

# Missouri

Assessment Program  
*Grade-Level Assessments*

## Grades 3-8 English Language Arts and Mathematics

### Technical Report 2018

Submitted to  
Missouri Department of Elementary and Secondary Education  
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## EXECUTIVE SUMMARY

This report is a technical summary of the 2018 administration of the Missouri Assessment Program (MAP) in English Language Arts (ELA) and Mathematics, administered in Grades 3 through 8. These tests are designed to measure students' knowledge of ELA and Mathematics and are aligned with Missouri Learning Standards. The ELA and Mathematics test forms were developed by Data Recognition Corporation (DRC) using DRC's College- and Career-Ready item bank and Missouri-owned items, which were written by Missouri educators. All assessments except for Braille, Large Print, and accommodated paper-and-pencil forms were administered online. This section provides a summary of the Spring 2018 MAP ELA and Mathematics Technical Report.

### E.1 Background

The MAP was originally designed as grade-span tests to measure Missouri's Show-Me Standards. These standards were adopted by the Missouri State Board of Education in 1996. Since their inception, Missouri's Show-Me Standards have been further refined to better delineate Content Standards, Process Standards, and Content Strands as Missouri changed its testing program to comply with the requirements of No Child Left Behind. Starting in 2006, grade-level tests were administered in Communication Arts and Mathematics. In 2009, the MAP was no longer administered at the high school level. It was replaced by the Missouri End-of-Course Assessments (the technical report for these assessments may be found at <http://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials>).

The MAP ELA and Mathematics tests have undergone multiple alignment analyses, with the latest changes in the 2017–18 administration.

The 2014–15 assessments were developed as fixed forms using Smarter Balanced Assessment Consortium's (SBAC) computer-adaptive item bank and consisted of items aligned to the new Missouri Learning Standards (MLS), which were the same as the Common Core State Standards. The students were classified into performance levels based on the cut scores established by the SBAC on their computer-adaptive item bank.

The 2015–16 tests were developed using DRC's College- and Career-Ready item pools. These assessments were not statistically linked to the previous scales. The 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 the Summer of 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 2017–18 ELA and Mathematics assessments were developed 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. These assessments 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

the Summer of 2018. The ELA and Mathematics Spring 2018 results are considered a new baseline for year-to-year student performance comparisons.

The 2017–18 assessments were administered online and contained various item types, including multiple-choice (MC), multi-select (MS), technology-enhanced (TE), evidence-based selected response (EBSR), short-answer (SA), and writing prompt items (in ELA Grades 4 and 8).

## E.2 Administration

In the Spring of 2018, Missouri administered summative assessments in English Language Arts and Mathematics to students in Grades 3 through 8. The MAP was administered from April 2 to May 25, 2018. Test administration is discussed in Chapter 4 of this report.

Approximately 560 districts, including charter schools, administered ELA and Mathematics MAP tests in Grades 3 through 8. Table E.1 shows test completion rates based on Missouri student census data.<sup>1</sup> For the purposes of this report, completion rate is defined as the percentage of students who received a valid 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 completion rates is provided in Chapter 7 of this report.

## E.3 Student Performance

This is the thirteenth year of the grade-level MAP testing programs in English Language Arts and Mathematics. Tables E.2 and E.3 present the percentage of students classified as *Proficient* or *Advanced* from 2006 through 2018 in English Language Arts and Mathematics, respectively. 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 48% for Grade 5 to approximately 50% for Grade 4. Approximately 44% of students were classified as *Proficient* or *Advanced* in ELA Grade 7. The percentage of students classified as *Proficient* or *Advanced* in Mathematics was found to be decreasing as grade level increased and ranged from approximately 47% for Grade 3 to approximately 30% for Grade 8.<sup>2</sup> More details on student performance are provided in Chapter 7.

Due to setting new performance cut scores for ELA and Mathematics after the 2017–18 test administration, the student performance in these two content areas is not directly comparable between the 2017–18 and 2016–17 administrations. Similarly, the 2015–16 assessments were not comparable with the 2014–15 assessments and the 2014–15 assessments were different in content and format from the 2013–14 assessments, resulting in the performance of students in the last five years not being directly comparable, except for administration years 2015–16 and 2016–17.

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<sup>1</sup> The census data used in this report do not reflect additional cleaning steps that DESE staff implements once DRC/CTB releases data to DESE; therefore, the numbers in this report may differ from those in DESE reports using their cleaned data.

<sup>2</sup> Approximately 20% of Grade 8 students took Algebra I End-of-Course assessment instead of Grade 8 Mathematics assessment.

#### **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 and Mathematics test scores. MAP scores are used to identify strengths and weaknesses 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.

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 ELA and Mathematics items from DRC’s College- and Career-Ready item pool and the Missouri-owned pool of items that were written by Missouri educators. More details on test content and test development are provided in Chapter 3 of this report.

With the exceptions of Braille, Large Print, and a limited number of paper-and-pencil 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 or accommodations or universal tools are provided in Chapter 4 of this report.

Scoring of technology-enhanced, short-answer, multi-select, evidence-based selected response, constructed-response, and writing prompts (in ELA Grades 4 and 8) items followed predefined scoring criteria. The technology-enhanced, short-answer, and evidence-based selected response items were auto-scored. ELA writing prompts and Mathematics constructed-response items were scored by human readers. The inter-rater reliability statistics demonstrated that the writing prompt items were scored reliably (refer to Chapter 5 for details).

The test scaling was conducted using item response theory (IRT) methodology. Students’ ELA and Mathematics scale scores were derived using item parameters estimated after the 2017–18 test administration. The IRT models used for ELA and Mathematics 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, refer to Chapter 6. The cut scores used for classification of students into different performance levels and associated performance level descriptors were established during the Summer 2018 standard setting 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 and Mathematics 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 (refer to Chapter 9 for details). In addition, test fairness was evaluated through differential item functioning analysis and analysis of differences in test performance among subgroups (refer to Chapter 10 for details).

**Table E.1: Test Completion Rates: All Students**

Grade	Accountable in ELA	Percent Reportable in ELA	Accountable in Mathematics	Percent Reportable in Mathematics
3	68,094	99.76	68,118	99.94
4	69,734	99.80	69,754	99.95
5	69,953	99.83	69,961	99.94
6	68,091	99.78	68,031	99.91
7	66,995	99.76	66,120	99.88
8	66,448	99.74	54,610	99.83

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 2006 through 2018 Using Census Data: English Language Arts**

Grade	English Language Arts												
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015*	2016**	2017**	2018***
3	42.4	42.6	40.3	40.3	43.1	43.6	45.3	47.8	41.6	57.1	60.6	62.1	48.6
4	43.8	45.1	45.1	46.3	50.9	51.9	52.2	52.8	45.5	58.3	63.2	64.2	50.1
5	45.0	47.8	48.1	48.8	51.0	51.1	51.8	52.3	50.0	58.9	62.0	62.5	48.0
6	42.2	43.6	47.4	47.7	49.6	50.5	50.2	51.0	47.5	54.9	58.3	59.5	48.3
7	42.7	44.4	49.0	50.8	51.7	53.8	55.2	54.9	55.4	57.2	58.0	59.2	43.7
8	41.5	41.6	48.1	49.7	51.8	52.5	53.3	53.9	50.4	57.5	59.2	60.3	49.0

\*Students were classified into performance levels based on the Smarter Balanced Assessment Consortium's cut scores.

\*\*Students were classified into performance levels based on the Missouri cut scores established in Summer 2016.

\*\*\*Students were classified into performance levels based on the Missouri cut scores established in Summer 2018.

**Table E.3: Percentage of Students Classified as *Proficient* or *Advanced* in 2006 through 2018 Using Census Data: Mathematics**

Grade	Mathematics												
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015*	2016**	2017**	2018***
3	43.3	45.0	43.8	44.4	47.1	49.4	51.9	50.7	50.2	52.0	52.5	53.5	47.2
4	43.4	44.5	44.2	44.4	48.4	50.5	50.5	50.1	42.1	49.6	52.9	54.2	46.1
5	43.3	46.6	45.8	47.2	51.7	52.5	54.3	53.9	52.2	39.8	46.7	48.3	41.2
6	43.9	47.8	50.7	50.1	55.4	56.9	55.7	56.2	55.6	38.1	43.3	43.7	41.5
7	42.9	44.9	49.5	51.9	54.5	55.8	59.6	57.3	56.7	35.3	42.1	43.8	38.2
8	39.8	40.6	43.8	46.4	51.3	50.8	52.0	40.3	42.2	28.2	28.3	30.0	29.8

\* Students were classified into performance levels based on the Smarter Balanced Assessment Consortium's cut scores.

\*\*Students were classified into performance levels based on the Missouri cut scores established in Summer 2016.

\*\*\*Students were classified into performance levels based on the Missouri cut scores established in Summer 2018.

## CHAPTER 1: INTRODUCTION

The 2018 Missouri Assessment Program (MAP) marked the thirteenth administration of the grade-level English Language Arts (ELA) and Mathematics MAP tests in Missouri. The MAP is designed to measure students' knowledge of English Language Arts and Mathematics. This report provides a technical overview of the English Language Arts and Mathematics assessments for the 2017–18 MAP. As such, it presents evidence for the validity of the intended interpretation of the 2017–18 MAP scores.

This chapter of the Technical Report serves to describe the background, history, purpose, and design of the MAP for ELA and Mathematics and provides an overview of the major sections of the current report.

### 1.1 Background of the Missouri Assessment Program

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. 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. Table 1.1 provides a brief timeline of the events of the grade-span MAP.

In 2001, the federal No Child Left Behind (NCLB) legislation was enacted, which required states to develop grade-level tests in both Reading and Mathematics to be administered annually in Grades 3 through 8 and once in Grades 10 through 12. In accordance with the NCLB legislation, student performance, reported in terms of proficiency categories, is used to determine the adequate yearly progress of students at the school, district, and state levels.

In response to NCLB, the Missouri Department of Elementary and Secondary Education (DESE) contracted with CTB/McGraw-Hill (CTB) in 2003 to expand the testing program to include grade-level testing for Communication Arts and Mathematics. This contract was renewed in 2007 and extended through 2013–14.

New ELA and Mathematics assessments for Grades 3–8 were developed for the 2014–15 administration. These assessments were built as fixed forms using Smarter Balanced Assessment Consortium's (SBAC) computer-adaptive item bank and consisted of items aligned to the new Missouri Learning Standards (MLS), which were the same as the Common Core State Standards. 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 yet 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. While the 2015–16 ELA and Mathematics assessments were comparable content- and construct-wise to the assessments administered in the 2014–15 year, there were no common items between the two assessments. Therefore, the 2015–16 assessments were not statistically linked to the previous scales. The 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 the Summer of 2016. The ELA and Mathematics Spring 2016 results are considered a new baseline for year-to-year student performance comparisons. 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. Therefore, the student scores and performance level data were directly comparable between the 2015–16 and 2016–17 administration years. 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.

Two fixed forms per grade and content area of the 2017–18 assessments were administered online and contained various item types, including multiple-choice (MC), multi-select (MS), technology-enhanced (TE), evidence-based selected response (EBSR), short-answer (SA), and writing-prompt items (in ELA Grades 4 and 8). The two forms in each grade shared a set of common items for linking purposes.

Table 1.2 shows a timeline of the development history of the NCLB-compliant testing program and the transition to the assessment aligned with the Missouri Learning Standards.

## **1.2 Purpose of the Missouri Assessment Program**

The MAP ELA and Mathematics 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.

## **1.3 Design of the Missouri Assessment Program**

The Spring 2018 MAP ELA Grades 3, 5, 6, and 7 assessments included two 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 included two operational test forms. Braille and Large Print test forms were constructed for each grade/content area to enable visually impaired students to participate in MAP testing. Table 1.3 provides an overview of the 2017–18 MAP ELA and Mathematics test design.

## **1.4 Overview of This 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 and Mathematics 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.

### **Uses of Test Scores (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 and Mathematics scores. In Chapter 2, some of the uses of the MAP scores are discussed.

### **Test Content Development (Chapter 3)**

Chapter 3 of the Technical Report provides a summary of the test development activities that occurred to create the Spring 2018 operational test forms and a summary of the materials developed to inform the public about the testing program. As each major event is presented and discussed, the role of the event in contributing to evidence for validity of the interpretation and use of test results is discussed.

### **Test Administration (Chapter 4)**

Chapter 4 of the Technical Report 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 of Writing Prompts and Auto-scored Items (Chapter 5)**

Chapter 5 of the Technical Report describes the processes and activities for auto-scoring technology-enhanced, short-answer, multi-select, and evidence-based selected response items and for hand-scoring 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.

### **Operational Data Analyses (Chapter 6)**

Chapter 6 of the Technical Report includes a detailed description of the operational analyses of the 2018 ELA and Mathematics MAP, which are composed of three major parts: the classical item analysis; calibration 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, scaling, and linking.

### **Test Results (Chapter 7)**

Chapter 7 of the Technical Report contains information on the results of the Spring 2018 MAP administration. Detailed summary statistics based on the scale scores and performance level information are also provided. Finally, this chapter presents information on the score reports sent to districts.

### **Performance Level Setting (Chapter 8)**

Chapter 8 of the Technical Report briefly discusses standard setting. It provides an overview of the standard setting procedures and the setting of cut scores used to classify students into performance levels for ELA and Mathematics after the 2017–18 test administration.

**Reliability and Validity Evidence (Chapter 9)**

Chapter 9 of the Technical Report provides evidence of reliability and validity of the interpretation of the MAP ELA and Mathematics scores. This chapter provides detailed results of the reliability of the tests as well as information on the decision consistency of the cut scores. It also provides evidence of construct-related validity for the intended interpretation of the MAP scores.

**Fairness (Chapter 10)**

Chapter 10 of the Technical Report discusses fairness and how the MAP ELA and Mathematics tests are constructed to be fair to all Missouri students. This chapter summarizes the results of the differential item functioning (DIF) analysis. It also discusses the results of an impact analysis to determine whether large differences exist between demographic groups in Missouri.

**Table 1.1: Time Line of the Grade-Span MAP**

Year	Event
1996	Show-Me Standards approved
1996	Frameworks for Curriculum Development published
1997	Annotations to the Curriculum Frameworks published
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)
2000	First operational administration of Social Studies MAP (Grades 4, 8, and 10)
2001	Mathematics Curriculum Supplement published
2005	Last year of grade-span MAP

**Table 1.2: Time Line of the Grade-Level MAP**

Year	Event
2004	Grade-Level Expectations published
2005	Communication Arts and Mathematics field test
2005	Standard setting for Communication Arts and Mathematics
2006	First operational Communication Arts and Mathematics MAP
2007	Science field test
2008	First operational Science MAP
2008	Standard setting for Science
2008	Last operational administration of High School MAP
2008	Version 2.0 Grade-Level Expectations (GLEs) published
2009	Last operational administration of MAP based on V1.0 GLEs
2010	First operational administration of MAP based on V2.0 GLEs
2015	First and last operational administration of MAP based on Common Core State Standards for ELA and Mathematics under SBAC patronage
2016	First operational administration of MAP based on Missouri Learning Standards for ELA and Mathematics using DRC's College- and Career-Ready item pool
2016	Standard setting for ELA and Mathematics
2017	Last operational administration of MAP based on Missouri Learning Standards for ELA and Mathematics using DRC's College- and Career-Ready item pool
2018	First operational administration of MAP based on Revised Missouri Learning Standards for ELA and Mathematics using DRC's College- and Career-Ready item pool and Missouri-owned items, written by Missouri educators
2018	Standard setting for ELA and Mathematics

**Table 1.3: Spring 2018 MAP Test Design**

Form Type	Number of Test Forms			
	English Language Arts			Mathematics
	3, 5, 6, and 7	4	8	All Grades
Regular Operational Form (online)	2	6*	6*	2
Braille or Large Print (transcribed)	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.

## CHAPTER 2: THE USES OF TEST SCORES

Validity is the overarching component of the MAP ELA and Mathematics testing program. 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. This section examines some possible uses of the MAP ELA and Mathematics test scores.

The following sections (Chapters 3 through 10) of this Technical Report provide additional evidence for these uses as well as technical support for some of the interpretations and uses of test scores. The information in Chapters 3 through 10 also provides a firm foundation of evidence that the MAP tests measure what they are intended to measure. However, this Technical Report cannot anticipate all possible interpretations and uses of the MAP ELA and Mathematics scores. It is recommended that policy and program evaluation studies, in accordance with the *Standards*, be conducted to support some of the uses of the MAP ELA and Mathematics scores.

### 2.1 Uses of Test Scores

The validity of an interpretation of a test score ultimately rests on how that 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 and Mathematics 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 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.

## 2.2 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 or Mathematics. 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 to indicate a student's achievement on the ELA and Mathematics MAP: (1) the scale score and (2) the performance level, which is derived from the scale score.

### 2.2.1 Scale Scores

A scale score indicating a student's total performance is determined for ELA and Mathematics on the MAP. The overall scale score for a content area quantifies the achievement being measured by the ELA or Mathematics test. 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.

### 2.2.2 Performance Levels

A student's performance on the ELA or Mathematics MAP is reported in one of four performance levels: *Below Basic*, *Basic*, *Proficient*, or *Advanced*. The cut scores for the ELA and Mathematics level of performance were recommended by Missouri educators at the Bookmark Standard Setting workshop in July 2018, after the Spring 2018 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 and Mathematics. (See Chapter 8 of this report for a discussion of the MAP ELA and Mathematics standard setting.)

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 level of performance in terms of what a student should know and be able to do are provided with the *Guide to Interpreting Results* (see Chapters 4 and 7).

### 2.2.3 Use of Test-Level Scores

The MAP scale scores and performance levels provide summary evidence of student performance in ELA and Mathematics. 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 a valid and reliable indicator of student performance in ELA and Mathematics.

## 2.3 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 and Mathematics. Higher scale scores indicate higher performance, and lower

scale scores indicate lower performance on the items measuring a reporting category. The scale scores are computed for content domains measured by at least 6 items, yielding a minimum of 8 raw score points. Based on the reporting category scale score, a student's performance can be compared to that of a "just *Proficient* student" on the same reporting category.

### **2.3.1 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 a 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. Chapter 3 of this Technical Report provides 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 grade level. Caution should be exercised when comparing reporting category scores across years because of a relatively small number of items measuring each category, which may result in lower reliability of these scores as compared to the total test scores.

## CHAPTER 3: TEST CONTENT 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 review of items for accessibility to English Learners (EL) and students with disabilities. In this chapter, we will provide a detailed discussion of the test development cycle. This section will show what procedures were followed in construction of ELA and Mathematics 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, 4.12, and 7.4, which will be discussed in pertinent sections of this chapter. Standards 4.0, 4.1, and 4.7 are from Chapter 4 of the AERA, APA, & NCME (2014) *Standards*, “Test Design and Development.” 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 and Mathematics tests. In this chapter, we describe steps taken to create the MAP tests, from the development of test specifications to the selection of operational forms. Section 3.1 of this chapter describes the development and field testing of DRC’s item bank, from which most of Spring 2018 MAP ELA and Mathematics operational items were selected. Section 3.2 describes the development and field testing of Missouri-owned items that were included in the Spring 2018 MAP ELA and Mathematics assessments. The remaining sections of the chapter describe the test development process for Missouri ELA and Mathematics tests.

### 3.1 Development of DRC’s Item Bank

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 was developed and the CCR items could be phased out. The CCR items are expected to be used in Missouri operational assessments through the Spring 2019 administration. This section of the document provides a high-level overview of the development of DRC’s CCR item bank, from which MAP ELA and Mathematics 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)

### **3.1.1 Considerations of Test Fairness in Item Development**

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)

DRC developed 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. DRC strongly relied on the bias and sensitivity guidelines in the development of the items and assessments, particularly in item writing and review. Items had 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 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 Section 3.1.4, "Item Reviews," for more information about the external item reviewers.

### **3.1.2 Item Writing**

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. Pools of items were written to support a variety of item types and standards covered 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 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 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 specialized 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 include 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
- Participation in the assessment-specific training workshop

The writers were trained individually and had previous experience in writing 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

### ***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 percent 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 should 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 the external reviewers for content and bias, fairness, and sensitivity. The approved passages were then used on the field test.

### **3.1.3 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 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 development of new items for the field tests.

### **3.1.4 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 are not limited to are 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 either 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 a national as well as a regional perspective and understanding of the items.

The twelve English Language Arts 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 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 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 perspective 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)

### **3.1.5 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 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

initial item classical 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.

### **3.1.6 Summary of 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. The content review focused on developmental appropriateness and 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 2015–16 MAP ELA and Mathematics test forms. Table 3.1 shows the high-level sequence of the activities that occurred in the development of the CCR item bank.

Various item types were developed for inclusion in the CCR item pool. Descriptions of each item type (in alphabetical order) used in Missouri ELA and Mathematics assessments are included in Table 3.2.

## **3.2 Development of Items for Missouri-Owned Item Bank**

Development of Missouri-owned item bank included writing performance event items for Mathematics Grades 3 through 8 and writing prompt items for ELA Grades 4 and 8.

### **3.2.1 Development of Performance Event Items**

In 2016, the Missouri Department of Elementary and Secondary Education (DESE) 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 will contain 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 per grade to the adopted Missouri Learning Standards (MLS). 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). Data Recognition Corporation (DRC) content-area test development specialists facilitated the meeting on behalf of the DESE. In addition, DRC content specialists provided committee members with training on the process of writing performance events.

The item writing meeting 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 training began with a statement on the goals of the meeting and a clarification about the role of the Missouri educators in the item development process.

The item writer training included the following:

- Alignment to the Missouri Learning Standards
- Writing skill-specific and balanced test items for all grades
- Item writing technical quality issues
- Bias, fairness, and sensitivity considerations
- Addressing DOK cognitive levels
- Providing contextual relevance
- Universal Design considerations
- Inclusiveness
- Using developmentally appropriate structure and content
- Item development 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 peer's performance events. To begin, the item writers were given a copy of the newly adopted MLS. Item writers were instructed to carefully examine the

content standards, or MLS Expectations, with a focus on the underlying core skills and/or learning targets as required by the Expectations. The purpose of this in-depth review of the Expectations by the item writers was to help ensure they were provided the opportunity to gain a full understanding of the fundamental principles underlying what students at a given grade level should know and be expected to do.

Upon completing their review of the MLS, the DRC facilitators reviewed the criteria used to develop the performance events, as described below. This criterion was also used during peer reviews as item writers shared their performance events periodically with each other over the two-day meeting.

Performance Event (PE) Criteria:

- **Content Alignment or Congruence with the Knowledge and Skills Specified in the Missouri Learning Standards Mathematics:** DRC emphasized that the first criterion for high-quality items is that there must be a high degree of correlation between an item and the expectation it is intended to measure. A major prerequisite for accomplishing this goal was each writer’s knowledge of the content to be addressed by the item. The Missouri item writer’s role was to apply both teaching experience at specific grade levels and a solid base of knowledge of his or her content area of expertise.
- **Estimated Difficulty Level:** Item writers were expected to indicate the estimated difficulty level of each item. Prior to field testing the items, the item difficulties were not known, and writers could only make approximations as to how difficult an item might be. The estimated difficulty level was based upon the writer’s judgment as directly related to his or her classroom teaching experience and knowledge of the curriculum for a given content area and grade level. The purpose for indicating estimated difficulty levels as items are written was to help ensure that the pool of items prepared for review by Missouri educators and for subsequent field testing would include a range of difficulty levels (easy, medium, and difficult).
- **Appropriate Grade Level, Item Context, and Assumed Student Knowledge:** As items were developed, item writers were also asked to consider the conceptual and cognitive level of each item. They were asked to review each item to determine whether the item was measuring something that is important and can be successfully taught in the classroom. For example, does the item measure more than simple recall of facts or is it a “so what” question? Item writers were asked to note any concerns as they reviewed their peers’ stimuli and items. In addition, item writers coded the appropriate grade level of the item.
- **Item Key or Rubric:** Item writers were asked to submit the answer key or rubric with each item. Each item had a clearly stated correct answer or answers. Item types with distractors would have plausible distractors that represented common errors and misconceptions in student reasoning.

- **Art and Graphics:** Writers were asked to ensure that art and graphics were used only when essential and that they were clear and uncluttered. Illustrations were placed directly next to the information to which they referred, and labels were used where appropriate.
- **Distribution of Items Based upon Depth of Knowledge (DOK):** DRC also instructed the item writers to assign the DOK using a model based on Norman Webb’s work. As each item was written, the item writers classified it based on one of four DOK levels: Recall, Basic Application of Skill/Concept, Strategic Thinking, and Extended Thinking.
- **Readability:** During the development of all items, DRC required writers to pay careful attention to the readability of each item and check to ensure that the focus is on the concepts, not on the reading load. The goal for each writer was to develop items that were independent of the attendant reading task, to the greatest degree possible. DRC provided several resources to check readability of items, including the *EDL Core Vocabularies*. Readability and comprehensibility are affected by student background, sentence difficulty, organization of text, and other factors. The DRC facilitators provided input to the writers to address any issues that could be related to students whose first language is not English, and during the process, they continually instructed writers to use simple, clear, grade-appropriate vocabulary, omit extraneous text, avoid use of idioms, and write sentences that are grade appropriate.
- **Grammar and Structure for Item Stems and Item Options:** DRC instructed writers to create items that meet technical quality—that is, items demonstrating correct grammar, syntax, and usage as well as parallel construction and structure of text associated with each multiple-choice item. In addition, DRC instructed its writers to use simple, brief, and consistent sentence structure, minimize pronoun use, and avoid words with multiple meanings.
- **Bias/Sensitivity-Free Items:** The training included an awareness of and sensitivity to issues of cultural and regional diversity. The DRC facilitators provided feedback regarding subtle forms of bias/sensitivity throughout the process and encouraged the item writers to identify areas of sensitivity for students in Missouri due to colloquial preferences and to share these areas of sensitivity with their peers.

Upon completion of the in-depth review of the MLS and 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. Upon completion of the item writing, the performance events were then reviewed internally by DRC content area item and test development specialists and editorial specialists and sent through the composition cycle.

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
- 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 a part of DRC's internal review of the performance events, item and test development team members and graphic specialists ensured that item art was able to 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 carefully 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 and passage was assigned a unique identifier. Item-level/passage-level associations established links as necessary to associated artwork, items/passages, and related items. 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 writing meeting. DRC content experts reviewed the PEs written by the MO educators for the overall item quality and alignment of the item content to Missouri Learning Standards. Based upon this review, ten PEs per grade were brought to the content and bias review held from October 31 to November 2, 2016. Upon completion of the review, all sixty PE's (ten per grade) were either accepted or accepted with revisions for operational test use.

### 3.2.2 Development of Passage-Based Writing Prompts

In 2017, DESE decided to assess new passage-based writing prompts (WPs) developed based on the new Missouri Learning Standards. The passage-based WPs were part of a reading passage set. Six additional items that assess reading standards were included in the 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, twenty-four WPs total.

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 Psychological Testing* (AERA, APA, & NCME 2014), assuring that the passage-based WPs were appropriate for each grade. Due to time constraints, the item writing was completed by DRC's item writers and content experts. The steps of the WP development process included the following:

- Review and/or develop guiding documents such as the pilot test blueprints and 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 test 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).

#### ***Writing-Prompt Passage Development***

Since these new WPs were passage based, passage development was also conducted. The task of passage writing and finding was conducted by DRC content experts with classroom experience in Reading/Language Arts and 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 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, where the average student should be able to read 90 percent of 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 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 should not require students to have extensive background knowledge in a certain discipline or area to understand the text.

After 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. The newly developed items went through DRC's internal review cycle and were prepared for the content and bias review that would be conducted by Missouri educators.

### **3.3 Content and Bias Review of Items Used in MAP**

Spring 2018 ELA and Mathematics assessments consisted of both DRC's CCR items and Missouri-owned items. This section of the report describes the process of content and bias review of the items used in the Spring 2018 ELA and Mathematics assessments.

#### **3.3.1 Content and Bias Review of CCR Items for Use on the MAP**

The CCR items were used in MAP ELA and Mathematics assessments in Spring 2016, 2017, and 2018. (Refer to Section 3.1 for information on the CCR item development.) Therefore, the first item content and bias review occurred prior to the Spring 2016 operational testing. All CCR items that could potentially be used on the Missouri tests were submitted to Missouri content and bias committees for review. The 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.

The first content and bias reviews were held in Missouri from September 29 to October 1, 2015, for ELA, and from October 6 to October 8, 2015, for Mathematics. Committee members were recruited by DESE. The meetings commenced with introductions by DESE and DRC, followed by an overview of the test development process 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
- Freedom from bias and sensitivity
- 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 decision 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 Spring 2016 test forms were selected. The Spring 2016 test forms included operational test items and a small number of embedded field test (FT) items (eight to ten FT items per grade for ELA and five FT items per grade for Mathematics).

The Spring 2016 operational test forms were reused in Spring 2017, but the items were first aligned to the revised Missouri Learning Standards that were adopted in April 2016. Therefore, committees of Missouri educators convened again to provide expert reviews of assessment items, passages, listening presentations, writing prompts, other corresponding stimulus materials that were candidates for inclusion on the 2017 operational assessment, as well as additional items for future Missouri test administrations. The content and bias reviews were held in Lake of the Ozarks, Missouri, from October 31 to November 2, 2016, for both ELA and Mathematics. Committee members were recruited by DESE. The committees consisted of eight to ten Missouri educators per grade and content area. They represented 71 school districts throughout the state. The ELA committee members included: teachers, ELA curriculum coordinators, instructional and academic coaches, content leaders, English as a second language teachers, a director of an English Language Learner program, and an assistant principal. The Mathematics committee members included: teachers, Mathematics curriculum coordinators, instructional coaches, an intervention teacher, and a district assessment director.

The primary responsibility of the committees 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 transition to the new Missouri Learning Standards (MLS), the committees reviewed two sets of items. The first set included CCR items that were brought before a Missouri committee the previous year and accepted. The main goal in reviewing these items was to ensure alignment to the new set of standards. The second set of CCR items that had not previously been reviewed by Missouri educators was reviewed for alignment to the new MLS, bias and sensitivity, as well as adherence to the principles of universal design, including language demand. Due to the leasing agreement of the CCR items, the committee members were asked to note items as either accepted without edits or rejected. DRC test development specialists facilitated the meetings and provided similar training to the one offered during the previous year's

content and bias review. 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.

The content and bias review resulted in approval of the Spring 2016 operational test forms for reuse in Spring 2017 and identification of new CCR items for field testing in Spring 2017. A total of sixty-four items per grade were selected for embedded field testing in ELA, and a total of seventy-five items per grade were selected for embedded field testing in Mathematics in Spring 2017.

### **3.3.2 Content and Bias Review of Missouri-Owned Items for Use on the MAP**

The newly written, Missouri-owned PE items were included in the content and bias reviews held in Lake of the Ozarks, Missouri from October 31 to November 2, 2016, for Mathematics. Since those items were owned by Missouri, the Mathematics educators had the opportunity to revise them as needed and accept them with revisions.

The writing prompts were reviewed during a content and bias review meeting conducted on June 19 and 20, 2017, in Lee Summit, Missouri. DESE invited six Missouri educators per grade level (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 goal in reviewing these items was 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).

## **3.4 Field Testing and Pilot Testing**

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

### **3.4.1 Field Testing ELA and Mathematics Items**

ELA and Mathematics items accepted during the 2015 content and bias reviews for future use on the operational assessments were subsequently field tested during the Spring 2016 test

administrations. The field test items were fully embedded in one operational test form per grade level and content area.

ELA and Mathematics items accepted during the 2016 content and bias reviews were field tested during the Spring 2017 test administrations. 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 a content area. The items field tested in the Spring 2017 administration included Missouri-owned Mathematics performance event items.

Following each field test data acquisition, the field test data analyses were conducted. The analyses included classical item analysis, differential functioning item (DIF) analysis, and item response theory (IRT). The classical item analysis included 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 is provided in Chapter 6 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 is provided in Chapter 10 of this report.

As the last step of the field test data analysis, the field test items were calibrated and equated to operational test scales using the IRT methodology (explained in detail in Chapter 6 of this report). Item statistics are used as a means of detecting items that deserve closer scrutiny, rather than being 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. For an item to be flagged for an additional review, the criteria included

- $p$ -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  $>5\%$ , and
- item flagged for differential item functioning (DIF).

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 that needed an additional review based on their statistical properties; thus, the criteria employed for item flagging tended to over-identify rather than under-identify potential item issues.

The review of the field test items with data was conducted by DESE staff and facilitated by DRC staff. The data review occurred in August 2017 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 acceptance. 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 and Mathematics assessments were included in the pool of items for Spring 2018 operational test form selection.

### **3.4.2 Pilot Testing of ELA Writing Prompts**

The ELA grade 4, 6, and 8 writing prompts and associated Reading items were administered in a stand-alone online pilot test on September 20 and 21, 2017. Because the pilot test was conducted in the Fall, the sets were administered to students in Grades 5, 7, and 9. DESE recruited schools for participation in the pilot. Between 160 and 200 students in Grade 5 took each of the Grade 4 writing prompts. Approximately 300 students in Grade 7 took each of the Grade 6 writing prompts. Fewer than 100 students in Grade 9 took each of the Grade 8 writing prompts. Classical item analysis was performed on the Reading items associated with each prompt. The results of this analysis were intended to provide information on whether these items needed additional revisions prior to field testing. The writing prompts were not scored and instead packets of approximately twenty to thirty responses were compiled for each writing prompt for DESE's review. The selected student responses represented a range of all responses to each prompt and were grouped into three categories: low-, middle-, and high-quality essays. Specific score points were not assigned. These sample responses demonstrated how students performed when presented with the task of incorporating and referencing information provided in passages. Writing-prompt reviews were conducted by DESE with assistance from DRC Performance Assessment Scoring Directors and test development specialists.

Based on the results of the reviews, five WPs were selected for inclusion in Grade 4 and six WPs were selected for inclusion in Grade 8 Spring 2018 operational assessments. DESE also determined that, due to the budget constraints, a WP would not be administered as part of Grade 6 summative assessments.

### **3.5 Test Specifications of MAP ELA and Mathematics**

As stated in the previous section, the test content for the 2018 MAP operational test was provided through DRC's CCR item bank. Items administered for the 2018 MAP operational test were aligned with Missouri Learning Standards adopted in April 2016. Operational forms were selected based on MAP test blueprint 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 purpose of the test is discussed in Chapter 2. The MAP ELA and Mathematics domains are generally defined as the knowledge and skills that are identified within the Missouri Learning Standards for ELA and Mathematics. 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.

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 2018 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's CCR item bank, which was aligned to the Missouri Learning Standards adopted in 2016, and Missouri-owned items were used to create the new test forms for the Spring 2018 administration. DRC and DESE content experts scrutinized each blueprint to ensure optimal content coverage and efficient use of time and resources. In general, the blueprints represent content sampling proportions that reflect intended emphasis in instruction and mastery at each grade level. The test specifications provide the number of items by strand, assessment focus, and item type in the desired proportions within test delivery constraints. The test designs for ELA and Mathematics were finalized in September 2017 by DESE and DRC.

The key structural aspect of the MAP ELA and Mathematics tests is the test blueprint, which specifies the target score points for each content category or domain, as shown in Table 3.3. The blueprint represents the target weights for each strand decided upon by DESE in collaboration with DRC. Test design elements include the number and type of item for each of the scores reported. The degree to which the 2018 MAP operational forms matched the test blueprint can be assessed by comparing the targeted score point distributions defined in the test blueprint in Table 3.3, with the actual point distributions displayed in Tables 3.4 and 3.5 for ELA and Tables 3.6 and 3.7 for Mathematics. Actual point distributions on the 2018 MAP operational forms matched blueprint targets within ten percent, which was the tolerance for variation approved by DESE.

### **3.5.1 Standard and Content Specifications of MAP ELA and Mathematics**

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)

The MAP item specifications are designed to ensure that the assessment items measure the assessment's domains. Indeed, 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 provide guidelines on how to create the items that are specific to each assessment domain or strand. In ELA and Mathematics, 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.

Table 3.4 provides the distribution of items and points on the 2018 MAP ELA by reporting category, and Table 3.5 shows the distribution of points by theme/big idea for ELA.

Table 3.6 provides the distribution of items and points on the 2018 MAP Mathematics by domain, and Table 3.7 shows the distribution of points by content category for Mathematics.

### **3.6 Operational Test Selection of MAP English Language Arts and Mathematics**

The Missouri educator-approved portion of the DRC CCR item bank was used to select the ELA and Mathematics forms. In addition, approved Missouri-owned ELA passage-based writing-prompt sets and Mathematics performance event items were added to the ELA and Mathematics item pools. MAP operational test item selections for the Spring 2018 summative assessment were performed in October 2017 by DESE and DRC. The DRC test development experts made initial selections which were either approved or revised by DESE content specialists. Only items approved by Missouri educators during content and bias reviews were used in form selection. The selection process followed criteria specified by DRC staff and approved by DESE.

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

Following preparation of all necessary materials and resources, forms construction began. Construction of the test forms themselves was a collaborative effort between DRC's integrated development team of assessment specialists, psychometric services specialists, and scoring specialists. Before test forms were created, passages, item/performance events, and artwork were selected. Below, we have described the content and psychometric criteria used for item selection:

- 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;
  - 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

- $p$ -value between 0.20 and 0.90,
- item-total test correlation  $<0.15$ ,
- omit rates  $\leq 5\%$ ,
- poor item fit statistics (misfit flag), and
- significant DIF statistics. (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 form selection was conducted in two phases.

In the first phase, the anchor (linking) items were selected. These anchor items were common for the two operational forms, A and B, in each grade level and content area and were selected to provide the link between the two test forms. In addition, although Spring 2018 test forms are not statistically linked to the Spring 2017 test forms, the statistical properties of the Spring 2017 test forms were used as guidelines for selection of the Spring 2018 test forms in order to create new test forms with initial statistical properties that would facilitate the development of new vertical scales.

The anchor items on the Spring 2018 A and B test forms were selected from the Spring 2017 operational item pool. 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 specification 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.

In the second phase of the item selection, non-anchor operational items 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 forms in order to meet the test blueprint. Except for ELA Grade 4 and 8 writing prompt items, the non-anchor operational items came from the MAP 2017 operational and field test item pool. These items had either operational or field test statistics from the Spring 2017 test administration in Missouri. The writing prompt items selected for the Spring 2018 test administration did not have prior item statistics. The non-anchor operational items were selected using the same item selection guidelines as implemented for the anchor item selection. Full form selections were reviewed for statistical equivalence within each grade level and content area and approved by a DRC psychometrician.

For the Spring 2018 administration, a breach form for ELA and Mathematics was also developed during the second phase of form construction for each grade level. All anchor items, which were common between forms A and B, were scrambled and used in the breach forms. The remaining items were a mixture of the non-anchor items from forms A and B. Since there were no field test items in the breach forms, the positions of anchor and non-anchor items on the test was different than in the regular A and B forms, which contained field test slots. However, the anchor items in the breach forms always appeared in the same session as in the regular A and B forms, and the anchor placement in the session item sequence was within three positions of its position in the regular A and B forms. The breach form also adhered to the same content and psychometric criteria as regular operational test forms.

DESE reviewed items placed on the operational test forms during the forms construction process. In addition, 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 to aid in the review of the forms. The form review criteria are provided in Table 3.8. Upon receipt of DESE feedback, DRC test development specialists adjusted the forms and received approval from a DRC psychometrician.

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 stage were made prior to the test forms being administered to students.

### **3.7 Universal Design**

Grade-level assessments that are universally designed allow 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 3.9 presents the elements of universal design (Thompson & Thurlow, 2002). The 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 2018 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)

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 print test books and through the web formatting of the online test forms. The page specifications define how directions and test items are placed on the pages, the location and appearance of headers and footers, spacing between an item stem and answer choices, and other page elements to ensure a consistent, legible appearance of printed test books and online 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.

### **3.8 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 Language Learners may be provided with test administration accommodation(s) based on their Individualized Education Plan (IEP). More information on accommodations can be found in Section 4.4.2 of Chapter 4. Accommodation code definitions can be found in the *Test Coordinator's Manual* and also in the *Examiner's Manual*, presented in Appendices A and B, respectively.

Braille and Large Print test versions were constructed for each grade/content area to enable students who are blind or visually impaired to participate in the MAP testing. Braille and Large Print forms for ELA and Mathematics were created by DRC test developers and contained the same items as one of the two 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 in February 2018 to ensure that both the Braille and Large Print versions of the 2018 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.

### 3.9 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 are in alignment with multiple best practices of the test 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.
- 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 4.12—Test developers should document the extent to which the content domain of a test represents the domain defined in the test specifications.

**Table 3.1: College- and Career-Ready Item Bank Development Activities**

<b>College- and Career-Ready Item bank Development Activities</b>
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 3.2: College- and Career-Ready Item Types Used in MAP Assessments**

<b>Item Type</b>	<b>Name</b>	<b>Description</b>
<b>EBSR</b>	Evidence-Based Selected Response	Each evidence-based selected response item has two parts, and each two-part item is designed to elicit an evidence-based response from a student who has read a literature text passage, an informational text passage, or a writing concept. In part one, which is similar to a multiple-choice item, the student analyzes a passage or writing concept and chooses the best answer from four response options. In part two, the student elicits evidence from the passage or writing concept to select one or more answers based on the response to part one. EBSR items are worth one or two points.
<b>MC</b>	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.
<b>MS</b>	Multi-Select	Each multi-select item requires a student to evaluate information presented and respond by choosing two or more correct responses. Multi-select items can be used to assess multiple skills and concepts in both Mathematics and English Language Arts. MS items are worth one or two points.
<b>SA</b>	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 mathematics problem without the assistance of response options. The short-answer items are worth one or two points and are scored using item-specific autoscoring rules.
<b>TE</b>	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, autoscoreable 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 worth one or two points and are scored using item-specific scoring rules.

**Table 3.3: MAP Test Blueprint: Target Score Points by Reporting Category**

Content Area Reporting Category	Grade					
	3	4	5	6	7	8
<b>English Language Arts</b>						
Reading	26	26	26	28	28	28
Research	8	8	8	8	8	8
Writing	14	14	14	8	8	12
Speaking/Listening	8	8	8	8	8	8
<b>Mathematics (Performance Event points <u>not</u> included)</b>						
Relationships and Algebraic Thinking	13	8	8			
Number Sense and Operations in Base Ten	9	10	8			
Number Sense and Operations in Fractions	9	11	13			
Data and Statistics*	3	3	3			
Geometry and Measurement*	8	10	10	7	6	12
Ratios and Proportional Relationships				8	11	
Number Sense and Operations**				11	9	3
Expressions, Equations and Inequalities**				15	13	18
Data Analysis, Statistics and Probability*				5	7	4
Functions						9

\*Mathematics domains combined into a single Reporting Category in all grades.

\*\*Mathematics domains combined into a single Reporting Category in Grade 8 only.

**Table 3.4: Reporting Category Item/Point Distributions, English Language Arts**

Grade	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				
3	Reading	22	22		22	22	26		26	46%
	Research	7	6		7	6	8		8	14%
	Writing	13	13		13	13	14		14	25%
	Speaking/Listening	8	8		8	8	8		8	14%
	Total	50	49	0	50	49	56	0	56	100%
4	Reading	23	23		23	23	26		26	46%
	Research	7	7		7	7	8		8	14%
	Writing	4	4	1	5	5	4	10	14	25%
	Speaking/Listening	8	8		8	8	8		8	14%
	Total	42	42	1	43	43	46	10	56	100%
5	Reading	22	21		22	21	26		26	46%
	Research	6	6		6	6	8		8	14%
	Writing	13	14		13	14	14		14	25%
	Speaking/Listening	8	8		8	8	8		8	14%
	Total	49	49	0	49	49	56	0	56	100%
6	Reading	24	24		24	24	28		28	54%
	Research	7	6		7	6	8		8	15%
	Writing	7	8		7	8	8		8	15%
	Speaking/Listening	8	8		8	8	8		8	15%
	Total	46	46	0	46	46	52	0	52	100%
7	Reading	25	24		25	24	28		28	54%
	Research	7	7		7	7	8		8	15%
	Writing	7	8		7	8	8		8	15%
	Speaking/Listening	8	8		8	8	8		8	15%
	Total	47	47	0	47	47	52	0	52	100%
8	Reading	23	24		23	24	28		28	50%
	Research	7	6		7	6	8		8	14%
	Writing	2	2	1	3	3	2	10	12	21%
	Speaking/Listening	8	8		8	8	8		8	14%
	Total	40	40	1	41	41	46	10	56	100%

Table 3.5: Theme/Big Idea Point Distributions, English Language Arts

English Language Arts Grades 3–5								
Reporting Category	Strand/ Domain	Theme/Big Idea	Total Points by Core Form					
			Grade 3		Grade 4		Grade 5	
			A	B	A	B	A	B
Reading	Reading Literary Text	Develop and apply skills to the reading process.	6	5	9	7	8	6
		Develop and apply skills and strategies to comprehend, analyze and evaluate fiction, poetry and drama from a variety of cultures and times.	8	7	5	7	5	6
		Comprehend and analyze words, images, graphics, and sounds in various media and digital forms to impact meaning.	0	0	0	0	0	0
	Reading Informational Text	Develop and apply skills to the reading process.	1	1	6	6	9	11
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.		11	13	6	6	4	3	
Comprehend and analyze words, images, graphics, and sounds in various media and digital forms to impact meaning.		0	0	0	0	0	0	
Research	Writing	Gather, analyze, evaluate and use information from a variety of sources.	8	8	8	8	8	8
Writing	Writing	Apply a writing process to develop a text for audience and purpose.	8	8	2	2	8	8
		Compose well-developed writing texts for audience and purpose.	0	0	8	8	0	0
	Language	Communicate using conventions of English language.	6	6	4	4	6	6
Speaking/ Listening	Speaking/ Listening	Listen for a purpose.	8	8	8	8	8	8
		Listen for entertainment.	0	0	0	0	0	0
		Speak effectively in collaborative discussions.	0	0	0	0	0	0
		Speak effectively when presenting.	0	0	0	0	0	0

**Table 3.5: Theme/Big Idea Point Distributions, English Language Arts (cont.)**

English Language Arts Grades 6–8								
Reporting Category	Strand/ Domain	Theme/Big Idea	Total Points by Core Form					
			Grade 6		Grade 7		Grade 8	
			A	B	A	B	A	B
Reading	Reading Literary Text	Comprehend and Interpret Texts (Approaching Texts as a Reader)	4	6	8	4	6	6
		Analyze Craft and Structure (Approaching Texts as a Writer)	9	7	6	10	6	6
		Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)	0	0	0	0	1	1
	Reading Informational Text	Comprehend and Interpret Texts (Approaching Texts as a Reader)	8	6	9	6	5	5
		Analyze Craft and Structure (Approaching Texts as a Writer)	6	8	5	8	7	5
		Synthesize Ideas from Multiple Texts (Approaching Texts as a Researcher)	1	1	0	0	3	5
Research	Writing	Approaching the Task as a Researcher	8	8	8	8	8	8
Writing	Writing	Approaching the Task as a Writer	0	0	0	0	8	8
		Approaching the Task as a Reader	8	8	8	8	4	4
Speaking/ Listening	Speaking and Listening	Collaborating	8	8	8	8	8	8
		Presenting	0	0	0	0	0	0

**Table 3.6: Domain Item/Point Distributions, Mathematics**

Grade	Domain	Stand-alone 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	1	1	9	9	17%
	Number Sense and Operations	11	0	0	11	11	20%
	Expressions, Equations and Inequalities	15	5	7	20	22	41%
	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	1	2	12	13	24%
	Number Sense and Operations	9	1	1	10	10	19%
	Expressions, Equations and Inequalities	13	4	5	17	18	33%
	Geometry and Measurement	6	0	0	6	6	11%
	Data Analysis, Statistics and Probability	7	0	0	7	7	13%
	Total	46	6	8	52	54	100%
8	Number Sense and Operations	3	2	3	5	6	11%
	Expressions, Equations and Inequalities	18	3	5	21	23	43%
	Geometry and Measurement	12	0	0	12	12	22%
	Data Analysis, Statistics and Probability	4	0	0	4	4	7%
	Functions	9	0	0	9	9	17%
	Total	46	5	8	51	54	100%

\* All Mathematics stand-alone items were worth 1 point in the MAP 2018 assessment.

**Table 3.7: Cluster (Content Category) Point Distributions, Mathematics**

<b>Mathematics Grade 3</b>		
<b>Domain</b>	<b>Cluster (Content Category)</b>	<b>Total Points*</b>
Relationships and Algebraic Thinking	Represent and solve problems involving multiplication and division.	3
	Understand properties of multiplication and the relationship between multiplication and division.	3
	Multiply and divide within 100.	3
	Use the four operations to solve word problems.	3
	Identify and explain arithmetic patterns.	2
Number Sense and Operations in Base Ten	Use place value understanding and properties of operations to perform multi-digit arithmetic.	10
Number Sense and Operations in Fractions	Develop understanding of fractions as numbers.	9
Geometry and Measurement	Reason with shapes and their attributes.	3
	Solve problems involving the measurement of time, liquid volumes and weights of objects.	2
	Understand concepts of area.	2
	Understand concepts of perimeter.	1
Data and Statistics	Represent and analyze data.	7

\*Performance Event points are included.

**Table 3.7: Cluster (Content Category) Point Distributions, Mathematics (cont.)**

<b>Mathematics Grade 4</b>		
<b>Domain</b>	<b>Cluster (Content Category)</b>	<b>Total Points*</b>
Relationships and Algebraic Thinking	Use the four operations with whole numbers to solve problems.	5
	Work with factors and multiples.	2
	Generate and analyze patterns.	2
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.	15
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.)	3
	Extend understanding of operations on whole numbers to fraction operations.	5
	Understand decimal notation for fractions, and compare decimal fractions (denominators of 10 or 100).	3
Geometry and Measurement	Classify two-dimensional shapes by properties of their lines and angles.	3
	Understand the concepts of angles and measure angles.	2
	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	5
Data and Statistics	Represent and analyze data.	3

\*Performance Event points are included.

**Table 3.7: Cluster (Content Category) Point Distributions, Mathematics (cont.)**

<b>Mathematics Grade 5</b>		
<b>Domain</b>	<b>Cluster (Content Category)</b>	<b>Total Points*</b>
Relationships and Algebraic Thinking	Represent and analyze patterns and relationships.	2
	Write and interpret numerical expressions.	7
	Use the four operations to represent and solve problems.	0
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.	9
Number Sense and Operations in Fractions	Understand the relationship between fractions and decimals (denominators that are factors of 100).	3
	Perform operations and solve problems with fractions and decimals.	10
Geometry and Measurement	Classify two- and three-dimensional geometric shapes.	2
	Understand and compute volume.	7
	Graph points on the Cartesian coordinate plane within the first quadrant to solve problems.	4
	Solve problems involving measurement and conversions within a measurement system.	1
Data and Statistics	Represent and analyze data.	3

\*Performance Event points are included.

**Table 3.7: Cluster (Content Category) Point Distributions, Mathematics (cont.)**

<b>Mathematics Grade 6</b>		
<b>Domain</b>	<b>Cluster (Content Category)</b>	<b>Total Points*</b>
Ratios and Proportional Relationships	Understand and use ratios to solve problems.	9
Number Sense and Operations	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	2
	Compute with non-negative multi-digit numbers, and find common factors and multiples.	5
	Apply and extend previous understandings of numbers to the system of rational numbers.	4
Expressions, Equations and Inequalities	Apply and extend previous understandings of arithmetic to algebraic expressions.	6
	Reason about and solve one-variable equations and inequalities.	10
	Represent and analyze quantitative relationships between dependent and independent variables.	6
Geometry and Measurement	Solve problems involving area, surface area and volume.	7
Data Analysis, Statistics and Probability	Develop understanding of statistical variability.	1
	Summarize and describe distributions.	4

\*Performance Event points are included.

**Table 3.7: Cluster (Content Category) Point Distributions, Mathematics (cont.)**

<b>Mathematics Grade 7</b>		
<b>Domain</b>	<b>Cluster (Content Category)</b>	<b>Total Points*</b>
Ratios and Proportional Relationships	Analyze proportional relationships and use them to solve problems.	13
Number Sense and Operations	Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.	10
Expressions, Equations and Inequalities	Use properties of operations to generate equivalent expressions.	5
	Solve problems using numerical and algebraic expressions and equations.	13
Geometry and Measurement	Draw and describe geometrical figures and describe the relationships between them.	4
	Apply and extend previous understanding of angle measure, area and volume.	2
Data Analysis, Statistics and Probability	Use random sampling to draw inferences about a population.	2
	Draw informal comparative inferences about two populations.	1
	Develop, use and evaluate probability models.	4

\*Performance Event points are included.

