in their native language without an IEP/504 plan. In order to have reading passages in English language arts read aloud in their native language, a student would need that accommodation listed in their IEP/504 plan.

Additionally, any EL taking the online, paper/pencil, Large Print or Braille assessments may respond to the assessment in their native language. The answers would need to be translated and transcribed into the system.

How To Determine If The Student Needs Translation

Here are some questions you can ask about the student to help make a determination:

- Does the student have an overall WIDA score of 3 or lower?
- Has the student attended a school where his/her first language is the primary language of instruction?
- Has the student ever received instruction in his/her first language?
- Does the student perform better when class assignments or assessments are translated?

Additionally, time should be set aside to talk to the student about his or her reading skills and the need for ***Translation***. Asking whether it is easier to read for themselves in English or to listen to someone read in their native language may provide an indication that ***Translation*** may be appropriate. Caution needs to be exercised here, however, because struggling readers may indicate a preference for ***Translation*** even though they do not understand better when the accommodation is provided.

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Choosing The Correct Translation – Codes

Read Aloud via Native Language can only be done by a human reader. There is no Native Language Text-To-Speech option.

When Using A Translator

- The district must find and contract with the translator on their own. DESE does NOT provide a list of translation services available.
- The district must provide the translator to do the oral reading at their own cost.
- The translator cannot be a family member of the student.
- The district must train the translator just as they would a test examiner.
- If the translator is not a district employee, a trained examiner from the district must be a proctor in the room as well.

TRANSLATION		
Accommodation	**Code**	**Use With**
Read Aloud (Not Including ELA Reading Passages)—Native Language	S111	
Read Aloud (ELA Reading Passages)—Native Language (Grades 3–5)	A111	S111
Read Aloud (ELA Reading Passages)—Native Language (Grades 6–8)	A112	S111
Translation	S109	A102

Translation Scenarios

There are multiple factors to consider in using choosing the correct ***Translation*** tools and accommodations.

- How many students are being tested?
- Is the student using the Read Aloud – Native Language tool?
- Does the student's IEP/504 plan allow the use of Read Aloud – Native Language for the ELA Reading Passages? If so what grade is the student in?
- Does the translator doing the Read Aloud need an advance copy of the assessment to translate technical terms?
- Is the student going to respond in their native language?
- Is the student testing online or does the student's IEP/504 plan allow them to test via paper/pencil, Large Print or Braille?

Marking Codes

- **S501** (Separate Setting) Assessing the student can be done either one-on-one or in a small group setting.
- **S111** (Read Aloud)
- **A111** (Read Aloud – ELA Reading Passages Grades 3–5) Only use if the student has an IEP/504 plan that allows ELA Reading Passages to be read to them.
- **A112** (Read Aloud – ELA Reading Passages Grades 6–8) Only use if the student has an IEP/504 plan that allows ELA Reading Passages to be read to them.
- **S109** (Native Language) Only use if the student will be responding in their Native Language.

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Prior Translation

If the person doing the Read Aloud **DOES** need a copy of the assessment in advance for translation purposes:

- Choose code **A102** (Paper Based Assessment) for one student. Print the paper copy, then go in and unmark the code. This will send the student back to an online assessment. Then choose the appropriate code(s) above.

Then, read and translate the items to the student via one of the following methods:

- **Option #1:** Read the items and answer choices off student's screens – either a single student or multiple students.
- **Option #2:** Attach a second display to a system being used by a single student.
- **Option #3:** Print off a paper copy and read to the student(s) from the paper copy.

After testing is complete, mark that copy as an "Examiner Copy" and send it back to the vendor with the other student paper assessments.

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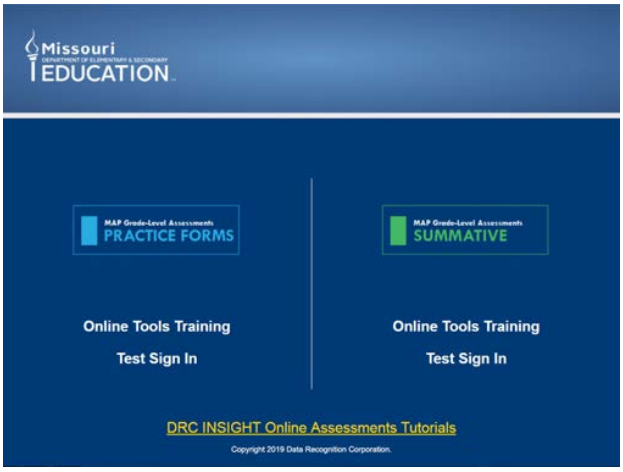
1.7 Online Tools Training and Tutorials

Online Tools Training

In preparation for the test and to expose students to the various item types in each content area (see Appendix A for item types), it is highly recommended that all students access the Online Tools Training (OTT) for each content area. Each OTT is designed to provide students and educators with an opportunity to quickly familiarize themselves with the software and navigational tools that they will use with the MAP Grade-Level Assessments. The OTT for each content area includes a variety of item types. Even though a student's test form may not include every item type, the OTT provides an opportunity to practice all item types. The OTTs also include a comprehensive reflection of embedded universal tools and accommodations. The OTTs should also be provided to students with any non-embedded universal tools and accommodations as allowed on the operational assessments.

The OTTs can be accessed via the INSIGHT desktop icon once the testing software has been installed. Non-accommodated versions of the OTTs can be publicly accessed using the Google Chrome browser at https://wbte.drcedirect.com/MO/portals/mo. Students should choose Online Tools Training on the right-hand side of the page.



Tutorials

The Tutorials provide step-by-step video instructions on how to navigate the online system and give detailed explanations about the key features of the software. **The Tutorials should be reviewed at least once by Test Examiners who will supervise any of the MAP Grade-Level Assessments and by students in advance of their first test day. Allow students to repeat the Tutorials as often as desired and needed.**

Students should review the Tutorials before completing the Online Tools Training (OTT). It has been proven beneficial for schools to schedule a Tutorial session for students immediately before at least one OTT session.

If computer lab availability is limited, the Tutorials may be presented to school personnel and students in a classroom using a projector and a single Internet connection.

The Tutorials can be accessed via the Online Tutorials desktop icon once the testing software has been installed. The Tutorials may also be accessed through eDIRECT.

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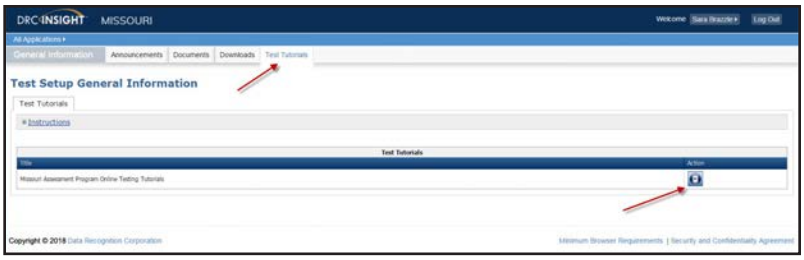
Instructions for Accessing the Tutorials through eDIRECT



1. Navigate to eDIRECT, https://mo.drcedirect.com. (Login is not required.)
2. Under **All Applications** select **General Information**.
3. Select the **Test Tutorials** tab.
4. Select the **Play Tutorial** action button.
5. Select **Play All** or choose from different sections within the tutorial.

The Tutorials walk students through the software and tools that are available. In the Tutorial, the student can move forward as directed or jump around if desired. A menu at the left of the page allows the student to select specific sections for review.

List of INSIGHT Keyboard Shortcuts and Icons

During online testing, all students may have access to a printed list of the keyboard shortcuts and icons available in INSIGHT. The list may be printed from Appendix B or may be accessed on the **Documents** page of eDIRECT, https://mo.drcedirect.com.

Practice Forms

Missouri Grade-Level Practice Forms aligned to the Missouri Learning Standards are available in the following areas:

- Mathematics grades 3–8
- English Language Arts grades 3–8
- Science grades 5 and 8

These assessments can be used to measure specific student strengths, areas of need, skills, and knowledge. The assessments can be accessed via the INSIGHT desktop icon once the testing software has been installed. Student results will be available through eDIRECT's View Online Results for all auto-scored items. Scoring materials for the hand-scored items on the practice forms are available through eDIRECT. See the eDIRECT Guide to Reports for more information on accessing reports.

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2.0 BEFORE ONLINE TESTING

2.1 Advance Announcements and Preparation

Parents and guardians should be informed of the district MAP Grade-Level Assessment schedule so they can help ensure their students are present on the testing days (without scheduled appointments or vacation days during the testing window) and prepared with the proper materials that may not be provided by the district.

In addition to completing the applicable content for their grade level, students should have experience using the specific device on which they will be taking the assessments. Students taking the assessments on a desktop or laptop computer should know how to use a mouse and keyboard. Instead of a mouse, students may use the embedded touchpad in the keyboard of a laptop. Students taking the assessments on iPads should know how to use a touchscreen (and/or stylus, if applicable). It is strongly recommended, but not required, that students taking the assessments on tablet devices have access to (and know how to use) an external keyboard. Students should review the INSIGHT Online Tools Training (OTT) for the MAP Grade-Level Assessment they will be taking. OTTs are for Test Examiners and students to become familiar with the format and functionality of the online test. The OTTs provide a preview of the item types included in the MAP Grade-Level Assessments. Item types are listed and described in Appendix A.

MAP Grade-Level Assessments are available on the following devices:

- **Desktop Computers**
- **Laptops**
- **Netbooks**
- **Chromebooks**
- **iPads**

Students should be familiar with the device on which they will be taking the assessment prior to testing. Please see the INSIGHT User Guide for complete device specifications.

2.2 User Roles

The District Test Coordinator (DTC) is responsible for training all School Test Coordinators (STCs) on testing procedures. If a district does not have STCs, the DTC performs the role of the STC. While the training of Test Examiners may be delegated to each building's STC, the DTC is responsible for ensuring that all Test Examiners are well-prepared and trained. Training includes special education teachers, proctors, translators, and Test Examiners who are administering the MAP Grade-Level Assessments to homebound or out-of-district students.

DTCs must ensure that all STCs/ Test Examiners, and other responsible district and/or school staff have been trained.

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Test Examiner Responsibilities

All Test Examiners are responsible for the following:

- Ensure all grade-level testing materials are secure at all times. **Both written and verbal discussion of specific MAP Grade-Level Assessment items breach the security and integrity of the test.** Discussion between Test Examiners, proctors, translators, or any district staff regarding test items is not permitted.

- Ensure any additional testing materials or tools are available or provided, such as:
  - scratch and graph paper
  - Braille paper (if provided)

- After testing is complete:
  - Check that tests have been submitted.
  - Check that tests are closed in the system.
  - Collect the Large Print, Braille, and/or paper/pencil materials from the students, and prepare materials for return to the STC.
  - Transcribe Large Print, Braille, and paper/pencil edition responses into INSIGHT.
  - Contact the STC for guidance regarding the handling of any contaminated test materials.
  - Collect all draft, scratch, grid, graph, or Braille paper and return all used materials to the DTC/STC for secure shredding.

Test Examiners must ensure that all grade-level testing materials are secure at all times. Although this manual is not considered secure, it contains links to secure test materials.

Both written and verbal discussion of specific MAP Grade-Level Assessment items breach the security and integrity of the test.

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2.3 Test Security

Test security and ethical testing practices continue to be of utmost importance. A test security policy must be in place for each district and charter school. The test security policy should be placed in the District's Assessment Plan, which is approved by the local board annually. The accurate assessment of student achievement is a critical component of the educational process in Missouri. It is the responsibility of everyone involved in the assessment process to understand the security measures in place to avoid any intentional or unintentional unethical behavior by students or staff members. Administrators and Test Examiners are responsible for reporting any of these behaviors to district administration and/or to the DESE Assessment Section at 573-751-3545 or assessment@dese.mo.gov.

Preparing for computer-based testing includes determining the physical layout of the testing room, training teachers and staff, and preparing students. Although DESE does not provide specific requirements for a layout, the room must be set up with test security in mind. Workstations must have adequate space between them so that students are not able to view one another's screens.

Instructional materials must be removed or covered, including, but not limited to, information that might assist students in answering questions that is displayed on bulletin boards, interactive whiteboards, chalkboards, dry-erase boards, or charts (e.g., wall charts that contain literary definitions, maps, mathematics formulas, etc.).

Administrators and Test Examiners are responsible for reporting any intentional or unintentional unethical behavior by students or staff members to district administration and/or to the DESE Assessment Section at 573-751-3545 or assessment@dese.mo.gov.

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District and School Test Coordinators, Test Examiners, translators, proctors, and any other district and/or staff who have testing responsibilities must follow test security procedures. The tests **must not** be read, scored, reviewed, photocopied, duplicated, scanned, transported by students, photographed, texted, or made accessible to personnel not responsible for testing. **Both written and/or verbal discussion of specific MAP Grade-Level Assessment items breach the security and integrity of the test and may result in an invalidation or loss of scores for accountability purposes.**

Both written and/or verbal discussion of specific MAP Grade-Level Assessment items breach the security and integrity of the test and may result in an invalidation or loss of scores for accountability purposes.

Test items or answers must not be discussed with anyone at any time. When hard-copy editions of the test are not in use, they must be stored in a secure, locked location outside of the classroom. **Large Print, Braille, and paper/pencil editions of the tests must be transcribed into INSIGHT and shipped back to DRC following the procedures in Section 5.3 in this manual once testing is complete.**

Test security and ethics also include standardized training for all District and School Test Coordinators, Test Examiners, translators, proctors, and any district and/or school staff who have responsibilities in testing. Training and manuals (including this manual) are provided for training purposes at http://dese.mo.gov/college-career-readiness/assessment/grade-level. This *Test Examiner Manual* is also available on the **Documents** page of eDIRECT.

This *Test Examiner Manual* may be reviewed before testing, NOT the secure tests. Only translators may review secure test material prior to test administration.

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2.4 Assessment Materials for Students/Administrators

This section concerns all materials required, permitted but not provided, or prohibited while taking Grade-Level Online Assessments.

Required Materials

- A workstation with Internet access, a monitor, a mouse, and a keyboard for each student, **OR** a tablet device with Internet access if a student will be testing on a tablet. Devices must have INSIGHT properly loaded and certified.
- Student Test Tickets (This ticket provides the secure login credentials (i.e., username and password) required for a student to use the testing software.)
- The resources in Table 6.

Table 6: Additional Required Resources for ELA, Mathematics, and Science

Content Area	Session 1	Session 2	Session 3
ELA	• Headphones are required for students using text-to-speech.	• Headphones are required for students using text-to-speech.	• Headphones are required for **all** students taking this session.
Mathematics	• Headphones are required for students using text-to-speech.	• Headphones are required for students using text-to-speech.	• Headphones are required for students using text-to-speech.
Science	• Headphones are required for students using text-to-speech.	• Headphones are required for students using text-to-speech.	N/A

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Permitted Materials

- Scratch paper and grid/graph paper are allowable for all assessments.
- A physical calculator cannot be accessed for any items for the grade 5 Mathematics assessments without an IEP.
- A physical calculator **can** be accessed for any items for the grade 5 Science assessments.
  - For the grade 5 Science assessments, a four-function calculator with square root and percentage functions is permitted.
  - Test Examiners are responsible for ensuring and verifying that any calculator with the ability to store functions and equations (e.g., a scientific calculator) has the memory cleared before and after each Science assessment.
  - Calculators cannot have Internet connectivity or be able to connect to anyone inside or outside the classroom during testing.
  - Students cannot use a calculator on a laptop or other portable computer, pocket organizer, cell phone, device with a typewriter-style keyboard, electronic writing pad, or pen-input device unless a particular assistive device is required for a student and is specified on his or her IEP.
  - No calculators with QWERTY keyboards are allowed.
- Mathematics Reference Sheet Grades 3–5 copied from Appendix C or printed from the Documents page of eDIRECT, https://mo.drcedirect.com.
- A Periodic Table of the Elements copied from Appendix D of this manual or printed from the Documents page of eDIRECT, https://mo.drcedirect.com.

Prohibited Materials

- Electronic devices, including any portable device that can connect to the Internet or to anyone inside or outside of the classroom, must not be accessible during the testing sessions. Such items include, but are not limited to:
  - cellular/mobile phones
  - electronic music players
  - digital cameras
  - handheld scanners
  - portable gaming devices
  - any device that can connect to the Internet
- As a part of your board approved assessment plan, each district shall have a cell phone policy in place that ensures both test security and test validity. Each classroom is expected to follow the district cell phone policy.

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Assessment Materials and Training for Test Examiners

- *Test Examiner Manual*
- Grade-Level Assessment training provided online by DRC
- Student Test Tickets (obtained from the School Test Coordinator)

  NOTE: All materials distributed to the students with usernames and passwords must be collected before the students leave the testing area.
- Extra pencils and a supply of scratch and grid/graph paper

NOTE: Physical scratch, grid and graph paper should be collected and destroyed immediately upon conclusion of a testing session.

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3.0 DURING ONLINE TESTING

Use the following information and script to assist students with the login procedures.

For sessions requiring listening devices, including ELA Session 3 and all sessions using text-to-speech technology, please ensure prior to testing that all listening devices (e.g., headphones, earbuds) are working properly and that the volume is set at an acceptable level.

The Test Examiner (TE) should verify the security of the testing environment prior to beginning a test session. TEs must ensure that students do not have access to prohibited devices and materials during testing.

To ensure that all students are tested under the same conditions, the TE should adhere strictly to the script for administering the test. These instructions can be found after the word "SAY" on the following pages. When asked, the TE should answer questions raised by students but should never help the class or individual students with specific test items. Except for single words, no test items can be read to any student for any content area, unless specified as an accommodation.

The TE should adhere strictly to the script for administering the test.

Please remember that the script must be followed exactly and used each time a test is administered. If the class is resuming a test and the TE is sure that all students are able to log in without hearing the login directions again, the TE may skip the italicized portions of the directions for the login section.

All directions that a TE needs to read to students are indicated by the word "SAY" so they stand out from the regular text. They should be read exactly as they are written, using a natural tone and manner. If the TE makes a mistake in reading a direction, the TE should stop and say, "I made a mistake. Listen again." Then the direction should be reread.

Test Examiners may read/pronounce one word per sentence to any student.

The TE should try to maintain a natural classroom atmosphere during the test administration. Before each test begins, he or she should encourage students to do their best.

Any time a student logs in to the testing system, the TE should follow this script. This includes logging in to complete any session of the Assessment.

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3.1 Specific Administration Information – Before Testing

1. The TE distributes the Test Tickets.

You should have received Test Tickets for this testing session from your DTC or STC. Before beginning, ensure that you have all of the correct test tickets for the students who will be testing. Note the Test Name and read it aloud where the script states [Test Name].

If students are starting a new session:

SAY **You are about to take (the) [Test Name].**

If students are resuming a session:

SAY **You are about to continue (the) [Test Name].**

I will now hand out a Test Ticket to each of you. When you receive your Test Ticket, check that your name appears on the ticket. If your name does not appear, raise your hand.

Distribute test tickets to each student, ensuring that each student is given the correct ticket with his or her name printed on it. Contact your STC or DTC if a ticket is missing or incorrect.

Note: *There are three steps to be completed to get students to the login screen. Districts may choose to perform some or all of the steps for the students before they enter the testing room.*

The first step (number 2) is starting DRC INSIGHT. The next step (number 3) is choosing the testing program for Missouri. The last step (number 4) is to choose "Test Sign In" for the MAP Summative assessment.

If any of these steps are executed for the students, skip the SAY portion of the appropriate number and move onto the next number.

2. The TE directs students to the test sign-in page.

SAY **Now select the "DRC INSIGHT Online Assessments" icon that appears on your screen.**

Students using a laptop or desktop workstation should double click on the icon. Students using a Chromebook or iPad device should tap on the icon. Help students if they have trouble activating the icon. Some devices are configured for multiple assessments. If that is the case, read number 3 below to the students. If not, go to number 4.

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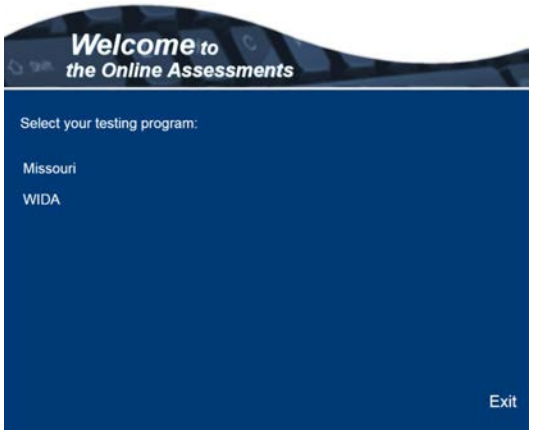
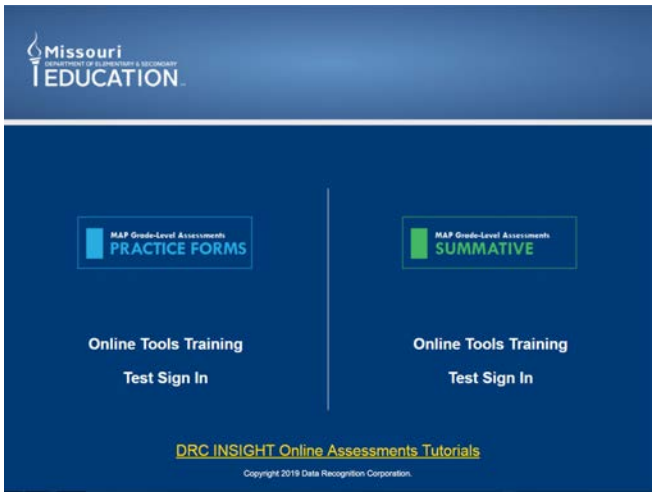
3. **The TE instructs students to select testing program.**

SAY **On your screen, you will be asked to select your testing program. Select "Missouri."**



4. **The TE instructs students to log in.**

SAY **At the top of your screen you should see "Missouri Department of Elementary & Secondary Education." On the right-hand side, you will see links for the Online Tools Training and Test Sign in for the MAP Grade-Level Assessments Summative test. Please select "Test Sign In."**



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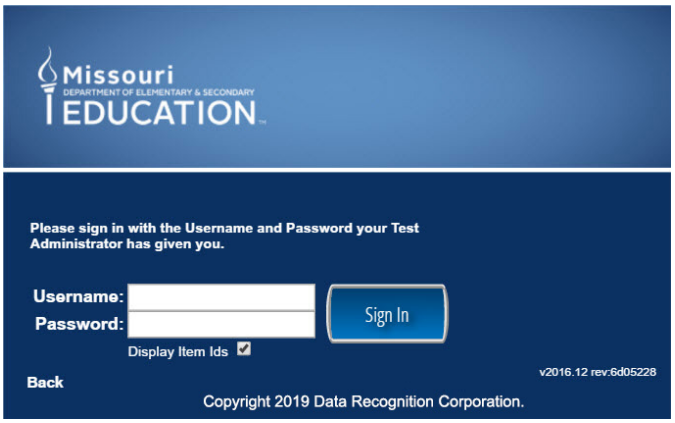
5. Student Login

SAY **This is the Login screen. Type your username and password from your Test Ticket into the correct boxes on the screen. Then select "Sign In."**

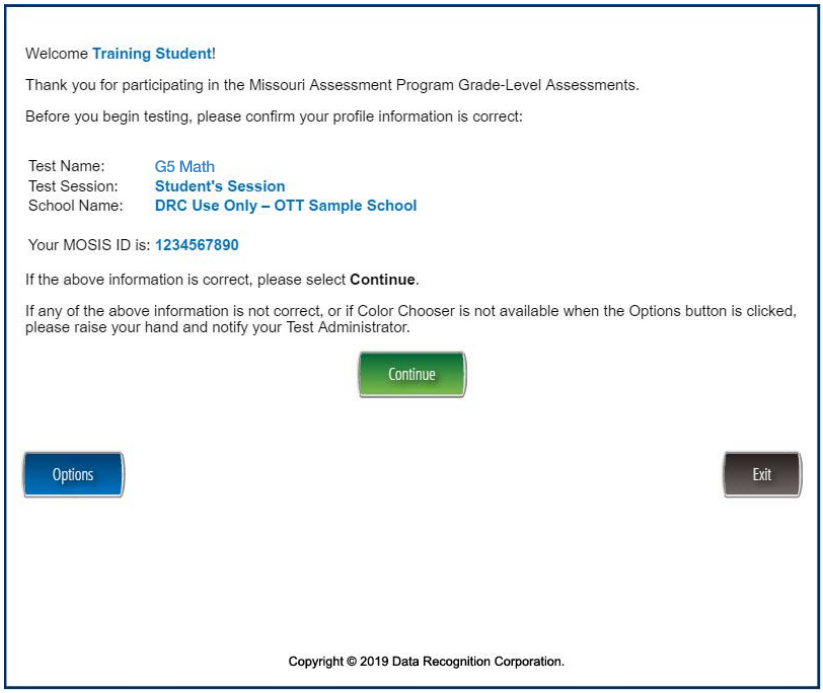


Test Ticket information is unique to each student and each session but is not case sensitive. Assist students as needed; TEs may have to help students type in this information. After the login, make sure all students are on the correct screen. Wait for all students to reach this page.

6. Welcome Screen

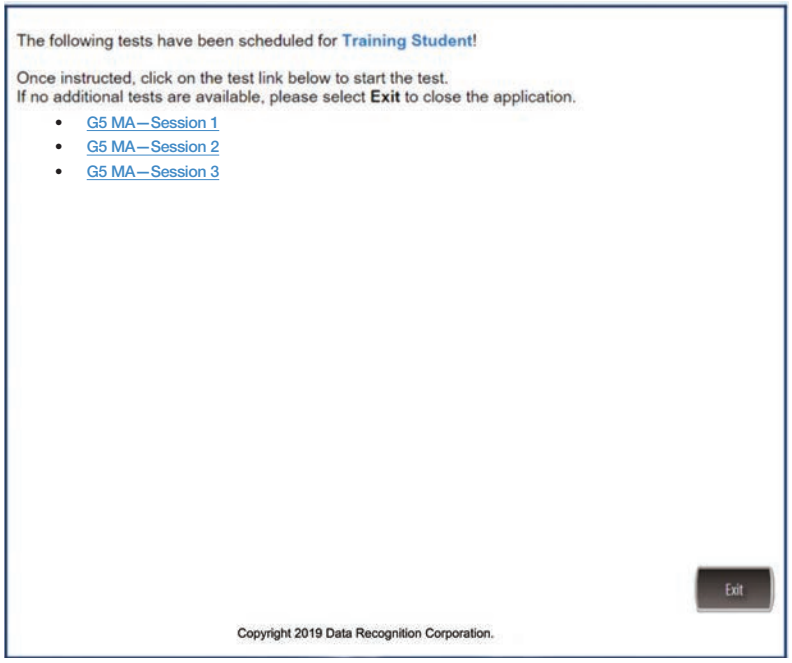
SAY **This is the Welcome screen. Please check that your name appears at the top of the screen. Check that the test name is [Test Name] and the test session is [Test Session]. Then check that your school is correct. If everything is correct, select "Continue." If your information is not correct, please raise your hand.**

If a student's information is incorrect, the TE should contact the STC and/or the DTC.



7. Choosing the Assessment

SAY **You are now on the screen that shows the name of the test you are scheduled to take. If you do not see this, please raise your hand. Please select the test link that is shown.**

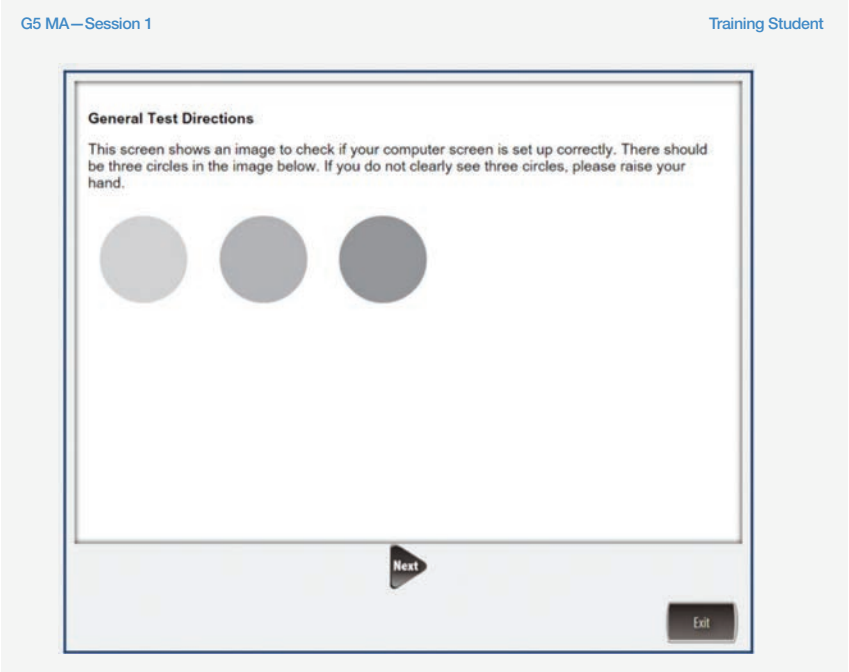


8. Display Setup and Test Directions

SAY **You are now on a screen that is used to make sure your screen is set up correctly. If you do not see three circles, please raise your hand.**

Once you have confirmed that all students have three circles,

SAY **Select the NEXT arrow to continue.**



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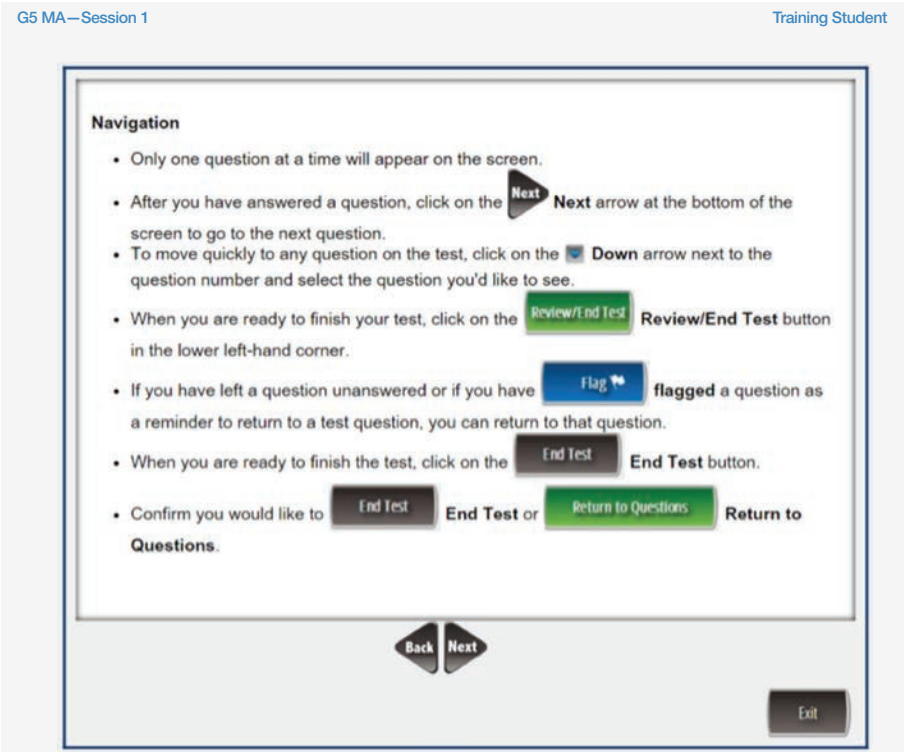
SAY

The following screens contain the test directions for the test you are taking today. Please read the directions carefully. If you have any questions about the directions, raise your hand. You can find the directions during your test by clicking the HELP button in the top right corner.

During the test, you may see a page with no test questions. Follow the directions on the page to continue taking the test.

If you are unsure of an answer, provide what you think is the best answer; there is no penalty for guessing. If you would like to review that answer at a later time, mark the item for review by clicking the FLAG at the bottom of the screen before going on to the next question. Flagging the item will remind you to go back and decide whether or not you want to change the answer.

You may PAUSE at any point in the test by clicking PAUSE after answering an item. The PAUSE button is used to stop the test. Please raise your hand if you need a break and ask me before you click PAUSE. After pausing, a timer will appear on your screen. After your break, click on the RESUME button to continue. If you pause for more than 20 minutes, you will need to log back in.



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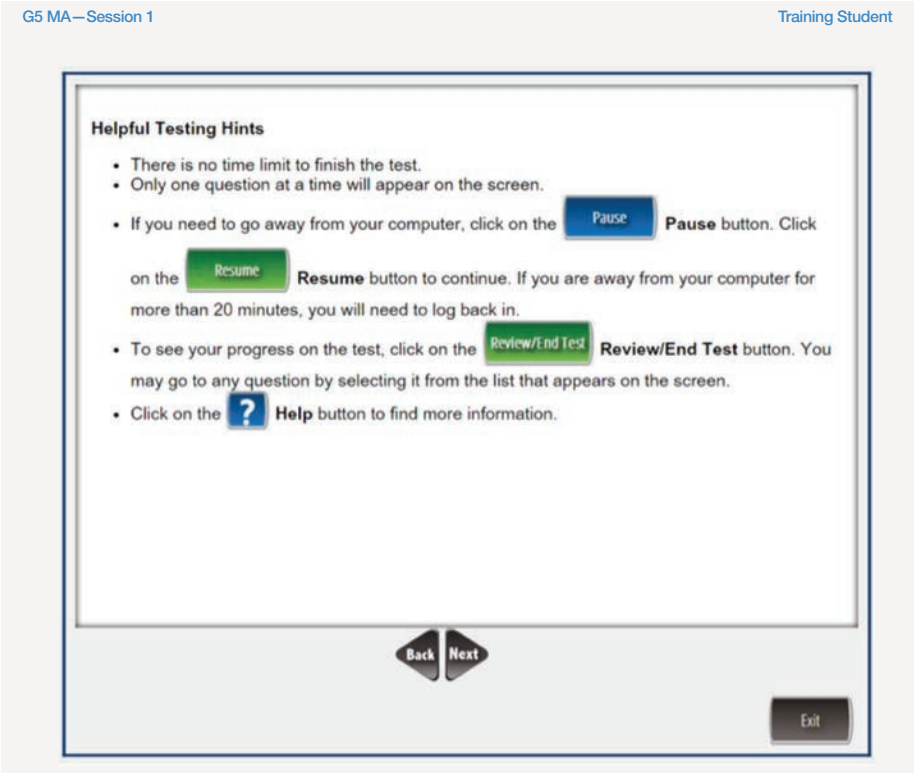

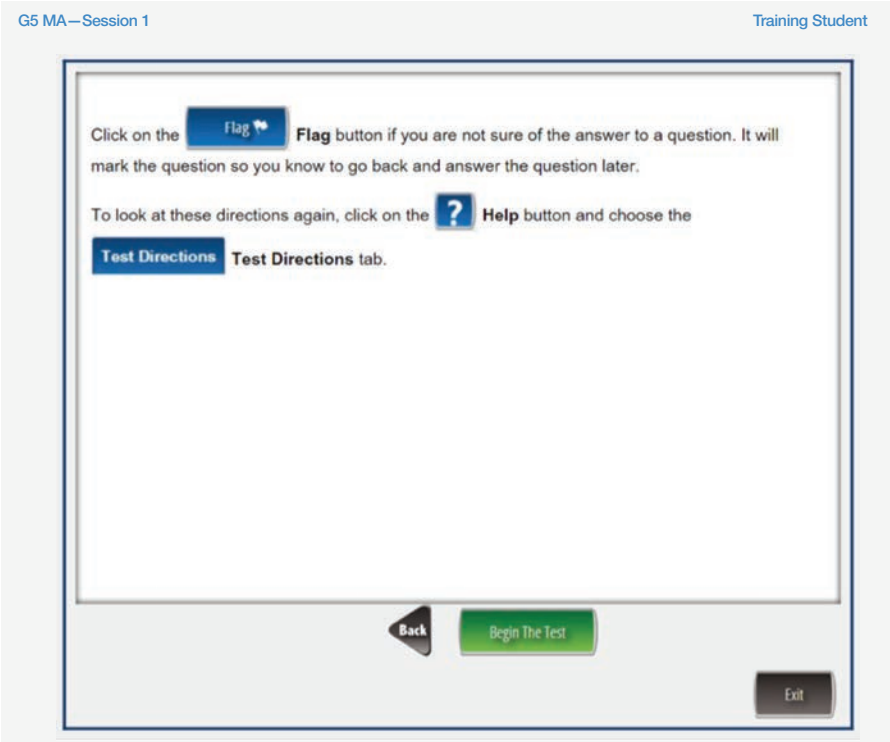

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3.2 Specific Administration Information – Testing

SAY **Remember that your answers need to be your own work. Please keep your eyes on your own test and remember that there should be no talking.**

Prior to students testing, the district needs to determine if it will require students to raise their hand when they finish testing and get to the Review/End Test screen. If students are required to raise their hand prior to exiting, say the following sentence. If not, move to the next paragraph.

SAY **Once you believe you have finished your test, please raise your hand and I will come over.**

When you are ready to begin your test, click BEGIN THE TEST.

1. The TE monitors student progress.

Monitoring Test Progress

Once students have started their tests, the TE should circulate through the room to ensure that all conditions of test security are maintained. If the TE witnesses or suspects the possibility of a test security incident, the STC and DTC should be contacted immediately in accordance with the security guidance provided in this manual.

If a student asks for assistance either in answering an item or manipulating an item type, the TE should let the student know that he or she should try his or her best, but that the TE cannot help answer an item.

SAY **I can't help you with your test. Check the HELP button to read the directions.**

The TE may remind the student to reread the instructions for that item.

Test Examiners may read/pronounce one word per sentence to any student.

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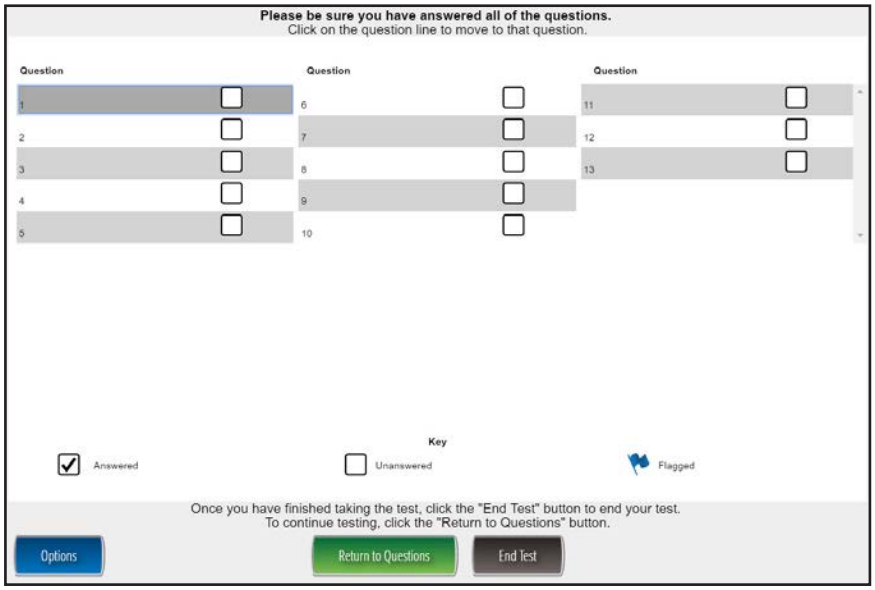
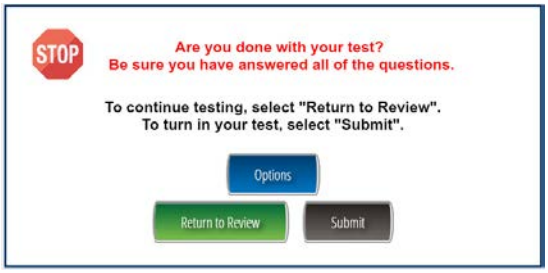
2. A student finishes their test session.



After answering the last item in each session, the student will press the Review/End Test button at the bottom left-hand corner of the screen. The student is then presented with a screen prompting him or her to review answers (marked and unmarked) for all items prior to submitting the test. At that point, the student can either click the Return to Questions button to answer previously unanswered questions or press End Test to submit the test. Once the student has pressed on the End Test button, the student must provide a confirmation that he or she is done.

If you have required the student to call you over prior to exiting, you may ask the student if they are finished or if they want to go back and review their answers, but they are not required to do so. You may not direct them to go back to a specific item.



If a student needs additional testing time well beyond other students, you may direct them to pause the test and exit testing so you can either move them or have them continue at another time. See section 3.4 for more information on moving a student.

Once all students have finished, be sure that they have all exited the test. TEs should collect all scratch, grid and graph paper. TEs should not review any work on the paper(s).

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3.3 Testing Over Multiple Sessions or Days

For some tests, students may be best served by sequential, uninterrupted time that may exceed the time in the regular class schedule.

If the TE intends to administer a session over the course of multiple days for a student or group of students, TEs may ask students to pause and exit after they reach a designated point. For most tests, there is nothing built into the system to prevent students from progressing from one section of the test to another. In those cases, the TE should give the students clear directions on when to pause. For example, TEs may designate a certain amount of time for testing. This guidance may be written on a dry-erase board, interactive white board, chalkboard, or another place that students can easily see.

3.4 Moving a Student During an Assessment

Occasionally a student must be moved to a new location to continue testing. In order for the student to continue his or her test, complete the following steps:

1. Pause and end the student's online assessment. To do so, select the "Pause" button, then select the "Exit" button, and then select the "Yes, Exit" button. (Once the student exits the test, the workstation becomes immediately available for other use.)

2. Escort the student to the new location.

3. Using the login and password from the student's Test Ticket, log the student in to his or her assessment at the new workstation to complete the assessment.

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4.0 AFTER ONLINE TESTING

4.1 Reporting Test Invalidations

Neither a student's behavior during testing nor the judgment of a student's effort during testing can invalidate a student's test.

A MAP Grade-Level Assessment should be invalidated only if a student is discovered cheating. Cheating is the only time the "Teacher Invalidation" code is used. This code invalidates all sessions of the content area.

If a district chooses to use the "Teacher Invalidation" bubble, the test examiner and the STC must agree that the student cheated. The STC should then notify the DTC.

The DTC will follow the instructions under section 11.4 of the Test Coordinators Manual. The DTC is the only one who should select the "Teacher Invalidation" bubble for the affected content area in eDIRECT.

4.2 Student Absences

If a student is absent for all of the MAP Grade-Level Assessments and unable to test in district-determined make-up sessions, then mark the student as absent in eDIRECT.

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5.0 LARGE PRINT, BRAILLE, AND PAPER/ PENCIL EDITIONS

Large Print, Braille, and paper/pencil editions of the MAP Grade-Level Assessments will be available for students with designated IEPs or special circumstances for spring 2019 testing. Test Examiners will work with the District Test Coordinator to generate paper/pencil editions from eDIRECT (after students are assigned an accommodation). Unique identification numbers will be used to produce barcodes that will be printed onto the paper/pencil editions. After testing, student responses for Large Print, Braille, and paper/pencil editions must be entered into the INSIGHT system, and all test materials must be collected for return to DRC.

For additional information regarding Large Print and Braille forms, refer to the Large Print and Braille Kit and follow the instructions in the Braille Omit Return Instruction Sheet.

5.1 Before Testing

Paper/Pencil Materials

For special circumstances that require students to test on paper, a paper/pencil edition is a part of the test delivery system. To activate the paper/pencil edition print function, districts access the Test Setup feature in eDIRECT to mark the applicable accommodation and code for students who require the paper version of the test. Once accommodations are assigned, the Test Examiner will contact the District Test Coordinator to generate the paper version. Using the information collected during the precode and enrollment processes, the administration component of the online testing system will generate a unique barcode number for a paper/pencil edition prior to local printing. Depending on the printed accommodation needed for a particular student, the unique barcode number will then become embedded into the electronic version on each page of the paper/pencil form. During local printing, the embedded barcode number will print along with each page of the paper/pencil edition. Each barcode number will be unique to a student for the purposes of linking the printed form to the student's record in the master database. Barcode numbers will be recorded and associated with each student's record.

For specific instructions regarding how to generate and download a paper/pencil edition from eDIRECT, see the *eDIRECT User Guide—Test Setup*, available on the **Documents** page of eDIRECT, https://mo.drcedirect.com.

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Once the PDF downloads, it is available for printing on the local network printer. Test Examiners will work with the District Test Coordinators to obtain the printed versions of the test so that proper accountability is maintained.

The Test Examiner should become familiar with the directions for administering a paper/pencil edition. The paper/pencil edition of the test is secure and should be treated as such.

Large Print and Braille Materials

Test Examiners or Test Coordinators must transcribe students' responses into INSIGHT.

Large Print and Braille testing materials are packaged by building and shipped to the district's office address (or the shipping address indicated by the district during the registration process). The materials shipped to the district are based on the content-specific test window entered during registration.

Test Examiners must also count the number of books received and assign each test book to a student. Write the student's name and MOSIS ID on the front of each test book.

Document this information in preparation for returning the test books to the STC.

Contaminated Test Materials

Test materials are considered **contaminated** due to: a) a student health issue that affects the test book itself (blood, fluids, etc.) or b) contact with any potentially hazardous material. If test materials are contaminated, the Test Examiner should notify the School Test Coordinator for instructions for handling the contaminated materials since **all** printed testing material must be accounted for. The DTC, or STC, or TE is responsible for transcribing the answers into the online system, and then the contaminated test materials must be securely destroyed at the test site by the DTC or STC. The DTC or STC should fill out the Missing Materials section of the Accountability Form to account for the contaminated test materials located under the Materials section of eDIRECT.

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Duration and Timing Information

The following table lists estimates of the time it will take students to complete each component of the assessment. Some students may complete the assessment in times that vary from the recommended durations. Districts should plan for flexibility in their schedules to accommodate students that may take more time than noted.

There is no time limit for any assessment.

The scheduling/rules for each component of the Large Print, Braille, and paper/pencil assessments are included in Tables 7, 8, and 9.

Table 7: Assessment Sequence for Large Print, Braille*, and Paper/Pencil—English Language Arts

ELA	Session 1	Session 2	Session 3
Content and Duration of Sessions	This session assesses the Reading Strand. It contains passage-based selected-response and technology-enhanced items. **Recommendation:** • Session duration ranges from 45–95 minutes.	This session assesses the Research and Writing Strands. It contains selected-response and technology-enhanced items. **Recommendation:** • Session duration ranges from 25–50 minutes.	This session assesses the Listening Strand. It contains passage-based selected-response and technology-enhanced items. **Recommendation:** • Session duration ranges from 15–35 minutes.

*Braille administration times will likely be longer than the times indicated here.

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Table 8: Assessment Sequence for Large Print, Braille*, and Paper/Pencil—Mathematics

Calculators are not allowed on any session of the grade 5 math assessment without an IEP.

Mathematics	Session 1	Session 2	Session 3 (Performance Event)
Content and Duration of Sessions	This session assesses the Mathematics Strands. It contains selected-response and technology-enhanced items. **Recommendation:** • Session duration ranges from 35–60 minutes.	This session assesses the Mathematics Strands. It contains selected-response and technology-enhanced items. **Recommendation:** • Session duration ranges from 35–60 minutes.	This session assesses the Mathematics Strands. It contains a performance event that is comprised of related selected-response and technology-enhanced items. A second hand-scored performance event will be included for each grade. **Recommendation:** • Session duration ranges from 15–30 minutes.

*Braille administration times will likely be longer than the times indicated here.

Table 9: Assessment Sequence for Large Print, Braille*, and Paper/Pencil—Science

Science	Session 1	Session 2
Content and Duration of Sessions	This session assesses the Science Strands. It contains selected-response, technology-enhanced, and constructed-response items. These items can be standalone questions or included in sets of questions based on a common task or scenario. **Recommendation:** • Session duration ranges from 60–80 minutes.	This session assesses the Science Strands. It contains selected-response, technology-enhanced, and constructed-response items. These items can be standalone questions or included in sets of questions based on a common task or scenario. **Recommendation:** • Session duration ranges from 60–80 minutes.

*Braille administration times will likely be longer than the times indicated here.

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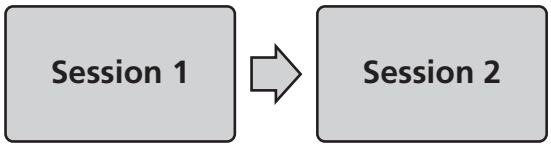
Recommended Order of Test Administration for ELA

Recommended Order of Test Administration for Mathematics

Recommended Order of Test Administration for Science



Students may take sessions on separate days. Districts/schools may opt to administer in a different order, if needed.

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5.2 During Testing

This section provides an overview of preparing the testing environment, guidelines for test administration, and directions for accessing specific scripts for administering the Large Print, Braille, and paper/pencil editions. Test Examiners should become familiar with this section well in advance of the start of testing.

The scripts are secure; do not print or allow unauthorized persons to access them. Maintaining the security of all test materials is crucial to obtaining valid and reliable test results. Therefore, test materials must be kept in locked storage, except during actual test administration. It is the responsibility of all individuals who administer the test to follow security procedures.

Before administering the assessment, make sure that you have the following materials available for students:

- A test book for each student
- Blank scratch paper for each student
- A four-function calculator with square root and percentage functions is permitted for students in grades 3–5 as an accommodation only, as the MAP Grade-Level Mathematic Assessments include no calculator-allowed items.
- A four-function calculator with square root and percentage functions **can** be accessed for any items on the grade 5 Science assessments.
- DESE does not provide, endorse, or recommend a list of calculator brands or types that students are permitted to use. Test Examiners should follow their own district's general education policy for the types of calculators permitted during district-administered quizzes, benchmark tests, common assessments, chapter/unit tests, and final exams.
    - Calculators cannot contain stored equations or functions at the time of the MAP Grade-Level Mathematics and Science Assessments. Test Examiners are responsible for ensuring and verifying that calculators that have the ability to store functions and equations (e.g., a scientific calculator) have the memory cleared before and after each Mathematics and Science Assessment.
    - Calculators cannot have Internet connectivity or be able to connect to anyone inside or outside the classroom during testing. Students cannot use a calculator on a laptop or other portable computer, pocket organizer, cell phone, device with a typewriter-style keyboard, electronic writing pad, or pen-input device unless a particular assistive device is required for a student and is specified on his or her IEP.
    - No calculators with QWERTY keyboards are allowed.
- Mathematics Reference Sheet Grades 3–5 copied from Appendix C or printed from the Documents page of eDIRECT, https://mo.drcedirect.com.
- A Periodic Table of the Elements copied from Appendix D of this manual or printed from the Documents page of eDIRECT, https://mo.drcedirect.com.

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Specific Directions for Administering the Braille Form

The directions in this manual also apply to the administration of the Braille version of the Summative Assessments. Additional Braille instructions are as follows:

- The student's name, Test Examiner's name, district, and school must be printed on the front cover of each Braille test book.
- Because extra time may be needed for administering the Braille version, it is recommended that students be tested individually or in a small group setting.
- When a Braille student responds by pointing to the answers or giving a verbal response in English only, the Test Examiner is permitted during the course of test administration to fill in student responses in the student test book. When a Braille student responds by using a Braillewriter or marking answers in the test book, the procedures for transcribing student responses detailed in the 5.3 "After Testing" section of this manual should be followed. In each instance, the Test Examiner must provide written affirmation to the School Test Coordinator that student responses have been completed in the student test book with accuracy. Under no circumstances should a student's answer be altered or edited—to do so is a direct violation of test security.

Scripts for Administering the Large Print, Braille, and Paper/Pencil Editions

The specific scripts for administering the Large Print, Braille, and paper/pencil editions of each assessment are located on the **Documents** page of eDIRECT, https://mo.drcedirect.com.

1. From the eDIRECT homepage, log in using your eDIRECT credentials.
2. In the left navigation pane, under **General Information**, select **Documents**.
3. In the main page on the **Documents** tab,
   a. Choose "Summative Grade-Level Assessments Spring 2019" from the Administration drop-down.
   b. Choose "Scripts" from the Document Type drop-down.
   c. Click "Show Documents." A list of all available scripts will appear in the grid.

5.3 After Testing

Assemble Materials for Return and for Entry into INSIGHT

After testing has been completed, prepare materials to be returned to the School Test Coordinator. Check test books to make sure there are no sticky notes, staples, pins, paper clips, or tape of any kind on any pages. Check to make sure that no scratch or graph paper was left inside test books. Remove any extraneous material.

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Transcription of Large Print, Braille, and Paper/Pencil Editions

After testing, student responses for Large Print, Braille, and paper/pencil editions **must** be transcribed into the INSIGHT testing software before the district's test window closes. It is recommended that transcription occur as soon after testing as possible. To transcribe responses requires the Test Examiner or other designated and authorized district or school personnel to log in to INSIGHT using the student's Test Ticket. Follow these steps to transcribe student answers:

1. In eDIRECT Test Setup, ensure that the student has been assigned the appropriate accommodation:

    a. Paper-Based Assessment

    b. Paper-Based Braille

    c. Paper-Based Large Print

2. In eDIRECT Test Setup, assign the student to a test session and print his or her Test Ticket. Retain the Test Ticket rather than distributing it to the student.

3. After the student has completed the test on paper, use a device that has the INSIGHT client software installed and use the student's Test Ticket to log in to the student's test.

4. Begin transcribing student responses. Once you have finished, select End Test and Submit. The Test Examiner should then return all printed test materials to the STC.

Transcribe the student's responses as faithfully and as completely as possible using the following guidelines:

- Do not transcribe erased or crossed out words or marks.
- If a student's response consists of incomprehensible squiggles, marks, etc., which clearly are not words or word fragments, then leave the item blank.
- If a student's response is wholly or partly illegible, enter "ILLEGIBLE" for the entire response or for the part where applicable.
- If 50% or more of a student's response is written in any language other than English, then note "WRITTEN IN ANOTHER LANGUAGE" where applicable.
- If part of a student's response cannot be entered into INSIGHT, then leave that part blank.
- If no part of a student's response can be entered, then leave the entire item blank.
- Additional clarifying notes may be entered as needed if the item type allows text entry.

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APPENDIX A: ITEM TYPES

As students engage with the MAP Grade-Level Assessments through INSIGHT, they will be asked test questions that require them to use technology to respond in several ways, some of which may be new to the test-takers. The following table lists the different item types and briefly describes each one. The Online Tools Training (OTT) and Tutorials provide an opportunity to see examples of the item types administered on the assessments.

Type of Item	Brief Description of How to Respond	ELA	Math	Science
Angle Drawing	Select and drag the ray within the response area.		✓	
Bar Graph	Select the height of the bar or bars in the response area.		✓	✓
Clock Input	Use a drop-down menu to indicate the hour or minute hand. Select and drag the hand or hands within the response area.		✓	
Drag and Drop	Click and drag an object to the appropriate location in the response area.	✓	✓	✓
Drop-Down Menu	Select an answer from a drop-down menu.	✓	✓	✓
Evidence-Based Selected-Response (EBSR), multi-part items	This item type has two parts. Each part may consist of one of three item types: Multiple Choice, Multi-select, and Hot Text. See those item types for descriptions of how to respond.	✓		✓
Graphing on Coordinate Grid	Plot points and/or draw lines in the response area. Use the keyboard to enter labels if required.		✓	✓
Hot Spot/Text Highlight	Highlight an option by selecting it. Select one or more options.	✓	✓	✓
Keypad Input	Select buttons representing numbers and mathematic symbols to create a numeric response or equation.		✓	
Line Plot	Respond by marking an X in the response area.		✓	
Matching (with connecting lines)	Select an option from the first column and then select the corresponding option from the second column to create a line between them. You can match more than one corresponding option in the second column.		✓	

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Appendix A: Item Types, continued

Type of Item	Brief Description of How to Respond	ELA	Math	Science
Matching Table (with a variation True/False or Yes/No)	Select a checkbox corresponding to an option in a table cell.		✓	✓
Multiple Choice	Select the radio button corresponding to one of four options. Select only one option.	✓	✓	✓
Multi-select	Mark a radio button corresponding to an option. Mark one or more options.	✓	✓	✓
Number Lines	Plot points and/or draw lines on the number line.		✓	
Text Input/Constructed Response	Respond via keyboard entry. Science and Math items may include an Equation Builder.		✓	✓
Writing Prompt	Respond via keyboard entry using text formatting buttons.	✓		

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APPENDIX B: INSIGHT KEYBOARD SHORTCUTS AND ICONS

Keyboard shortcuts are available for navigating through the INSIGHT testing system and answering multiple-choice questions. Shortcuts cannot be used to manipulate Technology Enhanced questions, nor can they be used to manipulate additional tools that may be available, such as the line guide or the calculator. These shortcuts are not intended to be a testing accommodation. **Please NOTE: The following keyboard shortcuts are only meant to support desktop platforms (Windows/Mac) – they do not address other devices and/or models students may be using.**

Keyboard Shortcut	Function
Tab	Will move Red Box from one tool to another in forward order (**from left to right**). The Tab focus default on the tool bar applies to Multiple-Choice items only. CR Short/Extended-Input items will have the focus on the CR response area and to get to the pointer you need to click on the pointer tool. Once focus is on the toolbar, then the tabbing feature will work as it does for Multiple-Choice Items.
Shift + tab	Will move Red Box from one tool to another in reverse order (**from right to left**). The Tab focus default on the tool bar applies only to multiple-choice items. CR Short/Extended-Input items will have the focus on the CR response area and to get to the pointer you need to click on the pointer tool. Once focus is on the toolbar, then the tabbing feature will work as it does for Multiple-Choice Items.
Enter	Activates the tool that the tab box is around.
Esc	Will close the active pop-up tool. If user selects ESC while on the tool bar with no active tools, the tab box will move to the pointer.
ABCD, abcd	Selects an answer option on a multiple-choice question. Entering one of the letters fills or un-fills the letter bubble before each answer option. Both uppercase and lowercase letters can be used.
Alt (option) + X	Exits the system from each page that has an Exit button.
Ctrl (control ⌘) + {Left, Right, Up, Down arrows}	Will move the active pop-up tools around on the screen (does not include sticky notes).
Ctrl (control ⌘) + Minus (Numerical Row)	Rotates the active tool 1 degree.
Ctrl (control ⌘) + tab	Switches between multiple active pop-up tools on the screen.
Up/Down Arrows	Moves cursor up or down through the list of questions on the Test Progress/Review Page. It will also continue to move the cursor up or down the selection list of calculator choices, or formula sheet choices.

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Appendix B: INSIGHT Keyboard Shortcuts and Icons, continued

Keyboard Shortcut	Function
Enter	Selects the highlighted test question from the Review/End Test page. Selects Sign In button after Username and Password are entered. Selects Continue from the Student Verification page. Selects the Go To Page number within the quick navigation dropdown arrow.
Alt + Delete	Will clear the Calculator.
"-"	Will work as a shortcut key for subtraction on all Calculators.
"!"	Will work as a shortcut key for factorial on all Scientific/Graphing Calculators.
"("	Will work as a shortcut key for open parenthesis on Scientific/ Graphing Calculators.
")"	Will work as a shortcut key for closed parenthesis on Scientific/ Graphing Calculators.
"*"	Will work as a shortcut key for Multiply on all Calculators.
"/"	Will work as a shortcut key for Divide on all Calculators.
"@"	Will work as a shortcut key for Square on all Scientific/Graphing Calculators.
"+"	Will work as a shortcut key for Add on all Calculators.
"0-9"	Will work as shortcut keys for numeric entry on all Calculators.
Backspace	Will work as a shortcut key for Backspace on all Calculators.
Delete	Will work as a delete function on all Calculators (will not work on a Mac).
Enter	Will work as an Enter key on all Calculators (this will not work for the graphing tools).
^	Will work as a shortcut to take a number to a specific power on scientific/graphing Calculators.
Ctrl+plus/minus ('+' or '-')	Will work to rotate ruler/protractor one degree.
" ' " (apostrophe)	Will works as a Negate key on the Basic Calculator.

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Appendix B: INSIGHT Keyboard Shortcuts and Icons, continued

Keyboard Shortcut	Function
F7	Will activate the Audio "tracks" aka Starting point button when Audio is active (on a Mac use **FUNC F7**). In addition, **ESC** will also disable TTS starting points view, along with Enter or space Key if starting point is active.
F8	Will activate the Play/Pause button when Audio is active (on a Mac use FUNC F8).
F9	Will activate the Stop button when Audio is active (on a Mac use FUNC F9).
Alt (option) – A	Will activate the Audio Settings Pop-up.
Alt (option) – B	Will activate the Back Button, and move student back a question (for Non-CAT tests).
Alt (option) – N	Will activate the Next button, and move the student forward a question.
Alt (option) – O	Will activate the Options button, Color Chooser selection popup window will open, or close the color chooser pop up.
Alt (option) – R	Activates the Review/End Test button and moves the user to the Review page of the test.
Alt (option) – P	Activates the Pause button and pauses the test.
Alt (option) – F	Activates the flagged button and marks an item as flagged or removes a flag from an item.

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Appendix B: INSIGHT Keyboard Shortcuts and Icons, continued

Tool Icon	Tool Name	Tool Definition
	Pointer	The **Pointer** tool is the default tool that is active when you begin. It is used to select answers as well as other tools and features within the online assessment. The **Pointer** will change to a pencil head when moved over a multiple-choice answer bubble. Use it to select your answer. If another tool has been selected, you can return to the **Pointer** tool mode by clicking on the Pointer tool button. This button is at the far left of the tools row.
	Cross-Off	The **Cross-Off** tool is used to narrow down the possible answer choices by allowing you to mark answer choices you believe to be incorrect. This tool is only available for multiple-choice items.
	Highlighter	The **Highlighter** tool is used to highlight important information.
	Sticky Note	The **Sticky Note** allows you to place a short note almost anywhere within the window that contains a question, passage, or scenario. Use a note to mark a special part or to leave a reminder of some important information in that question, passage, or scenario.
	Magnifier	The **Magnifier** allows you to enlarge the entire screen. Other tools, including the **Line Guide, Cross-Off, Highlighter,** and **Calculator,** can be used when the **Magnifier** is turned on.
	Line Guide	The **Line Guide** tool provides a horizontal line that brings the focus to a single line of text. The **Line Guide** can be used to track a passage or an individual question.
   	Measurement Tools	The **Measurement Tools** button allows you to access the ruler or protractor, which can be used to measure an object. The ruler can be moved around the screen and can also be rotated.

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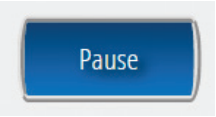
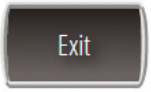
Appendix B: INSIGHT Keyboard Shortcuts and Icons, continued

Tool Icon	Tool Name	Tool Definition
	References	The **References** button allows you to access the reference materials that are available for your test.
	Periodic Table of the Elements	The **Periodic Table of Elements** button allows you to access an interactive Periodic Table of Elements.
	Calculator	The **Calculator** tool may be used to assist with calculations necessary to answer questions on the exam. You will be given a Basic or Scientific calculator.
	Graphing Tool	The **Graphing Tool** is designed to graph functions when solved for the "Y" variable and has the ability to give the corresponding "Y" values for given "X" values.
	Next Button **Back Button**	The **Next** and **Back** buttons are used to navigate between questions on the test. They are also used to move between pages on multi-page questions. Click on the **Next** button to move forward to the next question or page. Click on the **Back** button to move backward to the previous question or page.
 	**Pause** and **Resume**	When the **Pause** button is clicked, the test will be temporarily stopped. The test cannot be paused for more than 20 minutes. A countdown timer will be displayed showing how much longer the test will be paused. At any time during the countdown, the test can be resumed by clicking on the **Resume** button.
	**Exit**	The **Exit** button appears on the Pause Page. Click on **Exit** to close the test. WARNING: If a student exits a test using this button, the test remains incomplete. The student must log in again to complete the test.

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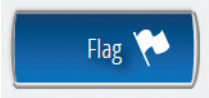
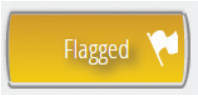
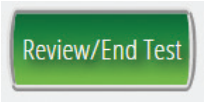
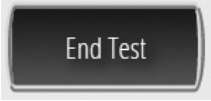
Appendix B: INSIGHT Keyboard Shortcuts and Icons, continued

Tool Icon	Tool Name	Tool Definition
 	**Flag**	Click on the **Flag** button to mark a test question for review at a later time. When you click on the **Flag** button, the color of the button will change to yellow to indicate the question is flagged. To unflag a test question, use the **Pointer** tool to click the button again.
	**Review/End Test**	The **Review/End Test** button allows you to see all of the test questions you have flagged for review. The Review Page also shows which questions have been answered and which have not.
	Return to Questions	The **Return to Questions** button appears on the Review Page. Clicking **Return to Questions** will take the student back to the most recently visited question. The student can then review any questions, and proceed by clicking **Review/End Test** again.
	**End Test**	The **End Test** button appears on the Review Page. Clicking this button will provide a prompt for the student to confirm whether they would like to **Return to Review** or **Submit.**
	Submit	The **Submit** button appears on the window that prompts a student to **Return to Review** or **Submit**. Selecting the **Submit** button will end the exam.
	Return to Review	The **Return to Review** button appears on the window that prompts a student to **Return to Review** or **Submit**. Selecting the **Return to Review** button will take the student back to the Review Page.
	Go to Question	To quickly navigate to any question, passage, or scenario on the test, click on the down arrow next to the question number in the upper-left corner of the screen. A list of all available test questions and scenarios will appear. Click on the number of the test question, passage, or scenario you want to go to, and that question will appear on the screen. Click on the passage or scenario and you will be taken to the first question that appears with the passage or scenario.

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Review Page Key

Key Icon	Key Description
☐	Unanswered item
☑	Answered item
	Flagged item
S	Scenario indicator for Science; example: (S1)
P	Passage indicator for ELA; example: (P1)

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APPENDIX C: MATHEMATICS REFERENCE SHEET GRADES 3–5

Standard Units	Metric Units
Conversions – Length	
1 yard (yd) = 3 feet (ft) = 36 inches (in)	1 centimeter (cm) = 10 millimeters (mm)
1 mile (mi) = 1,760 yards (yd) = 5,280 feet (ft)	1 meter (m) = 100 centimeters (cm)
	1 kilometer (km) = 1,000 meters (m)
Conversions – Volume	
1 cup (c) = 8 fluid ounces (fl oz)	1 liter (l) = 1,000 milliliters (ml)
1 pint (pt) = 2 cups (c)	1 liter (l) = 1,000 cubic centimeters (cc)
1 quart (qt) = 2 pints (pt)	
1 gallon (gal) = 4 quarts (qt)	
Conversions – Weight/Mass	
1 pound (lb) = 16 ounces (oz)	1 gram (g) = 1,000 milligrams (mg)
1 ton = 2,000 pounds (lb)	1 kilogram (kg) = 1,000 grams (g)
Conversions – Time	
1 minute (min) = 60 seconds (sec)	
1 hour (hr) = 60 minutes (min)	
1 day = 24 hours (hr)	

Grade Level(s)	Figure	Formula
Area		
3, 4, 5	Rectangle	$A = l \times w$
3, 4, 5	Square	$A = s \times s$
Volume		
5	Rectangular Prism	$V = B \times h$
Note: The volume *V* of all prisms is $V = B \times h$ where *B* is the area of the base and *h* is the height of the prism.		

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APPENDIX D: SAMPLE STUDENT TOOLS/ACCOMMODATIONS TRACKING FORM

Student Name:

Class/Content:

Teacher/Instructor:

School:

Approved By:

Date:

Universal Tools – Automatic These tools are available by default and do not need to be marked.	☐ Break (Pause)	☐ Mark For Review
	☐ Calculator	☐ Masking – Online
	☐ Color Contrast – Online	☐ Protractor
	☐ English Dictionary	☐ Read Aloud Test To Self
	☐ Grammar Handbook	☐ Reference Sheet
	☐ Graphing Tool	☐ Ruler
	☐ Highlighter	☐ Scratch Paper (Sticky Notes)
	☐ Keyboard Navigation	☐ Strikethrough (Cross Off)
	☐ Line Guide	☐ Thesaurus
	☐ Magnification	☐ Writing Tools

Universal Tools – To Be Marked These tools need to be marked 48 hours prior to testing in order to use them. *Without ELA Reading Passages	☐ Bilingual Dictionary	☐ *Read Aloud – Human Reader
	☐ Color Contrast – Paper	☐ *Read Aloud – Native Language
	☐ Color Overlay	☐ *Read Aloud – Text-To-Speech
	☐ Magnification – Assistive Tech	☐ Scribe
	☐ Masking – Paper	☐ Separate Setting
	☐ Non-Accommodation Paper Based	☐ Translation
	☐ *Read Aloud – Assistive Tech	

Accommodations Accommodations need to be marked 48 hours prior to testing in order to use them. **With ELA Reading Passages	☐ Abacus (Math)	☐ **Read Aloud – Assistive Tech
	☐ Alternate Response Options	☐ **Read Aloud – Human Reader
	☐ Braille	☐ **Read Aloud – Native Language
	☐ Calculator – Non Calc Items	☐ **Read Aloud – Text-To-Speech
	☐ Closed Captioning	☐ Sign Language
	☐ Large Print	☐ Specialized Calculator (Math/Sci)
	☐ Multiplication Table (Math)	☐ Speech-To-Text
	☐ Paper Based Assessment	

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Examiner's Manual

Grade 5
English Language Arts, Mathematics, and Science Assessments

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Appendix C: MAP Guide to Interpreting Results

Missouri Assessment Program Grade-Level Assessments

Guide to Interpreting Results

Summative Assessments

English Language Arts, Mathematics, and Science

October 2019

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This guide has been prepared by Data Recognition Corporation (DRC) to provide an overview for interpreting reports generated from the Missouri Assessment Program (MAP). It is intended to help educators apply MAP data to the needs of individual students and the district as a whole.

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INTRODUCTION

Educational Assessment: A Primary Tool

Assessment, or testing, fulfills a vital role in today's educational environment. Assessment results often are a major force in shaping public perceptions about the capabilities of our students and the quality of our schools. As a primary tool for educators and policymakers, assessment is used for many important purposes. Educators use assessment results to help improve teaching and learning and to evaluate programs and schools. Policy decisions are often based, in part, on assessment data. Because of its important role, educational assessment is used in every classroom, school, district, and state. It is vital to innovation, higher standards, and educational excellence.

Originally developed in response to Missouri's Outstanding Schools Act of 1993, the **Missouri Assessment Program (MAP)** encompasses several statewide assessments that meet state and federal statutory requirements. **MAP Grade-Level Assessments** are administered to students in grades 3 through 8 to determine their progress toward the Show-Me Standards/Missouri Learning Standards. As directed by the Outstanding Schools Act, the Show-Me Standards were developed by the Missouri Department of Elementary and Secondary Education (DESE), in cooperation with teachers, school administrators, parents, and business professionals throughout the state, to identify the knowledge, skills, and competencies that Missouri students should acquire prior to graduating from high school. For a more detailed explanation of the Show-Me Standards, refer to the DESE website (http://dese.mo.gov/show-me-standards). The Missouri Learning Standards articulate the Show-Me Standards in each content area across the grade levels. MAP Grade-Level Assessment items are aligned with the Missouri Learning Standards, which are available on the DESE website (http://dese.mo.gov/college-career-readiness/curriculum/missouri-learning-standards).

The spring 2019 Grade-Level MAP includes the following required assessments:

English Language Arts (ELA)—Grades 3–8

Mathematics—Grades 3–8

Science—Grades 5 and 8

The ELA assessments for students in grades 3, 5, 6, and 7 required approximately 1½ to 3 hours of test administration time. The ELA assessments for students in grades 4 and 8 required approximately 3–5 hours. The Mathematics assessments for students in grades 3–8 required approximately 2 to 2½ hours. In addition, students in grades 5 and 8 took a Science assessment that required an additional 2 to 3 hours of test administration. All assessments were administered online, unless students required a Braille, Large Print, or paper/pencil form as an accommodation.

For all grade levels (3 through 8), the MAP Grade-Level Assessments in ELA and Mathematics include multiple item types. **Selected-response items** (also known as multiple-choice) present students with a question followed by three or more response options. **Short-text items** require students to type an appropriate response. **Technology-enhanced items** use innovative technology to allow students to demonstrate their knowledge in ways that are not possible using paper/pencil assessments. For example, the items may require students to drag and drop data into a table, click on "hot spots" within a graphic, or indicate their response on a grid. Short-text and technology-enhanced items are machine scored.

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The ELA assessments in grades 4 and 8 also include a **writing prompt**. Writing prompts are a special type of performance event in which a student demonstrates his or her proficiency at writing. The ELA writing prompt is scored by trained human readers using a 10-point rubric that evaluates purpose and organization, evidence and elaboration, and conventions. Additional information on the rubrics for the writing process can be found on the DESE website (https://dese.mo.gov/college-career-readiness/curriculum/english-language-arts) under the Assessment Resources tab.

The Mathematics assessments in all grades include a performance event (PE). The PEs are designed to provide students with an opportunity to demonstrate their ability to apply their knowledge and higher-order thinking skills to explore and analyze a complex, real-world scenario. At grades 6–8, the performance event includes hand-scored constructed-response items as well as the autoscored items. Mathematics constructed-response items are scored by trained human readers using established scoring criteria.

The MAP Grade-Level Assessments in Science include selected-response items, technology-enhanced items, as well as **constructed-response items**, which require students to supply their answer (similar to short-text items). Science constructed-response items are scored by trained human readers using established scoring criteria.

The Department uses the information obtained through MAP to monitor the progress of Missouri's students toward meeting the Missouri Learning Standards in order to inform the public and the state legislature about student performance and to help make informed decisions about educational issues. The information obtained through MAP provides the academic performance data that drive student services throughout the state. The **MAP Grade-Level Assessment reports** provide useful information for determining the performance of individual students, as well as student performance at the classroom, building, district, and state levels.

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ASSESSMENT TERMS AND TYPES OF SCORES

Familiarity with the testing terms and the types of scores used in the MAP reports and other components will help you interpret test information accurately and efficiently.

MAP Scale Score

Data Recognition Corporation (DRC), the MAP Grade-Level Assessments testing vendor, uses the student's correct responses to derive a MAP scale score. The scale score describes achievement on a continuum that spans in most cases the complete range of grades 3–8. These scores range in value from 160–650 for English Language Arts and from 185–660 for Mathematics. Science scale score ranges are 100–540 for grade 5 and 285–710 for grade 8. Scale scores for English Language Arts, Mathematics, and Science are computed for the total test and for each reporting category.

The total test scale score is based on student performance on the entire test and indicate a student's overall achievement in English Language Arts, Mathematics, or Science. Higher scale scores indicate higher performance on the test and lower scale scores indicate lower performance on the test.

The reporting category scale score is based on student performance on a subset of test questions measuring a given content category (or domain) of English Language Arts, Mathematics, and Science. These scores represent student performance on the test reporting categories which are listed below:

English Language Arts Grades 3 through 8

- Reading
- Research
- Writing
- Listening

Mathematics Grades 3, 4 and 5

- Number Sense and Operations in Base Ten
- Number Sense and Operations in Fractions
- Relationships and Algebraic Thinking
- Geometry and Measurement & Data and Statistics

Mathematics Grades 6 and 7

- Ratios and Proportional Relationships
- Number Sense and Operations
- Expressions, Equations and Inequalities
- Geometry and Measurement & Data Analysis, Statistics and Probability

Mathematics Grade 8

- Number Sense and Operations & Expressions, Equations and Inequalities
- Geometry and Measurement Data Analysis, Statistics and Probability
- Functions

Science Grades 5 and 8

- Physical Science
- Life Science
- Earth and Space Science

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Each reporting category is measured by a minimum of 6 items yielding a minimum of 8 raw score points. Mathematics domains with fewer than 6 items were combined with other domains to increase the reliability of the reporting category scale scores.

Performance Levels

Student performance on the total test can be reported in terms of four performance levels that describe a pathway to proficiency and *college and career readiness*. Each performance level represents standards of performance for English Language Arts, Mathematics, and Science. Panels drawn from education, business, and professional communities determined the performance standards. Performance-level scores provide a description of what students can do in terms of the content and skills assessed, as described in the Missouri Learning Standards. Performance levels are not determined for reporting categories. Instead, a student's reporting category score can be compared to the total test score that separates *Basic* level from *Proficient* level.

Lowest Obtainable Scale Score and Level Not Determined

Within each grade level and content area, a Lowest Obtainable Scale Score (LOSS) is established for students whose scores are below the level expected by guessing. Students with certain accommodations that impact the construct being assessed (e.g., read-aloud of ELA passages for students in grades 3–5) also receive a LOSS.

A student may receive "Level Not Determined" (LND) instead of a MAP scale score. Students who receive LND are not assigned to a performance level. Students may receive LND for the following reason:

- A student is absent for all testing sessions for a particular content area.

Standard Error of Measurement

No test provides a perfect measure of a student's ability. This situation is expected because all tests have a known Standard Error of Measurement (SEM). The SEM reports the amount of variability that can be expected in a student's test score due to the inherent imprecision of the test. In other words, the SEM represents a range of scale scores in which the student's score would likely fall if the student took the same test again. The SEM around the English Language Arts, Mathematics, and Science total test and reporting category scale scores is included, in a graphical format, in the Individual Student Report and will be reported in the 2019 MAP Technical Report.

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PERFORMANCE-LEVEL DESCRIPTORS

English Language Arts, Reporting Performance-Level Descriptors

Grade 3

Below Basic

Students performing at the Below Basic level on the Missouri Assessment Program demonstrate a minimal command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently and/or incorrectly in reading processes responding to literary and informational texts and in writing, listening, and speaking forms. Students performing at the Below Basic level use few strategies to comprehend and interpret texts, demonstrate little understanding of literary forms, and apply few strategies for accessing information.

They demonstrate little or no ability to organize and/or develop writing or exhibit little command of the conventions of standard English.

MAP score range: 160–330

Basic

Students performing at the Basic level on the Missouri Assessment Program demonstrate a partial or uneven command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently, partially, or with below-grade-level text; in reading processes responding to both literary and informational texts (in minimal genres); and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Below Basic level, students performing at the Basic level use some strategies to comprehend and interpret a variety of texts, demonstrate a partial understanding of literary forms, and inconsistently apply some strategies for accessing and summarizing information. They demonstrate an inconsistent ability to organize and/or develop writing and exhibit an inconsistent command of the conventions of standard English.

MAP score range: 331–363

Proficient

Students performing at the Proficient level on the Missouri Assessment Program demonstrate an adept command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently and skillfully in reading processes in responding to literary and informational text and media (in different genres) and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Basic level, students performing at the Proficient level use a range of strategies to comprehend and interpret a variety of texts, demonstrate an understanding of literary forms, and apply strategies for accessing and summarizing information. They demonstrate an adequate ability to organize and develop writing (in different forms and for different purposes and audiences) using specific vocabulary and exhibit a competent command of the conventions of standard English.

MAP score range: 364–394

Advanced

Students performing at the Advanced level on the Missouri Assessment Program demonstrate a thorough command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently, precisely, and expertly in reading processes in responding to literary and informational text and media (in different genres) and in writing, listening, and speaking forms efficiently and effectively for different audiences and purposes. In addition to demonstrating, understanding, and applying the skills at the Proficient level, students performing at the Advanced level use a wide range of strategies to comprehend and interpret a variety of texts at a more complex level, demonstrate a complete and thorough understanding of literary forms, and consistently apply a wide range of different strategies for accessing and summarizing information. They demonstrate an effective and thorough ability to organize, develop, and reflect/analyze their own writing (in different forms and for different purposes and audiences) using specific vocabulary and exhibit an extensive command of the conventions of standard English.

MAP score range: 395–560

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Grade 4

Below Basic

Students performing at the Below Basic level on the Missouri Assessment Program demonstrate a minimal command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently and/or incorrectly in reading processes responding to literary and informational texts and in writing, listening, and speaking forms. Students performing at the Below Basic level use few strategies to comprehend and interpret texts, demonstrate little understanding of literary forms, and apply few strategies for accessing information. They demonstrate little or no ability to organize and/or develop writing or exhibit little command of the conventions of standard English.

MAP score range: 170–336

Basic

Students performing at the Basic level on the Missouri Assessment Program demonstrate a partial or uneven command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently, partially, or with below-grade-level text; in reading processes responding to both literary and informational texts (in minimal genres); and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Below Basic level, students performing at the Basic level use some strategies to comprehend and interpret a variety of texts, demonstrate a partial understanding of literary forms, and inconsistently apply some strategies for accessing and summarizing information. They demonstrate an inconsistent ability to organize and/or develop writing and exhibit an inconsistent command of the conventions of standard English.

MAP score range: 337–387

Proficient

Students performing at the Proficient level on the Missouri Assessment Program demonstrate an adept command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently and skillfully in reading processes in responding to literary and informational text and media (in different genres) and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Basic level, students performing at the Proficient level use a range of strategies to comprehend and interpret a variety of texts, demonstrate an understanding of literary forms, and apply strategies for accessing and summarizing information. They demonstrate an adequate ability to organize and develop writing (in different forms and for different purposes and audiences) using specific vocabulary and exhibit a competent command of the conventions of standard English.

MAP score range: 388–418

Advanced

Students performing at the Advanced level on the Missouri Assessment Program demonstrate a thorough command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently, precisely, and expertly in reading processes in responding to literary and informational text and media (in different genres) and in writing, listening, and speaking forms efficiently and effectively for different audiences and purposes. In addition to demonstrating, understanding, and applying the skills at the Proficient level, students performing at the Advanced level use a wide range of strategies to comprehend and interpret a variety of texts at a more complex level, demonstrate a complete and thorough understanding of literary forms, and consistently apply a wide range of different strategies for accessing and summarizing information. They demonstrate an effective and thorough ability to organize, develop, and reflect/analyze their own writing (in different forms and for different purposes and audiences) using specific vocabulary and exhibit an extensive command of the conventions of standard English.

MAP score range: 419–570

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Grade 5

Below Basic

Students performing at the Below Basic level on the Missouri Assessment Program demonstrate a minimal command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently and/or incorrectly in reading processes responding to literary and informational texts and in writing, listening, and speaking forms. Students performing at the Below Basic level use few strategies to comprehend and interpret texts, demonstrate little understanding of literary forms, and apply few strategies for accessing information. They demonstrate little or no ability to organize and/or develop writing or exhibit little command of the conventions of standard English.

MAP score range: 210–350

Basic

Students performing at the Basic level on the Missouri Assessment Program demonstrate a partial or uneven command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently, partially, or with below-grade-level text; in reading processes responding to both literary and informational texts (in minimal genres); and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Below Basic level, students performing at the Basic level use some strategies to comprehend and interpret a variety of texts, demonstrate a partial understanding of literary forms, and inconsistently apply some strategies for accessing and summarizing information. They demonstrate an inconsistent ability to organize and/or develop writing and exhibit an inconsistent command of the conventions of standard English.

MAP score range: 351–402

Proficient

Students performing at the Proficient level on the Missouri Assessment Program demonstrate an adept command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently and skillfully in reading processes in responding to literary and informational text and media (in different genres) and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Basic level, students performing at the Proficient level use a range of strategies to comprehend and interpret a variety of texts, demonstrate an understanding of literary forms, and apply strategies for accessing and summarizing information. They demonstrate an adequate ability to organize and develop writing (in different forms and for different purposes and audiences) using specific vocabulary and exhibit a competent command of the conventions of standard English.

MAP score range: 403–430

Advanced

Students performing at the Advanced level on the Missouri Assessment Program consistently demonstrate a thorough command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently and skillfully in reading processes in responding to literary and informational text, and in writing efficiently. In addition to demonstrating, understanding, and applying the skills at the Proficient level, students performing at the Advanced level use a wide range of strategies to comprehend and interpret a variety of texts, demonstrate a thorough understanding of literary forms, and consistently apply a wide range of different strategies for accessing and summarizing information. They demonstrate an effective and thorough ability to organize and develop writing and exhibit an adequate command of the conventions of standard English.

MAP score range: 431–600

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Grade 6

Below Basic

Students performing at the Below Basic level on the Missouri Assessment Program demonstrate a minimal command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently and/or incorrectly in reading processes responding to literary and informational texts and in writing, listening, and speaking forms. Students performing at the Below Basic level use few strategies to comprehend and interpret texts, demonstrate little understanding of literary forms, and apply few strategies for accessing information. They demonstrate little or no ability to organize and/or develop writing or exhibit little command of the conventions of standard English.

MAP score range: 230–370

Basic

Students performing at the Basic level on the Missouri Assessment Program demonstrate a partial or uneven command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently in reading processes responding to both literary and informational texts and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Below Basic level, students performing at the Basic level use some strategies to comprehend and interpret a variety of texts, demonstrate a partial understanding of literary forms, and inconsistently apply few strategies for accessing and summarizing information. They demonstrate an inconsistent ability to organize and/or develop writing and exhibit an inconsistent command of the conventions of standard English.

MAP score range: 371–412

Proficient

Students performing at the Proficient level on the Missouri Assessment Program demonstrate an adequate command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently and competently in reading processes in responding to literary and informational texts and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Basic level, students performing at the Proficient level use a range of strategies to comprehend and interpret a variety of texts, demonstrate an understanding of literary forms, and apply strategies for accessing and summarizing information. They demonstrate an adequate ability to organize and develop writing and exhibit a competent command of the conventions of standard English.

MAP score range: 413–437

Advanced

Students performing at the Advanced level on the Missouri Assessment Program consistently demonstrate a thorough command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently and skillfully in reading processes in responding to literary and informational texts and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Proficient level, students performing at the Advanced level use a wide range of strategies to comprehend and interpret a variety of texts, demonstrate a complete and thorough understanding of literary forms, and consistently apply a wide range of different strategies for accessing and summarizing information. They demonstrate an effective and thorough ability to organize and develop writing and exhibit an extensive command of the conventions of standard English.

MAP score range: 438–620

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Grade 7

Below Basic

Students performing at the Below Basic level on the Missouri Assessment Program demonstrate a minimal command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently and/or incorrectly in reading processes responding to literary and informational texts and in writing, listening, and speaking forms. Students performing at the Below Basic level use few strategies to comprehend and interpret texts, demonstrate little understanding of literary forms, and apply few strategies for accessing information. They demonstrate little or no ability to organize and/or develop writing or exhibit little command of the conventions of standard English.

MAP score range: 240–383

Basic

Students performing at the Basic level on the Missouri Assessment Program demonstrate a partial or uneven command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently in reading processes responding to both literary and informational texts and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Below Basic level, students performing at the Basic level use some strategies to comprehend and interpret a variety of texts, demonstrate a partial understanding of literary forms, and inconsistently apply few strategies for accessing and summarizing information. They demonstrate an inconsistent ability to organize and/or develop writing and exhibit an inconsistent command of the conventions of standard English.

MAP score range: 384–434

Proficient

Students performing at the Proficient level on the Missouri Assessment Program demonstrate an adequate command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently and competently in reading processes in responding to literary and informational texts and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Basic level, students performing at the Proficient level use a range of strategies to comprehend and interpret a variety of texts, demonstrate an understanding of literary forms, and apply strategies for accessing and summarizing information. They demonstrate an adequate ability to organize and develop writing and exhibit a competent command of the conventions of standard English.

MAP score range: 435–455

Advanced

Students performing at the Advanced level on the Missouri Assessment Program consistently demonstrate a thorough command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently and skillfully in reading processes in responding to literary and informational texts and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Proficient level, students performing at the Advanced level use a wide range of strategies to comprehend and interpret a variety of texts, demonstrate a complete and thorough understanding of literary forms, and consistently apply a wide range of different strategies for accessing and summarizing information. They demonstrate an effective and thorough ability to organize and develop writing and exhibit an extensive command of the conventions of standard English.

MAP score range: 456–630

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Grade 8

Below Basic

Students performing at the Below Basic level on the Missouri Assessment Program demonstrate a minimal command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently and/or incorrectly in reading processes in responding to literary and informational text and in writing, listening, and speaking forms. Students performing at the Below Basic level use few strategies to comprehend and interpret texts and media. They demonstrate little understanding of literary forms and apply few strategies for accessing information while rarely taking into account credibility of sources. They demonstrate little or no ability to organize and/or develop writing. Students exhibit little command of the conventions of standard English.

MAP score range: 250–392

Basic

Students performing at the Basic level on the Missouri Assessment Program demonstrate a partial or limited command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently in reading processes in responding to literary and informational text and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Below Basic level, students performing at the Basic level use some strategies to comprehend, interpret, and support an analysis of a variety of texts and media. They demonstrate a partial understanding of literary forms and inconsistently apply few strategies for accessing and summarizing information while occasionally taking into account credibility of sources. They demonstrate an inconsistent ability to organize and/or develop writing and exhibit an inconsistent command of the conventions of standard English.

MAP score range: 393–442

Proficient

Students performing at the Proficient level on the Missouri Assessment Program demonstrate an adequate command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently and competently in reading processes in responding to literary and informational text and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Basic level, students performing at the Proficient level use a range of strategies to comprehend, interpret, and support an analysis of a variety of texts and media. They demonstrate an understanding of literary forms and apply strategies for accessing and summarizing information while regularly taking into account credibility of sources. They demonstrate a sufficient ability to organize and develop writing and exhibit a competent command of the conventions of standard English.