**Table 3.7: Cluster (Content Category) Point Distributions, Mathematics (cont.)**

<b>Mathematics Grade 8</b>		
<b>Domain</b>	<b>Cluster (Content Category)</b>	<b>Total Points*</b>
Number Sense and Operations	Know that there are numbers that are not rational, and approximate them by rational numbers.	6
Expressions, Equations and Inequalities	Work with radicals and integer exponents.	10
	Understand the connections between proportional relationships, lines and linear equations.	8
	Analyze and solve linear equations and inequalities and pairs of simultaneous linear equations.	5
Functions	Define, evaluate and compare functions.	5
	Use functions to model relationships between quantities.	4
Geometry and Measurement	Understand congruence and similarity using physical models, transparencies or geometry software.	5 (core A) 6 (core B)
	Understand and apply the Pythagorean theorem.	5 (core A) 4 (core B)
	Solve problems involving volume of cones, pyramids and spheres.	2
Data Analysis, Statistics and Probability	Investigate patterns of association in bivariate data.	4

\*Performance Event points are included.

Table 3.8: MAP Test Form Review Criteria

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

**Table 3.9: 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, Non-Biased 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.

## CHAPTER 4: TEST ADMINISTRATION

Chapter 4 of the Technical Report describes the processes and activities implemented and 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 4 examines how test administration procedures implemented for the MAP strengthen and support the intended score interpretations and reduce construct-irrelevant variance that could threaten the validity of score interpretations.

Chapter 4 demonstrates adherence to AERA, APA, & NCME (2014) Standards 4.15, 4.16, 6.1, 6.2, 6.4, 6.6, and 6.7 in the ELA and Mathematics MAP. Each standard will be explicated within the relevant section of this chapter.

### 4.1 Training of Districts

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 2017.

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.

## 4.2 Ancillary Materials

Test administration ancillary materials for the MAP 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.

For the Spring 2018 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 2018. 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 nine steps the Test Coordinator should follow. Information included in the *Test Coordinator's Manual* is listed below.

- 1.0 Overview of Important Information for the MAP Grade-Level Assessments
  - 1.1 This Test Coordinator's Manual
  - 1.2 Glossary of Terms
  - 1.3 About the Tests
  - 1.4 Schedule of Important Dates for Spring 2018
  - 1.5 Special Populations, Optional Populations, and Special Circumstances
- 2.0 Before Online Testing
  - 2.1 Advance Announcements and Preparation
  - 2.2 User Roles
  - 2.3 Test Security
  - 2.4 eDIRECT and INSIGHT
  - 2.5 Assessment Materials for Students/Administrators
- 3.0 After Online Testing
  - 3.1 Submitting All Tests/Close of Testing Window
  - 3.2 Reporting Test Invalidations
  - 3.3 How to Handle Student Absences
  - 3.4 Securely Destroy Materials
  - 3.5 Individual Student Reports
- 4.0 Large Print, Braille, and Paper-and-Pencil Editions
  - 4.1 Before Testing
  - 4.2 After Testing

Appendix A: Handling Student Transfers and Changes in Testing Status

Appendix B: Test Timing Guidelines

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 Test 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
- 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
  - 3.2 Moving a Student During an Assessment
- 4.0 After Online Testing
  - 4.1 Reporting Test Invalidations
  - 4.2 How to Handle Student Absences
- 5.0 Large Print, Braille, and Paper-and-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: Periodic Table of Elements (Grades 5 and 8 manuals only)

Appendix E: Writer’s Checklist (Grade 8 manual only)

This section presents the AERA, APA, & NCME (2014) standards relevant to test administration and how 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 the tests; recommended order of test administration; classroom activity information; assessment

duration, timing, and sequencing information; and the 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, 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 examiner is instructed to read verbatim to students. Examiners are instructed to follow the script 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 Figure 4.1.

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 2–May 25, 2018. The *Examiner’s Manuals* contain the schedule for timing each test session and indicate whether timing is to be strictly enforced. The test timing schedule is presented in Table 4.1.

**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 computer-based testing for administering the MAP online test. These include the following:

- Determine the layout of the physical computer lab.
- 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 they 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; using 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 is shown in Figure 4.2.

**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 4.3.

#### **4.2.1 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, and give final approval. 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-and-pencil printed test books are packed and returned to DRC.

#### **4.2.2 Security Forms**

As soon as Large Print and Braille 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 material originally sent to each school. The Test Coordinators then enter the number of materials returned and provides 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 4.3.

#### **4.2.3 Interpretive Guides**

Essential to making valid interpretations of test scores is an understanding of what the test scores mean and how to interpret score reports. The *Guide to Interpreting Results* is written for Missouri teachers and administrators who receive the MAP score reports from the 2018 administration. More detail about the guide can be found in Chapter 7.

### **4.3 Test Security Measures**

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 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 login 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.

#### **4.4 Test Administration**

The 2018 test was administered to students within the state testing window of April 2–May 25, 2018. Schools and districts chose when and how to administer the MAP within this window. Each session within each content area of the MAP was required to be administered in one block of time.

##### **4.4.1 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 4.1. 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 4.2 and 4.3 for ELA and Mathematics, 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 and 2) the number of test log-ins was not equal to the number of test log-outs. Between 11% and 20% of the records were excluded for ELA, and between 8% and 12% of the records were excluded for Mathematics. 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. At least 90% of students completed the writing prompt session within the suggested times. For Mathematics, at least 50% of students completed Session 1 within the suggested times in all grades. Except for Grades 4 and 5, at least 75% of students completed Session 2 of the test within the suggested times. Mathematics Session 3 was completed by at least 90% of students in all grades within the suggested times. 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 very long 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.

##### **4.4.2 Universal Tools and Accommodations**

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 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 table of tools and accommodations presented in the *Examiner's Manual* is shown in Tables 4.4 and 4.5. 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 paraphrasing 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>.

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

Table 4.6 summarizes the numbers of reportable students for whom accommodations or universal tools were indicated by a teacher for the 2018 MAP. The analyses in Table 4.6 are based on reportable data and include only students who used universal tools or accommodations and received a scale score on the ELA or Mathematics 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 2018, 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 in Grades 4–8 Mathematics, and multiplication table use in Grades 4–8 Mathematics. The separate setting and having the test read aloud (text-to-speech or human reader) were the most frequently used universal tools for both ELA and Mathematics assessments.

## 4.5 Summary

In summary, the overall purpose of each of the test administration workshops 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 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.

**Table 4.1: MAP Administration Schedule Timing Guidelines by Session (Time in Minutes)**

<b>Grade</b>	<b>Session</b>	<b>English Language Arts</b>	<b>Mathematics</b>
3	1	50–80	35–45
	2	20–40	35–50
	3	20–35	15–30
4	1	100–130	35–45
	2	50–80	35–50
	3	15–25	15–30
	4	20–35	
5	1	50–80	35–45
	2	20–40	35–50
	3	20–35	15–30
6	1	30–50	35–45
	2	30–50	45–60
	3	20–30	40–45
	4	20–35	
7	1	50–85	20–25
	2	20–30	60–80
	3	20–35	40–45
8	1	100–130	15–20
	2	50–80	65–85
	3	15–25	40–45
	4	20–35	

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

**Table 4.2: 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	56,519	66	32	29	46	60	80	103	121	175
	2	59,244	34	16	17	24	31	40	53	63	92
	3	57,850	23	12	11	16	20	26	35	44	68
4	1	56,398	65	39	19	36	57	83	114	137	197
	2	59,289	59	53	27	42	54	70	90	105	149
	3	61,721	23	11	11	16	21	27	36	44	64
	4	59,738	23	11	12	16	20	26	35	42	65
5	1	60,010	61	27	28	44	56	72	92	108	154
	2	62,253	32	14	16	23	29	37	49	58	84
	3	60,864	21	11	10	14	18	23	32	39	60
6	1	60,736	38	16	19	28	35	45	57	67	95
	2	61,200	33	15	15	24	31	40	51	60	83
	3	61,212	26	10	13	19	24	30	38	44	62
	4	59,451	20	8	10	15	18	22	29	34	50
7	1	59,141	56	32	29	42	53	66	80	93	129
	2	60,329	26	10	13	20	24	30	37	42	59
	3	58,264	17	6	9	13	16	19	23	27	39
8	1	58,109	51	31	16	30	45	65	90	107	150
	2	58,883	49	22	24	37	47	58	71	82	116
	3	59,799	18	7	9	14	17	22	27	31	43
	4	57,947	16	6	9	13	15	18	23	26	37

**Table 4.3: 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	60,462	48	24	22	32	42	57	77	93	132
	2	61,376	39	22	16	25	34	47	64	78	118
	3	62,863	19	11	8	12	17	23	32	39	58
4	1	62,210	46	23	20	30	40	55	74	89	128
	2	61,772	47	23	21	32	42	56	75	90	128
	3	64,483	19	11	7	12	17	23	33	41	60
5	1	62,964	52	25	25	36	47	62	82	98	137
	2	63,575	49	24	21	33	44	58	78	93	131
	3	65,940	14	9	5	8	11	17	24	30	47
6	1	63,015	52	23	25	37	48	61	78	91	130
	2	63,202	44	20	22	32	41	52	67	78	112
	3	64,362	23	12	9	15	20	27	37	45	65
7	1	62,402	25	11	12	19	24	30	38	45	64
	2	61,233	57	24	27	42	53	67	84	98	136
	3	62,689	26	12	11	18	24	31	40	46	65
8	1	51,905	20	10	9	14	19	25	32	38	53
	2	50,056	57	24	25	42	54	69	86	99	136
	3	52,023	21	10	8	14	19	25	33	39	56

Table 4.4: MAP Universal Tools

Tool	Description	Code
<b>Bilingual Dictionary</b>	<p><b>EL students</b> may have access to a physical Bilingual Dictionary for use <b>ONLY</b> on the ELA Writing Prompts. If the Bilingual Dictionary is electronic, it may not connect to the internet.</p> <p>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	S431
<b>Break (Pause)</b>	<p><b>All students</b> 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.</p> <p>The INSIGHT student platform allows <b>all students</b> 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.</p> <p>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.</p>	N/A
<b>Calculator (For Mathematics items in grades 6-8 where allowed)</b>	<p>The INSIGHT student platform features an embedded calculator for <b>all students</b> to use on all science assessments and for mathematics items in grades 6-8 where calculator use is allowed.</p> <p><b>All students</b> 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.</p> <p><i>Please Note: Use of a calculator is only for the Mathematics and Science assessments.</i></p>	N/A
<b>Color Contrast – Online Testing</b>	<p>The INSIGHT student platform allows <b>all students</b> to adjust background or font color based on student needs or preferences.</p>	N/A
<b>Color Contrast – Paper Testing</b>	<p><b>All students</b> taking the paper/pencil assessment may have the test printed in different colors based on student needs or preferences.</p> <p>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	S102
<b>Color Overlay</b>	<p><b>All students</b> taking the paper/pencil assessment may have a color transparency placed over the test presented to them based on student needs or preferences.</p> <p>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	S103
<b>English Dictionary</b>	<p>The INSIGHT student platform allows <b>all students</b> access to an embedded English Dictionary for use <b>ONLY</b> on the ELA Writing Prompts.</p> <p><b>All students</b> may have access to a physical English Dictionary for use <b>ONLY</b> on the ELA Writing Prompts. If the English Dictionary is electronic, it may not connect to the internet.</p>	N/A

Table 4.4: MAP Universal Tools (cont.)

Tool		Code
<b>Grammar Handbook</b>	<p><b>All students</b> may have access to a physical Grammar Handbook for use <b>ONLY</b> on the ELA Writing Prompts. If the Grammar Handbook is electronic, it may not connect to the internet.</p> <p>The Grammar Handbook must be one that is published. It cannot be a district, school or classroom made handbook.</p>	N/A
<b>Graphing Tool</b>	The INSIGHT student platform allows <b>all students</b> to use an embedded tool to graph functions.	N/A
<b>Highlighter</b>	<p>The INSIGHT student platform allows <b>all students</b> access to an embedded highlighter for marking desired text.</p> <p><b>All students</b> may have access to a physical highlighter.</p>	N/A
<b>Keyboard Navigation</b>	The INSIGHT student platform allows <b>all students</b> to navigate through the text by using the keyboard.	N/A
<b>Line Guide</b>	The INSIGHT student platform allows <b>all students</b> to use an embedded line guide that brings focus to a single line of text.	N/A
<b>Magnification</b>	<p>The INSIGHT student platform allows <b>all students</b> to magnify the screen by 1.5 or 2 times the original size.</p> <p><b>All students</b> taking the paper/pencil or Large Print assessments may have access to a physical magnifying device.</p>	N/A
<b>Magnification – Assistive Technology</b>	<p><b>Students with visual impairments</b> may attempt to use assistive technology software that magnifies the screen beyond the built in capabilities of the embedded magnifier.</p> <p><i>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.</i></p> <p>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	S105
<b>Mark for Review</b>	The INSIGHT student platform allows <b>all students</b> to mark an item for review.	N/A
<b>Masking – Online Testing</b>	The INSIGHT student platform allows <b>all students</b> access to an embedded masking tool to block off content that is not of immediate need or that may be distracting.	N/A
<b>Masking – Paper Testing</b>	<p><b>All students</b> 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.</p> <p>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	S107

Table 4.4: MAP Universal Tools (cont.)

Tool	Description	Code
<b>Non-Accommodation Paper Based Assessment</b>	<p>This tool is available for the following scenarios:</p> <ul style="list-style-type: none"> <li>• For students that need to test off-site in a non-district building (e.g. hospital, juvenile facility, etc.)</li> <li>• For <b>EL students</b> 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 <b>Translation</b> that follows the Tools/Accommodations lists for more information.</li> <li>• For students using Read Aloud – Human Reader (S043) where the examiner needs a paper copy to read from. Please see the section on <b>Read Aloud</b> that follows the Tools/Accommodations lists for more information.</li> </ul> <p>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. This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	S112
<b>Protractor</b>	<p>The INSIGHT student platform allows <b>all students</b> to use an embedded protractor on specific items where appropriate.</p> <p><b>All students</b> taking the paper/pencil, Large Print or Braille assessments may have access to a physical protractor for use on specific items where appropriate.</p>	N/A
<b>Read Aloud Test to Self</b>	<p><b>All students</b> 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.</p> <p>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).</p>	N/A
<b>Read Aloud: Text Directions and Items</b>	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

Table 4.4: MAP Universal Tools (cont.)

Tool	Description	Code
<b>Reference Sheet</b>	The INSIGHT student platform allows <b>all students</b> access to use an embedded reference sheet on applicable assessments. Not all assessments have a reference sheet.	N/A
<b>Ruler</b>	The INSIGHT student platform allows <b>all students</b> to use an embedded ruler on specific items where appropriate. <b>All students</b> 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
<b>Scratch Paper (Sticky Notes)</b>	The INSIGHT student platform allows <b>all students</b> to use an embedded notepad (called Sticky Notes) to make notes about an item. Electronic notes <b>DO NOT</b> carry over from previous sessions. If a student logs off prior to finishing a session, any electronic notes <b>WILL NOT</b> carry over when the student logs back in.  <b>All students</b> 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 <b>IMMEDIATELY</b> upon the conclusion of a testing session.	N/A
<b>Scribe</b>	<b>Students with physical disabilities</b> that may prevent them from responding themselves may dictate their responses to a scribe, who must follow the scribing guidelines ( <a href="http://dese.mo.gov/sites/default/files/asmt-scribing-guidelines.pdf">http://dese.mo.gov/sites/default/files/asmt-scribing-guidelines.pdf</a> ).  <i>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.</i> <b>Students who obtain a physical injury prior to testing</b> that prevents them from responding may also dictate their responses to a scribe.  This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.	S351
<b>Separate Setting</b>	<b>All students</b> 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 the eDIRECT Administration portal under student accommodations prior to testing.	S501
<b>Strikethrough (Cross Off)</b>	The INSIGHT student platform allows <b>all students</b> to cross out answer options.	N/A
<b>Thesaurus</b>	<b>All students</b> may have access to a physical Thesaurus for use <b>ONLY</b> on the ELA Writing Prompts. If the Thesaurus is electronic, it may not connect to the internet.	N/A
<b>Writing Tools</b>	The INSIGHT student platform allows <b>all students</b> to 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

Table 4.5: MAP Accommodations for Students with Disabilities

Accommodation		Code
<b>Abacus</b>	<p><b>Students with this accommodation in their IEP/504 plan</b> may have access to an abacus.</p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A391
<b>Alternate Response Options</b>	<p><b>Students with this accommodation in their IEP/504 plan</b> 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.</p> <p><i>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.</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A441
<b>Braille</b>	<p><b>Students with visual impairments with this accommodation in their IEP/504 plan</b> may access the assessment via a Braille version. Tactile overlays and graphics tools may be used to assist the student in accessing the content.</p> <p><i>Please Note: Answers from students who access the assessment using the Braille format must be entered into eDIRECT prior to shipping the Braille assessment back. Please follow the instructions found in the virtual Braille kit (available in eDIRECT).</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A012
<p><b>*INVALIDATION*</b>  <b>Calculator (For Non-Calculator Allowed Items Only)</b></p> <p><b>GRADE 3 ONLY</b></p> <p><b>*INVALIDATION*</b></p>	<p><b>Students in 3<sup>rd</sup> grade with this accommodation in their IEP/504 plan</b> 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.</p> <p><i>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).</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A392
<p><b>Calculator (For Non-Calculator Allowed Items Only)</b></p> <p><b>GRADES 4-8</b></p>	<p><b>Students in grades 4-8 with this accommodation in their IEP/504 plan</b> 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.</p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A393

Table 4.5: MAP Accommodations for Students with Disabilities (cont.)

Accommodation		Code
<b>Large Print</b>	<p><b>Students with visual impairments with this accommodation in their IEP/504 plan</b> may access the assessment via a Large Print version.</p> <p><i>Please Note: Answers from students who access the assessment using the Large Print format must be entered into eDIRECT prior to shipping the Large Print assessment back. Please follow the instructions found in the virtual Large Print kit (available in eDIRECT).</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A021
<p><b>*INVALIDATION*</b> <b>Multiplication Table</b></p> <p><b>GRADE 3 ONLY</b></p> <p><b>*INVALIDATION*</b></p>	<p><b>Students in 3<sup>rd</sup> grade with this accommodation in their IEP/504 plan</b> may have access to a single digit multiplication table.</p> <p><i>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).</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A394
<p><b>Multiplication Table</b></p> <p><b>GRADES 4-8</b></p>	<p><b>Students in grades 4-8 with this accommodation in their IEP/504 plan</b> may have access to a single digit multiplication table.</p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A395
<p><b>Paper Based Assessment</b></p>	<p><b>Students with this accommodation in their IEP/504 plan</b> may take the assessment using the paper/pencil format.</p> <p><i>Please Note: Answers from students who access the assessment using the Paper/Pencil format must be entered into eDIRECT prior to shipping the Paper assessment back. Please follow the return instructions found in the manual.</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A102
<p><b>Read Aloud: ELA Reading Passages Grades 3-5</b></p>	<p>Read Aloud (ELA Reading Passages)—Text-To-Speech (Grades 3–5)</p>	A040
	<p>Read Aloud (ELA Reading Passages)—Human Reader (Grades 3–5)</p>	A041
	<p>Read Aloud (ELA Reading Passages)—Assistive Technology (Grades 3–5)</p>	A042
	<p>Read Aloud (ELA Reading Passages)—Native Language (Grades 3–5)</p>	A111

Table 4.5: MAP Accommodations for Students with Disabilities (cont.)

Accommodation		Code
<b>Read Aloud: ELA Reading Passages Grades 6-8</b>	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
<b>Read Aloud: ELA Reading Passages All Grades</b>	Read Aloud (ELA Reading Passages)—Blind Students (All Grades)	A046
<b>Sign Language</b>	<p><b>Hearing Impaired students with this accommodation in their IEP/504 plan</b> may have ELA listening items translated into American Sign Language (ASL), Signing Exact English (SEE) or any other form of sign language.</p> <p><i>Please Note: Signing of ELA Listening items will require the download of a script. See the Test Administration Manual for more details.</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A052
<b>Specialized Calculator (For Calculator Allowed Items Only)</b>	<p><b>Students with this accommodation in their IEP/504 plan</b> 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.</p> <p><i>Please Note: Use of a calculator is only for the Mathematics and Science assessments.</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A396
<b>Speech-To-Text – Assistive Technology</b>	<p><b>Students with this accommodation in their IEP/504 plan</b> may use that technology in conjunction with the INSIGHT testing platform.</p> <p><i>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.</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A352

**Table 4.6: Number and Percentage of Students Using Accommodations or Universal Tools**

Grade	Accommodations	English Language Arts		Mathematics	
		Freq.	Pct.	Freq.	Pct.
3	Braille	8	0.01%	7	0.01%
	Large Print	26	0.04%	25	0.04%
	Read-Aloud - ELA Reading Passages - Text-to-Speech - GRADES 3–5 ONLY - INVALIDATION ELA	66	0.1%		
	Read Aloud - ELA Reading Passages - Human Reader - GRADES 3-5 ONLY - INVALIDATION ELA	45	0.07%		
	Read Aloud - ELA Reading Passages - Assistive Technology - GRADES 3-5 ONLY - INVALIDATION ELA	2	0%		
	Read Aloud - ELA Reading Passages - Blind Students	6	0.01%		
	Sign Language	14	0.02%	10	0.01%
	Paper-Based Assessment	84	0.12%	87	0.13%
	Speech-to-Text - Assistive Technology	17	0.02%	16	0.02%
	Abacus			30	0.04%
	Calculator - For Non-Calculator Allowed Items Only - GRADE 3 ONLY - INVALIDATION MATH			41	0.06%
	Multiplication Table - GRADE 3 ONLY - INVALIDATION MATH			57	0.08%
	Specialized Calculator			5	0.01%
	Alternate Response Options	9	0.01%	8	0.01%
		<b>Universal Tools</b>	<b>Freq.</b>	<b>Pct.</b>	<b>Freq.</b>
3	Read Aloud - Text-to-Speech	25,855	37.97%	27,274	40.04%
	Read Aloud - Assistive Technology	34	0.05%	32	0.05%
	Read Aloud - Human Reader	3,364	4.94%	3,513	5.16%
	Color Contrast - Paper	4	0.01%	4	0.01%
	Color Overlay	10	0.01%	10	0.01%
	Magnification - Assistive Technology	34	0.05%	33	0.05%
	Masking - Paper	3	0%	3	0%
	Translation	48	0.07%	70	0.1%
	Read Aloud - Native Language	111	0.16%	150	0.22%
	Non-Accommodation Paper-Based Assessment	67	0.1%	82	0.12%
	Scribe	1,225	1.8%	1,178	1.73%
	Bilingual Dictionary	39	0.06%		
	Separate Setting	11,546	16.96%	11,572	16.99%

**Table 4.6: Number and Percentage of Students Using Accommodations or Universal Tools (cont.)**

Grade	Accommodations	English Language Arts		Mathematics	
		Freq.	Pct.	Freq.	Pct.
4	Braille	1	0%	1	0%
	Large Print	35	0.05%	35	0.05%
	Read Aloud - ELA Reading Passages - Text-to-Speech - GRADES 3-5 ONLY - INVALIDATION ELA	53	0.08%		
	Read Aloud - ELA Reading Passages - Human Reader - GRADES 3-5 ONLY - INVALIDATION ELA	49	0.07%		
	Read Aloud - ELA Reading Passages - Assistive Technology - GRADES 3-5 ONLY - INVALIDATION ELA	2	0%		
	Read Aloud - ELA Reading Passages -Blind Students	6	0.01%		
	Sign Language	15	0.02%	12	0.02%
	Paper Based Assessment	99	0.14%	105	0.15%
	Speech-to-Text - Assistive Technology	31	0.04%	26	0.04%
	Abacus			13	0.02%
	Calculator - For Non-Calculator Allowed Items Only - GRADES 4-8			1,903	2.73%
	Multiplication Table - GRADES 4-8			2,531	3.63%
	Specialized Calculator			25	0.04%
	Alternate Response Options	10	0.01%	9	0.01%
		<b>Universal Tools</b>	<b>Freq.</b>	<b>Pct.</b>	<b>Freq.</b>
4	Read Aloud - Text-to-Speech	25,209	36.15%	26,320	37.74%
	Read Aloud - Assistive Technology	6	0.01%	12	0.02%
	Read Aloud - Human Reader	3,404	4.88%	3,532	5.06%
	Color Contrast - Paper	2	0%	2	0%
	Color Overlay	7	0.01%	8	0.01%
	Magnification - Assistive Technology	24	0.03%	25	0.04%
	Masking - Paper	6	0.01%	5	0.01%
	Translation	58	0.08%	115	0.16%
	Read Aloud - Native Language	121	0.17%	163	0.23%
	Non-Accommodation Paper Based Assessment	99	0.14%	112	0.16%
	Scribe	1,592	2.28%	1,408	2.02%
	Bilingual Dictionary	183	0.26%		
	Separate Setting	11,964	17.16%	11,892	17.05%

**Table 4.6: Number and Percentage of Students Using Accommodations or Universal Tools (cont.)**

Grade	Accommodations	English Language Arts		Mathematics	
		Freq.	Pct.	Freq.	Pct.
5	Braille	5	0.01%	4	0.01%
	Large Print	29	0.04%	31	0.04%
	Read Aloud - ELA Reading Passages - Text-to-Speech - GRADES 3-5 ONLY - INVALIDATION ELA	51	0.07%		
	Read Aloud - ELA Reading Passages - Human Reader - GRADES 3-5 ONLY - INVALIDATION ELA	33	0.05%		
	Read Aloud - ELA Reading Passages - Assistive Technology - GRADES 3-5 ONLY - INVALIDATION ELA	2	0%		
	Read Aloud - ELA Reading Passages - Blind Students	6	0.01%		
	Sign Language	12	0.02%	10	0.01%
	Paper Based Assessment	65	0.09%	90	0.13%
	Read Aloud - ELA Reading Passages – Native Language-GRADES 3-5 ONLY - INVALIDATION ELA	1	0%		
	Speech-to-Text - Assistive Technology	32	0.05%	35	0.05%
	Abacus			11	0.02%
	Calculator - For Non-Calculator Allowed Items Only - GRADES 4-8			2,592	3.7%
	Multiplication Table-GRADES 4-8			3,198	4.57%
	Specialized Calculator			40	0.06%
	Alternate Response Options	5	0.01%	5	0.01%
	<b>Universal Tools</b>	<b>Freq.</b>	<b>Pct.</b>	<b>Freq.</b>	<b>Pct.</b>
5	Read Aloud - Text-to-Speech	25,262	36.11%	26,376	37.7%
	Read Aloud - Assistive Technology	8	0.01%	10	0.01%
	Read Aloud - Human Reader	2,509	3.59%	2,732	3.91%
	Color Contrast - Paper	3	0%	3	0%
	Color Overlay	2	0%	2	0%
	Magnification - Assistive Technology	26	0.04%	27	0.04%
	Masking - Paper	3	0%	4	0.01%
	Translation	50	0.07%	81	0.12%
	Read Aloud - Native Language	105	0.15%	144	0.21%
	Non-Accommodation Paper Based Assessment	73	0.1%	85	0.12%
	Scribe	1,265	1.81%	1,240	1.77%
	Bilingual Dictionary	35	0.05%		
	Separate Setting	11,331	16.2%	11,358	16.23%

**Table 4.6: Number and Percentage of Students Using Accommodations or Universal Tools (cont.)**

Grade	Accommodations	English Language Arts		Mathematics	
		Freq.	Pct.	Freq.	Pct.
6	Braille	8	0.01%	8	0.01%
	Large Print	24	0.04%	24	0.04%
	Read Aloud - ELA Reading Passages - Text-to-Speech - GRADES 6-8	3,736	5.49%		
	Read Aloud - ELA Reading Passages – Assistive Technology - GRADES 6-8	14	0.02%		
	Read Aloud - ELA Reading Passages – Human Reader - GRADES 6-8	1,238	1.82%		
	Read Aloud - ELA Reading Passages - Blind Students	5	0.01%		
	Sign Language	20	0.03%	18	0.03%
	Paper Based Assessment	75	0.11%	99	0.15%
	Read Aloud - ELA Reading Passages – Native Language - GRADES 6-8	8	0.01%		
	Speech-to-Text - Assistive Technology	56	0.08%	53	0.08%
	Abacus			7	0.01%
	Calculator - For Non-Calculator Allowed Items Only - GRADES 4-8			4,012	5.9%
	Multiplication Table - GRADES 4-8			3,031	4.46%
	Specialized Calculator			54	0.08%
	Alternate Response Options	3	0%	3	0%
		<b>Universal Tools</b>	<b>Freq.</b>	<b>Pct.</b>	<b>Freq.</b>
6	Read Aloud - Text-to-Speech	17,229	25.3%	21,186	31.14%
	Read Aloud - Assistive Technology	10	0.01%	19	0.03%
	Read Aloud - Human Reader	1,100	1.62%	1,827	2.69%
	Color Contrast - Paper	1	0%	1	0%
	Color Overlay	5	0.01%	4	0.01%
	Magnification - Assistive Technology	28	0.04%	30	0.04%
	Masking - Paper	1	0%	1	0%
	Translation	34	0.05%	75	0.11%
	Read Aloud - Native Language	90	0.13%	116	0.17%
	Non-Accommodation Paper Based Assessment	105	0.15%	103	0.15%
	Scribe	765	1.12%	735	1.08%
	Bilingual Dictionary	75	0.11%		
	Separate Setting	8,931	13.12%	8,906	13.09%

**Table 4.6: Number and Percentage of Students Using Accommodations or Universal Tools (cont.)**

Grade	Accommodations	English Language Arts		Mathematics	
		Freq.	Freq.	Pct.	Pct.
7	Braille	9	0.01%	9	0.01%
	Large Print	35	0.05%	37	0.06%
	Read Aloud - ELA Reading Passages - Text-to-Speech - GRADES 6-8	3,657	5.46%		
	Read Aloud - ELA Reading Passages – Assistive Technology - GRADES 6-8	16	0.02%		
	Read Aloud - ELA Reading Passages – Human Reader - GRADES 6-8	1,129	1.69%		
	Read Aloud - ELA Reading Passages - Blind Students	5	0.01%		
	Sign Language	19	0.03%	18	0.03%
	Paper Based Assessment	94	0.14%	118	0.18%
	Read Aloud - ELA Reading Passages – Native Language - GRADES 6-8	12	0.02%		
	Speech-to-Text - Assistive Technology	39	0.06%	39	0.06%
	Abacus			6	0.01%
	Calculator - For Non-Calculator Allowed Items Only-GRADES 4-8			4,201	6.35%
	Multiplication Table-GRADES 4-8			1,967	2.97%
	Specialized Calculator			58	0.09%
	Alternate Response Options	2	0%	1	0%
		<b>Universal Tools</b>	<b>Freq.</b>	<b>Pct.</b>	<b>Freq.</b>
7	Read Aloud - Text-to-Speech	15,114	22.56%	18,356	27.76%
	Read Aloud - Assistive Technology	7	0.01%	16	0.02%
	Read Aloud - Human Reader	706	1.05%	1,652	2.5%
	Color Overlay	2	0%	2	0%
	Magnification - Assistive Technology	16	0.02%	18	0.03%
	Masking - Paper	1	0%	1	0%
	Translation	12	0.02%	29	0.04%
	Read Aloud - Native Language	102	0.15%	139	0.21%
	Non-Accommodation Paper Based Assessment	80	0.12%	89	0.13%
	Scribe	366	0.55%	341	0.52%
	Bilingual Dictionary	92	0.14%		
	Separate Setting	7,875	11.75%	7,910	11.96%

**Table 4.6: Number and Percentage of Students Using Accommodations or Universal Tools (cont.)**

Grade	Accommodations	English Language Arts		Mathematics	
		Freq.	Pct.	Freq.	Pct.
8	Braille	3	0%	3	0.01%
	Large Print	32	0.05%	29	0.05%
	Read Aloud - ELA Reading Passages - Text-to-Speech - GRADES 6-8	3,583	5.39%		
	Read Aloud - ELA Reading Passages – Assistive Technology - GRADES 6-8	22	0.03%		
	Read Aloud - ELA Reading Passages – Human Reader - GRADES 6-8	1,007	1.52%		
	Read Aloud - ELA Reading Passages - Blind Students	6	0.01%		
	Sign Language	20	0.03%	18	0.03%
	Paper Based Assessment	82	0.12%	96	0.18%
	Read Aloud - ELA Reading Passages – Native Language - GRADES 6-8	5	0.01%		
	Speech-to-Text - Assistive Technology	19	0.03%	18	0.03%
	Calculator - For Non-Calculator Allowed Items Only - GRADES 4-8			4,229	7.74%
	Multiplication Table-GRADES 4-8			1,447	2.65%
	Specialized Calculator			60	0.11%
	Alternate Response Options	6	0.01%	6	0.01%
		<b>Universal Tools</b>	<b>Freq.</b>	<b>Pct.</b>	<b>Freq.</b>
8	Read Aloud - Text-to-Speech	14,586	21.95%	15,441	28.28%
	Read Aloud - Assistive Technology	53	0.08%	59	0.11%
	Read Aloud - Human Reader	659	0.99%	1,240	2.27%
	Color Contrast - Paper	2	0%	1	0%
	Color Overlay	7	0.01%	6	0.01%
	Magnification - Assistive Technology	27	0.04%	19	0.03%
	Translation	16	0.02%	32	0.06%
	Read Aloud - Native Language	90	0.14%	118	0.22%
	Non-Accommodation Paper Based Assessment	104	0.16%	94	0.17%
	Scribe	380	0.57%	297	0.54%
	Bilingual Dictionary	152	0.23%		
	Separate Setting	7,473	11.25%	7,263	13.3%

**Figure 4.1: Sample Script from *Test Examiner’s Manual***

### 3.1 Specific Administration Information

#### 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.*

#### 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, iPad, or Android 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.*



#### 3. The TE instructs students to select testing program.

**SAY** On your screen, you will be asked to select your testing program. Select “Missouri.”

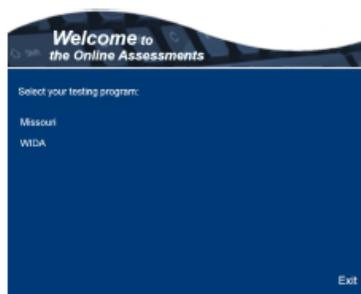
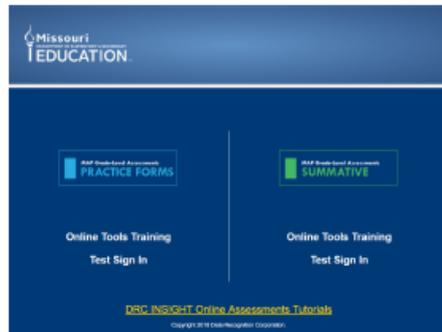


Figure 4.1: Sample Script from *Test Examiner's Manual* (cont.)

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."



**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.*

**Figure 4.1: Sample Script from *Test Examiner’s Manual* (cont.)**

**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.*

Welcome Training Student!

Thank you for participating in the Missouri Assessment Program Grade-Level Assessments.

Before you begin testing, please confirm your profile information is correct:

Test Name: GG Math  
 Test Session: Student's Session  
 School Name: DRC Use Only - OTT Sample School

Your MOBIS ID is: 1234567890

If the above information is correct, please select **Continue**.

If any of the above information is not correct, or if Color Chooser is not available when the Options button is clicked, please raise your hand and notify your Test Administrator.

Options Continue Exit

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Figure 4.1: Sample Script from *Test Examiner's Manual* (cont.)

**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.



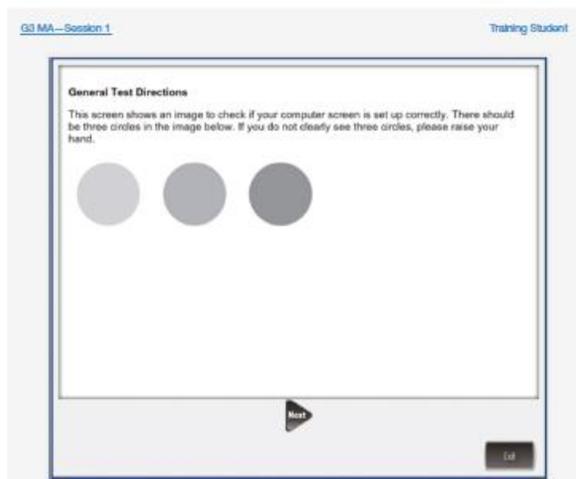
**SAY**

You are now on a screen that is used to make sure your computer 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.



**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.

Figure 4.2: Sample District Report 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 2018

INSTRUCTIONS
<p>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.</p> <p><b>IF DISTRICT SELF-MONITORING</b> the District Test Coordinator (DTC) completes this form during the spring of 2018. 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.</p> <p>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). <i>Note that if the visit is for EOC, the visit MUST be for Algebra I, Biology or English II.</i></p> <p><b>IF DESE ON-SITE VISIT</b> a DESE employee or designee completes this form at an onsite QA visit during the Spring 2018 assessment window. 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.</p> <p>Additionally, the employee/designee should participate in one classroom observation for the assigned assessment. <i>Note that if the visit is for EOC, the visit MUST be for Algebra I, Biology or English II.</i></p> <p>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 <a href="http://tiny.cc/deseqa">http://tiny.cc/deseqa</a>. Forms must be entered electronically by June 22, 2018.</p> <p><b>Important:</b> If you have questions, or need to report testing irregularities or concerns, please contact the Assessment Section at 573-751-3545 or <a href="mailto:assessment@deese.mo.gov">assessment@deese.mo.gov</a>.</p>
ABOUT THE VISIT
<p>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.</p>
DISTRICT INFORMATION
<p>NAME OF PERSON FILLING OUT THIS FORM</p>
<p>DISTRICT SELF-MONITORING OR DESE ON-SITE VISIT</p>
<p>SCHOOL DISTRICT NAME</p>
<p>COUNTY-DISTRICT CODE</p>
<p>DISTRICT TEST COORDINATOR NAME</p>

The Department of Elementary and Secondary Education does not discriminate on the basis of race, color, religion, gender, national origin, age, or disability in its programs and activities. Inquiries related to Department programs and to the location of services, activities, and facilities that are accessible by persons with disabilities may be directed to the Jefferson State Office Building, Office of the General Counsel, Coordinator – Civil Rights Compliance (Title VI/Title IX/504/ADA/Age Act), 6<sup>th</sup> Floor, 205 Jefferson Street, P.O. Box 480, Jefferson City, MO 65102-0480, telephone number 573-526-4757 or TTY 800-735-2996, email [civilrights@deese.mo.gov](mailto:civilrights@deese.mo.gov).

Figure 4.3: Sample Test Book Accountability Form via eDIRECT

## Accountability Form

**Accountability Form System is currently locked for selected Administration.**

\* Indicates required fields

Administration: \*      District:       School:

[+ Instructions](#)

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

## CHAPTER 5: SCORING OF WRITING PROMPTS AND AUTO-SCORED ITEMS

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 writing prompts and the automated scoring of 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 5 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 5:

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)

Chapter 5 explains the procedures used for scoring the MAP writing-prompt items, auto-scored technology-enhanced items, evidence-based selected response items, short-answer items, and multiple-choice and multi-select items. To preserve the integrity of the items for future use, the scoring criteria used for each item are not presented in this chapter.

### 5.1 Writing Prompt Scoring Process

Writing prompts in ELA Grades 4 and 8 were scored by human readers who were trained by DRC.

#### 5.1.1 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)

Sections 5.1.1 and 5.1.2 explain how readers are selected and trained for the MAP handscoring process. Section 5.1.3 describes how the scorers are monitored throughout the MAP handscoring process.

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

### ***Recruitment***

The MAP 2018 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, call centers, accounting, healthcare, scientific, 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 requires 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 examples of test responses and were supplied with a scoring guide. In a brief introduction, they became acquainted with the application of a rubric. After the introduction, applicants applied the scoring guide to score the sample responses. The applicant's scores were used for discussion during the interview process to determine the applicant's trainability as well as his/her ability to understand and implement the standards set forth in the sample scoring guide.

Stafforward interviewed each applicant and determined the applicant's suitability for a scoring of ELA writing prompts in Grades 4 and 8. Applicants with strong leadership skills were questioned further to determine whether they were qualified to be team leaders.

When Stafforward determined 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.

#### **5.1.2 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 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.

Missouri text-based writing prompts were administered operationally for the first time to Missouri students during the Spring 2018 test administration. A total of five writing prompts were administered in Grade 4, and six writing prompts were administered in Grade 8. Once enough student responses were available in Scoreboard, Scoring Directors assembled materials based on the rubrics and presented the materials and annotations to DESE participants in an on-site Rangefinding review.

### ***Rangefinding Activities***

Rangefinding was conducted for a single item type—a three-trait extended writing prompt. In preparation for Rangefinding activities, DRC’s scoring directors reviewed approximately 500 to 700 student responses for each writing prompt in order to obtain a representative sample of papers, in terms of the score points and ways in which students responded to the prompts, to be used during Rangefinding. Between 50 and 70 student responses to each prompt were selected for the Rangefinding review.

The Rangefinding took place at DRC’s scoring facilities in Indianapolis, Indiana, from April 30, 2018, to May 4, 2018. A total of eleven participants (two from DESE and nine 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. Before all responses for an item were reviewed, the PAS scoring directors provided three examples of each score point to familiarize the reviewers with the range of responses each prompt elicited. DRC PAS staff recorded the score point decisions made by the DESE representatives in order to include the information in final material preparation. The reasoning/scoring philosophies utilized in arriving at the final scores were also noted in order 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.

### ***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 a specific writing prompt to be scored. Readers were trained using the following steps:

- Reviewing writing prompt items
- Reviewing rubrics
- Reviewing anchor papers
- Explaining scoring strategies, followed by a question and answer session
- Scoring a training set, followed by sharing established scores
- Qualifying Round 1
- Qualifying Round 2 (if necessary)
- 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. The qualification standards were the following:

- 4-point rubric: 80% exact agreement qualification
- 2-point rubric: 90% exact agreement qualification

Qualification rounds consisted of approximately 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.

### **5.1.3 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 CR items, which specify the criteria for scoring those CR 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 administration. 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 1:10.

Approximately 10% of all responses were scored by a second reader to establish inter-rater reliability statistics for all writing prompt items. This procedure is called a “double-blind read,” because the second reader does not know the first reader’s score. Individual reader data, including 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.

#### **5.1.4 Security**

Security guards were onsite 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.

## **5.2 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 auto-scoring quality assurance process included the following:

- A scoring rubric was created for each auto-scored 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.

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

### **5.3 Multiple-Choice and Multi-select Item Scoring Process**

Responses to multiple-choice and multi-select items were captured during the online test administration. In case of Braille, Large Print, or paper-and-pencil non-accommodated form administration, student responses to these items were transcribed into the online system by a test examiner.

### **5.4 Inter-rater Reliability**

Approximately 10% of the writing-prompt responses in ELA Grades 4 and 8 were scored independently by a second reader. The statistics for the inter-rater reliability were calculated for all items at all grades. To determine the reliability of scoring, the percentage of exact agreement and adjacent agreement between the two readers was examined.

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 are presented in Table 5.1. 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 five writing prompts for Grade 4 and six writing prompts for Grade 8 were scored by human readers across all test forms. Each writing prompt was scored on three components: Conventions, Evidence/Elaboration, and Organization/Purpose. A total of fifteen components were scored for Grade 4, and a total of eighteen components were scored for Grade 8. As shown in Table 5.1, raters demonstrated at least 99% exact and adjacent agreement for the writing-prompt component scoring. The exact agreement ranged from 82.26% to 91.53% for components scored using a 1–4-point rubric and from 91.64% to 98.57% for components scored using a 0–2-point rubric. The quadratic weighted kappa values ranged from 0.64 to 0.95, indicating good or very good inter-rater agreement for all components.

## 5.5 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 technology-enhanced item scoring and handscoring process. The inter-rater reliability statistics presented in Section 5.4 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, 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.

**Table 5.1: Inter-rater Reliability, English Language Arts**

Grade	Prompt Number/Form	Component	Item #	Score Range	% Exact	% Adjacent	% Exact & Adjacent*	Quadratic Weighted Kappa
4	1/B	Organization/Purpose	4	1-4	88.27	11.73	100.00	.90
		Evidence/Elaboration		1-4	89.40	10.60	100.00	.92
		Conventions		0-2	93.40	6.60	100.00	.80
	2/A&B	Organization/Purpose	4	1-4	89.91	10.09	100.00	.93
		Evidence/Elaboration		1-4	90.26	9.74	100.00	.94
		Conventions		0-2	92.81	7.19	100.00	.81
	3/A	Organization/Purpose	4	1-4	90.23	9.71	99.94	.93
		Evidence/Elaboration		1-4	89.83	10.09	99.91	.94
		Conventions		0-2	92.04	7.96	100.00	.84
	4/B	Organization/Purpose	4	1-4	89.86	10.02	99.88	.87
		Evidence/Elaboration		1-4	88.25	11.64	99.88	.87
		Conventions		0-2	96.77	3.23	100.00	.78
5/A	Organization/Purpose	4	1-4	91.52	8.35	99.88	.88	
	Evidence/Elaboration		1-4	90.79	9.09	99.88	.88	
	Conventions		0-2	94.84	5.16	100.00	.75	
8	1/A	Organization/Purpose	4	1-4	87.32	11.73	99.05	.90
		Evidence/Elaboration		1-4	84.83	13.74	98.58	.88
		Conventions		0-2	96.21	3.79	100.00	.80
	2/A	Organization/Purpose	4	1-4	82.46	17.39	99.84	.88
		Evidence/Elaboration		1-4	82.26	17.31	99.57	.89
		Conventions		0-2	91.64	8.36	100.00	.67
	3/A	Organization/Purpose	4	1-4	91.53	8.08	99.61	.95
		Evidence/Elaboration		1-4	90.35	9.65	100.00	.94
		Conventions		0-2	98.57	1.43	100.00	.64
	4/B	Organization/Purpose	4	1-4	89.32	10.68	100.00	.94
		Evidence/Elaboration		1-4	88.35	11.65	100.00	.93
		Conventions		0-2	97.86	2.14	100.00	.76
	5/B	Organization/Purpose	4	1-4	83.48	16.26	99.75	.89
		Evidence/Elaboration		1-4	82.97	17.03	100.00	.91
		Conventions		0-2	94.16	5.84	100.00	.65
6/B	Organization/Purpose	4	1-4	91.49	8.12	99.61	.92	
	Evidence/Elaboration		1-4	90.97	8.64	99.61	.92	
	Conventions		0-2	96.20	3.80	100.00	.79	

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

## CHAPTER 6: OPERATIONAL DATA ANALYSES

This chapter of the MAP Technical Report describes the analyses that occurred on the ELA and Mathematics operational data. These analyses included a classical item analysis and examination of the raw scores and an item response theory (IRT) analysis involving calibration and vertical scale development. These analyses were conducted using the calibration sample.

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 6 demonstrates adherence in the MAP to AERA, APA, & NCME (2014) Standards 1.8, 4.14, 5.2, and 7.2. Each standard will be explicated within the appropriate section of this chapter. 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)

In Section 6.3, we will discuss the calibration sample and compare it to the general population. Chapter 3 presents the test specifications. Information regarding reported data is discussed in detail in Chapter 7.

### 6.1 Classical Item Statistics

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

#### 6.1.1 Test-Level Statistics

Tables 6.1 and 6.2 present the number of 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 and Mathematics, 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 6.1 and 6.2, the average  $p$ -values associated with the ELA forms range from 0.58 (Grade 6, Form A) to 0.65 (Grade 4, Form B) and the average  $p$ -values associated with the Mathematics forms range from 0.41 (Grade 8, Form A) to 0.55 (Grade 3, Form B). A trend of higher mean  $p$ -values for lower grade levels and lower mean  $p$ -values for higher grade levels was observed for Mathematics.

### 6.1.2 Item-Level Statistics

Tables 6.3 through 6.8 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 6.9 through 6.14 show the operational item statistics for each item by grade for Mathematics. The tables include form number, session number, item number on the test,  $p$ -value, item-total correlation ( $R_{it}$ ), omit rates, 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 and Mathematics 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 0.17 to 0.98 (see Tables 6.3 through 6.8) across all grade levels. The  $p$ -values on the Mathematics forms range from 0.04 to 0.94 (see Tables 6.9 through 6.14). 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. One ELA item (across all grades) showed the item-total test correlation below the threshold

and was reviewed by DRC content specialists to confirm that it functioned properly. No Mathematics items had item-test correlations below 0.15.

*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. Detailed item analysis report, including distractor statistics for MC items and score point distribution for non-MC items, was provided to DESE in a secure document. 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 6.3 through 6.14 show that omit rates were under 1.5% for ELA and under 2% for Mathematics items.

## **6.2 Vertical Scaling Design**

A common item-linking design was implemented to facilitate Missouri vertical scale development. In this design, samples of students were administered test forms with embedded test items from the grade above. These off-grade level items were used for linking adjacent grades but did not contribute to the test score. Using off-grade level items for linking adjacent grades is possible because of normal overlap in content and difficulty across adjacent grades. The content of the off-grade level items conformed to the Missouri Learning Standards for each grade. The linking items were selected to ensure that the tests for all grades were anchored and continuous and that they conformed to the learning standards assessed in Grades 3–8 ELA and Mathematics tests.

For ELA, either twenty or twenty-one items from the grade above were administered to student samples in Grades 3 through 7. Grade 8 students were not administered any off-grade level items. The off-grade level items were administered in three different test forms.

For Mathematics, ten items from the grade above were administered to student samples in Grades 3 through 7. Grade 8 students were not administered any off-grade level items. The off-grade level items were administered in two different forms. All test forms for ELA and Mathematics were administered in a spiraled manner.

The off-grade level items that were to be administered in each grade were selected and their content was matched to the on-grade operational test blueprint as closely as possible while at the same time being appropriate for grades below.

For ELA, vertical linking items were selected from four content categories: Reading, Research, Writing, and Listening. For Mathematics, with a couple of exceptions, the items were also selected from all content categories. The exceptions were the Geometry and Measurement category, and the Data Analysis, Statistics and Probability category in Grade 6. No items from these two categories in Grade 6 were selected for administration in Grade 5, because these items required students to use a calculator and calculators were not allowed in the Grade 5 test.

Tables 6.15 and 6.16 show content alignment of operational on-grade level tests with off-grade level linking items across ELA and Mathematics tests, respectively. The percentage of points obtainable across ELA and Mathematics strands (content categories) in the operational assessments as well as the percentage of points obtainable in the vertical linking sets are presented. It should be noted for Mathematics that, while the domain names change between Grade 5 and Grade 6, there is continuity of the construct being measured by the Mathematics assessment across all grades. The diagram on the next page shows the progression of the mathematics concepts in the Missouri Learning Standards and the continuity of the domains in mathematics.

### Missouri Learning Standards - Mathematics Standard Progression

Grades					
3	4	5	6	7	8
Number Sense and Operations in Base Ten & Number Sense and Operations in Fractions			Ratios and Proportional Relationships		
			Number Sense and Operations		
Relationships and Algebraic Thinking			Expressions, Equations and Inequalities		
				Functions	
Geometry and Measurement					
Data and Statistics			Data Analysis, Statistics and Probability		

### 6.2.1 Evaluation of Student Performance on Linking Items

Classical item analysis was performed on the data used for vertical scale development. Tables 6.17 to 6.21 present the item analysis results for on-grade level operational items and the same items administered off-grade level for ELA, and Tables 6.22 to 6.26 show similar item analysis results for Mathematics. The following information is provided in Tables 6.17 to 6.26: item type, item classification by test strand (or content category), item difficulty ( $p$ -value) on- and off-grade level, item-total test correlation on- and off-grade level, omit rates on- and off-grade level, and the number of students who took each item on- and off-grade level. The table headers are labeled as follows: PvalG $x$  is the item  $p$ -value, RitG $x$  is the item-total test correlation, OmitG $x$  is the proportion of students who omitted the item, and NobsG $x$  is the total number of students who took the item ( $x$  is the grade level in which the item was administered).

As demonstrated by average  $p$ -values of the ELA linking sets in Tables 6.17 to 6.21, the students who were administered the linking items as part of their operational test (that is, the items were administered on-grade level) performed better on these items than students from the adjacent lower grade who were administered the same items in addition to the operational test. For example, students in Grade 4 performed better on the Grade 4 vertical linking items than did students in Grade 3 on the same items. When looking at the average mean item-total test correlations, the items displayed, on average, slightly higher discrimination when administered on-grade level compared to the administration of the same items in an adjacent lower grade. The exception was the average item-total test correlation of Grade 8 items in the vertical linking set administered to Grade 7 students, which was the same in both grades.

A similar pattern was observed for Mathematics vertical linking sets (Tables 6.22 to 6.26). Students who were administered the linking items as part of their operational test (that is, the items were administered on-grade level) performed better on these items compared to students from the adjacent lower grade who were administered the same items. Evaluation of the average item-total test correlations of the linking sets revealed that the items were more discriminating when administered on-grade level compared to being administered off-grade level.

The proportions of students who omitted linking items were very small and comparable in the on- and off-grade level administrations for both ELA and Mathematics.