MAP score range: 443–475

Advanced

Students performing at the Advanced level on the Missouri Assessment Program consistently demonstrate a thorough command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently and skillfully in reading processes in responding to literary and informational text and in writing, listening, and speaking forms. In addition to demonstrating, understanding, and applying the skills at the Proficient level, students performing at the Advanced level use a wide range of strategies to comprehend and interpret a variety of texts, demonstrate a complete and thorough understanding of literary forms, and consistently apply a wide range of different strategies for accessing and summarizing information. They demonstrate an effective and thorough ability to organize and develop writing and exhibit an extensive command of the conventions of standard English.

MAP score range: 476–650

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Mathematics, Reporting Performance-Level Descriptors

Grade 3

Below Basic

Below Basic do not yet demonstrate proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students need substantial academic support to be prepared for the next grade level or course and to be on track for *college and career readiness*.

MAP score range: 185–325

Basic

Basic demonstrate partial proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students need additional academic support to ensure success in the next grade level or course and to be on track for *college and career readiness*.

MAP score range: 326–361

Proficient

Proficient demonstrate proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations, and uses clear and precise language when communicating mathematical understanding. The students are prepared for the next grade level or course and are on track for *college and career readiness*.

MAP score range: 362–389

Advanced

Advanced demonstrate advanced proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students are well prepared for the next grade level or course and are well prepared for *college and career readiness*.

MAP score range: 390–520

Grade 4

Below Basic

Below Basic do not yet demonstrate proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students need substantial academic support to be prepared for the next grade level or course and to be on track for *college and career readiness*.

MAP score range: 210–357

Basic

Basic demonstrate partial proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students need additional academic support to ensure success in the next grade level or course and to be on track for *college and career readiness*.

MAP score range: 358–386

Proficient

Proficient demonstrate proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations, and uses clear and precise language when communicating mathematical understanding. The students are prepared for the next grade level or course and are on track for *college and career readiness*.

MAP score range: 387–412

Advanced

Advanced demonstrate advanced proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students are well prepared for the next grade level or course and are well prepared for *college and career readiness*.

MAP score range: 413–540

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Grade 5

Below Basic

Below Basic do not yet demonstrate proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students need substantial academic support to be prepared for the next grade level or course and to be on track for *college and career readiness*.

MAP score range: 250–376

Basic

Basic demonstrate partial proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students need additional academic support to ensure success in the next grade level or course and to be on track for *college and career readiness*.

MAP score range: 377–409

Proficient

Proficient demonstrate proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations, and uses clear and precise language when communicating mathematical understanding. The students are prepared for the next grade level or course and are on track for *college and career readiness*.

MAP score range: 410–434

Advanced

Advanced demonstrate advanced proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students are well prepared for the next grade level or course and are well prepared for *college and career readiness*.

MAP score range: 435–570

Grade 6

Below Basic

Below Basic do not yet demonstrate proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students need substantial academic support to be prepared for the next grade level or course and to be on track for *college and career readiness*.

MAP score range: 260–387

Basic

Basic demonstrate partial proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students need additional academic support to ensure success in the next grade level or course and to be on track for *college and career readiness*.

MAP score range: 388–416

Proficient

Proficient demonstrate proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations, and uses clear and precise language when communicating mathematical understanding. The students are prepared for the next grade level or course and are on track for *college and career readiness*.

MAP score range: 417–437

Advanced

Advanced demonstrate advanced proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students are well prepared for the next grade level or course and are well prepared for *college and career readiness*.

MAP score range: 438–580

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Grade 7

Below Basic

Students do not yet demonstrate proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. These students need substantial academic support to be prepared for the next grade level or course and to be on track for *college and career readiness*.

MAP score range: 270–393

Basic

Students demonstrate partial proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. These students need additional academic support to ensure success in the next grade level or course and to be on track for *college and career readiness*.

MAP score range: 394–434

Proficient

Students demonstrate proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. These students are prepared for the next grade level or course and are on track for *college and career readiness*.

MAP score range: 435–461

Advanced

Students demonstrate advanced proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. These students are well prepared for the next grade level or course and are well prepared for *college and career readiness*.

MAP score range: 462–600

Grade 8

Below Basic

Students do not yet demonstrate proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. These students need substantial academic support to be prepared for the next grade level or course and to be on track for *college and career readiness*.

MAP score range: 310–419

Basic

Students demonstrate partial proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. These students need additional academic support to ensure success in the next grade level or course and to be on track for *college and career readiness*.

MAP score range: 420–467

Proficient

Students demonstrate proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. These students are prepared for the next grade level or course and are on track for *college and career readiness*.

MAP score range: 468–505

Advanced

Students demonstrate advanced proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. These students are well prepared for the next grade level or course and are well prepared for *college and career readiness*.

MAP score range: 506–660

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Science, Reporting Performance-Level Descriptors

Grade 5

Below Basic

A 5th grade student performing at Below Basic seldom applies science and engineering practices to explain phenomena and design solutions to problems in the natural and the designed world. The student occasionally identifies models and information to identify patterns in data, and to describe parts of systems. The student infrequently recognizes trends in the data collected during an investigation in order to answer questions or to identify possible solutions to problems. The student occasionally uses data and basic computational thinking to explain the cause and effect relationships.

MAP score range: 100–274

Basic

A 5th grade student performing at Basic applies, with support, science and engineering practices to explain phenomena and design solutions to problems in the natural and the designed world. The student uses models and information to support arguments and explanations, to identify patterns in data, and to describe relationships among parts of systems. The student identifies the data to collect in an investigation in order to answer questions or to describe possible solutions to problems. The student uses data and basic computational thinking to support arguments and explanations about cause and effect relationships.

MAP score range: 275–309

Proficient

A 5th grade student performing at Proficient effectively applies science and engineering practices to explain phenomena and design solutions to problems in the natural and the designed world. The student develops and uses models and information to construct arguments and explanations and to identify and describe patterns in data and system characteristics. The student asks questions that can be investigated and designs solutions to problems that meet given criteria and constraints. The student uses data and mathematical and computational thinking to construct arguments and explanations about cause and effect relationships.

MAP score range: 310–343

Advanced

A 5th grade student performing at Advanced effectively, consistently, and appropriately applies science and engineering practices to explain phenomena and design solutions to problems in the natural and the designed world. The student evaluates models and information and revises arguments and explanations by analyzing patterns in data, cause and effect relationships, and system interactions. The student conducts investigations to collect data in order to answer questions and uses criteria and constraints to evaluate solutions to a problem. The student uses mathematical and computational thinking and scientific reasoning to analyze and interpret data in order to evaluate arguments and explanations about cause and effect relationships.

MAP score range: 344–540

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Grade 8

Below Basic

An 8th grade student performing at Below Basic seldom applies science and engineering practices to explain phenomena and design solutions to problems in the natural and the designed world. The student occasionally identifies models, information, and patterns in data to describe relationships among parts of systems and to make predictions about how systems change over time. The student infrequently recognizes trends in the data collected during an investigation in order to identify the relationship between two variables. The student can sometimes identify a solution to a problem. The student occasionally uses data and basic mathematical thinking to explain the cause and effect relationships among parts of systems.

MAP score range: 285–467

Basic

An 8th grade student performing at Basic applies, with support, science and engineering practices to explain phenomena and design solutions to problems in the natural and the designed world. The student uses models, information, and patterns in data to describe relationships among parts of systems and to make predictions about how systems change over time. The student describes the data to collect in an investigation in order to identify the relationship between two variables. The student identifies a solution to a problem that meets given criteria for success. The student uses data and basic mathematical thinking to support arguments and explanations about cause and effect relationships among parts of systems.

MAP score range: 468–509

Proficient

An 8th grade student performing at Proficient effectively applies science and engineering practices to explain phenomena and design solutions to problems in the natural and the designed world. The student develops models and uses information and patterns in data to describe relationships among parts of systems and to identify scientific principles, which can be used to make predictions about how systems change over time. The student asks questions and plans investigations to determine the relationship between two variables. The student identifies criteria and constraints and uses patterns in data to evaluate solutions to problems. The student uses data and mathematical and computational thinking to construct arguments and explanations about how parts of a system depend on each other.

MAP score range: 510–536

Advanced

An 8th grade student performing at Advanced effectively, consistently, and appropriately applies science and engineering practices to explain phenomena and design solutions to problems in the natural and the designed world. The student evaluates how well models, information, and patterns in data describe relationships among parts of systems, and uses scientific principles and reasoning to make predictions about how systems change over time. The student plans and evaluates investigations designed to determine the relationship between two variables. The student uses patterns in data to determine which solution to a problem best meets the criteria for success. The student uses data, mathematical and computational thinking, and scientific reasoning to construct and evaluate arguments and explanations about how parts of a system depend on each other.

MAP score range: 537–710

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SAMPLE REPORTS

Individual Student Report (ISR)

The Individual Student Report (ISR) provides information about performance on the MAP Grade-Level Assessments in English Language Arts, Mathematics, and Science, describing results in terms of four levels of performance in a content area. This information may be used for instructional planning, as a point of reference during a parent/teacher conference, and for permanent record keeping. Other sources of information, such as classroom performance, should be used along with this report when determining the student's areas of strength or need.

Performance-level scores describe what students can do in terms of the content and skills assessed by the MAP. Because the English Language Arts, Mathematics, and Science Missouri Learning Standards are grounded in expectations for *college and career readiness*, the MAP Grade-Level Assessments are designed to measure each student's progress toward meeting those expectations. Teachers, students, and parents/guardians can use this information, in addition to how the student performs in the classroom, to determine what skills and abilities need to be acquired to enable the student to progress to higher performance levels. A student in the Proficient or Advanced level has met the standard. Students in the Below Basic and Basic levels have typically mastered skills described for their levels, but need to work on skills in higher levels.

The following page contains a sample Individual Student Report.

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Sample Individual Student Report

Missouri DEPARTMENT OF ELEMENTARY & SECONDARY EDUCATION

Student Report

Student Name: Tomkowicz, Joanna R
Grade: 4
Student ID: 0123456789
Test Date: Spring 2019

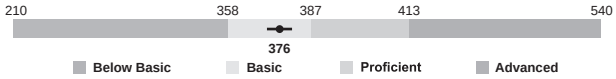
1

District Name: Any District
School Name: Any School
School Group: Home School

Missouri Assessment Program (MAP)

MAP stands for Missouri Assessment Program. It is a series of assessments for English language arts, mathematics and science at grades 3-8; and English language arts, mathematics, science and social studies in high school. These assessments are designed to check student learning to find out if Missouri students are reaching the Missouri Learning Standards Grade-Level Expectations.

Mathematics | Scale Score 376 2



The symbol shows the student's scale score represented by the dark circle. The horizontal line represents the range of scale scores in which the student's test score would likely fall if the student were to take the same test again.

Performance Level: Basic 3

Basic demonstrate partial proficiency in the knowledge and skills necessary at this grade level/course of learning, as specified in content expectations. The students need additional academic support to ensure success in the next grade level or course and to be on track for college and career readiness.

Mathematics | Reporting Category Scale Scores 4

Category	Student Results 210 — 387* — 540
Number Sense and Operations in Base Ten	397
Number Sense and Operations in Fractions	350
Relationships and Algebraic Thinking	390
Geometry and Measurement + Data and Statistics**	388

The symbol shows the student's reporting category scale score represented by the dark circle. The horizontal line represents the range of reporting category scale scores in which the student's score would likely fall if the student were to take the same test again.

* This value represents the total scale score that separates Basic level from Proficient level.

** Categories were combined in cases where one or both categories did not have a sufficient number of items for reliable reporting. Combined categories yield at least 8 raw score points, which is a minimum number of points required for computation of category scale scores.

DATA RECOGNITION DRC CORPORATION

For more information on the MAP student report, please visit the Missouri Department of Elementary and Secondary Education website at https://dese.mo.gov/map-information-parents.

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1. This area of the report is reserved for the name and biographical data of the student taking the assessment.
2. This is your child's scale score.
3. This is your child's Performance Level.
4. This is your child's scale score for each of the listed reporting categories.

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Student Label

MISSOURI
ASSESSMENT PROGRAM

SAMPLE, STUDENT1

❶

Grade:	**Grade 4**
Test Date:	**04/01/2019**
DOB:	**01/01/2009**
MOSIS State ID:	**1234567890**

Content Area	**Mathematics**
Performance Level	**Basic** ❷
MAP Scale Score	**376** ❸

02/22/2019

Above is a sample of the MAP student label. The student label is designed so that each student's test results can be placed in the student's permanent record. A label is provided for every student who participated in the spring 2019 administration of the MAP. Each label has a self-adhesive backing so that it can be peeled from the sheet and placed in the student's cumulative school record. The label presents a snapshot of the student's results on the MAP. Separate labels are generated for each grade and content area; thus, a student will have multiple labels—one for each of the content areas administered within a grade.

❶ **Student Demographic Information.** The left side of the label lists the name and biographical data of the student taking the assessment.

❷ **Performance Level.** This is the student's Performance Level (Advanced, Proficient, Basic, or Below Basic).

❸ **Scale Score.** This is the student's Scale Score for the content area listed at the top of the label.

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Appendix D: Conditional Standard Error of Measurement with Cut Scores

Figure D1: CSEM with Cut Scores, English Language Arts Grade 3, Form A

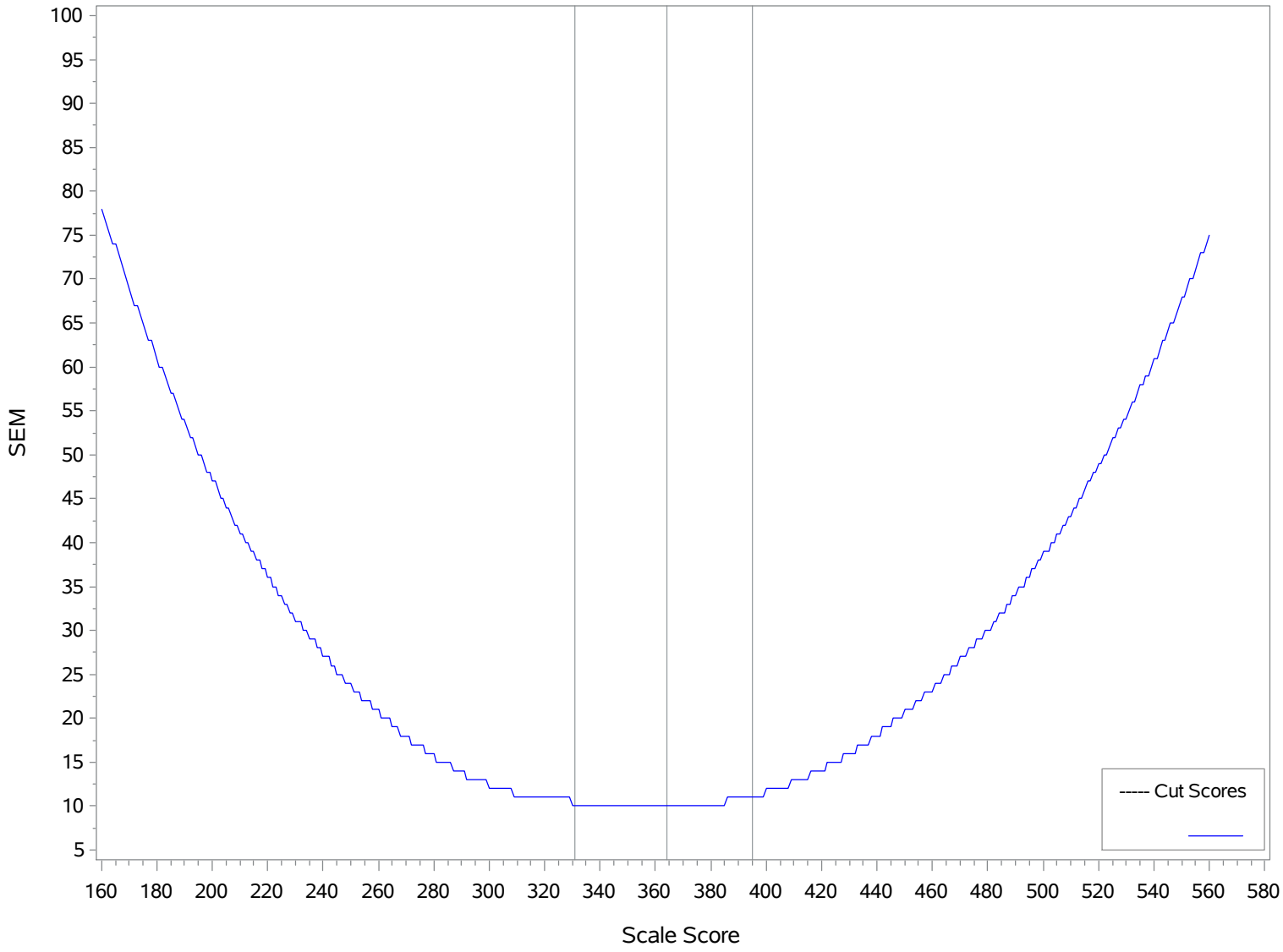


Figure D2: CSEM with Cut Scores, English Language Arts Grade 3, Form B

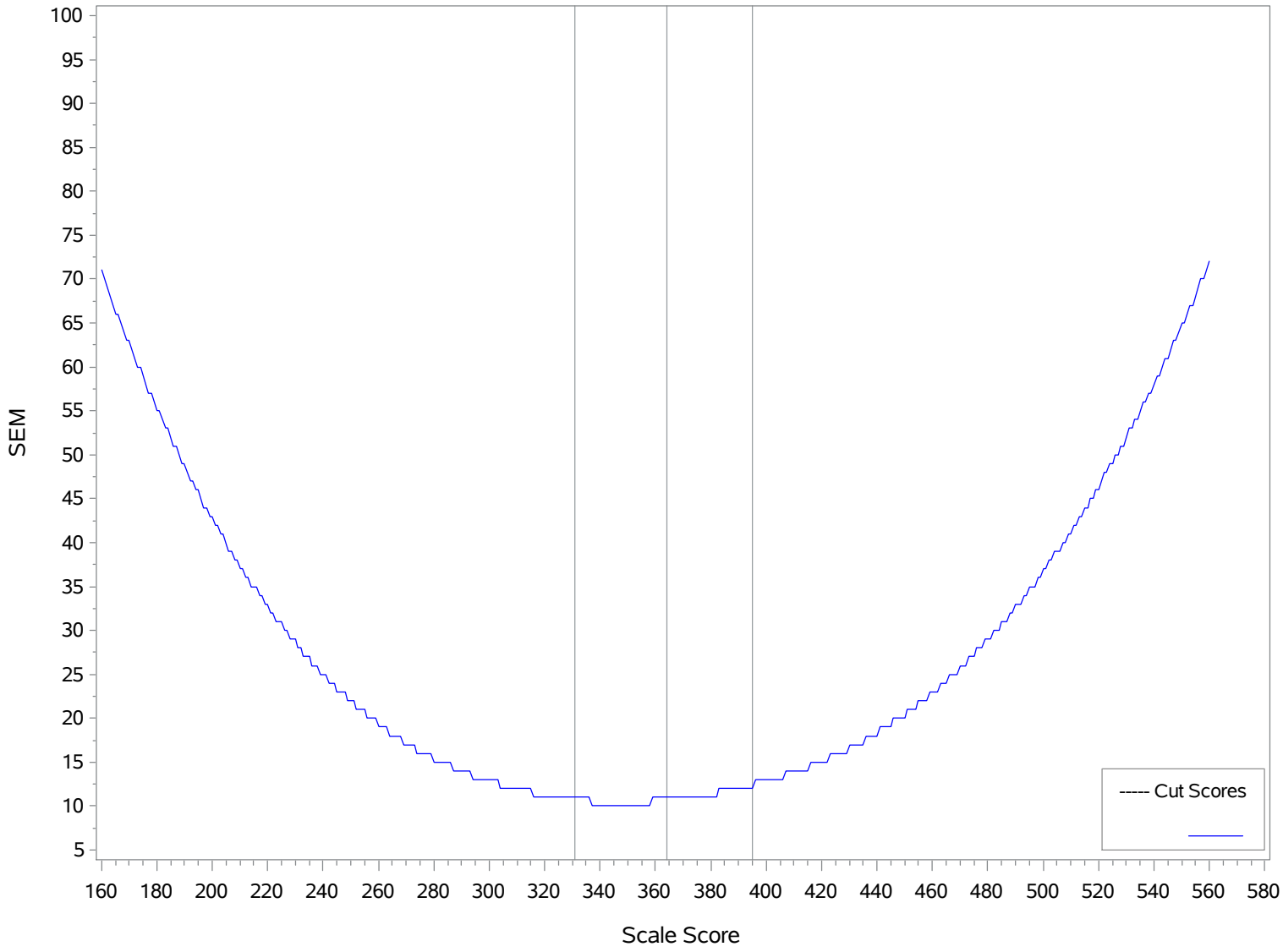


Figure D3: CSEM with Cut Scores, English Language Arts Grade 4, Form A01

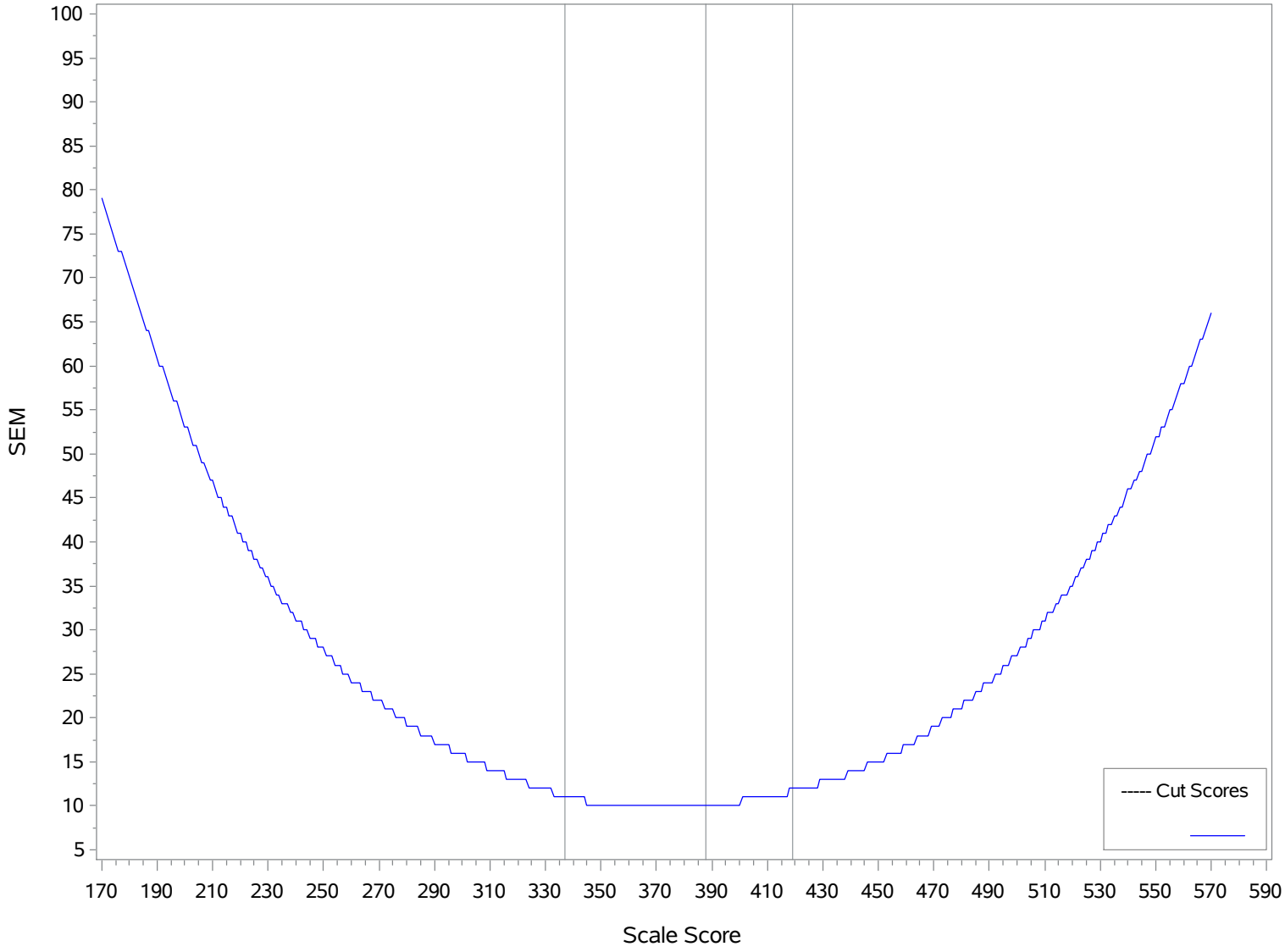


Figure D4: CSEM with Cut Scores, English Language Arts Grade 4, Form A05

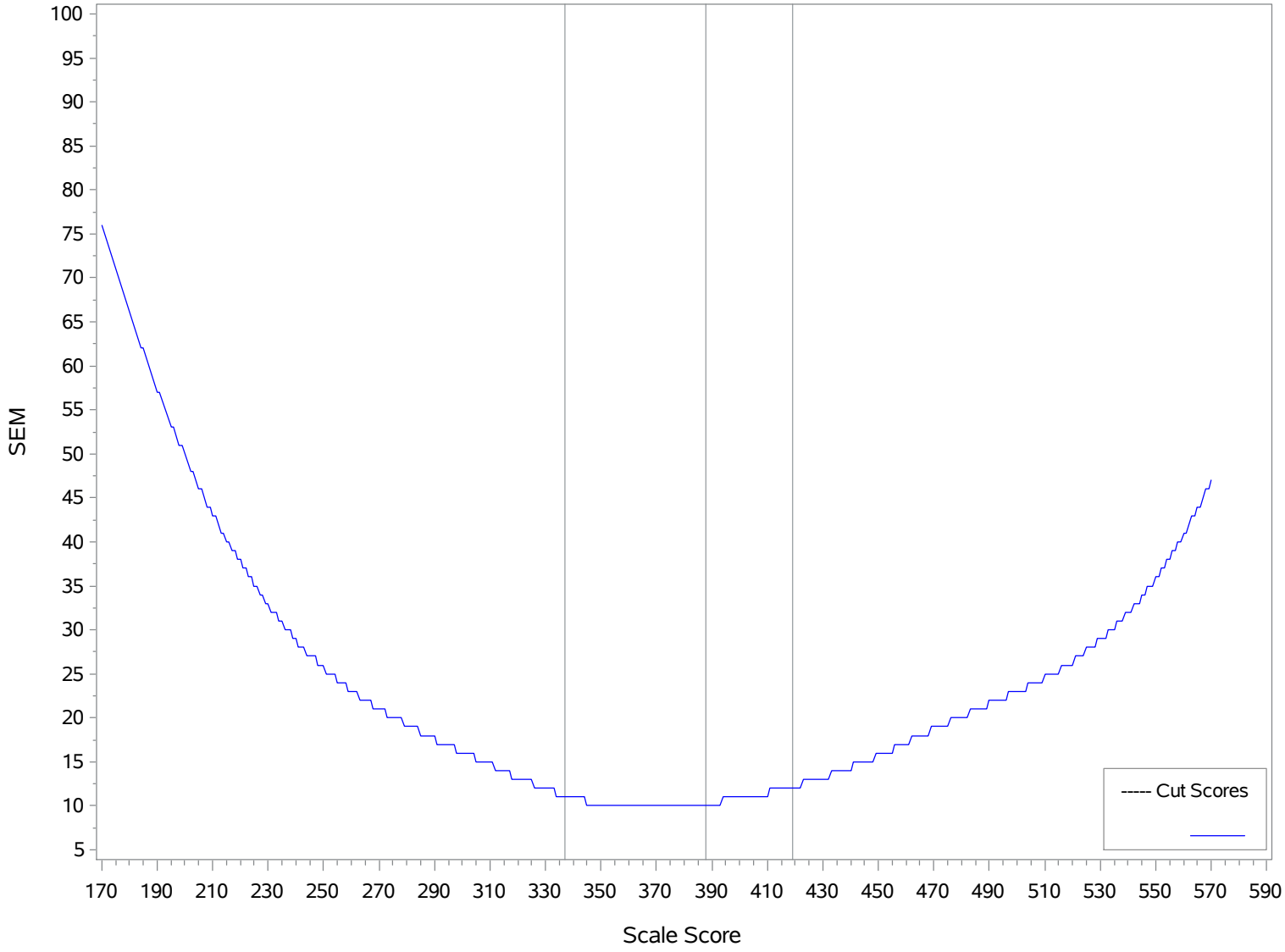


Figure D5: CSEM with Cut Scores, English Language Arts Grade 4, Form A09

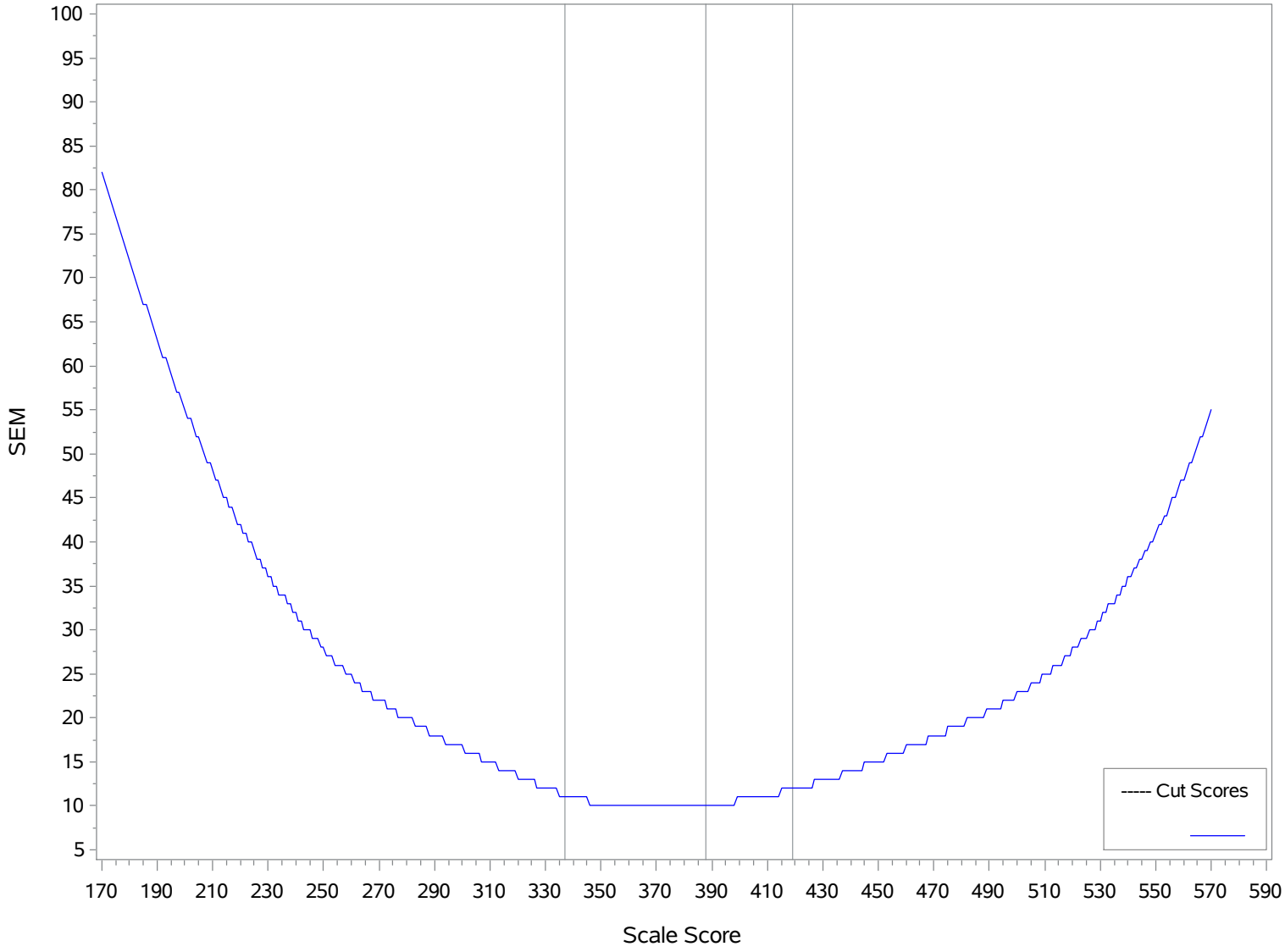


Figure D6: CSEM with Cut Scores, English Language Arts Grade 4, Form A13

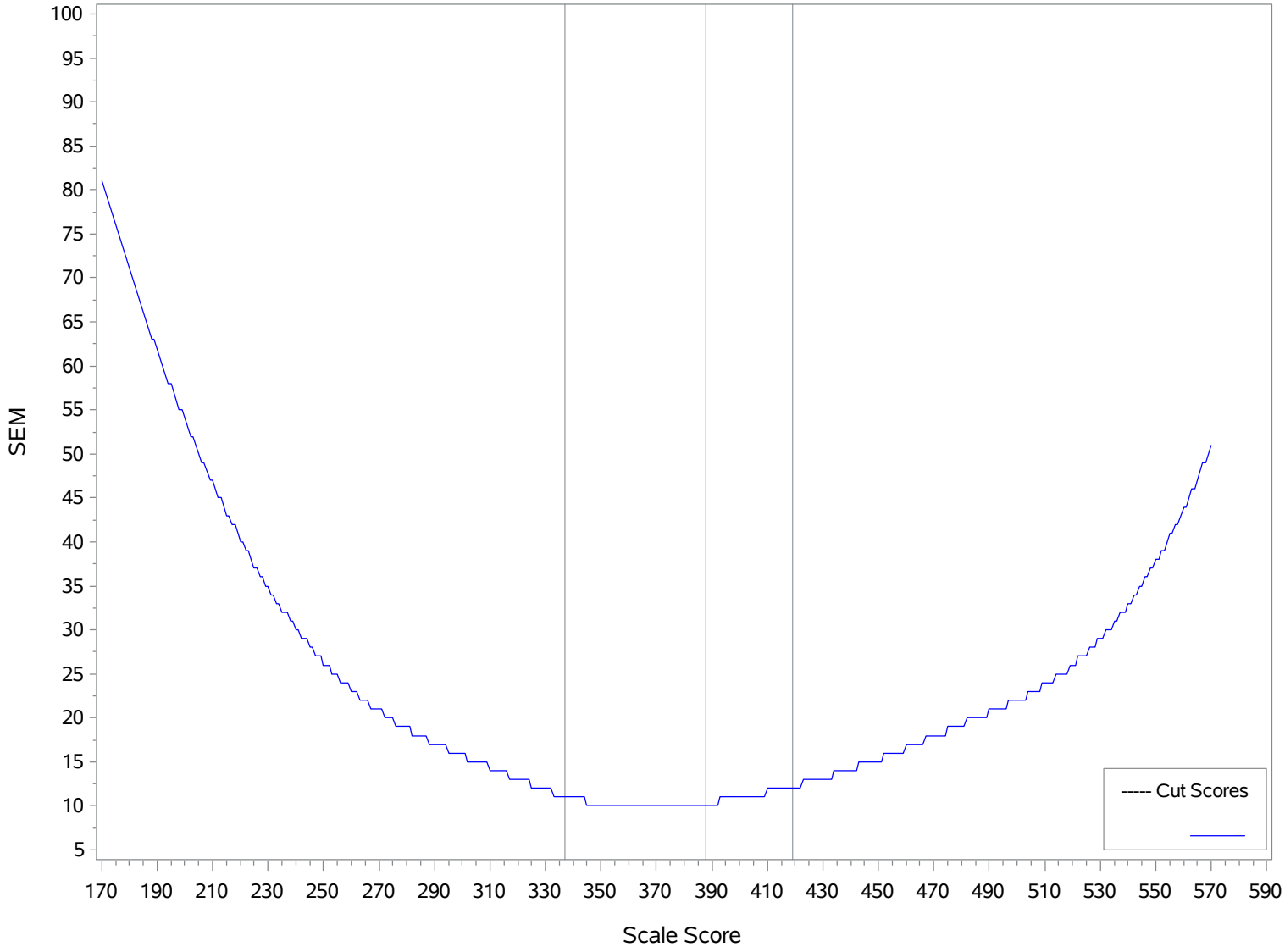


Figure D7: CSEM with Cut Scores, English Language Arts Grade 4, Form A17

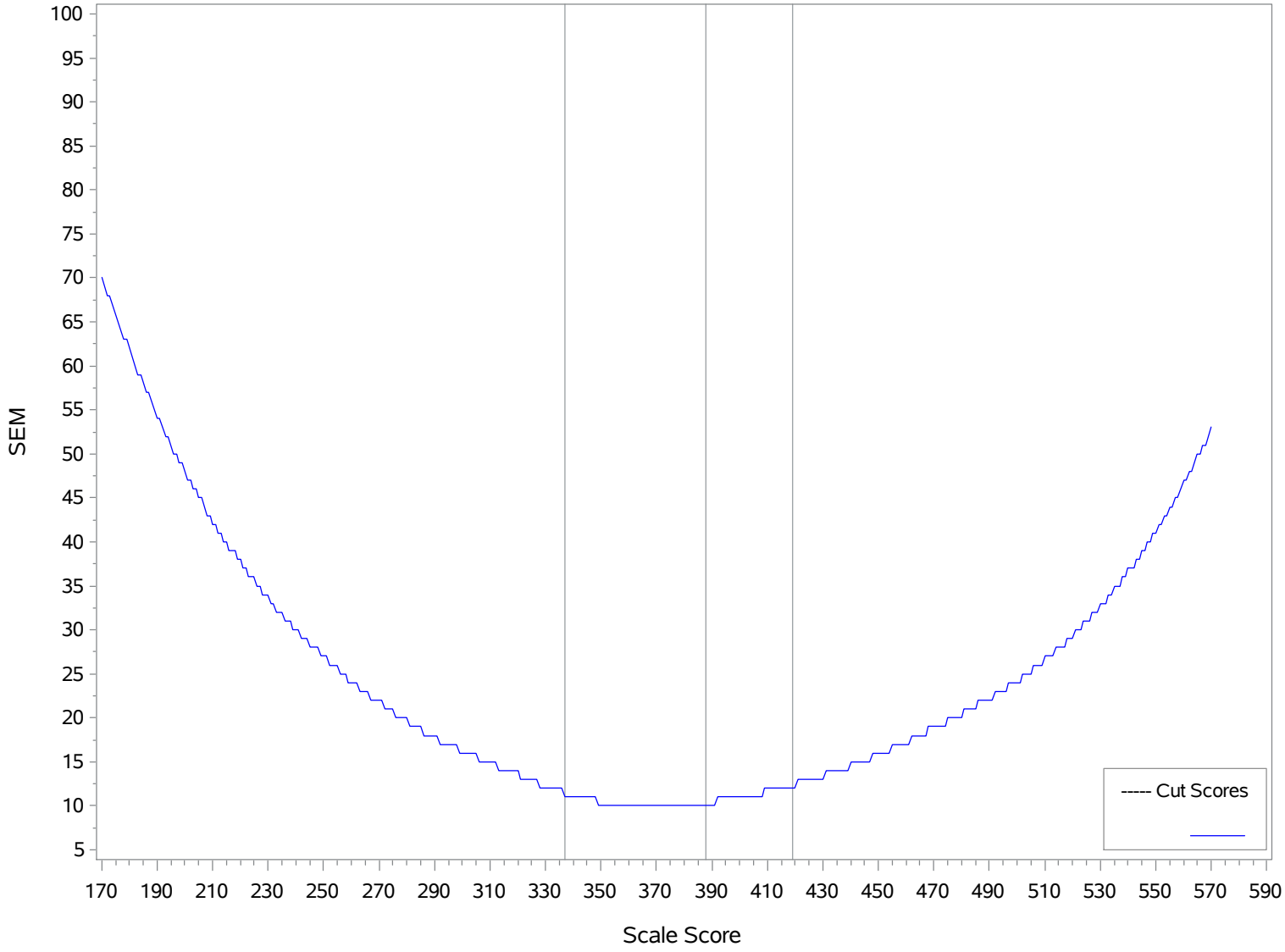


Figure D8: CSEM with Cut Scores, English Language Arts Grade 4, Form B04

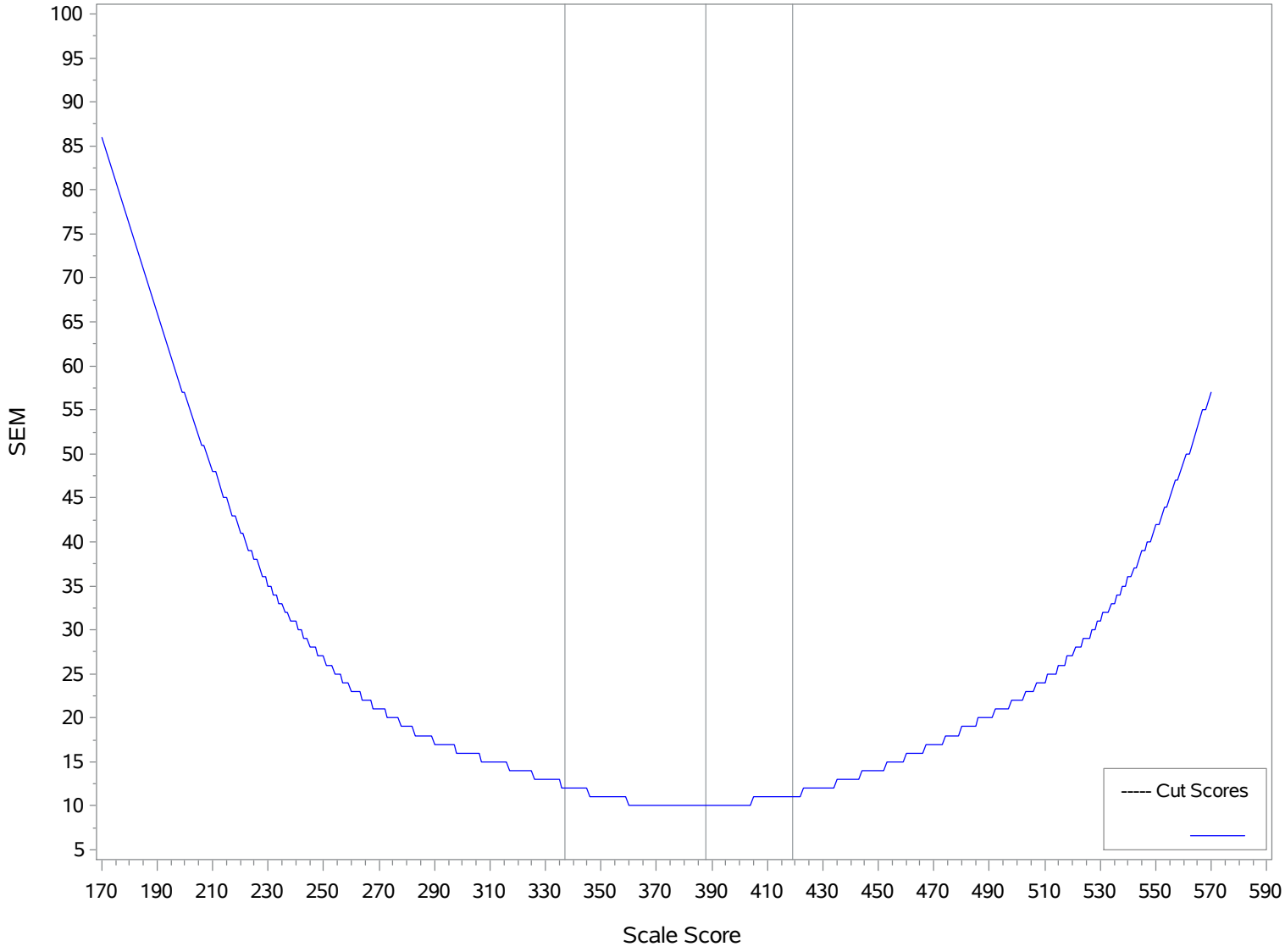


Figure D9: CSEM with Cut Scores, English Language Arts Grade 4, Form B06

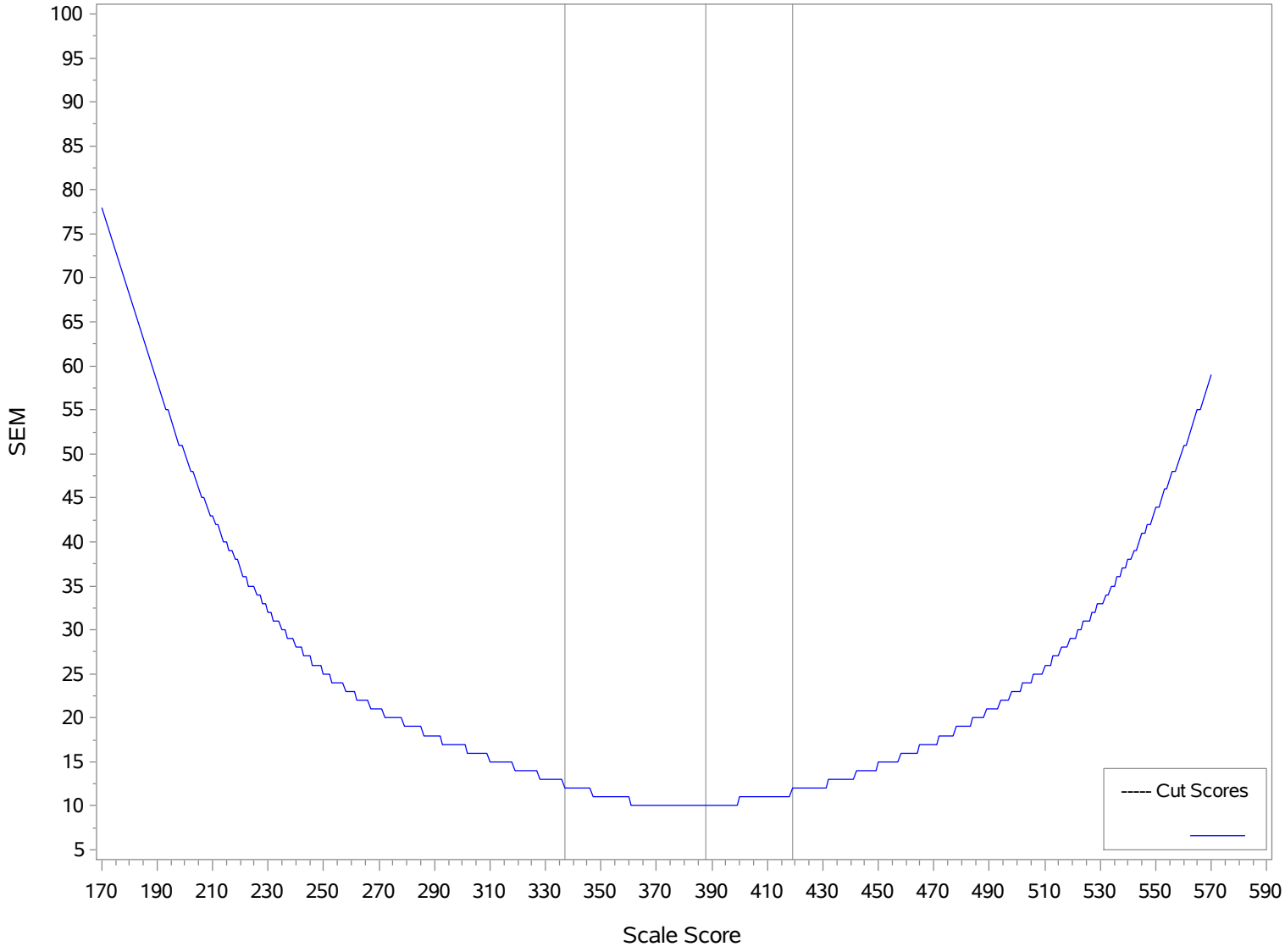
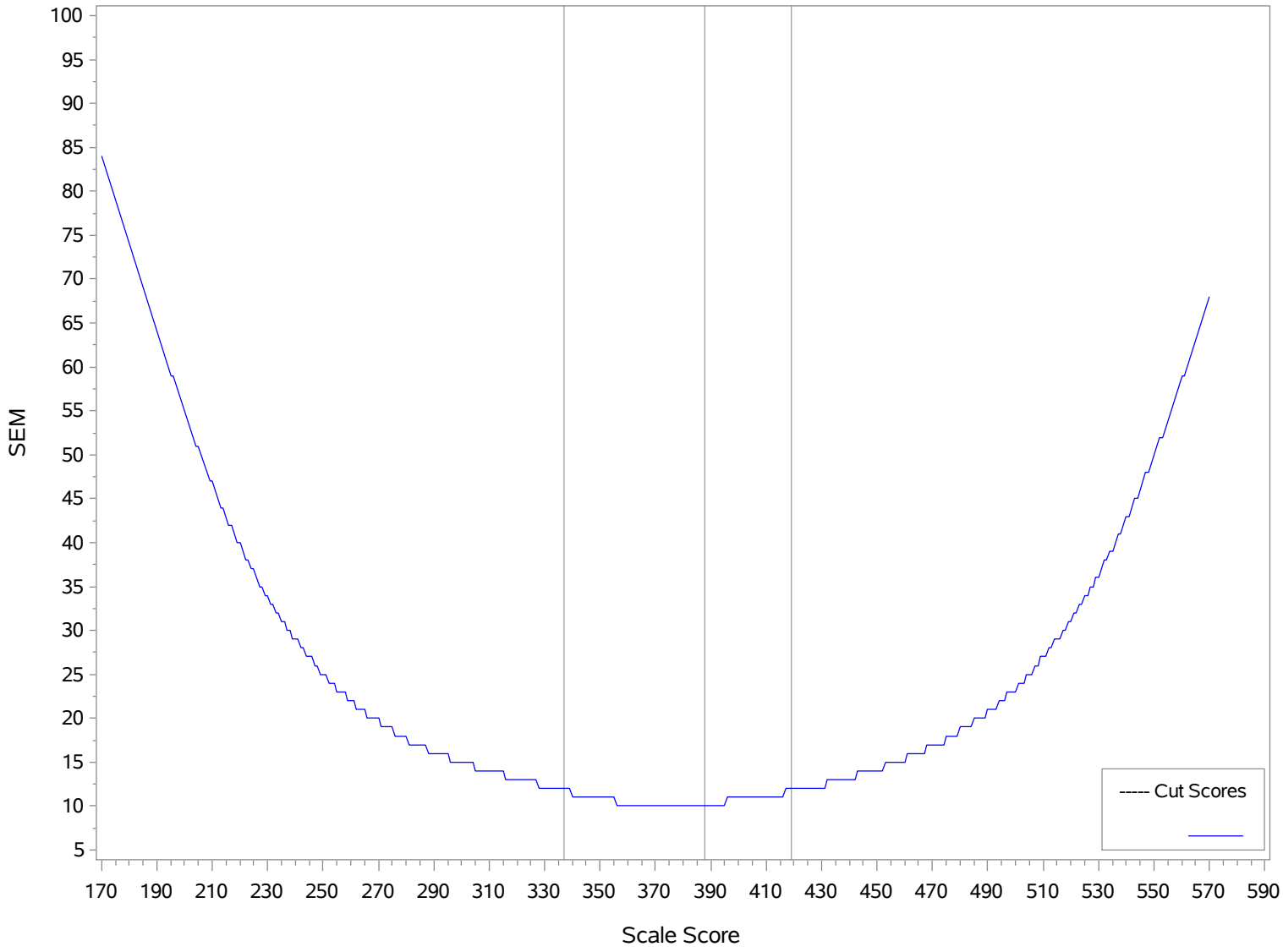