### 6.3 Item Response Theory

Item parameters for items contained in ELA and Mathematics 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 trait or scale score  $\theta$  will respond correctly to multiple-choice item  $j$  is

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

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 trait or scale score  $\theta$  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  $g_{j0} = \mathbf{0}$  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 ELA and Mathematics item parameters was consistent with the past methodology (except for administration year 2014–15) implemented for these content areas. Item parameters estimated after the 2017–18 ELA and Mathematics test administration were used to score Missouri students who took these tests.

### 6.3.1 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)

ELA and Mathematics test data were analyzed using calibration samples. The Mathematics samples were acquired in the last week of the testing window and contained between 96% and 97% of the total student data, depending on the grade level. ELA

samples were acquired after the testing window ended and contained close to 100% of the student data for each grade.

### 6.3.2 Data Calibration and Scaling

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).

Calibrating and scaling ELA and Mathematics 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 items.

In the process of item calibration, the number of estimation cycles was set to 300 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 and Mathematics tests. When the PARDUX program encounters difficulty estimating the  $c$ -parameter, it assigns a default  $c$ -parameter value of 0.20.

New scales were established for ELA and Mathematics after the 2017–18 test administration. The test forms in adjacent grade levels of each content area shared common items and were calibrated concurrently at that grade level.

Concurrent calibration is a method that allows for establishing the common scale in a single step—the calibration phase—by simultaneously estimating parameters for all items at all grades. The estimated parameters in the theta metric are on the same scale. In addition, population ability estimates are obtained for multiple groups. The population mean and standard deviation for the base grade are then used to compute the  $M1$  and  $M2$  transformation parameters to convert the parameter estimates of the other grades onto the common scale score metric. Tables 6.27 and 6.28 present the sample mean and standard deviation ability estimates for multiple groups, as obtained from the concurrent calibration for ELA and Mathematics, respectively.

After placing item parameters on common scales for ELA and Mathematics, the Grade 5 theta means were re-estimated using only item parameters for on-grade level items. These estimates were then used to identify transformation constants that would allow the transformation of item parameter estimates in a theta metric into a scale score metric and produce a scale with a target mean of 400 and a target standard deviation of 40 for Grade 5 of both ELA and Mathematics assessments.

The following formulae were used to compute transformation constants for the transformation of the base grade item parameter estimates from the theta metric to the scale score metric:

$$M1 = \frac{SD_{ss,5}}{SD_{\theta,5}}, \text{ and}$$

$$M2 = \bar{X}_5 - (\bar{\theta}_5 * M1)$$

where

$M1$  and  $M2$  are the transformation constants,

$SD_{ss,5}$  is the target standard deviation in the scale score metric for the base grade,

$SD_{\theta,5}$  is the estimated standard deviation in the theta metric for the base grade,

$\bar{\theta}_5$  is the estimated population mean in the theta metric for the base grade, and

$\bar{X}_5$  is the target mean in the scale score metric for the base grade.

Table 6.29 presents the population mean and standard deviation estimates and the transformation constants used for scale transformation of the base grade (5) for ELA and Mathematics.

Because the parameter estimates in the theta metric were estimated for all grades (within each content area) and were already on the same scale, the same  $M1$  and  $M2$  transformation constants were applied to all (Grades 3 through 8) student ability estimates.

### 6.3.3 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. 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  $(N/1500 \times 4)$  for a given test, where  $N$  is the sample size.

No ELA items were flagged for poor fit in the calibration. One Mathematics item was flagged for poor fit. Table 6.30 shows the chi-square statistic and the  $Z$ -statistic for the flagged Mathematics item. 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 Mathematics item occurred only at the lower end 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.

### 6.3.4 Vertical Scale Evaluation

In this section, the results of the vertical scaling of ELA and Mathematics are described and evaluated. The scale evaluation includes examination of the pattern of grade-to-grade growth (means), grade-to-grade variability (standard deviations), separation of scale score distributions across grades, the test characteristic curves (TCCs), and standard error

(SE) curves. Only on-grade level operational test items were used in the computation of statistics used in scale evaluation.

### ***ELA Scale***

Table 6.31 shows the scale score means, standard deviations, and change in mean from previous grade for ELA. As seen in Table 6.31, the ELA scale score means increase as grade level increases. The standard deviations range from 36.36 for Grade 6 to 43.19 for Grade 3 and show a pattern of larger standard deviations for the lowest and the highest grades compared to the “middle grades.” The mean difference between grades is not uniform across grade levels. Most growth across grades is observed between 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 6.32 summarizes this information for ELA. The data in Table 6.32 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 75th and 90th percentiles, compared to other grades.

Figures 6.1 and 6.2 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 6.1 and 6.2 show two forms: A and B per grade level. As shown in Figure 6.1, the ELA test TCCs are generally ordinal across grades, indicating that the test difficulty increases as the grade level increases. Grade 3 TCCs and Grade 4 Form B TCC are crossing at the lower end of the ability scale, indicating comparable difficulty for the Grade 3 tests and the Grade 4 Form B for the lowest-ability students. However, it should be noted that even if the adjacent grade assessments are of comparable difficulty for some students, the higher-grade students are of higher ability as demonstrated by the increasing scale score means across grades in Table 6.31 and the increasing scale scores associated with selected percentiles (refer to Table 6.32).

The standard error curves presented in Figure 6.2 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.

Six operational test forms, each containing a different combination of Form A or B core items and one of five writing prompts, were administered to Grade 4 students. The Grade 4 TCCs for these forms, presented in Figure 6.3, demonstrate good alignment of the form difficulty. The standard error curves for the Grade 4 test forms, presented in Figure 6.4, are also aligned for the most part of the scale, except for two forms with higher standard errors at the upper end of the ability scale.

Six forms, each containing a different combination of Form A or B core items and one of six writing prompts, were administered to Grade 8 students. The Grade 8 TCCs for the four test forms, presented in Figure 6.5, show good alignment of the form difficulty. The standard error curves for the Grade 8 test forms, presented in Figure 6.6, are also aligned.

### ***Mathematics Scale***

A growth pattern similar to the one described in ELA is observed for Mathematics from Grade 3 to Grade 8. As presented in Table 6.33, the scale score means increase as the grade increases and most growth is observed between Grades 3 and 4, followed by growth between Grades 4 and 5, and between Grades 7 and 8. Less growth is observed between Grades 5 and 6 and between Grades 6 and 7. The standard deviations ranged from 39.14 for Grade 6 to 50.17 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 6.34, there is an upward progression of scale scores from Grade 3 through 8 and across all percentiles. The data in Table 6.34 show that the scale scores increase as the percentile and grade level increase between all grades. 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 and 25th percentiles.

Figures 6.7 and 6.8 show the TCCs and SE curves for the Mathematics tests. As observed in Figure 6.7, the TCCs for Mathematics are ordinal, indicating increasing difficulty of the assessment as the grade level increases. In addition, the TCCs for Form A and Form B are aligned at each grade level, indicating statistical comparability of the two forms.

The standard error curves presented in Figure 6.8 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.

### ***Summary of Vertical Linking Analysis and Results***

The concurrent calibration design was implemented to develop vertical scales for Missouri ELA and Mathematics assessments. Concurrent calibration is an efficient way

of scaling multiple-group data and results in a smaller linking error compared to on-grade level separate calibrations and chain linking. Linking sets, including items from above-grade level, provided the students with an opportunity to demonstrate their ability on the Missouri Learning Standards beyond their current grade level. Using linking items from above-grade level in the vertical scale development resulted in ELA and Mathematics scales with desirable psychometric properties.

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

#### **6.4 Lowest and Highest Obtainable Scale 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 to increase as the grade level increases while minimizing the standard error around them. Table 6.35 shows the LOSS and HOSS values used for each grade of the ELA and Mathematics MAP tests.

#### **6.5 Item-Pattern Scoring**

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 of the items that are in the test (such as item difficulty). A scale score can be interpreted as a highly probable estimate of a student's ability in a given content area (Yen & Candell, 1991).

Using item-pattern scoring, a student's scale score is based on the student's responses to each item (his or her item-response vector). 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.

#### **6.6 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 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.

**Table 6.1: Means and Standard Deviations for Raw Scores and  $p$ -Values, English Language Arts**

Grade	Form	Total Items	Total Points	Mean Raw Score	Raw Score SD	Mean $p$ -Value	$p$ -Value SD	Mean $R_{it}$	$R_{it}$ SD
3	A01	50	56	32.29	11.00	0.58	0.15	0.39	0.09
3	B01	49	56	34.47	11.11	0.61	0.15	0.40	0.09
4	A01	45	56	33.24	10.36	0.62	0.17	0.41	0.10
4	A04	45	56	36.68	9.09	0.63	0.17	0.41	0.09
4	A07	45	56	36.24	9.37	0.63	0.17	0.41	0.09
4	B01	45	56	35.07	9.59	0.64	0.17	0.39	0.08
4	B02	45	56	36.69	9.25	0.64	0.17	0.39	0.08
4	B04	45	56	37.02	8.73	0.65	0.17	0.39	0.08
5	A01	49	56	34.68	11.43	0.62	0.15	0.41	0.10
5	B01	49	56	35.67	10.41	0.63	0.15	0.39	0.09
6	A01	46	52	30.45	9.93	0.58	0.13	0.38	0.10
6	B01	46	52	31.28	9.57	0.60	0.14	0.37	0.09
7	A01	47	52	29.94	10.69	0.58	0.12	0.40	0.08
7	B01	47	52	31.78	10.00	0.60	0.14	0.38	0.09
8	A01	43	56	32.28	10.90	0.58	0.16	0.42	0.12
8	A03	43	56	35.73	10.12	0.59	0.17	0.41	0.11
8	A05	43	56	35.37	10.07	0.59	0.16	0.42	0.10
8	B01	43	56	34.11	10.87	0.60	0.17	0.42	0.13
8	B02	43	56	35.15	10.12	0.60	0.17	0.41	0.12
8	B04	43	56	34.75	10.01	0.60	0.17	0.41	0.12

Note that Form A01, in addition to being spiraled with other forms, was administered to students using Text-to-Speech testing accommodations or universal tools. Students using accommodations or universal tools tend to perform less well on the test compared to students not using accommodations resulting in systematically lower mean raw scores and mean  $p$ -values for these forms.

Form numbers in Grades 4 and 8 reflect unique combinations of “core” item sets (A or B) and writing prompts.

**Table 6.2: Means and Standard Deviations for Raw Scores and  $p$ -Values, Mathematics**

Grade	Form	Total Items	Total Points	Mean Raw Score	Raw Score SD	Mean $p$ -value	$p$ -value SD	Mean $R_{it}$	$R_{it}$ SD
3	A01	47	48	25.50	10.74	0.55	0.17	0.45	0.09
3	B01	47	48	26.87	10.20	0.55	0.18	0.44	0.09
4	A01	47	48	24.10	10.79	0.51	0.17	0.44	0.09
4	B01	47	48	26.13	10.67	0.53	0.17	0.44	0.08
5	A01	48	48	22.64	10.73	0.48	0.15	0.43	0.11
5	B01	48	48	23.85	10.44	0.48	0.14	0.42	0.10
6	A01	52	54	24.25	11.90	0.45	0.17	0.44	0.11
6	B01	52	54	25.77	12.08	0.46	0.17	0.45	0.11
7	A01	52	54	24.57	11.76	0.46	0.16	0.43	0.12
7	B01	52	54	26.01	11.72	0.46	0.16	0.43	0.12
8	A01	51	54	21.23	10.46	0.41	0.16	0.39	0.09
8	B01	51	54	22.19	10.32	0.41	0.15	0.38	0.10

Note that Form A01, in addition to being spiraled with other forms, was administered to students using Text-to-Speech universal tools. Students using accommodations or universal tools tend to perform less well on the test compared to students not using accommodations resulting in systematically lower mean raw scores and mean  $p$ -values for these forms.

**Table 6.3: Item Statistics English Language Arts Grade 3**

English Language Arts						
Form	Session	Item	<i>p</i> -value	$R_{it}$	Omit Rate	Adj. N
A	1	1	0.67	0.39	0.38	43,702
A	1	2	0.60	0.40	0.61	43,601
A	1	3	0.46	0.28	0.89	43,478
A	1	4	0.72	0.62	0.52	43,639
A	1	5	0.52	0.25	0.11	43,819
A	1	6	0.52	0.50	0.04	43,851
A	1	7	0.65	0.52	0.08	43,832
A	1	8	0.50	0.33	0.22	43,769
A	1	9	0.44	0.33	0.16	43,798
A	1	10	0.46	0.42	0.50	43,648
A	1	11	0.53	0.26	0.48	43,658
A	1	12	0.48	0.40	0.65	43,584
A	1	13	0.38	0.30	0.04	43,848
A,B	1	14	0.51	0.41	0.09	67,722
A,B	1	15	0.30	0.38	0.64	67,346
A,B	1	16	0.70	0.51	0.13	67,696
A,B	1	17	0.31	0.46	0.08	67,726
A,B	1	18	0.37	0.21	0.33	67,562
A,B	1	19	0.29	0.41	0.21	67,643
A,B	1	20	0.84	0.25	1.34	66,873
A,B	1	21	0.53	0.40	0.49	67,451
A,B	1	22	0.52	0.34	0.18	67,663
A,B	2	27	0.66	0.34	0.03	67,751
A,B	2	28	0.66	0.37	0.07	67,724
A	2	29	0.62	0.47	0.07	43,833
A	2	30	0.44	0.34	0.08	43,829
A,B	2	31	0.82	0.45	0.08	67,717
A	2	32	0.39	0.23	0.07	43,833
A	2	33	0.69	0.46	0.04	43,845
A,B	2	36	0.63	0.30	0.09	67,709
A,B	2	37	0.42	0.40	0.10	67,705
A,B	2	38	0.68	0.47	0.09	67,706
A,B	2	39	0.49	0.28	0.10	67,701
A,B	2	40	0.69	0.43	0.08	67,719
A,B	2	41	0.53	0.32	0.05	67,737
A,B	2	42	0.49	0.35	0.41	67,490
A,B	2	43	0.78	0.54	0.15	67,669
A	2	44	0.51	0.26	0.14	43,802
A,B	2	45	0.85	0.38	0.07	67,723
A,B	2	46	0.63	0.36	0.07	67,723

**Table 6.3: Item Statistics English Language Arts Grade 3 (cont.)**

English Language Arts						
Form	Session	Item	<i>p</i> -Value	R <sub>it</sub>	Omit Rate	Adj. N
A,B	2	47	0.87	0.41	0.07	67,725
A	2	48	0.68	0.55	0.08	43,829
A	3	49	0.88	0.37	0.06	43,830
A	3	50	0.58	0.33	0.11	43,809
A	3	51	0.67	0.46	0.05	43,837
A	3	52	0.57	0.47	0.05	43,836
A,B	3	53	0.71	0.50	0.10	67,694
A,B	3	54	0.71	0.43	0.11	67,686
A,B	3	55	0.60	0.47	0.07	67,715
A,B	3	56	0.60	0.50	0.03	67,742
B	1	1	0.63	0.25	0.31	23,843
B	1	2	0.75	0.42	0.42	23,815
B	1	3	0.67	0.60	0.33	23,836
B	1	4	0.68	0.43	0.29	23,846
B	1	5	0.49	0.43	0.03	23,908
B	1	6	0.61	0.31	0.14	23,882
B	1	7	0.62	0.43	0.21	23,865
B	1	8	0.67	0.52	0.15	23,879
B	1	9	0.56	0.35	0.22	23,863
B	1	10	0.54	0.40	0.46	23,807
B	1	11	0.69	0.50	0.56	23,782
B	1	12	0.53	0.35	0.56	23,783
B	1	13	0.54	0.54	0.11	23,889
B	2	29	0.62	0.43	0.03	23,899
B	2	30	0.62	0.46	0.07	23,891
B	2	32	0.38	0.25	0.30	23,835
B	2	43	0.43	0.29	0.10	23,884
B	2	47	0.49	0.30	0.09	23,886
B	3	48	0.88	0.41	0.04	23,894
B	3	49	0.70	0.35	0.13	23,873
B	3	50	0.84	0.44	0.11	23,877
B	3	51	0.78	0.48	0.08	23,884

**Table 6.4: Item Statistics English Language Arts Grade 4**

English Language Arts						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A,B	1	4A	0.47	0.54	0.40	8,073
A,B	1	4B	0.48	0.54	0.40	8,073
A,B	1	4C	0.88	0.44	0.40	8,073
A	1	4A	0.44	0.63	0.69	33,537
A	1	4B	0.46	0.63	0.69	33,537
A	1	4C	0.83	0.49	0.69	33,537
A	1	4A	0.54	0.52	0.23	8,117
A	1	4B	0.54	0.52	0.23	8,117
A	1	4C	0.94	0.40	0.23	8,117
A,B	2	5	0.82	0.46	0.20	69,318
A,B	2	6	0.58	0.57	0.22	69,305
A,B	2	7	0.83	0.46	0.28	69,263
A,B	2	8	0.32	0.47	0.32	69,235
A,B	2	9	0.54	0.39	0.07	69,407
A	2	10	0.85	0.45	0.17	44,237
A	2	11	0.52	0.42	0.14	44,250
A	2	12	0.66	0.56	0.16	44,240
A	2	13	0.52	0.37	0.14	44,247
A	2	14	0.49	0.37	0.14	44,251
A	2	15	0.81	0.50	0.47	44,104
A	2	16	0.46	0.29	0.49	44,094
A	2	17	0.66	0.32	0.42	44,124
A	2	18	0.42	0.24	0.09	44,271
A	2	19	0.57	0.42	0.07	44,282
A	2	20	0.52	0.41	0.03	44,298
A	2	21	0.74	0.53	0.14	44,248
A	2	22	0.61	0.48	0.06	44,284
A,B	2	23	0.76	0.41	0.21	69,314
A,B	2	24	0.77	0.49	0.38	69,190
A,B	2	25	0.53	0.42	0.50	69,111
A,B	2	26	0.28	0.44	0.04	69,428
A,B	2	27	0.78	0.50	0.13	69,368
A,B	3	32	0.93	0.30	0.03	69,423
A,B	3	33	0.32	0.34	0.04	69,417
A,B	3	34	0.45	0.24	0.07	69,393
A,B	3	35	0.77	0.44	0.10	69,375
A,B	3	36	0.68	0.38	0.05	69,407
A,B	3	37	0.53	0.31	0.10	69,372
A	3	38	0.59	0.46	0.09	44,257
A,B	3	41	0.41	0.27	0.06	69,402

**Table 6.4: Item Statistics English Language Arts Grade 4 (cont.)**

English Language Arts						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A	3	42	0.66	0.38	0.05	44,279
A	3	43	0.71	0.37	0.06	44,271
A,B	3	44	0.87	0.38	0.04	69,419
A,B	4	45	0.57	0.27	0.05	69,388
A,B	4	46	0.44	0.47	0.07	69,380
A,B	4	47	0.62	0.51	0.02	69,411
A,B	4	48	0.65	0.36	0.13	69,336
A	4	49	0.82	0.43	0.13	44,233
A	4	50	0.89	0.38	0.09	44,251
A	4	51	0.86	0.43	0.11	44,244
A	4	52	0.54	0.18	0.09	44,251
B	1	4A	0.48	0.56	0.22	11,626
B	1	4B	0.48	0.55	0.22	11,626
B	1	4C	0.92	0.39	0.22	11,626
B	1	4A	0.51	0.51	0.27	8,107
B	1	4B	0.51	0.51	0.27	8,107
B	1	4C	0.95	0.34	0.27	8,107
B	2	10	0.88	0.42	0.18	25,100
B	2	11	0.91	0.36	0.12	25,115
B	2	12	0.44	0.29	0.13	25,114
B	2	13	0.80	0.27	0.26	25,080
B	2	14	0.60	0.49	0.41	25,042
B	2	15	0.84	0.43	0.46	25,031
B	2	16	0.73	0.29	0.20	25,096
B	2	17	0.58	0.41	0.17	25,104
B	2	18	0.58	0.22	0.12	25,117
B	2	19	0.69	0.43	0.12	25,117
B	2	20	0.88	0.29	0.11	25,119
B	2	21	0.71	0.41	0.09	25,123
B	2	22	0.67	0.38	0.12	25,116
B	3	38	0.61	0.34	0.08	25,124
B	3	42	0.55	0.35	0.27	25,077
B	3	43	0.65	0.37	0.08	25,126
B	4	49	0.56	0.40	0.12	25,106
B	4	50	0.71	0.36	0.11	25,108
B	4	51	0.41	0.33	0.08	25,116
B	4	52	0.82	0.38	0.10	25,111

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 prompt are computed at the item level and are the same for the three traits.

**Table 6.5: Item Statistics English Language Arts Grade 5**

English Language Arts						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A	1	1	0.46	0.31	0.12	44,732
A	1	2	0.73	0.50	1.07	44,305
A	1	3	0.55	0.29	0.46	44,578
A	1	4	0.64	0.56	0.01	44,780
A	1	5	0.72	0.55	0.07	44,753
A	1	6	0.74	0.48	0.06	44,758
A	1	7	0.72	0.40	0.19	44,697
A	1	8	0.72	0.38	0.10	44,741
A	1	9	0.61	0.47	0.13	44,724
A	1	10	0.56	0.31	0.36	44,621
A	1	11	0.57	0.54	0.09	44,745
A	1	12	0.83	0.34	0.17	44,709
A	1	13	0.78	0.49	0.09	44,743
A,B	1	14	0.73	0.28	0.13	69,625
A,B	1	15	0.44	0.45	0.10	69,643
A,B	1	16	0.49	0.43	0.24	69,552
A,B	1	17	0.52	0.48	0.15	69,610
A,B	1	18	0.62	0.51	0.26	69,534
A,B	1	19	0.33	0.27	0.50	69,366
A,B	1	20	0.55	0.62	0.53	69,345
A,B	1	21	0.59	0.55	0.37	69,460
A,B	1	22	0.55	0.32	0.13	69,622
A,B	2	27	0.64	0.38	0.02	69,678
A	2	28	0.80	0.51	0.04	44,762
A,B	2	29	0.87	0.36	0.03	69,674
A,B	2	30	0.78	0.44	0.09	69,632
A,B	2	31	0.70	0.50	0.08	69,642
A,B	2	32	0.72	0.46	0.08	69,641
A,B	2	35	0.32	0.23	0.05	69,658
A,B	2	36	0.72	0.40	0.10	69,622
A	2	37	0.85	0.45	0.07	44,747
A	2	38	0.53	0.36	0.12	44,727
A,B	2	39	0.49	0.22	0.10	69,625
A,B	2	40	0.74	0.44	0.06	69,652
A	2	41	0.57	0.51	0.02	44,770
A,B	2	42	0.81	0.44	0.08	69,636
A,B	2	43	0.26	0.22	0.17	69,574
A,B	2	44	0.48	0.44	0.07	69,644
A,B	2	45	0.39	0.35	0.06	69,650
A,B	2	46	0.53	0.49	0.05	69,657

**Table 6.5: Item Statistics English Language Arts Grade 5 (cont.)**

English Language Arts						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A,B	2	47	0.61	0.32	0.06	69,651
A,B	3	48	0.75	0.34	0.04	69,654
A,B	3	49	0.57	0.51	0.01	69,673
A,B	3	50	0.42	0.41	0.05	69,645
A,B	3	51	0.81	0.49	0.09	69,621
A	3	52	0.40	0.32	0.08	44,733
A	3	53	0.61	0.27	0.06	44,745
A	3	54	0.71	0.42	0.05	44,747
A	3	55	0.70	0.48	0.08	44,733
B	1	1	0.66	0.33	0.14	24,894
B	1	2	0.36	0.30	0.12	24,900
B	1	3	0.55	0.45	0.04	24,919
B	1	4	0.74	0.43	0.12	24,901
B	1	5	0.63	0.41	0.17	24,887
B	1	6	0.64	0.20	0.10	24,904
B	1	7	0.84	0.35	0.18	24,885
B	1	8	0.75	0.39	0.24	24,869
B	1	9	0.66	0.47	0.51	24,802
B	1	10	0.74	0.41	0.37	24,838
B	1	11	0.63	0.39	0.18	24,884
B	1	12	0.64	0.39	0.08	24,911
B	2	31	0.67	0.42	0.09	24,892
B	2	36	0.73	0.30	0.16	24,876
B	2	37	0.66	0.30	0.11	24,887
B	2	38	0.68	0.38	0.10	24,891
B	2	41	0.68	0.29	0.31	24,839
B	3	52	0.53	0.26	0.10	24,889
B	3	53	0.85	0.41	0.10	24,888
B	3	54	0.77	0.36	0.10	24,889
B	3	55	0.89	0.44	0.09	24,891

**Table 6.6: Item Statistics English Language Arts Grade 6**

English Language Arts						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A,B	1	1	0.72	0.52	0.21	67,767
A,B	1	2	0.65	0.34	0.11	67,839
A,B	1	3	0.82	0.37	0.12	67,831
A,B	1	4	0.72	0.34	0.15	67,806
A,B	1	5	0.58	0.34	0.11	67,838
A,B	1	6	0.52	0.47	0.03	67,892
A	1	7	0.57	0.32	0.24	41,787
A	1	8	0.31	0.36	0.15	41,825
A	1	9	0.65	0.33	0.18	41,812
A	1	10	0.82	0.50	0.14	41,829
A	1	11	0.66	0.39	0.07	41,858
A	1	12	0.44	0.31	0.15	41,826
A	1	13	0.61	0.34	0.14	41,830
A	2	17	0.52	0.26	0.06	41,858
A	2	18	0.61	0.27	0.17	41,812
A	2	19	0.58	0.45	0.15	41,820
A	2	20	0.63	0.46	0.26	41,775
A	2	21	0.54	0.49	0.03	41,873
A	2	22	0.46	0.47	0.17	41,811
A	2	23	0.64	0.46	0.17	41,813
A,B	2	24	0.59	0.38	0.19	67,765
A,B	2	25	0.45	0.49	0.03	67,872
A,B	2	26	0.64	0.50	0.09	67,830
A,B	2	27	0.50	0.22	0.16	67,786
A,B	3	31	0.68	0.28	0.05	67,846
A,B	3	32	0.69	0.19	0.13	67,793
A	3	33	0.63	0.42	0.10	41,830
A,B	3	34	0.55	0.38	0.13	67,789
A	3	35	0.78	0.49	0.09	41,834
A	3	36	0.62	0.37	0.06	41,846
A	3	37	0.61	0.51	0.12	41,823
A	3	40	0.55	0.29	0.10	41,831
A	3	41	0.75	0.56	0.05	41,849
A	3	42	0.68	0.47	0.05	41,849
A,B	3	43	0.41	0.26	0.09	67,820
A,B	3	44	0.51	0.39	0.08	67,824
A,B	3	45	0.34	0.26	0.13	67,790
A,B	3	46	0.51	0.25	0.10	67,808
A	4	47	0.44	0.33	0.05	41,841
A	4	48	0.33	0.26	0.11	41,816

**Table 6.6: Item Statistics English Language Arts Grade 6 (cont.)**

English Language Arts						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A	4	49	0.69	0.39	0.09	41,822
A	4	50	0.45	0.19	0.09	41,821
A,B	4	51	0.65	0.51	0.13	67,779
A,B	4	52	0.30	0.46	0.18	67,741
A,B	4	53	0.63	0.32	0.03	67,842
A,B	4	54	0.76	0.50	0.14	67,773
B	1	7	0.50	0.27	0.20	25,973
B	1	8	0.54	0.34	0.12	25,992
B	1	9	0.73	0.44	0.11	25,995
B	1	10	0.57	0.30	0.09	26,001
B	1	11	0.73	0.49	0.07	26,006
B	1	12	0.63	0.41	0.15	25,984
B	1	13	0.59	0.41	0.17	25,980
B	2	17	0.51	0.29	0.07	25,991
B	2	18	0.85	0.46	0.13	25,977
B	2	19	0.45	0.18	0.16	25,969
B	2	20	0.52	0.29	0.20	25,958
B	2	21	0.45	0.42	0.04	25,999
B	2	22	0.66	0.42	0.16	25,969
B	2	23	0.69	0.34	0.18	25,964
B	3	33	0.80	0.44	0.05	25,995
B	3	35	0.28	0.27	0.07	25,990
B	3	36	0.71	0.40	0.07	25,989
B	3	39	0.61	0.45	0.10	25,981
B	3	40	0.52	0.31	0.14	25,970
B	3	41	0.50	0.36	0.08	25,986
B	3	42	0.88	0.38	0.05	25,993
B	4	47	0.56	0.34	0.06	25,989
B	4	48	0.77	0.43	0.17	25,962
B	4	49	0.69	0.44	0.16	25,963
B	4	50	0.52	0.40	0.13	25,971

**Table 6.7: Item Statistics English Language Arts Grade 7**

English Language Arts						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A	1	1	0.62	0.37	0.19	38,458
A	1	2	0.71	0.39	0.36	38,394
A	1	3	0.47	0.33	0.36	38,396
A	1	4	0.60	0.46	0.05	38,513
A	1	5	0.68	0.46	0.11	38,489
A	1	6	0.67	0.36	0.11	38,492
A	1	7	0.53	0.40	0.32	38,411
A	1	8	0.74	0.51	0.15	38,477
A,B	1	9	0.80	0.43	0.22	66,643
A,B	1	10	0.63	0.30	0.16	66,679
A,B	1	11	0.57	0.53	0.07	66,743
A,B	1	12	0.70	0.46	1.00	66,118
A,B	1	13	0.58	0.32	0.52	66,438
A,B	1	14	0.69	0.45	0.44	66,495
A,B	1	15	0.31	0.37	0.44	66,496
A,B	1	16	0.44	0.30	0.29	66,591
A,B	1	17	0.48	0.47	0.08	66,733
A,B	1	18	0.58	0.43	0.20	66,652
A	1	19	0.59	0.43	0.17	38,468
A	1	20	0.68	0.38	0.22	38,449
A	1	21	0.74	0.50	0.20	38,457
A	1	22	0.54	0.31	0.40	38,380
A	1	23	0.70	0.58	0.65	38,283
A	1	24	0.36	0.45	0.16	38,473
A	1	25	0.58	0.42	0.39	38,382
A	2	30	0.86	0.39	0.04	38,506
A,B	2	31	0.44	0.58	0.09	66,702
A	2	32	0.70	0.37	0.08	38,494
A,B	2	33	0.69	0.43	0.12	66,685
A	2	34	0.52	0.38	0.34	38,393
A,B	2	35	0.51	0.32	0.09	66,702
A	2	36	0.49	0.42	0.07	38,496
A	2	39	0.74	0.34	0.10	38,486
A,B	2	40	0.48	0.26	0.09	66,704
A	2	41	0.52	0.35	0.07	38,497
A,B	2	42	0.56	0.33	0.14	66,670
A,B	2	43	0.66	0.32	0.14	66,669
A,B	2	44	0.39	0.35	0.11	66,691
A	2	45	0.53	0.54	0.10	38,484
A	3	46	0.57	0.32	0.06	38,496

**Table 6.7: Item Statistics English Language Arts Grade 7 (cont.)**

English Language Arts						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A	3	47	0.52	0.43	0.12	38,473
A	3	48	0.54	0.41	0.13	38,468
A	3	49	0.42	0.41	0.09	38,486
A,B	3	50	0.67	0.33	0.12	66,673
A,B	3	51	0.52	0.50	0.03	66,733
A,B	3	52	0.42	0.46	0.10	66,691
A,B	3	53	0.72	0.33	0.15	66,654
B	1	1	0.63	0.35	0.09	28,230
B	1	2	0.65	0.25	0.26	28,182
B	1	3	0.59	0.17	0.52	28,107
B	1	4	0.68	0.45	0.51	28,110
B	1	5	0.55	0.28	0.13	28,217
B	1	6	0.63	0.35	0.22	28,194
B	1	17	0.52	0.28	0.20	28,199
B	1	18	0.50	0.25	0.25	28,185
B	1	19	0.77	0.46	0.13	28,217
B	1	20	0.74	0.36	0.13	28,218
B	1	21	0.63	0.46	0.11	28,225
B	1	22	0.69	0.53	0.30	28,170
B	1	23	0.76	0.51	0.31	28,166
B	1	24	0.74	0.42	0.18	28,204
B	2	29	0.31	0.24	0.01	28,236
B	2	31	0.54	0.36	0.06	28,222
B	2	33	0.52	0.46	0.01	28,237
B	2	35	0.65	0.43	0.12	28,204
B	2	38	0.68	0.42	0.05	28,224
B	2	39	0.63	0.38	0.06	28,223
B	2	41	0.31	0.33	0.09	28,214
B	2	45	0.30	0.35	0.08	28,216
B	3	46	0.92	0.31	0.05	28,222
B	3	47	0.73	0.45	0.15	28,194
B	3	48	0.70	0.28	0.11	28,204
B	3	49	0.84	0.40	0.09	28,211

**Table 6.8: Item Statistics English Language Arts Grade 8**

English Language Arts						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A	1	4A	0.61	0.59	0.63	7,767
A	1	4B	0.61	0.59	0.63	7,767
A	1	4C	0.94	0.41	0.63	7,767
A	1	4A	0.57	0.71	1.13	25,841
A	1	4B	0.58	0.70	1.13	25,841
A	1	4C	0.91	0.46	1.13	25,841
A	1	4A	0.66	0.61	0.67	7,796
A	1	4B	0.72	0.62	0.67	7,796
A	1	4C	0.98	0.26	0.67	7,796
A,B	2	5	0.86	0.37	0.13	66,114
A,B	2	6	0.45	0.28	0.06	66,158
A,B	2	7	0.45	0.39	0.19	66,074
A,B	2	8	0.58	0.36	0.14	66,105
A	2	9	0.74	0.50	0.24	41,300
A	2	10	0.68	0.48	0.19	41,323
A	2	11	0.61	0.35	0.21	41,314
A	2	12	0.69	0.46	0.21	41,315
A	2	13	0.65	0.23	0.14	41,342
A	2	14	0.70	0.48	0.37	41,248
A	2	15	0.76	0.45	0.36	41,252
A	2	16	0.70	0.39	0.43	41,221
A	2	17	0.69	0.51	0.22	41,307
A	2	18	0.59	0.43	0.16	41,332
A	2	19	0.74	0.48	0.07	41,372
A	2	20	0.63	0.53	0.19	41,322
A	2	21	0.67	0.45	0.13	41,348
A,B	2	22	0.59	0.53	0.18	66,081
A,B	2	23	0.37	0.21	0.39	65,943
A,B	2	24	0.55	0.40	0.90	65,603
A,B	2	25	0.22	0.43	0.40	65,936
A,B	2	26	0.47	0.55	0.31	65,996
A,B	2	27	0.56	0.63	0.22	66,056
A	3	32	0.17	0.35	0.05	41,360
A,B	3	33	0.47	0.31	0.24	66,008
A,B	3	34	0.34	0.32	0.06	66,133
A,B	3	35	0.65	0.44	0.05	66,134
A	3	36	0.88	0.42	0.08	41,347
A	3	37	0.48	0.37	0.06	41,358
A,B	3	38	0.53	0.56	0.02	66,155
A	3	41	0.59	0.52	0.08	41,349

**Table 6.8: Item Statistics English Language Arts Grade 8 (cont.)**

English Language Arts						
Form	Session	Item	<i>p</i> -Value	R <sub>it</sub>	Omit Rate	Adj. N
A,B	3	42	0.37	0.44	0.05	66,138
A,B	4	43	0.59	0.26	0.05	66,122
A,B	4	44	0.87	0.41	0.15	66,057
A,B	4	45	0.63	0.25	0.10	66,093
A,B	4	46	0.55	0.43	0.10	66,094
A	4	47	0.46	0.26	0.11	41,329
A	4	48	0.61	0.36	0.13	41,320
A	4	49	0.57	0.32	0.07	41,344
A	4	50	0.39	0.35	0.06	41,348
B	1	4A	0.63	0.68	0.98	9,401
B	1	4B	0.69	0.68	0.98	9,401
B	1	4C	0.96	0.36	0.98	9,401
B	1	4A	0.60	0.61	0.39	7,697
B	1	4B	0.62	0.61	0.39	7,697
B	1	4C	0.94	0.39	0.39	7,697
B	1	4A	0.58	0.59	0.38	7,710
B	1	4B	0.58	0.59	0.38	7,710
B	1	4C	0.94	0.42	0.38	7,710
B	2	9	0.60	0.35	0.23	24,743
B	2	10	0.85	0.48	0.21	24,747
B	2	11	0.59	0.26	0.21	24,748
B	2	12	0.82	0.58	0.15	24,762
B	2	13	0.83	0.46	0.22	24,745
B	2	14	0.44	0.21	0.22	24,744
B	2	15	0.66	0.47	0.08	24,779
B	2	16	0.60	0.45	0.46	24,685
B	2	17	0.85	0.53	0.32	24,719
B	2	18	0.78	0.50	0.17	24,756
B	2	19	0.74	0.51	0.17	24,757
B	2	20	0.69	0.45	0.20	24,750
B	2	21	0.67	0.48	0.17	24,757
B	2	22	0.76	0.54	0.15	24,761
B	3	33	0.69	0.51	0.01	24,785
B	3	37	0.27	0.46	0.22	24,733
B	3	41	0.42	0.29	0.08	24,767
B	4	47	0.54	0.27	0.13	24,753
B	4	48	0.54	0.14	0.19	24,738
B	4	49	0.47	0.30	0.13	24,752
B	4	50	0.57	0.42	0.07	24,766

Note: Writing prompt statistics are presented separately for the three traits: A–Organization/Purpose, B–Evidence/Elaboration, and C–Conventions. See note about omit rates under Table 6.4

**Table 6.9: Item Statistics Mathematics Grade 3**

Mathematics						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A,B	1	1	0.65	0.46	0.27	67,798
A,B	1	2	0.77	0.45	0.04	67,954
A	1	3	0.30	0.49	0.42	46,967
A,B	1	4	0.75	0.44	0.09	67,923
A,B	1	6	0.54	0.44	0.10	67,918
A,B	1	7	0.79	0.44	0.22	67,832
A,B	1	8	0.47	0.42	0.18	67,859
A	1	9	0.81	0.45	0.30	47,024
A,B	1	11	0.41	0.42	0.11	67,908
A	1	12	0.21	0.51	0.15	47,097
A,B	1	13	0.71	0.42	0.14	67,891
A,B	1	14	0.68	0.24	0.09	67,923
A,B	1	16	0.43	0.38	0.16	67,877
A,B	1	17	0.50	0.28	0.45	67,680
A,B	1	18	0.49	0.39	0.15	67,880
A	1	19	0.30	0.57	0.13	47,106
A,B	1	20	0.40	0.46	0.11	67,908
A,B	1	21	0.45	0.60	0.12	67,902
A,B	1	22	0.74	0.50	0.10	67,915
A,B	1	23	0.48	0.53	0.09	67,921
A,B	1	24	0.46	0.42	0.12	67,900
A,B	2	25	0.54	0.63	0.02	67,954
A,B	2	26	0.90	0.34	0.10	67,901
A,B	2	27	0.65	0.46	0.09	67,906
A	2	28	0.62	0.38	0.08	47,114
A,B	2	29	0.17	0.44	0.09	67,903
A	2	30	0.52	0.52	0.11	47,102
A,B	2	31	0.83	0.43	0.08	67,916
A,B	2	32	0.57	0.35	0.47	67,649
A,B	2	33	0.42	0.22	0.09	67,903
A,B	2	34	0.69	0.47	0.11	67,890
A,B	2	35	0.47	0.45	0.12	67,887
A,B	2	36	0.71	0.50	0.11	67,893

**Table 6.9: Item Statistics Mathematics Grade 3 (cont.)**

Mathematics						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A,B	2	37	0.20	0.28	0.13	67,879
A,B	2	38	0.69	0.50	0.09	67,905
A,B	2	40	0.81	0.36	0.41	67,686
A	2	41	0.44	0.60	0.10	47,104
A	2	42	0.60	0.51	0.11	47,101
A	2	43	0.50	0.48	0.11	47,099
A,B	2	45	0.51	0.53	0.09	67,908
A,B	2	46	0.44	0.40	0.10	67,898
A,B	2	47	0.47	0.40	0.07	67,917
A,B	3	48	0.57	0.55	0.04	67,938
A,B	3	49	0.51	0.58	0.04	67,932
A,B	3	50	0.62	0.48	0.09	67,903
A,B	3	51	0.59	0.41	0.33	67,737
A,B	3	52	0.29	0.52	0.09	67,898
B	1	3	0.68	0.52	0.07	20,803
B	1	9	0.76	0.44	0.33	20,750
B	1	12	0.27	0.26	0.13	20,790
B	1	19	0.19	0.48	0.11	20,796
B	2	28	0.55	0.31	0.07	20,800
B	2	30	0.73	0.33	0.12	20,789
B	2	41	0.59	0.60	0.06	20,802
B	2	42	0.33	0.47	0.12	20,791
B	2	43	0.29	0.49	0.10	20,795

**Table 6.10: Item Statistics Mathematics Grade 4**

Mathematics						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A,B	1	1	0.37	0.49	0.17	69,581
A,B	1	2	0.45	0.31	0.06	69,654
A,B	1	3	0.59	0.35	0.07	69,646
A,B	1	4	0.69	0.54	0.11	69,622
A,B	1	6	0.75	0.45	0.12	69,612
A,B	1	7	0.63	0.52	0.07	69,649
A,B	1	8	0.77	0.40	0.09	69,635
A,B	1	9	0.37	0.31	0.30	69,492
A,B	1	11	0.62	0.40	0.11	69,619
A,B	1	12	0.92	0.29	0.08	69,641
A,B	1	13	0.41	0.31	0.11	69,623
A,B	1	14	0.43	0.38	0.18	69,573
A,B	1	16	0.38	0.51	0.10	69,631
A,B	1	17	0.52	0.60	0.32	69,475
A,B	1	18	0.34	0.48	0.14	69,600
A,B	1	19	0.43	0.47	0.13	69,605
A,B	1	20	0.59	0.48	0.16	69,588
A,B	1	21	0.61	0.33	0.13	69,604
A,B	1	22	0.72	0.41	0.14	69,603
A,B	1	23	0.71	0.42	0.08	69,640
A,B	1	24	0.46	0.49	0.11	69,624
A	2	25	0.38	0.57	0.12	47,547
A,B	2	26	0.64	0.42	0.06	69,637
A,B	2	27	0.48	0.52	0.10	69,609
A	2	28	0.42	0.61	0.15	47,535
A,B	2	29	0.67	0.40	0.13	69,585
A	2	30	0.66	0.39	0.17	47,524
A	2	31	0.19	0.52	0.11	47,554
A,B	2	32	0.41	0.31	0.46	69,360
A,B	2	33	0.53	0.58	0.12	69,597
A,B	2	34	0.29	0.47	0.08	69,620
A,B	2	35	0.77	0.42	0.12	69,596
A	2	36	0.71	0.53	0.17	47,526
A	2	37	0.54	0.44	0.14	47,539
A	2	38	0.29	0.22	0.12	47,546
A	2	40	0.33	0.26	0.61	47,316

**Table 6.10: Item Statistics Mathematics Grade 4 (cont.)**

Mathematics						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A	2	41	0.40	0.38	0.18	47,518
A,B	2	42	0.49	0.47	0.20	69,538
A,B	2	43	0.21	0.48	0.23	69,517
A,B	2	45	0.61	0.45	0.12	69,593
A,B	2	46	0.18	0.49	0.09	69,613
A,B	2	47	0.70	0.38	0.07	69,633
A,B	3	48	0.64	0.48	0.08	69,611
A,B	3	49	0.73	0.41	0.05	69,633
A,B	3	50	0.34	0.56	0.08	69,612
A,B	3	51	0.32	0.55	0.07	69,615
A,B	3	52	0.51	0.46	0.03	69,644
B	2	25	0.67	0.40	0.10	22,053
B	2	28	0.53	0.39	0.08	22,057
B	2	30	0.36	0.43	0.12	22,048
B	2	31	0.34	0.42	0.08	22,056
B	2	36	0.44	0.54	0.14	22,043
B	2	37	0.78	0.44	0.10	22,051
B	2	38	0.74	0.45	0.08	22,056
B	2	40	0.49	0.53	0.38	21,991
B	2	41	0.40	0.29	0.11	22,049

**Table 6.11: Item Statistics Mathematics Grade 5**

Mathematics						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A	1	1	0.37	0.51	0.35	47,959
A	1	2	0.36	0.60	0.04	48,106
A,B	1	3	0.58	0.30	0.07	69,844
A,B	1	4	0.39	0.40	0.09	69,832
A,B	1	6	0.49	0.61	0.10	69,825
A,B	1	7	0.65	0.41	0.06	69,848
A,B	1	8	0.17	0.40	0.22	69,738
A	1	9	0.71	0.48	0.22	48,019
A,B	1	11	0.40	0.34	0.09	69,832
A,B	1	12	0.71	0.44	0.11	69,816
A,B	1	13	0.33	0.62	0.10	69,819
A,B	1	14	0.75	0.45	0.09	69,830
A,B	1	16	0.31	0.32	0.10	69,825
A	1	17	0.32	0.21	0.31	47,977
A,B	1	18	0.32	0.21	0.15	69,788
A,B	1	19	0.48	0.59	0.10	69,825
A,B	1	20	0.54	0.43	0.10	69,820
A,B	1	21	0.48	0.56	0.09	69,831
A,B	1	22	0.50	0.30	0.10	69,823
A,B	1	23	0.45	0.27	0.08	69,833
A	1	24	0.45	0.55	0.11	48,071
A,B	2	25	0.57	0.36	0.04	69,846
A,B	2	26	0.39	0.50	0.09	69,813
A	2	27	0.59	0.45	0.04	48,099
A	2	28	0.63	0.32	0.11	48,068
A,B	2	29	0.21	0.51	0.28	69,679
A,B	2	30	0.43	0.51	0.14	69,774
A	2	31	0.39	0.40	0.05	48,097
A,B	2	32	0.55	0.27	0.34	69,635
A,B	2	33	0.56	0.48	0.09	69,810
A	2	34	0.33	0.37	0.12	48,060
A,B	2	35	0.23	0.49	0.53	69,503
A,B	2	36	0.73	0.36	0.10	69,807
A,B	2	37	0.50	0.50	0.09	69,815
A,B	2	38	0.71	0.49	0.13	69,787
A,B	2	40	0.52	0.31	0.30	69,666

**Table 6.11: Item Statistics Mathematics Grade 5 (cont.)**

Mathematics						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A,B	2	41	0.72	0.47	0.10	69,807
A,B	2	42	0.65	0.44	0.10	69,805
A,B	2	43	0.32	0.43	0.09	69,815
A,B	2	45	0.39	0.30	0.10	69,805
A,B	2	46	0.52	0.37	0.08	69,816
A,B	2	47	0.44	0.23	0.08	69,821
A,B	3	48	0.64	0.48	0.03	69,840
A,B	3	49	0.61	0.58	0.07	69,811
A,B	3	50	0.46	0.51	0.06	69,818
A,B	3	51	0.33	0.42	0.04	69,830
A,B	3	52	0.47	0.54	0.04	69,835
A,B	3	53	0.42	0.61	0.05	69,824
B	1	1	0.52	0.40	0.14	21,735
B	1	2	0.51	0.45	0.12	21,739
B	1	9	0.67	0.35	0.25	21,711
B	1	17	0.32	0.37	0.32	21,696
B	1	24	0.29	0.32	0.11	21,743
B	2	27	0.55	0.52	0.08	21,738
B	2	28	0.39	0.32	0.18	21,717
B	2	31	0.56	0.48	0.13	21,728
B	2	34	0.35	0.32	0.15	21,723

**Table 6.12: Item Statistics Mathematics Grade 6**

Mathematics						
Form	Session	Item	<i>p</i> -Value	R <sub>it</sub>	Omit Rate	Adj. N
A,B	1	1	0.53	0.44	0.05	67,907
A,B	1	2	0.30	0.17	0.07	67,895
A,B	1	3	0.29	0.58	0.34	67,710
A	1	4	0.29	0.27	0.16	45,117
A	1	6	0.53	0.49	0.23	45,087
A,B	1	7	0.56	0.46	0.08	67,892
A,B	1	8	0.50	0.32	0.54	67,580
A,B	1	9	0.37	0.44	0.16	67,836
A,B	1	11	0.32	0.59	0.20	67,807
A,B	1	12	0.51	0.62	0.12	67,863
A,B	1	13	0.24	0.30	0.14	67,850
A	1	14	0.53	0.26	0.14	45,125
A,B	1	16	0.15	0.47	1.22	67,118
A,B	1	17	0.38	0.53	0.15	67,839
A,B	1	18	0.37	0.25	0.18	67,823
A,B	1	19	0.45	0.56	0.35	67,708
A,B	1	20	0.19	0.50	0.15	67,839
A,B	1	21	0.59	0.34	0.11	67,866
A,B	1	22	0.63	0.47	0.12	67,863
A,B	2	23	0.70	0.40	0.15	67,812
A,B	2	24	0.42	0.32	0.29	67,715
A,B	2	25	0.33	0.50	0.28	67,726
A,B	2	26	0.75	0.32	0.13	67,825
A	2	27	0.69	0.53	0.12	45,119
A,B	2	28	0.58	0.42	0.16	67,807
A,B	2	29	0.60	0.31	0.16	67,804
A	2	30	0.78	0.32	0.55	44,923
A,B	2	31	0.37	0.47	0.19	67,782
A,B	2	32	0.60	0.54	0.27	67,733
A,B	2	33	0.37	0.36	0.31	67,705
A,B	2	34	0.36	0.63	0.30	67,709
A,B	2	35	0.19	0.34	0.27	67,728
A,B	2	36	0.71	0.50	0.14	67,820
A,B	2	38	0.22	0.37	0.30	67,708
A,B	2	39	0.37	0.40	0.15	67,815
A	2	40	0.69	0.38	0.19	45,084

**Table 6.12: Item Statistics Mathematics Grade 6 (cont.)**

Mathematics						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A,B	2	41	0.64	0.57	0.13	67,828
A,B	2	43	0.49	0.47	0.27	67,729
A	2	44	0.22	0.60	0.26	45,053
A,B	2	45	0.33	0.54	0.35	67,677
A,B	2	46	0.25	0.56	0.34	67,681
A,B	2	47	0.63	0.40	0.23	67,761
A,B	2	48	0.43	0.49	0.15	67,809
A,B	2	49	0.15	0.47	0.14	67,820
A,B	2	50	0.52	0.37	0.21	67,773
A,B	2	51	0.49	0.35	0.15	67,810
A,B	3	52	0.41	0.28	0.06	67,859
A,B	3	53	0.60	0.52	0.14	67,802
A,B	3	54	0.41	0.51	0.19	67,774
A,B	3	55	0.60	0.56	0.19	67,772
A,B	3	56	0.60	0.60	0.12	67,820
A,B	3	57	0.38	0.29	0.07	67,850
B	1	4	0.33	0.33	0.11	22,731
B	1	6	0.67	0.45	0.22	22,705
B	1	14	0.52	0.58	0.11	22,730
B	2	27	0.53	0.59	0.31	22,671
B	2	30	0.94	0.28	0.25	22,686
B	2	40	0.64	0.47	0.26	22,683
B	2	44	0.25	0.60	0.43	22,645

**Table 6.13: Item Statistics Mathematics Grade 7**

Mathematics						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A,B	1	1	0.45	0.40	0.04	65,989
A,B	1	2	0.17	0.28	0.09	65,955
A,B	1	3	0.39	0.51	0.11	65,941
A,B	1	4	0.53	0.60	0.13	65,930
A,B	1	5	0.44	0.40	0.09	65,958
A,B	1	6	0.19	0.33	0.26	65,847
A,B	1	7	0.48	0.34	0.12	65,940
A,B	1	8	0.37	0.63	0.21	65,880
A,B	1	9	0.37	0.40	0.07	65,972
A,B	1	11	0.53	0.34	0.11	65,941
A,B	1	12	0.42	0.36	0.13	65,930
A,B	1	13	0.24	0.46	0.18	65,894
A,B	1	14	0.79	0.41	0.09	65,955
A,B	2	15	0.46	0.43	0.10	65,927
A,B	2	16	0.50	0.61	0.25	65,827
A,B	2	17	0.35	0.43	0.30	65,790
A,B	2	18	0.62	0.50	0.31	65,784
A,B	2	19	0.22	0.45	0.37	65,748
A,B	2	20	0.43	0.21	0.46	65,686
A,B	2	21	0.62	0.30	0.06	65,948
A,B	2	22	0.32	0.27	0.20	65,860
A,B	2	23	0.50	0.45	0.20	65,855
A,B	2	24	0.80	0.45	0.17	65,881
A,B	2	25	0.31	0.25	0.12	65,908
A,B	2	26	0.64	0.21	0.37	65,746
A,B	2	27	0.68	0.31	0.14	65,897
A,B	2	28	0.50	0.22	0.35	65,758
A,B	2	30	0.57	0.57	0.33	65,769
A	2	31	0.59	0.37	0.28	41,298
A,B	2	32	0.56	0.56	0.23	65,836
A,B	2	33	0.25	0.57	0.53	65,642
A,B	2	35	0.67	0.47	0.17	65,877
A	2	36	0.50	0.47	0.22	41,322

**Table 6.13: Item Statistics Mathematics Grade 7 (cont.)**

Mathematics						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A,B	2	37	0.45	0.50	0.17	65,875
A	2	38	0.38	0.62	0.29	41,296
A,B	2	40	0.32	0.46	0.12	65,910
A,B	2	41	0.53	0.23	0.31	65,788
A,B	2	42	0.68	0.29	0.31	65,786
A	2	43	0.40	0.38	0.37	41,260
A,B	2	45	0.12	0.42	0.23	65,835
A,B	2	46	0.31	0.64	0.85	65,430
A,B	2	47	0.33	0.40	0.19	65,862
A,B	2	48	0.21	0.57	0.46	65,688
A,B	2	49	0.50	0.53	0.20	65,859
A	2	50	0.41	0.35	0.26	41,306
A	2	51	0.47	0.45	0.16	41,347
A,B	3	52	0.38	0.55	0.02	65,969
A,B	3	53	0.43	0.55	0.12	65,898
A,B	3	54	0.34	0.56	0.30	65,780
A,B	3	55	0.70	0.57	0.22	65,831
A,B	3	56	0.71	0.51	0.23	65,824
A,B	3	57	0.58	0.34	0.12	65,902
B	2	31	0.44	0.56	0.24	24,517
B	2	36	0.63	0.28	0.15	24,538
B	2	38	0.26	0.52	0.36	24,486
B	2	43	0.51	0.40	0.25	24,513
B	2	50	0.55	0.44	0.15	24,538
B	2	51	0.51	0.47	0.16	24,536

**Table 6.14: Item Statistics Mathematics Grade 8**

Mathematics						
Form	Session	Item	<i>p</i> -Value	$R_{it}$	Omit Rate	Adj. N
A,B	1	1	0.53	0.36	0.04	54,457
A	1	2	0.04	0.40	0.34	35,466
A,B	1	3	0.44	0.40	0.06	54,445
A,B	1	4	0.46	0.41	0.08	54,435
A,B	1	5	0.07	0.39	0.28	54,325
A,B	1	6	0.32	0.41	0.14	54,405
A,B	1	7	0.42	0.41	0.06	54,445
A,B	1	8	0.34	0.60	0.41	54,254
A,B	1	9	0.45	0.35	0.14	54,404
A	1	11	0.46	0.36	0.11	35,549
A,B	2	12	0.35	0.44	0.13	54,374
A	2	13	0.60	0.24	0.29	35,461
A,B	2	14	0.55	0.41	0.24	54,311
A,B	2	15	0.52	0.46	1.68	53,526
A,B	2	16	0.45	0.37	0.37	54,243
A,B	2	17	0.55	0.37	0.33	54,261
A,B	2	18	0.51	0.34	0.38	54,234
A,B	2	19	0.26	0.35	0.15	54,360
A,B	2	20	0.45	0.30	0.14	54,369
A,B	2	21	0.32	0.26	0.18	54,346
A	2	22	0.48	0.49	0.17	35,501
A,B	2	23	0.23	0.23	0.19	54,342
A,B	2	24	0.47	0.49	0.16	54,354
A	2	25	0.35	0.39	0.15	35,508
A,B	2	27	0.36	0.29	0.38	54,235
A	2	28	0.68	0.44	0.37	35,432
A	2	29	0.21	0.27	0.43	35,411
A,B	2	30	0.23	0.53	0.99	53,902
A	2	32	0.27	0.27	0.37	35,430
A,B	2	33	0.60	0.27	0.17	54,348
A,B	2	34	0.36	0.38	0.22	54,325
A,B	2	35	0.37	0.25	0.23	54,316
A,B	2	37	0.51	0.44	0.21	54,329

**Table 6.14: Item Statistics Mathematics Grade 8 (cont.)**

Mathematics						
Form	Session	Item	<i>p</i> -Value	<i>R</i> <sub>it</sub>	Omit Rate	Adj. N
A,B	2	38	0.70	0.41	0.20	54,336
A,B	2	39	0.48	0.40	0.20	54,336
A,B	2	40	0.52	0.45	0.31	54,276
A,B	2	42	0.13	0.35	0.95	53,928
A,B	2	43	0.38	0.31	0.33	54,263
A	2	44	0.21	0.21	0.39	35,426
A,B	2	45	0.73	0.42	0.35	54,253
A,B	2	46	0.37	0.29	0.36	54,246
A,B	2	47	0.31	0.45	0.53	54,157
A	2	48	0.56	0.34	0.24	35,476
A,B	2	49	0.58	0.41	0.20	54,332
A,B	2	50	0.65	0.38	0.16	54,358
A,B	2	51	0.22	0.32	0.19	54,337
A,B	3	52	0.53	0.41	0.10	54,378
A,B	3	53	0.12	0.48	0.10	54,377
A,B	3	54	0.27	0.56	0.48	54,173
A,B	3	55	0.34	0.61	0.17	54,339
A,B	3	56	0.42	0.52	0.10	54,382
B	1	2	0.10	0.40	0.30	18,836
B	1	11	0.50	0.37	0.07	18,879
B	2	13	0.51	0.20	0.31	18,821
B	2	22	0.31	0.36	0.19	18,844
B	2	25	0.46	0.38	0.19	18,845
B	2	28	0.46	0.15	0.29	18,826
B	2	29	0.20	0.23	0.28	18,828
B	2	32	0.47	0.25	0.31	18,821
B	2	44	0.26	0.25	0.34	18,815
B	2	48	0.63	0.50	0.23	18,836

**Table 6.15: ELA Test Blueprint and Vertical Linking Set Content Coverage**

Grade	Item Set	Content Categories (Strands)				Total
		Reading	Research	Writing	Listening	
3	OP	46%	14%	25%	14%	100%
4	OP	46%	14%	25%	14%	100%
4	VS set in G3	40%	15%	15%	30%	100%
5	OP	46%	14%	25%	14%	100%
5	VS set in G4	39%	22%	13%	26%	100%
6	OP	54%	15%	15%	15%	100%
6	VS set in G5	38%	19%	14%	29%	100%
7	OP	54%	15%	15%	15%	100%
7	VS set in G6	41%	18%	14%	27%	100%
8	OP	50%	14%	21%	14%	100%
8	VS set in G7	43%	17%	13%	26%	100%

**Table 6.16: Mathematics Test Blueprint and Vertical Linking Set Content Coverage**

Grade	Item Set	Content Categories										Total
		NBT	NF	RA	DS	GM	NS	EEI	DSP	RP	FN	
3	OP	21%	21%	31%	7%	19%						100%
4	OP	24%	26%	19%	7%	24%						100%
4	VS set in G3	20%	30%	20%	10%	20%						100%
5	OP	19%	31%	19%	7%	24%						100%
5	VS set in G4	20%	30%	20%	10%	20%						100%
6	OP					15%	24%	33%	11%	17%		100%
6	VS set in G5						30%	40%		30%		100%
7	OP					13%	20%	28%	15%	24%		100%
7	VS set in G6					10%	30%	30%	10%	20%		100%
8	OP					26%	7%	39%	9%		20%	100%
8	VS set in G7					20%	10%	40%	10%		20%	100%

Note: Content categories are as follows: NBT = Numbers and Operations in Base Ten; NF = Numbers and Operations–Fractions; RA = Relationship and Algebraic Thinking; DS = Data and Statistics; GM = Geometry and Measurement; NS = The Number System; EEI = Expressions, Equations and Inequalities; DSP = Data Analysis, Statistics and Probability; RP = Ratios and Proportional Relationships; and FN = Functions.