Figure D10: CSEM with Cut Scores, English Language Arts Grade 4, Form B10



490

Figure D11: CSEM with Cut Scores, English Language Arts Grade 4, Form B14

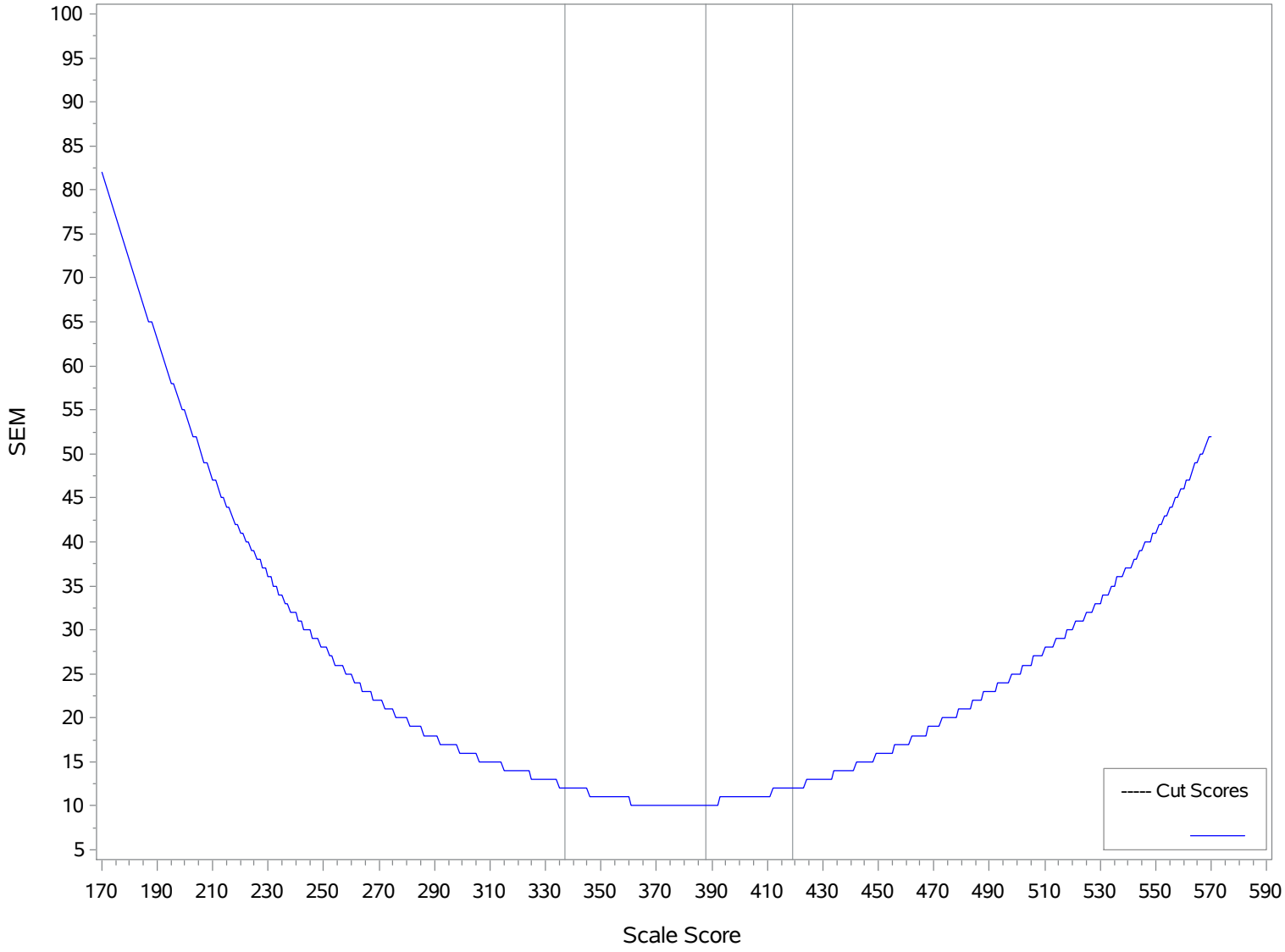


Figure D12: CSEM with Cut Scores, English Language Arts Grade 4, Form B18

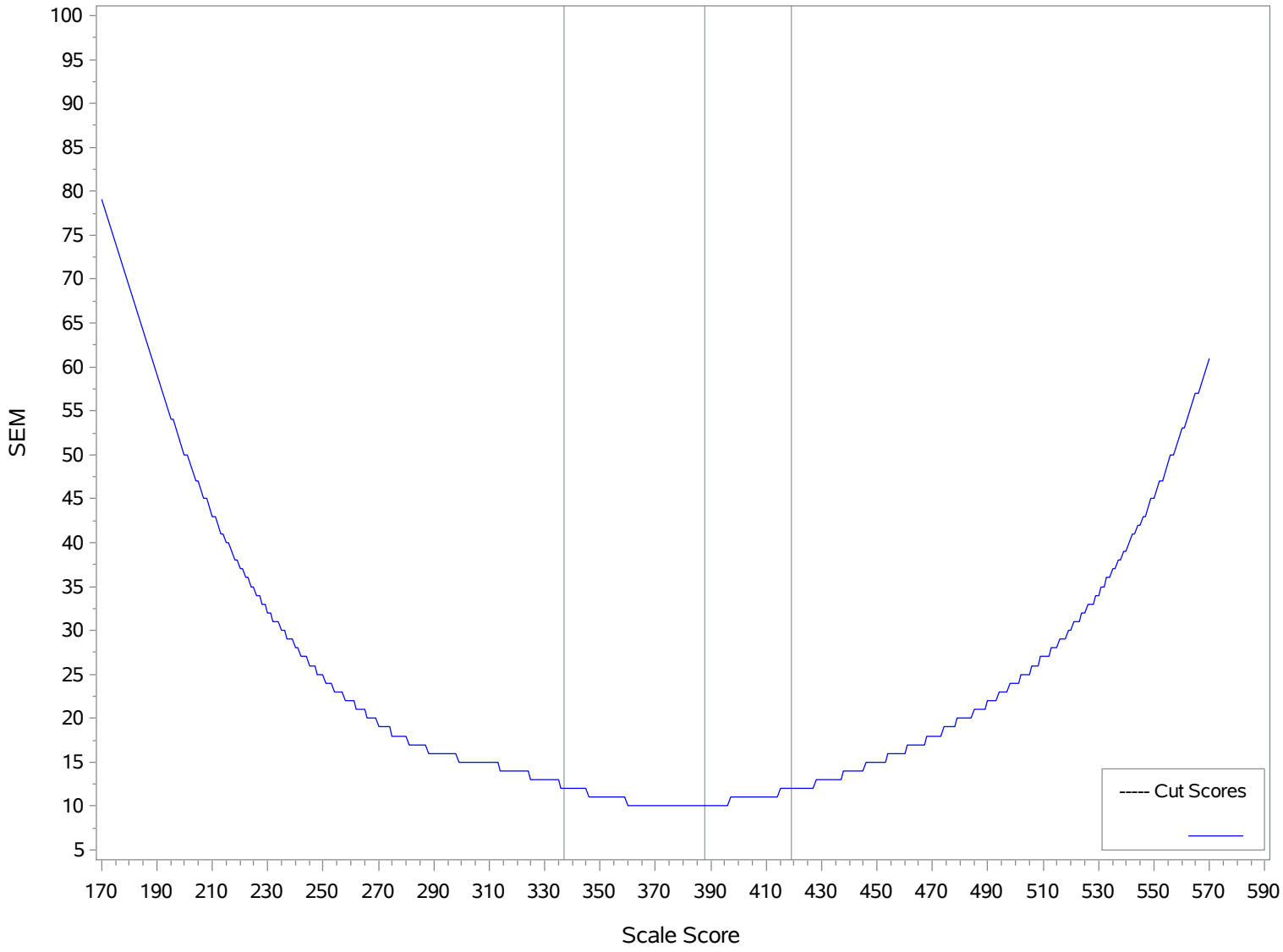


Figure D13: CSEM with Cut Scores, English Language Arts Grade 4, Form BM4

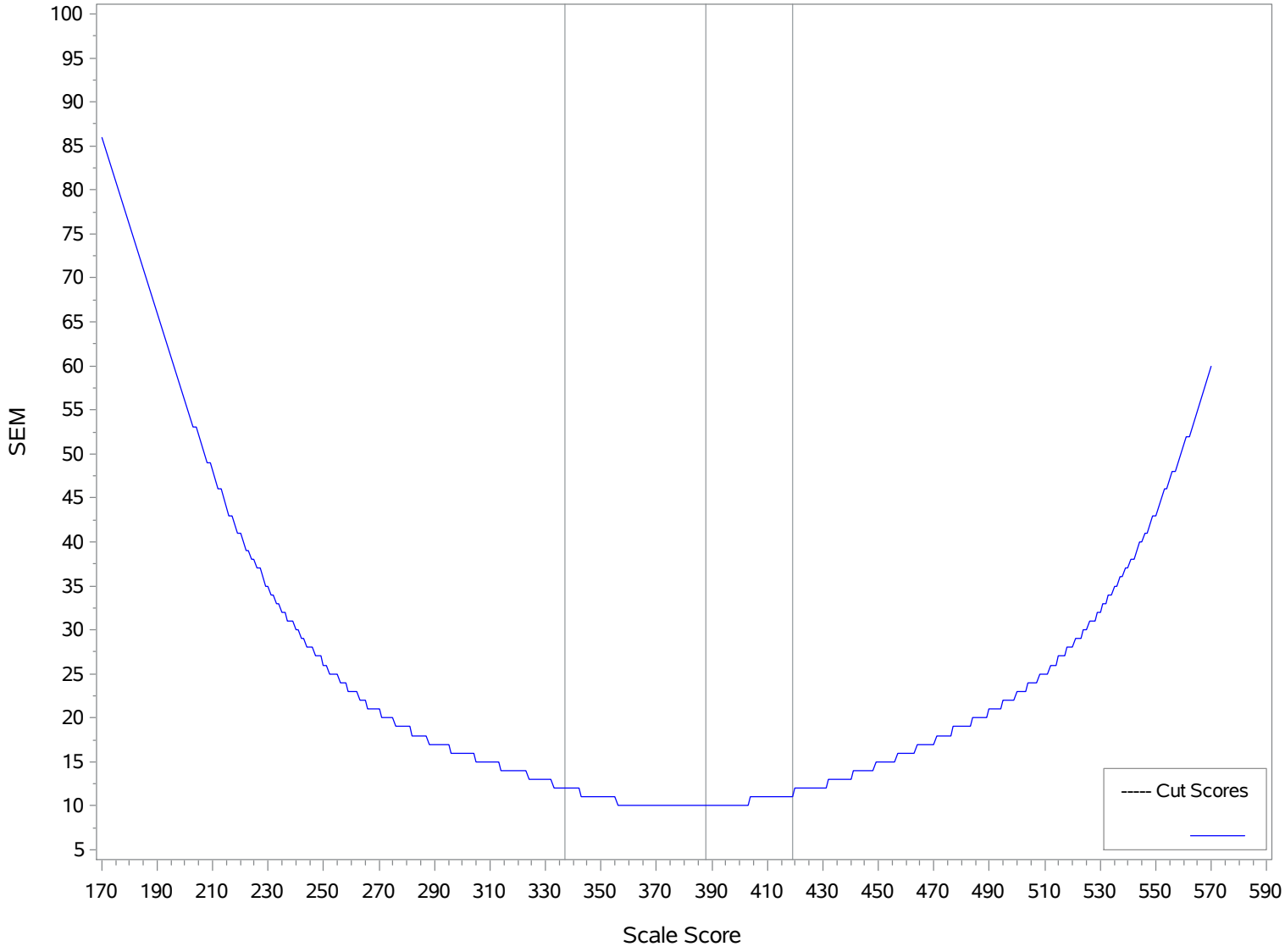


Figure D14: CSEM with Cut Scores, English Language Arts Grade 5, Form A

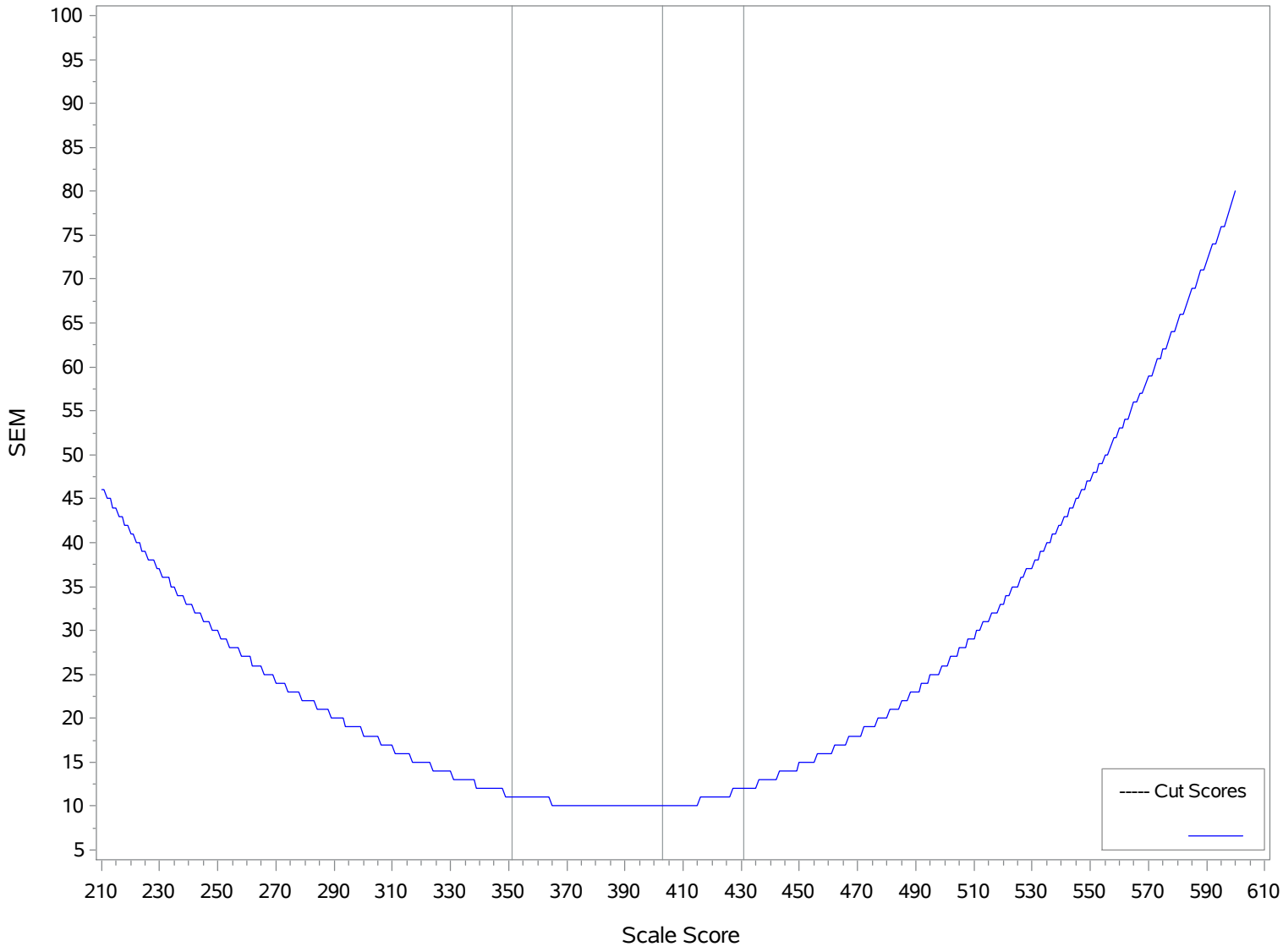


Figure D15: CSEM with Cut Scores, English Language Arts Grade 5, Form B

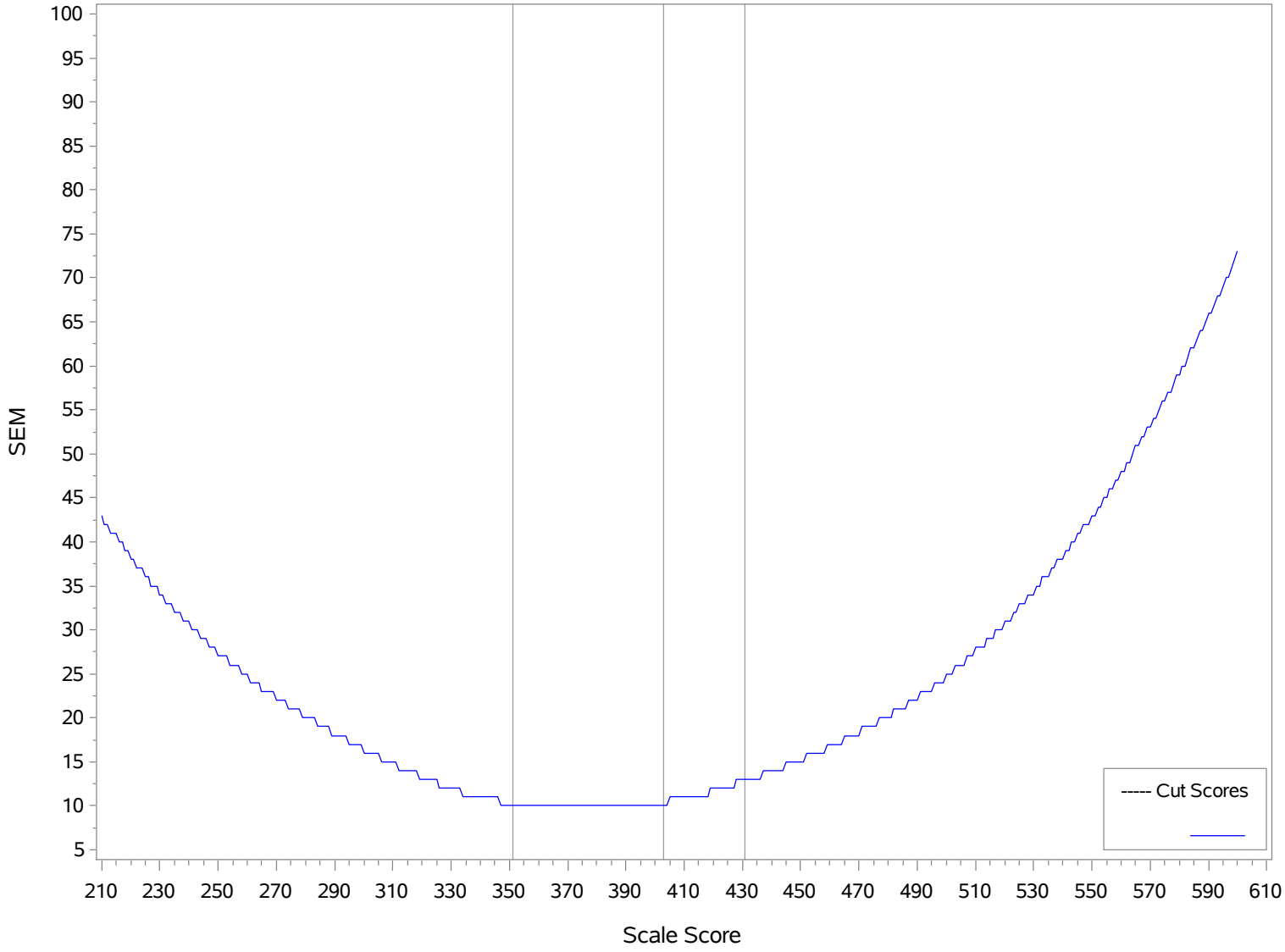


Figure D16: CSEM with Cut Scores, English Language Arts Grade 6, Form A

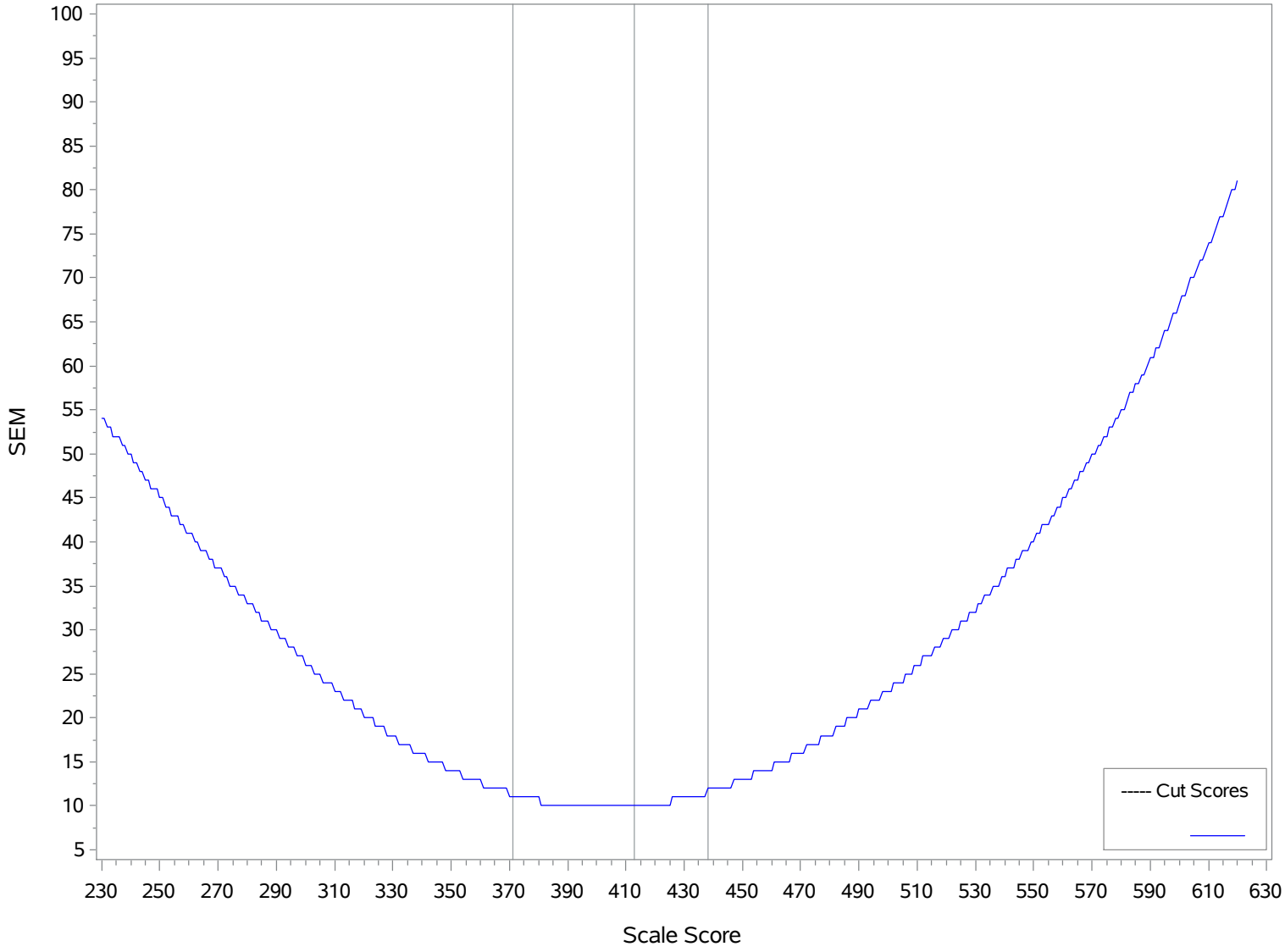


Figure D17: CSEM with Cut Scores, English Language Arts Grade 6, Form B

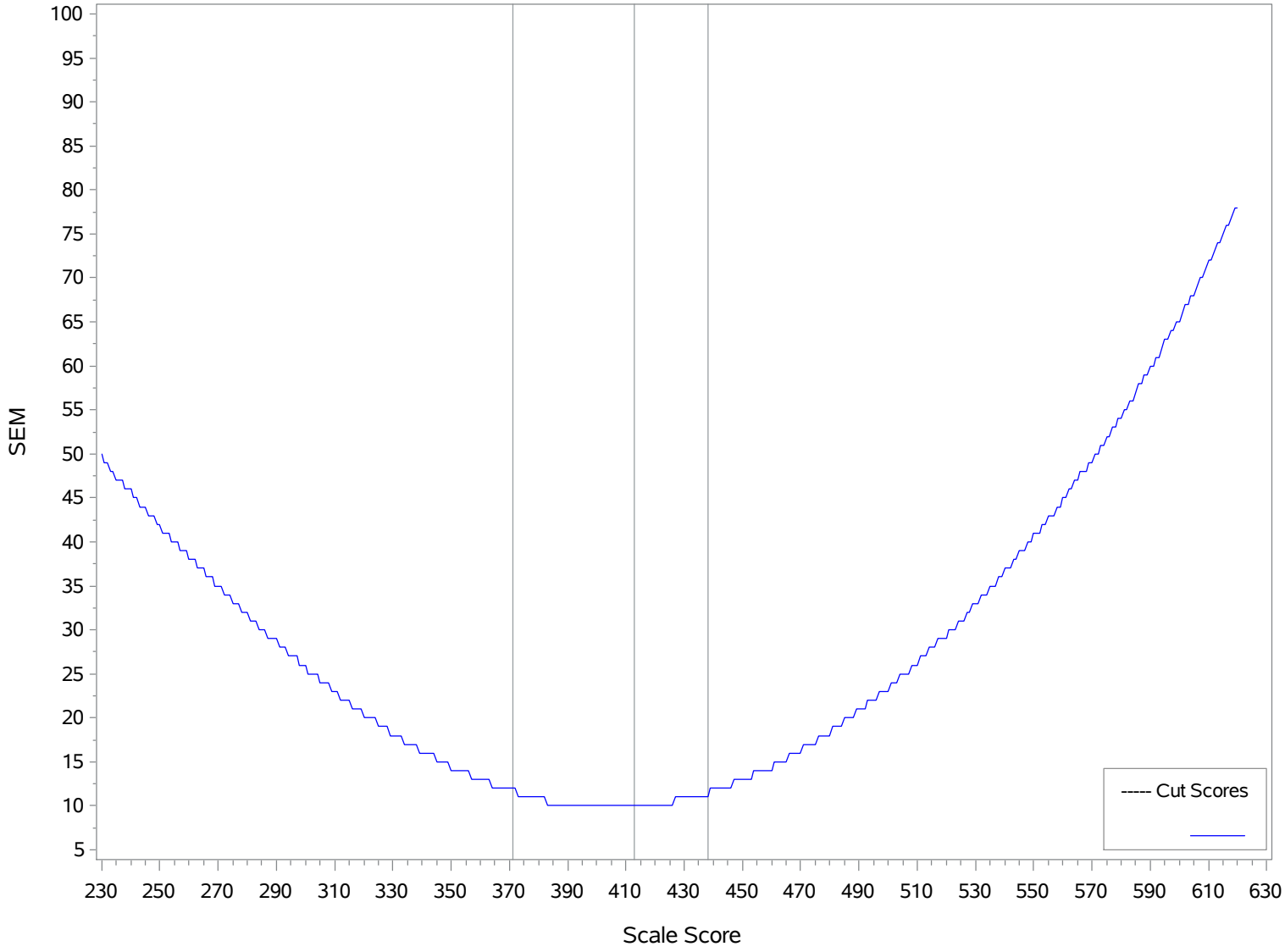


Figure D18: CSEM with Cut Scores, English Language Arts Grade 7, Form A

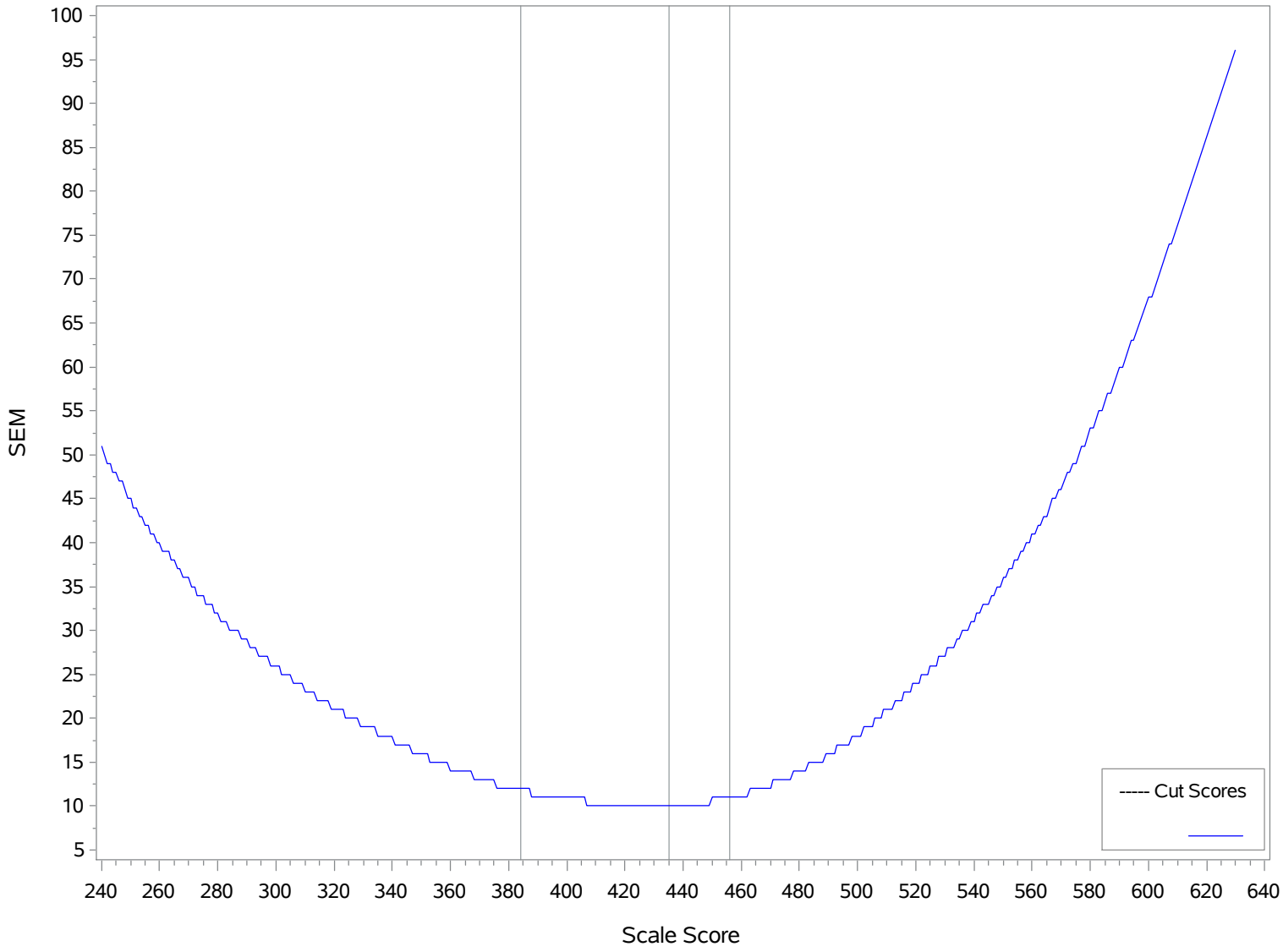


Figure D19: CSEM with Cut Scores, English Language Arts Grade 7, Form B

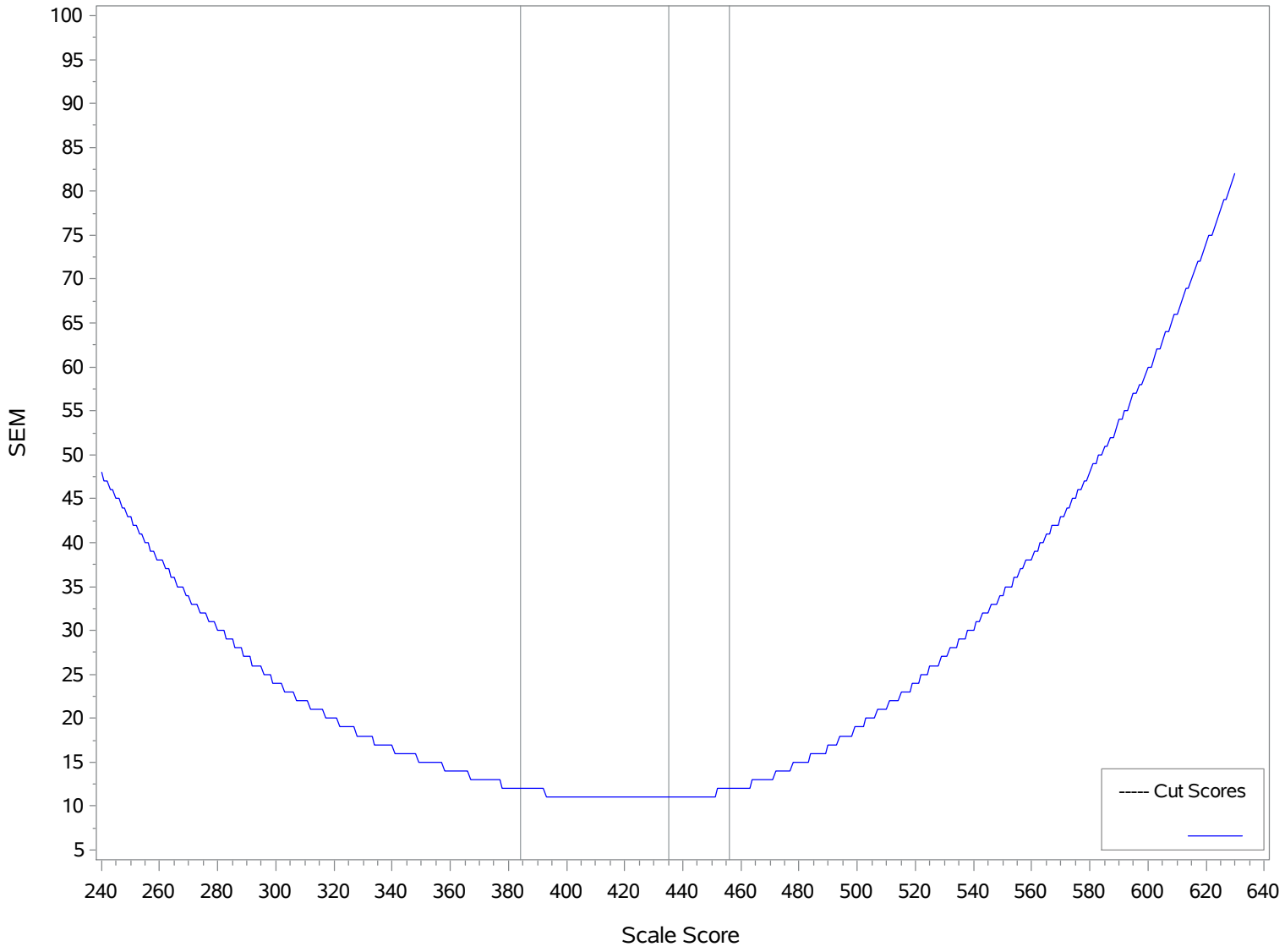
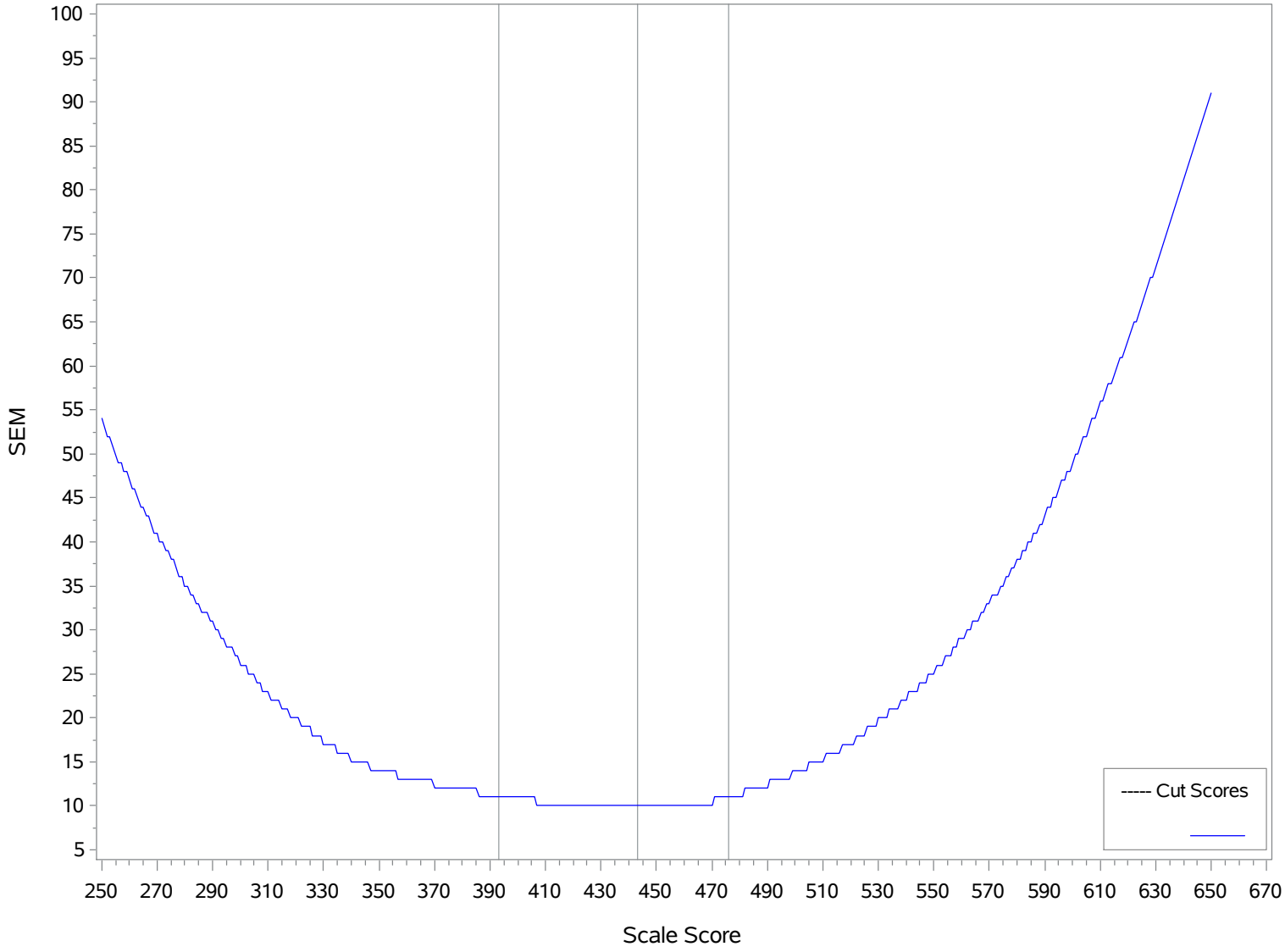
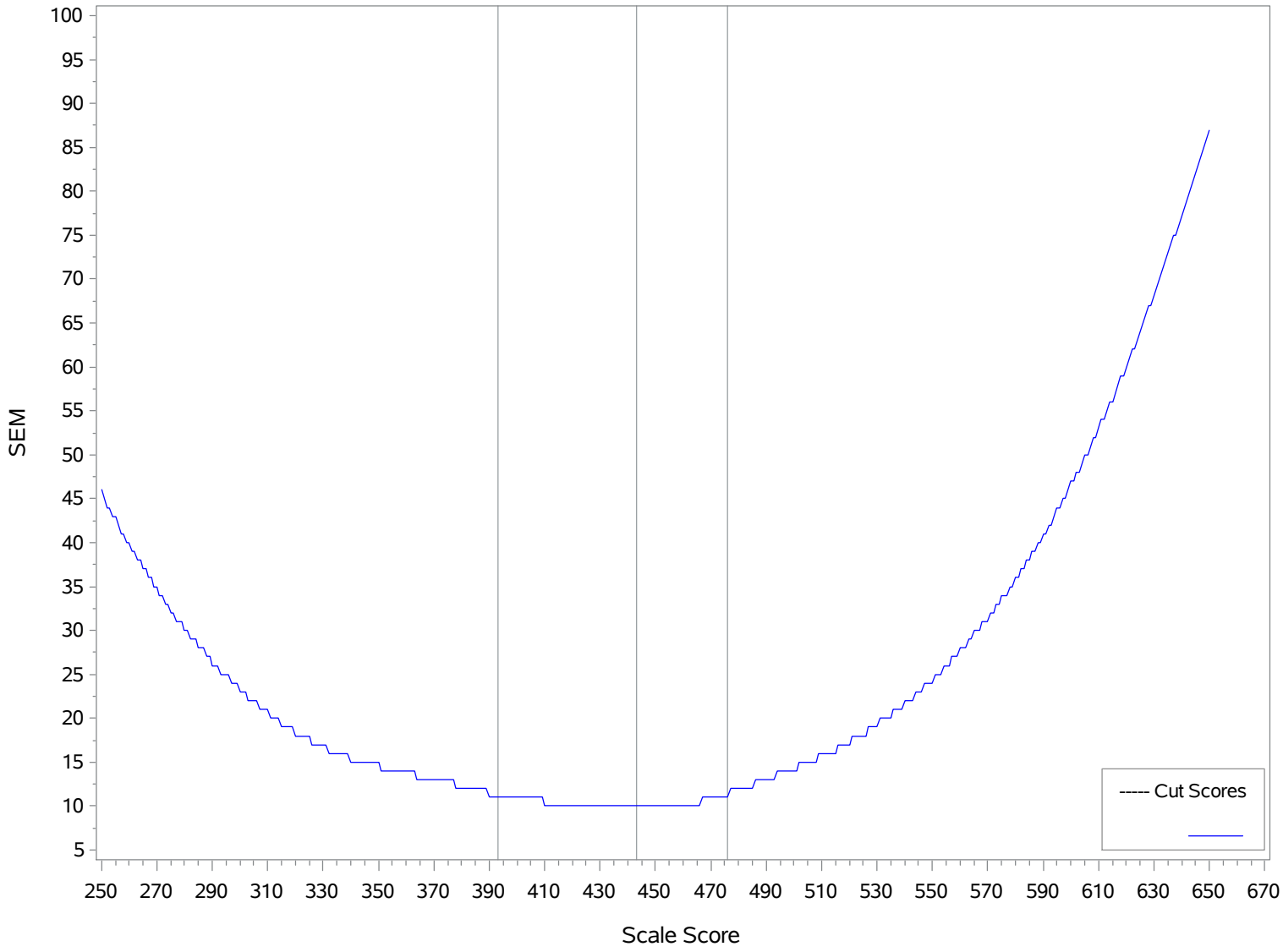