**Table 6.17: ELA Grade 3 vs. Grade 4 Vertical Linking Item Statistics**

Item Grade	Item Type	Content Category	Item Statistics in Administration Grade							
			PvalG3	PvalG4	RitG3	RitG4	OmitG3	OmitG4	NobsG3	NobsG4
4	EBSR	Listening	0.48	0.62	0.47	0.51	0.00	0.00	2,550	69,411
4	MC	Listening	0.46	0.57	0.28	0.27	0.00	0.00	2,549	69,388
4	MC	Listening	0.60	0.71	0.32	0.36	0.00	0.00	2,569	25,108
4	MC	Listening	0.59	0.65	0.37	0.35	0.00	0.00	2,548	69,336
4	MC	Listening	0.30	0.41	0.25	0.33	0.00	0.00	2,567	25,116
4	MC	Listening	0.47	0.56	0.34	0.40	0.00	0.00	2,569	25,106
4	MC	Reading	0.69	0.76	0.41	0.41	0.00	0.00	2,569	69,314
4	MC	Reading	0.65	0.77	0.53	0.48	0.00	0.00	2,565	69,190
4	MC	Reading	0.72	0.78	0.49	0.49	0.00	0.00	2,566	69,368
4	MC	Reading	0.43	0.53	0.30	0.41	0.00	0.00	2,567	69,111
4	MC	Reading	0.73	0.83	0.54	0.46	0.00	0.00	2,548	69,263
4	TE	Reading	0.40	0.58	0.59	0.56	0.00	0.00	2,549	69,305
4	TE	Reading	0.21	0.32	0.37	0.46	0.01	0.00	2,538	69,235
4	MC	Reading	0.41	0.54	0.35	0.38	0.00	0.00	2,548	69,407
4	MC	Research	0.44	0.45	0.23	0.24	0.00	0.00	2,549	69,393
4	MC	Research	0.90	0.93	0.38	0.30	0.00	0.00	2,575	69,423
4	MS	Research	0.27	0.32	0.36	0.33	0.00	0.00	2,572	69,417
4	MC	Writing	0.66	0.71	0.43	0.37	0.00	0.00	2,550	44,271
4	MC	Writing	0.31	0.41	0.16	0.26	0.00	0.00	2,577	69,402
4	TE	Writing	0.85	0.87	0.39	0.37	0.00	0.00	2,571	69,419
		AVERAGE	0.53	0.62	0.38	0.39				

**Table 6.18: ELA Grade 4 vs. Grade 5 Vertical Linking Item Statistics**

<b>Item Grade</b>	<b>Item Type</b>	<b>Content Category</b>	<b>PvalG4</b>	<b>PvalG5</b>	<b>RitG4</b>	<b>RitG5</b>	<b>OmitG4</b>	<b>OmitG5</b>	<b>NobsG4</b>	<b>NobsG5</b>
5	MC	Listening	0.71	0.70	0.46	0.48	0.00	0.00	2,724	44,733
5	MC	Listening	0.79	0.85	0.46	0.42	0.00	0.00	2,707	24,888
5	MC	Listening	0.50	0.53	0.28	0.26	0.00	0.00	2,708	24,889
5	MC	Listening	0.87	0.89	0.48	0.45	0.00	0.00	2,708	24,891
5	MC	Listening	0.60	0.71	0.30	0.42	0.00	0.00	2,720	44,747
5	MC	Listening	0.34	0.40	0.31	0.32	0.00	0.00	2,724	44,733
5	MS	Reading	0.69	0.72	0.43	0.37	0.00	0.00	2,724	44,741
5	TE	Reading	0.81	0.83	0.31	0.34	0.00	0.00	2,723	44,709
5	MC	Reading	0.57	0.56	0.31	0.31	0.00	0.00	2,725	44,621
5	MC	Reading	0.68	0.72	0.41	0.40	0.00	0.00	2,722	44,697
5	TE	Reading	0.38	0.49	0.38	0.43	0.00	0.00	2,708	69,552
5	MC	Reading	0.72	0.73	0.28	0.28	0.00	0.00	2,709	69,625
5	MC	Reading	0.44	0.52	0.42	0.48	0.00	0.00	2,709	69,610
5	MC	Reading	0.54	0.62	0.49	0.51	0.00	0.00	2,707	69,534
5	MS	Research	0.78	0.80	0.51	0.50	0.00	0.00	2,724	44,762
5	MS	Research	0.61	0.70	0.44	0.49	0.00	0.00	2,708	69,642
5	MC	Research	0.85	0.87	0.37	0.37	0.00	0.00	2,651	69,674
5	MC	Writing	0.73	0.74	0.44	0.44	0.00	0.00	2,707	69,652
5	MC	Writing	0.68	0.66	0.33	0.30	0.00	0.00	2,653	24,887
5	TE	Writing	0.81	0.81	0.40	0.44	0.00	0.00	2,724	69,636
		<b>AVERAGE</b>	<b>0.66</b>	<b>0.70</b>	<b>0.39</b>	<b>0.40</b>				

**Table 6.19: ELA Grade 5 vs. Grade 6 Vertical Linking Item Statistics**

<b>Item Grade</b>	<b>Item Type</b>	<b>Content Category</b>	<b>PvalG5</b>	<b>PvalG6</b>	<b>RitG5</b>	<b>RitG6</b>	<b>OmitG5</b>	<b>OmitG6</b>	<b>NobsG5</b>	<b>NobsG6</b>
6	EBSR	Listening	0.65	0.63	0.33	0.32	0.00	0.00	2,793	67,842
6	MC	Listening	0.64	0.65	0.48	0.51	0.00	0.00	2,793	67,779
6	MC	Listening	0.74	0.76	0.47	0.50	0.00	0.00	2,791	67,773
6	MC	Listening	0.75	0.77	0.48	0.43	0.00	0.00	2,761	25,962
6	MC	Listening	0.41	0.52	0.34	0.40	0.00	0.00	2,762	25,971
6	MC	Listening	0.66	0.69	0.42	0.44	0.00	0.00	2,761	25,963
6	MC	Reading	0.56	0.72	0.35	0.34	0.00	0.00	2,795	67,806
6	TE	Reading	0.54	0.65	0.35	0.34	0.00	0.00	2,794	67,839
6	MC	Reading	0.73	0.82	0.45	0.37	0.00	0.00	2,795	67,831
6	EBSR	Reading	0.43	0.52	0.44	0.47	0.00	0.00	2,795	67,892
6	EBSR	Reading	0.43	0.45	0.48	0.49	0.00	0.00	2,761	67,872
6	MC	Reading	0.52	0.64	0.44	0.50	0.00	0.00	2,758	67,830
6	MC	Reading	0.54	0.59	0.39	0.38	0.00	0.00	2,759	67,765
6	MC	Reading	0.44	0.50	0.16	0.22	0.00	0.00	2,759	67,786
6	MC	Research	0.74	0.80	0.48	0.44	0.00	0.00	2,762	25,995
6	MS	Research	0.63	0.62	0.37	0.37	0.00	0.00	2,795	41,846
6	MC	Research	0.64	0.61	0.45	0.51	0.00	0.00	2,781	41,823
6	TE	Writing	0.63	0.61	0.44	0.45	0.00	0.00	2,756	25,981
6	MC	Writing	0.46	0.50	0.29	0.36	0.00	0.00	2,793	25,986
6	TE	Writing	0.33	0.34	0.17	0.26	0.00	0.00	2,774	67,790
		<b>AVERAGE</b>	<b>0.58</b>	<b>0.62</b>	<b>0.39</b>	<b>0.40</b>				

**Table 6.20: ELA Grade 6 vs. Grade 7 Vertical Linking Item Statistics**

<b>Item Grade</b>	<b>Item Type</b>	<b>Content Category</b>	<b>PvalG6</b>	<b>PvalG7</b>	<b>RitG6</b>	<b>RitG7</b>	<b>OmitG6</b>	<b>OmitG7</b>	<b>NobsG6</b>	<b>NobsG7</b>
7	MC	Listening	0.47	0.52	0.44	0.43	0.00	0.00	2,969	38,473
7	MC	Listening	0.45	0.42	0.42	0.41	0.00	0.00	2,972	38,486
7	EBSR	Listening	0.48	0.52	0.46	0.50	0.00	0.00	2,947	66,733
7	MS	Listening	0.36	0.42	0.38	0.45	0.00	0.00	2,946	66,691
7	MC	Listening	0.70	0.72	0.36	0.33	0.00	0.00	2,946	66,654
7	MC	Listening	0.54	0.57	0.30	0.32	0.00	0.00	2,972	38,496
7	MC	Reading	0.58	0.74	0.45	0.50	0.00	0.00	2,970	38,477
7	MC	Reading	0.36	0.47	0.24	0.33	0.00	0.00	2,969	38,396
7	MC	Reading	0.55	0.71	0.44	0.39	0.00	0.00	2,967	38,394
7	MC	Reading	0.69	0.74	0.34	0.37	0.00	0.00	2,945	28,218
7	MC	Reading	0.46	0.52	0.28	0.29	0.00	0.00	2,943	28,199
7	MC	Reading	0.52	0.63	0.34	0.30	0.00	0.00	2,971	66,679
7	MC	Reading	0.71	0.80	0.45	0.43	0.00	0.00	2,976	66,643
7	EBSR	Reading	0.45	0.57	0.53	0.53	0.00	0.00	2,978	66,743
7	MC	Reading	0.70	0.77	0.47	0.46	0.00	0.00	2,944	28,217
7	MC	Research	0.83	0.86	0.47	0.40	0.00	0.00	2,962	38,506
7	MC	Research	0.25	0.31	0.14	0.24	0.00	0.00	2,945	28,236
7	MS	Research	0.73	0.70	0.41	0.37	0.00	0.00	2,971	38,494
7	MC	Writing	0.67	0.74	0.30	0.34	0.00	0.00	2,965	38,486
7	MC	Writing	0.66	0.68	0.41	0.42	0.00	0.00	2,974	28,224
7	MC	Writing	0.53	0.52	0.33	0.35	0.00	0.00	2,946	38,497
		<b>AVERAGE</b>	0.56	0.62	0.38	0.39				

**Table 6.21: ELA Grade 7 vs. Grade 8 Vertical Linking Item Statistics**

<b>Item Grade</b>	<b>Item Type</b>	<b>Content Category</b>	<b>PvalG7</b>	<b>PvalG8</b>	<b>RitG7</b>	<b>RitG8</b>	<b>OmitG7</b>	<b>OmitG8</b>	<b>NobsG7</b>	<b>NobsG8</b>
8	MS	Listening	0.50	0.55	0.40	0.42	0.00	0.001	3,345	66,094
8	MC	Listening	0.82	0.87	0.45	0.41	0.00	0.002	3,342	66,057
8	MC	Listening	0.40	0.47	0.23	0.29	0.00	0.001	3,279	24,752
8	MC	Listening	0.56	0.59	0.25	0.26	0.00	0.001	3,345	66,122
8	MC	Listening	0.51	0.57	0.42	0.41	0.00	0.001	3,278	24,766
8	MC	Listening	0.57	0.54	0.15	0.13	0.00	0.002	3,280	24,738
8	MS	Reading	0.59	0.61	0.36	0.35	0.00	0.002	3,276	41,314
8	TE	Reading	0.75	0.76	0.43	0.45	0.00	0.004	3,281	41,252
8	MC	Reading	0.65	0.70	0.49	0.48	0.00	0.004	3,280	41,248
8	MC	Reading	0.63	0.69	0.42	0.46	0.00	0.002	3,279	41,315
8	MC	Reading	0.78	0.86	0.45	0.37	0.00	0.001	3,342	66,114
8	MC	Reading	0.49	0.58	0.31	0.35	0.00	0.001	3,343	66,105
8	MS	Reading	0.35	0.45	0.42	0.38	0.00	0.002	3,337	66,074
8	EBSR	Reading	0.34	0.45	0.33	0.28	0.00	0.001	3,345	66,158
8	MC	Research	0.88	0.88	0.42	0.41	0.00	0.001	3,345	41,347
8	TE	Research	0.42	0.47	0.27	0.31	0.00	0.002	3,278	66,008
8	MS	Research	0.65	0.69	0.49	0.50	0.00	0.000	3,288	24,785
8	MS	Writing	0.34	0.37	0.37	0.43	0.00	0.000	3,343	66,138
8	MC	Writing	0.42	0.42	0.26	0.28	0.00	0.001	3,282	24,767
8	MC	Writing	0.61	0.59	0.47	0.51	0.00	0.001	3,286	41,349
8		AVERAGE	0.58	0.62	0.37	0.37				

**Table 6.22: Mathematics Grade 3 vs. Grade 4 Vertical Linking Item Statistics**

Item Grade	Item Type	Content Category	PvalG3	PvalG4	RitG3	RitG4	OmitG3	OmitG4	NobsG3	NobsG4
4	MC	DS	0.57	0.68	0.33	0.39	0.00	0.00	2,369	67,371
4	MC	GM	0.36	0.71	0.25	0.42	0.00	0.00	2,372	67,416
4	MC	GM	0.90	0.92	0.31	0.28	0.00	0.00	2,363	67,415
4	MC	NBT	0.81	0.75	0.45	0.45	0.00	0.00	2,360	67,393
4	SA	NBT	0.41	0.67	0.42	0.39	0.00	0.00	2,363	21,340
4	MC	NF	0.45	0.69	0.47	0.54	0.00	0.00	2,371	67,392
4	MC	NF	0.34	0.77	0.10	0.42	0.00	0.00	2,366	67,387
4	MC	NF	0.42	0.53	0.49	0.58	0.00	0.00	2,361	67,388
4	MC	RA	0.72	0.77	0.39	0.40	0.00	0.00	2,370	67,410
4	MC	RA	0.58	0.75	0.41	0.44	0.00	0.00	2,361	21,339
4		AVERAGE	0.56	0.72	0.36	0.43				

Note: Content categories are as follows: NBT = Number Sense and Operations in Base Ten; NF = Number Sense and Operations in Fractions; RA = Relationships and Algebraic Thinking; DS = Data and Statistics; and GM = Geometry and Measurement.

**Table 6.23: Mathematics Grade 4 vs. Grade 5 Vertical Linking Item Statistics**

Item Grade	Item Type	Content Category	PvalG4	PvalG5	RitG4	RitG5	OmitG4	OmitG5	NobsG4	NobsG5
5	MC	DS	0.52	0.56	0.44	0.48	0.00	0.00	2,574	21,075
5	SA	GM	0.31	0.71	0.50	0.48	0.00	0.00	2,527	67,687
5	MC	GM	0.50	0.72	0.45	0.46	0.00	0.00	2,573	67,699
5	MC	NBT	0.54	0.65	0.43	0.41	0.00	0.00	2,528	67,720
5	MC	NBT	0.50	0.71	0.43	0.44	0.00	0.00	2,575	67,692
5	MC	NF	0.34	0.51	0.24	0.50	0.00	0.00	2,575	67,708
5	MC	NF	0.50	0.55	0.23	0.27	0.00	0.00	2,529	67,529
5	MC	NF	0.24	0.49	0.50	0.61	0.00	0.00	2,572	67,697
5	MC	RA	0.68	0.75	0.47	0.45	0.00	0.00	2,529	67,705
5	SA	RA	0.28	0.51	0.49	0.44	0.00	0.00	2,527	21,079
5		AVERAGE	0.44	0.62	0.42	0.46				

Note: Content categories are as follows: NBT = Number Sense and Operations in Base Ten; NF = Number Sense and Operations in Fractions; RA = Relationships and Algebraic Thinking; DS = Data and Statistics; and GM = Geometry and Measurement.

**Table 6.24: Mathematics Grade 5 vs. Grade 6 Vertical Linking Item Statistics**

Item Grade	Item Type	Content Category	PvalG5	PvalG6	RitG5	RitG6	OmitG5	OmitG6	NobsG5	NobsG6
6	MC	EEI	0.26	0.37	0.00	0.25	0.00	0.00	2,631	65,677
6	MC	EEI	0.64	0.59	0.23	0.34	0.00	0.00	2,631	65,718
6	MC	EEI	0.40	0.53	0.27	0.44	0.00	0.00	2,632	65,746
6	MC	EEI	0.13	0.33	0.06	0.33	0.00	0.00	2,592	22,000
6	MC	NS	0.62	0.63	0.49	0.47	0.00	0.00	2,590	65,717
6	MC	NS	0.13	0.52	0.31	0.58	0.00	0.00	2,592	22,002
6	SA	NS	0.65	0.67	0.45	0.45	0.00	0.00	2,630	21,975
6	TE	RP	0.49	0.45	0.50	0.56	0.00	0.00	2,585	65,569
6	MS	RP	0.26	0.51	0.44	0.62	0.00	0.00	2,631	65,710
6	MC	RP	0.27	0.37	0.15	0.44	0.00	0.00	2,590	65,683
6		AVERAGE	0.39	0.50	0.29	0.45				

Note: Content categories are as follows: NS = Number Sense and Operations; EEI = Expressions, Equations and Inequalities; and RP = Ratios and Proportional Relationships.

**Table 6.25: Mathematics Grade 6 vs. Grade 7 Vertical Linking Item Statistics**

Item Grade	Item Type	Content Category	PvalG6	PvalG7	RitG6	RitG7	OmitG6	OmitG7	NobsG6	NobsG7
7	MC	DSP	0.66	0.68	0.26	0.31	0.00	0.00	2,885	63,639
7	MC	EEI	0.40	0.45	0.37	0.40	0.00	0.00	2,895	63,680
7	MC	EEI	0.46	0.53	0.28	0.34	0.00	0.00	2,896	63,665
7	MC	EEI	0.37	0.48	0.20	0.34	0.00	0.00	2,891	63,661
7	SA	GM	0.36	0.57	0.53	0.57	0.00	0.00	2,897	63,520
7	MC	NS	0.41	0.43	0.31	0.36	0.00	0.00	2,890	63,651
7	SA	NS	0.46	0.53	0.63	0.60	0.00	0.00	2,891	63,648
7	MC	NS	0.72	0.79	0.43	0.41	0.00	0.00	2,899	63,676
7	MC	RP	0.54	0.62	0.49	0.50	0.00	0.00	2,887	63,524
7	MC	RP	0.75	0.80	0.50	0.45	0.00	0.00	2,895	63,622
7		AVERAGE	0.51	0.59	0.40	0.43				

Note: Content categories are as follows: GM = Geometry and Measurement; NS = Number Sense and Operations; EEI = Expressions, Equations and Inequalities; DSP = Data Analysis, Statistics and Probability; and RP = Ratios and Proportional Relationships.

**Table 6.26: Mathematics Grade 7 vs. Grade 8 Vertical Linking Item Statistics**

Item Grade	Item Type	Content Category	PvalG7	PvalG8	RitG7	RitG8	OmitG7	OmitG8	NobsG7	NobsG8
8	MC	DSP	0.74	0.66	0.38	0.38	0.00	0.00	3,141	52,948
8	MC	EEI	0.32	0.51	0.18	0.43	0.00	0.00	3,140	52,918
8	MC	EEI	0.36	0.53	0.34	0.44	0.00	0.00	3,146	52,868
8	MC	EEI	0.73	0.74	0.38	0.42	0.00	0.00	3,118	52,843
8	MC	EEI	0.38	0.54	0.25	0.36	0.00	0.00	3,119	52,997
8	MC	FN	0.65	0.64	0.52	0.50	0.00	0.00	3,147	18,218
8	MC	FN	0.61	0.71	0.34	0.41	0.00	0.00	3,116	52,927
8	MC	GM	0.46	0.55	0.29	0.36	0.00	0.00	3,107	52,852
8	MC	GM	0.38	0.58	0.26	0.41	0.00	0.00	3,115	52,922
8	MC	NS	0.27	0.46	0.40	0.40	0.00	0.00	3,144	52,983
8		AVERAGE	0.49	0.59	0.33	0.41				

Note: Content categories are as follows: GM = Geometry and Measurement; NS = Number Sense and Operations; EEI = Expressions, Equations and Inequalities; DSP = Data Analysis, Statistics and Probability; and FN = Functions.

**Table 6.27: ELA Population Ability Estimates across Multiple Groups on All Items**

Estimates	Grade					
	3	4	5 (base)	6	7	8
N-Count	67,747	69,407	69,669	67,853	66,743	66,105
Mean Theta	-1.52	-0.76	-0.29	0.02	0.52	0.95
Theta SD	1.38	1.31	1.27	1.15	1.25	1.32

**Table 6.28: Mathematics Population Ability Estimates across Multiple Groups on All Items**

Estimates	Grade					
	3	4	5 (base)	6	7	8
N-Count	65,134	67,458	67,755	65,778	63,723	53,015
Mean Theta	-1.81	-1.06	-0.29	-0.09	0.36	1.1
Theta SD	1.77	2.08	1.72	1.71	1.88	1.93

**Table 6.29: Transformation Constants for ELA and Mathematics Base Grades**

Content Area and Grade	Target Scale Properties in Scale Score Metric		Estimated Population Ability in Theta Metric		Transformation Constants	
	Mean	SD	Mean	SD	M1	M2
ELA 5	400	40	-0.29	1.25	31.89925	409.40450
Math 5	400	40	-0.22	1.33	29.96675	406.62545

**Table 6.30: Mathematics Items Flagged for Poor Fit**

Item Position in Calib.	Form (Item Number)	Item Grade	Model	ChiSqr	Chi DF	Total N	Z Score	Z Obsd	Z Pred	Obsd-Pred
14	A, B (12)	3	3PL	293.81	1	69,655	207.05	0.9158	0.907	0.0088

**Table 6.31: ELA Scale Score Means and Standard Deviations**

Grade	Scale Statistics		Mean Difference between Grades (Scale Score Points)
	Mean	SD	
3	360.91	43.19	
4	385.21	41.46	24.29
5	400.00	39.99	14.79
6	410.01	36.36	10.01
7	426.02	39.64	16.02
8	439.82	41.75	13.80

**Table 6.32: ELA Scale Scores at Different Percentiles across Grades**

Grade	Percentile				
	10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>
3	306	333	362	390	414
4	331	360	388	413	435
5	348	373	401	427	449
6	362	386	411	434	454
7	373	399	428	454	474
8	385	413	442	468	490

**Table 6.33: Mathematics Scale Score Means and Standard Deviations**

Grade	Scale Statistics		Mean Difference between Grades (Scale Score Points)
	Mean	SD	
3	352.60	48.47	
4	376.70	49.12	24.10
5	399.66	39.76	22.96
6	405.75	39.14	6.09
7	418.81	45.80	13.06
8	440.66	50.51	21.85

**Table 6.34: Mathematics Scale Scores at Different Percentiles across Grades**

Grade	Percentile				
	10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>
3	290	326	359	386	408
4	322	354	383	408	429
5	353	377	402	425	446
6	358	384	409	432	451
7	363	393	422	449	472
8	377	407	442	474	503

**Table 6.35: ELA and Mathematics Lowest and Highest Obtainable Scores**

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

Figure 6.1: ELA Test Characteristic Curves

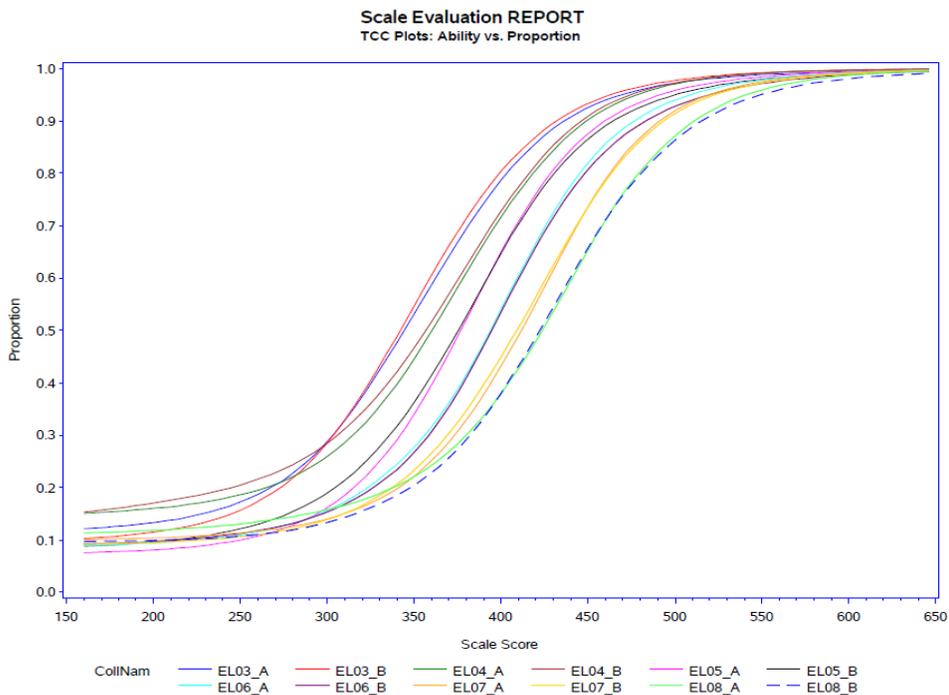


Figure 6.2: ELA Standard Error Curves

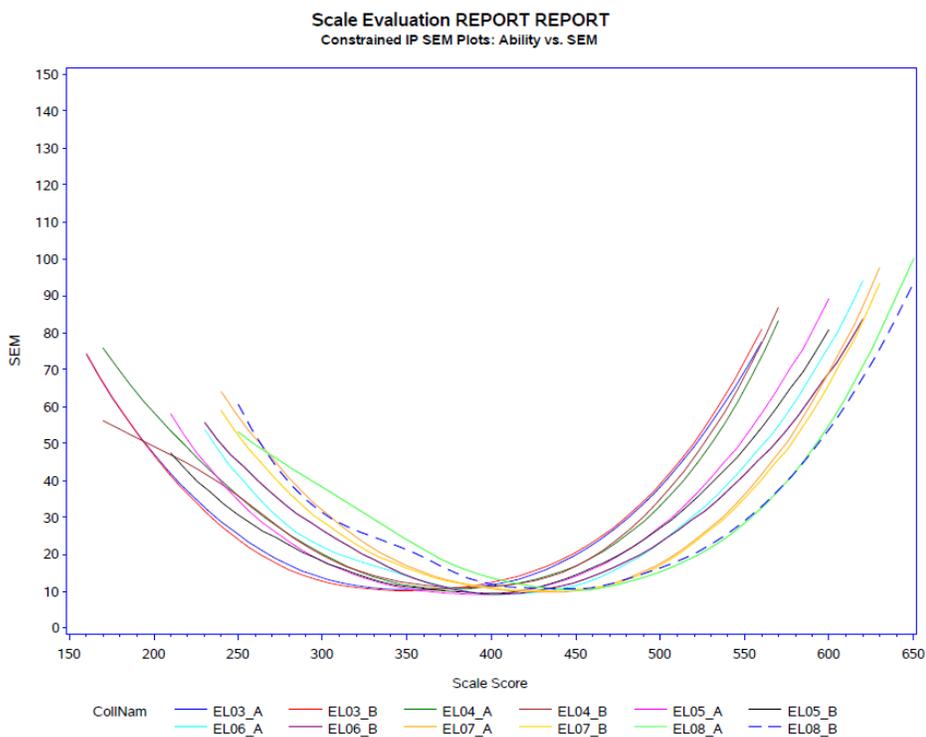


Figure 6.3: ELA Test Characteristic Curves for Grade 4 Forms

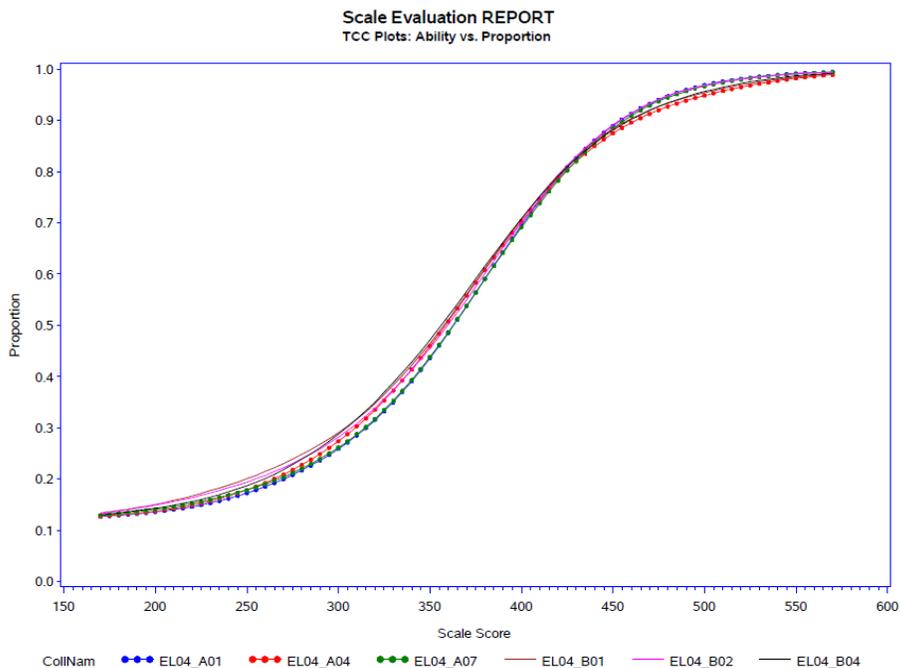
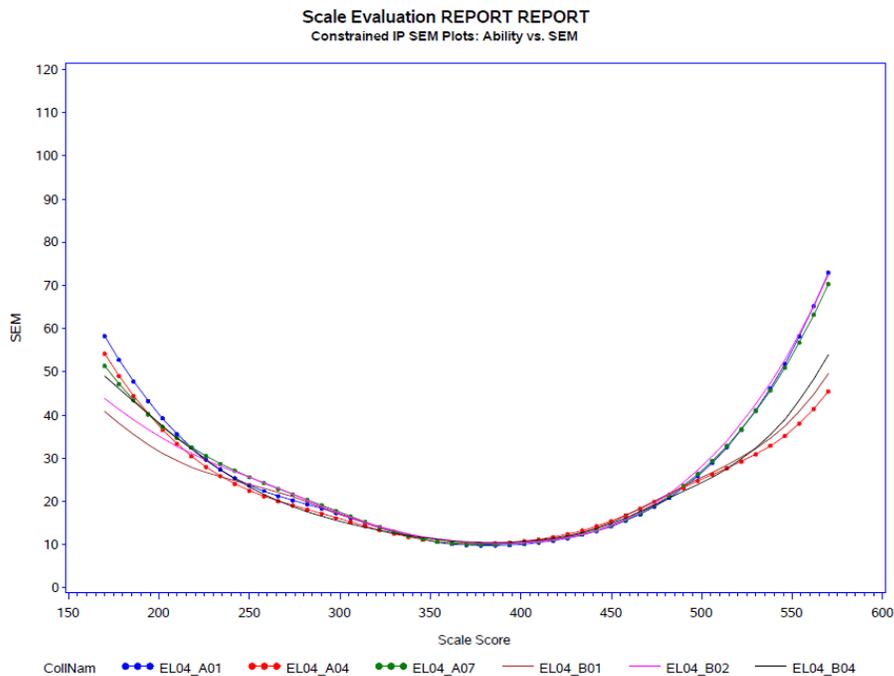
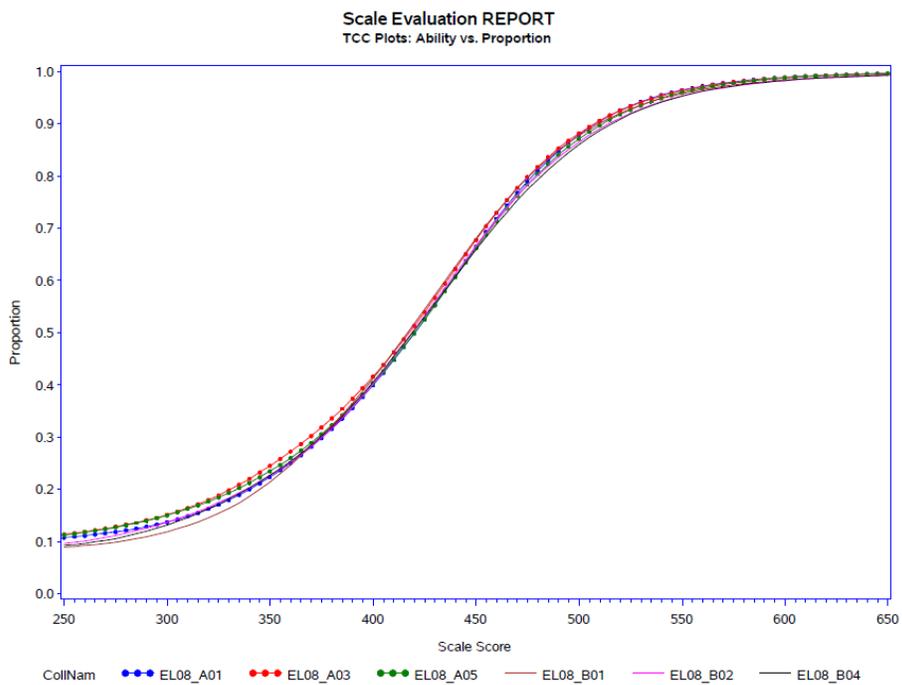


Figure 6.4: ELA Standard Error Curves for Grade 4 Forms



**Figure 6.5: ELA Test Characteristic Curves for Grade 8 Forms**



**Figure 6.6: ELA Standard Error Curves for Grade 8 Forms**

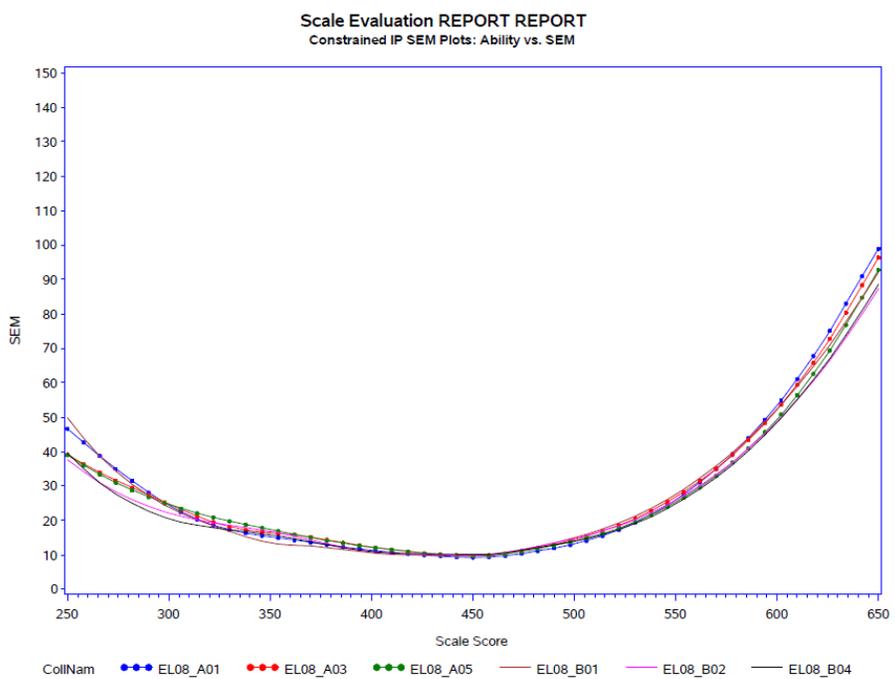


Figure 6.7: Mathematics Test Characteristic Curves

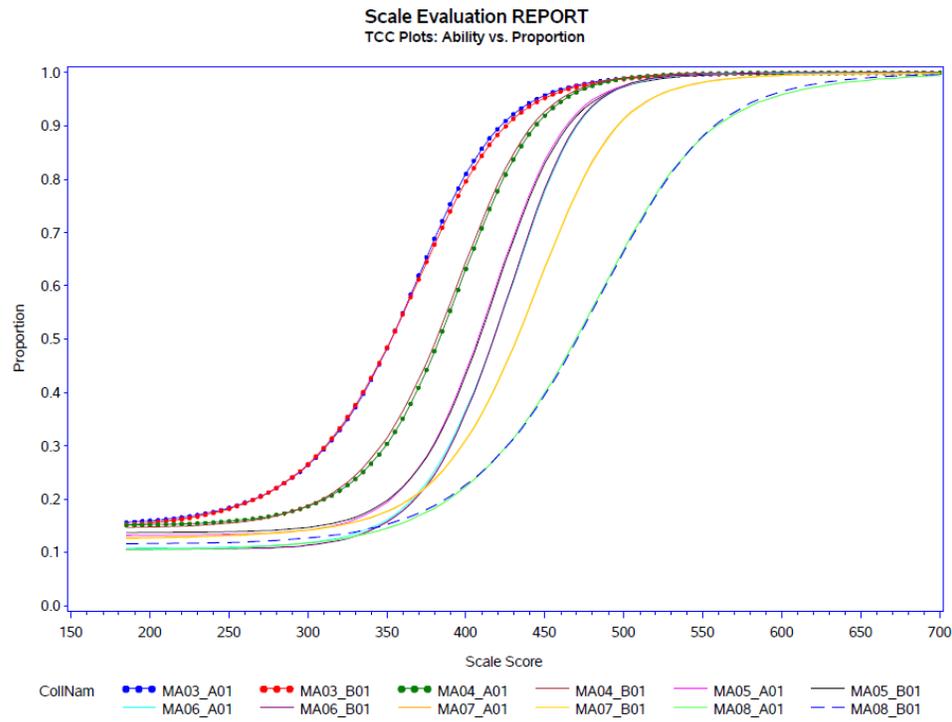
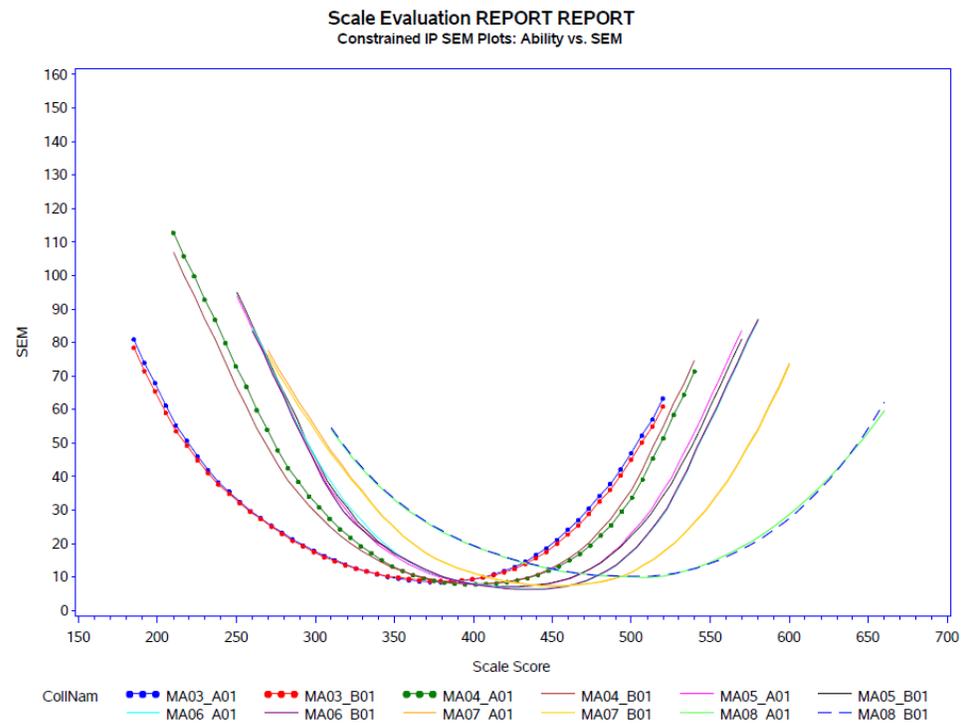


Figure 6.8: Mathematics Standard Error Curves



## CHAPTER 7: TEST RESULTS

This chapter of the Technical Report contains information on the results of the Spring 2018 administration of the ELA and Mathematics MAP. The scale score results are presented here. Performance level information is also provided. 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 to 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.

This chapter also provides descriptions of the score reports, data structure, and interpretive guide. The AERA, APA, & NCME (2014) standards addressed in Chapter 7 are 5.1, 6.10, 7.0, and 12.18. Each standard will be presented in the pertinent section of this chapter.

Results presented in this chapter are based on Missouri student census data. 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.

### 7.1 Test Completion

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

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

For the purposes of this report, *test completion rate* is defined as the percentage of students who received a valid scale score given the total number of students eligible to take the online test or receive a test book. These test completion rates are summarized in Tables 7.1 through 7.10. The tables show both the percentage of students classified as reportable and the number 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 number of students eligible to take an online test or receive a test book. This includes students who should have received an 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 Mathematics. Exclusion of these students from the Mathematics assessment may affect the state-level student performance in Mathematics.

## **7.2 Current Administration Data**

The ELA and Mathematics MAP assessments were administered to students in Grades 3 through 8. Tables 7.11 and 7.12 provide a summary of the total test scale scores based on the state population for the 2018 administration of the ELA and Mathematics assessments, respectively. Tables 7.13 and 7.14 show a summary of the reporting category scale scores of the ELA and Mathematics assessments, respectively.

## **7.3 Cross-Year, Cross-Sectional Comparisons**

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. This was not the case for the 2017–18 ELA and Mathematics assessments.

New scales were developed for both ELA and Mathematics after the 2017–18 test administration. Therefore, the test scores for ELA and Mathematics are not directly comparable with the previous year scores and the cross-year scale score summary is not presented for ELA and Mathematics in this report. The Spring 2017–18 impact data are considered a new baseline for MAP ELA and Mathematics Grades 3 through 8.

Table 7.15 shows four sets of the impact data. First, the percentages of students in each performance level from 2005–06 through 2013–14 on the Communication Arts test are presented. These data are followed by the percentages of students in each performance level after the 2014–15 test administration, when the ELA test scores were reported on the Smarter Balanced Assessment Consortium (SBAC) scale and students were classified into the performance levels based on the cut scores established after the 2014 SBAC field test on the SBAC item bank. Next, the percentages of students in each performance level from 2015–16 through 2016–17 are presented. During these two administration years, the ELA scores were reported on the Missouri scale developed after the 2015–16 test administration and the students were classified into performance levels based on the Missouri cut scores set in the Summer of 2016. The last set of the impact data reflects Missouri student performance on the new ELA assessments measuring new Missouri Learning Standards. The new ELA assessments were developed for the Spring 2018 test administration, after which ELA tests were placed on a new vertical scale. The new cut scores were set by Missouri educators in a process of standard setting in Summer 2018.

Table 7.16 shows the Mathematics impact data from 2005–06 through 2017–18. Similar to ELA, the Mathematics test scores and associated performance levels were reported on the Missouri Mathematics scale from 2005–06 through 2013–14, on the SBAC scale in the 2014–15 test administration, and on another custom Missouri scale in the 2015–16 and 2016–17 test administrations. The last of the four sets of the impact data reflects Missouri student performance on the new Mathematics assessments measuring new

Missouri Learning Standards. The new Mathematics assessments were developed for the Spring 2018 test administration, after which Mathematics tests were placed on a new vertical scale. The new cut scores for Mathematics were set by Missouri educators in a process of standard setting in Summer 2018. It is worth noting that not all Grade 8 students participated in the Mathematics assessment. As stated previously, approximately 20% of Grade 8 students took the Algebra I assessment instead of Mathematics. Exclusion of these students from the Mathematics assessment may affect the state-level student performance in Mathematics.

In both tables, the past data are provided for reference purposes only and are separated from this year's data by gray horizontal bars. Therefore, the percentages of students in each performance level after the 2017–18 test administration are not directly comparable to the percentages of students in each performance level after the 2016–17 test administration, the percentages of students in each performance level after the 2015–16 and 2016–17 test administrations are not directly comparable with the percentages of students in each performance level after the 2014–15 test administration, and the percentages of students in each performance level after the 2014–15 test administration are not directly comparable with the percentages of students in each performance level before the 2014–15 test administration.

#### 7.4 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)

Interpretations related to the test scores are disseminated in two ways: (1) the individual score report and (2) the *Guide to Interpreting Results* (DRC, 2018).

In addition to providing interpretation, it is important that the information 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 from which parents can glean relevant information so they understand their child's test score. In the 2017–18 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 level for the Missouri public schools.

#### **7.4.1 Description of Each Type of Report**

In this section, descriptions for the following reports are provided: Student Roster, Individual Student Report, and Student Score Label. 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 individual student achievement 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-type format for the content area chosen. Selecting a student from the roster will open that student's Individual Student Report.

#### ***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 the 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 and Mathematics, are provided. These scores represent student performance on the test reporting categories, which are listed below.

English Language Arts Grades 3 through 8 reporting categories include the following:

- Reading
- Research
- Writing
- Listening

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

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

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

In addition to the reporting category scores for a student who took the MAP assessment, a reporting category scale score of a “just *Proficient* student” was provided for comparison. The “just *Proficient* student” score was computed as an average of the category scale scores for students whose total test score is at the *Proficient* cut score.

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 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). Invalidated students are assigned the lowest obtainable scale score (LOSS) for a given content area (and for the reporting categories in that content area) 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 participated 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).

### ***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 on-demand, 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. 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.

## **7.5 Data Structures**

A data file referred to as a General Research File (GRF) was provided to DESE by DRC. It contains one record for every test book submitted; each record contains demographic information for a student as well as item responses, total test raw score, scale score, and standard error of measurement information, student performance level classification, reporting category raw scores, scale scores, and associated standard errors of measurement, and the “just *Proficient* student” scale score for each ELA and Mathematics reporting category.

### **7.5.1 General Research File**

The layout for the state-level GRF is included in Appendix D.