Figure D20: CSEM with Cut Scores, English Language Arts Grade 8, Form A01



500

Figure D21: CSEM with Cut Scores, English Language Arts Grade 8, Form A05



501

Figure D22: CSEM with Cut Scores, English Language Arts Grade 8, Form A09

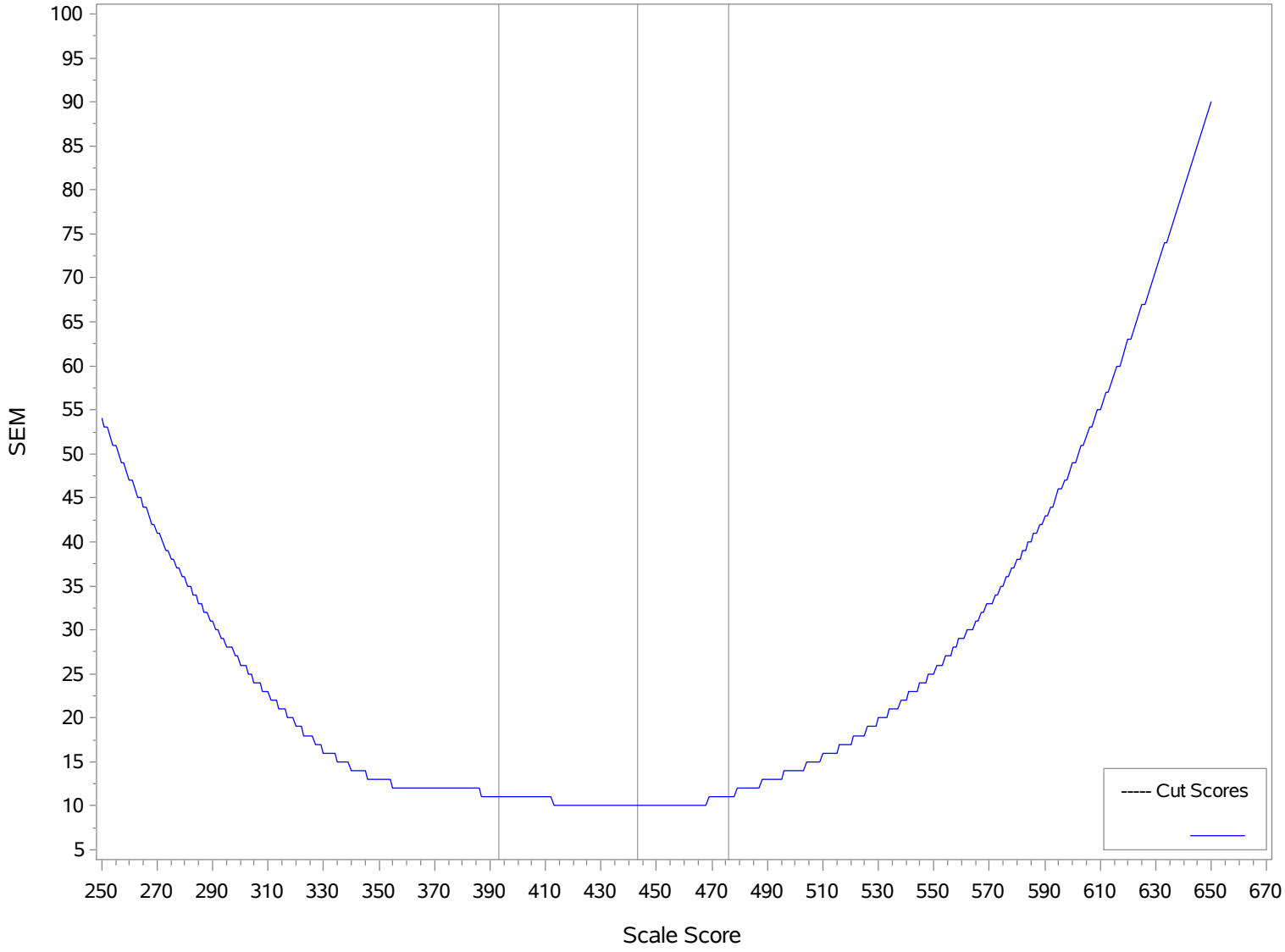


Figure D23: CSEM with Cut Scores, English Language Arts Grade 8, Form A13

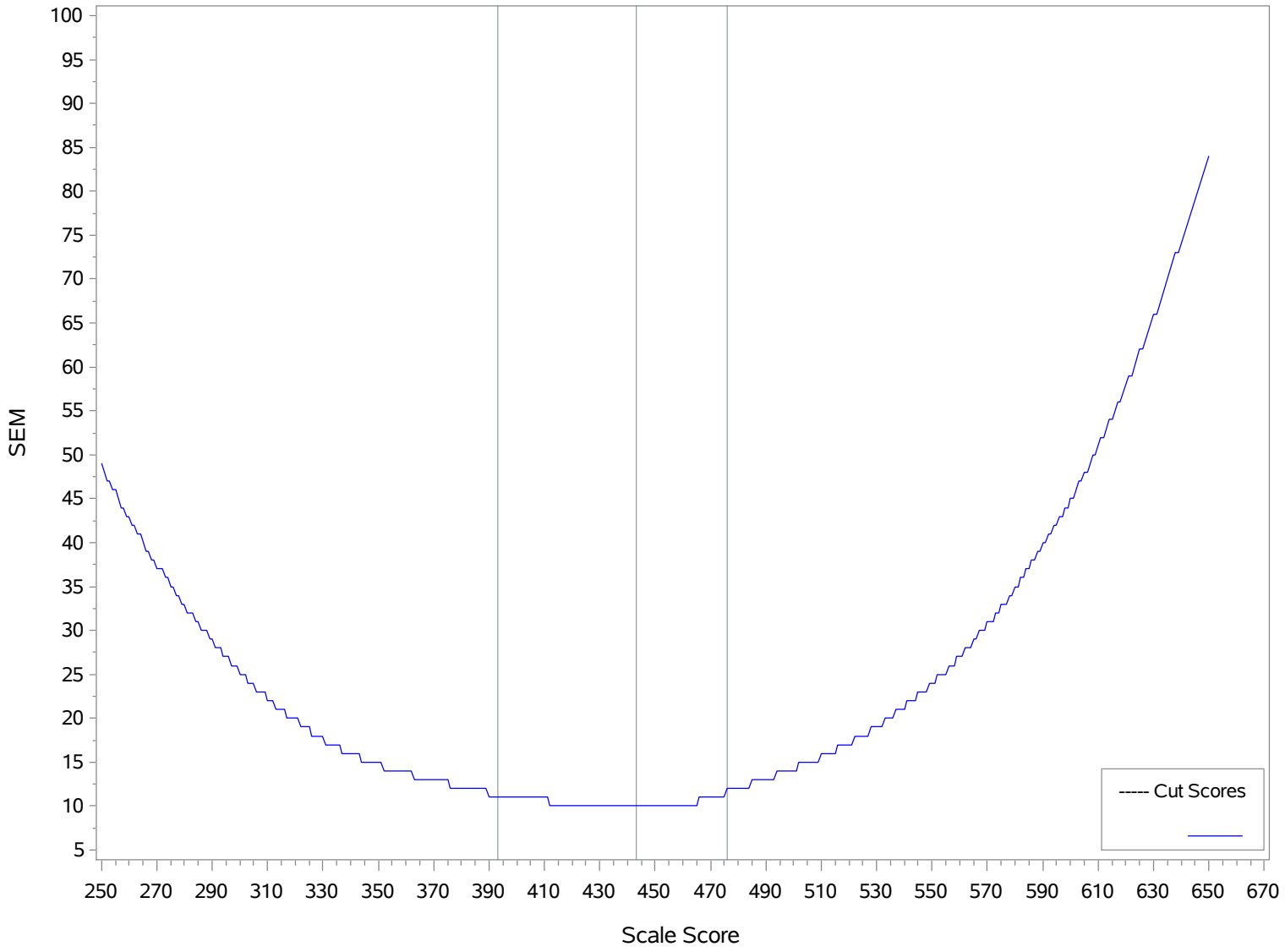


Figure D24: CSEM with Cut Scores, English Language Arts Grade 8, Form A17

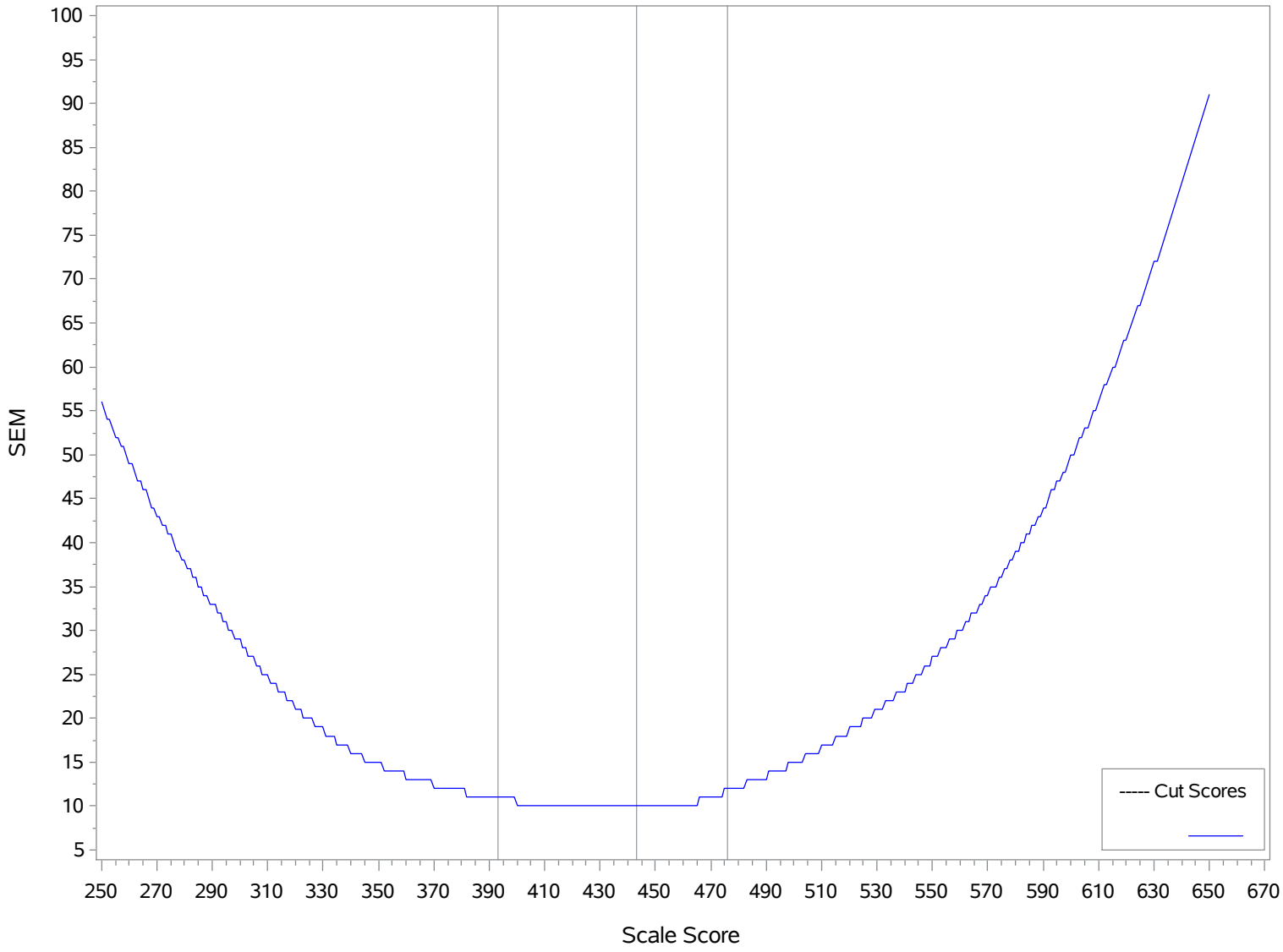
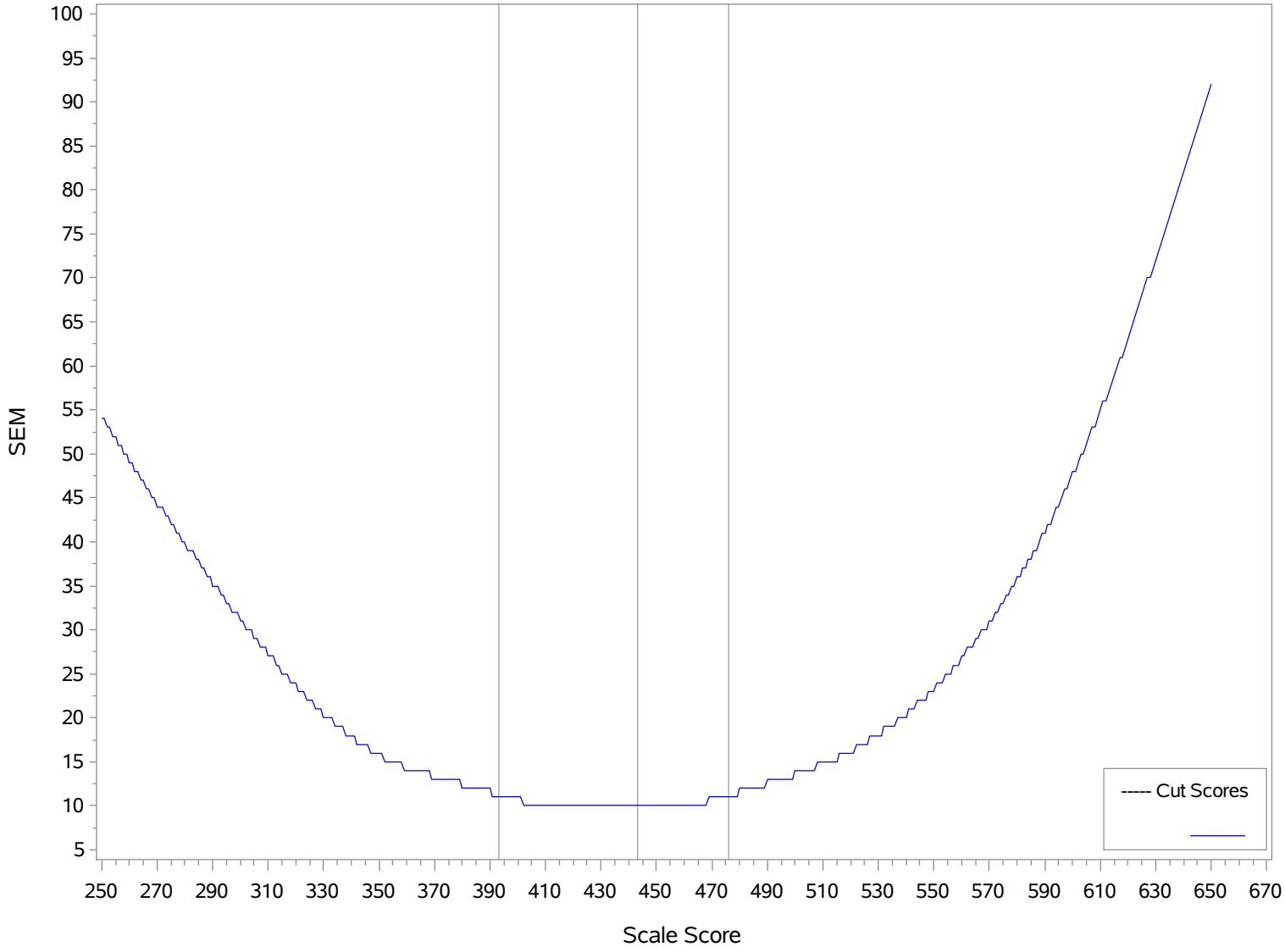