## **7.6 Interpreting Test Results**

The student’s correct responses to the assessment questions are used to derive an MAP scale score. The scale score describes performance on a continuum that in most cases

spans the complete range of Grades 3–8. These scores range in value from 160 to 650 for English Language Arts and from 185 to 660 for Mathematics. Scores from adjacent grades may be compared within a content area. Scale scores cannot be compared across content areas. For example, it is appropriate to compare a student’s Grade 5 Mathematics scale score with his or her Grade 6 Mathematics scale score, but it is not appropriate to compare Mathematics and ELA scores. The MAP scale scores determine the student’s performance level. Student performance 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 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, the reporting category scores should not be compared with the total test score or 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. Instead, a student’s scale score in a given reporting category can be compared with a scale score of a “just *Proficient* student” for that reporting category. A reporting category scale score of a “just *Proficient* student” is computed as an average of the category scale scores for students whose total test scores are at the *Proficient* cut (or more accurately, within +/- 0.25 standard error of measurement around the *Proficient* cut). 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.

The information on score interpretation is included in the *Guide to Interpreting Results*, which was written for Missouri teachers and administrators who receive score reports from the 2017–18 administration of the MAP. This guide has three sections. The first section presents an overview of key terms and test-related concepts. The second section discusses assessment terms and 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.

## 7.7 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 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.

**Table 7.1: Test Completion Rates: All Students**

Grade	Accountable in ELA	Percent Reportable in ELA	Accountable in Mathematics	Percent Reportable in Mathematics
3	68,094	99.76	68,118	99.94
4	69,734	99.80	69,754	99.95
5	69,953	99.83	69,961	99.94
6	68,091	99.78	68,031	99.91
7	66,995	99.76	66,120	99.88
8	66,448	99.74	54,610*	99.83

\*Grade 8 students had the option of taking Algebra I instead of MAP Grade 8 Mathematics test.

**Table 7.2: Test Completion Rates: Males**

Grade	Accountable in ELA	Percent Reportable in ELA	Accountable in Mathematics	Percent Reportable in Mathematics
3	35,016	99.73	35,036	99.92
4	35,570	99.79	35,573	99.94
5	35,645	99.83	35,648	99.94
6	34,866	99.78	34,829	99.90
7	34,228	99.75	33,732	99.85
8	33,982	99.71	28,347*	99.82

\*Grade 8 students had the option of taking Algebra I instead of MAP Grade 8 Mathematics test.

**Table 7.3: Test Completion Rates: Females**

Grade	Accountable in ELA	Percent Reportable in ELA	Accountable in Mathematics	Percent Reportable in Mathematics
3	33,078	99.80	33,082	99.97
4	34,164	99.81	34,181	99.96
5	34,308	99.84	34,313	99.94
6	33,225	99.78	33,202	99.91
7	32,767	99.77	32,388	99.91
8	32,466	99.77	26,263*	99.85

\*Grade 8 students had the option of taking Algebra I instead of MAP Grade 8 Mathematics test.

**Table 7.4: Test Completion Rates: White**

Grade	Accountable in ELA	Percent Reportable in ELA	Accountable in Mathematics	Percent Reportable in Mathematics
3	47,392	99.92	47,385	99.95
4	48,709	99.93	48,706	99.95
5	49,076	99.93	49,068	99.93
6	48,354	99.88	48,299	99.91
7	48,044	99.86	47,371	99.88
8	48,059	99.84	38,922*	99.83

\*Grade 8 students had the option of taking Algebra I instead of MAP Grade 8 Mathematics test.

**Table 7.5: Test Completion Rates: Black**

Grade	Accountable in ELA	Percent Reportable in ELA	Accountable in Mathematics	Percent Reportable in Mathematics
3	11,255	99.89	11,262	99.95
4	11,434	99.84	11,436	99.95
5	11,435	99.82	11,436	99.95
6	10,865	99.77	10,863	99.94
7	10,341	99.77	10,294	99.89
8	10,330	99.77	9,234*	99.89

\*Grade 8 students had the option of taking Algebra I instead of MAP Grade 8 Mathematics test.

**Table 7.6: Test Completion Rates: Hispanic**

Grade	Accountable in ELA	Percent Reportable in ELA	Accountable in Mathematics	Percent Reportable in Mathematics
3	4,449	99.12	4,461	99.93
4	4,620	99.29	4,635	99.98
5	4,635	99.35	4,647	99.94
6	4,454	99.24	4,464	99.89
7	4,381	99.04	4,368	99.84
8	4,104	99.00	3,466*	99.80

\*Grade 8 students had the option of taking Algebra I instead of MAP Grade 8 Mathematics test.

**Table 7.7: Test Completion Rates: Asian/Pacific Islander**

Grade	Accountable in ELA	Percent Reportable in ELA	Accountable in Mathematics	Percent Reportable in Mathematics
3	1,579	95.82	1,591	100.00
4	1,550	96.77	1,559	100.00
5	1,526	97.97	1,531	100.00
6	1,533	98.17	1,520	99.74
7	1,475	98.37	1,367	99.93
8	1,520	98.42	962*	100.00

\*Grade 8 students had the option of taking Algebra I instead of MAP Grade 8 Mathematics test.

**Table 7.8: Test Completion Rates: American Indian**

Grade	Accountable in ELA	Percent Reportable in ELA	Accountable in Mathematics	Percent Reportable in Mathematics
3	225	99.11	225	99.56
4	279	100.00	279	100.00
5	281	100.00	281	100.00
6	262	100.00	262	100.00
7	274	100.00	273	100.00
8	297	99.66	261*	99.62

\*Grade 8 students had the option of taking Algebra I instead of MAP Grade 8 Mathematics test.

**Table 7.9: Test Completion Rates: Other Race/Ethnicity**

Grade	Accountable in ELA	Percent Reportable in ELA	Accountable in Mathematics	Percent Reportable in Mathematics
3	3,194	99.81	3,194	99.81
4	3,142	99.84	3,139	99.94
5	3,000	99.90	2,998	99.97
6	2,623	99.85	2,623	99.92
7	2,480	99.88	2,447	99.88
8	2,138	99.72	1,765*	99.66

\*Grade 8 students had the option of taking Algebra I instead of MAP Grade 8 Mathematics test.

**Table 7.10: Test Completion Rates: Students Receiving Accommodations**

Grade	Accountable in ELA	Percent Reportable in ELA	Accountable in Mathematics	Percent Reportable in Mathematics
3	223	100.00	190	100.00
4	238	100.00	3,053	99.93
5	201	100.00	3,867	100.00
6	5,075	100.00	4,592	100.00
7	4,904	100.00	4,571	100.00
8	4,699	100.00	4,516*	100.00

\*Grade 8 students had the option of taking Algebra I instead of MAP Grade 8 Mathematics test.

**Table 7.11: State-Level Total Test Scale Score Statistics: English Language Arts**

Grade	N	Mean Scale Score	Scale Score Std.Dev.	Percentile				
				10th	25th	50th	75th	90th
3	67,932	360.47	44.08	305	333	362	390	414
4	69,593	384.77	42.38	331	360	388	413	434
5	69,835	399.65	40.68	347	373	401	427	449
6	67,941	409.89	36.53	362	386	411	434	454
7	66,833	425.91	39.78	373	399	428	454	474
8	66,276	439.58	42.04	385	413	442	468	490

**Table 7.12: State-Level Total Test Scale Score Statistics: Mathematics**

Grade	N	Mean Scale Score	Scale Score Std.Dev.	Percentile				
				10th	25th	50th	75th	90th
3	68,080	352.39	48.79	290	325	359	386	407
4	69,719	376.68	49.15	322	354	383	408	429
5	69,919	399.64	39.79	353	377	402	425	446
6	67,968	405.73	39.17	358	384	409	432	451
7	66,041	418.80	45.81	363	393	422	449	472
8	54,518	440.62	50.55	376	407	442	474	503

**Table 7.13: State-Level Reporting Category Scale Score Statistics: English Language Arts**

<b>Grade</b>	<b>Reporting Category</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>Scale Score StdDev.</b>	<b>Min. Scale Score</b>	<b>Max. Scale Score</b>
3	Reading	67,932	359.72	50.49	160	560
	Research	67,932	367.78	77.66	160	560
	Writing	67,932	364.10	60.69	160	560
	Speaking and Listening	67,932	382.32	102.03	160	560
4	Reading	69,593	386.16	50.05	170	570
	Research	69,593	389.02	69.86	170	570
	Writing	69,593	384.51	56.66	170	570
	Speaking and Listening	69,593	391.51	87.14	170	570
5	Reading	69,835	400.14	47.14	210	600
	Research	69,835	433.94	100.08	210	600
	Writing	69,835	402.71	55.58	210	600
	Speaking and Listening	69,835	409.99	88.60	210	600
6	Reading	67,941	410.67	41.09	230	620
	Research	67,941	420.76	77.70	230	620
	Writing	67,941	415.01	61.69	230	620
	Speaking and Listening	67,941	407.35	84.71	230	620
7	Reading	66,833	426.84	44.99	240	630
	Research	66,833	431.73	76.10	240	630
	Writing	66,833	421.90	76.74	240	630
	Speaking and Listening	66,833	434.39	84.11	240	630
8	Reading	66,276	440.58	47.85	250	650
	Research	66,276	436.09	79.21	250	650
	Writing	66,276	447.07	71.15	250	650
	Speaking and Listening	66,276	438.02	87.81	250	650

**Table 7.14: State-Level Reporting Category Scale Score Statistics: Mathematics**

<b>Grade</b>	<b>Reporting Category</b>	<b>N</b>	<b>Mean Scale Score</b>	<b>Scale Score StdDev.</b>	<b>Min. Scale Score</b>	<b>Max. Scale Score</b>
3	Number Sense and Operations in Base Ten	68,080	349.95	75.85	185	520
	Number Sense and Operations in Fractions	68,080	359.01	81.30	185	520
	Relationships and Algebraic Thinking	68,080	348.97	65.71	185	520
	Geometry and Measurement & Data and Statistics	68,080	349.88	60.96	185	520
4	Number Sense and Operations in Base Ten	69,719	372.33	68.27	210	540
	Number Sense and Operations in Fractions	69,719	375.48	69.27	210	540
	Relationships and Algebraic Thinking	69,719	370.45	74.34	210	540
	Geometry and Measurement & Data and Statistics	69,719	374.86	61.64	210	540
5	Number Sense and Operations in Base Ten	69,919	400.37	68.09	250	570
	Number Sense and Operations in Fractions	69,919	383.12	71.85	250	570
	Relationships and Algebraic Thinking	69,919	396.11	66.68	250	570
	Geometry and Measurement & Data and Statistics	69,919	396.33	54.23	250	570
6	Ratios and Proportional Relationships	67,968	385.24	76.12	260	580
	Number Sense and Operations	67,968	401.55	58.21	260	580
	Expressions, Equations and Inequalities	67,968	401.15	55.27	260	580
	Geometry and Measurement & Data Analysis, Statistics and Probability	67,968	405.37	51.97	260	580
7	Ratios and Proportional Relationships	66,041	419.76	64.74	270	600
	Number Sense and Operations	66,041	414.57	64.58	270	600
	Expressions, Equations and Inequalities	66,041	412.70	62.14	270	600
	Geometry and Measurement & Data Analysis, Statistics and Probability	66,041	412.89	61.65	270	600
8	Number Sense and Operations & Expressions, Equations and Inequalities	54,518	438.88	55.12	310	660
	Geometry and Measurement & Data Analysis, Statistics and Probability	54,518	436.57	64.36	310	660
	Functions	54,518	439.65	70.88	310	660

**Table 7.15: Comparison of Percentage of Students in Each Performance Level, English Language Arts 2006 through 2018 Census Data**

<b>Grade</b>	<b>Year</b>	<b>N</b>	<b>No Level</b>	<b><i>Below Basic</i></b>	<b><i>Basic</i></b>	<b><i>Proficient</i></b>	<b><i>Advanced</i></b>	<b><i>Prof. &amp; Adv.</i></b>
<b>3</b>	2006	65,344	1.3	8.8	47.5	25.7	16.7	42.4
	2007	67,259	1.4	9.4	46.6	25.8	16.8	42.6
	2008	66,357	0.3	9.3	50.2	25.2	15.1	40.3
	2009	67,357	0.3	9.6	49.8	25.1	15.2	40.3
	2010	66,947	0.3	8.2	48.4	26.9	16.2	43.1
	2011	66,487	0.4	7.6	48.4	27.0	16.6	43.6
	2012	66,323	0.3	8.0	46.5	27.2	18.1	45.3
	2013	66,754	0.3	7.8	44.2	27.7	20.1	47.8
	2014	67,211	0.3	9.8	48.3	25.5	16.0	41.6
	2015	67,998	0.2	19.4	23.3	24.0	33.1	57.1
	2016	69,490	0.2	18.5	20.7	42.2	18.4	60.6
	2017	69,472	0.3	17.5	20.1	42.7	19.4	62.1
	2018	68,094	0.2	23.3	27.9	27.0	21.6	48.6
<b>4</b>	2006	65,849	1.0	10.6	44.5	28.8	15.0	43.8
	2007	65,982	1.1	10.5	43.4	28.2	16.8	45.1
	2008	67,049	0.3	8.0	46.7	33.4	11.7	45.1
	2009	66,709	0.3	7.6	45.8	33.6	12.7	46.3
	2010	67,510	0.3	8.6	40.2	31.2	19.7	50.9
	2011	67,049	0.4	8.2	39.5	31.6	20.2	51.9
	2012	65,996	0.3	8.3	39.3	31.2	20.9	52.2
	2013	66,085	0.3	8.2	38.8	31.6	21.2	52.8
	2014	66,647	0.3	7.8	46.4	31.5	14.0	45.5
	2015	67,013	0.2	21.8	19.7	25.3	33.1	58.3
	2016	67,966	0.2	15.2	21.4	42.6	20.6	63.2
	2017	69,622	0.3	14.4	21.2	43.0	21.2	64.2
	2018	69,734	0.2	12.1	37.5	29.9	20.2	50.1

Note: Grey bars separate administrations in which student scores were reported on different scales, and students were classified into performance levels based on different sets of cut scores.

**Table 7.15: Comparison of Percentage of Students in Each Performance Level, English Language Arts 2006 through 2018 Census Data (cont.)**

Grade	Year	N	No Level	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>Prof. &amp; Adv.</i>
5	2006	66,704	1.0	9.1	44.8	29.6	15.4	45.0
	2007	66,098	1.0	8.3	42.9	29.8	18.0	47.8
	2008	65,734	0.3	6.4	45.1	32.2	15.9	48.1
	2009	67,307	0.3	6.3	44.6	33.9	14.9	48.8
	2010	66,730	0.3	7.1	41.5	32.1	18.9	51.0
	2011	67,461	0.6	6.9	41.4	32.4	18.7	51.1
	2012	66,675	0.3	7.0	40.9	32.3	19.6	51.8
	2013	65,980	0.3	7.1	40.3	32.2	20.1	52.3
	2014	66,153	0.3	6.2	43.5	33.2	16.8	50.0
	2015	66,416	0.2	18.9	21.9	35.6	23.3	58.9
	2016	66,925	0.2	15.1	22.6	41.7	20.3	62.0
	2017	68,082	0.3	14.6	22.7	41.6	20.9	62.5
	2018	69,953	0.2	11.4	40.4	26.2	21.8	48.0
	6	2006	67,709	1.1	11.9	44.8	31.6	10.6
2007		67,045	1.2	11.2	44	31.8	11.7	43.6
2008		65,830	0.2	9.0	43.5	34	13.4	47.4
2009		65,908	0.3	8.6	43.4	33.8	13.9	47.7
2010		67,476	0.3	7.8	42.3	33.9	15.7	49.6
2011		66,633	0.3	7.3	41.9	34.3	16.2	50.5
2012		67,342	0.3	7.5	42.0	34.7	15.5	50.2
2013		66,731	0.4	7.2	41.4	34.9	16.1	51.0
2014		66,019	0.3	8.5	43.8	32.9	14.5	47.5
2015		66,059	0.2	19.6	25.3	35.0	19.8	54.9
2016		66,500	0.2	18.6	22.9	41.7	16.6	58.3
2017		66,945	0.2	18.4	21.9	42.0	17.5	59.5
2018		68,091	0.2	14.3	37.1	26.3	22.0	48.3

Note: Grey bars separate administrations in which student scores were reported on different scales, and students were classified into performance levels based on different sets of cut scores.

**Table 7.15: Comparison of Percentage of Students in Each Performance Level, English Language Arts 2006 through 2018 Census Data (cont.)**

Grade	Year	N	No Level	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>Prof. &amp; Adv.</i>
7	2006	71,632	1.9	13.7	41.8	30.5	12.2	42.7
	2007	68,404	1.8	13.1	40.7	32.8	11.6	44.4
	2008	66,923	0.3	10.0	40.7	36.1	12.9	49.0
	2009	66,531	0.3	8.7	40.3	37.2	13.6	50.8
	2010	66,279	0.4	9.8	38.1	35.2	16.5	51.7
	2011	67,517	0.4	9.0	36.9	36.0	17.8	53.8
	2012	66,845	0.3	8.7	35.8	36.6	18.7	55.2
	2013	67,319	0.3	9.0	35.7	36.5	18.4	55.0
	2014	66,893	0.4	8.2	36.0	36.9	18.6	55.4
	2015	66,000	0.3	18.4	24.1	38.6	18.5	57.2
	2016	66,143	0.2	23.4	18.3	39.0	19.0	58.0
	2017	66,507	0.3	22.6	17.9	38.6	20.6	59.2
	2018	66,995	0.2	15.5	40.5	19.9	23.8	43.7
8	2006	73,516	1.4	9.1	48.0	26.6	15.0	41.5
	2007	71,200	1.4	8.7	48.3	26.9	14.6	41.6
	2008	67,574	0.4	5.7	45.8	33.1	15.0	48.1
	2009	67,077	0.5	5.3	44.5	33.4	16.3	49.7
	2010	66,463	0.5	4.9	42.8	34.3	17.4	51.8
	2011	66,205	0.5	4.6	42.5	33.9	18.5	52.5
	2012	67,037	0.4	4.3	42.0	34.3	19.0	53.3
	2013	66,710	0.5	4.1	41.5	34.9	19.0	53.9
	2014	67,168	0.5	4.5	44.6	34.1	16.3	50.4
	2015	66,528	0.2	14.7	27.6	40.4	17.1	57.5
	2016	65,845	0.2	19.3	21.2	38.5	20.7	59.2
	2017	66,041	0.3	19.0	20.3	38.4	21.9	60.3
	2018	66,448	.3	13.2	37.5	30.0	19.0	49.0

Note: Grey bars separate administrations in which student scores were reported on different scales, and students were classified into performance levels based on different sets of cut scores.

**Table 7.16: Comparison of Percentage of Students in Each Performance Level, Mathematics 2006 through 2018 Census Data**

Grade	Year	N	No Level	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>Prof. &amp; Adv.</i>
3	2006	65,325	0.9	7.2	48.7	33.3	10.0	43.3
	2007	67,257	0.9	7.2	46.9	35.0	10.0	45.0
	2008	66,357	0.1	6.5	49.6	35.0	8.8	43.8
	2009	67,357	0.2	6.8	48.5	35.6	8.8	44.4
	2010	66,947	0.2	6.2	46.6	37.0	10.1	47.1
	2011	66,487	0.3	5.6	44.7	38.1	11.3	49.4
	2012	66,323	0.2	5.4	42.6	39.9	11.9	51.9
	2013	66,754	0.2	5.3	43.8	39.2	11.4	50.7
	2014	67,211	0.2	6.0	43.7	36.6	13.5	50.2
	2015	68,012	0.0	21.4	26.5	30.8	21.2	52.0
	2016	69,492	0.0	18.1	29.4	32.0	20.5	52.5
	2017	69,510	0.1	18.0	28.4	31.8	21.7	53.5
	2018	68,118	0.1	25.1	27.7	25.3	21.9	47.2
	4	2006	65,845	0.8	8.3	47.5	34.4	9.0
2007		65,975	0.9	8.1	46.5	35.2	9.3	44.5
2008		67,049	0.2	7.6	48.0	36.0	8.2	44.2
2009		66,709	0.2	7.3	48.2	36.6	7.8	44.4
2010		67,510	0.2	6.1	45.4	39.3	9.1	48.4
2011		67,049	0.3	5.6	43.7	39.9	10.5	50.5
2012		65,996	0.1	5.7	43.7	40.5	10.0	50.5
2013		66,085	0.1	5.5	44.2	40.7	9.4	50.1
2014		66,647	0.2	6.6	51.1	34.5	7.6	42.1
2015		67,023	0.0	16.8	33.6	29.9	19.6	49.6
2016		67,968	0.1	15.5	31.6	30.6	22.3	52.9
2017		69,684	0.1	15.3	30.3	31.0	23.2	54.2
2018		69,754	0.0	27.3	26.6	25.2	20.9	46.1

Note: Grey bars separate administrations in which student scores were reported on different scales, and students were classified into performance levels based on different sets of cut scores.

**Table 7.16: Comparison of Percentage of Students in Each Performance Level, Mathematics 2006 through 2018 Census Data (cont.)**

Grade	Year	N	No Level	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>Prof. &amp; Adv.</i>
5	2006	66,703	0.9	8.1	47.8	32.7	10.6	43.3
	2007	66,075	0.9	7.6	44.9	33.1	13.4	46.6
	2008	65,734	0.1	7.5	46.5	34.4	11.4	45.8
	2009	67,307	0.2	7.5	45.1	35.6	11.6	47.2
	2010	66,730	0.2	6.2	41.9	36.7	15.1	51.7
	2011	67,461	0.5	6.1	40.9	36.3	16.2	52.5
	2012	66,675	0.2	5.8	39.7	35.9	18.4	54.3
	2013	65,980	0.2	5.9	40.1	35.9	18.0	53.9
	2014	66,153	0.2	7.2	40.5	35.5	16.7	52.2
	2015	66,429	0.0	28.5	31.6	20.1	19.7	39.8
	2016	66,934	0.1	20.7	32.6	28.5	18.2	46.7
	2017	68,112	0.1	21.1	30.6	28.1	20.2	48.3
	2018	69,961	0.1	24.2	34.6	24.1	17.1	41.2
6	2006	67,706	1.0	11.1	44.1	34.4	9.5	43.9
	2007	67,039	1.1	11.1	40.0	35.5	12.3	47.8
	2008	65,830	0.2	9.5	39.6	37.8	12.9	50.7
	2009	65,908	0.2	8.9	40.7	37.5	12.6	50.1
	2010	67,476	0.2	7.8	36.6	40.3	15.0	55.4
	2011	66,633	0.2	7.5	35.4	40.5	16.4	56.9
	2012	67,342	0.2	7.4	36.7	39.7	16.0	55.7
	2013	66,731	0.3	7.1	36.4	39.9	16.3	56.2
	2014	66,019	0.3	7.2	36.9	40.3	15.3	55.6
	2015	66,014	0.1	28.7	33.1	21.6	16.5	38.1
	2016	66,486	0.1	20.5	36.1	27.9	15.4	43.3
	2017	66,958	0.1	21.0	35.1	27.4	16.3	43.7
	2018	68,031	0.1	27.7	30.8	21.9	19.6	41.5

Note: Grey bars separate administrations in which student scores were reported on different scales, and students were classified into performance levels based on different sets of cut scores.

**Table 7.16: Comparison of Percentage of Students in Each Performance Level, Mathematics 2006 through 2018 Census Data (cont.)**

Grade	Year	N	No Level	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>Prof. &amp; Adv.</i>
7	2006	71,575	1.2	17.4	38.5	32.7	10.2	42.9
	2007	68,405	1.2	16.7	37.1	33.2	11.7	44.9
	2008	66,923	0.3	13.9	36.3	36.7	12.8	49.5
	2009	66,531	0.3	12.5	35.2	37.6	14.3	51.9
	2010	66,279	0.3	10.8	34.3	38.8	15.7	54.5
	2011	67,517	0.3	10.5	33.5	39.2	16.6	55.8
	2012	66,845	0.3	9.8	30.3	40.0	19.6	59.6
	2013	67,319	1.5	10.1	31.1	39.1	18.2	57.3
	2014	66,893	1.6	9.6	32.0	38.6	18.2	56.7
	2015	65,036	0.1	31.4	33.2	21.1	14.1	35.3
	2016	65,317	0.1	22.4	35.4	26.7	15.4	42.1
	2017	65,742	0.2	22.1	34.0	26.8	17.0	43.8
	2018	66,120	0.1	25.2	36.5	22.2	16.0	38.2
8	2006	73,523	1.3	21.1	37.8	27.6	12.2	39.8
	2007	71,190	1.4	21.4	36.6	26.6	14.0	40.6
	2008	67,574	0.4	18.0	37.7	29.9	13.9	43.8
	2009	67,077	0.5	16.4	36.8	31.5	14.9	46.4
	2010	66,463	0.4	14.9	33.3	32.1	19.2	51.3
	2011	66,205	0.4	15.0	33.9	31.0	19.8	50.8
	2012	67,037	0.3	14.1	33.6	31.8	20.2	52.0
	2013*	52,335	1.4	17.1	41.2	30.2	10.1	40.3
	2014*	52,818	1.6	17.5	38.7	30.9	11.3	42.2
	2015*	52,840	0.2	39.3	32.3	18.1	10.1	28.2
	2016*	52,861	0.2	27.9	43.5	19.3	9.0	28.3
	2017*	53,211	0.2	28.4	41.4	19.8	10.2	30.0
2018*	54,610	0.2	32.9	37.1	20.8	9.0	29.8	

\*Grade 8 students had the option of taking Algebra I instead of MAP Mathematics.

Note: Grey bars separate administrations in which student scores were reported on different scales, and students were classified into performance levels based on different sets of cut scores.

## CHAPTER 8: PERFORMANCE LEVEL SETTING

In this chapter, we briefly describe the MAP ELA and Mathematics 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.

A Bookmark standard setting was held in 2005 to establish cut scores for the Communication Arts and Mathematics MAP tests (refer to the *Missouri Assessment Program Final Bookmark Standard Setting Technical Report* [2006] available at <https://dese.mo.gov/sites/default/files/MOFINAL2005StandardSettingTechReport.pdf>). After nine years of administration of these tests, Missouri students took ELA and Mathematics tests measuring different content and constructs in the 2014–15 test administration. These tests were built using the SBAC item bank and were fully aligned to the Common Core State Standards. The test scores were reported on the scales developed by the SBAC, and students were classified into performance levels based on the cut scores derived after the SBAC’s field test. A detailed discussion and the results of that standard setting can be found in the SBAC’s *2013–14 Technical Report* (2016), posted at <https://portal.smarterbalanced.org/library/en/2013-14-technical-report.pdf>.

Following a one-year administration of the tests built using the SBAC item bank, new test forms were developed and new scales were established for the MAP ELA and Mathematics tests for the 2015–16 school year and a standard setting was conducted to establish cut scores that reflected content-based expectations of the Missouri Learning Standards (MLS), supported by the test data. These test forms were administered for two years: 2015–16 and 2016–17.

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 the Summer of 2018.

### 8.1 Standard Setting Process

The Missouri Department of Elementary and Secondary Education (DESE) and Data Recognition Corporation (DRC) conducted the MAP standard 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 standard 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 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.

The process of the standard setting 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)

## 8.2 Standard Setting Methodology

Prior to the standard setting workshop, DESE worked in collaboration with DRC and Missouri TAC to select the methodology to be used at the standard setting. 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 in over half of the states in the United States and abroad 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).

### 8.2.1 Standard Setting Workshop

During the standard 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  $\pm 1$  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 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 standard 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.

### **8.3 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 standard setting participants. At the standard setting, 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 and Mathematics. Tables 8.1 and 8.2 show the cut scores for Grades 3 through 8 ELA and Mathematics, respectively.

#### **8.5 Summary**

This chapter presented a brief overview of the standard setting process used for establishing the ELA and Mathematics cut scores after the 2017–18 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*, submitted to Missouri DESE.

The standard 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.

**Table 8.1: English Language Arts Cut Scores**

Grade	Cut Scores		
	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>
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: Mathematics Cut Scores**

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

## CHAPTER 9: EVIDENCE OF 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 and Mathematics 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. All analyses in this chapter are based on reportable census data.

Chapter 9 of this report demonstrates adherence to AERA, APA, & NCME (2014) Standards 1.13, 1.21, 2.0, 2.3, 2.13, 2.14, 2.16, and 2.19. 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 in the following steps of the test development process: 1) specification, 2) item writing, 3) review, 4) field testing, 5) test construction, and 6) item calibration (see Chapter 3 for more information on 1 through 5 and Chapter 6 for more information on calibration).

Construct-irrelevant variance refers to error variance that is caused by factors that are unrelated to the constructs measured by the test. For example, when tests are not administered under standardized conditions (e.g., one administration may be timed, but another administration may not be timed), differences in student performance related to different administration conditions may result. Careful specification of content and review of the items representing that content are first steps in minimizing construct-irrelevant variance. Then, empirical evidence, especially item-level data, is used to infer construct irrelevance.

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, as well as the alignment analysis are primary steps in the development process designed to ensure that content is appropriately represented.

### 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, DRC has calculated the reliability of each MAP test 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 SEM of the total score is discussed in Section 9.2.2. The subscore reliabilities and SEMs are presented in Section 9.4.2.

**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)

The raw score–based SEM is discussed in Section 9.2.2 and is presented in raw score units in Tables 9.1 and 9.2. The conditional SEM is discussed in Section 9.2.3 and is presented in scale score units in Tables 9.3 and 9.4. Note that the SEM associated with any type of score is not reported on Individual Student Reports for the MAP.

**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 based on Missouri student census 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 formula

$$\alpha = \frac{n}{n-1} \left[ 1 - \frac{\sum_{i=1}^n \sigma_i^2}{\sigma_x^2} \right], \quad (9.1)$$

where  $n$  is the number of items on the test,  $\sigma_i^2$  is the variance of item  $i$ , and  $\sigma_x^2$  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 and 9.2 for ELA and Mathematics, respectively. These reliability coefficients were computed using Missouri student census data. The reliability statistics ranged from 0.89 to 0.92 for all ELA forms. For Mathematics, the reliabilities ranged from 0.90 to 0.93 for all forms. These results indicate acceptable reliability coefficients for MAP tests.

The reliability statistics by subgroup are reported and discussed in Chapter 10.

### 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:

$$\text{SEM} = SD\sqrt{1 - R_{xx'}}, \quad (9.2)$$

where  $SD$  represents standard deviation of the raw score distribution and  $R_{xx'}$  is estimated by  $\hat{\alpha}$ , as expressed in Formula 9.1.

The SEM at the test level was computed in the raw score metric and is also presented in Tables 9.1 and 9.2 for ELA and Mathematics, respectively.

### 9.2.3 Conditional Standard Error of Measurement

In contrast to 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. We report the CSEM 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)

In further compliance with Standard 2.14, the CSEM of each cut score is reported in Tables 9.3 and 9.4.

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):

$$\text{CSEM}(\theta_i) = \frac{1}{\sqrt{I(\theta_i)}}, \quad (9.3)$$

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

$$I(\theta_i) = \sum_j \frac{p'_{ij}(\theta_i)^2}{p_{ij}(\theta_i)q_{ij}(\theta_i)}, \quad (9.4)$$

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 9.3 for ELA and Table 9.4 for Mathematics. The CSEM at the *Basic* cut score ranged from 11 to 13 points, the CSEM at the *Proficient* cut ranged from 9 to 11 points, and the CSEM at the *Advanced* cut ranged from 10 to 12 points for ELA across all grades and test forms. For Mathematics, the CSEM at the *Basic* cut ranged from 9 to 13 points, the CSEM at the *Proficient* cut ranged from 7 to 9 points, and the CSEM at the *Advanced* cut ranged from 6 to 9 points across all test forms for Grades 3 through 7. The CSEM for Mathematics Grade 8 was 16 points at the *Basic* cut score, 11 points at the *Proficient* cut score, and 10 points at the *Advanced* cut.

The CSEM curves, with cut scores indicated, for all ELA and Mathematics test forms are presented in Figures E1 through E32 in Appendix E. 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 E1 through E32 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 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  $(H + 1) \times (H + 1)$ , where  $H$  is the number of cut scores, such that two cut scores yield a  $3 \times 3$  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 ( $\mathbf{I}$ ) 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  $\theta_i$ , generate two sets of item responses using the item parameters from a test form, assuming that the same test form was administered twice to an examinee with the true ability  $\theta_i$ .
- 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 (Table 9.5) and on cut score (Table 9.6) are presented for the 2018 MAP ELA and Mathematics tests. As shown in Table 9.5, classification accuracy conditioned on performance level ranges from 0.61 to 0.99 and classification consistency conditioned on performance level ranges from 0.58 to 0.91 for all ELA performance levels, with two exceptions. Lower classification consistency values were found for students classified in the *Proficient* levels in Grade 7 (0.52 for Form A01 and 0.49 for Form B01). For Mathematics, classification accuracy conditioned on performance level ranges from 0.72 to 0.92 and classification consistency conditioned on performance level ranges from 0.63 to 0.87. 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 fewer 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 the 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 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*. Table 9.6 shows the classification accuracy and consistency estimates when conditioned on MAP cut points. The classification accuracy and consistency statistics were at or above 0.87 for all test forms and all cut points for ELA. The classification accuracy and consistency statistics were at or above 0.88 for all test forms and all cut points for Mathematics. 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 F. For ELA, with one exception, the classification accuracy conditioned on performance level ranged from 0.56 to 0.99 for any grade, test form or group. The classification consistency conditioned on performance level, also with one exception, ranged from 0.46 to 0.90 for all ELA grades, test forms, and groups (see Table F1). The two exceptions were low indices of classification consistency (0.09) and accuracy (0.25) for Asian/Pacific Islander group at the *Below Basic* level in Grade 8, Form A05. The distribution of scale scores and

performance levels for this group was investigated and it was found that no students were classified in the *Below Basic* level.

As shown in Table F2, the classification accuracy conditioned on the cut scores ranged from 0.88 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 0.70 to 0.99 for any grade, test form or group. The classification consistency conditioned on performance level ranged from 0.56 to 0.96 for all Mathematics grades, test forms, and groups of students (see Table F3). Also for Mathematics, the classification accuracy conditioned on the cut scores ranged from 0.89 to 0.99 and the classification consistency conditioned on the cut scores ranged from 0.83 to 0.99 for all grades, test forms, and groups (refer to Table F4).

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 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.

This Technical Report summarizes additional statistics that contribute to the evidence of construct-related validity (Cronbach's coefficient alpha reported previously in this section and item fit reported in Chapter 6) through 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 6, no items were flagged for poor model-data fit for ELA across all grade levels and only one item was flagged for Mathematics.

#### **9.3.1 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 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. It is common to have additional eigenvalues greater than 1.0, which may suggest the presence of other factors.

For all grades of ELA and Mathematics, 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 more than 18% of the test variance for ELA and Mathematics (see Tables 9.7 and 9.8). To further investigate the unidimensionality of the ELA and Mathematics tests, the ratio of the first eigenvalue to the second eigenvalue was explored (see Tables 9.7 and 9.8). These ratios show that the first eigenvalue is at least five times as large as the second eigenvalue for all test forms in both content areas. This substantial difference in magnitude indicates that one factor appears to be dominant and that the ELA and Mathematics 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 primarily determined by that ability. Construct-irrelevant variance, such as factual knowledge irrelevant to doing well in a subject, does not appear to create significant nuisance factors.

#### **9.4 Analyses by Reporting Categories**

Three sets of analyses were conducted at the reporting category level for ELA and Mathematics 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.

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.

#### 9.4.1 Correlations among Reporting Category Scores

In this section, we report the strength of the interrelationships among the reporting categories by computing correlation between them. Tables 9.9 and 9.10 report the uncorrected Pearson product-moment (PPM) correlation coefficients and the PPM corrected for attenuation (CAPPM). 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 9.9 and 9.10 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 0.43 to 0.74 for any pair of content strands. The lowest correlations were observed between Research, Writing, and Speaking and Listening reporting categories in Grades 4 and 8. These categories were measured by the relatively low number of items, and the forms were administered to lower numbers of students compared to other ELA grades. For Mathematics, the correlations ranged from 0.63 to 0.81 for any pair of reporting categories. 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 both ELA and Mathematics. So, caution should be used when comparing the PPM coefficients measuring the relationships between reporting categories to those measuring the relationships between content areas (Table 9.13). We expect to see a more modest relationship reported between the reporting categories as a consequence 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)

We can correct for the attenuation of the PPM statistically using Spearman's formula:

$$CAPPM = \frac{r_{xy}}{\sqrt{r_{xx}r_{yy}}}, \quad (9.5)$$

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 9.9 and 9.10, 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 9.9 and 9.10 are further evidence of the validity of the test construct. 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.

#### **9.4.2 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 9.11 and 9.12 for ELA and Mathematics, 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.

### **9.5 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 three measures: evaluation of correlations between the MAP content area scores, evaluation of correlations between the MAP cross-content area reporting category scale scores, and comparisons of the percentages of students classified in different proficiency levels (impact data) on the state assessment and on the NAEP assessment.

#### **9.5.1 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.

To assess the relationship between the MAP content area scores, the correlations between the ELA and Mathematics scale scores for students who took both subject area tests in 2018 were computed and examined for the total student population and by subgroups. These correlations are based on the reportable census data and the results are shown in Table 9.13. The correlation coefficients ranged from 0.73 (in Grade 5) to 0.78 (in Grade 3) for the total population of students who took the tests in both content areas. The correlations between the ELA and Mathematics scores for male or female groups ranged from 0.73 to 0.78 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 0.65 to 0.80. The highest correlations by ethnic group were 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 correlation coefficients between the content area scores were not computed by accommodation use because the accommodation use status is not consistent across ELA and Mathematics 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 and Mathematics 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.

### **9.5.2 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 constructs (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. These results are presented in Table 9.14.

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 (correlations coefficients ranging from 0.50 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 0.61). It is hypothesized that the stronger relationship between the ELA Reading scores and Mathematics reporting category scores may be so 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 correlation coefficients suggest that the ELA content category scores and the Mathematics content category scores are moderately related. This, in turn, indicates that the specific ELA and Mathematics skills measured by the tests are different in the two content areas, supporting the evidence that the two assessments measure two different constructs.

### **9.5.3 Comparison of the Missouri 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 assessment, which occurred in Spring 2017.

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 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 last Reading and Mathematics NAEP assessments in Spring 2017. 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 and Mathematics assessments and the corresponding NAEP assessments are presented in Table 9.15.

As presented in Table 9.15, the percentages of students classified in the *Proficient* and *Basic* performance levels on the NAEP Reading assessment and on the MAP ELA were comparable within 5% or less for both grades. Higher percentages of students were classified in the *Advanced* performance level and lower percentages of students were classified in the *Below Basic* performance level on the MAP ELA compared to NAEP Reading for both grades (differences between 10% and 19%, depending on the grade and performance level).

Looking at the percentages of students classified as *Proficient* or above, higher percentages of students were classified in these two combined performance levels on the MAP ELA in both grades compared to the NAEP Reading (differences of 13% 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 on the NAEP assessments compared to the MAP Mathematics assessments (differences between 6% and 14%) 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 3% 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 (difference of 6%). There was no practical difference in the percentage of students classified as *Proficient* or above on the MAP Mathematics compared to the NAEP Mathematics for Grade 8.

It should be noted that the Spring 2017 Reading and Mathematics NAEP *Proficient* cut scores were used benchmarks during the Missouri ELA and Mathematics standard setting in Summer 2018. 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). While the standard setting participants were free to deviate from the benchmarks while placing their bookmarks in the ordered item booklets in consideration of the Missouri Learning Standards (MLS) performance level descriptors, they were asked to consider placing their *Proficient* bookmark within a *Proficient* range defined as the benchmark cut score +/-1 CSEM around this cut score.

The Missouri impact data (percentage of students at or above the *Proficient* cut score) achieved after the standard 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 and Mathematics 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.

## 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. In addition, the relationship between the MAP scale scores and other variables was explored and validated through the measures of correlations of the ELA and Mathematics scores for the total population and by subgroups, as well as comparisons of the student performance on the MAP with the performance on the NAEP. These analyses are in alignment with multiple best practices of the testing industry and support the following standards from the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 2014):

- 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 2.13—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.

**Table 9.1: Test Reliability, English Language Arts**

Grade	Form	Number of Items	Number of Score Points	Cronbach's Alpha	SEM	N-Count
3	A01	50	56	0.91	3.34	43,864
	B01	49	56	0.91	3.30	23,916
4	A01	45	56	0.91	3.08	33,536
	A04	45	56	0.90	2.90	8,118
	A07	45	56	0.89	3.05	2,655
	B01	45	56	0.91	2.95	11,624
	B02	45	56	0.90	2.98	5,414
	B04	45	56	0.89	2.85	8,107
5	A01	49	56	0.92	3.26	44,784
	B01	49	56	0.91	3.19	24,928
6	A01	46	52	0.90	3.17	41,880
	B01	46	52	0.89	3.17	26,024
7	A01	47	52	0.91	3.18	38,528
	B01	47	52	0.90	3.14	28,252
8	A01	43	56	0.91	3.24	25,844
	A03	43	56	0.90	3.21	7,794
	A05	43	56	0.90	3.18	7,762
	B01	43	56	0.91	3.25	9,388
	B02	43	56	0.90	3.19	7,696
	B04	43	56	0.90	3.12	7,714

**Table 9.2: Test Reliability, Mathematics**

Grade	Form	Number of Items	Number of Score Points	Cronbach's Alpha	SEM	N-Count
3	A01	47	48	0.93	2.86	47,160
	B01	47	48	0.92	2.85	20,816
4	A01	47	48	0.93	2.95	47,608
	B01	47	48	0.92	2.96	22,084
5	A01	48	48	0.92	2.96	48,120
	B01	48	48	0.92	2.98	21,764
6	A01	52	54	0.93	3.17	45,184
	B01	52	54	0.93	3.15	22,752
7	A01	52	54	0.93	3.15	41,432
	B01	52	54	0.93	3.14	24,580
8	A01	51	54	0.91	3.16	35,584
	B01	51	54	0.90	3.21	18,892

**Table 9.3: Conditional Standard Error of Measurement at the *Basic, Proficient & Advanced* Cut Scores, English Language Arts**

Grade	Form	<i>Basic</i>		<i>Proficient</i>		<i>Advanced</i>	
		Cut Score	CSEM	Cut Score	CSEM	Cut Score	CSEM
3	A01	331	11	364	11	395	11
	B01		11		10		12
4	A01	337	12	388	10	419	11
	A04		12		10		12
	A07		12		10		11
	B01		12		10		11
	B02		13		10		11
	B04		12		10		11
5	A01	351	11	403	9	431	11
	B01		11		10		12
6	A01	371	11	413	9	438	10
	B01		11		9		11
7	A01	384	12	435	10	456	10
	B01		12		10		11
8	A01	393	12	443	9	476	11
	A03		13		10		11
	A05		13		10		11
	B01		11		10		12
	B02		12		10		12
	B04		11		10		11

**Table 9.4: Conditional Standard Error of Measurement at the *Basic, Proficient & Advanced* Cut Scores, Mathematics**

Grade	Form	<i>Basic</i>		<i>Proficient</i>		<i>Advanced</i>	
		Cut Score	CSEM	Cut Score	CSEM	Cut Score	CSEM
3	A01	326	13	362	9	390	9
	B01		12		9		9
4	A01	358	11	387	8	413	8
	B01		11		8		8
5	A01	377	10	410	7	435	7
	B01		11		7		7
6	A01	388	9	417	7	438	6
	B01		9		7		6
7	A01	394	12	435	8	462	8
	B01		12		8		8
8	A01	420	16	468	11	506	10
	B01		16		11		10

**Table 9.5: Classification Accuracy and Consistency Conditioned on Level of Performance**

Content Area	Grade	Form	Accuracy				Consistency			
			<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>	<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>
English Language Arts	3	A01	0.88	0.75	0.69	0.87	0.83	0.65	0.63	0.79
		B01	0.94	0.69	0.61	0.99	0.89	0.72	0.69	0.91
	4	A01	0.84	0.84	0.72	0.90	0.78	0.79	0.64	0.79
		A04	0.84	0.81	0.72	0.88	0.76	0.77	0.62	0.78
		A07	0.81	0.82	0.72	0.89	0.75	0.75	0.63	0.78
		B01	0.85	0.81	0.73	0.88	0.79	0.76	0.64	0.75
		B02	0.86	0.82	0.72	0.89	0.76	0.74	0.65	0.76
		B04	0.84	0.81	0.73	0.88	0.76	0.75	0.65	0.75
	5	A01	0.84	0.86	0.69	0.86	0.78	0.80	0.58	0.79
		B01	0.92	0.83	0.64	0.97	0.82	0.83	0.65	0.86
	6	A01	0.86	0.79	0.72	0.84	0.79	0.75	0.58	0.77
		B01	0.84	0.79	0.71	0.84	0.71	0.73	0.59	0.78
	7	A01	0.82	0.83	0.63	0.86	0.79	0.77	0.52	0.79
		B01	0.83	0.81	0.61	0.87	0.79	0.77	0.49	0.80
	8	A01	0.86	0.83	0.77	0.86	0.77	0.79	0.70	0.79
		A03	0.85	0.82	0.76	0.87	0.74	0.76	0.69	0.79
		A05	0.86	0.83	0.75	0.86	0.74	0.77	0.67	0.79
		B01	0.87	0.82	0.75	0.84	0.76	0.77	0.64	0.77
		B02	0.86	0.82	0.74	0.86	0.75	0.75	0.64	0.78
		B04	0.86	0.82	0.74	0.84	0.74	0.77	0.64	0.78
Mathematics	3	A01	0.87	0.75	0.77	0.90	0.84	0.67	0.66	0.83
		B01	0.86	0.75	0.76	0.90	0.82	0.69	0.67	0.82
	4	A01	0.90	0.73	0.74	0.91	0.83	0.65	0.67	0.81
		B01	0.88	0.72	0.74	0.92	0.81	0.63	0.66	0.84
	5	A01	0.85	0.79	0.78	0.91	0.82	0.72	0.71	0.82
		B01	0.84	0.78	0.77	0.89	0.79	0.71	0.66	0.81
	6	A01	0.90	0.77	0.74	0.90	0.84	0.69	0.66	0.83
		B01	0.90	0.79	0.75	0.91	0.84	0.71	0.67	0.87
	7	A01	0.88	0.81	0.77	0.89	0.83	0.75	0.69	0.82
		B01	0.87	0.80	0.78	0.89	0.80	0.75	0.71	0.83
	8	A01	0.87	0.79	0.76	0.89	0.82	0.72	0.67	0.77
		B01	0.86	0.79	0.78	0.89	0.80	0.71	0.69	0.79

**Table 9.6: Classification Accuracy and Consistency at Performance Cut Points**

Content Area	Grade	Form	Accuracy			Consistency		
			<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>	<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>
English Language Arts	3	A01	0.94	0.92	0.93	0.91	0.89	0.91
		B01	0.96	0.93	0.90	0.95	0.92	0.94
	4	A01	0.95	0.93	0.94	0.93	0.90	0.91
		A04	0.97	0.91	0.91	0.96	0.88	0.88
		A07	0.97	0.91	0.92	0.96	0.87	0.88
		B01	0.96	0.91	0.93	0.95	0.88	0.90
		B02	0.97	0.91	0.92	0.96	0.87	0.88
		B04	0.97	0.92	0.91	0.96	0.88	0.88
	5	A01	0.95	0.93	0.93	0.94	0.90	0.90
		B01	0.97	0.94	0.91	0.96	0.92	0.91
	6	A01	0.95	0.92	0.93	0.93	0.89	0.90
		B01	0.95	0.92	0.92	0.93	0.88	0.89
	7	A01	0.94	0.93	0.93	0.92	0.90	0.90
		B01	0.95	0.91	0.92	0.94	0.88	0.89
	8	A01	0.95	0.93	0.95	0.93	0.90	0.93
		A03	0.96	0.92	0.93	0.94	0.89	0.91
		A05	0.97	0.92	0.93	0.95	0.89	0.90
		B01	0.95	0.92	0.93	0.93	0.89	0.91
		B02	0.96	0.92	0.93	0.95	0.88	0.90
		B04	0.96	0.92	0.92	0.94	0.89	0.89
Mathematics	3	A01	0.93	0.94	0.95	0.91	0.91	0.92
		B01	0.94	0.93	0.94	0.93	0.90	0.91
	4	A01	0.93	0.94	0.94	0.90	0.91	0.93
		B01	0.94	0.93	0.94	0.91	0.90	0.92
	5	A01	0.93	0.94	0.96	0.90	0.91	0.94
		B01	0.94	0.93	0.95	0.91	0.89	0.93
	6	A01	0.93	0.94	0.95	0.90	0.92	0.94
		B01	0.94	0.94	0.95	0.91	0.92	0.94
	7	A01	0.93	0.94	0.96	0.90	0.92	0.95
		B01	0.93	0.94	0.96	0.91	0.92	0.94
	8	A01	0.91	0.94	0.97	0.88	0.91	0.96
		B01	0.91	0.93	0.97	0.88	0.91	0.96

**Table 9.7: Principal Component Analysis for English Language Arts**

Grade	Form	Components	Eigenvalue	Percent of Variance Explained	Cumulative Percent of Variance Explained
3	A01	First Component	9.75	19.49	19.49
		Second Component	1.52	3.05	22.54
		Ratio (First/Second)	6.40		
	B01	First Component	10.02	20.46	20.46
		Second Component	1.54	3.13	23.59
		Ratio (First/Second)	6.53		
4	A01	First Component	9.85	21.90	21.90
		Second Component	1.52	3.39	25.29
		Ratio (First/Second)	6.46		
	A04	First Component	8.97	19.93	19.93
		Second Component	1.63	3.63	23.56
	A07	First Component	8.75	19.44	19.44
		Second Component	1.66	3.69	23.12
B01	First Component	9.26	20.57	20.57	
	Second Component	1.60	3.56	24.13	
	Ratio (First/Second)	5.78			
B02	First Component	8.71	19.34	19.34	
	Second Component	1.70	3.77	23.12	
B04	First Component	8.42	18.70	18.70	
	Second Component	1.64	3.63	22.34	
5	A01	First Component	10.62	21.67	21.67
		Second Component	1.50	3.06	24.73
		Ratio (First/Second)	7.09		
	B01	First Component	9.52	19.43	19.43
Second Component		1.46	2.98	22.42	
		Ratio (First/Second)	6.51		

**Table 9.7: Principal Component Analysis for English Language Arts (cont.)**

Grade	Form	Components	Eigenvalue	Percent of Variance Explained	Cumulative Percent of Variance Explained
6	A01	First Component	8.80	19.12	19.12
		Second Component	1.22	2.64	21.77
		Ratio (First/Second)	7.24		
	B01	First Component	8.41	18.28	18.28
		Second Component	1.17	2.54	20.82
		Ratio (First/Second)	7.19		
7	A01	First Component	9.70	20.63	20.63
		Second Component	1.24	2.65	23.28
		Ratio (First/Second)	7.79		
	B01	First Component	8.99	19.13	19.13
		Second Component	1.32	2.81	21.94
		Ratio (First/Second)	6.81		
8	A01	First Component	9.66	22.47	22.47
		Second Component	1.50	3.50	25.97
		Ratio (First/Second)	6.43		
	A03	First Component	8.83	20.54	20.54
		Second Component	1.54	3.57	24.11
		Ratio (First/Second)	5.75		
	A05	First Component	8.85	20.59	20.59
	Second Component	1.60	3.72	24.30	
	Ratio (First/Second)	5.54			
B01	First Component	9.87	22.96	22.96	
	Second Component	1.53	3.56	26.51	
	Ratio (First/Second)	6.45			
B02	First Component	9.17	21.33	21.33	
	Second Component	1.46	3.39	24.72	
	Ratio (First/Second)	6.29			
B04	First Component	9.25	21.51	21.51	
	Second Component	1.52	3.53	25.04	
	Ratio (First/Second)	6.09			

**Table 9.8: Principal Component Analysis for Mathematics**

Grade	Form	Components	Eigenvalue	Percent of Variance Explained	Cumulative Percent of Variance Explained
3	A01	First Component	11.38	24.22	24.22
		Second Component	1.56	3.32	27.54
		Ratio (First/Second)	7.29		
	B01	First Component	10.62	22.59	22.59
		Second Component	1.65	3.50	26.09
		Ratio (First/Second)	6.45		
4	A01	First Component	11.09	23.60	23.60
		Second Component	1.58	3.36	26.95
		Ratio (First/Second)	7.03		
	B01	First Component	10.71	22.78	22.78
		Second Component	1.63	3.46	26.24
		Ratio (First/Second)	6.58		
5	A01	First Component	11.11	23.14	23.14
		Second Component	1.61	3.36	26.50
		Ratio (First/Second)	6.90		
	B01	First Component	10.42	21.70	21.70
		Second Component	1.56	3.26	24.96
		Ratio (First/Second)	6.66		
6	A01	First Component	12.10	23.26	23.26
		Second Component	1.97	3.78	27.04
		Ratio (First/Second)	6.15		
	B01	First Component	12.39	23.83	23.83
		Second Component	1.87	3.60	27.43
		Ratio (First/Second)	6.62		
7	A01	First Component	12.04	23.15	23.15
		Second Component	1.83	3.52	26.66
		Ratio (First/Second)	6.58		
	B01	First Component	11.91	22.90	22.90
		Second Component	1.76	3.38	26.28
		Ratio (First/Second)	6.78		
8	A01	First Component	9.61	18.84	18.84
		Second Component	1.73	3.40	22.24
		Ratio (First/Second)	5.55		
	B01	First Component	9.23	18.10	18.10
		Second Component	1.58	3.09	21.20
		Ratio (First/Second)	5.85		

**Table 9.9: 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	A01	1	Reading	22	.	0.92	0.94	0.91
		2	Research	7	0.63	.	0.96	0.95
		3	Writing	13	0.72	0.62	.	0.93
		4	Speaking and Listening	8	0.69	0.61	0.67	.
3	B01	1	Reading	22	.	0.92	0.94	0.87
		2	Research	6	0.63	.	0.95	0.88
		3	Writing	13	0.72	0.60	.	0.88
		4	Speaking and Listening	8	0.69	0.57	0.63	.
4	A01	1	Reading	23	.	0.94	0.84	0.91
		2	Research	7	0.65	.	0.83	0.90
		3	Writing	7	0.67	0.53	.	0.73
		4	Speaking and Listening	8	0.68	0.54	0.51	.
4	A04	1	Reading	23	.	0.92	0.78	0.91
		2	Research	7	0.62	.	0.80	0.89
		3	Writing	7	0.60	0.48	.	0.73
		4	Speaking and Listening	8	0.65	0.50	0.47	.
4	A07	1	Reading	23	.	0.92	0.77	0.90
		2	Research	7	0.61	.	0.81	0.86
		3	Writing	7	0.59	0.49	.	0.68
		4	Speaking and Listening	8	0.62	0.47	0.43	.
4	B01	1	Reading	23	.	0.94	0.83	0.92
		2	Research	7	0.63	.	0.84	0.93
		3	Writing	7	0.64	0.52	.	0.78
		4	Speaking and Listening	8	0.68	0.55	0.53	.
4	B02	1	Reading	23	.	0.94	0.77	0.93
		2	Research	7	0.61	.	0.79	0.96
		3	Writing	7	0.59	0.47	.	0.74
		4	Speaking and Listening	8	0.68	0.54	0.49	.
4	B04	1	Reading	23	.	0.91	0.80	0.92
		2	Research	7	0.58	.	0.78	0.90
		3	Writing	7	0.60	0.45	.	0.73
		4	Speaking and Listening	8	0.66	0.50	0.48	.
5	A01	1	Reading	22	.	0.91	0.96	0.92
		2	Research	6	0.69	.	0.92	0.90
		3	Writing	13	0.74	0.63	.	0.92
		4	Speaking and Listening	8	0.69	0.60	0.63	.
5	B01	1	Reading	21	.	0.93	0.93	0.90
		2	Research	6	0.65	.	0.95	0.93
		3	Writing	14	0.70	0.61	.	0.89
		4	Speaking and Listening	8	0.67	0.59	0.61	.