Figure D25: CSEM with Cut Scores, English Language Arts Grade 8, Form B04



505

Figure D26: CSEM with Cut Scores, English Language Arts Grade 8, Form B06

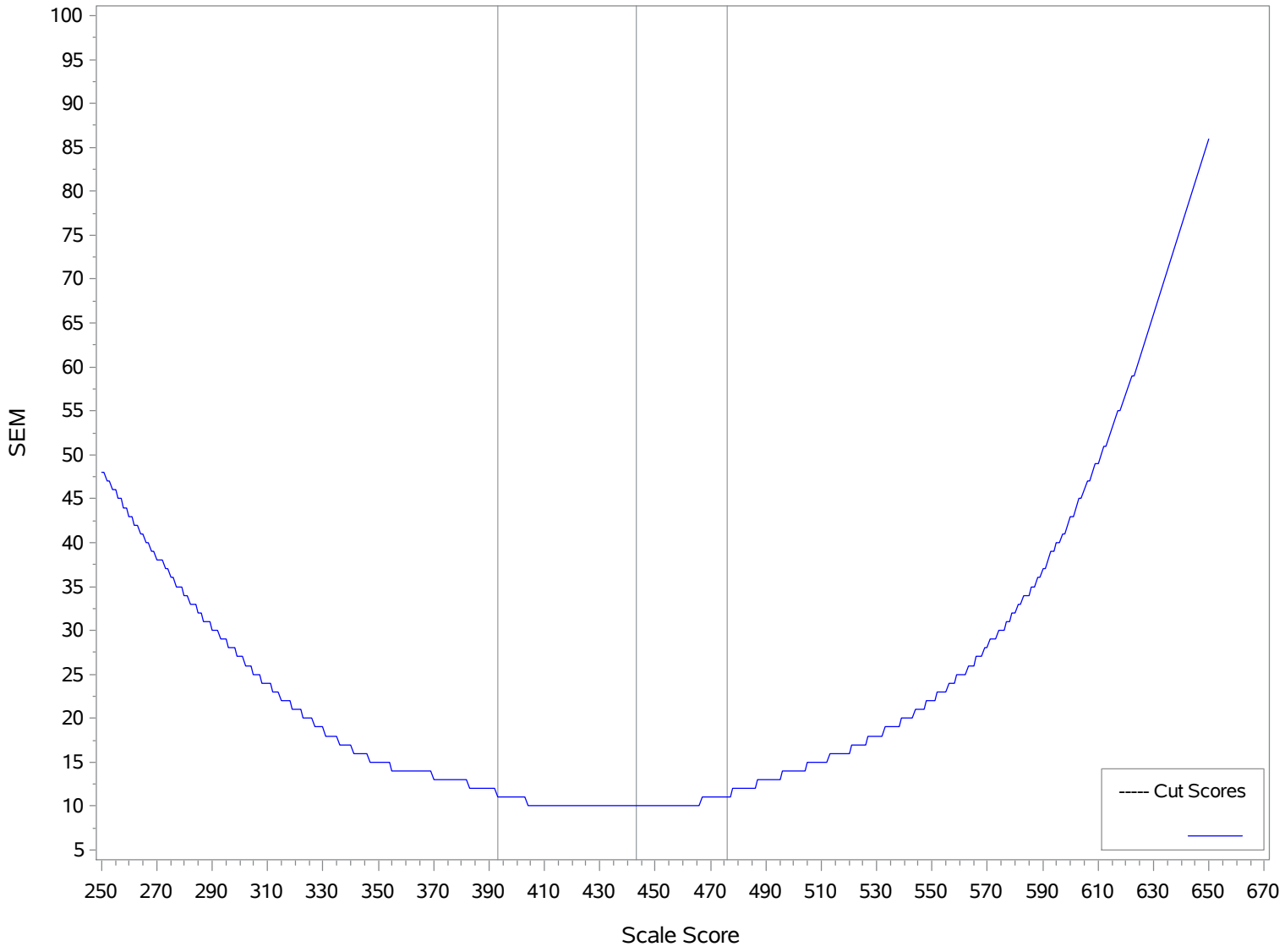


Figure D27: CSEM with Cut Scores, English Language Arts Grade 8, Form B10

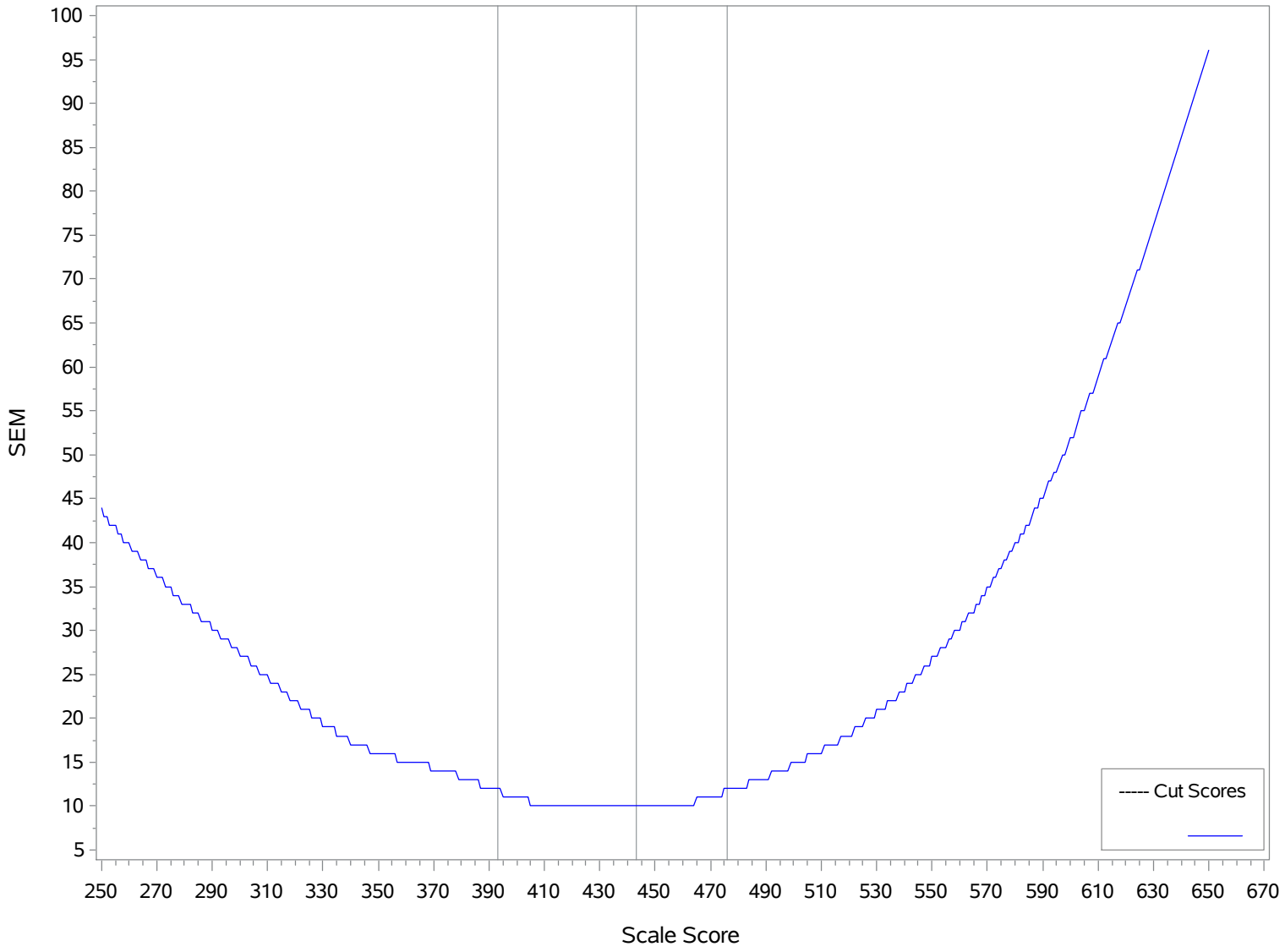


Figure D28: CSEM with Cut Scores, English Language Arts Grade 8, Form B14

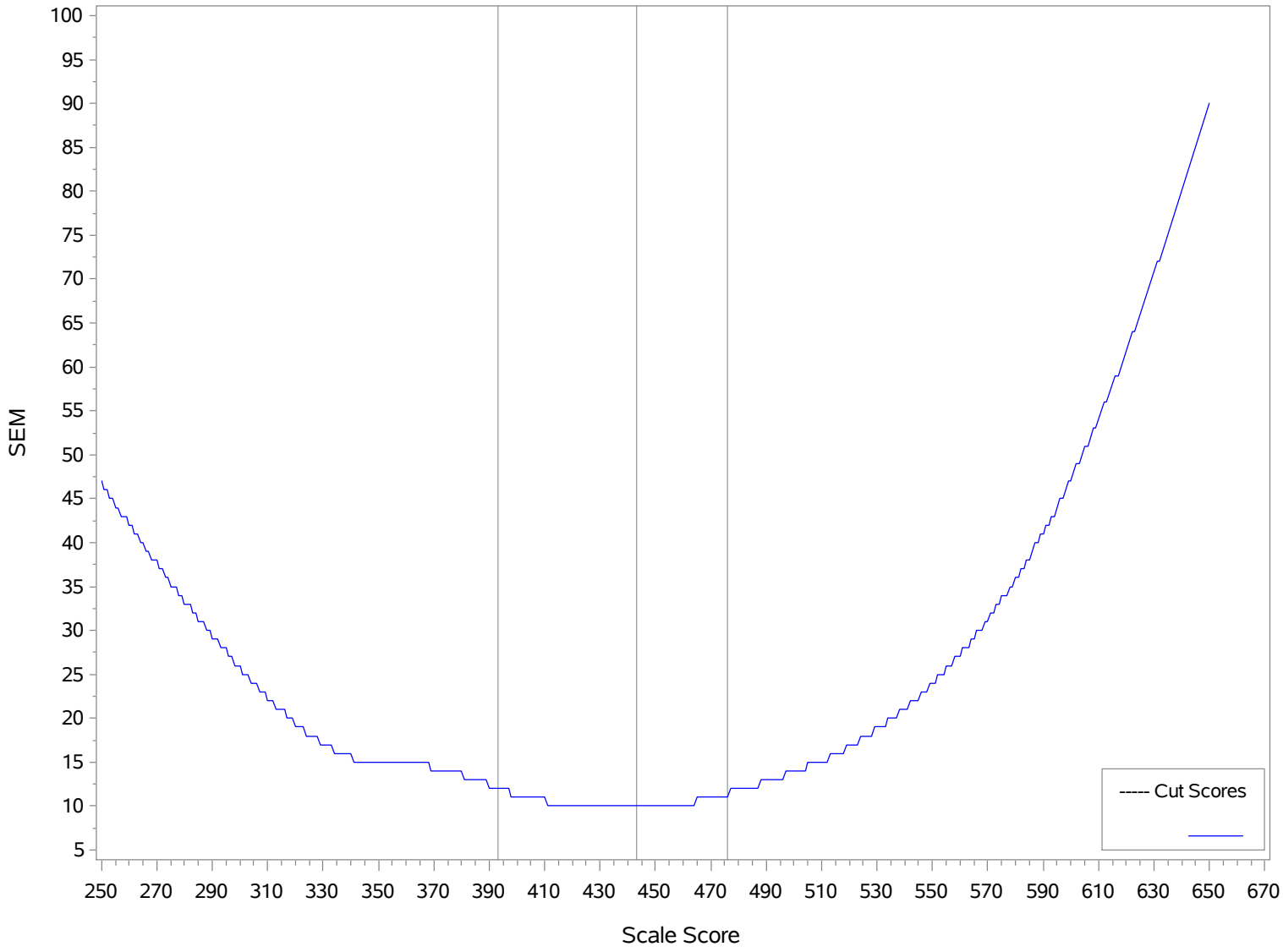


Figure D29: CSEM with Cut Scores, English Language Arts Grade 8, Form B18

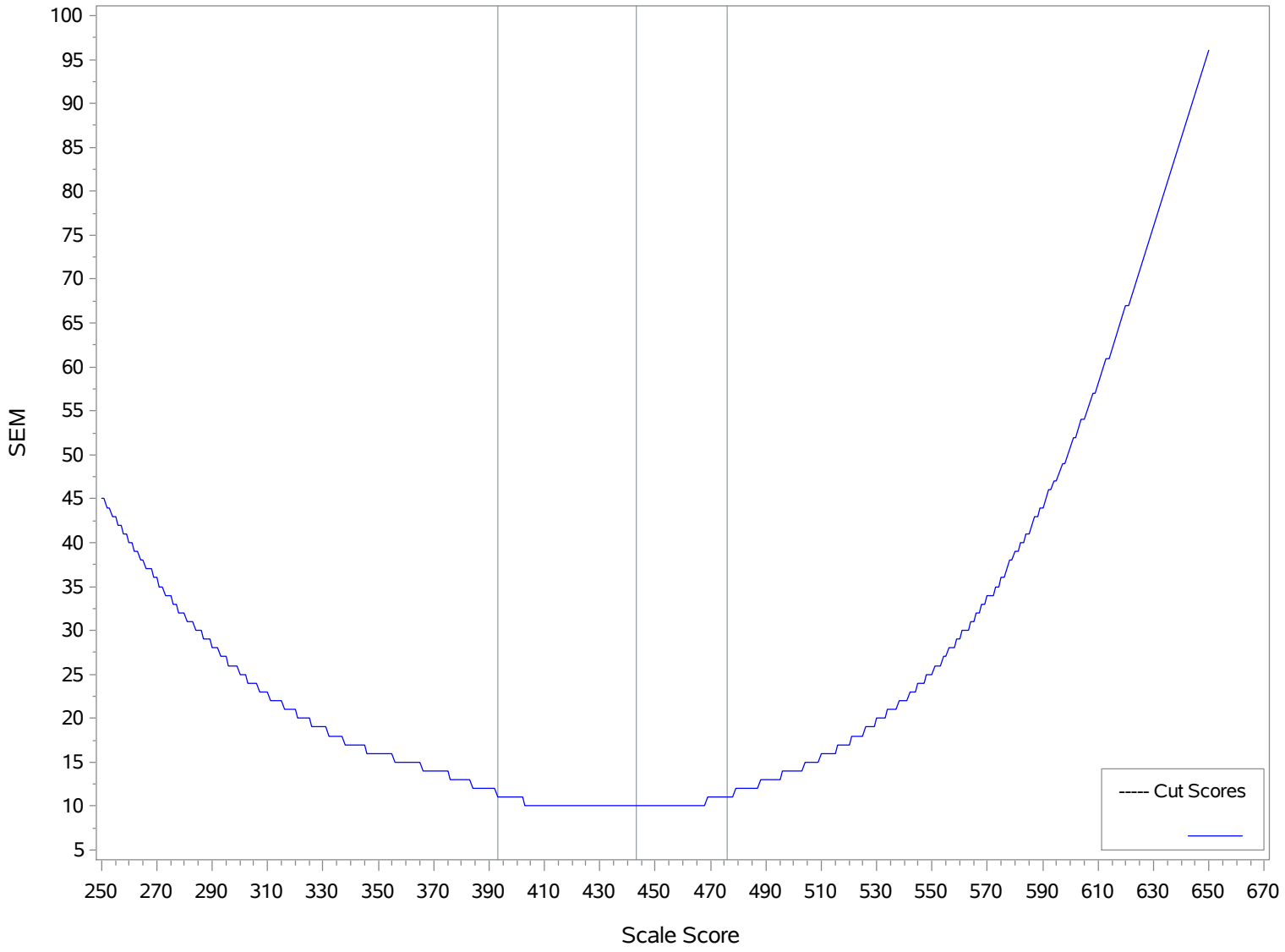


Figure D30: CSEM with Cut Scores, Mathematics Grade 3, Form A

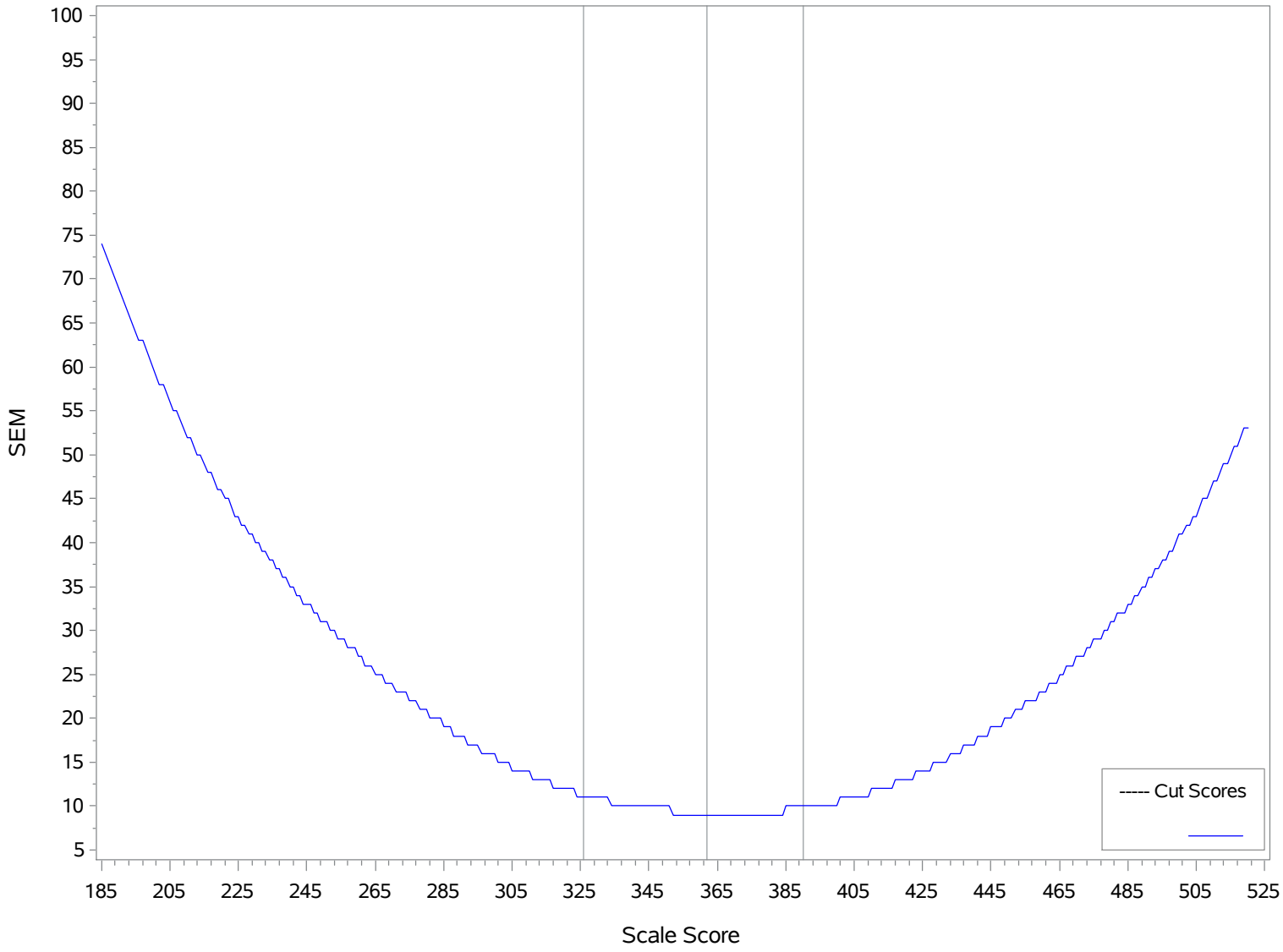


Figure D31: CSEM with Cut Scores, Mathematics Grade 3, Form B

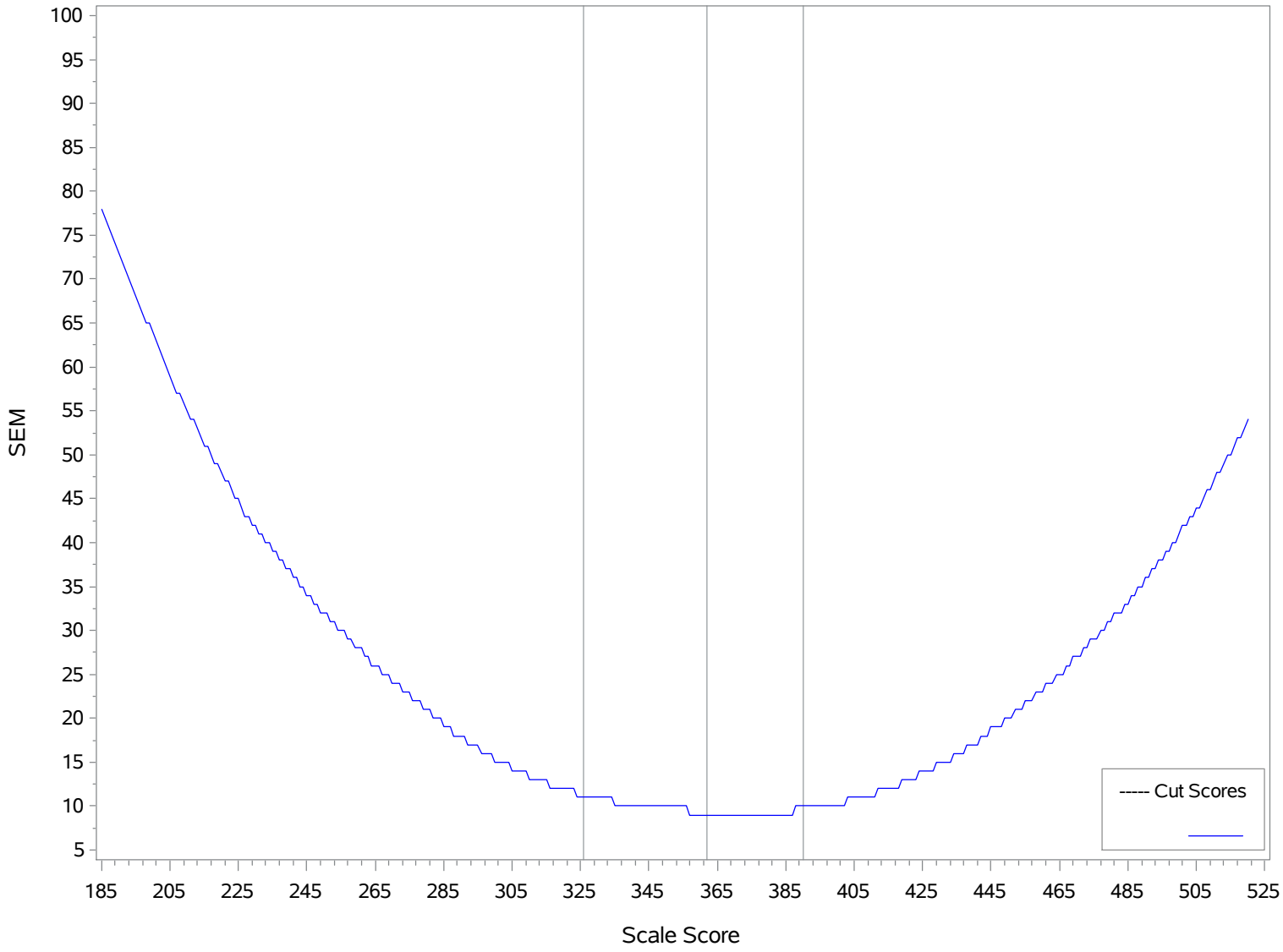


Figure D32: CSEM with Cut Scores, Mathematics Grade 4, Form A

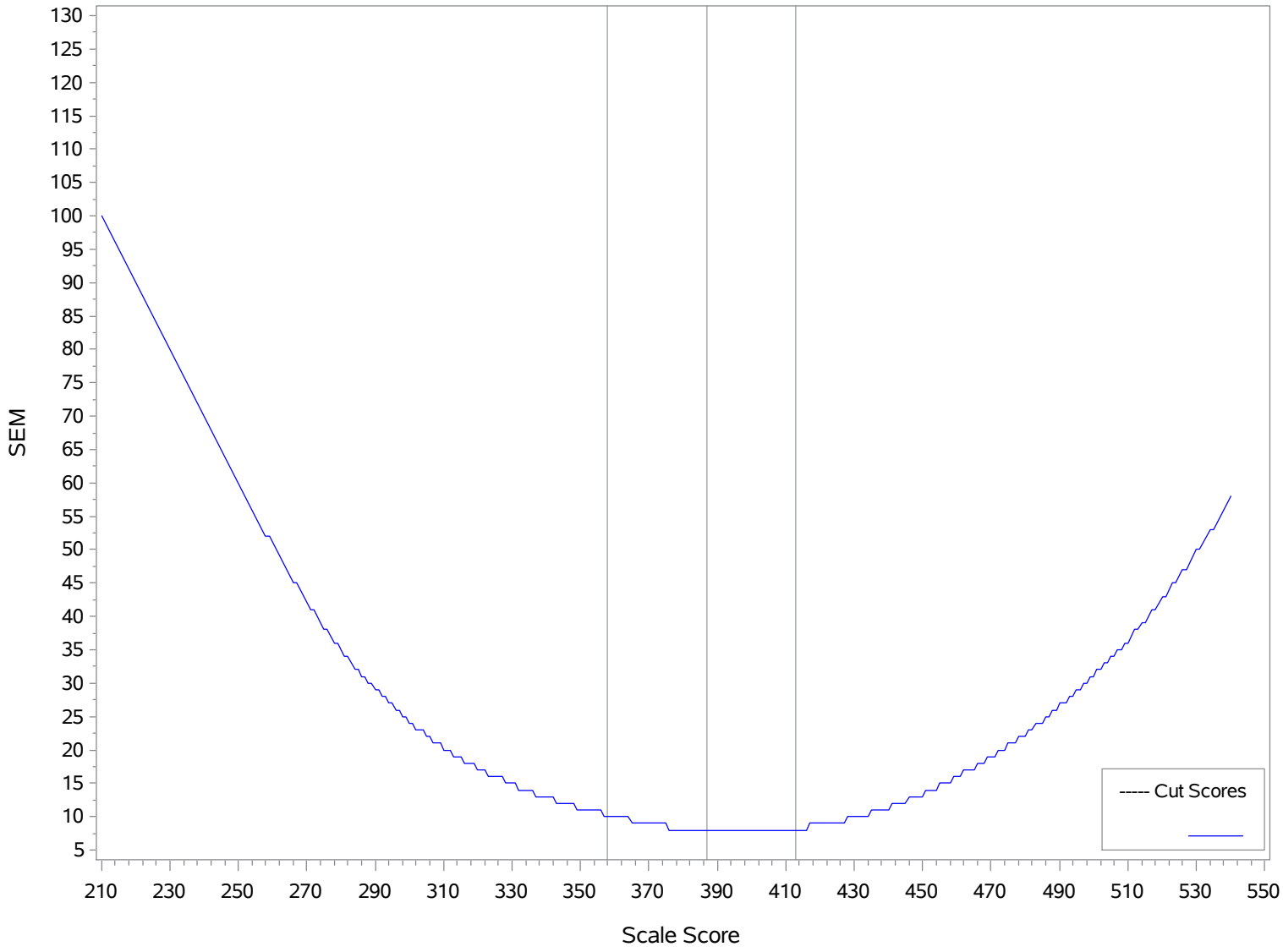


Figure D33: CSEM with Cut Scores, Mathematics Grade 4, Form B

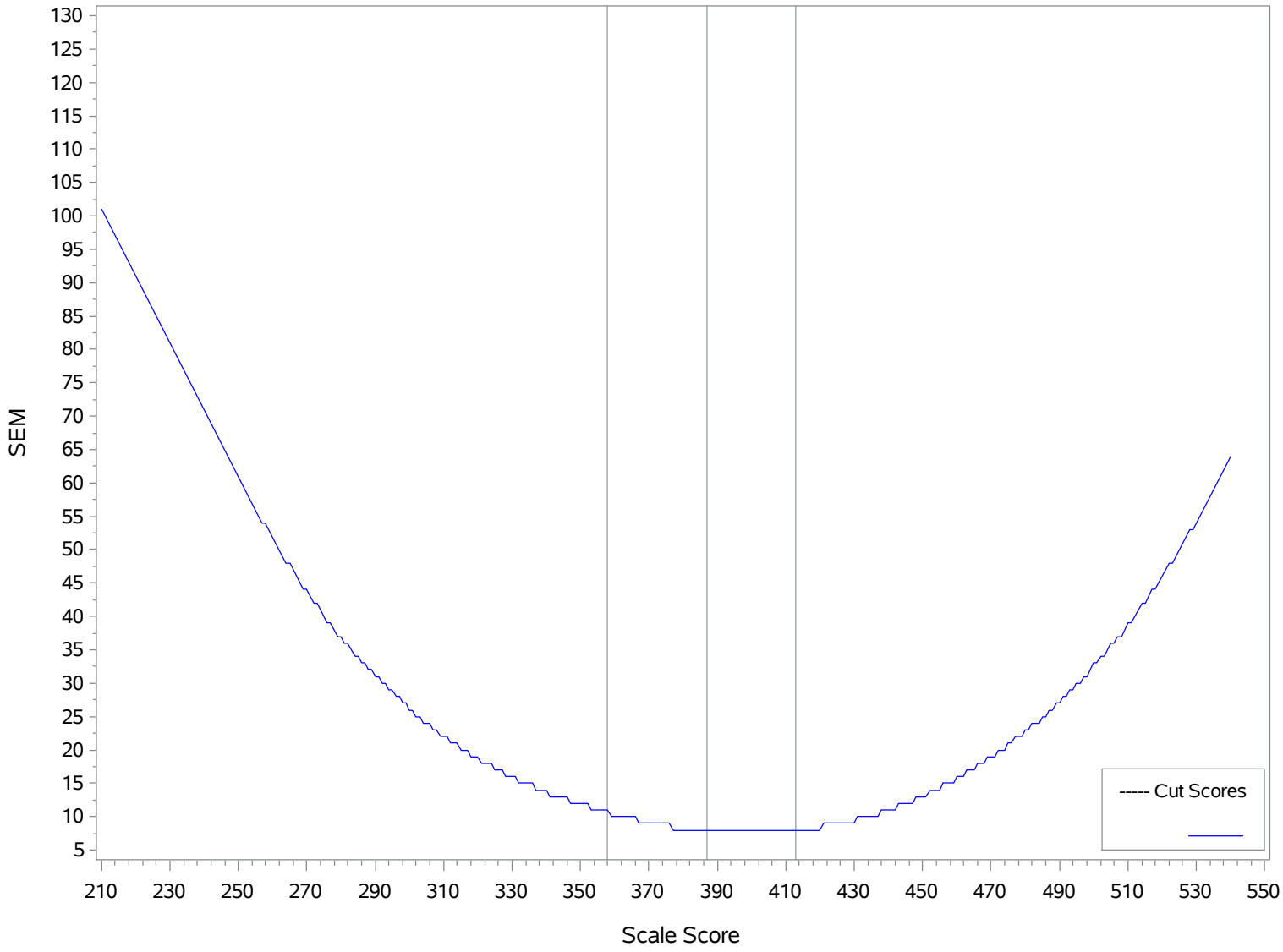


Figure D34: CSEM with Cut Scores, Mathematics Grade 5, Form A

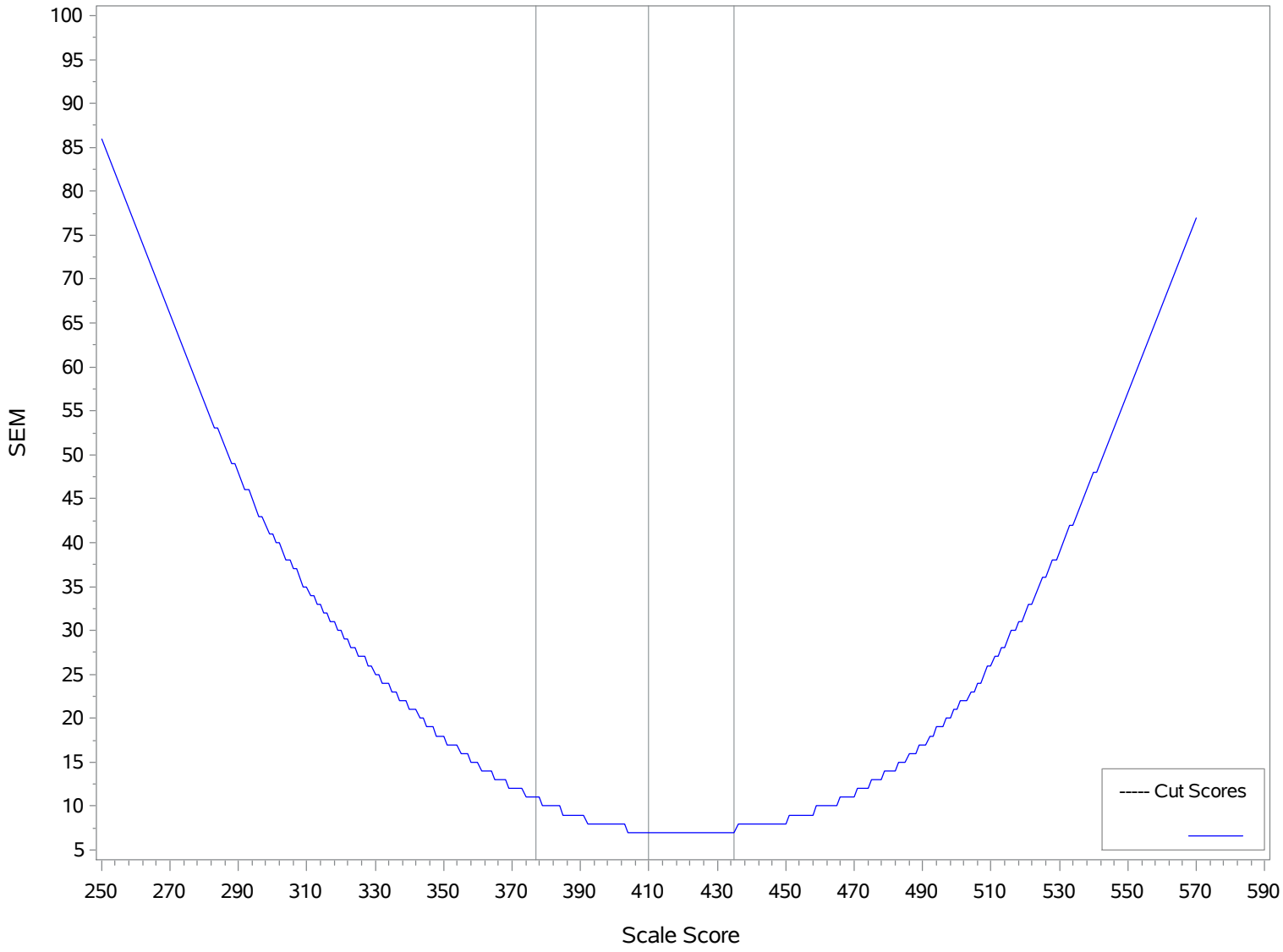


Figure D35: CSEM with Cut Scores, Mathematics Grade 5, Form B

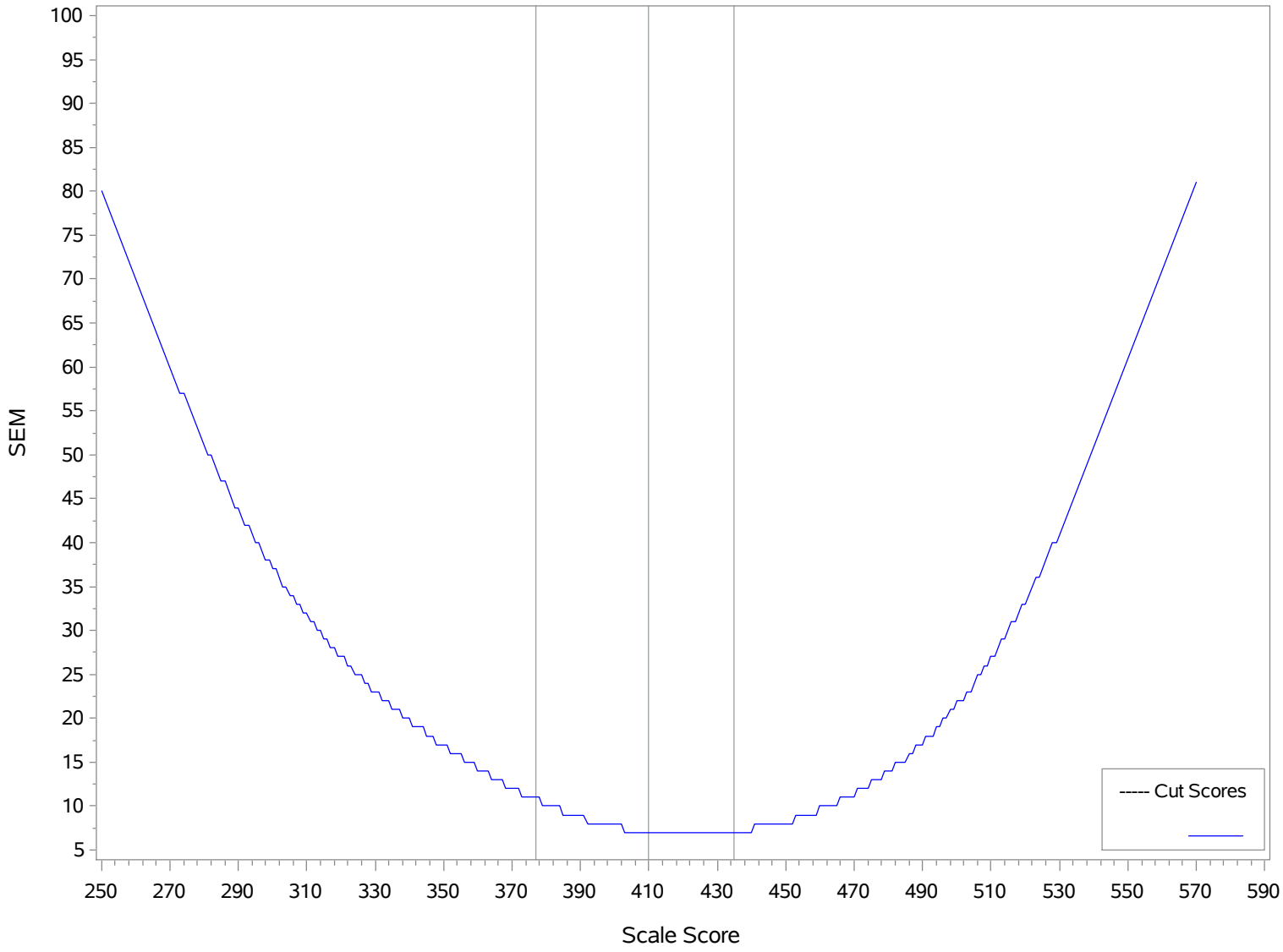


Figure D36: CSEM with Cut Scores, Mathematics Grade 6, Form A

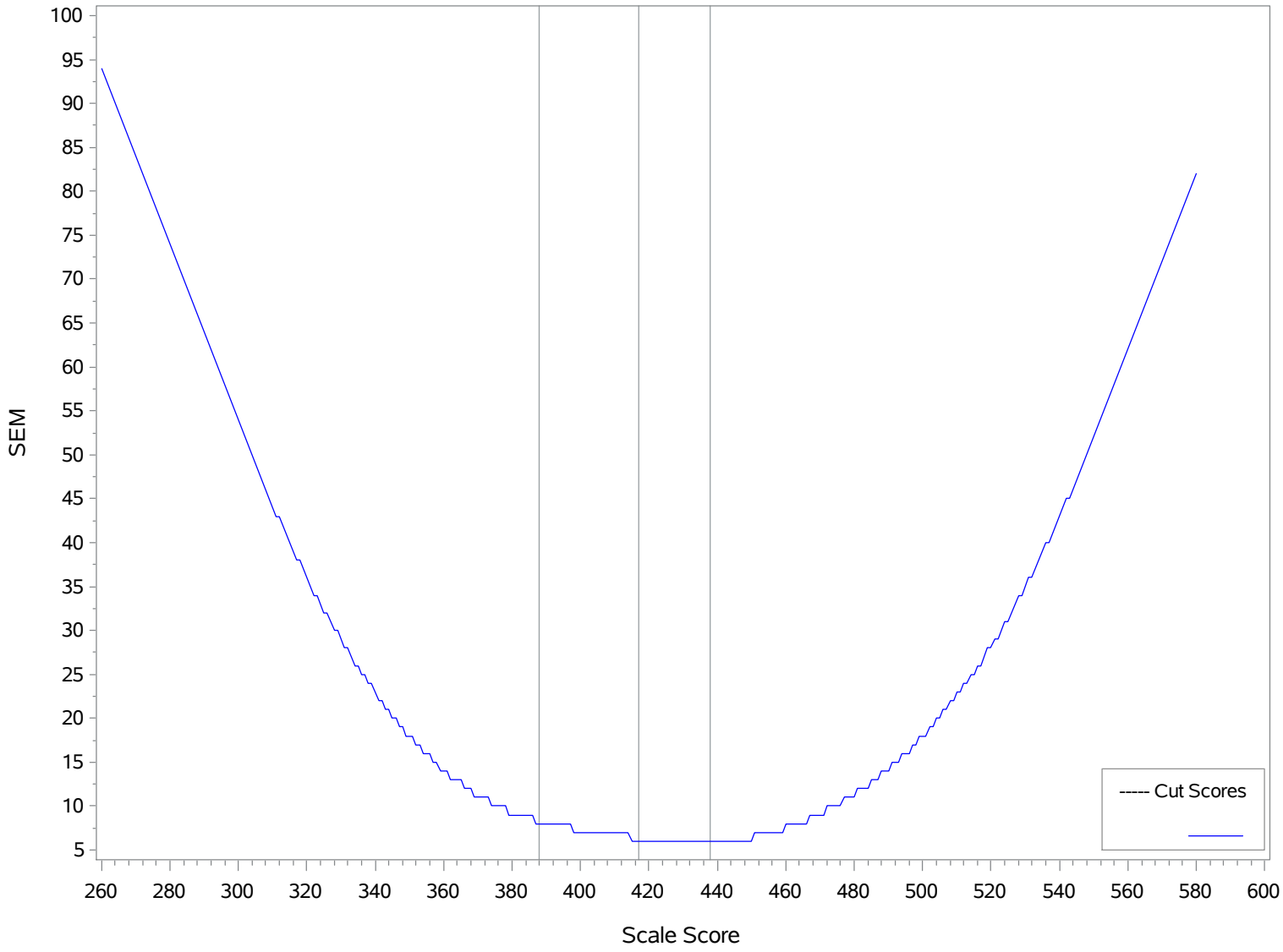


Figure D37: CSEM with Cut Scores, Mathematics Grade 6, Form B

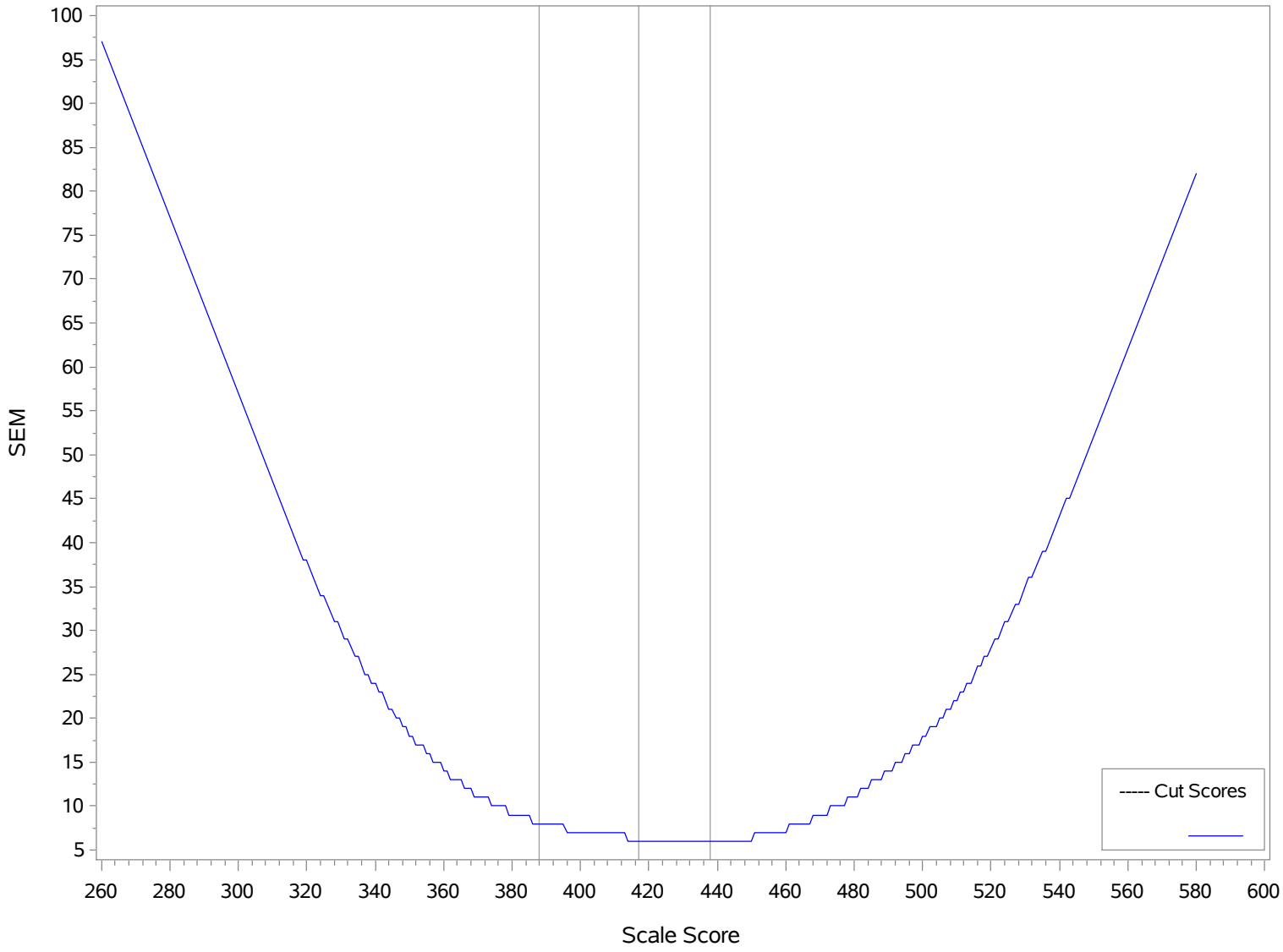


Figure D38: CSEM with Cut Scores, Mathematics Grade 7, Form A

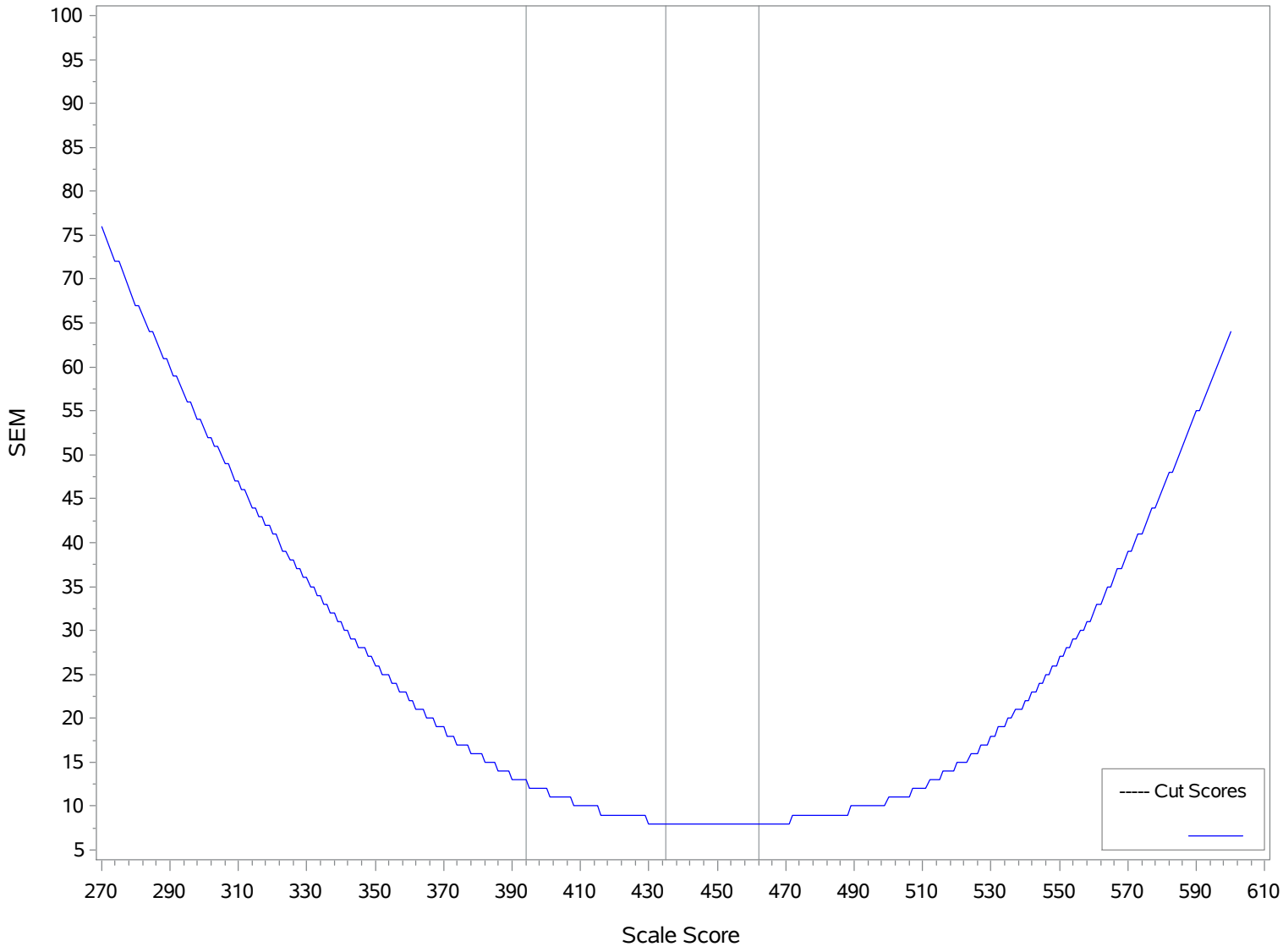


Figure D39: CSEM with Cut Scores, Mathematics Grade 7, Form B

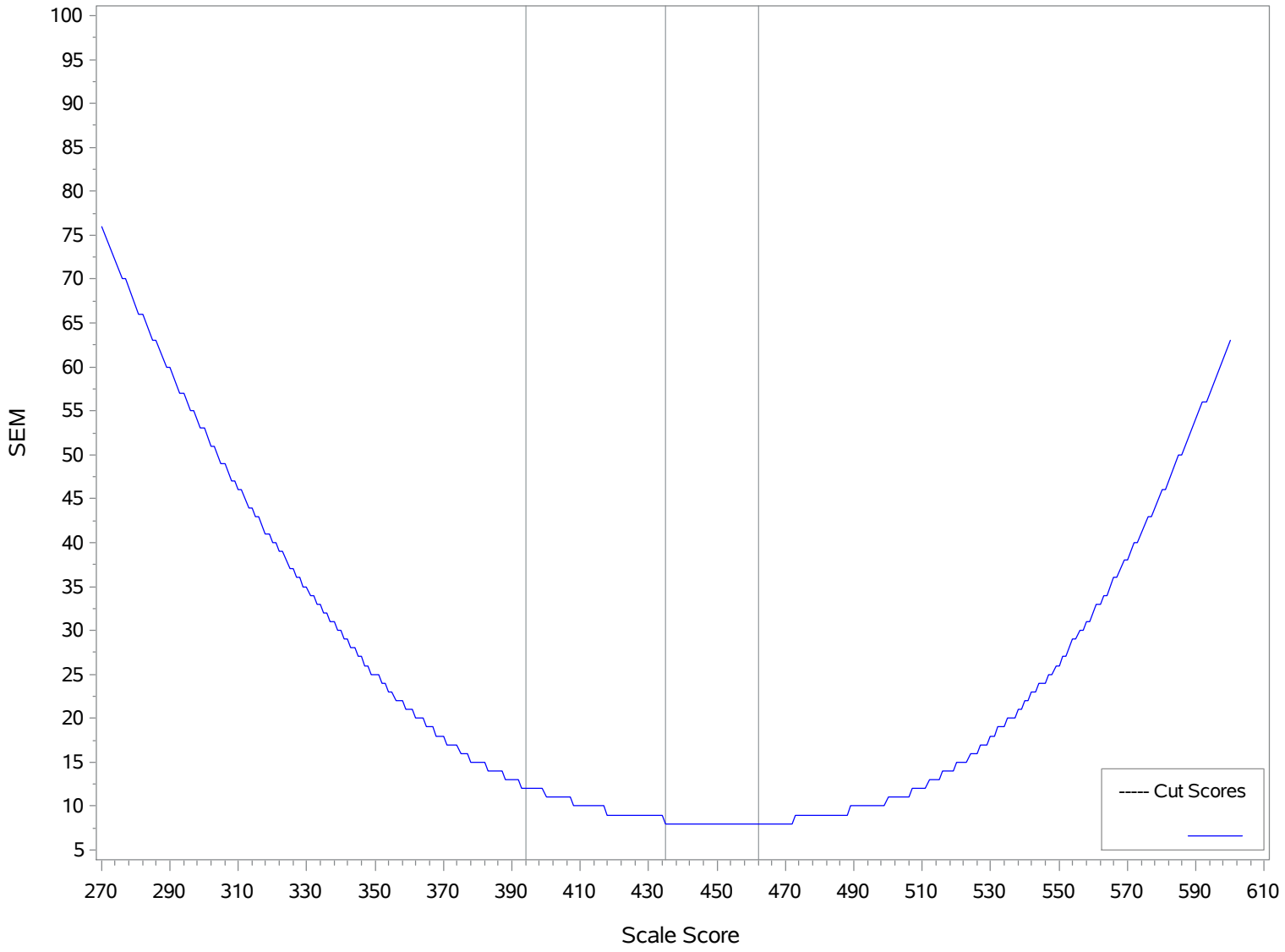
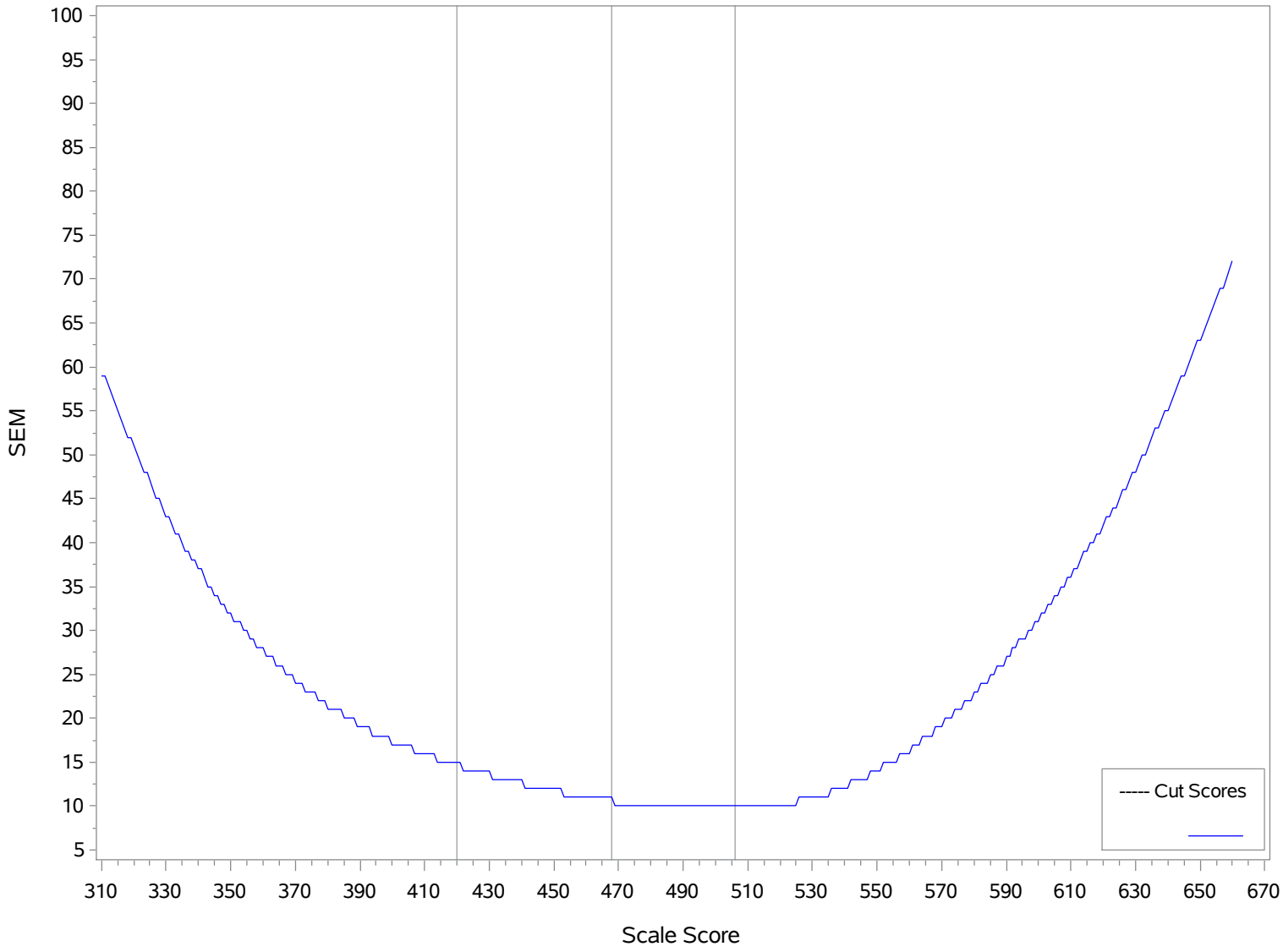


Figure D40: CSEM with Cut Scores, Mathematics Grade 8, Form A



520

Figure D41: CSEM with Cut Scores, Mathematics Grade 8, Form B

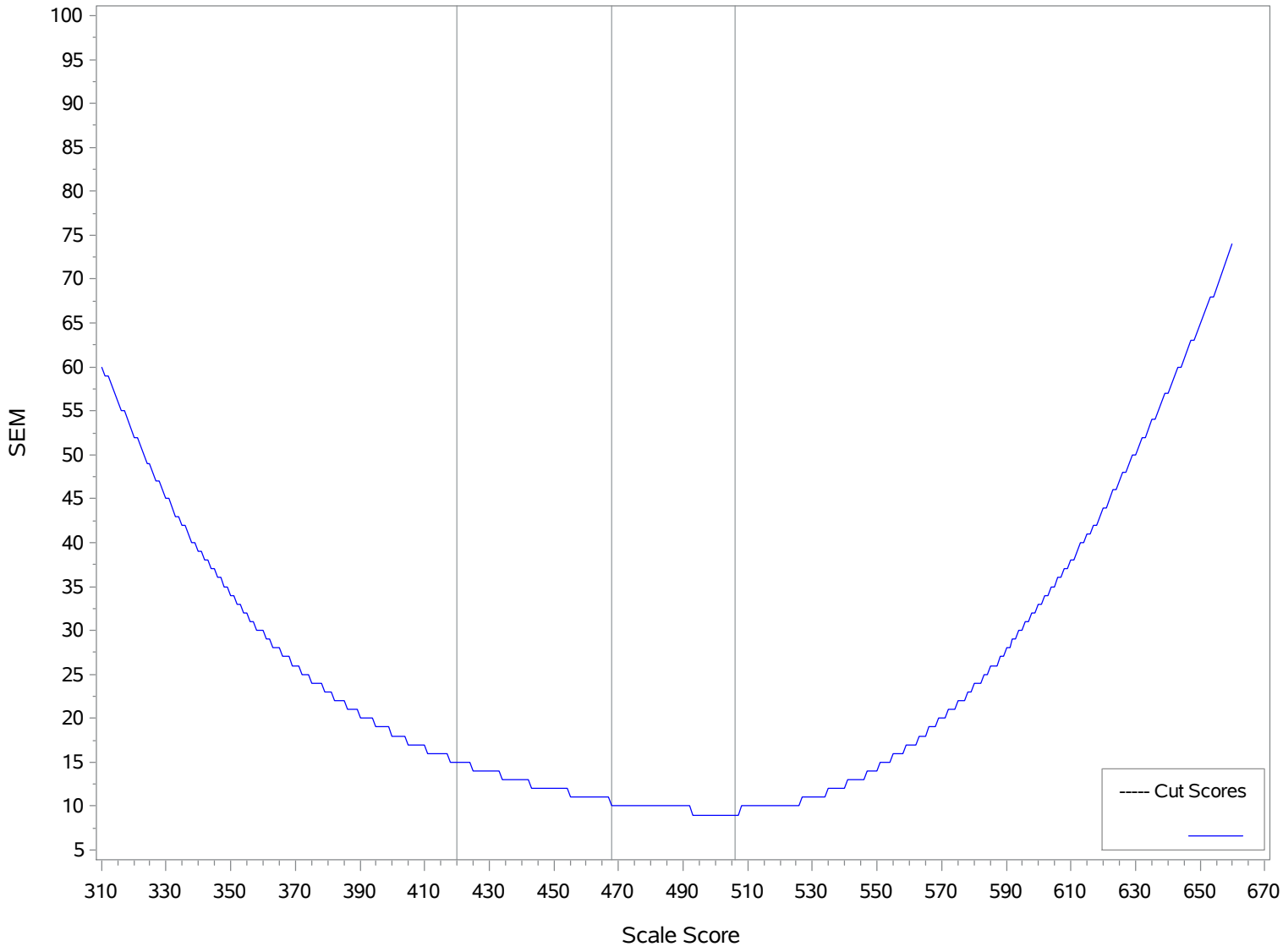


Figure D42: CSEM with Cut Scores, Science Grade 5, Form A

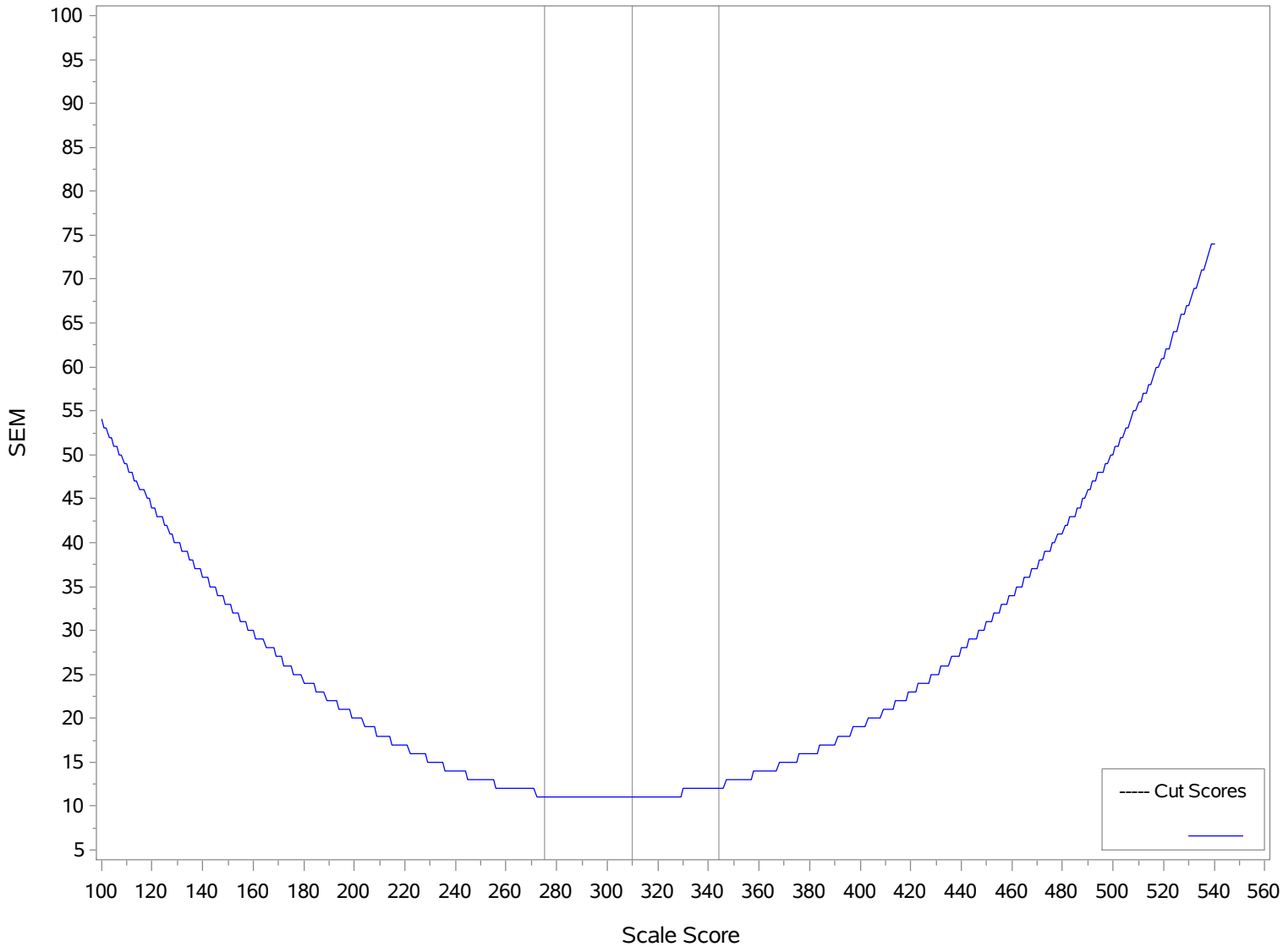


Figure D43: CSEM with Cut Scores, Science Grade 5, Form B

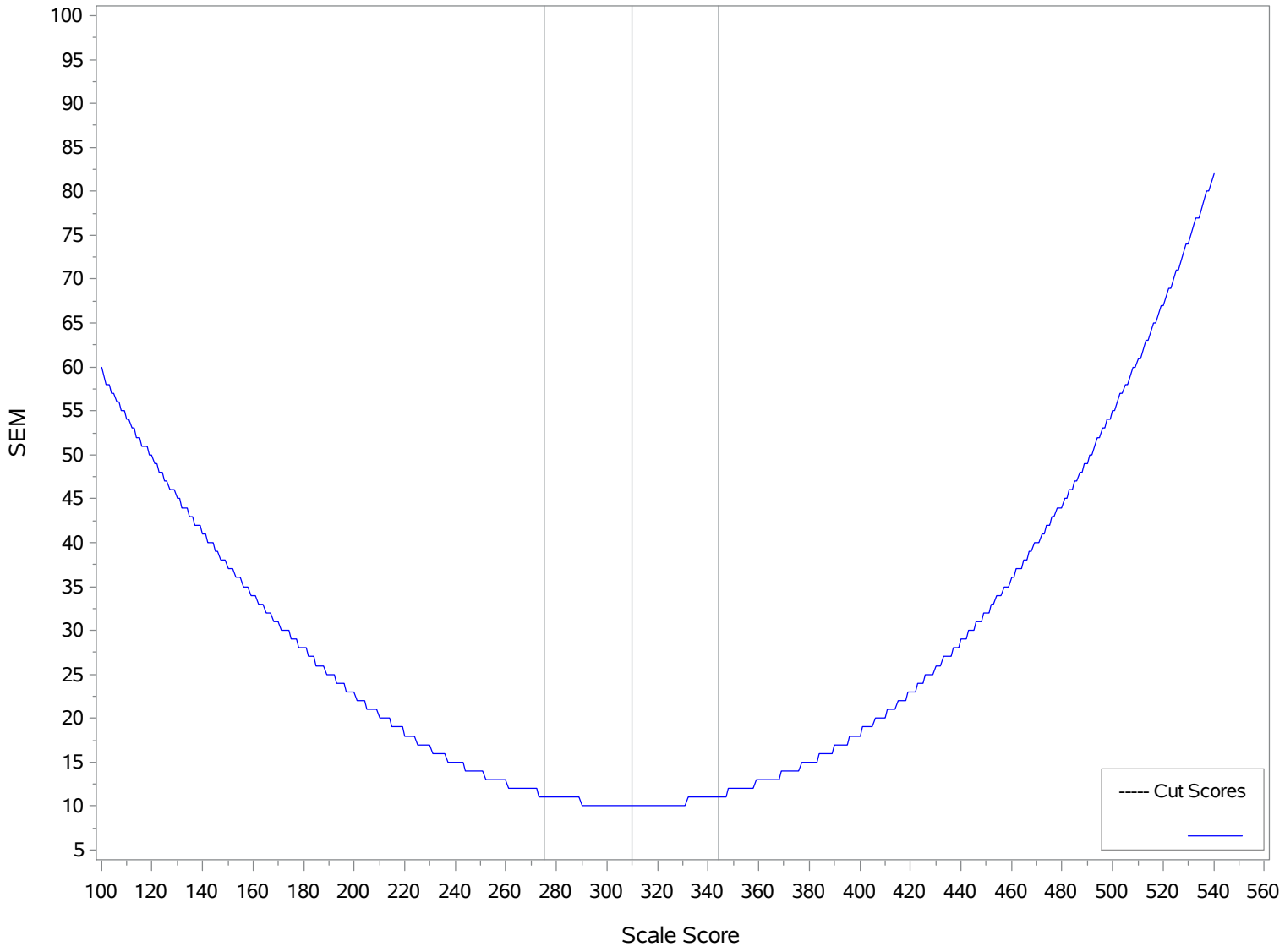


Figure D44: CSEM with Cut Scores, Science Grade 8, Form A

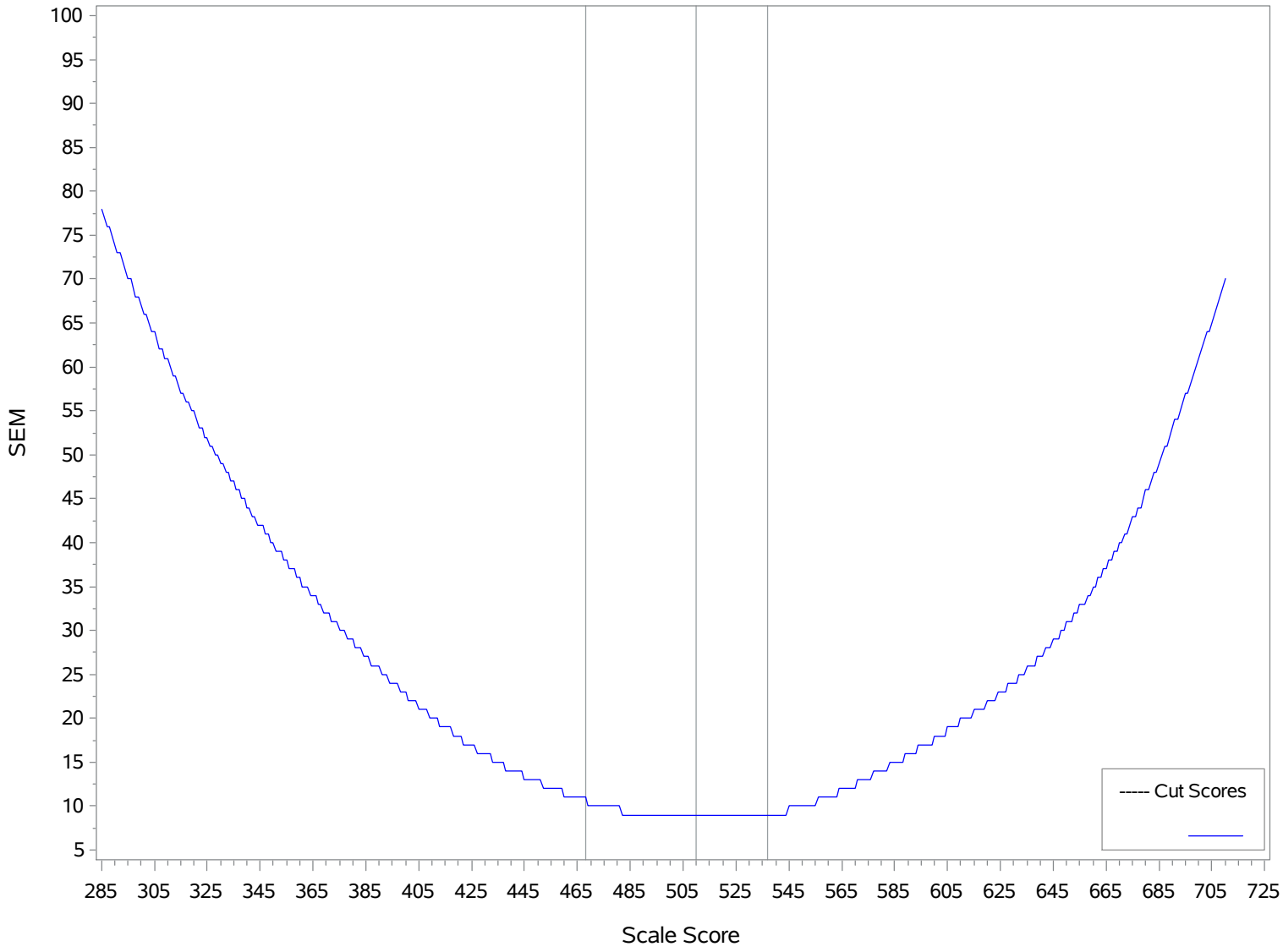
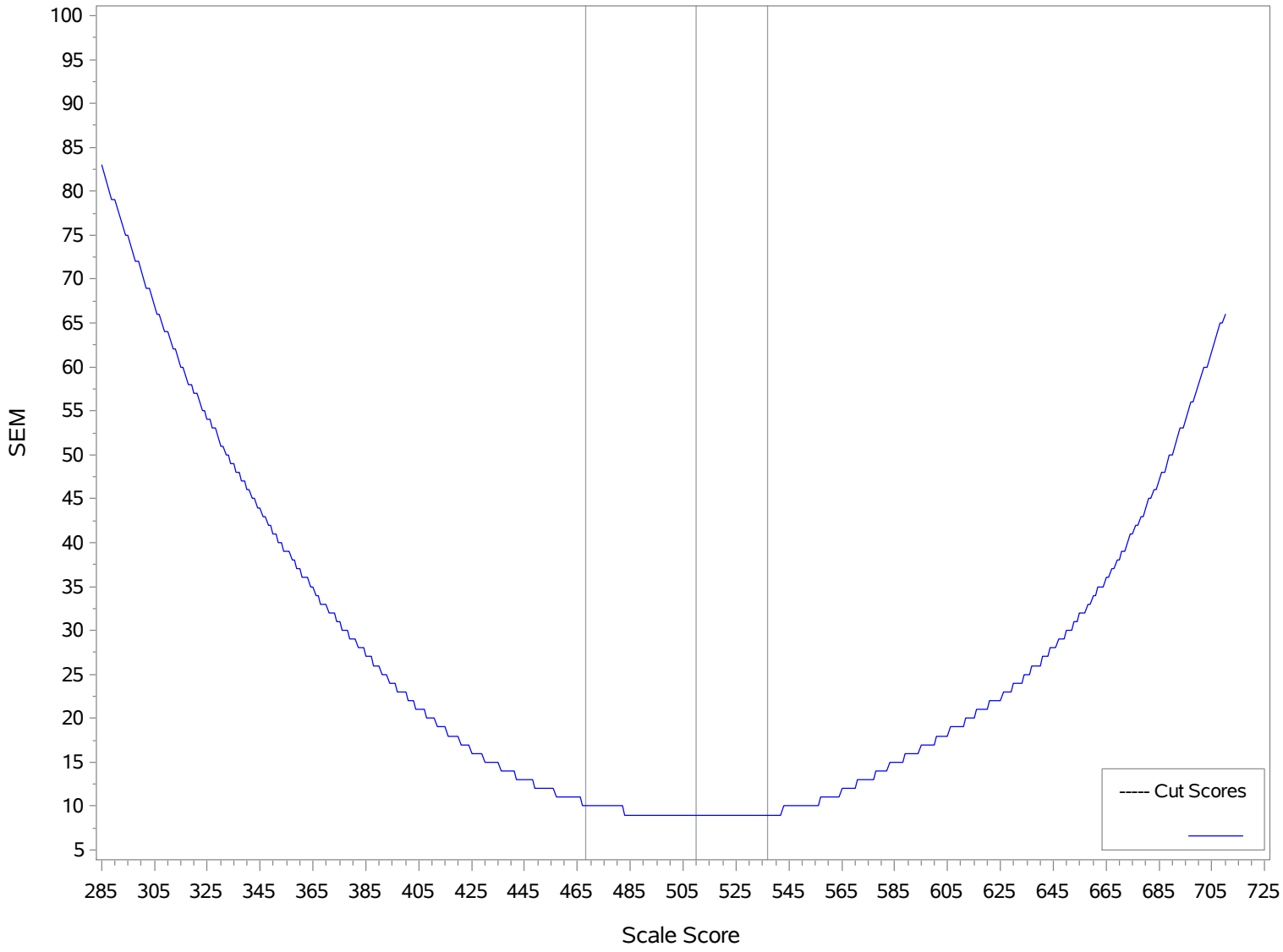


Figure D45: CSEM with Cut Scores, Science Grade 8, Form B



Appendix E: Classification Consistency and Accuracy by Subgroup

Table E1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
3	A	Ethnicity	White (not Hispanic)	0.84	0.75	0.73	0.88	0.78	0.64	0.66	0.82
3	A	Ethnicity	Asian/Pacific Islander	0.86	0.75	0.72	0.91	0.81	0.65	0.65	0.86
3	A	Ethnicity	Black (not Hispanic)	0.89	0.75	0.73	0.85	0.87	0.64	0.65	0.75
3	A	Ethnicity	Hispanic	0.85	0.75	0.73	0.87	0.81	0.64	0.66	0.77
3	A	Ethnicity	Native Americans	0.94	0.75	0.71	0.78	0.83	0.70	0.66	0.62
3	A	Ethnicity	Other	0.86	0.75	0.73	0.89	0.82	0.64	0.66	0.82
3	A	Gender	Male	0.86	0.75	0.73	0.88	0.83	0.64	0.66	0.81
3	A	Gender	Female	0.84	0.75	0.73	0.88	0.80	0.64	0.66	0.82
3	B	Ethnicity	White (not Hispanic)	0.86	0.74	0.70	0.87	0.78	0.65	0.61	0.79
3	B	Ethnicity	Asian/Pacific Islander	0.90	0.73	0.70	0.88	0.82	0.64	0.61	0.82
3	B	Ethnicity	Black (not Hispanic)	0.90	0.74	0.70	0.84	0.86	0.65	0.60	0.71
3	B	Ethnicity	Hispanic	0.88	0.74	0.71	0.85	0.81	0.66	0.60	0.76
3	B	Ethnicity	Native Americans	0.84	0.76	0.67	0.80	0.73	0.69	0.57	0.68
3	B	Ethnicity	Other	0.87	0.74	0.70	0.87	0.80	0.65	0.61	0.80
3	B	Gender	Male	0.89	0.74	0.70	0.87	0.82	0.65	0.61	0.78
3	B	Gender	Female	0.87	0.74	0.70	0.87	0.79	0.65	0.61	0.79
3	B	Accommodations	Yes	0.91	0.75	0.75	0.82	0.87	0.65	0.67	0.56
4	A01	Ethnicity	White (not Hispanic)	0.82	0.84	0.72	0.88	0.73	0.80	0.64	0.78
4	A01	Ethnicity	Asian/Pacific Islander	0.91	0.84	0.67	0.92	0.79	0.78	0.56	0.88
4	A01	Ethnicity	Black (not Hispanic)	0.84	0.85	0.72	0.88	0.79	0.81	0.62	0.70
4	A01	Ethnicity	Hispanic	0.87	0.83	0.70	0.89	0.81	0.79	0.62	0.76
4	A01	Ethnicity	Other	0.73	0.85	0.68	0.88	0.60	0.81	0.59	0.79
4	A01	Gender	Male	0.84	0.84	0.72	0.87	0.77	0.81	0.63	0.75
4	A01	Gender	Female	0.82	0.84	0.71	0.89	0.73	0.80	0.63	0.79

Table E1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	*Basic*	*Prof.*	*Adv.*	*Below Basic*	*Basic*	*Prof.*	*Adv.*
4	A05	Ethnicity	White (not Hispanic)	0.83	0.83	0.72	0.87	0.76	0.79	0.65	0.78
4	A05	Ethnicity	Asian/Pacific Islander	0.84	0.83	0.65	0.90	0.73	0.79	0.61	0.82
4	A05	Ethnicity	Black (not Hispanic)	0.86	0.86	0.72	0.84	0.83	0.81	0.63	0.71
4	A05	Ethnicity	Hispanic	0.84	0.82	0.69	0.87	0.75	0.76	0.62	0.75
4	A05	Ethnicity	Other	0.84	0.82	0.68	0.86	0.76	0.78	0.59	0.74
4	A05	Gender	Male	0.86	0.84	0.72	0.85	0.80	0.80	0.65	0.75
4	A05	Gender	Female	0.82	0.84	0.72	0.88	0.77	0.79	0.65	0.78
4	A09	Ethnicity	White (not Hispanic)	0.82	0.83	0.71	0.88	0.73	0.79	0.65	0.77
4	A09	Ethnicity	Asian/Pacific Islander	0.83	0.79	0.66	0.90	0.75	0.73	0.58	0.82
4	A09	Ethnicity	Black (not Hispanic)	0.85	0.86	0.74	0.89	0.79	0.81	0.67	0.69
4	A09	Ethnicity	Hispanic	0.81	0.82	0.69	0.90	0.74	0.76	0.62	0.82
4	A09	Ethnicity	Other	0.85	0.82	0.73	0.83	0.79	0.77	0.65	0.76
4	A09	Gender	Male	0.84	0.84	0.72	0.87	0.77	0.80	0.65	0.75
4	A09	Gender	Female	0.83	0.83	0.71	0.89	0.74	0.79	0.65	0.77
4	A13	Ethnicity	White (not Hispanic)	0.82	0.83	0.71	0.87	0.72	0.79	0.64	0.78
4	A13	Ethnicity	Asian/Pacific Islander	0.99	0.62	0.44	0.99	0.87	0.74	0.63	0.89
4	A13	Ethnicity	Black (not Hispanic)	0.85	0.84	0.69	0.84	0.80	0.79	0.58	0.69
4	A13	Ethnicity	Hispanic	0.83	0.82	0.71	0.86	0.78	0.78	0.63	0.74
4	A13	Ethnicity	Other	0.94	0.70	0.58	0.98	0.84	0.79	0.66	0.81
4	A13	Gender	Male	0.83	0.84	0.71	0.87	0.75	0.80	0.64	0.76
4	A13	Gender	Female	0.83	0.83	0.70	0.88	0.75	0.79	0.64	0.78
4	A17	Ethnicity	White (not Hispanic)	0.82	0.83	0.71	0.88	0.73	0.80	0.65	0.78
4	A17	Ethnicity	Asian/Pacific Islander	0.88	0.79	0.67	0.87	0.83	0.70	0.58	0.78
4	A17	Ethnicity	Black (not Hispanic)	0.85	0.85	0.71	0.85	0.80	0.81	0.63	0.70
4	A17	Ethnicity	Hispanic	0.85	0.83	0.70	0.87	0.77	0.81	0.63	0.75
4	A17	Ethnicity	Other	0.81	0.83	0.69	0.88	0.72	0.78	0.61	0.82
4	A17	Gender	Male	0.85	0.84	0.71	0.86	0.78	0.80	0.65	0.75
4	A17	Gender	Female	0.82	0.83	0.71	0.89	0.73	0.80	0.65	0.79

Table E1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
4	B04	Ethnicity	White (not Hispanic)	0.84	0.84	0.71	0.88	0.74	0.78	0.64	0.76
4	B04	Ethnicity	Asian/Pacific Islander	0.85	0.81	0.74	0.90	0.79	0.75	0.66	0.78
4	B04	Ethnicity	Black (not Hispanic)	0.85	0.84	0.73	0.88	0.77	0.78	0.64	0.68
4	B04	Ethnicity	Hispanic	0.82	0.84	0.70	0.89	0.75	0.78	0.61	0.75
4	B04	Ethnicity	Other	0.83	0.81	0.73	0.89	0.74	0.74	0.65	0.76
4	B04	Gender	Male	0.84	0.84	0.71	0.88	0.76	0.78	0.64	0.74
4	B04	Gender	Female	0.83	0.84	0.71	0.88	0.73	0.77	0.64	0.76
4	B04	Accommodations	Yes	0.87	0.81	0.74	0.76	0.78	0.74	0.64	0.58
4	B06	Ethnicity	White (not Hispanic)	0.82	0.83	0.71	0.89	0.71	0.77	0.66	0.78
4	B06	Ethnicity	Asian/Pacific Islander	0.86	0.79	0.70	0.92	0.75	0.69	0.64	0.78
4	B06	Ethnicity	Black (not Hispanic)	0.85	0.83	0.70	0.85	0.77	0.78	0.63	0.64
4	B06	Ethnicity	Hispanic	0.80	0.85	0.69	0.89	0.73	0.79	0.62	0.77
4	B06	Ethnicity	Other	0.84	0.84	0.73	0.91	0.76	0.79	0.63	0.81
4	B06	Gender	Male	0.83	0.84	0.71	0.88	0.75	0.78	0.66	0.74
4	B06	Gender	Female	0.83	0.83	0.71	0.90	0.72	0.77	0.66	0.80
4	B10	Ethnicity	White (not Hispanic)	0.81	0.83	0.71	0.87	0.70	0.78	0.63	0.78
4	B10	Ethnicity	Asian/Pacific Islander	0.81	0.79	0.72	0.86	0.75	0.72	0.60	0.80
4	B10	Ethnicity	Black (not Hispanic)	0.83	0.85	0.72	0.86	0.79	0.78	0.63	0.72
4	B10	Ethnicity	Hispanic	0.79	0.83	0.70	0.86	0.71	0.77	0.62	0.73
4	B10	Ethnicity	Other	0.87	0.87	0.71	0.90	0.76	0.80	0.63	0.80
4	B10	Gender	Male	0.82	0.84	0.71	0.86	0.76	0.77	0.64	0.74
4	B10	Gender	Female	0.81	0.83	0.70	0.89	0.71	0.79	0.63	0.79
4	B14	Ethnicity	White (not Hispanic)	0.81	0.83	0.70	0.88	0.71	0.77	0.62	0.78
4	B14	Ethnicity	Asian/Pacific Islander	0.93	0.77	0.68	0.92	0.77	0.70	0.59	0.84
4	B14	Ethnicity	Black (not Hispanic)	0.83	0.84	0.73	0.88	0.76	0.79	0.64	0.73
4	B14	Ethnicity	Hispanic	0.84	0.79	0.69	0.84	0.75	0.76	0.60	0.73
4	B14	Ethnicity	Other	0.86	0.83	0.72	0.87	0.73	0.81	0.62	0.78
4	B14	Gender	Male	0.84	0.83	0.71	0.88	0.75	0.77	0.63	0.76
4	B14	Gender	Female	0.80	0.82	0.69	0.88	0.69	0.77	0.61	0.79

Table E1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
4	B18	Ethnicity	White (not Hispanic)	0.80	0.82	0.70	0.88	0.70	0.77	0.63	0.79
4	B18	Ethnicity	Asian/Pacific Islander	0.80	0.81	0.71	0.91	0.79	0.75	0.62	0.86
4	B18	Ethnicity	Black (not Hispanic)	0.83	0.84	0.72	0.85	0.77	0.77	0.63	0.69
4	B18	Ethnicity	Hispanic	0.81	0.84	0.70	0.90	0.72	0.81	0.62	0.78
4	B18	Ethnicity	Other	0.85	0.83	0.70	0.88	0.77	0.77	0.61	0.80
4	B18	Gender	Male	0.83	0.84	0.70	0.88	0.76	0.77	0.62	0.76
4	B18	Gender	Female	0.81	0.83	0.71	0.89	0.71	0.78	0.63	0.80
4	BM4	Ethnicity	White (not Hispanic)	0.80	0.82	0.72	0.90	0.69	0.77	0.66	0.79
4	BM4	Ethnicity	Asian/Pacific Islander	0.81	0.84	0.72	0.89	0.66	0.83	0.62	0.83
4	BM4	Ethnicity	Black (not Hispanic)	0.82	0.84	0.73	0.89	0.76	0.78	0.67	0.68
4	BM4	Ethnicity	Hispanic	0.83	0.83	0.74	0.85	0.76	0.77	0.59	0.79
4	BM4	Ethnicity	Other	0.85	0.82	0.73	0.89	0.70	0.78	0.67	0.73
4	BM4	Gender	Male	0.83	0.83	0.72	0.90	0.73	0.78	0.66	0.78
4	BM4	Gender	Female	0.80	0.81	0.72	0.89	0.71	0.76	0.64	0.80
5	A	Ethnicity	White (not Hispanic)	0.83	0.86	0.70	0.86	0.68	0.79	0.62	0.79
5	A	Ethnicity	Asian/Pacific Islander	0.85	0.86	0.70	0.89	0.76	0.77	0.59	0.86
5	A	Ethnicity	Black (not Hispanic)	0.85	0.85	0.70	0.82	0.75	0.80	0.61	0.70
5	A	Ethnicity	Hispanic	0.85	0.85	0.71	0.84	0.73	0.80	0.61	0.75
5	A	Ethnicity	Native Americans	0.82	0.83	0.69	0.78	0.71	0.74	0.62	0.70
5	A	Ethnicity	Other	0.85	0.86	0.71	0.87	0.72	0.81	0.63	0.78
5	A	Gender	Male	0.85	0.86	0.70	0.85	0.73	0.79	0.62	0.77
5	A	Gender	Female	0.83	0.86	0.70	0.86	0.68	0.79	0.62	0.79
5	B	Ethnicity	White (not Hispanic)	0.85	0.86	0.69	0.85	0.75	0.80	0.60	0.80
5	B	Ethnicity	Asian/Pacific Islander	0.85	0.88	0.67	0.88	0.77	0.80	0.56	0.83
5	B	Ethnicity	Black (not Hispanic)	0.87	0.85	0.69	0.81	0.80	0.81	0.57	0.74
5	B	Ethnicity	Hispanic	0.84	0.85	0.68	0.80	0.75	0.80	0.59	0.71
5	B	Ethnicity	Native Americans	0.84	0.88	0.67	0.78	0.77	0.81	0.58	0.68
5	B	Ethnicity	Other	0.81	0.85	0.66	0.83	0.71	0.79	0.57	0.74
5	B	Gender	Male	0.86	0.85	0.69	0.83	0.78	0.80	0.59	0.78
5	B	Gender	Female	0.84	0.86	0.69	0.85	0.74	0.80	0.59	0.80
5	B	Accommodations	Yes	0.92	0.86	0.72	0.99	0.87	0.79	0.63	0.73

Table E1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
6	A	Ethnicity	White (not Hispanic)	0.84	0.79	0.69	0.84	0.75	0.74	0.58	0.78
6	A	Ethnicity	Asian/Pacific Islander	0.86	0.78	0.69	0.88	0.75	0.73	0.55	0.84
6	A	Ethnicity	Black (not Hispanic)	0.87	0.80	0.70	0.80	0.81	0.75	0.57	0.68
6	A	Ethnicity	Hispanic	0.88	0.80	0.66	0.83	0.80	0.75	0.56	0.74
6	A	Ethnicity	Native Americans	0.82	0.77	0.68	0.80	0.71	0.70	0.61	0.68
6	A	Ethnicity	Other	0.85	0.77	0.69	0.84	0.71	0.73	0.59	0.75
6	A	Gender	Male	0.86	0.79	0.69	0.83	0.78	0.75	0.55	0.74
6	A	Gender	Female	0.85	0.79	0.69	0.84	0.76	0.75	0.58	0.78
6	A	Accommodations	Yes	0.88	0.79	0.70	0.80	0.84	0.74	0.55	0.66
6	B	Ethnicity	White (not Hispanic)	0.83	0.78	0.68	0.85	0.67	0.72	0.57	0.77
6	B	Ethnicity	Asian/Pacific Islander	0.84	0.77	0.69	0.88	0.71	0.71	0.58	0.82
6	B	Ethnicity	Black (not Hispanic)	0.85	0.80	0.69	0.80	0.78	0.75	0.56	0.70
6	B	Ethnicity	Hispanic	0.84	0.79	0.69	0.82	0.72	0.75	0.55	0.73
6	B	Ethnicity	Native Americans	0.82	0.79	0.70	0.89	0.76	0.75	0.56	0.79
6	B	Ethnicity	Other	0.83	0.81	0.69	0.84	0.72	0.76	0.58	0.75
6	B	Gender	Male	0.84	0.79	0.69	0.84	0.73	0.73	0.57	0.76
6	B	Gender	Female	0.82	0.79	0.69	0.86	0.71	0.75	0.58	0.80
6	B	Accommodations	Yes	0.86	0.79	0.70	0.80	0.81	0.73	0.55	0.68
7	A	Ethnicity	White (not Hispanic)	0.83	0.82	0.65	0.87	0.79	0.77	0.54	0.81
7	A	Ethnicity	Asian/Pacific Islander	0.85	0.83	0.63	0.91	0.81	0.73	0.52	0.86
7	A	Ethnicity	Black (not Hispanic)	0.86	0.84	0.64	0.84	0.82	0.77	0.53	0.72
7	A	Ethnicity	Hispanic	0.83	0.82	0.64	0.87	0.78	0.77	0.49	0.78
7	A	Ethnicity	Native Americans	0.83	0.80	0.60	0.86	0.77	0.73	0.48	0.75
7	A	Ethnicity	Other	0.81	0.82	0.64	0.85	0.78	0.75	0.51	0.79
7	A	Gender	Male	0.84	0.83	0.63	0.86	0.81	0.76	0.53	0.80
7	A	Gender	Female	0.82	0.82	0.63	0.88	0.75	0.77	0.49	0.82
7	A	Accommodations	Yes	0.87	0.85	0.63	0.80	0.85	0.76	0.50	0.64

Table E1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
7	B	Ethnicity	White (not Hispanic)	0.82	0.81	0.57	0.87	0.76	0.77	0.47	0.80
7	B	Ethnicity	Asian/Pacific Islander	0.85	0.78	0.60	0.90	0.77	0.73	0.45	0.86
7	B	Ethnicity	Black (not Hispanic)	0.86	0.83	0.58	0.84	0.83	0.79	0.45	0.72
7	B	Ethnicity	Hispanic	0.84	0.82	0.61	0.84	0.79	0.77	0.49	0.75
7	B	Ethnicity	Native Americans	0.83	0.80	0.61	0.85	0.79	0.75	0.42	0.80
7	B	Ethnicity	Other	0.78	0.81	0.61	0.86	0.70	0.75	0.47	0.81
7	B	Gender	Male	0.84	0.82	0.58	0.87	0.80	0.78	0.46	0.79
7	B	Gender	Female	0.82	0.81	0.58	0.87	0.76	0.77	0.46	0.79
7	B	Accommodations	Yes	0.87	0.85	0.60	0.81	0.84	0.79	0.46	0.57
8	A01	Ethnicity	White (not Hispanic)	0.87	0.82	0.77	0.83	0.82	0.77	0.66	0.75
8	A01	Ethnicity	Asian/Pacific Islander	0.88	0.80	0.77	0.88	0.82	0.74	0.68	0.83
8	A01	Ethnicity	Black (not Hispanic)	0.90	0.82	0.76	0.80	0.87	0.76	0.63	0.65
8	A01	Ethnicity	Hispanic	0.96	0.79	0.69	0.97	0.88	0.79	0.68	0.83
8	A01	Ethnicity	Other	0.85	0.83	0.75	0.86	0.76	0.78	0.64	0.77
8	A01	Gender	Male	0.89	0.82	0.76	0.81	0.86	0.76	0.65	0.71
8	A01	Gender	Female	0.85	0.83	0.75	0.87	0.79	0.78	0.66	0.78
8	A01	Accommodations	Yes	0.89	0.82	0.76	0.73	0.86	0.76	0.60	0.50
8	A05	Ethnicity	White (not Hispanic)	0.86	0.83	0.75	0.85	0.75	0.77	0.66	0.77
8	A05	Ethnicity	Asian/Pacific Islander	0.87	0.85	0.77	0.91	0.75	0.77	0.67	0.87
8	A05	Ethnicity	Black (not Hispanic)	0.88	0.82	0.76	0.83	0.81	0.77	0.64	0.69
8	A05	Ethnicity	Hispanic	0.88	0.84	0.76	0.86	0.77	0.80	0.66	0.74
8	A05	Ethnicity	Other	0.81	0.83	0.76	0.82	0.72	0.78	0.67	0.74
8	A05	Gender	Male	0.88	0.83	0.76	0.85	0.80	0.78	0.66	0.78
8	A05	Gender	Female	0.85	0.82	0.75	0.85	0.71	0.76	0.68	0.75
8	A09	Ethnicity	White (not Hispanic)	0.82	0.83	0.75	0.86	0.72	0.77	0.67	0.78
8	A09	Ethnicity	Asian/Pacific Islander	0.93	0.83	0.72	0.96	0.85	0.76	0.68	0.90
8	A09	Ethnicity	Black (not Hispanic)	0.87	0.83	0.75	0.82	0.80	0.78	0.67	0.68
8	A09	Ethnicity	Hispanic	0.85	0.82	0.75	0.85	0.76	0.78	0.63	0.75
8	A09	Ethnicity	Other	0.84	0.83	0.77	0.84	0.76	0.79	0.67	0.77
8	A09	Gender	Male	0.85	0.82	0.75	0.86	0.76	0.78	0.66	0.76
8	A09	Gender	Female	0.83	0.83	0.76	0.85	0.71	0.77	0.69	0.77

Table E1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
8	A13	Ethnicity	White (not Hispanic)	0.84	0.83	0.76	0.85	0.72	0.77	0.67	0.77
8	A13	Ethnicity	Asian/Pacific Islander	0.89	0.80	0.76	0.89	0.82	0.72	0.66	0.84
8	A13	Ethnicity	Black (not Hispanic)	0.87	0.84	0.75	0.84	0.81	0.79	0.67	0.69
8	A13	Ethnicity	Hispanic	0.84	0.82	0.78	0.80	0.74	0.78	0.66	0.70
8	A13	Ethnicity	Other	0.77	0.84	0.76	0.87	0.64	0.76	0.67	0.78
8	A13	Gender	Male	0.86	0.83	0.76	0.84	0.79	0.77	0.67	0.77
8	A13	Gender	Female	0.83	0.82	0.77	0.85	0.67	0.77	0.66	0.79
8	A17	Ethnicity	White (not Hispanic)	0.85	0.84	0.76	0.85	0.73	0.80	0.65	0.75
8	A17	Ethnicity	Asian/Pacific Islander	0.88	0.80	0.77	0.91	0.76	0.75	0.68	0.87
8	A17	Ethnicity	Black (not Hispanic)	0.87	0.83	0.74	0.83	0.79	0.79	0.64	0.70
8	A17	Ethnicity	Hispanic	0.85	0.83	0.76	0.82	0.71	0.81	0.66	0.73
8	A17	Ethnicity	Other	0.91	0.82	0.74	0.85	0.76	0.80	0.63	0.76
8	A17	Gender	Male	0.87	0.84	0.74	0.84	0.76	0.80	0.65	0.74
8	A17	Gender	Female	0.86	0.84	0.75	0.86	0.72	0.79	0.65	0.77
8	B04	Ethnicity	White (not Hispanic)	0.87	0.84	0.75	0.85	0.79	0.78	0.66	0.78
8	B04	Ethnicity	Asian/Pacific Islander	0.88	0.78	0.71	0.89	0.79	0.69	0.64	0.87
8	B04	Ethnicity	Black (not Hispanic)	0.86	0.84	0.74	0.81	0.83	0.79	0.63	0.73
8	B04	Ethnicity	Hispanic	0.84	0.83	0.78	0.82	0.77	0.78	0.69	0.74
8	B04	Ethnicity	Other	0.83	0.84	0.76	0.89	0.73	0.79	0.65	0.77
8	B04	Gender	Male	0.87	0.83	0.74	0.84	0.80	0.77	0.66	0.76
8	B04	Gender	Female	0.84	0.84	0.75	0.85	0.78	0.79	0.64	0.78
8	B04	Accommodations	Yes	0.90	0.84	0.76	0.75	0.85	0.78	0.65	0.56
8	B06	Ethnicity	White (not Hispanic)	0.83	0.84	0.76	0.84	0.77	0.79	0.65	0.76
8	B06	Ethnicity	Asian/Pacific Islander	0.77	0.84	0.76	0.87	0.73	0.78	0.66	0.84
8	B06	Ethnicity	Black (not Hispanic)	0.87	0.83	0.75	0.79	0.82	0.79	0.63	0.68
8	B06	Ethnicity	Hispanic	0.88	0.80	0.75	0.85	0.79	0.76	0.69	0.73
8	B06	Ethnicity	Other	0.83	0.82	0.76	0.85	0.74	0.76	0.67	0.80
8	B06	Gender	Male	0.85	0.83	0.74	0.84	0.79	0.77	0.66	0.74
8	B06	Gender	Female	0.84	0.83	0.75	0.84	0.76	0.78	0.64	0.77

Table E1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
8	B10	Ethnicity	White (not Hispanic)	0.87	0.82	0.74	0.89	0.74	0.78	0.66	0.80
8	B10	Ethnicity	Asian/Pacific Islander	0.84	0.80	0.75	0.87	0.75	0.74	0.65	0.81
8	B10	Ethnicity	Black (not Hispanic)	0.88	0.82	0.73	0.83	0.80	0.78	0.63	0.70
8	B10	Ethnicity	Hispanic	0.83	0.83	0.79	0.83	0.72	0.79	0.67	0.77
8	B10	Ethnicity	Other	0.85	0.83	0.77	0.82	0.70	0.81	0.68	0.76
8	B10	Gender	Male	0.86	0.83	0.76	0.83	0.78	0.79	0.65	0.77
8	B10	Gender	Female	0.81	0.82	0.76	0.85	0.68	0.78	0.67	0.79
8	B14	Ethnicity	White (not Hispanic)	0.82	0.82	0.76	0.84	0.74	0.77	0.66	0.78
8	B14	Ethnicity	Asian/Pacific Islander	0.81	0.82	0.76	0.91	0.73	0.74	0.64	0.89
8	B14	Ethnicity	Black (not Hispanic)	0.87	0.83	0.73	0.77	0.80	0.78	0.63	0.65
8	B14	Ethnicity	Hispanic	0.83	0.82	0.76	0.82	0.74	0.77	0.67	0.75
8	B14	Ethnicity	Other	0.80	0.83	0.78	0.86	0.63	0.80	0.68	0.79
8	B14	Gender	Male	0.85	0.83	0.74	0.84	0.75	0.77	0.65	0.76
8	B14	Gender	Female	0.84	0.82	0.76	0.84	0.75	0.77	0.65	0.78
8	B18	Ethnicity	White (not Hispanic)	0.85	0.83	0.75	0.85	0.75	0.79	0.64	0.78
8	B18	Ethnicity	Asian/Pacific Islander	0.91	0.84	0.75	0.86	0.79	0.80	0.64	0.84
8	B18	Ethnicity	Black (not Hispanic)	0.84	0.83	0.76	0.79	0.80	0.78	0.63	0.70
8	B18	Ethnicity	Hispanic	0.85	0.82	0.75	0.83	0.71	0.77	0.66	0.74
8	B18	Ethnicity	Other	0.81	0.81	0.76	0.87	0.61	0.77	0.70	0.81
8	B18	Gender	Male	0.85	0.84	0.76	0.83	0.79	0.78	0.64	0.77
8	B18	Gender	Female	0.83	0.82	0.75	0.86	0.74	0.78	0.66	0.79

Table E2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
3	A	Ethnicity	White (not Hispanic)	0.95	0.93	0.92	0.93	0.90	0.90
3	A	Ethnicity	Asian/Pacific Islander	0.96	0.94	0.92	0.94	0.91	0.89
3	A	Ethnicity	Black (not Hispanic)	0.91	0.94	0.97	0.88	0.91	0.96
3	A	Ethnicity	Hispanic	0.92	0.92	0.94	0.89	0.90	0.92
3	A	Ethnicity	Native Americans	0.94	0.92	0.92	0.92	0.89	0.89
3	A	Ethnicity	Other	0.94	0.93	0.93	0.92	0.90	0.90
3	A	Gender	Male	0.94	0.93	0.94	0.91	0.90	0.91
3	A	Gender	Female	0.94	0.93	0.93	0.92	0.90	0.90
3	B	Ethnicity	White (not Hispanic)	0.95	0.92	0.92	0.92	0.88	0.89
3	B	Ethnicity	Asian/Pacific Islander	0.95	0.93	0.91	0.93	0.90	0.89
3	B	Ethnicity	Black (not Hispanic)	0.92	0.93	0.97	0.88	0.91	0.96
3	B	Ethnicity	Hispanic	0.92	0.92	0.95	0.89	0.89	0.93
3	B	Ethnicity	Native Americans	0.92	0.90	0.94	0.88	0.87	0.91
3	B	Ethnicity	Other	0.94	0.92	0.93	0.91	0.88	0.91
3	B	Gender	Male	0.94	0.92	0.94	0.91	0.89	0.91
3	B	Gender	Female	0.94	0.92	0.92	0.91	0.88	0.90
3	B	Accommodations	Yes	0.91	0.95	0.97	0.87	0.93	0.96
4	A01	Ethnicity	White (not Hispanic)	0.97	0.92	0.92	0.96	0.89	0.88
4	A01	Ethnicity	Asian/Pacific Islander	0.98	0.95	0.92	0.97	0.92	0.89
4	A01	Ethnicity	Black (not Hispanic)	0.92	0.95	0.96	0.89	0.93	0.95
4	A01	Ethnicity	Hispanic	0.95	0.92	0.94	0.94	0.89	0.92
4	A01	Ethnicity	Other	0.96	0.93	0.92	0.94	0.90	0.89
4	A01	Gender	Male	0.96	0.92	0.93	0.94	0.90	0.90
4	A01	Gender	Female	0.97	0.92	0.92	0.95	0.90	0.89
4	A05	Ethnicity	White (not Hispanic)	0.98	0.92	0.91	0.97	0.89	0.88
4	A05	Ethnicity	Asian/Pacific Islander	0.99	0.91	0.90	0.98	0.89	0.87
4	A05	Ethnicity	Black (not Hispanic)	0.93	0.94	0.96	0.90	0.92	0.95
4	A05	Ethnicity	Hispanic	0.95	0.90	0.94	0.93	0.87	0.92
4	A05	Ethnicity	Other	0.95	0.92	0.91	0.94	0.89	0.88
4	A05	Gender	Male	0.96	0.92	0.93	0.95	0.89	0.90
4	A05	Gender	Female	0.97	0.92	0.92	0.96	0.90	0.89

Table E2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
4	A09	Ethnicity	White (not Hispanic)	0.97	0.92	0.91	0.96	0.89	0.88
4	A09	Ethnicity	Asian/Pacific Islander	0.97	0.94	0.89	0.97	0.91	0.85
4	A09	Ethnicity	Black (not Hispanic)	0.92	0.95	0.97	0.89	0.93	0.95
4	A09	Ethnicity	Hispanic	0.94	0.91	0.95	0.92	0.88	0.93
4	A09	Ethnicity	Other	0.96	0.92	0.92	0.94	0.89	0.90
4	A09	Gender	Male	0.96	0.92	0.93	0.94	0.90	0.91
4	A09	Gender	Female	0.97	0.92	0.92	0.95	0.90	0.89
4	A13	Ethnicity	White (not Hispanic)	0.97	0.92	0.91	0.96	0.89	0.88
4	A13	Ethnicity	Asian/Pacific Islander	0.98	0.91	0.80	0.98	0.93	0.89
4	A13	Ethnicity	Black (not Hispanic)	0.92	0.93	0.96	0.89	0.91	0.95
4	A13	Ethnicity	Hispanic	0.95	0.91	0.94	0.93	0.88	0.92
4	A13	Ethnicity	Other	0.96	0.88	0.88	0.96	0.91	0.90
4	A13	Gender	Male	0.96	0.92	0.93	0.94	0.89	0.91
4	A13	Gender	Female	0.97	0.92	0.92	0.95	0.90	0.89
4	A17	Ethnicity	White (not Hispanic)	0.97	0.92	0.91	0.96	0.89	0.88
4	A17	Ethnicity	Asian/Pacific Islander	0.97	0.92	0.89	0.96	0.89	0.85
4	A17	Ethnicity	Black (not Hispanic)	0.93	0.94	0.96	0.90	0.92	0.95
4	A17	Ethnicity	Hispanic	0.95	0.92	0.94	0.94	0.89	0.92
4	A17	Ethnicity	Other	0.96	0.92	0.92	0.94	0.90	0.90
4	A17	Gender	Male	0.96	0.92	0.92	0.95	0.90	0.90
4	A17	Gender	Female	0.97	0.92	0.92	0.95	0.90	0.89
4	B04	Ethnicity	White (not Hispanic)	0.95	0.92	0.93	0.93	0.90	0.91
4	B04	Ethnicity	Asian/Pacific Islander	0.96	0.92	0.94	0.93	0.89	0.91
4	B04	Ethnicity	Black (not Hispanic)	0.91	0.94	0.97	0.87	0.92	0.96
4	B04	Ethnicity	Hispanic	0.93	0.93	0.96	0.89	0.90	0.94
4	B04	Ethnicity	Other	0.94	0.92	0.95	0.91	0.88	0.93
4	B04	Gender	Male	0.94	0.93	0.95	0.91	0.90	0.93
4	B04	Gender	Female	0.95	0.93	0.93	0.92	0.90	0.91
4	B04	Accommodations	Yes	0.91	0.93	0.98	0.86	0.90	0.97

Table E2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	*Basic/ Prof.*	*Prof./ Adv.*	*Below Basic/ Basic*	*Basic/ Prof.*	*Prof./ Adv.*
4	B06	Ethnicity	White (not Hispanic)	0.97	0.92	0.91	0.95	0.89	0.89
4	B06	Ethnicity	Asian/Pacific Islander	0.98	0.92	0.89	0.97	0.89	0.85
4	B06	Ethnicity	Black (not Hispanic)	0.91	0.94	0.96	0.88	0.91	0.95
4	B06	Ethnicity	Hispanic	0.94	0.93	0.94	0.92	0.90	0.92
4	B06	Ethnicity	Other	0.96	0.92	0.94	0.95	0.88	0.92
4	B06	Gender	Male	0.95	0.93	0.92	0.93	0.90	0.90
4	B06	Gender	Female	0.96	0.93	0.92	0.95	0.90	0.90
4	B10	Ethnicity	White (not Hispanic)	0.97	0.92	0.91	0.95	0.89	0.88
4	B10	Ethnicity	Asian/Pacific Islander	0.97	0.92	0.90	0.96	0.89	0.85
4	B10	Ethnicity	Black (not Hispanic)	0.92	0.93	0.96	0.89	0.91	0.95
4	B10	Ethnicity	Hispanic	0.95	0.92	0.93	0.93	0.89	0.90
4	B10	Ethnicity	Other	0.97	0.94	0.91	0.96	0.90	0.88
4	B10	Gender	Male	0.95	0.93	0.92	0.93	0.90	0.90
4	B10	Gender	Female	0.97	0.92	0.92	0.95	0.89	0.89
4	B14	Ethnicity	White (not Hispanic)	0.97	0.92	0.91	0.95	0.89	0.88
4	B14	Ethnicity	Asian/Pacific Islander	0.98	0.92	0.90	0.97	0.89	0.86
4	B14	Ethnicity	Black (not Hispanic)	0.92	0.93	0.97	0.88	0.91	0.95
4	B14	Ethnicity	Hispanic	0.94	0.91	0.93	0.92	0.88	0.91
4	B14	Ethnicity	Other	0.97	0.92	0.92	0.96	0.90	0.89
4	B14	Gender	Male	0.96	0.92	0.93	0.93	0.89	0.90
4	B14	Gender	Female	0.96	0.92	0.92	0.94	0.89	0.89
4	B18	Ethnicity	White (not Hispanic)	0.96	0.92	0.91	0.95	0.89	0.89
4	B18	Ethnicity	Asian/Pacific Islander	0.99	0.91	0.92	0.98	0.89	0.88
4	B18	Ethnicity	Black (not Hispanic)	0.91	0.94	0.96	0.87	0.92	0.95
4	B18	Ethnicity	Hispanic	0.94	0.92	0.94	0.92	0.90	0.93
4	B18	Ethnicity	Other	0.95	0.92	0.93	0.94	0.89	0.91
4	B18	Gender	Male	0.95	0.93	0.93	0.93	0.90	0.90
4	B18	Gender	Female	0.96	0.93	0.92	0.94	0.90	0.89

Table E2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
4	BM4	Ethnicity	White (not Hispanic)	0.97	0.92	0.92	0.95	0.89	0.89
4	BM4	Ethnicity	Asian/Pacific Islander	0.97	0.95	0.92	0.95	0.93	0.89
4	BM4	Ethnicity	Black (not Hispanic)	0.91	0.93	0.97	0.88	0.91	0.96
4	BM4	Ethnicity	Hispanic	0.95	0.91	0.95	0.93	0.87	0.93
4	BM4	Ethnicity	Other	0.96	0.92	0.92	0.94	0.90	0.89
4	BM4	Gender	Male	0.95	0.92	0.93	0.93	0.90	0.91
4	BM4	Gender	Female	0.96	0.92	0.93	0.94	0.89	0.90
5	A	Ethnicity	White (not Hispanic)	0.97	0.92	0.92	0.95	0.89	0.89
5	A	Ethnicity	Asian/Pacific Islander	0.98	0.93	0.91	0.97	0.90	0.88
5	A	Ethnicity	Black (not Hispanic)	0.92	0.94	0.97	0.88	0.91	0.95
5	A	Ethnicity	Hispanic	0.95	0.93	0.94	0.92	0.90	0.92
5	A	Ethnicity	Native Americans	0.94	0.91	0.92	0.92	0.88	0.89
5	A	Ethnicity	Other	0.96	0.93	0.93	0.94	0.90	0.91
5	A	Gender	Male	0.95	0.93	0.93	0.93	0.90	0.91
5	A	Gender	Female	0.96	0.92	0.93	0.94	0.89	0.90
5	B	Ethnicity	White (not Hispanic)	0.96	0.92	0.92	0.95	0.89	0.89
5	B	Ethnicity	Asian/Pacific Islander	0.97	0.94	0.92	0.96	0.91	0.88
5	B	Ethnicity	Black (not Hispanic)	0.92	0.94	0.96	0.89	0.91	0.95
5	B	Ethnicity	Hispanic	0.94	0.92	0.94	0.92	0.89	0.92
5	B	Ethnicity	Native Americans	0.96	0.93	0.93	0.93	0.90	0.90
5	B	Ethnicity	Other	0.95	0.91	0.92	0.94	0.88	0.89
5	B	Gender	Male	0.95	0.93	0.93	0.93	0.90	0.91
5	B	Gender	Female	0.96	0.93	0.92	0.95	0.89	0.90
5	B	Accommodations	Yes	0.93	0.95	0.99	0.90	0.93	0.98