**Table 9.9: 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
6	A01	1	Reading	24	.	0.96	0.96	0.94
		2	Research	7	0.66	.	0.98	0.93
		3	Writing	7	0.66	0.55	.	0.93
		4	Speaking and Listening	8	0.67	0.55	0.54	.
6	B01	1	Reading	24	.	0.94	0.96	0.93
		2	Research	6	0.58	.	0.95	0.90
		3	Writing	8	0.63	0.48	.	0.92
		4	Speaking and Listening	8	0.71	0.52	0.56	.
7	A01	1	Reading	25	.	0.95	0.95	0.94
		2	Research	7	0.70	.	0.99	0.95
		3	Writing	7	0.65	0.58	.	0.94
		4	Speaking and Listening	8	0.71	0.61	0.57	.
7	B01	1	Reading	24	.	0.93	0.95	0.92
		2	Research	7	0.68	.	0.98	0.92
		3	Writing	8	0.65	0.59	.	0.91
		4	Speaking and Listening	8	0.67	0.58	0.55	.
8	A01	1	Reading	23	.	0.98	0.85	0.93
		2	Research	7	0.69	.	0.90	0.99
		3	Writing	5	0.69	0.60	.	0.81
		4	Speaking and Listening	8	0.63	0.55	0.53	.
8	A03	1	Reading	23	.	0.98	0.81	0.93
		2	Research	7	0.68	.	0.84	0.99
		3	Writing	5	0.63	0.54	.	0.76
		4	Speaking and Listening	8	0.61	0.53	0.47	.
8	A05	1	Reading	23	.	1.00	0.77	0.91
		2	Research	7	0.68	.	0.86	0.98
		3	Writing	5	0.61	0.56	.	0.73
		4	Speaking and Listening	8	0.61	0.53	0.46	.
8	B01	1	Reading	24	.	0.96	0.83	0.92
		2	Research	6	0.70	.	0.86	0.96
		3	Writing	5	0.66	0.57	.	0.85
		4	Speaking and Listening	8	0.61	0.55	0.52	.
8	B02	1	Reading	24	.	0.96	0.77	0.93
		2	Research	6	0.69	.	0.82	0.99
		3	Writing	5	0.60	0.54	.	0.83
		4	Speaking and Listening	8	0.57	0.51	0.47	.
8	B04	1	Reading	24	.	0.94	0.75	0.91
		2	Research	6	0.69	.	0.78	0.95
		3	Writing	5	0.59	0.52	.	0.78
		4	Speaking and Listening	8	0.58	0.51	0.45	.

**Table 9.10: 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	A01	1	Number Sense and Operations in Base Ten	10	.	0.94	1.00	0.99
		2	Number Sense and Operations in Fractions	9	0.72	.	0.94	0.96
		3	Relationships and Algebraic Thinking	14	0.81	0.73	.	0.97
		4	Geometry and Measurement & Data and Statistics	14	0.75	0.71	0.75	.
3	B01	1	Number Sense and Operations in Base Ten	10	.	0.93	1.00	1.00
		2	Number Sense and Operations in Fractions	9	0.69	.	0.92	0.94
		3	Relationships and Algebraic Thinking	14	0.79	0.70	.	0.99
		4	Geometry and Measurement & Data and Statistics	14	0.74	0.68	0.75	.
4	A01	1	Number Sense and Operations in Base Ten	14	.	0.97	1.00	0.96
		2	Number Sense and Operations in Fractions	11	0.78	.	0.98	0.97
		3	Relationships and Algebraic Thinking	9	0.72	0.70	.	0.98
		4	Geometry and Measurement & Data and Statistics	13	0.75	0.75	0.68	.
4	B01	1	Number Sense and Operations in Base Ten	14	.	0.96	0.99	0.96
		2	Number Sense and Operations in Fractions	11	0.76	.	0.97	0.97
		3	Relationships and Algebraic Thinking	9	0.73	0.72	.	0.97
		4	Geometry and Measurement & Data and Statistics	13	0.73	0.74	0.69	.

**Table 9.10: 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	A01	1	Number Sense and Operations in Base Ten	9	.	0.96	0.96	0.97
		2	Number Sense and Operations in Fractions	13	0.71	.	0.90	0.94
		3	Relationships and Algebraic Thinking	9	0.69	0.66	.	0.96
		4	Geometry and Measurement & Data and Statistics	17	0.75	0.74	0.74	.
5	B01	1	Number Sense and Operations in Base Ten	9	.	0.96	0.97	0.97
		2	Number Sense and Operations in Fractions	13	0.70	.	0.92	0.95
		3	Relationships and Algebraic Thinking	9	0.67	0.66	.	0.96
		4	Geometry and Measurement & Data and Statistics	17	0.73	0.74	0.71	.
6	A01	1	Ratios and Proportional Relationships	9	.	0.98	0.98	0.95
		2	Number Sense and Operations	11	0.74	.	0.99	0.96
		3	Expressions, Equations and Inequalities	20	0.77	0.78	.	0.97
		4	Geometry and Measurement & Data Analysis, Statistics and Probability	12	0.71	0.72	0.75	.
6	B01	1	Ratios and Proportional Relationships	9	.	0.98	0.98	0.96
		2	Number Sense and Operations	11	0.75	.	0.99	0.97
		3	Expressions, Equations and Inequalities	20	0.77	0.80	.	0.97
		4	Geometry and Measurement & Data Analysis, Statistics and Probability	12	0.71	0.74	0.76	.

**Table 9.10: 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	A01	1	Ratios and Proportional Relationships	12	.	0.97	0.98	0.97
		2	Number Sense and Operations	10	0.76	.	1.00	0.99
		3	Expressions, Equations and Inequalities	17	0.78	0.77	.	1.00
		4	Geometry and Measurement & Data Analysis, Statistics and Probability	13	0.73	0.73	0.75	.
7	B01	1	Ratios and Proportional Relationships	12	.	0.98	0.99	0.97
		2	Number Sense and Operations	10	0.76	.	1.00	0.98
		3	Expressions, Equations and Inequalities	17	0.79	0.77	.	0.99
		4	Geometry and Measurement & Data Analysis, Statistics and Probability	13	0.73	0.71	0.74	.
8	A01	1	Number Sense and Operations & Expressions, Equations and Inequalities	26	.	0.95	0.97	
		2	Geometry and Measurement & Data Analysis, Statistics and Probability	16	0.75	.	0.97	
		3	Functions	9	0.71	0.65	.	
8	B01	1	Number Sense and Operations & Expressions, Equations and Inequalities	26	.	0.96	0.96	
		2	Geometry and Measurement & Data Analysis, Statistics and Probability	16	0.75	.	0.97	
		3	Functions	9	0.68	0.63	.	

**Table 9.11: Mean, Standard Deviation, and Standard Error of Measurement of English Language Arts Reporting Categories**

Grade	Form	Reporting Category	Number of Items	Number of Score Points	N Count	Mean	Std. Dev.	Cronbach's Alpha	SEM
3	A01	1	22	26	43,864	13.44	5.55	0.81	2.41
		2	7	8	43,856	4.98	1.84	0.58	1.19
		3	13	14	43,856	8.61	3.00	0.72	1.58
		4	8	8	43,856	5.28	2.12	0.71	1.15
	B01	1	22	26	23,916	14.82	5.86	0.84	2.36
		2	6	8	23,904	5.00	1.87	0.57	1.23
		3	13	14	23,904	8.75	2.87	0.70	1.57
		4	8	8	23,900	5.91	2.05	0.74	1.05
4	A01	1	23	26	33,536	15.32	5.61	0.86	2.13
		2	7	8	33,528	4.81	1.69	0.55	1.13
		3	7	14	33,528	7.87	2.78	0.74	1.42
		4	8	8	33,520	5.25	1.92	0.64	1.14
	A04	1	23	26	8,118	16.87	5.25	0.84	2.10
		2	7	8	8,116	5.16	1.61	0.53	1.10
		3	7	14	8,116	8.97	2.08	0.69	1.15
		4	8	8	8,114	5.68	1.75	0.60	1.11
	A07	1	23	26	2,655	17.03	5.19	0.84	2.09
		2	7	8	2,654	5.14	1.60	0.53	1.10
		3	7	14	2,654	8.35	2.63	0.71	1.42
		4	8	8	2,654	5.75	1.69	0.57	1.11
	B01	1	23	26	11,624	17.48	5.02	0.84	2.00
		2	7	8	11,624	4.90	1.64	0.53	1.12
		3	7	14	11,624	8.07	2.44	0.72	1.30
		4	8	8	11,618	4.63	2.08	0.66	1.22
	B02	1	23	26	5,414	18.37	4.77	0.84	1.93
		2	7	8	5,414	5.13	1.58	0.50	1.11
		3	7	14	5,414	8.17	2.66	0.71	1.44
		4	8	8	5,411	5.02	1.96	0.63	1.20
	B04	1	23	26	8,107	18.34	4.70	0.83	1.94
		2	7	8	8,106	5.12	1.56	0.50	1.11
		3	7	14	8,106	8.56	2.15	0.69	1.21
		4	8	8	8,106	5.01	1.96	0.63	1.20
5	A01	1	22	26	44,784	15.97	5.88	0.85	2.27
		2	6	8	44,776	6.01	1.85	0.67	1.07
		3	13	14	44,776	7.80	3.12	0.71	1.67
		4	8	8	44,768	4.92	2.04	0.67	1.18
	B01	1	21	26	24,928	16.11	5.21	0.83	2.16
		2	6	8	24,912	5.73	1.94	0.59	1.24
		3	14	14	24,912	8.18	2.90	0.69	1.62
		4	8	8	24,912	5.67	1.87	0.67	1.08

**Table 9.11: Mean, Standard Deviation, and Standard Error of Measurement of English Language Arts Reporting Categories (cont.)**

Grade	Form	Reporting Category	Number of Items	Number of Score Points	N Count	Mean	Std. Dev.	Cronbach's Alpha	SEM
6	A01	1	24	28	41,880	16.62	5.73	0.83	2.35
		2	7	8	41,872	5.16	1.89	0.58	1.23
		3	7	8	41,872	4.46	1.82	0.56	1.21
		4	8	8	41,856	4.22	1.96	0.61	1.22
	B01	1	24	28	26,024	17.31	5.48	0.81	2.36
		2	6	8	26,004	4.73	1.67	0.47	1.21
		3	8	8	26,004	4.31	1.83	0.53	1.26
		4	8	8	26,004	4.94	2.12	0.70	1.16
7	A01	1	25	28	38,528	16.41	6.12	0.86	2.31
		2	7	8	38,520	4.88	1.94	0.63	1.18
		3	7	8	38,520	4.34	1.95	0.55	1.31
		4	8	8	38,520	4.32	2.12	0.66	1.24
	B01	1	24	28	28,252	17.73	5.66	0.83	2.32
		2	7	8	28,236	4.36	2.03	0.63	1.23
		3	8	8	28,236	4.11	1.92	0.57	1.26
		4	8	8	28,236	5.58	1.85	0.64	1.12
8	A01	1	23	28	25,844	16.69	5.95	0.86	2.26
		2	7	8	25,828	3.85	2.03	0.57	1.33
		3	5	12	25,828	7.29	2.63	0.79	1.22
		4	8	8	25,816	4.48	1.87	0.54	1.27
	A03	1	23	28	7,794	18.08	5.55	0.84	2.21
		2	7	8	7,794	4.28	2.01	0.57	1.33
		3	5	12	7,794	8.51	2.45	0.73	1.27
		4	8	8	7,794	4.89	1.79	0.52	1.25
	A05	1	23	28	7,762	18.29	5.51	0.84	2.20
		2	7	8	7,759	4.37	2.00	0.56	1.32
		3	5	12	7,759	7.82	2.43	0.75	1.21
		4	8	8	7,761	4.93	1.81	0.53	1.24
	B01	1	24	28	9,388	17.47	5.99	0.86	2.21
		2	6	8	9,384	4.10	2.13	0.62	1.31
		3	5	12	9,384	7.95	2.54	0.72	1.35
		4	8	8	9,382	4.63	1.84	0.52	1.27
	B02	1	24	28	7,696	18.28	5.71	0.86	2.17
		2	6	8	7,694	4.33	2.09	0.60	1.32
		3	5	12	7,694	7.63	2.37	0.72	1.26
		4	8	8	7,692	4.94	1.70	0.44	1.27
B04	1	24	28	7,714	18.22	5.74	0.86	2.17	
	2	6	8	7,710	4.32	2.12	0.61	1.31	
	3	5	12	7,710	7.32	2.15	0.73	1.13	
	4	8	8	7,709	4.92	1.74	0.47	1.27	

**Table 9.12: Mean, Standard Deviation, and Standard Error of Measurement of Mathematics Reporting Categories**

Grade	Form	Reporting Category	Number of Items	Number of Score Points	N Count	Mean	Std. Dev.	Cronbach's Alpha	SEM
3	A01	1	10	10	47,160	5.24	2.80	0.79	1.29
		2	9	9	47,160	5.42	2.39	0.74	1.22
		3	14	14	47,160	6.92	3.51	0.81	1.51
		4	14	15	47,160	7.92	3.21	0.74	1.64
	B01	1	10	10	20,816	5.56	2.67	0.77	1.27
		2	9	9	20,816	5.72	2.20	0.71	1.18
		3	14	14	20,816	7.65	3.43	0.80	1.55
		4	14	15	20,816	7.94	3.10	0.72	1.64
4	A01	1	14	15	47,608	7.39	3.93	0.81	1.71
		2	11	11	47,608	5.41	2.98	0.80	1.35
		3	9	9	47,608	4.48	2.17	0.65	1.29
		4	13	13	47,608	6.81	2.94	0.74	1.49
	B01	1	14	15	22,084	8.01	3.76	0.79	1.71
		2	11	11	22,084	6.00	2.99	0.80	1.35
		3	9	9	22,084	4.86	2.28	0.69	1.28
		4	13	13	22,084	7.26	2.89	0.73	1.51
5	A01	1	9	9	48,120	4.74	2.39	0.73	1.25
		2	13	13	48,120	5.36	3.11	0.75	1.56
		3	9	9	48,120	4.52	2.38	0.72	1.27
		4	17	17	48,120	8.02	4.17	0.82	1.76
	B01	1	9	9	21,764	5.16	2.33	0.71	1.25
		2	13	13	21,764	5.70	3.15	0.75	1.57
		3	9	9	21,764	4.71	2.28	0.68	1.30
		4	17	17	21,764	8.28	4.02	0.81	1.76
6	A01	1	9	9	45,184	2.99	2.36	0.75	1.18
		2	11	11	45,184	4.96	2.82	0.76	1.38
		3	20	22	45,184	10.70	5.16	0.83	2.16
		4	12	12	45,168	5.61	2.78	0.74	1.42
	B01	1	9	9	22,752	3.27	2.39	0.75	1.21
		2	11	11	22,752	5.38	2.91	0.78	1.35
		3	20	22	22,752	11.16	5.20	0.83	2.15
		4	12	12	22,740	5.97	2.77	0.75	1.39

**Table 9.12: Mean, Standard Deviation, and Standard Error of Measurement of Mathematics Reporting Categories (cont.)**

Grade	Form	Reporting Category	Number of Items	Number of Score Points	N Count	Mean	Std. Dev.	Cronbach's Alpha	SEM
7	A01	1	12	13	41,408	6.99	3.46	0.80	1.56
		2	10	10	41,432	4.02	2.61	0.76	1.28
		3	17	18	41,432	8.11	4.05	0.79	1.85
		4	13	13	41,408	5.46	2.86	0.72	1.53
	B01	1	12	13	24,572	7.19	3.42	0.80	1.52
		2	10	10	24,580	4.31	2.64	0.76	1.30
		3	17	18	24,580	8.63	4.08	0.79	1.85
		4	13	13	24,572	5.88	2.82	0.70	1.54
8	A01	1	26	29	35,584	10.91	6.04	0.86	2.30
		2	16	16	35,560	6.32	3.29	0.73	1.72
		3	9	9	35,560	4.01	2.13	0.63	1.29
	B01	1	26	29	18,892	11.46	6.06	0.85	2.33
		2	16	16	18,880	6.76	3.24	0.71	1.75
		3	9	9	18,880	3.98	2.07	0.60	1.32

**Table 9.13: Inter-Correlation of English Language Arts and Mathematics Scale Scores**

Grade	Total Population	Gender		Race/Ethnicity					
		Female	Male	White	Asian/Pacific Islander	Black (not Hispanic)	Hispanic	American Indian	Other
3	0.78	0.78	0.78	0.77	0.78	0.73	0.75	0.77	0.78
4	0.74	0.73	0.74	0.72	0.76	0.67	0.71	0.72	0.72
5	0.73	0.73	0.73	0.72	0.75	0.65	0.71	0.66	0.72
6	0.76	0.76	0.76	0.75	0.77	0.70	0.73	0.73	0.75
7	0.75	0.76	0.76	0.74	0.79	0.71	0.73	0.70	0.75
8	0.74	0.74	0.74	0.72	0.80	0.69	0.72	0.72	0.74

**Table 9.14: 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	0.60	0.49	0.59	0.51
	Number Sense and Operations in Fractions	0.57	0.46	0.56	0.48
	Relationships and Algebraic Thinking	0.61	0.50	0.59	0.52
	Geometry and Measurement & Data and Statistics	0.63	0.51	0.61	0.53
4	Number Sense and Operations in Base Ten	0.60	0.49	0.49	0.49
	Number Sense and Operations in Fractions	0.57	0.46	0.46	0.46
	Relationships and Algebraic Thinking	0.56	0.45	0.45	0.45
	Geometry and Measurement & Data and Statistics	0.58	0.47	0.47	0.47
5	Number Sense and Operations in Base Ten	0.53	0.41	0.51	0.44
	Number Sense and Operations in Fractions	0.50	0.40	0.48	0.41
	Relationships and Algebraic Thinking	0.57	0.44	0.54	0.46
	Geometry and Measurement & Data and Statistics	0.61	0.47	0.57	0.49
6	Ratios and Proportional Relationships	0.61	0.45	0.47	0.47
	Number Sense and Operations	0.61	0.45	0.47	0.46
	Expressions, Equations and Inequalities	0.65	0.48	0.51	0.51
	Geometry and Measurement & Data Analysis, Statistics and Probability	0.59	0.44	0.46	0.45
7	Ratios and Proportional Relationships	0.62	0.52	0.48	0.50
	Number Sense and Operations	0.58	0.49	0.45	0.47
	Expressions, Equations and Inequalities	0.60	0.51	0.47	0.49
	Geometry and Measurement & Data Analysis, Statistics and Probability	0.60	0.50	0.46	0.48
8	Number Sense and Operations & Expressions, Equations and Inequalities	0.62	0.51	0.52	0.46
	Geometry and Measurement & Data Analysis, Statistics and Probability	0.59	0.49	0.48	0.43
	Functions	0.58	0.48	0.46	0.43

**Table 9.15: Comparison of Most Recent Missouri NAEP and Spring 2018 Missouri MAP Impact Data**

Content	Grade	Missouri NAEP Percentages of Students							MAP Spring 2018 Percentages of Students					
		NAEP Year	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>At or Above Proficient</i>	<i>At or Above Basic</i>	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>At or Above Proficient</i>	<i>At or Above Basic</i>
<b>Reading/ ELA</b>	4	2017	31	33	28	8	37	69	12.1	37.5	29.9	20.2	50.1	87.7
<b>Reading/ ELA</b>	8	2017	23	42	32	3	35	77	13.2	37.5	30.0	19.0	49.0	86.5
<b>Math</b>	4	2017	21	39	33	7	40	79	27.3	26.6	25.2	20.9	46.1	72.7
<b>Math</b>	8	2017	30	40	23	8	30	70	32.9	37.1	20.8	9.0	29.8	66.9

Note: NEAP 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.

Note: NAEP data are from <https://nces.ed.gov/nationsreportcard/assessments>.

## CHAPTER 10: FAIRNESS

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 and Mathematics 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.

This chapter 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 item development and selections, as is explained in Section 10.1 of this chapter. In addition, DESE conducts content and bias reviews on items, as explained in Chapter 3. 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 and Mathematics test development, DRC content experts avoided including items that may potentially favor one demographic group over another. Also, Section 10.2 of this chapter explains the steps taken to evaluate MAP items through the use of DIF in order to adhere to this standard.

In addition, standardized test administration and 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 10.1 of this chapter is also directly relevant to Standards 3.1 and 3.2:

**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 explain the steps taken by DRC to minimize words, phrases, and content that may be regarded as offensive by members of particular demographic subgroups. Chapter 3 discusses item content considerations during item development and item reviews for items included in MAP. These reviews are also critical in fulfilling Standards 3.1 and 3.2.

## **10.1 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 item writers and test developers 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 of Missouri participants, are described in more detail in Chapter 3 of this report.

## **10.2 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 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 and Mathematics 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 3 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 (including the use of content and bias review committees). 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):

$$\text{Mantel } \chi^2 = \frac{\left( \sum_k F_k - \sum_k E(F_k) \right)^2}{\sum_k \text{Var}(F_k)},$$

where  $F_k$  is the sum of scores for the focal group at the  $k$ th 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. 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 ( $\chi_{MH}^2$ ) 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  $\alpha$  is assumed to be constant across the  $K$  matched levels. The  $\chi_{MH}^2$ , 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 ( $\Delta_{MH}$ ) 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 (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  $k$ th level of the matching variable,  $m_{Fk}$  is  $1/N_{Fk}$ , and  $m_{Rk}$  is  $1/N_{Rk}$ . 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  $|\text{ES}|$  is between 0.17 and 0.25
- Large DIF: If the MH statistic is significant ( $p < .05$ ) and  $|\text{ES}| \geq 0.25$

A positive DIF value indicates that the item favors the focal group, while a negative value indicates that the item disadvantages the focal group. Tables 10.1 and 10.2 show the DIF results 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 10.1 and 10.2 summarize the number of moderate and large DIF flags by grade for each focal group that included at least 200 students for ELA and Mathematics, respectively. For example, consider Grade 3 ELA. In this grade, one item was flagged for gender DIF and displayed moderate negative DIF. One item was flagged for DIF against the Asian/Pacific Islander subgroup (large DIF), and one item was flagged against each of three ethnic groups: Asian/Pacific Islander (moderate DIF), Black (moderate DIF), and Hispanic (large DIF). No DIF was computed for a group of students using testing accommodations because of insufficient case count in the focal group.

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.

### 10.3 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 in terms of test score reliability.

#### 10.3.1 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

$$d = \frac{\bar{x}_a - \bar{x}_b}{\sqrt{\frac{(n_a - 1)s_a^2 + (n_b - 1)s_b^2}{(n_a + n_b) - 2}}},$$

where  $\bar{x}_a$  is the mean score of group A,  $\bar{x}_b$  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  $d = .34$  for two groups, then it may be interpreted that the mean difference between the two groups is .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.

Using Cohen's (1988) guidelines, certain trends become apparent in Tables 10.3 through 10.8.

In English Language Arts, there are small differences between the mean test scores of female students and male students, with female students outperforming male students in Grades 5, 7, and 8 (no difference in Grades 3, 4, and 6).

There is a large difference in mean English Language Arts test scores of Black students compared to White students in Grade 3 and a medium difference in Grades 4 through 8, with Black students underperforming White students in all grades. There is a small difference between the mean test scores of Hispanic and White students, with Hispanic students underperforming White students on English Language Arts in all grades. There is a small difference between the mean test scores of Native Americans and White students, with Native American students underperforming White students on English Language Arts in all grades except for Grade 5. 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, 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 Native American students compared to White students, with Native American 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.

The mean scale score differences trends observed in the Spring 2018 data are similar to the trends observed in the Spring 2017 data.

### 10.3.2 Comparison of Student Performance Level Classification by Subgroup

Tables 10.9 through 10.14 show the percentages of students in different proficiency levels by student race/ethnicity, student gender, and whether or not students used any testing accommodations. 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 10.3.1).

In terms of gender, more female students than male students were classified as *Proficient* or above (with the differences between genders ranging from approximately 5% to 11%) in all grades. The percentages of female and male students were generally similar in *Proficient* or above performance levels for Mathematics (differences less than 4%) in all grade 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 African-American 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 35% to 44% for ELA, depending on the grade level. For Mathematics, these differences ranged from 28% to 41%, depending on the grade level.

### 10.3.3 Reliability

Tables 10.15 through 10.26 show the test form reliability coefficients and standard error of measurement by student race/ethnicity, student gender, and whether or not students used any testing accommodations.

The reliability coefficients for English Language Arts forms ranged from 0.82 to 0.92. For Mathematics, the reliability coefficients ranged from 0.71 to 0.95. 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.

## 10.4 Summary

In summary, the overall purpose of this chapter is to address fairness concerns that are relevant to the administration of MAP. 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:

- 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.
- 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.

**Table 10.1: Number of Items Flagged for DIF, English Language Arts**

English Language Arts		Grade	3	4	5	6	7	8
		# of Items	72	77	70	71	73	79
Group	DIF Magnitude	DIF Direction	Number of Flagged Items					
Female	Moderate	Negative	1	2	0	1	2	2
		Positive	0	5	0	0	0	4
	Large	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	2
Asian/ Pacific Islander	Moderate	Negative	1	1	2	1	0	2
		Positive	0	1	1	0	0	0
	Large	Negative	1	2	1	0	0	1
		Positive	0	2	0	0	0	0
Black	Moderate	Negative	1	0	2	0	1	1
		Positive	0	0	0	0	0	0
	Large	Negative	0	0	0	0	0	0
		Positive	0	0	0	1	0	0
Hispanic	Moderate	Negative	0	1	1	0	0	1
		Positive	0	0	0	0	0	0
	Large	Negative	1	2	1	0	0	0
		Positive	0	0	0	0	0	0
American Indian	Moderate	Negative	0	1	0	1	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	5	4	2
		Positive	n/a	n/a	n/a	2	2	2
	Large	Negative	n/a	n/a	n/a	0	3	1
		Positive	n/a	n/a	n/a	0	0	0
Total Number of Flagged Items			3	13	6	10	12	13

Note: For Grades 4 and 8, the three components of the writing prompts were analyzed as separate items.

**Table 10.2: Number of Items Flagged for DIF, Mathematics**

Mathematics		Grade	3	4	5	6	7	8
		# of Items	56	56	57	59	58	61
Group	DIF Magnitude	DIF Direction	Number of Flagged Items					
Female	Moderate	Negative	1	1	1	2	3	1
		Positive	2	0	0	2	2	0
	Large	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
Asian/ Pacific Islander	Moderate	Negative	0	1	0	2	0	1
		Positive	3	2	0	2	1	0
	Large	Negative	0	0	0	0	0	0
		Positive	0	0	0	0	0	0
Black	Moderate	Negative	0	0	1	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
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	3	1	0
		Positive	n/a	0	2	2	2	0
	Large	Negative	n/a	1	0	0	1	0
		Positive	n/a	0	0	1	1	0
Total Number of Flagged Items			6	6	6	12	11	2

Table 10.3: Scale Score Comparison, Grade 3

Content Area	Category	Group	N	Mean	Std. Dev.	Effect Size
English Language Arts	Race/Ethnicity	White (not Hispanic)	47,355	367.34	42.11	-0.14
		Asian/Pacific Islander	1,513	373.08	46.44	
		Black (not Hispanic)	11,243	333.73	42.73	
		Hispanic	4,410	350.13	40.35	
		American Indian	223	356.74	42.29	
		Other	3,188	361.25	42.12	
	Gender	Male	34,920	356.60	44.55	-0.18
		Female	33,012	364.56	43.19	
	Accommodations	No	67,710	360.77	43.54	2.10
Yes		222	268.67	88.65		
Mathematics	Race/Ethnicity	White (not Hispanic)	47,363	359.82	45.57	-0.25
		Asian/Pacific Islander	1,591	371.47	50.44	
		Black (not Hispanic)	11,256	322.74	50.16	
		Hispanic	4,458	343.54	46.96	
		American Indian	224	345.82	51.81	
		Other	3,188	350.10	48.36	
	Gender	Male	35,008	351.79	51.37	-0.03
		Female	33,072	353.03	45.89	
	Accommodations	No	67,891	352.55	48.64	1.14
Yes		189	296.85	65.96		

Table 10.4: Scale Score Comparison, Grade 4

Content Area	Category	Group	N	Mean	Std. Dev.	Effect Size
English Language Arts	Race/Ethnicity	White (not Hispanic)	48,674	391.33	39.96	-0.19
		Asian/Pacific Islander	1,500	398.94	42.43	
		Black (not Hispanic)	11,416	359.13	42.82	
		Hispanic	4,587	374.54	40.62	
		American Indian	279	380.98	40.23	
		Other	3,137	384.85	40.98	
	Gender	Male	35,495	381.35	43.53	-0.17
		Female	34,098	388.34	40.85	
	Accommodations	No	69,357	385.06	41.86	2.01
Yes		236	300.54	87.93		
Mathematics	Race/Ethnicity	White (not Hispanic)	48,680	384.29	44.35	-0.32
		Asian/Pacific Islander	1,559	398.51	52.79	
		Black (not Hispanic)	11,430	345.84	54.47	
		Hispanic	4,634	366.39	49.51	
		American Indian	279	374.27	51.89	
		Other	3,137	375.54	48.59	
	Gender	Male	35,551	377.43	51.17	0.03
		Female	34,168	375.89	46.94	
	Accommodations	No	66,673	379.56	46.73	1.40
Yes		3,046	313.52	57.68		

Table 10.5: Scale Score Comparison, Grade 5

Content Area	Category	Group	N	Mean	Std. Dev.	Effect Size
English Language Arts	Race/Ethnicity	White (not Hispanic)	49,043	404.85	39.94	
		Asian/Pacific Islander	1,495	413.91	43.45	-0.23
		Black (not Hispanic)	11,414	378.30	37.50	0.67
		Hispanic	4,605	392.08	37.88	0.32
		American Indian	281	398.30	37.51	0.16
		Other	2,997	400.50	38.34	0.11
	Gender	Male	35,583	395.74	41.16	
		Female	34,252	403.70	39.78	-0.20
	Accommodations	No	69,634	399.88	40.29	
Yes		201	317.80	77.23	2.03	
Mathematics	Race/Ethnicity	White (not Hispanic)	49,036	404.85	37.59	
		Asian/Pacific Islander	1,531	421.92	44.84	-0.45
		Black (not Hispanic)	11,430	376.93	40.27	0.73
		Hispanic	4,644	393.56	38.25	0.30
		American Indian	281	395.83	36.81	0.24
		Other	2,997	399.37	38.63	0.15
	Gender	Male	35,625	399.43	41.88	
		Female	34,294	399.86	37.51	-0.01
	Accommodations	No	66,058	402.20	38.22	
Yes		3,861	355.78	40.66	1.21	

Table 10.6: Scale Score Comparison, Grade 6

Content Area	Category	Group	N	Mean	Std. Dev.	Effect Size
English Language Arts	Race/Ethnicity	White (not Hispanic)	48,295	414.94	35.28	
		Asian/Pacific Islander	1,505	424.99	41.03	-0.28
		Black (not Hispanic)	10,840	388.18	33.67	0.76
		Hispanic	4,420	402.86	34.27	0.34
		American Indian	262	406.18	33.84	0.25
		Other	2,619	410.25	35.77	0.13
	Gender	Male	34,789	406.81	37.00	
		Female	33,152	413.13	35.75	-0.17
	Accommodations	No	62,880	412.90	35.30	
Yes		5,061	372.52	30.36	1.15	
Mathematics	Race/Ethnicity	White (not Hispanic)	48,254	411.25	36.44	
		Asian/Pacific Islander	1,516	427.47	44.57	-0.44
		Black (not Hispanic)	10,856	381.78	40.41	0.79
		Hispanic	4,459	397.90	37.86	0.36
		American Indian	262	399.27	41.89	0.33
		Other	2,621	404.66	38.70	0.18
	Gender	Male	34,795	404.30	41.62	
		Female	33,173	407.22	36.36	-0.07
	Accommodations	No	63,385	409.25	36.47	
Yes		4,583	357.03	42.57	1.41	

**Table 10.7: Scale Score Comparison, Grade 7**

Content Area	Category	Group	N	Mean	Std. Dev.	Effect Size
English Language Arts	Race/Ethnicity	White (not Hispanic)	47,975	431.13	38.28	-0.31 0.74 0.35 0.28 0.13
		Asian/Pacific Islander	1,451	443.20	42.07	
		Black (not Hispanic)	10,317	402.81	37.95	
		Hispanic	4,339	417.62	38.19	
		American Indian	274	420.46	38.76	
		Other	2,477	425.97	38.94	
	Gender	Male	34,142	420.99	40.62	-0.25
		Female	32,691	431.05	38.21	
	Accommodations	No	61,952	429.06	38.55	1.13
Yes		4,881	385.97	32.94		
Mathematics	Race/Ethnicity	White (not Hispanic)	47,314	425.75	42.77	-0.34 0.86 0.40 0.28 0.18
		Asian/Pacific Islander	1,366	440.32	52.58	
		Black (not Hispanic)	10,283	388.59	45.54	
		Hispanic	4,361	408.69	44.49	
		American Indian	273	413.58	45.58	
		Other	2,444	418.07	45.12	
	Gender	Male	33,681	417.15	48.78	-0.07
		Female	32,360	420.53	42.43	
	Accommodations	No	61,490	422.66	43.55	1.28
Yes		4,551	366.73	43.74		

**Table 10.8: Scale Score Comparison, Grade 8**

Content Area	Category	Group	N	Mean	Std. Dev.	Effect Size
English Language Arts	Race/Ethnicity	White (not Hispanic)	47,983	444.71	40.42	-0.37 0.70 0.33 0.24 0.16
		Asian/Pacific Islander	1,496	459.85	46.18	
		Black (not Hispanic)	10,306	416.37	40.84	
		Hispanic	4,063	431.41	40.31	
		American Indian	296	435.14	39.00	
		Other	2,132	438.35	41.19	
	Gender	Male	33,885	433.38	43.08	-0.31
		Female	32,391	446.07	39.92	
	Accommodations	No	61,594	442.96	40.54	1.19
Yes		4,682	395.10	35.69		
Mathematics	Race/Ethnicity	White (not Hispanic)	38,854	447.54	48.39	-0.42 0.72 0.36 0.23 0.18
		Asian/Pacific Islander	962	468.20	64.49	
		Black (not Hispanic)	9,224	413.02	47.76	
		Hispanic	3,459	430.08	48.05	
		American Indian	260	436.45	53.81	
		Other	1,759	438.77	50.95	
	Gender	Male	28,295	437.21	52.45	-0.14
		Female	26,223	444.30	48.15	
	Accommodations	No	50,016	444.89	49.06	1.07
Yes		4,502	393.13	41.74		

Table 10.9: Performance Level Comparison, Grade 3

Content Area	Category	Group	Percentage of Students in Performance Level					
			No Level	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>Prof. &amp; Adv.</i>
English Language Arts	Race/Ethnicity	White (not Hispanic)	0.1	17.5	27.2	29.6	25.6	55.2
		Asian/Pacific Islander	4.2	16.1	21.8	26.5	31.5	58.0
		Black (not Hispanic)	0.1	46.3	29.4	17.2	7.0	24.2
		Hispanic	0.9	30.8	31.5	23.7	13.1	36.8
		American Indian	0.9	23.1	32.4	23.1	20.4	43.5
		Other	0.2	22.0	29.4	27.7	20.8	48.5
	Gender	Male	0.3	26.0	28.7	25.9	19.2	45.1
		Female	0.2	20.5	27.0	28.1	24.1	52.2
	Accommodations	No	0.2	23.2	27.9	27.0	21.6	48.6
		Yes	0.4	67.7	19.3	8.1	4.5	12.6
Mathematics	Race/Ethnicity	White (not Hispanic)	0.0	19.0	27.2	28.1	25.6	53.7
		Asian/Pacific Islander	0.0	15.2	20.1	24.8	39.8	64.6
		Black (not Hispanic)	0.1	48.6	29.1	15.2	7.0	22.2
		Hispanic	0.1	31.6	30.8	22.5	15.0	37.5
		American Indian	0.4	32.9	23.1	21.3	22.2	43.5
		Other	0.2	26.6	29.5	23.4	20.4	43.8
	Gender	Male	0.1	25.8	26.6	24.6	22.9	47.5
		Female	0.0	24.3	28.9	26.0	20.8	46.8
	Accommodations	No	0.1	25.0	27.7	25.3	22.0	47.3
		Yes	0.5	58.9	23.7	12.6	4.2	16.8

**Table 10.10: Performance Level Comparison, Grade 4**

Content Area	Category	Group	Percentage of Students in Performance Level					
			No Level	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>Prof. &amp; Adv.</i>
<b>English Language Arts</b>	Race/Ethnicity	White (not Hispanic)	0.1	8.3	35.1	32.6	23.9	56.5
		Asian/Pacific Islander	3.2	6.8	28.0	29.4	32.6	62.0
		Black (not Hispanic)	0.2	27.7	46.4	19.5	6.2	25.7
		Hispanic	0.7	16.9	43.0	27.3	12.1	39.4
		American Indian	0.0	13.6	39.4	30.5	16.5	47.0
		Other	0.2	11.3	38.8	30.6	19.2	49.8
	Gender	Male	0.2	14.3	38.0	29.0	18.5	47.5
		Female	0.2	9.9	37.0	30.9	21.9	52.8
	Accommodations	No	0.2	12.0	37.6	30.0	20.3	50.3
		Yes	0.8	53.4	30.3	13.9	1.7	15.6
<b>Mathematics</b>	Race/Ethnicity	White (not Hispanic)	0.0	20.8	26.7	28.0	24.4	52.4
		Asian/Pacific Islander	0.0	16.2	18.4	23.6	41.8	65.4
		Black (not Hispanic)	0.0	52.3	26.8	14.6	6.3	20.9
		Hispanic	0.0	36.1	27.5	22.2	14.1	36.3
		American Indian	0.0	29.4	22.2	29.0	19.4	48.4
		Other	0.1	28.1	27.7	24.4	19.7	44.1
	Gender	Male	0.0	27.0	25.0	25.2	22.8	48.0
		Female	0.0	27.6	28.2	25.2	19.0	44.2
	Accommodations	No	0.0	24.9	27.1	26.1	21.8	47.9
		Yes	0.2	78.1	14.9	5.3	1.6	6.9

Table 10.11: Performance Level Comparison, Grade 5

Content Area	Category	Group	Percentage of Students in Performance Level					
			No Level	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>Prof. &amp; Adv.</i>
English Language Arts	Race/Ethnicity	White (not Hispanic)	0.1	8.7	37.6	28.3	25.4	53.7
		Asian/Pacific Islander	2.0	7.3	30.0	27.0	33.7	60.7
		Black (not Hispanic)	0.2	23.4	50.5	17.8	8.1	25.9
		Hispanic	0.6	13.5	47.1	23.8	14.9	38.7
		American Indian	0.0	12.1	40.2	29.5	18.1	47.6
		Other	0.1	8.6	42.7	27.5	21.1	48.6
	Gender	Male	0.2	13.6	42.1	24.4	19.7	44.1
		Female	0.2	9.1	38.6	28.0	24.1	52.1
	Accommodations	No	0.2	11.3	40.4	26.2	21.9	48.1
		Yes	0.0	57.7	29.9	9.5	3.0	12.5
Mathematics	Race/Ethnicity	White (not Hispanic)	0.1	19.1	34.4	26.5	19.9	46.4
		Asian/Pacific Islander	0.0	12.7	23.1	24.8	39.5	64.3
		Black (not Hispanic)	0.1	45.7	35.3	14.3	4.6	18.9
		Hispanic	0.1	28.8	37.5	21.8	11.8	33.6
		American Indian	0.0	25.3	36.7	26.7	11.4	38.1
		Other	0.0	24.0	36.0	24.0	16.0	40.0
	Gender	Male	0.1	25.7	32.4	23.2	18.7	41.9
		Female	0.1	22.7	36.8	25.0	15.5	40.5
	Accommodations	No	0.1	21.4	35.3	25.2	18.0	43.2
		Yes	0.2	71.5	22.8	4.3	1.2	5.5

Table 10.12: Performance Level Comparison, Grade 6

Content Area	Category	Group	Percentage of Students in Performance Level					
			No Level	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>Prof. &amp; Adv.</i>
<b>English Language Arts</b>	Race/Ethnicity	White (not Hispanic)	0.1	10.6	35.1	28.7	25.5	54.2
		Asian/Pacific Islander	1.8	10.3	23.5	26.9	37.4	64.3
		Black (not Hispanic)	0.2	30.8	45.3	16.2	7.5	23.7
		Hispanic	0.8	17.6	42.1	24.7	14.8	39.5
		American Indian	0.0	15.3	38.2	32.1	14.5	46.6
		Other	0.2	12.9	39.2	26.0	21.7	47.7
	Gender	Male	0.2	16.7	37.8	25.2	20.1	45.3
		Female	0.2	11.9	36.4	27.5	24.0	51.5
	Accommodations	No	0.2	11.6	36.7	27.8	23.7	51.5
		Yes	0.3	48.1	42.5	7.5	1.7	9.2
<b>Mathematics</b>	Race/Ethnicity	White (not Hispanic)	0.1	21.9	30.7	24.5	22.7	47.2
		Asian/Pacific Islander	0.3	15.5	19.8	20.5	43.9	64.4
		Black (not Hispanic)	0.1	51.4	31.1	12.1	5.3	17.4
		Hispanic	0.1	34.8	34.1	18.1	12.9	31.0
		American Indian	0.0	30.9	33.2	21.8	14.1	35.9
		Other	0.1	28.8	31.6	20.4	19.1	39.5
	Gender	Male	0.1	29.8	28.8	21.0	20.3	41.3
		Female	0.1	25.4	32.9	22.8	18.8	41.6
	Accommodations	No	0.1	24.0	31.8	23.2	20.9	44.1
		Yes	0.2	77.7	16.9	4.0	1.3	5.3

Table 10.13: Performance Level Comparison, Grade 7

Content Area	Category	Group	Percentage of Students in Performance Level					
			No Level	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>Prof. &amp; Adv.</i>
English Language Arts	Race/Ethnicity	White (not Hispanic)	0.1	11.8	39.0	21.8	27.3	49.1
		Asian/Pacific Islander	1.6	8.9	28.6	18.8	42.0	60.8
		Black (not Hispanic)	0.2	32.0	47.0	12.2	8.6	20.8
		Hispanic	1.0	19.6	45.7	17.5	16.3	33.8
		American Indian	0.0	17.9	44.2	19.3	18.6	37.9
		Other	0.1	15.6	40.5	20.5	23.3	43.8
	Gender	Male	0.3	19.2	41.5	18.4	20.7	39.1
		Female	0.2	11.7	39.5	21.5	27.1	48.6
	Accommodations	No	0.2	12.9	40.3	21.0	25.5	46.5
		Yes	0.5	49.2	42.8	5.6	2.0	7.6
Mathematics	Race/Ethnicity	White (not Hispanic)	0.1	19.3	36.5	25.4	18.7	44.1
		Asian/Pacific Islander	0.0	15.5	25.8	23.4	35.2	58.6
		Black (not Hispanic)	0.1	50.3	36.4	9.6	3.5	13.1
		Hispanic	0.2	32.5	39.2	18.5	9.6	28.1
		American Indian	0.0	28.2	39.6	20.5	11.7	32.2
		Other	0.1	25.9	38.6	19.9	15.5	35.4
	Gender	Male	0.1	27.8	33.5	21.8	16.7	38.5
		Female	0.1	22.5	39.7	22.6	15.2	37.8
	Accommodations	No	0.1	21.7	37.5	23.6	17.1	40.7
		Yes	0.4	72.3	23.4	3.0	0.8	3.8

Table 10.14: Performance Level Comparison, Grade 8

Content Area	Category	Group	Percentage of Students in Performance Level					
			No Level	<i>Below Basic</i>	<i>Basic</i>	<i>Proficient</i>	<i>Advanced</i>	<i>Prof. &amp; Adv.</i>
English Language Arts	Race/Ethnicity	White (not Hispanic)	0.2	10.2	35.4	32.4	21.9	54.3
		Asian/Pacific Islander	1.6	7.5	24.5	30.1	36.3	66.4
		Black (not Hispanic)	0.2	27.0	46.4	20.0	6.4	26.4
		Hispanic	1.0	16.6	42.3	27.6	12.6	40.2
		American Indian	0.3	13.5	41.8	30.0	14.5	44.5
		Other	0.2	13.0	39.9	29.5	17.4	46.9
	Gender	Male	0.3	17.2	38.9	27.8	15.8	43.6
		Female	0.2	9.1	36.0	32.3	22.4	54.7
	Accommodations	No	0.2	10.6	37.0	31.7	20.4	52.1
		Yes	0.4	47.3	44.1	7.4	0.8	8.2
Mathematics	Race/Ethnicity	White (not Hispanic)	0.2	26.6	39.1	23.7	10.4	34.1
		Asian/Pacific Islander	0.0	21.9	30.7	22.3	25.1	47.4
		Black (not Hispanic)	0.1	56.9	30.0	10.0	3.0	13.0
		Hispanic	0.2	41.6	35.7	16.8	5.7	22.5
		American Indian	0.4	35.6	31.0	25.3	7.7	33.0
		Other	0.3	33.6	38.4	19.3	8.4	27.7
	Gender	Male	0.2	36.7	35.0	19.1	9.0	28.1
		Female	0.1	28.8	39.4	22.5	9.1	31.6
	Accommodations	No	0.2	29.0	38.7	22.3	9.8	32.1
		Yes	0.3	75.6	19.8	3.5	0.7	4.2

**Table 10.15: Grade 3 English Language Arts Reliability and SEM by Subgroup**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White (not Hispanic)	30,112	0.90	3.31
		Asian/Pacific Islander	960	0.91	3.23
		Black (not Hispanic)	7,643	0.89	3.42
		Hispanic	2,990	0.89	3.40
		American Indian	139	0.90	3.36
		Other	2,023	0.90	3.34
	Gender	Male	22,732	0.91	3.36
		Female	21,132	0.91	3.32
	Accommodations	No	43,848	0.91	3.34
Yes		14	-	-	
B01	Race/Ethnicity	White (not Hispanic)	17,152	0.90	3.26
		Asian/Pacific Islander	545	0.92	3.17
		Black (not Hispanic)	3,562	0.90	3.41
		Hispanic	1,416	0.91	3.37
		American Indian	83	0.90	3.26
		Other	1,155	0.90	3.32
	Gender	Male	12,094	0.91	3.32
		Female	11,822	0.91	3.27
	Accommodations	No	23,780	0.91	3.30
Yes		133	0.91	3.47	

Note: Reliability and SEM were not computed for groups smaller than 50 students.

**Table 10.16: Grade 4 English Language Arts Reliability and SEM by Subgroup**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White (not Hispanic)	22,392	0.91	3.06
		Asian/Pacific Islander	728	0.91	3.01
		Black (not Hispanic)	6,363	0.90	3.12
		Hispanic	2,489	0.90	3.12
		American Indian	127	0.92	3.11
		Other	1,439	0.91	3.09
	Gender	Male	17,392	0.91	3.07
		Female	16,144	0.91	3.09
	Accommodations	No	33,512	0.91	3.08
Yes		20	-	-	
A04	Race/Ethnicity	White (not Hispanic)	5,974	0.88	2.87
		Asian/Pacific Islander	157	0.89	2.73
		Black (not Hispanic)	1,161	0.90	3.05
		Hispanic	399	0.90	2.95
		American Indian	34	-	-
		Other	393	0.89	2.91
	Gender	Male	3,948	0.90	2.91
		Female	4,170	0.89	2.88
	Accommodations	No	8,116	0.90	2.90
Yes		2	-	-	

Note: Reliability and SEM were not computed for groups smaller than 50 students.

**Table 10.16: Grade 4 English Language Arts Reliability and SEM by Subgroup (cont.)**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A07	Race/Ethnicity	White (not Hispanic)	1,973	0.88	3.04
		Asian/Pacific Islander	44	-	-
		Black (not Hispanic)	368	0.90	3.12
		Hispanic	132	0.83	3.02
		American Indian	11	-	-
		Other	127	0.90	2.99
	Gender	Male	1,257	0.90	3.04
		Female	1,398	0.89	3.04
	Accommodations	No	2,654	0.89	3.05
Yes		1	-	-	
B01	Race/Ethnicity	White (not Hispanic)	8,290	0.90	2.91
		Asian/Pacific Islander	285	0.92	2.85
		Black (not Hispanic)	1,552	0.90	3.06
		Hispanic	898	0.90	3.01
		American Indian	52	0.89	2.91
		Other	548	0.90	2.93
	Gender	Male	6,121	0.91	2.96
		Female	5,504	0.90	2.92
	Accommodations	No	11,472	0.90	2.94
Yes		152	0.90	3.11	
B02	Race/Ethnicity	White (not Hispanic)	3,978	0.88	2.96
		Asian/Pacific Islander	109	0.87	2.90
		Black (not Hispanic)	770	0.91	3.02
		Hispanic	278	0.89	2.99
		American Indian	24	-	-
		Other	255	0.88	3.07
	Gender	Male	2,724	0.90	2.96
		Female	2,690	0.89	2.98
	Accommodations	No	5,414	0.90	2.98
Yes		0	-	-	
B04	Race/Ethnicity	White (not Hispanic)	5,991	0.88	2.81
		Asian/Pacific Islander	174	0.88	2.83
		Black (not Hispanic)	1,161	0.89	3.01
		Hispanic	383	0.88	2.87
		American Indian	31	-	-
		Other	367	0.88	2.88
	Gender	Male	3,964	0.90	2.86
		Female	4,143	0.89	2.83
	Accommodations	No	8,106	0.89	2.85
Yes		1	-	-	

Note: Reliability and SEM were not computed for groups smaller than 50 students.