Table E2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
6	A	Ethnicity	White (not Hispanic)	0.95	0.91	0.92	0.93	0.88	0.89
6	A	Ethnicity	Asian/Pacific Islander	0.97	0.93	0.91	0.95	0.89	0.88
6	A	Ethnicity	Black (not Hispanic)	0.91	0.94	0.96	0.87	0.91	0.95
6	A	Ethnicity	Hispanic	0.94	0.91	0.94	0.91	0.89	0.92
6	A	Ethnicity	Native Americans	0.93	0.92	0.91	0.90	0.88	0.88
6	A	Ethnicity	Other	0.94	0.91	0.93	0.91	0.88	0.90
6	A	Gender	Male	0.94	0.92	0.93	0.91	0.89	0.90
6	A	Gender	Female	0.95	0.92	0.92	0.93	0.89	0.89
6	A	Accommodations	Yes	0.89	0.96	0.98	0.85	0.94	0.98
6	B	Ethnicity	White (not Hispanic)	0.95	0.91	0.91	0.93	0.88	0.88
6	B	Ethnicity	Asian/Pacific Islander	0.96	0.91	0.92	0.95	0.88	0.88
6	B	Ethnicity	Black (not Hispanic)	0.90	0.94	0.96	0.86	0.91	0.95
6	B	Ethnicity	Hispanic	0.93	0.92	0.94	0.89	0.89	0.91
6	B	Ethnicity	Native Americans	0.95	0.90	0.94	0.92	0.87	0.91
6	B	Ethnicity	Other	0.95	0.92	0.92	0.93	0.89	0.89
6	B	Gender	Male	0.94	0.92	0.93	0.90	0.89	0.90
6	B	Gender	Female	0.95	0.92	0.92	0.93	0.89	0.89
6	B	Accommodations	Yes	0.87	0.96	0.98	0.83	0.94	0.97
7	A	Ethnicity	White (not Hispanic)	0.95	0.93	0.92	0.94	0.90	0.89
7	A	Ethnicity	Asian/Pacific Islander	0.97	0.94	0.92	0.95	0.92	0.88
7	A	Ethnicity	Black (not Hispanic)	0.92	0.94	0.97	0.88	0.92	0.95
7	A	Ethnicity	Hispanic	0.93	0.93	0.95	0.90	0.90	0.92
7	A	Ethnicity	Native Americans	0.94	0.91	0.92	0.92	0.88	0.88
7	A	Ethnicity	Other	0.94	0.92	0.93	0.92	0.89	0.90
7	A	Gender	Male	0.94	0.93	0.93	0.92	0.91	0.91
7	A	Gender	Female	0.95	0.92	0.93	0.93	0.89	0.89
7	A	Accommodations	Yes	0.89	0.97	0.99	0.85	0.96	0.98

Table E2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	*Basic/ Prof.*	*Prof./ Adv.*	*Below Basic/ Basic*	*Basic/ Prof.*	*Prof./ Adv.*
7	B	Ethnicity	White (not Hispanic)	0.96	0.90	0.91	0.95	0.88	0.88
7	B	Ethnicity	Asian/Pacific Islander	0.97	0.92	0.91	0.95	0.90	0.87
7	B	Ethnicity	Black (not Hispanic)	0.92	0.93	0.96	0.89	0.91	0.94
7	B	Ethnicity	Hispanic	0.94	0.92	0.93	0.92	0.89	0.91
7	B	Ethnicity	Native Americans	0.94	0.91	0.93	0.92	0.87	0.90
7	B	Ethnicity	Other	0.94	0.92	0.92	0.92	0.89	0.89
7	B	Gender	Male	0.95	0.92	0.93	0.93	0.89	0.89
7	B	Gender	Female	0.96	0.91	0.92	0.95	0.87	0.88
7	B	Accommodations	Yes	0.90	0.96	0.98	0.87	0.94	0.97
8	A01	Ethnicity	White (not Hispanic)	0.93	0.94	0.95	0.91	0.91	0.93
8	A01	Ethnicity	Asian/Pacific Islander	0.96	0.93	0.93	0.94	0.91	0.90
8	A01	Ethnicity	Black (not Hispanic)	0.91	0.96	0.98	0.87	0.94	0.98
8	A01	Ethnicity	Hispanic	0.93	0.95	0.95	0.91	0.94	0.96
8	A01	Ethnicity	Other	0.91	0.95	0.96	0.88	0.92	0.95
8	A01	Gender	Male	0.92	0.95	0.96	0.89	0.93	0.95
8	A01	Gender	Female	0.94	0.94	0.95	0.91	0.91	0.93
8	A01	Accommodations	Yes	0.89	0.97	0.99	0.85	0.95	0.99
8	A05	Ethnicity	White (not Hispanic)	0.97	0.93	0.92	0.95	0.89	0.89
8	A05	Ethnicity	Asian/Pacific Islander	0.98	0.96	0.92	0.97	0.94	0.88
8	A05	Ethnicity	Black (not Hispanic)	0.93	0.92	0.97	0.90	0.89	0.96
8	A05	Ethnicity	Hispanic	0.96	0.92	0.94	0.94	0.89	0.92
8	A05	Ethnicity	Other	0.95	0.93	0.93	0.93	0.91	0.89
8	A05	Gender	Male	0.95	0.93	0.93	0.94	0.90	0.91
8	A05	Gender	Female	0.96	0.92	0.92	0.95	0.89	0.89
8	A09	Ethnicity	White (not Hispanic)	0.97	0.92	0.92	0.95	0.89	0.90
8	A09	Ethnicity	Asian/Pacific Islander	0.98	0.95	0.93	0.97	0.93	0.91
8	A09	Ethnicity	Black (not Hispanic)	0.92	0.93	0.97	0.89	0.91	0.96
8	A09	Ethnicity	Hispanic	0.95	0.91	0.94	0.93	0.88	0.92
8	A09	Ethnicity	Other	0.96	0.92	0.93	0.95	0.89	0.91
8	A09	Gender	Male	0.95	0.92	0.94	0.93	0.89	0.92
8	A09	Gender	Female	0.97	0.92	0.92	0.95	0.89	0.89

Table E2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	*Basic/ Prof.*	*Prof./ Adv.*	*Below Basic/ Basic*	*Basic/ Prof.*	*Prof./ Adv.*
8	A13	Ethnicity	White (not Hispanic)	0.96	0.92	0.92	0.95	0.89	0.89
8	A13	Ethnicity	Asian/Pacific Islander	0.98	0.94	0.91	0.97	0.91	0.88
8	A13	Ethnicity	Black (not Hispanic)	0.92	0.93	0.97	0.89	0.91	0.96
8	A13	Ethnicity	Hispanic	0.94	0.92	0.94	0.92	0.90	0.92
8	A13	Ethnicity	Other	0.96	0.91	0.94	0.94	0.86	0.92
8	A13	Gender	Male	0.95	0.93	0.94	0.93	0.90	0.91
8	A13	Gender	Female	0.96	0.92	0.93	0.95	0.88	0.90
8	A17	Ethnicity	White (not Hispanic)	0.97	0.92	0.92	0.96	0.89	0.88
8	A17	Ethnicity	Asian/Pacific Islander	0.97	0.95	0.93	0.96	0.93	0.89
8	A17	Ethnicity	Black (not Hispanic)	0.92	0.94	0.97	0.89	0.91	0.95
8	A17	Ethnicity	Hispanic	0.94	0.92	0.95	0.92	0.90	0.93
8	A17	Ethnicity	Other	0.96	0.92	0.93	0.94	0.90	0.90
8	A17	Gender	Male	0.95	0.93	0.93	0.93	0.91	0.91
8	A17	Gender	Female	0.97	0.92	0.93	0.95	0.89	0.89
8	B04	Ethnicity	White (not Hispanic)	0.95	0.93	0.94	0.93	0.91	0.91
8	B04	Ethnicity	Asian/Pacific Islander	0.94	0.93	0.94	0.91	0.91	0.92
8	B04	Ethnicity	Black (not Hispanic)	0.91	0.94	0.98	0.88	0.92	0.97
8	B04	Ethnicity	Hispanic	0.93	0.94	0.95	0.90	0.91	0.94
8	B04	Ethnicity	Other	0.95	0.93	0.95	0.92	0.89	0.93
8	B04	Gender	Male	0.93	0.94	0.95	0.91	0.92	0.93
8	B04	Gender	Female	0.95	0.93	0.94	0.94	0.90	0.91
8	B04	Accommodations	Yes	0.90	0.97	0.99	0.86	0.95	0.98
8	B06	Ethnicity	White (not Hispanic)	0.97	0.93	0.92	0.96	0.89	0.88
8	B06	Ethnicity	Asian/Pacific Islander	0.98	0.95	0.89	0.98	0.93	0.86
8	B06	Ethnicity	Black (not Hispanic)	0.93	0.93	0.97	0.90	0.90	0.95
8	B06	Ethnicity	Hispanic	0.94	0.91	0.95	0.92	0.88	0.93
8	B06	Ethnicity	Other	0.95	0.93	0.93	0.93	0.90	0.91
8	B06	Gender	Male	0.95	0.93	0.93	0.93	0.90	0.90
8	B06	Gender	Female	0.97	0.92	0.92	0.96	0.88	0.89

Table E2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts (cont.)

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
8	B10	Ethnicity	White (not Hispanic)	0.96	0.93	0.93	0.95	0.90	0.90
8	B10	Ethnicity	Asian/Pacific Islander	0.98	0.94	0.90	0.97	0.92	0.86
8	B10	Ethnicity	Black (not Hispanic)	0.92	0.92	0.97	0.90	0.89	0.96
8	B10	Ethnicity	Hispanic	0.95	0.92	0.94	0.93	0.89	0.92
8	B10	Ethnicity	Other	0.95	0.94	0.93	0.92	0.92	0.91
8	B10	Gender	Male	0.95	0.93	0.94	0.93	0.90	0.91
8	B10	Gender	Female	0.96	0.92	0.93	0.95	0.89	0.90
8	B14	Ethnicity	White (not Hispanic)	0.96	0.93	0.92	0.95	0.89	0.89
8	B14	Ethnicity	Asian/Pacific Islander	0.97	0.93	0.94	0.95	0.90	0.91
8	B14	Ethnicity	Black (not Hispanic)	0.92	0.93	0.97	0.89	0.91	0.96
8	B14	Ethnicity	Hispanic	0.94	0.93	0.94	0.92	0.90	0.92
8	B14	Ethnicity	Other	0.94	0.94	0.94	0.91	0.91	0.92
8	B14	Gender	Male	0.95	0.93	0.93	0.93	0.90	0.91
8	B14	Gender	Female	0.96	0.92	0.92	0.95	0.89	0.89
8	B18	Ethnicity	White (not Hispanic)	0.97	0.92	0.92	0.96	0.89	0.89
8	B18	Ethnicity	Asian/Pacific Islander	0.98	0.93	0.92	0.97	0.91	0.89
8	B18	Ethnicity	Black (not Hispanic)	0.93	0.93	0.97	0.90	0.90	0.95
8	B18	Ethnicity	Hispanic	0.93	0.94	0.94	0.90	0.91	0.91
8	B18	Ethnicity	Other	0.96	0.93	0.92	0.94	0.91	0.90
8	B18	Gender	Male	0.95	0.93	0.94	0.94	0.89	0.91
8	B18	Gender	Female	0.96	0.92	0.92	0.95	0.90	0.89

Table E3. Classification Consistency and Accuracy Conditioned on Performance Level: Mathematics

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
3	A	Ethnicity	White (not Hispanic)	0.86	0.78	0.74	0.89	0.83	0.70	0.64	0.82
3	A	Ethnicity	Asian/Pacific Islander	0.89	0.76	0.74	0.93	0.84	0.71	0.62	0.89
3	A	Ethnicity	Black (not Hispanic)	0.90	0.79	0.74	0.86	0.89	0.69	0.63	0.74
3	A	Ethnicity	Hispanic	0.88	0.79	0.76	0.87	0.86	0.71	0.65	0.78
3	A	Ethnicity	Native Americans	0.87	0.75	0.77	0.89	0.83	0.64	0.67	0.87
3	A	Ethnicity	Other	0.87	0.78	0.74	0.89	0.84	0.70	0.64	0.82
3	A	Gender	Male	0.88	0.78	0.74	0.89	0.86	0.70	0.64	0.83
3	A	Gender	Female	0.87	0.78	0.75	0.88	0.84	0.70	0.64	0.81
3	B	Ethnicity	White (not Hispanic)	0.86	0.78	0.75	0.89	0.82	0.72	0.65	0.82
3	B	Ethnicity	Asian/Pacific Islander	0.89	0.78	0.75	0.93	0.86	0.70	0.66	0.89
3	B	Ethnicity	Black (not Hispanic)	0.90	0.79	0.75	0.85	0.88	0.70	0.64	0.74
3	B	Ethnicity	Hispanic	0.88	0.78	0.75	0.88	0.85	0.71	0.65	0.78
3	B	Ethnicity	Native Americans	0.86	0.80	0.75	0.88	0.82	0.72	0.69	0.75
3	B	Ethnicity	Other	0.88	0.77	0.76	0.89	0.84	0.71	0.66	0.81
3	B	Gender	Male	0.89	0.78	0.75	0.89	0.85	0.71	0.65	0.82
3	B	Gender	Female	0.87	0.78	0.75	0.89	0.83	0.71	0.65	0.81
3	B	Accommodations	Yes	0.93	0.79	0.77	0.95	0.91	0.70	0.68	0.75
4	A	Ethnicity	White (not Hispanic)	0.88	0.74	0.77	0.92	0.80	0.64	0.70	0.86
4	A	Ethnicity	Asian/Pacific Islander	0.92	0.76	0.75	0.93	0.84	0.65	0.68	0.89
4	A	Ethnicity	Black (not Hispanic)	0.93	0.74	0.77	0.89	0.89	0.64	0.70	0.79
4	A	Ethnicity	Hispanic	0.90	0.73	0.77	0.90	0.84	0.64	0.69	0.84
4	A	Ethnicity	Native Americans	0.91	0.78	0.77	0.91	0.88	0.67	0.68	0.79
4	A	Ethnicity	Other	0.90	0.73	0.77	0.92	0.84	0.65	0.69	0.87
4	A	Gender	Male	0.92	0.73	0.76	0.94	0.85	0.64	0.69	0.86
4	A	Gender	Female	0.90	0.74	0.77	0.91	0.83	0.64	0.70	0.85
4	A	Accommodations	Yes	0.96	0.73	0.80	0.89	0.95	0.62	0.64	0.81

Table E3. Classification Consistency and Accuracy Conditioned on Performance Level: Mathematics (cont.)

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
4	B	Ethnicity	White (not Hispanic)	0.89	0.74	0.75	0.91	0.82	0.65	0.68	0.85
4	B	Ethnicity	Asian/Pacific Islander	0.91	0.74	0.75	0.95	0.83	0.65	0.67	0.91
4	B	Ethnicity	Black (not Hispanic)	0.92	0.74	0.76	0.88	0.89	0.65	0.66	0.79
4	B	Ethnicity	Hispanic	0.91	0.74	0.76	0.91	0.86	0.65	0.67	0.83
4	B	Ethnicity	Native Americans	0.88	0.75	0.74	0.94	0.86	0.63	0.65	0.84
4	B	Ethnicity	Other	0.89	0.74	0.76	0.91	0.82	0.65	0.66	0.85
4	B	Gender	Male	0.91	0.74	0.75	0.92	0.85	0.65	0.67	0.85
4	B	Gender	Female	0.90	0.74	0.75	0.91	0.84	0.65	0.67	0.84
4	B	Accommodations	Yes	0.95	0.73	0.74	0.85	0.94	0.63	0.62	0.72
5	A	Ethnicity	White (not Hispanic)	0.83	0.78	0.79	0.90	0.76	0.74	0.70	0.81
5	A	Ethnicity	Asian/Pacific Islander	0.85	0.80	0.79	0.94	0.80	0.72	0.69	0.91
5	A	Ethnicity	Black (not Hispanic)	0.88	0.78	0.80	0.87	0.85	0.72	0.68	0.74
5	A	Ethnicity	Hispanic	0.86	0.78	0.79	0.88	0.81	0.73	0.70	0.78
5	A	Ethnicity	Native Americans	0.80	0.78	0.78	0.81	0.77	0.70	0.69	0.70
5	A	Ethnicity	Other	0.82	0.79	0.80	0.90	0.78	0.72	0.70	0.79
5	A	Gender	Male	0.86	0.78	0.79	0.90	0.81	0.73	0.70	0.83
5	A	Gender	Female	0.83	0.78	0.79	0.89	0.78	0.74	0.70	0.79
5	A	Accommodations	Yes	0.92	0.77	0.81	0.86	0.90	0.64	0.64	0.70
5	B	Ethnicity	White (not Hispanic)	0.84	0.79	0.78	0.91	0.79	0.74	0.68	0.82
5	B	Ethnicity	Asian/Pacific Islander	0.88	0.76	0.77	0.94	0.80	0.72	0.68	0.89
5	B	Ethnicity	Black (not Hispanic)	0.88	0.80	0.79	0.87	0.85	0.72	0.66	0.74
5	B	Ethnicity	Hispanic	0.85	0.79	0.79	0.90	0.82	0.73	0.69	0.81
5	B	Ethnicity	Native Americans	0.86	0.81	0.78	0.93	0.83	0.70	0.69	0.85
5	B	Ethnicity	Other	0.87	0.79	0.79	0.92	0.81	0.74	0.69	0.85
5	B	Gender	Male	0.87	0.79	0.78	0.91	0.83	0.74	0.67	0.83
5	B	Gender	Female	0.83	0.78	0.79	0.89	0.79	0.74	0.70	0.81
5	B	Accommodations	Yes	0.91	0.79	0.78	0.87	0.90	0.68	0.64	0.68

Table E3. Classification Consistency and Accuracy Conditioned on Performance Level: Mathematics (cont.)

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
6	A	Ethnicity	White (not Hispanic)	0.88	0.80	0.77	0.91	0.83	0.73	0.67	0.85
6	A	Ethnicity	Asian/Pacific Islander	0.87	0.80	0.77	0.95	0.81	0.71	0.67	0.91
6	A	Ethnicity	Black (not Hispanic)	0.92	0.79	0.77	0.87	0.89	0.72	0.64	0.76
6	A	Ethnicity	Hispanic	0.90	0.78	0.78	0.91	0.83	0.70	0.68	0.85
6	A	Ethnicity	Native Americans	0.96	0.84	0.59	0.99	0.93	0.81	0.61	0.89
6	A	Ethnicity	Other	0.89	0.78	0.77	0.91	0.85	0.69	0.71	0.84
6	A	Gender	Male	0.90	0.80	0.77	0.91	0.86	0.72	0.67	0.85
6	A	Gender	Female	0.89	0.80	0.77	0.91	0.84	0.73	0.66	0.84
6	A	Accommodations	Yes	0.95	0.78	0.76	0.92	0.94	0.68	0.65	0.76
6	B	Ethnicity	White (not Hispanic)	0.85	0.79	0.78	0.85	0.81	0.73	0.68	0.81
6	B	Ethnicity	Asian/Pacific Islander	0.88	0.83	0.77	0.95	0.85	0.75	0.65	0.92
6	B	Ethnicity	Black (not Hispanic)	0.93	0.80	0.78	0.89	0.89	0.75	0.67	0.81
6	B	Ethnicity	Hispanic	0.90	0.78	0.76	0.91	0.84	0.71	0.66	0.84
6	B	Ethnicity	Native Americans	0.87	0.76	0.75	0.86	0.84	0.70	0.67	0.71
6	B	Ethnicity	Other	0.90	0.80	0.78	0.91	0.83	0.74	0.72	0.84
6	B	Gender	Male	0.92	0.80	0.77	0.91	0.86	0.74	0.68	0.87
6	B	Gender	Female	0.91	0.79	0.76	0.90	0.84	0.75	0.67	0.84
6	B	Accommodations	Yes	0.95	0.78	0.77	0.89	0.94	0.69	0.65	0.79
7	A	Ethnicity	White (not Hispanic)	0.95	0.76	0.73	0.98	0.84	0.76	0.70	0.89
7	A	Ethnicity	Asian/Pacific Islander	0.88	0.81	0.74	0.95	0.82	0.73	0.65	0.90
7	A	Ethnicity	Black (not Hispanic)	0.91	0.80	0.77	0.86	0.87	0.72	0.65	0.73
7	A	Ethnicity	Hispanic	0.88	0.81	0.77	0.88	0.82	0.75	0.66	0.79
7	A	Ethnicity	Native Americans	0.96	0.79	0.70	0.97	0.86	0.77	0.64	0.88
7	A	Ethnicity	Other	0.88	0.79	0.76	0.90	0.80	0.73	0.66	0.83
7	A	Gender	Male	0.90	0.80	0.77	0.90	0.84	0.73	0.67	0.82
7	A	Gender	Female	0.87	0.80	0.78	0.89	0.79	0.74	0.67	0.80
7	A	Accommodations	Yes	0.93	0.78	0.78	0.77	0.91	0.65	0.61	0.56

Table E3. Classification Consistency and Accuracy Conditioned on Performance Level: Mathematics (cont.)

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
7	B	Ethnicity	White (not Hispanic)	0.88	0.80	0.78	0.89	0.81	0.74	0.69	0.82
7	B	Ethnicity	Asian/Pacific Islander	0.91	0.78	0.75	0.93	0.85	0.74	0.65	0.89
7	B	Ethnicity	Black (not Hispanic)	0.91	0.79	0.78	0.85	0.89	0.72	0.67	0.73
7	B	Ethnicity	Hispanic	0.89	0.79	0.78	0.87	0.85	0.73	0.68	0.78
7	B	Ethnicity	Native Americans	0.88	0.81	0.76	0.89	0.84	0.73	0.68	0.83
7	B	Ethnicity	Other	0.89	0.80	0.74	0.90	0.83	0.72	0.64	0.83
7	B	Gender	Male	0.90	0.80	0.78	0.89	0.86	0.73	0.69	0.82
7	B	Gender	Female	0.88	0.80	0.78	0.89	0.82	0.74	0.68	0.81
7	B	Accommodations	Yes	0.93	0.78	0.79	0.86	0.92	0.66	0.63	0.78
8	A	Ethnicity	White (not Hispanic)	0.86	0.80	0.79	0.90	0.80	0.74	0.70	0.79
8	A	Ethnicity	Asian/Pacific Islander	0.87	0.78	0.79	0.94	0.82	0.72	0.71	0.88
8	A	Ethnicity	Black (not Hispanic)	0.90	0.79	0.80	0.89	0.89	0.70	0.69	0.78
8	A	Ethnicity	Hispanic	0.87	0.80	0.78	0.88	0.84	0.73	0.68	0.77
8	A	Ethnicity	Native Americans	0.91	0.80	0.78	0.94	0.84	0.75	0.72	0.77
8	A	Ethnicity	Other	0.88	0.78	0.79	0.89	0.84	0.71	0.68	0.80
8	A	Gender	Male	0.89	0.80	0.80	0.90	0.85	0.73	0.71	0.80
8	A	Gender	Female	0.86	0.80	0.79	0.89	0.81	0.74	0.70	0.77
8	A	Accommodations	Yes	0.93	0.78	0.81	0.92	0.93	0.65	0.64	0.74
8	B	Ethnicity	White (not Hispanic)	0.87	0.79	0.79	0.89	0.80	0.73	0.69	0.80
8	B	Ethnicity	Asian/Pacific Islander	0.88	0.78	0.80	0.95	0.85	0.71	0.72	0.89
8	B	Ethnicity	Black (not Hispanic)	0.90	0.79	0.78	0.92	0.88	0.69	0.65	0.80
8	B	Ethnicity	Hispanic	0.87	0.78	0.77	0.86	0.83	0.71	0.67	0.73
8	B	Ethnicity	Native Americans	0.87	0.81	0.79	0.89	0.83	0.73	0.67	0.82
8	B	Ethnicity	Other	0.88	0.79	0.78	0.91	0.83	0.72	0.70	0.81
8	B	Gender	Male	0.89	0.79	0.79	0.90	0.84	0.71	0.69	0.81
8	B	Gender	Female	0.86	0.79	0.78	0.89	0.81	0.73	0.68	0.78
8	B	Accommodations	Yes	0.93	0.78	0.79	0.84	0.92	0.67	0.64	0.62

Table E4. Classification Consistency and Accuracy Conditioned on Cut Scores: Mathematics

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
3	A	Ethnicity	White (not Hispanic)	0.95	0.93	0.93	0.93	0.90	0.90
3	A	Ethnicity	Asian/Pacific Islander	0.97	0.94	0.93	0.96	0.92	0.91
3	A	Ethnicity	Black (not Hispanic)	0.92	0.95	0.97	0.89	0.93	0.96
3	A	Ethnicity	Hispanic	0.94	0.93	0.95	0.91	0.91	0.93
3	A	Ethnicity	Native Americans	0.91	0.95	0.96	0.88	0.93	0.94
3	A	Ethnicity	Other	0.94	0.93	0.94	0.92	0.91	0.92
3	A	Gender	Male	0.95	0.93	0.94	0.93	0.91	0.92
3	A	Gender	Female	0.94	0.93	0.94	0.92	0.91	0.92
3	B	Ethnicity	White (not Hispanic)	0.95	0.93	0.94	0.93	0.91	0.91
3	B	Ethnicity	Asian/Pacific Islander	0.96	0.95	0.94	0.95	0.93	0.92
3	B	Ethnicity	Black (not Hispanic)	0.92	0.95	0.98	0.89	0.93	0.97
3	B	Ethnicity	Hispanic	0.93	0.93	0.96	0.90	0.91	0.94
3	B	Ethnicity	Native Americans	0.93	0.93	0.95	0.90	0.90	0.94
3	B	Ethnicity	Other	0.94	0.93	0.95	0.92	0.91	0.92
3	B	Gender	Male	0.95	0.94	0.94	0.92	0.91	0.92
3	B	Gender	Female	0.94	0.93	0.95	0.91	0.91	0.93
3	B	Accommodations	Yes	0.94	0.94	0.98	0.91	0.93	0.98
4	A	Ethnicity	White (not Hispanic)	0.94	0.93	0.94	0.92	0.90	0.93
4	A	Ethnicity	Asian/Pacific Islander	0.97	0.96	0.93	0.96	0.93	0.91
4	A	Ethnicity	Black (not Hispanic)	0.92	0.95	0.98	0.89	0.93	0.97
4	A	Ethnicity	Hispanic	0.93	0.93	0.96	0.90	0.90	0.94
4	A	Ethnicity	Native Americans	0.94	0.94	0.95	0.92	0.91	0.93
4	A	Ethnicity	Other	0.94	0.93	0.96	0.91	0.90	0.94
4	A	Gender	Male	0.95	0.94	0.95	0.92	0.91	0.93
4	A	Gender	Female	0.94	0.93	0.95	0.91	0.90	0.94
4	A	Accommodations	Yes	0.95	0.98	1.00	0.93	0.97	1.00

Table E4. Classification Consistency and Accuracy Conditioned on Cut Scores: Mathematics (cont.)

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	*Basic/ Prof.*	*Prof./ Adv.*	*Below Basic/ Basic*	*Basic/ Prof.*	*Prof./ Adv.*
4	B	Ethnicity	White (not Hispanic)	0.94	0.93	0.94	0.92	0.91	0.92
4	B	Ethnicity	Asian/Pacific Islander	0.96	0.95	0.95	0.94	0.93	0.93
4	B	Ethnicity	Black (not Hispanic)	0.92	0.95	0.98	0.88	0.93	0.97
4	B	Ethnicity	Hispanic	0.93	0.94	0.96	0.90	0.91	0.95
4	B	Ethnicity	Native Americans	0.94	0.93	0.95	0.92	0.90	0.93
4	B	Ethnicity	Other	0.93	0.94	0.96	0.90	0.91	0.94
4	B	Gender	Male	0.94	0.94	0.95	0.92	0.91	0.93
4	B	Gender	Female	0.93	0.94	0.95	0.91	0.91	0.94
4	B	Accommodations	Yes	0.93	0.97	0.99	0.91	0.96	0.99
5	A	Ethnicity	White (not Hispanic)	0.94	0.93	0.95	0.91	0.91	0.93
5	A	Ethnicity	Asian/Pacific Islander	0.96	0.95	0.94	0.95	0.93	0.92
5	A	Ethnicity	Black (not Hispanic)	0.90	0.95	0.98	0.86	0.94	0.98
5	A	Ethnicity	Hispanic	0.92	0.94	0.96	0.89	0.92	0.94
5	A	Ethnicity	Native Americans	0.92	0.94	0.94	0.88	0.92	0.91
5	A	Ethnicity	Other	0.92	0.94	0.96	0.89	0.91	0.94
5	A	Gender	Male	0.93	0.94	0.95	0.91	0.92	0.93
5	A	Gender	Female	0.92	0.93	0.96	0.90	0.91	0.94
5	A	Accommodations	Yes	0.90	0.99	1.00	0.86	0.98	1.00
5	B	Ethnicity	White (not Hispanic)	0.93	0.93	0.95	0.91	0.90	0.93
5	B	Ethnicity	Asian/Pacific Islander	0.96	0.95	0.94	0.94	0.93	0.92
5	B	Ethnicity	Black (not Hispanic)	0.90	0.96	0.98	0.86	0.94	0.98
5	B	Ethnicity	Hispanic	0.91	0.94	0.97	0.87	0.93	0.96
5	B	Ethnicity	Native Americans	0.91	0.96	0.97	0.87	0.94	0.96
5	B	Ethnicity	Other	0.93	0.94	0.97	0.90	0.92	0.95
5	B	Gender	Male	0.93	0.94	0.96	0.91	0.92	0.94
5	B	Gender	Female	0.92	0.93	0.96	0.89	0.91	0.95
5	B	Accommodations	Yes	0.91	0.98	0.99	0.87	0.97	0.99

Table E4. Classification Consistency and Accuracy Conditioned on Cut Scores: Mathematics (cont.)

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
6	A	Ethnicity	White (not Hispanic)	0.95	0.94	0.95	0.93	0.91	0.93
6	A	Ethnicity	Asian/Pacific Islander	0.97	0.96	0.95	0.95	0.93	0.92
6	A	Ethnicity	Black (not Hispanic)	0.92	0.96	0.98	0.89	0.93	0.97
6	A	Ethnicity	Hispanic	0.93	0.94	0.97	0.89	0.92	0.95
6	A	Ethnicity	Native Americans	0.96	0.96	0.93	0.95	0.94	0.95
6	A	Ethnicity	Other	0.94	0.94	0.96	0.91	0.91	0.94
6	A	Gender	Male	0.94	0.94	0.96	0.92	0.92	0.93
6	A	Gender	Female	0.94	0.94	0.96	0.92	0.91	0.94
6	A	Accommodations	Yes	0.93	0.99	1.00	0.90	0.98	0.99
6	B	Ethnicity	White (not Hispanic)	0.94	0.93	0.94	0.92	0.91	0.92
6	B	Ethnicity	Asian/Pacific Islander	0.96	0.96	0.95	0.95	0.94	0.93
6	B	Ethnicity	Black (not Hispanic)	0.92	0.96	0.98	0.89	0.94	0.98
6	B	Ethnicity	Hispanic	0.92	0.94	0.97	0.89	0.92	0.96
6	B	Ethnicity	Native Americans	0.92	0.94	0.94	0.90	0.92	0.92
6	B	Ethnicity	Other	0.94	0.95	0.96	0.91	0.93	0.94
6	B	Gender	Male	0.94	0.95	0.96	0.92	0.93	0.94
6	B	Gender	Female	0.94	0.94	0.96	0.92	0.92	0.94
6	B	Accommodations	Yes	0.94	0.99	0.99	0.91	0.98	0.99
7	A	Ethnicity	White (not Hispanic)	0.93	0.95	0.95	0.92	0.93	0.95
7	A	Ethnicity	Asian/Pacific Islander	0.96	0.95	0.94	0.94	0.94	0.92
7	A	Ethnicity	Black (not Hispanic)	0.91	0.96	0.99	0.86	0.95	0.98
7	A	Ethnicity	Hispanic	0.92	0.95	0.97	0.89	0.92	0.96
7	A	Ethnicity	Native Americans	0.93	0.95	0.97	0.92	0.92	0.96
7	A	Ethnicity	Other	0.92	0.94	0.96	0.89	0.91	0.94
7	A	Gender	Male	0.94	0.94	0.96	0.91	0.92	0.94
7	A	Gender	Female	0.93	0.94	0.96	0.90	0.91	0.94
7	A	Accommodations	Yes	0.91	0.99	1.00	0.87	0.98	0.99

Table E4. Classification Consistency and Accuracy Conditioned on Cut Scores: Mathematics (cont.)

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
7	B	Ethnicity	White (not Hispanic)	0.94	0.94	0.95	0.92	0.91	0.93
7	B	Ethnicity	Asian/Pacific Islander	0.96	0.96	0.94	0.94	0.94	0.92
7	B	Ethnicity	Black (not Hispanic)	0.91	0.97	0.99	0.87	0.95	0.98
7	B	Ethnicity	Hispanic	0.92	0.95	0.97	0.89	0.92	0.96
7	B	Ethnicity	Native Americans	0.92	0.94	0.97	0.89	0.92	0.96
7	B	Ethnicity	Other	0.93	0.94	0.96	0.90	0.91	0.94
7	B	Gender	Male	0.94	0.95	0.96	0.91	0.92	0.94
7	B	Gender	Female	0.93	0.94	0.96	0.90	0.91	0.94
7	B	Accommodations	Yes	0.91	0.99	1.00	0.88	0.98	1.00
8	A	Ethnicity	White (not Hispanic)	0.93	0.93	0.97	0.90	0.90	0.95
8	A	Ethnicity	Asian/Pacific Islander	0.94	0.94	0.96	0.92	0.92	0.94
8	A	Ethnicity	Black (not Hispanic)	0.91	0.96	0.99	0.87	0.95	0.99
8	A	Ethnicity	Hispanic	0.90	0.95	0.98	0.87	0.92	0.97
8	A	Ethnicity	Native Americans	0.92	0.95	0.98	0.88	0.93	0.97
8	A	Ethnicity	Other	0.91	0.94	0.98	0.88	0.91	0.97
8	A	Gender	Male	0.92	0.95	0.97	0.90	0.92	0.96
8	A	Gender	Female	0.92	0.93	0.97	0.89	0.91	0.96
8	A	Accommodations	Yes	0.92	0.98	1.00	0.88	0.98	1.00
8	B	Ethnicity	White (not Hispanic)	0.92	0.93	0.97	0.89	0.90	0.96
8	B	Ethnicity	Asian/Pacific Islander	0.93	0.95	0.96	0.91	0.92	0.95
8	B	Ethnicity	Black (not Hispanic)	0.90	0.97	0.99	0.86	0.95	0.99
8	B	Ethnicity	Hispanic	0.90	0.95	0.98	0.86	0.93	0.97
8	B	Ethnicity	Native Americans	0.91	0.94	0.98	0.87	0.92	0.97
8	B	Ethnicity	Other	0.91	0.94	0.97	0.88	0.92	0.96
8	B	Gender	Male	0.92	0.94	0.98	0.89	0.92	0.96
8	B	Gender	Female	0.92	0.93	0.97	0.89	0.90	0.96
8	B	Accommodations	Yes	0.92	0.98	1.00	0.88	0.97	1.00

Table E5. Classification Consistency and Accuracy Conditioned on Performance Level: Science

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
5	A	Ethnicity	White (not Hispanic)	0.83	0.75	0.73	0.83	0.79	0.66	0.64	0.74
5	A	Ethnicity	Asian/Pacific Islander	0.90	0.77	0.67	0.95	0.85	0.67	0.66	0.87
5	A	Ethnicity	Black (not Hispanic)	0.89	0.78	0.72	0.80	0.86	0.67	0.63	0.64
5	A	Ethnicity	Hispanic	0.85	0.77	0.75	0.77	0.83	0.66	0.67	0.68
5	A	Ethnicity	Native Americans	0.83	0.73	0.75	0.76	0.78	0.62	0.62	0.66
5	A	Ethnicity	Other	0.85	0.76	0.75	0.82	0.81	0.65	0.66	0.69
5	A	Gender	Male	0.86	0.77	0.73	0.84	0.81	0.67	0.65	0.73
5	A	Gender	Female	0.85	0.75	0.73	0.83	0.82	0.66	0.64	0.73
5	A	Accommodations	Yes	0.92	0.76	0.75	0.82	0.91	0.65	0.57	0.62
5	B	Ethnicity	White (not Hispanic)	0.85	0.78	0.77	0.83	0.82	0.67	0.70	0.71
5	B	Ethnicity	Asian/Pacific Islander	0.86	0.76	0.78	0.87	0.83	0.63	0.69	0.80
5	B	Ethnicity	Black (not Hispanic)	0.90	0.79	0.77	0.79	0.89	0.68	0.67	0.63
5	B	Ethnicity	Hispanic	0.88	0.77	0.76	0.80	0.84	0.70	0.66	0.70
5	B	Ethnicity	Native Americans	0.84	0.74	0.78	0.78	0.83	0.61	0.70	0.69
5	B	Ethnicity	Other	0.87	0.78	0.78	0.83	0.82	0.67	0.69	0.74
5	B	Gender	Male	0.87	0.78	0.77	0.83	0.85	0.68	0.69	0.71
5	B	Gender	Female	0.86	0.78	0.77	0.83	0.83	0.68	0.70	0.71
5	B	Accommodations	Yes	0.92	0.79	0.76	0.74	0.91	0.67	0.65	0.57
8	A	Ethnicity	White (not Hispanic)	0.88	0.80	0.74	0.86	0.79	0.75	0.64	0.77
8	A	Ethnicity	Asian/Pacific Islander	0.88	0.80	0.74	0.89	0.81	0.72	0.62	0.83
8	A	Ethnicity	Black (not Hispanic)	0.91	0.81	0.74	0.83	0.86	0.75	0.60	0.69
8	A	Ethnicity	Hispanic	0.89	0.79	0.74	0.86	0.83	0.74	0.62	0.74
8	A	Ethnicity	Native Americans	0.91	0.79	0.77	0.80	0.88	0.75	0.67	0.74
8	A	Ethnicity	Other	0.87	0.79	0.73	0.86	0.81	0.74	0.60	0.79
8	A	Gender	Male	0.90	0.80	0.74	0.87	0.83	0.74	0.63	0.78
8	A	Gender	Female	0.88	0.80	0.74	0.86	0.79	0.75	0.63	0.76
8	A	Accommodations	Yes	0.93	0.81	0.78	0.85	0.91	0.71	0.58	0.67

Table E5. Classification Consistency and Accuracy Conditioned on Performance Level: Science (cont.)

Grade	Form	Category	Group	Accuracy				Consistency			
				Below Basic	***Basic***	***Prof.***	***Adv.***	***Below Basic***	***Basic***	***Prof.***	***Adv.***
8	B	Ethnicity	White (not Hispanic)	0.88	0.81	0.74	0.87	0.82	0.74	0.64	0.80
8	B	Ethnicity	Asian/Pacific Islander	0.94	0.78	0.73	0.91	0.89	0.72	0.65	0.85
8	B	Ethnicity	Black (not Hispanic)	0.92	0.81	0.74	0.87	0.89	0.75	0.62	0.72
8	B	Ethnicity	Hispanic	0.90	0.81	0.73	0.86	0.87	0.75	0.63	0.76
8	B	Ethnicity	Native Americans	0.89	0.82	0.76	0.88	0.79	0.78	0.64	0.81
8	B	Ethnicity	Other	0.88	0.79	0.74	0.85	0.80	0.75	0.60	0.79
8	B	Gender	Male	0.90	0.82	0.74	0.88	0.86	0.74	0.64	0.81
8	B	Gender	Female	0.88	0.81	0.74	0.86	0.83	0.74	0.63	0.78
8	B	Accommodations	Yes	0.93	0.82	0.77	0.77	0.93	0.74	0.64	0.58

Table E6. Classification Consistency and Accuracy Conditioned on Cut Scores: Science

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
5	A	Ethnicity	White (not Hispanic)	0.94	0.91	0.93	0.92	0.87	0.90
5	A	Ethnicity	Asian/Pacific Islander	0.96	0.94	0.91	0.94	0.91	0.91
5	A	Ethnicity	Black (not Hispanic)	0.91	0.95	0.98	0.86	0.92	0.97
5	A	Ethnicity	Hispanic	0.91	0.92	0.96	0.88	0.89	0.94
5	A	Ethnicity	Native Americans	0.91	0.91	0.95	0.88	0.87	0.92
5	A	Ethnicity	Other	0.93	0.91	0.95	0.90	0.88	0.93
5	A	Gender	Male	0.94	0.92	0.94	0.91	0.89	0.91
5	A	Gender	Female	0.93	0.91	0.94	0.91	0.87	0.92
5	A	Accommodations	Yes	0.91	0.97	0.99	0.88	0.95	0.99
5	B	Ethnicity	White (not Hispanic)	0.94	0.92	0.94	0.92	0.89	0.91
5	B	Ethnicity	Asian/Pacific Islander	0.95	0.94	0.93	0.92	0.91	0.90
5	B	Ethnicity	Black (not Hispanic)	0.91	0.95	0.98	0.88	0.93	0.97
5	B	Ethnicity	Hispanic	0.92	0.93	0.97	0.89	0.90	0.95
5	B	Ethnicity	Native Americans	0.92	0.93	0.94	0.89	0.90	0.92
5	B	Ethnicity	Other	0.93	0.93	0.95	0.90	0.89	0.93
5	B	Gender	Male	0.94	0.93	0.95	0.91	0.90	0.92
5	B	Gender	Female	0.93	0.92	0.95	0.91	0.89	0.92
5	B	Accommodations	Yes	0.92	0.95	0.99	0.89	0.94	0.98
8	A	Ethnicity	White (not Hispanic)	0.96	0.92	0.93	0.94	0.89	0.90
8	A	Ethnicity	Asian/Pacific Islander	0.96	0.94	0.92	0.95	0.92	0.88
8	A	Ethnicity	Black (not Hispanic)	0.92	0.95	0.98	0.88	0.92	0.97
8	A	Ethnicity	Hispanic	0.93	0.93	0.95	0.90	0.90	0.93
8	A	Ethnicity	Native Americans	0.95	0.92	0.96	0.93	0.89	0.95
8	A	Ethnicity	Other	0.94	0.93	0.94	0.92	0.90	0.91
8	A	Gender	Male	0.95	0.93	0.94	0.92	0.90	0.92
8	A	Gender	Female	0.95	0.92	0.94	0.93	0.89	0.91
8	A	Accommodations	Yes	0.92	0.97	0.99	0.88	0.96	0.99

Table E6. Classification Consistency and Accuracy Conditioned on Cut Scores: Science (cont.)

Grade	Form	Category	Group	Accuracy			Consistency		
				Below Basic/ Basic	***Basic/ Prof.***	***Prof./ Adv.***	***Below Basic/ Basic***	***Basic/ Prof.***	***Prof./ Adv.***
8	B	Ethnicity	White (not Hispanic)	0.96	0.92	0.93	0.94	0.89	0.91
8	B	Ethnicity	Asian/Pacific Islander	0.97	0.94	0.93	0.96	0.92	0.90
8	B	Ethnicity	Black (not Hispanic)	0.93	0.95	0.98	0.89	0.92	0.97
8	B	Ethnicity	Hispanic	0.94	0.93	0.96	0.91	0.90	0.94
8	B	Ethnicity	Native Americans	0.95	0.92	0.96	0.93	0.89	0.93
8	B	Ethnicity	Other	0.94	0.92	0.95	0.91	0.89	0.93
8	B	Gender	Male	0.95	0.93	0.94	0.93	0.90	0.93
8	B	Gender	Female	0.95	0.92	0.94	0.93	0.88	0.92
8	B	Accommodations	Yes	0.93	0.97	0.99	0.90	0.96	0.98