**Table 10.17: Grade 5 English Language Arts Reliability and SEM by Subgroup**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White (not Hispanic)	30,796	0.92	3.21
		Asian/Pacific Islander	931	0.92	3.07
		Black (not Hispanic)	7,975	0.90	3.39
		Hispanic	3,049	0.91	3.34
		American Indian	160	0.91	3.29
		Other	1,870	0.91	3.26
	Gender	Male	22,904	0.92	3.29
		Female	21,876	0.92	3.22
	Accommodations	No	44,760	0.92	3.26
Yes		23	-	-	
B01	Race/Ethnicity	White (not Hispanic)	18,176	0.90	3.17
		Asian/Pacific Islander	562	0.92	2.99
		Black (not Hispanic)	3,404	0.90	3.33
		Hispanic	1,542	0.90	3.26
		American Indian	121	0.89	3.21
		Other	1,124	0.89	3.21
	Gender	Male	12,592	0.91	3.24
		Female	12,336	0.90	3.15
	Accommodations	No	24,808	0.91	3.19
Yes		120	0.90	3.34	

Note: Reliability and SEM were not computed for groups smaller than 50 students.

**Table 10.18: Grade 6 English Language Arts Reliability and SEM by Subgroup**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White (not Hispanic)	29,456	0.89	3.15
		Asian/Pacific Islander	893	0.91	3.02
		Black (not Hispanic)	7,082	0.87	3.25
		Hispanic	2,703	0.88	3.22
		American Indian	150	0.88	3.24
		Other	1,600	0.89	3.17
	Gender	Male	21,712	0.90	3.18
		Female	20,172	0.89	3.16
	Accommodations	No	38,184	0.89	3.16
Yes		3,700	0.82	3.24	
B01	Race/Ethnicity	White (not Hispanic)	18,816	0.88	3.15
		Asian/Pacific Islander	610	0.90	2.99
		Black (not Hispanic)	3,751	0.87	3.27
		Hispanic	1,716	0.88	3.22
		American Indian	112	0.86	3.28
		Other	1,018	0.89	3.17
	Gender	Male	13,056	0.89	3.19
		Female	12,966	0.89	3.15
	Accommodations	No	24,668	0.89	3.16
Yes		1,354	0.83	3.32	

**Table 10.19: Grade 7 English Language Arts Reliability and SEM by Subgroup**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White (not Hispanic)	27,312	0.91	3.16
		Asian/Pacific Islander	793	0.92	3.03
		Black (not Hispanic)	6,355	0.89	3.25
		Hispanic	2,527	0.90	3.22
		American Indian	146	0.91	3.21
		Other	1,398	0.91	3.19
	Gender	Male	19,824	0.91	3.19
		Female	18,708	0.91	3.16
	Accommodations	No	34,888	0.91	3.17
Yes		3,642	0.83	3.21	
B01	Race/Ethnicity	White (not Hispanic)	20,652	0.89	3.11
		Asian/Pacific Islander	657	0.91	2.94
		Black (not Hispanic)	3,939	0.89	3.26
		Hispanic	1,799	0.90	3.19
		American Indian	128	0.89	3.21
		Other	1,078	0.90	3.14
	Gender	Male	14,288	0.91	3.16
		Female	13,966	0.89	3.11
	Accommodations	No	27,016	0.90	3.13
Yes		1,236	0.86	3.27	

**Table 10.20: Grade 8 English Language Arts Reliability and SEM by Subgroup**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White (not Hispanic)	17,932	0.91	3.21
		Asian/Pacific Islander	545	0.92	3.15
		Black (not Hispanic)	4,884	0.89	3.29
		Hispanic	1,595	0.90	3.28
		American Indian	103	0.91	3.16
		Other	785	0.91	3.26
	Gender	Male	13,542	0.91	3.26
		Female	12,300	0.91	3.18
	Accommodations	No	22,308	0.90	3.20
Yes		3,534	0.84	3.27	
A03	Race/Ethnicity	White (not Hispanic)	5,822	0.89	3.17
		Asian/Pacific Islander	176	0.91	3.09
		Black (not Hispanic)	1,056	0.90	3.33
		Hispanic	436	0.90	3.24
		American Indian	35	-	-
		Other	269	0.89	3.25
	Gender	Male	3,931	0.90	3.23
		Female	3,863	0.89	3.14
	Accommodations	No	7,788	0.90	3.21
Yes		6	-	-	

Note: Reliability and SEM were not computed for groups smaller than 50 students.

**Table 10.20: Grade 8 English Language Arts Reliability and SEM by Subgroup (cont.)**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A05	Race/Ethnicity	White (not Hispanic)	5,755	0.89	3.15
		Asian/Pacific Islander	194	0.87	2.93
		Black (not Hispanic)	1,051	0.90	3.31
		Hispanic	464	0.90	3.21
		American Indian	39	-	-
		Other	259	0.91	3.24
	Gender	Male	3,801	0.91	3.21
		Female	3,961	0.89	3.13
	Accommodations	No	7,758	0.90	3.18
Yes		4	-	-	
B01	Race/Ethnicity	White (not Hispanic)	6,971	0.90	3.23
		Asian/Pacific Islander	201	0.92	3.08
		Black (not Hispanic)	1,207	0.91	3.31
		Hispanic	633	0.91	3.29
		American Indian	55	0.92	3.19
		Other	322	0.91	3.25
	Gender	Male	4,842	0.91	3.28
		Female	4,547	0.91	3.19
	Accommodations	No	8,282	0.90	3.21
Yes		1,106	0.87	3.28	
B02	Race/Ethnicity	White (not Hispanic)	5,725	0.89	3.17
		Asian/Pacific Islander	197	0.90	2.85
		Black (not Hispanic)	1,052	0.90	3.26
		Hispanic	456	0.89	3.16
		American Indian	25	-	-
		Other	241	0.89	3.19
	Gender	Male	3,823	0.90	3.22
		Female	3,873	0.89	3.13
	Accommodations	No	7,691	0.90	3.18
Yes		5	-	-	
B04	Race/Ethnicity	White (not Hispanic)	5,740	0.90	3.11
		Asian/Pacific Islander	180	0.90	2.91
		Black (not Hispanic)	1,033	0.90	3.21
		Hispanic	472	0.90	3.13
		American Indian	39	-	-
		Other	250	0.90	3.11
	Gender	Male	3,896	0.91	3.15
		Female	3,818	0.89	3.07
	Accommodations	No	7,705	0.90	3.12
Yes		9	-	-	

Note: Reliability and SEM were not computed for groups smaller than 50 students.

**Table 10.21: Grade 3 Mathematics Reliability and SEM by Subgroup**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White (not Hispanic)	32,284	0.93	2.85
		Asian/Pacific Islander	1,090	0.94	2.73
		Black (not Hispanic)	8,354	0.90	2.90
		Hispanic	3,117	0.92	2.90
		American Indian	156	0.93	2.89
		Other	2,162	0.93	2.87
	Gender	Male	24,396	0.93	2.86
		Female	22,768	0.93	2.87
	Accommodations	No	47,120	0.93	2.86
Yes		40	-	-	
B01	Race/Ethnicity	White (not Hispanic)	15,016	0.92	2.84
		Asian/Pacific Islander	500	0.93	2.74
		Black (not Hispanic)	2,873	0.90	2.91
		Hispanic	1,339	0.92	2.89
		American Indian	68	0.93	2.83
		Other	1,022	0.92	2.86
	Gender	Male	10,544	0.93	2.84
		Female	10,272	0.92	2.86
	Accommodations	No	20,676	0.92	2.85
Yes		141	0.89	3.01	

Note: Reliability and SEM were not computed for groups smaller than 50 students.

**Table 10.22: Grade 4 Mathematics Reliability and SEM by Subgroup**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White (not Hispanic)	32,684	0.92	2.95
		Asian/Pacific Islander	1,038	0.94	2.82
		Black (not Hispanic)	8,456	0.90	2.92
		Hispanic	3,200	0.92	2.96
		American Indian	180	0.93	2.97
		Other	2,053	0.92	2.96
	Gender	Male	24,308	0.93	2.93
		Female	23,304	0.92	2.96
	Accommodations	No	45,624	0.92	2.95
Yes		1,987	0.80	2.76	
B01	Race/Ethnicity	White (not Hispanic)	15,986	0.92	2.96
		Asian/Pacific Islander	521	0.94	2.78
		Black (not Hispanic)	2,963	0.90	2.97
		Hispanic	1,432	0.92	2.98
		American Indian	99	0.92	2.99
		Other	1,083	0.92	2.97
	Gender	Male	11,232	0.93	2.95
		Female	10,852	0.92	2.97
	Accommodations	No	21,024	0.92	2.96
Yes		1,058	0.86	2.94	

**Table 10.23: Grade 5 Mathematics Reliability and SEM by Subgroup**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White (not Hispanic)	33,128	0.92	2.96
		Asian/Pacific Islander	1,010	0.94	2.80
		Black (not Hispanic)	8,574	0.88	2.95
		Hispanic	3,231	0.91	2.98
		American Indian	172	0.91	2.99
		Other	2,009	0.92	2.96
	Gender	Male	24,480	0.93	2.95
		Female	23,644	0.92	2.98
	Accommodations	No	45,464	0.92	2.97
Yes		2,662	0.71	2.79	
B01	Race/Ethnicity	White (not Hispanic)	15,892	0.92	2.98
		Asian/Pacific Islander	521	0.94	2.80
		Black (not Hispanic)	2,846	0.89	2.99
		Hispanic	1,410	0.91	3.01
		American Indian	109	0.86	3.04
		Other	987	0.91	3.01
	Gender	Male	11,124	0.93	2.96
		Female	10,642	0.91	3.00
	Accommodations	No	20,572	0.92	2.98
Yes		1,191	0.85	2.92	

**Table 10.24: Grade 6 Mathematics Reliability and SEM by Subgroup**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White (not Hispanic)	31,884	0.93	3.17
		Asian/Pacific Islander	951	0.95	3.01
		Black (not Hispanic)	7,549	0.89	3.11
		Hispanic	2,889	0.91	3.18
		American Indian	177	0.92	3.20
		Other	1,739	0.93	3.16
	Gender	Male	23,244	0.93	3.16
		Female	21,940	0.92	3.17
	Accommodations	No	41,856	0.93	3.17
Yes		3,331	0.80	2.88	
B01	Race/Ethnicity	White (not Hispanic)	16,358	0.93	3.14
		Asian/Pacific Islander	564	0.95	2.97
		Black (not Hispanic)	3,298	0.90	3.11
		Hispanic	1,569	0.92	3.16
		American Indian	85	0.93	3.13
		Other	881	0.93	3.15
	Gender	Male	11,534	0.94	3.13
		Female	11,220	0.93	3.15
	Accommodations	No	21,504	0.93	3.15
Yes		1,248	0.87	2.98	

**Table 10.25: Grade 7 Mathematics Reliability and SEM by Subgroup**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White (not Hispanic)	29,400	0.93	3.15
		Asian/Pacific Islander	833	0.95	3.00
		Black (not Hispanic)	6,829	0.88	3.09
		Hispanic	2,707	0.91	3.17
		American Indian	154	0.92	3.16
		Other	1,512	0.93	3.14
	Gender	Male	21,304	0.93	3.14
		Female	20,128	0.92	3.14
	Accommodations	No	38,184	0.93	3.14
Yes		3,248	0.76	2.98	
B01	Race/Ethnicity	White (not Hispanic)	17,900	0.92	3.14
		Asian/Pacific Islander	532	0.95	2.96
		Black (not Hispanic)	3,444	0.89	3.11
		Hispanic	1,653	0.92	3.15
		American Indian	119	0.92	3.15
		Other	931	0.93	3.14
	Gender	Male	12,356	0.93	3.14
		Female	12,224	0.92	3.14
	Accommodations	No	23,284	0.93	3.14
Yes		1,297	0.81	3.06	

**Table 10.26: Grade 8 Mathematics Reliability and SEM by Subgroup**

Form	Category	Group	N Count	Cronbach's Alpha	SEM
A01	Race/Ethnicity	White (not Hispanic)	25,028	0.91	3.19
		Asian/Pacific Islander	604	0.95	3.08
		Black (not Hispanic)	6,446	0.87	3.06
		Hispanic	2,225	0.89	3.14
		American Indian	157	0.91	3.15
		Other	1,126	0.91	3.16
	Gender	Male	18,636	0.91	3.14
		Female	16,948	0.90	3.18
	Accommodations	No	32,292	0.91	3.18
Yes		3,294	0.73	2.95	
B01	Race/Ethnicity	White (not Hispanic)	13,806	0.90	3.23
		Asian/Pacific Islander	358	0.94	3.11
		Black (not Hispanic)	2,763	0.87	3.10
		Hispanic	1,232	0.88	3.20
		American Indian	102	0.90	3.21
		Other	631	0.90	3.20
	Gender	Male	9,640	0.91	3.19
		Female	9,252	0.90	3.23
	Accommodations	No	17,692	0.90	3.22
Yes		1,200	0.81	3.03	

## References

- Altman, D. G. (1991). *Practical statistics for medical research*. London: Chapman and Hall.
- American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. Washington, DC: American Educational Research Association.
- Bock, R. D., & Aitkin, M. (1981). Marginal maximum likelihood estimation of item parameters: An application of an EM algorithm. *Psychometrika*, *46*, 443–459.
- Burket, G. R. (2002). *PARDUX* [Computer program]. Monterey, CA: CTB/McGraw-Hill.
- Camilli, G., & Shepard, A. L. (1994). *Methods for identifying biased test items*. Thousand Oaks, CA: Sage Publications.
- Cattell, R. B. (1952). *Factor analysis*. New York, NY: Harper.
- Cizek, G. J., & Bunch, M. B. (2007). *Standard setting: A guide to establishing and evaluating performance standards on tests*. Thousand Oaks, CA: Sage Publications.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Crocker, L., & Algina, J. (1986). *Introduction to classical and modern test theory*. Belmont, CA: Wadsworth Group/Thomson Learning.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*(3), 297–334.
- CTB/McGraw-Hill. (2003). *TerraNova the 2nd edition: CAT technical report*. Monterey, CA: Author.
- Dorans, N. J., & Schmitt, M. P. (1991). *Constructed response and differential item functioning: A pragmatic approach*. Princeton, NJ: Educational Testing Service.
- Green, D. R. (1975). *Procedures for assessing bias in achievement tests*. Paper presented at the National Institute of Education Conference on Test Bias, Annapolis, MD.
- Hambleton, R. K., & Swaminathan, H. (1985). *Item response theory: Principles and applications*. Hingham, MA: Kluwer-Nijhoff Publishing.
- Karantonis, A., & Sireci, S. G. (2006). The bookmark standard-setting method: A literature review. *Educational Measurement: Issues and Practice*, *25*(1), 4–12.
- Kim, D. (2005). *KKCLASS* [Computer program]. Unpublished.

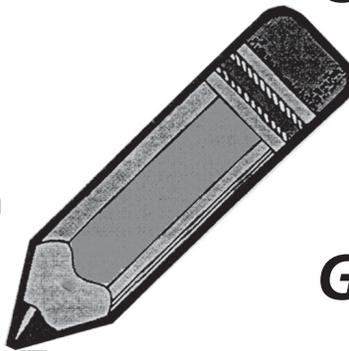
- Kim, D., Barton, K., & Kim, J. (2007). *Estimating classification consistency and classification accuracy with pattern scoring*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.
- Kim, D., Choi, S., Um, K., & Kim, J. (2006). *A comparison of methods for estimating classification consistency*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Francisco, CA.
- Kolen, M. J., & Brennan, R. L. (1995). *Test equating: Methods and practices*. New York, NY: Springer-Verlag.
- Kolen, M. J., & Kim, D. (2005). Personal correspondence.
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159–174.
- Lewis D. M., Mitzel, H. C., & Green, D. R. (1996). Standard setting: A bookmark approach. In D. R. Green (Chair), *IRT-based standard-setting procedures utilizing behavioral anchoring*. Symposium conducted at the Council of Chief State School Officers National Conference on Large-Scale Assessment, Phoenix, AZ.
- Lewis, D. M., Mitzel, H. C., Mercado, R. L., & Schulz, E. M. (2012). The bookmark standard setting procedure. In G. J. Cizek (Ed.), *Setting performance standards: Foundations, methods, and innovations* (pp. 225–254). New York, NY: Routledge.
- Livingston, S. A., & Lewis, C. (1995). Estimating the consistency and accuracy of classifications based on test scores. *Journal of Educational Measurement*, 32(2), 179–197.
- Lord, F. M., & Novick, M. R. (1968). *Statistical theories of mental test scores*. Reading, MA: Addison-Wesley.
- Mantel, N., & Haenszel, W. (1959). Statistical aspects of the analysis of data from retrospective studies of disease. *Journal of the National Cancer Institute*, 22(4), 719–748.
- Schumacker, R. E., & Muchinsky, P. M. (1996). Disattenuating correlation coefficients. *Rasch Measurement Transactions*, 10(1), 479.
- Smarter Balanced Assessment Consortium. (2016). *2013–14 technical report*. Retrieved from [http://www.smarterbalanced.org/wp-content/uploads/2015/08/2013-14\\_Technical\\_Report.pdf](http://www.smarterbalanced.org/wp-content/uploads/2015/08/2013-14_Technical_Report.pdf)
- Thissen, D. (1982). Marginal maximum-likelihood estimation for the one-parameter logistic model. *Psychometrika*, 47(2), 175–186.

- Thompson, S., & Thurlow, M. (2002). *Universally designed assessments: Better tests for everyone!* (Policy Directions. No. 14). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.
- Yen, W. M. (1981). Using simulation results to choose a latent trait model. *Applied Psychological Measurement*, 5(2), 245–262.
- Yen, W. M. (1993). Scaling performance assessments: Strategies for managing local item dependence. *Journal of Educational Measurement*, 30(3), 187–213.
- Yen, W. M., & Candell, G. L. (1991). Increasing score reliability with item-pattern scoring: An empirical study in five score metrics. *Applied Measurement in Education*, 4(3), 209–228.
- Zwick, R., Donoghue, J. R., & Grima, A. (1993). Assessment of differential item functioning for performance tasks. *Journal of Educational Measurement*, 30(3), 233–251.

## **Appendix A: Test Coordinator's Manual**

***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***

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***This Test Coordinator's Manual is NOT a secure document. All administrators should read this manual before administering the test.***

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# 1.0 OVERVIEW OF IMPORTANT INFORMATION FOR THE MAP GRADE-LEVEL ASSESSMENTS

## 1.1 This Test Coordinator’s 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.

## 1.2 Glossary of Terms

<b>Accommodations</b>	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.
<b>Break/Pause</b>	Action taken by a student or Test Examiner (TE) to temporarily halt the test during any part of the test, as needed. The online assessment provides an opportunity to pause the test for up to 20 minutes.
<b>Constructed-Response Item Type</b>	Test questions that require students to provide or input their response or responses using a keyboard or keypad. This type includes <b>short answer/text input, writing prompts, and keypad input</b> items.
<b>eDIRECT</b>	DRC’s administrative platform from which district personnel will manage the assessments.
<b>INSIGHT</b>	DRC’s INSIGHT is the secure, browser-based test engine for the MAP Grade-Level Assessments.
<b>Item</b>	A test question or stimulus presented to a student to elicit a response.
<b>Performance Event</b>	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, real-world scenario. A performance event will contain a variety of item types.
<b>Selected-Response Item Type</b>	Test questions that require students to respond to a stem by selecting an appropriate response or responses, usually from answers provided. This type includes <b>multiple-choice, matching, multi-select, and evidence-based selected-response</b> items.
<b>Session</b>	A specific part of a test assigned to a specific student, which is grouped by Test Examiner according to the precode file.

<b>Stimulus/Stimuli</b>	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.
<b>Technology-Enhanced Items</b>	Test questions that capitalize on technology to collect evidence through a non-traditional response type. These items are scored automatically. This item type includes <b>drag and drop, drop-down menu, matching, hot spots, graphing, bar graphing, line graphing, number lines, line plots, clock input, and angle drawing.</b>
<b>Universal Tools</b>	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.
<b>Writing Prompt</b>	A special type of performance event that appears in the Grades 4 and 8 English Language Arts (ELA) Assessments; 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 Grade-Level Expectations. 2018 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.

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<sup>245</sup> Spring 2018 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 2018 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 or four sessions. Grades 3, 5, and 7 have three sessions. Grades 4, 6, and 8 have four sessions. 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-and-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.

## 1.4 Schedule of Important Dates for Spring 2018

Precode File Due to DESE	Student Test Setup Available in eDIRECT	MAP Grade-Level Assessment Test Window
Window 1 - February 9, 2018 Window 2 - March 2, 2018 Window 3 - March 16, 2018	Window 1 - February 26, 2018 Window 2 - March 12, 2018 Window 3 - March 26, 2018	April 2, 2018–May 25, 2018

Event	Schedule
eDIRECT test administration portal opens.	January 8, 2018
DTCs provide assessment test windows, purchase order numbers, and Large Print and Braille orders through eDIRECT Enrollments.	January 8, 2018—February 2, 2018. The deadline for ordering additional Large Print and Braille testing materials is May 14, 2018. Purchase Orders must be submitted to DRC at <a href="mailto:maphelpdesk@datarecognitioncorp.com">maphelpdesk@datarecognitioncorp.com</a> by February 2, 2018.
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 <i>Using the System Readiness Check</i> in Volume IV of the <i>INSIGHT Technology User Guide</i> . The System Readiness Check must be completed for all testing devices before the statewide administration window begins on April 2, 2018.
STCs verify that all student accommodations and status codes are recorded through eDIRECT Test Setup.	February 26, 2018 is when Test Setup can begin. All accommodations and universal tools <b>must</b> be marked prior to testing for those who precoded in window 1.
DTCs are allowed to update assessment test windows (if needed).	February 26, 2018–March 30, 2018. DTCs update assessment test windows by contacting DRC MAP Service Line. <b>After March 30, 2018</b> , DTCs will need to obtain DESE approval in order to change test windows. DTCs must submit an Appeal Request to DESE in order to change test windows. Requests to close a test window early will not be allowed after March 30, 2018; only test window extensions will be allowed with DESE approval. See section 3.1 for details on the Appeal Request process.
DTCs schedule pickup of Large Print, Braille, and paper-and-pencil test books.	May 29, 2018 is the deadline to schedule pickups. Materials must be picked up no later than June 1, 2018.
Test results and Individual Student Reports (ISRs) are available online via eDIRECT.	Please refer to DESE Administrative Memo CCR-17-010 <a href="https://dese.mo.gov/sites/default/files/am/documents/CCR-17-010.pdf">https://dese.mo.gov/sites/default/files/am/documents/CCR-17-010.pdf</a> .

## 1.5 Special Populations, Optional Populations, and Special Circumstances<sup>247</sup>

### Inclusion of Special Populations

All students, including, but not limited to, the following groups of students, must participate in the required MAP Grade-Level Assessments.

- **Missouri Virtual Instruction Program (MoVIP):** Missouri students enrolled in MoVIP are required to participate in the MAP Grade-Level Assessments. For further inquiries regarding MoVIP participation, contact MoVIP at 573-751-2453.
- **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 Testing Site Manager (TSM) installed. If, for any reason, the student cannot take the test online, then the student may take a paper-and-pencil edition of the test. (See instructions in the Large Print, Braille, and Paper-and-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-and-pencil tests.
- **IEP Students:** Students with disabilities, as classified under the Individuals with Disabilities Education Act (IDEA), have an Individualized Education Program (IEP). All decisions regarding a student's participation in the MAP Grade-Level Assessments are made by the student's IEP team and documented in the IEP. All students, including those students with an IEP, must take the MAP Grade-Level Assessments that are required for accountability purposes. The IEP team has the responsibility and authority to determine accommodations needed to ensure accessibility to the MAP Grade-Level Assessments.
- **IAP/504 Students:** Students with an Individual Accommodation Program (IAP) are considered disabled under Section 504 of the 1973 Rehabilitation Act. These students are not served under IDEA and are not documented with a particular designation for the MAP Grade-Level Assessments. However, professionals knowledgeable about IAP students' disabilities and their educational needs will make decisions about universal tools and accommodations for these students as they would with IEP students. All IAP/504 accommodations should be marked in the same manner as the IEP student accommodations.
- **English Learner (EL) Students:** 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.

### Further Information on Special Populations

For further questions regarding special populations, contact the DESE Assessment Section at 573-751-3545 or the Special Education Section at 573-751-5739. Accommodation definitions and codes can be found in the *Examiner's Manuals*.

## Optional Populations

The following student groups MAY participate in MAP Grade-Level Assessments:

- **Foreign Exchange Students:** Foreign exchange students are allowed, but not required, to take the MAP Grade-Level Assessments at the discretion of the district.
- **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 3.5 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.
- **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.

## Special Circumstances

Some students may require special arrangements for testing. Please refer to the following guidelines for students requiring a change in test setting, test format, or test administration.

- **Universal Tools and Accommodations:** Prior to testing, be sure to consider any additional planning that may be required to administer the test using students' universal tools and/or accommodations. Universal tools/accommodations that require particular attention include, but are not limited to:
  - **Use of a Translator:** District staff may read Mathematics and Science Assessments and English items to students in their native language. 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 INSIGHT.
  - Refer to the *Examiner's Manuals* for the appropriate universal tools/accommodation 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 Grade-Level Assessments. If needed, translators for students taking the assessments may have access to printed student test books in a secure environment to read and review before the test administration. Please see Section 4.0 for instructions regarding administering the Large Print, Braille, and paper-and-pencil editions of the tests.





DTCs print the MAP Grade-Level Assessments as appropriate. Print copies of the assessments will have a barcode. Barcoded printed assessments must be returned to DRC after the tests have been transcribed into the test delivery system (INSIGHT).



The DTC must contact the off-site district/agency prior to the first day of the district of residence’s testing window to make arrangements:

- If the student is testing online at a school, arrange for the student’s Test Tickets to be available through eDIRECT.
- If the student is testing online at an off-site location, arrange for the student to take the test using a district device.
- If the student is taking a paper-and-pencil edition of the assessment, follow the administration instructions in Section 4.0 of this manual.

## 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 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, Chromebook, 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 or Android devices should know how to use a touchscreen (and/or stylus, if applicable). It is strongly recommended 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.



MAP Grade-Level Assessments are available on the following devices:

- Desktop Computers
- Laptops
- Netbooks
- Chromebooks
- iPads
- Android devices

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.





.....  
DRC's dedicated MAP Service Line  
1-800-544-9868  
7:30 A.M. to 6:30 P.M. Central Time,  
Monday–Friday  
.....

.....  
Any Test Examiner who needs to  
set or check accommodations will  
need an eDIRECT account. Other  
Test Examiners do not need an  
eDIRECT account, as logging into  
eDIRECT is not required to start a  
test.  
.....

.....  
STCs must ensure that all Test  
Examiners are trained on MAP  
Grade-Level Assessment  
procedures.  
.....

- Communicate with DRC and DESE on behalf of the district. The STC should contact the DTC if help is needed. If the DTC is unable to answer a question, he or she will contact DRC's dedicated MAP Service Line.
- Ensure the DTC's email account allows receipt of all communication from DESE's and DRC's email domains (@dese.mo.gov and @datarecognitioncorp.com).
- Verify with the STCs that INSIGHT has been installed and certified on all applicable workstations for the current statewide window.
- After verifying each building's security, ensure that STCs have access to eDIRECT and secure test administration materials.
- Enter Test Examiners into eDIRECT in order to generate their eDIRECT logins (for Test Examiners needing an eDIRECT login).
- Ensure test security is maintained by restricting Test Examiner access to the MAP Grade-Level Assessments and other secure testing materials before and after testing.
- Transcribe Large Print, Braille, and paper-and-pencil edition responses into INSIGHT (in districts where this role is not assigned to the Test Examiner).

### School Test Coordinator Responsibilities

All STCs are responsible for the following:

- View all trainings provided by the DTC, DESE, and DRC.
- Stay abreast of all communication from the DTC regarding the MAP Grade-Level Assessments.
- Ensure that all Test Examiners are trained on MAP Grade-Level Assessment procedures.
- 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.
- Work with the DITC (if applicable) to ensure INSIGHT has been installed and certified on all applicable workstations.
- Verify the accuracy of student and Test Examiner information in eDIRECT for the school and update as needed. Confirm that any appropriate student accommodation codes are marked in eDIRECT, under **Student Management**, prior to testing.

- Communicate with the DTC regarding the school's testing schedule prior to testing. If the school's testing schedule changes in any way, the STC is responsible for updating the DTC.
- Ensure that all Test Examiners are knowledgeable about permitted and prohibited materials (see Section 2.5 Assessment Materials for Students/ Administrators).
- Verify that Test Examiners have eDIRECT access and necessary permissions to allow adequate time for reviewing documents and training in preparation for administering the tests.
- On each testing day, ensure that each Test Examiner has the following:
  - Student Test Tickets for each test session
  - Appropriate Large Print and Braille test books or access to paper-and-pencil editions as required per content area
  - Any required ancillary testing materials
- Ensure test security is maintained by restricting Test Examiner access to the MAP Grade-Level Assessments and other secure testing materials before and after testing.
- Validate that testing procedures are followed as written in this *Test Coordinator's Manual*. Printed copies of the manual should be destroyed at the building level after the final district content testing window has closed.

## 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 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](mailto:assessment@dese.mo.gov).



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](mailto:assessment@dese.mo.gov).







## 2.5 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 provide the secure login credentials (i.e., username and password) required for a student to use the testing software.
- The resources in Table 7

**Table 7: Additional Required Resources for ELA, Mathematics, and Science**

Content Area	Session 1	Session 2	Session 3	Session 4
<b>ELA</b>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> <li>• Writing Prompt Grades 4 &amp; 8 only</li> </ul>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> </ul>	<ul style="list-style-type: none"> <li>• Headphones are required for all students taking this session in grades 3, 5, &amp; 7.</li> </ul>	<ul style="list-style-type: none"> <li>• Headphones are required for all students taking this session in grades 4, 6, &amp; 8.</li> </ul>
<b>Mathematics</b>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> </ul>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> </ul>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> </ul>	N/A
<b>Science</b>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> </ul>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> </ul>	N/A	N/A

## Permitted Materials

- Scratch paper and grid/graph paper are allowed for all assessments.
- A physical calculator can be accessed for calculator-allowed items for the Mathematics assessments.
  - For grade 5 Science and grade 6 Mathematics assessments, a four-function calculator with square root and percentage functions is permitted.
  - For grade 7 Mathematics and grade 8 Mathematics and Science 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.
- 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.
- Mathematics Reference Sheets can be copied from the *Examiner's Manual* or printed from the Documents page of eDIRECT, <https://mo.dracedirect.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.dracedirect.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.

## Assessment Materials and Training for Test Examiners

- *Examiner’s Manual*
- Grade-Level Assessment training provided online by DESE
- 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 paper should be collected and destroyed immediately upon conclusion of a testing session.

### Accessing and Printing Listening Script

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 school 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 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.

## 3.0 AFTER ONLINE TESTING

### 3.1 Submitting All Tests/Close of Testing Window

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.” The DTC or DITC should also check the Testing Site Manager (if used) to ensure that there are no unsent responses.

DTCs are allowed to update assessment test windows (if needed) from February 26, 2018, to March 30, 2018, by contacting the DRC MAP Service Line. **After March 30, 2018**, DTCs will need to obtain DESE approval in order to change test windows. DTCs must submit an Appeal Request to DESE in order to change test windows. Requests to close a test window early will not be allowed after March 30, 2018; only test window extensions will be allowed with DESE approval.

The Appeal Request must be emailed by the DTC to DESE Assessment at [assessment@dese.mo.gov](mailto:assessment@dese.mo.gov).

Please include:

- Date
- District Name
- County District Code
- Rationale for your request to extend the testing window, including requested extension dates

## 3.2 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. To do so, select the "Teacher Invalidation" box for the affected content area in eDIRECT. (See the eDIRECT User Guide 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.
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.

## 3.3 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.

## 3.4 Securely Destroy Materials

*Federal law—the Family Educational Rights and Privacy Act (FERPA)—prohibits the release of any student's personally identifiable information. Printed materials with student identifiable information, with the exception of printed test books, must be securely shredded. Printed test books must be returned to DRC. See section 4.2 for details.*

The STC or DTC should destroy the following materials at the building level:

- Printed copies of the *Test Coordinator's Manual* should be destroyed after the final district content testing window has closed.
- All manuals for Large Print, Braille, and paper-and-pencil administrations should be destroyed after the final district content testing window has closed. Electronic files must be deleted.

Scratch paper and grid/graph paper must be kept in a securely locked room or locked cabinet that can be opened only with a key or keycard by staff responsible for test administration. All test materials must remain secure at all times. Scratch paper and grid/graph paper must be collected and inventoried at the end of each test session and then given to the School Test Coordinator to securely destroy.

### 3.5 Individual Student Reports

Individual Student Reports (ISRs) are available in INSIGHT Online Reporting. A link to INSIGHT Online Reporting is in eDIRECT under All Applications – Report Delivery. Select the MAP Grade-Level Reports to be taken to INSIGHT Online Reporting. Please refer to DESE Administrative Memo CCR-17-010 <https://dese.mo.gov/sites/default/files/am/documents/CCR-17-010.pdf>.

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 16–June 22, 2018. The ordering page can be accessed in eDIRECT under All Applications > Materials > Enrollments. POs must be entered in the system and emailed to [maphelpdesk@datarecognitioncorp.com](mailto:maphelpdesk@datarecognitioncorp.com). 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.

## 4.0 LARGE PRINT, BRAILLE, AND PAPER-AND-PENCIL EDITIONS

Large Print, Braille, and paper-and-pencil editions of the MAP Grade-Level Assessments will be available for students with designated IEPs or special circumstances for spring 2018 testing. Large Print and Braille forms may be ordered online via eDIRECT during the enrollment period, January 8, 2018, to February 2, 2018. Test Examiners will work with the DTC to generate paper-and-pencil editions from eDIRECT (after students are assigned such an accommodation). Unique identification numbers will be used to produce barcodes that will be printed onto the paper-and-pencil editions. After testing, student responses for Large Print, Braille, and paper-and-pencil editions must be entered into the INSIGHT system and all test materials must be collected for return to DRC for processing and storage.

### 4.1 Before Testing

#### Paper-and-Pencil Materials

For special circumstances that require students to test on paper, a paper-and-pencil edition is available. To activate the paper-and-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. 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-and-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-and-pencil form. During local printing, the embedded barcode number will print along with each page of the paper-and-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-and-pencil edition, see the *eDIRECT User Guide – Test Setup*, available on the **Documents** page of eDIRECT, <https://mo.drccedirect.com>.



For additional information regarding Large Print and Braille forms, refer to the Large Print and Braille Kit.



Before printing your test, please make sure your pop-up blocker is turned off. Only choose the Print Test/Item icon one time. If the student test does not download, please contact the DRC MAP Service Line 1-800-544-9868.

Unless a student’s IEP requires a paper-based accommodation, **districts will be charged a processing fee of \$15** for each paper-and-pencil PDF form of the test that is printed per content area.

Once the PDF downloads, it is available for printing.

The Test Examiner should become familiar with the directions for administering a paper-and-pencil edition. The paper-and-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. <b>NOTE:</b> 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. <b>NOTE:</b> 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. <b>NOTE:</b> There is a \$15 charge to the district for each printed Paper/Pencil assessment not required by an IEP.

## Large Print and Braille Materials

Large Print and Braille forms can be ordered online via eDIRECT. Material orders must be placed between January 8, 2018, and February 2, 2018. DTCs should order all Large Print and Braille materials through the Enrollments tab in eDIRECT. See the *eDIRECT User Guide – User Administration* for enrollment instructions.

### 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.

### District Test Coordinator

For every building administering a Large Print, Braille, or paper-and-pencil assessment, the DTC needs to complete the Accountability Form located under the Materials section of eDIRECT. Reference the *eDIRECT User Guide – User Administration* 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-and-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 7:30 A.M. and 6:30 P.M. Central Time, Monday–Friday.

### 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 Administration*.
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 Test Materials section of this manual for any contaminated test materials.
9. Maintain the Accountability Form during the test administration.

## 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.

## 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, 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.

## 4.2 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 to make sure that no scratch or graph paper was left inside test books. Remove any extraneous material.

### Transcription of Large Print, Braille, and Paper-and-Pencil Editions

After testing, student responses for Large Print, Braille, and paper-and-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<sup>265</sup> 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.

### **Arrange for the Return Shipment of Test Materials to DRC**

DTCs MUST use DRC boxes to return Large Print, Braille, and Paper-and-Pencil test books; Braille Test Administrator notes; and Test Administration scripts for Large Print, Braille, or Paper-and-Pencil editions 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-and-Pencil test books may be returned in the same shipping boxes with Braille and Large Print test books.

If the district downloaded Paper-and-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-and-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 Administration*.

### **Organize Materials for the District Test Coordinator**

#### **Instructions for the School Test Coordinator**

Make sure that all Large Print, Braille, and Paper-and-Pencil testing materials, including Braille test administrator notes and test administration scripts, 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-and-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

## 3. Affix Shipping Labels

- Affix the green 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.

## Package and Ship Testing Materials

### Instructions for the District Test Coordinator

Make sure that all testing materials are received from each school in the district. Contact any STC who delays returning school testing materials. Verify that the STC followed the instructions in this *Test Coordinator's Manual*.

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*
- listening scripts (must be **securely** destroyed by district)
- scratch and/or grid 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 4.1 under Contaminated Test Materials in this manual)
- unused return shipping labels

Check all materials from the STCs to ensure they have correctly followed the procedure<sup>267</sup> described in this manual.

### 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.

### 3. Schedule Testing Material Pickup

The DTC will return MAP Grade-Level Assessment testing materials via UPS. Contact UPS no later than May 29, 2018, 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 June 1, 2018.

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. Questions

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.

# APPENDIX A: HANDLING STUDENT TRANSFERS AND CHANGES IN TESTING STATUS

## Students Who Move Before or During the MAP Grade-Level Assessment Administration

<i>If . . .</i>	<i>then . . .</i>
a new student moves into the district:	Add the new student in eDIRECT. Then assign the student to the appropriate test session(s).*  <b>NOTE:</b> 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 or during the district test administration window:	Remove the student from any test session in eDIRECT. Do <b>not</b> log into the test and do <b>not</b> mark any status code(s) for the student.*
a student moves from one building to another building within the same district <b>prior</b> 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.*
a student moves from one building to another building within the same district <b>after</b> 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.  <b>NOTE:</b> It is recommended that students complete all sessions for a content area at the same school.

\*See the *eDIRECT User Guide – Test Setup*, available on the **Documents** page of eDIRECT, <https://mo.drctedirect.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.

# APPENDIX B: TEST TIMING GUIDELINES

## Spring 2018 Timing Guidelines – MAP Grade-Level

Grade	Session 1	Session 2	Session 3	Session 4	Total
<b>3 ELA</b>	50–80 minutes	20–40 minutes	20–35 minutes Listening Strand – Headphones required		90–155 minutes
<b>3 Math</b>	35–45 minutes Calculators not allowed	35–50 minutes Calculators not allowed	15–30 minutes Performance Event Calculators not allowed		85–130 minutes
<b>4 ELA</b>	100–130 minutes Writing Prompt	50–80 minutes	15–25 minutes	20–35 minutes Listening Strand – Headphones required	185–270 minutes
<b>4 Math</b>	35–45 minutes Calculators not allowed	35–50 minutes Calculators not allowed	15–30 minutes Performance Event Calculators not allowed		85–130 minutes
<b>5 ELA</b>	50–80 minutes	20–40 minutes	20–35 minutes Listening Strand – Headphones required		90–155 minutes
<b>5 Math</b>	35–45 minutes Calculators not allowed	35–50 minutes Calculators not allowed	15–30 minutes Performance Event Calculators not allowed		85–130 minutes
<b>5 Science</b>	30–45 minutes*	30–45 minutes*			60–90 minutes*
<b>6 ELA</b>	30–50 minutes	30–50 minutes	20–30 minutes	20–35 minutes Listening Strand – Headphones required	100–165 minutes
<b>6 Math</b>	35–45 minutes Calculators not allowed	45–60 minutes Calculators allowed	40–45 minutes Performance Event Calculators allowed		120–150 minutes
<b>7 ELA</b>	50–85 minutes	20–30 minutes	20–35 minutes Listening Strand – Headphones required		90–150 minutes
<b>7 Math</b>	20–25 minutes Calculators not allowed	60–80 minutes Calculators allowed	40–45 minutes Performance Event Calculators allowed		120–150 minutes
<b>8 ELA</b>	100–130 minutes Writing Prompt	50–80 minutes	15–25 minutes	20–35 minutes Listening Strand – Headphones required	185–270 minutes
<b>8 Math</b>	15–20 minutes Calculators not allowed	65–85 minutes Calculators allowed	40–45 minutes Performance Event Calculators allowed		120–150 minutes
<b>8 Science</b>	30–45 minutes*	30–45 minutes*			60–90 minutes*

\*Science times are estimations as they are part of a full-census field-test.











***Grade-Level Assessments  
Test Coordinator's Manual***



## **Appendix B: Examiner's Manual**



## *Examiner's Manual*

***Grade 4  
English Language Arts and Mathematics  
Assessments  
Spring 2018***

## NOTICE OF NON-DISCRIMINATION

It is the policy of the Missouri Department of Elementary and Secondary Education not to discriminate on the basis of race, color, religion, gender, national origin, age, or disability in its programs or employment practices as required by Title VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975 and Title II of the Americans with Disabilities Act of 1990.

Inquiries related to Department employment practices may be directed to the Jefferson State Office Building, Human Resources Director, 8th Floor, 205 Jefferson Street, P.O. Box 480, Jefferson City, MO 65102-0480; telephone number (573) 751-9619 or TTY (800) 735-2966. Inquiries related to Department programs and to the location of services, activities, and facilities that are accessible by persons with disabilities may be directed to the Jefferson State Office Building, Office of the General Counsel, Coordinator–Civil Rights Compliance (Title VI/Title IX/504/ADA/Age Act), 6th Floor, 205 Jefferson Street, P.O. Box 480, Jefferson City, MO 65102-0480; telephone number (573) 526-4757 or TTY (800) 735-2966, email [civilrights@dese.mo.gov](mailto:civilrights@dese.mo.gov).

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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# 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

<b>Accommodations</b>	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.
<b>Break/Pause</b>	Action taken by a student or Test Examiner (TE) to temporarily halt the test during any part of the test, as needed. The online assessment provides an opportunity to pause the test for up to 20 minutes.
<b>Constructed-Response Item Type</b>	Test questions that require students to provide or input their response or responses using a keyboard or keypad. This type includes <b>short answer/text input, writing prompts, and keypad input</b> items.
<b>eDIRECT</b>	DRC’s administrative platform—the Missouri Assessment Program Portal—from which district personnel will manage the assessments.
<b>INSIGHT</b>	DRC’s INSIGHT is the secure, browser-based test engine for the MAP Grade-Level Assessments.
<b>Item</b>	A test question or stimulus presented to a student to elicit a response.
<b>Performance Event</b>	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, real-world scenario. A performance event will contain a variety of item types. See Appendix A: Item Types.
<b>Selected-Response Item Type</b>	Test questions that require students to respond to a stem by selecting an appropriate response or responses, usually from answers provided. This type includes <b>multiple-choice, matching, multi-select, and evidence-based selected-response</b> items.
<b>Session</b>	A specific part of a test assigned to a specific student, which is grouped by a Test Examiner according to the precode file.

<b>Stimulus/Stimuli</b>	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.
<b>Technology-Enhanced Items</b>	Test questions that capitalize on technology to collect evidence through a non-traditional response type. These items are scored automatically. This item type includes <b>drag and drop, drop-down menu, matching, hot spots, graphing, bar graphing, line graphing, number lines, line plots, clock input, and angle drawing.</b>
<b>Universal Tools</b>	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.
<b>Writing Prompt</b>	A special type of performance event that appears in the Grades 4 and 8 English Language (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 revised Missouri Learning Standards approved on April 19, 2016.

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<sup>282</sup> Spring 2018 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 4, the Spring 2018 MAP Grade-Level Assessments include the following:
  - English Language Arts Assessment
  - Mathematics Assessment
- The English Language Arts Assessment consists of four sessions. At grade 4, 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. 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 a performance event. 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.

## 1.4 Test Administration Policies

### General Rules of Online Testing

Students in grade 4 will take online tests for English Language Arts and Mathematics consisting of selected-response (SR) and technology-enhanced (TE) items. These items types can be found in all sessions. The ELA and Mathematics assessments also include performance events (PEs). The PE for ELA is the writing prompt (WP) and appears in session 1. The Mathematics PE appears 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 8 P.M. on the last day of the scheduled district administration window, even if the student has not finished.

.....

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 8 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.

## 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 Testing Site Manager (TSM) as the original device. The students will need to log in again upon resuming the test.

## 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.



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.



## 1.5 Scheduling the Tests

The following table lists general estimates of the time it will take most students to complete each component of the online MAP Grade-Level Assessments. These times do not include time needed to start computers, load secure browsers, and log in students; nor do they include time needed for students to complete the INSIGHT Tutorials and Online Tools Training.

### Duration and Timing Information

The scheduling/rules for each assessment are included in tables 1 and 2. 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	Session 4
<b>Content and Duration of Sessions</b>	<p>This session assesses the Reading and Writing Strands. It contains passage-based selected-response and technology-enhanced items. One passage also includes a passage-based writing prompt.</p> <p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>Session duration ranges from 100–130 minutes.</li> </ul>	<p>This session assesses the Reading Strand. It contains passage-based selected-response and technology-enhanced items.</p> <p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>Session duration ranges from 50–80 minutes.</li> </ul>	<p>This session assesses the Research and Writing Strands. It contains selected-response and technology-enhanced items.</p> <p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>Session duration ranges from 15–25 minutes.</li> </ul>	<p>This session assesses the Listening Strand. It contains passage-based selected-response and technology-enhanced items.</p> <p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>Session duration ranges from 20–35 minutes.</li> </ul>
<b>Total Duration</b>	<p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>Student completes this component in one session.</li> </ul>	<p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>Student completes this component within two days of starting.</li> </ul>	<p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>Student completes this component within three days of starting.</li> </ul>	<p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>Student completes this component within three days of starting.</li> </ul>

**Table 2: Assessment Sequence—Mathematics**

Mathematics	Session 1	Session 2	Session 3 (Performance Event)
<b>Content and Duration of Sessions</b>	<p>This session assesses the Mathematics Strands. It contains selected-response and technology-enhanced items.</p> <p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Session duration ranges from 35–45 minutes.</li> </ul>	<p>This session assesses the Mathematics Strands. It contains selected-response and technology-enhanced items.</p> <p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Session duration ranges from 35–50 minutes.</li> </ul>	<p>This session assesses the Mathematics Strands. It contains a performance event that is comprised of related selected-response and technology-enhanced items.</p> <p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Session duration ranges from 15–30 minutes.</li> </ul>
<b>Total Duration</b>	<p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Student completes this component within two days of starting.</li> </ul>	<p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Student completes this component within two days of starting.</li> </ul>	<p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Student completes this component within three days of starting.</li> </ul>

**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.
- When responding to the writing prompt, students may wish to write their rough draft on scratch paper. To do this, the student must first log in to the test using his or her Test Ticket, in order to view the writing prompt. After reading the prompt, the student must press “Pause” to pause the test. Once the student has finished the rough draft and is ready to input the final response into the online test, the student should press “Resume Test.” (If the 20-minute countdown has expired, the student will need to log back into the test, using the original test ticket.) Students must complete both the rough draft on paper and the final draft in the online test during the same testing session. Students in grades 4 and 8 may be given a paper copy of the writer’s checklist to use as a reference during ELA Session 1.
- 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.

## 1.6 Accommodations and Special Populations

### Updated Accommodations Procedures/Codes

The accommodations for the MAP Grade-Level Assessments are provided as Universal Tools and Accommodations.

- 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 accommodations that a student will receive.

Some tools and accommodations are only for EL students with an IEP/504 Plan.

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 3: Universal Tools**

<u>UNIVERSAL TOOLS</u>		
<p>These tools for use on the Grade-Level Assessment are available to <b>ALL STUDENTS</b> unless otherwise noted. Please read the full description prior to usage.</p> <ul style="list-style-type: none"> <li>• Tools with a code (Sxxx) need to be marked in the eDIRECT Administration portal prior to the assessment.</li> <li>• Some tools are only for use by English Learner (EL) students (EL students are those marked LEP-RCV or LEP-NRC in Core Data).</li> </ul>		
Tool	Description	Code
<b>Bilingual Dictionary</b>	<p><b>EL students</b> may have access to a physical Bilingual Dictionary for use <b>ONLY</b> on the ELA Writing Prompts. If the Bilingual Dictionary is electronic, it may not connect to the internet.</p> <p>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	S431
<b>Break (Pause)</b>	<p><b>All students</b> 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.</p> <p>The INSIGHT student platform allows <b>all students</b> 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.</p> <p>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.</p>	N/A

**Table 3: Universal Tools, continued**

<u><b>UNIVERSAL TOOLS</b></u>		
<p>These tools for use on the Grade-Level Assessment are available to <b>ALL STUDENTS</b> unless otherwise noted.</p> <p>Please read the full description prior to usage.</p> <ul style="list-style-type: none"> <li>• Tools with a code (Sxxx) need to be marked in the eDIRECT Administration portal prior to the assessment.</li> <li>• Some tools are only for use by English Learner (EL) students (EL students are those marked LEP-RCV or LEP-NRC in Core Data).</li> </ul>		
<b>Tool</b>	<b>Description</b>	<b>Code</b>
<p><b>Calculator</b> (For all Science Assessments and for Math items in grades 6–8 where allowed)</p>	<p>The INSIGHT student platform features an embedded calculator for <b>all students</b> to use on all science assessments and for mathematics items in grades 6–8 where calculator use is allowed.</p> <p><b>All students</b> 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.</p> <p><i>Please Note: Use of a calculator is only for the Mathematics and Science assessments.</i></p>	N/A
<p><b>Color Contrast—Online Testing</b></p>	<p>The INSIGHT student platform allows <b>all students</b> to adjust background or font color based on student needs or preferences.</p>	N/A
<p><b>Color Contrast—Paper Testing</b></p>	<p><b>All students</b> taking the paper/pencil assessment may have the test printed in different colors based on student needs or preferences.</p> <p>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	S102
<p><b>Color Overlay</b></p>	<p><b>All students</b> taking the paper/pencil assessment may have a color transparency placed over the test presented to them based on student needs or preferences.</p> <p>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	S103
<p><b>English Dictionary</b></p>	<p>The INSIGHT student platform allows <b>all students</b> access to an embedded English Dictionary for use <b>ONLY</b> on the ELA Writing Prompts.</p> <p><b>All students</b> may have access to a physical English Dictionary for use <b>ONLY</b> on the ELA Writing Prompts. If the English Dictionary is electronic, it may not connect to the internet.</p>	N/A
<p><b>Grammar Handbook</b></p>	<p><b>All students</b> may have access to a physical Grammar Handbook for use <b>ONLY</b> on the ELA Writing Prompts. If the Grammar Handbook is electronic, it may not connect to the internet.</p> <p>The Grammar Handbook must be one that is published. It cannot be a district-, school- or classroom-made handbook.</p>	N/A
<p><b>Graphing Tool</b></p>	<p>The INSIGHT student platform allows <b>all students</b> to use an embedded tool to graph functions.</p>	N/A
<p><b>Highlighter</b></p>	<p>The INSIGHT platform allows <b>all students</b> access to a highlighter for marking desired text.</p> <p><b>All students</b> may have access to a physical highlighter.</p>	N/A

**Table 3: Universal Tools, continued**

<u><b>UNIVERSAL TOOLS</b></u>		
<p>These tools for use on the Grade-Level Assessment are available to <b>ALL STUDENTS</b> unless otherwise noted. Please read the full description prior to usage.</p> <ul style="list-style-type: none"> <li>• Tools with a code (Sxxx) need to be marked in the eDIRECT Administration portal prior to the assessment.</li> <li>• Some tools are only for use by English Learner (EL) students (EL students are those marked LEP-RCV or LEP-NRC in Core Data).</li> </ul>		
<b>Tool</b>	<b>Description</b>	<b>Code</b>
<b>Keyboard Navigation</b>	The INSIGHT student platform allows <b>all students</b> to navigate through the text by using the keyboard.	N/A
<b>Line Guide</b>	The INSIGHT student platform allows <b>all students</b> to use an embedded line guide that brings focus to a single line of text.	N/A
<b>Magnifier</b>	<p>The INSIGHT student platform allows <b>all students</b> to magnify the screen by 1.5 or 2 times the original size.</p> <p><b>All students</b> taking the paper/pencil or Large Print assessments may have access to a physical magnifying device.</p>	N/A
<b>Magnification— Assistive Technology</b>	<p><b>Students with visual impairments</b> may attempt to use assistive technology software that magnifies the screen beyond the built-in capabilities of the embedded magnifier.</p> <p><i>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.</i></p> <p><i>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</i></p>	S105
<b>Mark For Review</b>	The INSIGHT student platform allows <b>all students</b> to mark an item for review.	N/A
<b>Masking—Online Testing</b>	The INSIGHT student platform allows <b>all students</b> access to an embedded masking tool to block off content that is not of immediate need or that may be distracting.	N/A
<b>Masking—Paper</b>	<p><b>All students</b> 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.</p> <p>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	S107

**Table 3: Universal Tools, continued**

<u><b>UNIVERSAL TOOLS</b></u>		
<p>These tools for use on the Grade-Level Assessment are available to <b>ALL STUDENTS</b> unless otherwise noted. Please read the full description prior to usage.</p> <ul style="list-style-type: none"> <li>• Tools with a code (Sxxx) need to be marked in the eDIRECT Administration portal prior to the assessment.</li> <li>• Some tools are only for use by English Learner (EL) students (EL students are those marked LEP-RCV or LEP-NRC in Core Data).</li> </ul>		
<b>Tool</b>	<b>Description</b>	<b>Code</b>
<b>Non-Accommodation Paper-Based Assessment</b>	<p>This tool is available for the following scenarios:</p> <ul style="list-style-type: none"> <li>• For students who need to test off-site in a non-district building (e.g., hospital, juvenile facility, etc.)</li> <li>• For <b>EL students</b> 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 <b>Translation</b> that follows the Tools/Accommodations lists for more information.</li> <li>• For students using Read Aloud—Human Reader (S043) where the examiner needs a paper copy to read from. Please see the section on <b>Read Aloud</b> that follows the Tools/Accommodations lists for more information.</li> </ul> <p>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.</p> <p><i>Please Note: There is a \$15 charge to the district for each printed Paper/Pencil assessment not required by an IEP. If the student does have an IEP that requires using a Paper/Pencil assessment, use accommodation A102 instead.</i></p> <p><i>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</i></p>	S112
<b>Protractor</b>	<p>The INSIGHT student platform allows <b>all students</b> to use an embedded protractor on specific items where appropriate.</p> <p><b>All students</b> taking the paper/pencil, Large Print or Braille assessments may have access to a physical protractor for use on specific items where appropriate.</p>	N/A
<b>Read Aloud</b>	<p><i>Please see the Read Aloud section after the universal tools/accommodations list.</i></p>	
<b>Read Aloud Test To Self</b>	<p><b>All students</b> 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.</p> <p>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).</p>	N/A
<b>Reference Sheet</b>	<p>The INSIGHT student platform allows <b>all students</b> access to use an embedded reference sheet on applicable assessments. Not all assessments have a reference sheet.</p>	N/A

**Table 3: Universal Tools, continued**

<u><b>UNIVERSAL TOOLS</b></u>		
<p>These tools for use on the Grade-Level Assessment are available to <b>ALL STUDENTS</b> unless otherwise noted. Please read the full description prior to usage.</p> <ul style="list-style-type: none"> <li>• Tools with a code (Sxxx) need to be marked in the eDIRECT Administration portal prior to the assessment.</li> <li>• Some tools are only for use by English Learner (EL) students (EL students are those marked LEP-RCV or LEP-NRC in Core Data).</li> </ul>		
<b>Tool</b>	<b>Description</b>	<b>Code</b>
<b>Ruler</b>	<p>The INSIGHT student platform allows <b>all students</b> to use an embedded ruler on specific items where appropriate.</p> <p><b>All students</b> taking the paper/pencil, Large Print or Braille assessments may have access to a physical ruler for use on specific items where appropriate.</p>	<u>N/A</u>
<b>Scratch Paper (Sticky Notes)</b>	<p>The INSIGHT student platform allows <b>all students</b> to use an embedded notepad (called Sticky Notes) to make notes about an item. Electronic notes <b>DO NOT</b> carry over from previous sessions. If a student logs off prior to finishing a session, any electronic notes <b>WILL NOT</b> carry over when the student logs back in.</p> <p><b>All students</b> 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 <b>IMMEDIATELY</b> upon the conclusion of a testing session.</p>	<u>N/A</u>
<b>Scribe</b>	<p><b>Students with physical disabilities</b> that may prevent them from responding themselves may dictate their responses to a scribe, who must follow the scribing guidelines (<a href="http://dese.mo.gov/sites/default/files/asmt-scribing-guidelines.pdf">http://dese.mo.gov/sites/default/files/asmt-scribing-guidelines.pdf</a>).</p> <p><i>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.</i></p> <p><b>Students who obtain a physical injury prior to testing</b> that prevents them from responding may also dictate their responses to a scribe.</p> <p>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	S351
<b>Separate Setting</b>	<p><b>All students</b> may be allowed to test in a separate setting from other students. This includes testing individually or testing as part of a smaller group.</p> <p>This tool must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	S501
<b>Strikethrough (Cross Off)</b>	<p>The INSIGHT student platform allows <b>all students</b> to cross out answer options.</p>	N/A
<b>Thesaurus</b>	<p><b>All students</b> may have access to a physical Thesaurus for use <b>ONLY</b> on the ELA Writing Prompts. If the Thesaurus is electronic, it may not connect to the internet.</p>	N/A

<u><b>UNIVERSAL TOOLS</b></u>		
<p>These tools for use on the Grade-Level Assessment are available to <b>ALL STUDENTS</b> unless otherwise noted.</p> <p>Please read the full description prior to usage.</p> <ul style="list-style-type: none"> <li>• Tools with a code (Sxxx) need to be marked in the eDIRECT Administration portal prior to the assessment.</li> <li>• Some tools are only for use by English Learner (EL) students (EL students are those marked LEP-RCV or LEP-NRC in Core Data).</li> </ul>		
<b>Tool</b>	<b>Description</b>	<b>Code</b>
<b>Translation</b>	Please see the Translation section after the universal tools/accommodations list.	
<b>Writing Tools</b>	The INSIGHT platform allows <b>all students</b> to 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

**Table 4: Accommodations**

<u><b>ACCOMMODATIONS</b></u>		
<p>These accommodations for use on the Grade-Level Assessment are available only to students with an IEP/504 plan. Please read the full description prior to usage.</p> <ul style="list-style-type: none"> <li>All accommodations need to be marked in eDIRECT prior to the assessment.</li> <li>Some accommodations are only for use by English Learner (EL) students (EL students are those marked LEP-RCV or LEP-NRC in Core Data).</li> </ul>		
<b>Accommodation</b>	<b>Description</b>	<b>Code</b>
<b>Abacus</b>	<p><b>Students with this accommodation in their IEP/504 plan</b> may have access to an abacus.</p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A391
<b>Alternate Response Options</b>	<p><b>Students with this accommodation in their IEP/504 plan</b> 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.</p> <p><i>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.</i></p> <p><i>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</i></p>	A441
<b>Braille</b>	<p><b>Students with visual impairments with this accommodation in their IEP/504 plan</b> may access the assessment via a Braille version. Tactile overlays and graphics tools may be used to assist the student in accessing the content.</p> <p><i>Please Note: Answers from students who access the assessment using the Braille format must be entered into eDIRECT prior to shipping the Braille assessment back. Please follow the instructions found in the virtual Braille kit (available in eDIRECT).</i></p> <p><i>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</i></p>	A012
<p><b>*INVALIDATION*</b></p> <p><b>Calculator (For Non-Calculator-Allowed Items Only)</b></p> <p><b>GRADE 3 ONLY</b></p> <p><b>*INVALIDATION*</b></p>	<p><b>Students in 3rd grade with this accommodation in their IEP/504 plan</b> 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.</p> <p><i>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).</i></p> <p><i>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</i></p>	A392
<p><b>Calculator (For Non-Calculator-Allowed Items Only)</b></p> <p><b>GRADES 4-8</b></p>	<p><b>Students in grades 4-8 with this accommodation in their IEP/504 plan</b> 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.</p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A393

**Table 4: Accommodations, continued**

<b><u>ACCOMMODATIONS</u></b>		
<p>These accommodations for use on the Grade-Level Assessment are available only to students with an IEP/504 plan. Please read the full description prior to usage.</p> <ul style="list-style-type: none"> <li>• All accommodations need to be marked in eDIRECT prior to the assessment.</li> <li>• Some accommodations are only for use by English Learner (EL) students (EL students are those marked LEP-RCV or LEP-NRC in Core Data).</li> </ul>		
<b>Accommodation</b>	<b>Description</b>	<b>Code</b>
<b>Large Print</b>	<p>Students with visual impairments with this accommodation in their IEP/504 plan may access the assessment via a Large Print version.</p> <p><i>Please Note: Answers from students who access the assessment using the Large Print format must be entered into eDIRECT prior to shipping the Large Print assessment back. Please follow the instructions found in the virtual Large Print kit (available in eDIRECT).</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A021
<p><b>*INVALIDATION*</b></p> <p><b>Multiplication Table</b></p> <p><b>GRADE 3 ONLY</b></p> <p><b>*INVALIDATION*</b></p>	<p><b>Students in 3rd grade with this accommodation in their IEP/504 plan</b> may have access to a single-digit multiplication table.</p> <p><i>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).</i></p> <p>This accommodation must be chosen in the eDIRECT system under student accommodations prior to testing.</p>	A394
<b>Multiplication Table</b> <b>GRADES 4–8</b>	<p>Students in grades 4–8 with this accommodation in their IEP/504 plan may have access to a single-digit multiplication table.</p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A395
<b>Paper Based Assessment</b>	<p><b>Students with this accommodation in their IEP/504 plan</b> may take the assessment using the paper/pencil format.</p> <p><i>Please Note: Answers from students who access the assessment using the Paper/Pencil format must be entered into eDIRECT prior to shipping the Paper assessment back. Please follow the return instructions found in the manual.</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A102
<b>Read Aloud</b> <b>(ELA Reading Passages)</b>	<p>Please see the Read Aloud section after the universal tools/accommodations list.</p>	
<b>Sign Language</b>	<p><b>Hearing Impaired students with this accommodation in their IEP/504 plan</b> may have ELA listening items translated into American Sign Language (ASL), Signing Exact English (SEE), or any other form of sign language.</p> <p><i>Please Note: Signing of ELA Listening items will require the download of a script. See the Test Administration Manual for more details.</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	A052

**Table 4: Accommodations, continued**

<u><b>ACCOMMODATIONS</b></u>		
<p>These accommodations for use on the Grade-Level Assessment are available only to students with an IEP/504 plan. Please read the full description prior to usage.</p> <ul style="list-style-type: none"> <li>• All accommodations need to be marked in eDIRECT prior to the assessment.</li> <li>• Some accommodations are only for use by English Learner (EL) students (EL students are those marked LEP-RCV or LEP-NRC in Core Data).</li> </ul>		
<b>Accommodation</b>	<b>Description</b>	<b>Code</b>
<p><b>Specialized Calculator (For Calculator Allowed Items Only)</b></p>	<p><b>Students with this accommodation in their IEP/504 plan</b> 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.</p> <p><i>Please Note: Use of a calculator is only for the Mathematics and Science assessments.</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	<p>A396</p>
<p><b>Speech-to-Text— Assistive Technology</b></p>	<p><b>Students with this accommodation in their IEP/504 plan</b> may use that technology in conjunction with the INSIGHT testing platform.</p> <p><i>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.</i></p> <p>This accommodation must be chosen in the eDIRECT Administration portal under student accommodations prior to testing.</p>	<p>A352</p>

## Read Aloud

**Read Aloud** for statewide testing should only be used with students who truly need it.

Any student taking the online, paper/pencil, Large Print or Braille assessments may have the test directions and items in English Language Arts, Mathematics and Science read aloud to them without an IEP/504 plan.

In order to have reading passages in English Language Arts read aloud, a student would need that accommodation listed in their IEP/504 plan.

The **Read Aloud** tool for statewide testing should only be available to students who can benefit from it. **Read Aloud** can be overused 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.

### 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 a clearly 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<sup>298</sup> disability precludes or severely limits his or her ability to decode printed text (possibly due to other co-occurring disabilities or long-term language deprivation in early childhood)?

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, or cue a student through uneven voice inflection.

### 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.**

## Choosing the correct Read Aloud-Codes

For those without an IEP, the **test directions and items** in English Language Arts, Mathematics, and Science can be read aloud to them via:

<u>READ ALOUD—UNIVERSAL TOOLS</u>	
Tools	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

- For students who have Read Aloud of ELA Reading Passages in their IEP, you only need to choose the appropriate code below. This is a change from previous years, where you also had to choose the code in conjunction with a corresponding code from above.
- 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.
- 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). This excludes blind students who do not yet possess adequate Braille skills.

<u>READ ALOUD—ACCOMMODATIONS</u>	
Accommodations	Code
Read Aloud (ELA Reading Passages)—Text-To-Speech (Grades 3–5)*	A040
Read Aloud (ELA Reading Passages)—Text-To-Speech (Grades 6–8)	A043
Read Aloud (ELA Reading Passages)—Human Reader (Grades 3–5)*	A041
Read Aloud (ELA Reading Passages)—Human Reader (Grades 6–8)	A045
Read Aloud (ELA Reading Passages)—Assistive Technology (Grades 3–5)*	A042
Read Aloud (ELA Reading Passages)—Assistive Technology (Grades 6–8)	A044
Read Aloud (ELA Reading Passages)—Native Language (Grades 3–5)*	A111
Read Aloud (ELA Reading Passages)—Native Language (Grades 6–8)	A112
Read Aloud (ELA Reading Passages)—Blind Students (All Grades)	A046

**Read Aloud Scenarios**

\* **Students testing using Native Language**—Please see the section on Translation that follows this. \*

Text-To-Speech	Assistive Technology	Human Reader
<p>Choose code <b>S041</b> for the student(s). If the student(s) have an IEP/504 plan that allows ELA Reading Passages to be read to them, then choose code <b>A040</b> (Grades 3–5) or <b>A043</b> (Grades 6–8).</p> <p>This can be done individually or in a group setting. Student(s) will need to be provided headsets to listen with.</p> <p>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).</p>	<p>Choose code S042 for the students. If the student(s) have an IEP/504 plan that allows ELA Reading Passages to be read to them, then choose code <b>A042</b> (Grades 3–5) or <b>A044</b> (Grades 6–8).</p> <p>The student should test in a one-on-one setting. Code <b>S501</b> should be marked for separate setting.</p> <p>Use of Assistive Technology 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).</p>	<p><b>Computer Based Assessment:</b></p> <p>Choose code <b>S043</b> for the student(s). If the student(s) have an IEP/504 plan that allows ELA Reading Passages to be read to them, then choose code <b>A041</b> (Grades 3–5) or <b>A045</b> (Grades 6–8).</p> <p>Then choose one of the following options:</p> <p><b>Option #1:</b> Read the items and answer choices off of student’s screens – either a single student or multiple students.</p> <p><b>Option #2:</b> Attach a second display to a system being used by a single student.</p> <p><b>Option #3:</b> Print off a paper copy and read to the group from the paper copy. In order to use this option, choose code <b>S112</b> for a single student in the group. That student should log on as normal and take the test online.</p> <p>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).</p>

Text-To-Speech	Assistive Technology	Human Reader
		<p><b>Paper Based Assessment:</b></p> <p>For students using code <b>S112</b> or <b>A102</b>, choose code <b>S043</b> for the student(s). If the student(s) have an IEP/504 plan that allows ELA Reading Passages to be read to them, then choose code <b>A041</b> (Grades 3–5) or <b>A045</b> (Grades 6–8).</p> <p>This can be done either one-on-one or in a small group setting. Code <b>S501</b> should be marked for separate setting. The examiner should make a copy of one student’s test to read from. After testing is complete, mark that copy as an “Examiner Copy” and send it back to the vendor with the other student paper assessments.</p> <p>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).</p>

## 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 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.

### 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 should be a part of the test session as well.

## TRANSLATION

Type	Code
Read Aloud (Not Including ELA Reading Passages)—Native Language	S111
Read Aloud (ELA Reading Passages)—Native Language (Grades 3–5)*	A111
Read Aloud (ELA Reading Passages)—Native Language (Grades 6–8)	A112
Translation	S109 (Use with code A102)

### Translation Scenarios

There are multiple factors to consider when 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

- If the student is testing alone or in a small group, mark code **S501** for separate setting.
- If the student is using Read Aloud—Native Language for test directions and items, mark code **S111**.
- If the student has an IEP/504 plan that allows the Read Aloud—Native Language for ELA Reading Passages, mark code **A111 (for grades 3–5) or A112 (for grades 6–8)**. Note that use of code **A111** for students in grades 3–5 will result in invalidation and the student will receive the Lowest Obtainable Scale Score (LOSS). This excludes blind students who do not yet possess adequate Braille skills.
- If the student will be responding in their Native Language, mark code **S109**.
- If the person doing the Read Aloud **DOES** need a copy of the assessment in advance:
  - Choose code **S112** for a single student in the group. That student should log on as normal and take the test online.
- The translator doing the Read Aloud has three options for reading the assessment to the student(s) taking a computer based assessment:
  - **Option #1:** Read the items and answer choices off of 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 group from the paper copy. In order to use this option, follow these instructions:
    - Choose code **S112** for a single student. That student should log on as normal and take the test online.

- For students taking the assessment via Paper/Pencil—This can be done either one-on-one<sup>304</sup> or in a small group setting. Code **S501** should be marked for separate setting. The examiner should make a copy of one student’s test to read from. After testing is complete, mark that copy as a “Examiner Copy” and send it back to the vendor with the other student paper assessments.

## 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.drctdirect.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.**

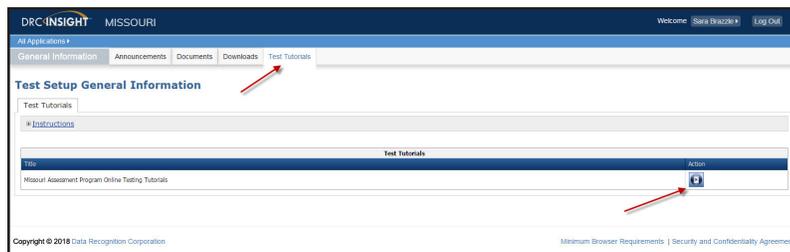
Students should review the Tutorials before completing the Online Tools Training (OTT). It has been proven beneficial for schools to schedule a Tutorial session for students immediately before at least one OTT session.

If computer lab availability is limited, the Tutorials may be presented to school personnel and students in a classroom using 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.

## 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 Items

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

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.

## 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 or Android devices 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.

### 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.

MAP Grade-Level Assessments are available on the following devices:

- Desktop Computers
- Laptops
- Netbooks
- Chromebooks
- iPads
- Some Android devices

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.

DTCs must ensure that all STCs/ Test Examiners, and other responsible district and/or school staff have been trained.



## 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](mailto:assessment@dese.mo.gov).

Preparing for computer-based testing includes determining the physical layout of the computer lab, training teachers and staff, and preparing students. Although DESE does not provide specific requirements for a computer lab, the lab 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](mailto: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, transported by students, 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.**

Translators and transcribers who read student test items and answers must maintain test security at all times. 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 webinars from DESE 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.



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.



This *Test Examiner Manual* may be reviewed before testing, NOT the secure tests. Only translators may review secure test material prior to test administration.



## 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 5: Additional Required Resources for ELA and Mathematics**

Content Area	Session 1 (Writing Prompt)	Session 2	Session 3	Session 4
<b>ELA</b>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> </ul>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> </ul>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> </ul>	<ul style="list-style-type: none"> <li>• Headphones are required for all students taking this session.</li> </ul>
<b>Mathematics</b>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> </ul>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> </ul>	<ul style="list-style-type: none"> <li>• Headphones are required for students using text-to-speech.</li> </ul>	N/A

## 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 4 Mathematics assessments.
- An English dictionary and a thesaurus may be available for the ELA Session 1 writing prompt. EL students may use an English or a bilingual dictionary and thesaurus as needed during Session 1.
- Mathematics Reference Sheet Grades 3–5 copied from Appendix C 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
- If students are allowed to enter the testing room with cell phones, the phones **must** be collected prior to testing and returned at the end of the testing session. Students are not allowed to have cell phones in their pockets, purses, or backpacks during testing.

## Assessment Materials and Training for Test Examiners

- *Test Examiner Manual*
- Grade-Level Assessment training provided online by DESE
- 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 paper should be collected and destroyed immediately upon conclusion of a testing session.

### 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 4 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.

### 3.1 Specific Administration Information

#### 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.*

#### 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, iPad, or Android 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.*

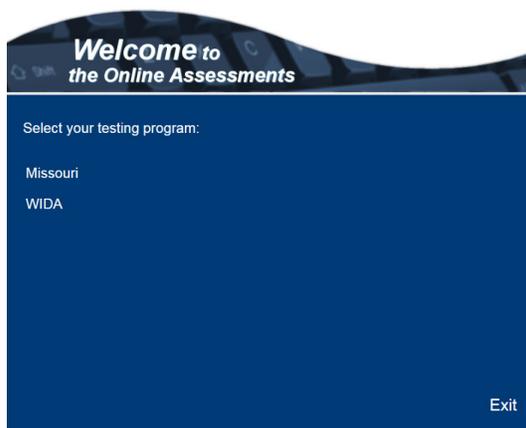


DRC INSIGHT  
Online  
Assessments

### 3. The TE instructs students to select testing program.

**SAY**

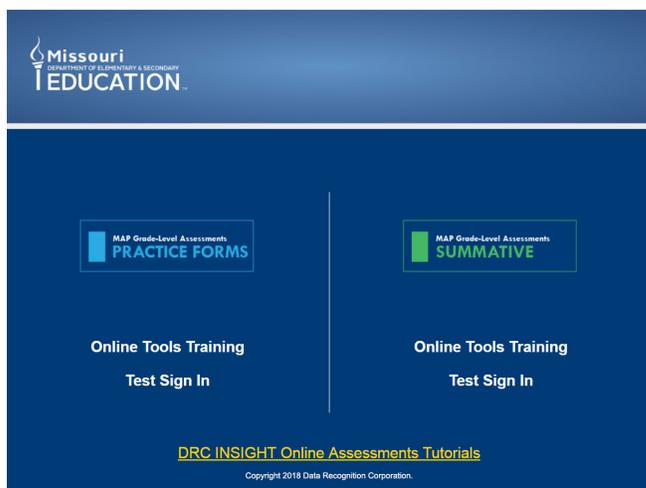
On your screen, you will be asked to select your testing program. Select “Missouri.”



### 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.”



**SAY**

This is the Login screen. Type your username and password from your Test Ticket<sup>316</sup> into the correct boxes on the screen. Then select "Sign In."

Missouri  
DEPARTMENT OF ELEMENTARY & SECONDARY  
EDUCATION

Please sign in with the Username and Password your Test Administrator has given you.

Username:

Password:

Display Item Ids

Sign In

Back

v2016.12 rev:6d05228

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*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.*

**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.*

Welcome **Training Student!**

Thank you for participating in the Missouri Assessment Program Grade-Level Assessments.

Before you begin testing, please confirm your profile information is correct:

Test Name: **G4 Math**  
Test Session: **Student's Session**  
School Name: **DRC Use Only - OTT Sample School**

Your MOSIS ID is: **1234567890**

If the above information is correct, please select **Continue**.

If any of the above information is not correct, or if Color Chooser is not available when the Options button is clicked, please raise your hand and notify your Test Administrator.

Options

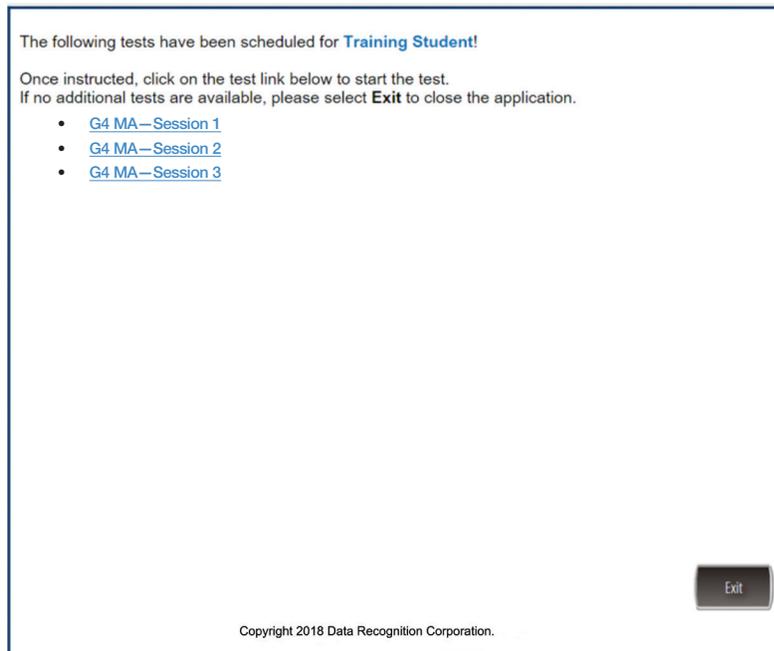
Continue

Exit

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**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.



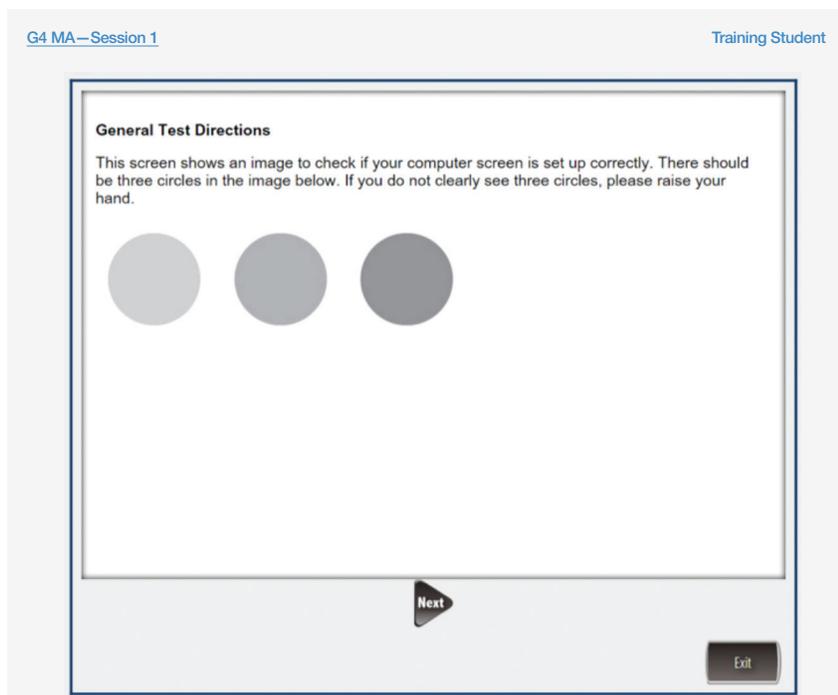
**SAY**

You are now on a screen that is used to make sure your computer 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.



**SAY**

The following screens contain the test directions for the test you are taking<sup>318</sup> 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.

**SAY**

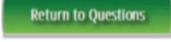
You may PAUSE at any point in the test by clicking PAUSE after answering an item. The PAUSE button is used to stop the test. Please raise your hand if you need a break and ask me before you click PAUSE. After pausing, a timer will appear on your screen. After your break, click on the RESUME button to continue. If you pause for more than 20 minutes, you will need to log back in.

Your answers need to be your own work. Please keep your eyes on your own test and remember that there should be no talking.

When you are ready to begin your test, click BEGIN THE TEST.

Students may PAUSE at any point in the test by clicking PAUSE after answering an item. The PAUSE button is used to stop the test. Students must raise their hands if they need a break and ask the TE before clicking PAUSE. After pausing, students must click on the RESUME button to continue. If students pause for more than 20 minutes, they will need to log back in.

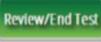
**Navigation**

- Only one question at a time will appear on the screen.
- After you have answered a question, click on the  **Next** arrow at the bottom of the screen to go to the next question.
- To move quickly to any question on the test, click on the  **Down** arrow next to the question number and select the question you'd like to see.
- When you are ready to finish your test, click on the  **Review/End Test** button in the lower left-hand corner.
- If you have left a question unanswered or if you have  **flagged** a question as a reminder to return to a test question, you can return to that question.
- When you are ready to finish the test, click on the  **End Test** button.
- Confirm you would like to  **End Test** or  **Return to Questions**.



### Helpful Testing Hints

- There is no time limit to finish the test.
- Only one question at a time will appear on the screen.
- If you need to go away from your computer, click on the  **Pause** button. Click on the  **Resume** button to continue. If you are away from your computer for more than 20 minutes, you will need to log back in.
- To see your progress on the test, click on the  **Review/End Test** button. You may go to any question by selecting it from the list that appears on the screen.
- Click on the  **Help** button to find more information.



Click on the  **Flag** button if you are not sure of the answer to a question. It will mark the question so you know to go back and answer the question later.

To look at these directions again, click on the  **Help** button and choose the  **Test Directions** tab.



## 5. 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 the TE notices that a student is off task, the TE may say the following statement to the student, verbatim, to keep him or her focused.*

**SAY**

**It is important that you do your best. Do you need to pause the test and take a break? Be sure to press the Pause button. Do not end the test.**

*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.*

## 6. The TE ends the test session.

*When there are approximately ten minutes left in the test session, the TE should give students a brief warning.*

*If students will continue this portion of the test at a later time, read aloud the following two scripts:*

**SAY**

**We are nearing the end of this test session. Please review any completed or marked items now. You will be able to finish the test at another time.**

*At the end of the session:*

**SAY**

**This test session is now over. Click PAUSE, then click EXIT, and then click YES, EXIT. You will be able to finish at another time. I will now collect any scratch paper or other material.**

*If students are completing this portion of the test, read aloud the following two "SAY" scripts:*

.....  
 Test Examiners may  
 read/pronounce one word  
 per sentence to any student.  
 .....

**SAY**

We are nearing the end of this test session. Please review any completed or marked items now. Do not submit your test unless you have answered all of the questions.

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 a student needs additional testing time, direct him or her to pause the test and then exit so testing can continue at another time.

Please be sure you have answered all of the questions.  
Click on the question line to move to that question.

Question	Question	Question
1 <input type="checkbox"/>	6 <input type="checkbox"/>	11 <input type="checkbox"/>
2 <input type="checkbox"/>	7 <input type="checkbox"/>	12 <input type="checkbox"/>
3 <input type="checkbox"/>	8 <input type="checkbox"/>	13 <input type="checkbox"/>
4 <input type="checkbox"/>	9 <input type="checkbox"/>	
5 <input type="checkbox"/>	10 <input type="checkbox"/>	

Answered     
  Unanswered     
  Key     
  Flagged

Once you have finished taking the test, click the "End Test" button to end your test.  
To continue testing, click the "Return to Questions" button.

Options      Return to Questions      End Test

**SAY**

This test session is now over. When you have finished, click the "End Test" button. Then click on Submit, confirming that you are done. Then click on the last screen to close the test. I will now collect any scratch paper or other material.

**STOP**

Are you done with your test?  
Be sure you have answered all of the questions.

To continue testing, select "Return to Review".  
To turn in your test, select "Submit".

Options      Return to Review      Submit

TEs should collect any scratch paper.

## 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.

## 3.2 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.

## 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. To do so, select the "Teacher Invalidation" bubble for the affected content area in eDIRECT. (See the eDIRECT User Guide for instructions.) Cheating is the only time the "Teacher Invalidation" code is used. This code invalidates all sessions of the content area.

**If the "Teacher Invalidation" bubble 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.
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.

### 4.2 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. English Learner (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 and Science) regardless of the length of time they have been in the United States.

## 5.0 LARGE PRINT, BRAILLE, AND PAPER/<sup>325</sup> PENCIL EDITIONS

.....  
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.  
.....

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 2018 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 processing and storage.

### 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, 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 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.drctedirect.com>.

Once the PDF downloads, it is available for printing on the local network printer. Test<sup>326</sup> 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.

## Duration and Timing Information

The scheduling/rules for each component of the Large Print, Braille, and paper/pencil assessments are included in Tables 6 and 7. Note that the duration, timing, break/pause rules, and session recommendations vary for each content area and component. This information is for scheduling purposes only, as the assessments are untimed.

**Table 6: Assessment Sequence for Large Print, Braille\*, and Paper/Pencil—  
English Language Arts**

ELA	Session 1	Session 2	Session 3	Session 4
<b>Content and Duration of Sessions</b>	<p>This session assesses the Reading and Writing Strands. It contains passage-based selected-response and technology-enhanced items. One passage also includes a passage-based writing prompt.</p> <p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Session duration ranges from 100–130 minutes.</li> </ul>	<p>This session assesses the Reading Strand. It contains passage-based selected-response and technology-enhanced items.</p> <p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Session duration ranges from 50–80 minutes.</li> </ul>	<p>This session assesses the Research and Writing Strands. It contains selected-response and technology-enhanced items.</p> <p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Session duration ranges from 15–25 minutes.</li> </ul>	<p>This session assesses the Listening Strand. It contains passage-based selected-response and technology-enhanced items.</p> <p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Session duration ranges from 20–35 minutes.</li> </ul>
<b>Total Duration</b>	<p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Student completes this component in one session.</li> </ul>	<p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Student completes this component within two days of starting.</li> </ul>	<p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Student completes this component within three days of starting.</li> </ul>	<p><b>Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Student completes this component within three days of starting.</li> </ul>

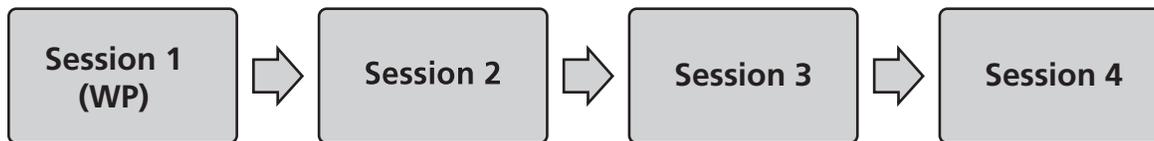
\*Braille administration times will likely be longer than the times indicated here.

**Table 7: Assessment Sequence for Large Print, Braille\*, and Paper/Pencil—Mathematics**

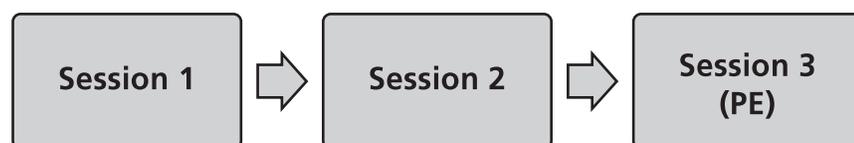
Mathematics	Session 1	Session 2	Session 3 (Performance Event)
<b>Content and Duration of Sessions</b>	This session assesses the Mathematics Strands. It contains selected-response and technology-enhanced items. <b>Recommendation:</b> <ul style="list-style-type: none"> <li>Session duration ranges from 35–45 minutes.</li> </ul>	This session assesses the Mathematics Strands. It contains selected-response and technology-enhanced items. <b>Recommendation:</b> <ul style="list-style-type: none"> <li>Session duration ranges from 35–50 minutes.</li> </ul>	This session assesses the Mathematics Strands. It contains a performance event that is comprised of related selected-response and technology-enhanced items. <b>Recommendation:</b> <ul style="list-style-type: none"> <li>Session duration ranges from 15–30 minutes.</li> </ul>
<b>Total Duration</b>	<b>Recommendation:</b> <ul style="list-style-type: none"> <li>Student completes this component within two days of starting.</li> </ul>	<b>Recommendation:</b> <ul style="list-style-type: none"> <li>Student completes this component within two days of starting.</li> </ul>	<b>Recommendation:</b> <ul style="list-style-type: none"> <li>Student completes this component within three days of starting.</li> </ul>

\*Braille administration times will likely be longer than the times indicated here.

#### Recommended Order of Test Administration for ELA



#### Recommended Order of Test Administration for Mathematics



Students may take sessions on separate days. Districts/schools may opt to administer in a different order, if needed.

## 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
- At least two sharpened No. 2 pencils
- Blank scratch paper for each student
- An English dictionary and a thesaurus for the writing prompt
- A four-function calculator with square root and percentage functions is permitted for students in grades 3–5 as an accommodation only, as the assessments include no calculator-allowed items. (Calculators must meet the guidelines below.) Use of this accommodation will result in an invalidation and the student will receive the Lowest Obtainable Scale Score (LOSS).
- 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 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 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.drctdirect.com>.

## 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 2018” 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.

## 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.

## APPENDIX A: ITEM TYPES

As students engage with the MAP Grade-Level Assessments, 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
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.	✓	✓	✓
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.	✓		✓
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.	✓	✓	✓
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.		✓	✓
Hot Spot	Highlight an option by selecting it. Select one or more options.	✓	✓	✓
Graphing on Coordinate Grid	Plot points and/or draw lines in the response area. Use the keyboard to enter labels if required.		✓	✓
Bar Graph	Select the height of the bar or bars in the response area.		✓	✓
Number Lines	Plot points and/or draw lines on the number line.		✓	

## Appendix A: Item Types, continued

Type of Item	Brief Description of How to Respond	ELA	Math	Science
Line Plot	Respond by marking an X 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.		✓	
Angle Drawing	Select and drag the ray within the response area.		✓	
Text Input	Respond via keyboard entry. Science items may include an Equation Builder.		✓	✓
Keypad Input	Select buttons representing numbers and mathematic symbols to create a numeric response or equation.		✓	
Writing Prompt	Respond via keyboard entry using text formatting buttons.	✓		

## APPENDIX B: INSIGHT KEYBOARD SHORTCUTS AND ICONS

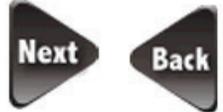
Keyboard shortcuts are available for navigating through the INSIGHT testing system and answering multiple-choice questions. Shortcuts cannot be used to manipulate Technology Enhanced questions, nor can they be used to manipulate additional tools that may be available, such as the line guide or the calculator. 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.**

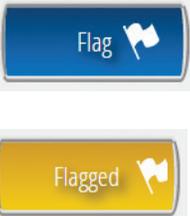
Keyboard Shortcut	Function
<b>tab</b>	Will move Red Box from one tool to another in forward order ( <b>from left to right</b> ). The Tab focus default on the tool bar applies to Multiple-Choice items only. CR Short/Extended-Input items will have the focus on the CR response area and to get to the pointer 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.
<b>shift + tab</b>	Will move Red Box from one tool to another in reverse order ( <b>from right to left</b> ). 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.
<b>enter</b>	Activates the tool that the tab box is around.
<b>Esc</b>	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.
<b>ABCD, abcd</b>	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.
<b>Alt (option) + X</b>	Exits the system from each page that has an Exit button.
<b>Ctrl (control ⌘) + {Left, Right, Up, Down arrows}</b>	Will move the active pop-up tools around on the screen (does not include sticky notes).
<b>Ctrl (control ⌘) + Minus (Numerical Row)</b>	Rotates the active tool 1 degree.
<b>Ctrl (control ⌘) + tab</b>	Switches between multiple active pop-up tools on the screen.
<b>Up/Down Arrows</b>	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.

Keyboard Shortcut	Function
<b>Enter</b>	<p>Selects the highlighted test question from the Review/End Test page.</p> <p>Selects Sign In button after Username and Password are entered.</p> <p>Selects Continue from the Student Verification page.</p> <p>Selects the Go To Page number within the quick navigation dropdown arrow.</p>
<b>Alt + Delete</b>	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.
<b>Backspace</b>	Will work as a shortcut key for Backspace on all Calculators.
<b>Delete</b>	Will work as a delete function on all Calculators (will not work on a Mac).
<b>Enter</b>	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.
<b>Ctrl+plus/minus ('+' or '-')</b>	Will work to rotate ruler/protractor one degree.
<b>" ' " (apostrophe)</b>	Will works as a Negate key on the Basic Calculator.

<b>F7</b>	Will activate the Audio “tracks” aka Starting point button when Audio is active (on a Mac use <b>FUNC F7</b> ). In addition, <b>ESC</b> will also disable TTS starting points view, along with Enter or space Key if starting point is active.
<b>F8</b>	Will activate the Play/Pause button when Audio is active (on a Mac use <b>FUNC F8</b> ).
<b>F9</b>	Will activate the Stop button when Audio is active (on a Mac use <b>FUNC F9</b> ).
<b>Alt (option) – A</b>	Will activate the Audio Settings Pop-up.
<b>Alt (option) – B</b>	Will activate the Back Button, and move student back a question (for Non-CAT tests).
<b>Alt (option) – N</b>	Will activate the Next button, and move the student forward a question.
<b>Alt (option) – O</b>	Will activate the Options button, Color Chooser selection popup window will open, or close the color chooser pop up.
<b>Alt (option) – R</b>	Activates the Review/End Test button and moves the user to the Review page of the test.
<b>Alt (option) – P</b>	Activates the Pause button and pauses the test.
<b>Alt (option) – F</b>	Activates the flagged button and marks an item as flagged or removes a flag from an item.

Tool Icon	Tool Name	Tool Definition
	<p><b>Pointer</b></p>	<p>The <b>Pointer</b> 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.</p> <p>The <b>Pointer</b> will change to a pencil head when moved over a multiple-choice answer bubble. Use it to select your answer.</p> <p>If another tool has been selected, you can return to the <b>Pointer</b> tool mode by clicking on the Pointer tool button. This button is at the far left of the tools row.</p>
	<p><b>Cross-Off</b></p>	<p>The <b>Cross-Off</b> 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.</p>
	<p><b>Highlighter</b></p>	<p>The <b>Highlighter</b> tool is used to highlight important information.</p>
	<p><b>Sticky Note</b></p>	<p>The <b>Sticky Note</b> 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.</p>
	<p><b>Magnifier</b></p>	<p>The <b>Magnifier</b> allows you to enlarge the entire screen. Other tools, including the <b>Line Guide</b>, <b>Cross-Off</b>, <b>Highlighter</b>, and <b>Calculator</b>, can be used when the <b>Magnifier</b> is turned on.</p>
	<p><b>Line Guide</b></p>	<p>The <b>Line Guide</b> tool provides a horizontal line that brings the focus to a single line of text. The <b>Line Guide</b> can be used to track a passage or an individual question.</p>
	<p><b>Measurement Tools</b></p>	<p>The <b>Measurement Tools</b> 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.</p>

Tool Icon	Tool Name	Tool Definition
	<b>References</b>	The <b>References</b> button allows you to access the reference materials that are available for your test.
	<b>Periodic Table of the Elements</b>	The <b>Periodic Table of Elements</b> button allows you to access an interactive Periodic Table of Elements.
	<b>Calculator</b>	The <b>Calculator</b> tool may be used to assist with calculations necessary to answer questions on the exam. You will be given a Basic or Scientific calculator.
	<b>Graphing Tool</b>	The <b>Graphing Tool</b> 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.
	<b>Next Button</b> <b>Back Button</b>	<p>The <b>Next</b> and <b>Back</b> buttons are used to navigate between questions on the test. They are also used to move between pages on multi-page questions.</p> <p>Click on the <b>Next</b> button to move forward to the next question or page.</p> <p>Click on the <b>Back</b> button to move backward to the previous question or page.</p>
	<b>Pause and Resume</b>	When the <b>Pause</b> 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 <b>Resume</b> button.
	<b>Exit</b>	<p>The <b>Exit</b> button appears on the Pause Page. Click on <b>Exit</b> to close the test.</p> <p><b>WARNING:</b> If a student exits a test using this button, the test remains incomplete. The student must log in again to complete the test.</p>

Tool Icon	Tool Name	Tool Definition
	<b>Flag</b>	<p>Click on the <b>Flag</b> button to mark a test question for review at a later time. When you click on the <b>Flag</b> button, the color of the button will change to yellow to indicate the question is flagged.</p> <p>To unflag a test question, use the <b>Pointer</b> tool to click the button again.</p>
	<b>Review/End Test</b>	<p>The <b>Review/End Test</b> 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.</p>
	<b>Return to Questions</b>	<p>The <b>Return to Questions</b> button appears on the Review Page. Clicking <b>Return to Questions</b> will take the student back to the most recently visited question. The student can then review any questions, and proceed by clicking <b>Review/End Test</b> again.</p>
	<b>End Test</b>	<p>The <b>End Test</b> button appears on the Review Page. Clicking this button will provide a prompt for the student to confirm whether they would like to <b>Return to Review</b> or <b>Submit</b>.</p>
	<b>Submit</b>	<p>The <b>Submit</b> button appears on the window that prompts a student to <b>Return to Review</b> or <b>Submit</b>. Selecting the <b>Submit</b> button will end the exam.</p>
	<b>Return to Review</b>	<p>The <b>Return to Review</b> button appears on the window that prompts a student to <b>Return to Review</b> or <b>Submit</b>. Selecting the <b>Return to Review</b> button will take the student back to the Review Page.</p>
	<b>Go to Question</b>	<p>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.</p>

Key Icon	Key Description
<input type="checkbox"/>	Unanswered item
<input checked="" type="checkbox"/>	Answered item
	Flagged item
S	Scenario indicator for Science; example: (S1)
P	Passage indicator for ELA; example: (P1)

# APPENDIX C: MATHEMATICS REFERENCE SHEET GRADES 3–5

Standard Units	Metric Units
<b>Conversions – Length</b>	
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)
<b>Conversions – Volume</b>	
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)	
<b>Conversions – Weight/Mass</b>	
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)
<b>Conversions – Time</b>	
1 minute (min) = 60 seconds (sec)	
1 hour (hr) = 60 minutes (min)	
1 day = 24 hours (hr)	

Grade Level(s)	Figure	Formula
<b>Area</b>		
3, 4, 5	Rectangle	$A = l \times w$
3, 4, 5	Square	$A = s \times s$
<b>Volume</b>		
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.		

## Grade 4 Writer's Checklists

- 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).











*Examiner's Manual*

**Grade 4**  
***English Language Arts and Mathematics Assessments***

## **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*

November 2018

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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 2018 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 3–5 required approximately 1½ to 2 hours of test administration time. The Mathematics assessments for students in grades 6–8 required approximately 2 to 2½ hours. In addition, students in grades 5 and 8 took a Science assessment that required an additional 1 to 1½ 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.

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. 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, 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.

## 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 the complete range of English Language Arts and Mathematics grades 3–8. These scores range in value from 160–650 for English Language Arts and from 185–660 for Mathematics. Scale scores for English Language Arts and Mathematics 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 or Mathematics. 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 and Mathematics. 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

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.

Scale scores are not reported for Science assessments in Spring 2018 administration. Missouri students participated in Science field test to try out items measuring new Missouri Science standards. The Missouri Learning Standards for Science are a blending of practices, core ideas, and broad concepts that link different domains of science. The practices include actions that scientists engage in as they gather, reason, and communicate while investigating the natural world. There are also engineering practices that engineers use when designing and constructing problem-solving models and systems. These practices seek to clarify the relevance of science, technology, engineering, and mathematics (STEM) to everyday life. The core ideas are the fundamental ideas that are necessary for understanding a given science discipline such as Life Science, Physical Science, and Earth & Space Sciences. The core ideas all have broad importance within or across science or engineering disciplines and provide a key tool for understanding or investigating complex ideas and solving problems. Student performance on Science field test items will be considered in development of new summative Science assessments for administration in Spring 2019.

## 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 and Mathematics. 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, based on the reporting category scale score, a student's performance can be compared to that of a 'just *Proficient* student' on the same reporting category.

Performance-level scores are not provided for Science field test.

## 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 and Mathematics total test and reporting category scale scores is included, in a graphical format, in the Individual Student Report and will be reported in the 2018 MAP Technical Report.

# 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

## 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

## 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

## 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

## 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

## 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

## 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

## 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

## 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

## 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 and Mathematics, 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 and Mathematics 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.

# Sample Individual Student Report





**Missouri**  
DEPARTMENT OF ELEMENTARY & SECONDARY  
**EDUCATION**



**Student Report**

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**Student Name:** AXX112361763, SAMPLE D

**Grade:** 4

**Student ID:** 9992729129

**Test Date:** Spring 2018

**District Name:** ANY DISTRICT

**School Name:** ANY SCHOOL

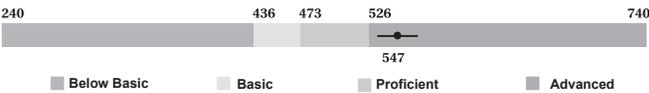
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**Missouri Assessment Program (MAP)**

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.

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**English Language Arts | Scale Score** 547



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: Advanced**

Students performing at the Advanced level on the Missouri Assessment Program demonstrate thorough command of 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 and in writing, listening, and speaking forms efficiently and effectively for different audiences and purposes. 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 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 extensive command of conventions of standard English.

---

**English Language Arts | Reporting Category Scale Scores**

Category	Student Results	A Just Proficient Student *
Reading	387	500
Research	541	499
Writing	398	498
Listening	416	497

The symbol shows the student's reporting category 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.

\* Reporting category scale score of a 'just Proficient student' is computed as an average of the category scale scores for students whose total test score is at the Proficient cut.

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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10/18/2018

- 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.

## Student Label

MISSOURI ASSESSEMENT PROGRAM <b>SAMPLE, STUDENT1</b> <b>①</b> Grade: <b>Grade 4</b> Test Date: <b>04/04/2018</b> DOB: <b>01/01/2003</b> MOSIS State ID: <b>1234567890</b>	<b>Content Area</b> <b>English Language Arts</b>
	Performance Level <b>Advanced ②</b>  MAP Scale Score <b>547 ③</b>
02/22/2018	

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 2018 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.

- ① **Student Demographic Information.** The left side of the label lists the name and biographical data of the student taking the assessment.
- ② **Performance Level.** This is the student's Performance Level (Advanced, Proficient, Basic, or Below Basic).
- ③ **Scale Score.** This is the student's Scale Score for the content area listed at the top of the label.

## NOTICE OF NON-DISCRIMINATION

It is the policy of the Missouri Department of Elementary and Secondary Education not to discriminate on the basis of race, color, religion, gender, national origin, age, or disability in its programs or employment practices as required by Title VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, and Title II of the Americans with Disabilities Act of 1990.

Inquiries related to Department employment practices may be directed to the Jefferson State Office Building, Human Resources Director, 8th Floor, 205 Jefferson Street, P.O. Box 480, Jefferson City, MO 65102-0480; telephone number (573) 751-9619 or TYY (800) 735-2966. Inquiries related to Department programs and to the location of services, activities, and facilities that are accessible by persons with disabilities may be directed to the Jefferson State Office Building, Office of the General Counsel, Coordinator–Civil Rights Compliance (Title VI/Title IX/504/ADA/Age Act), 6th Floor, 205 Jefferson Street, P.O. Box 480, Jefferson City, MO 65102-0480; telephone number (573) 526-4757 or TYY (800) 735-2966, email [civilrights@dese.mo.gov](mailto:civilrights@dese.mo.gov).

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, 8930 Ward Parkway, Suite 2037, Kansas City, MO 64114; telephone number (816) 268-0550; FAX (816) 823-1404; TDD (877) 521-2172.

DATA RECOGNITION

**DRC**

CORPORATION

13490 Bass Lake Road  
Maple Grove, MN 55311

## **Appendix D: General Research File Layout**

MO MAP GLA Spring 2018 GRF Layout_v1.2					
Start	End	Len	Field	Valid Values	Comments/Description
			<b>Hierarchical Information</b>		
1	2	2	StateCode	MO	Missouri
3	15	13	Test type	MAPSMTSPR2018	Represents the assessment the student will be taking. MAPSMTSPR2018 is MAP Grade-Level Assessment spring Summative
16	43	28	District Name	A-Z, a-z, 0-9, "&", "#", ".", ";", "(", ")", " ", "!", "-", "@", embedded space	Data will come from Node file, not Precode file.
44	49	6	DistCd	0-9; DESE-Assigned Unique 6 digit code representing the district in which the school is located. Include leading zeroes, when applicable.	Tested District Code.
50	77	28	School Name	A-Z, a-z, 0-9, "&", "#", ".", ";", "(", ")", " ", "!", "-", "@", embedded space	Data will come from Node file, not Precode file.
78	81	4	ScCd	0-9; Four digit school code	Tested School Code
82	83	2	Grade	03 - 08; Must include 2 characters (leading zeroes when applicable).	Grade level as of the time data is being submitted.
84	113	30	City	A-Z, a-z, 0-9 Alphanumeric characters, embedded space	This is the "SHIP_TO_CITY" in Node file.
114	117	4	Current School Year	YYYY	2018
118	167	50	Blank for Future Use	Filler	Reserved for future use
			<b>Student BIO Information</b>		
168	179	12	Record ID (unique system-generated ID)	0-9	A unique number per student record. The Record ID number shall be unique by student record and unique within an administration year.
180	189	10	DRC Student ID (Unique System-generated)	0-9	Unique record number per student. This is a DRC internal number that uniquely identifies each student within an administration in a given contract year.
190	209	20	Local Student ID	0-9, A-Z; blank	
210	219	10	StateID	0-9	MOSIS ID - State assigned student identifier. See <a href="http://dese.mo.gov/MOSIS">http://dese.mo.gov/MOSIS</a> for more information.

MO MAP GLA Spring 2018 GRF Layout_v1.2					
Start	End	Len	Field	Valid Values	Comments/Description
220	279	60	Last Name	Legal last name. Supported Characters : A-Z, a-z, 0-9, "-", "_", "'", ":", space	Student Last Name
280	339	60	First Name	Legal first name Supported Characters : A-Z, a-z, 0-9, "-", "_", "'", ":", space	Student First Name
340	399	60	Middle Name	Legal middle name Supported Characters : A-Z, a-z, 0-9, "-", "_", "'", ":", space	Student Middle Name
400	409	10	Suffix	Legal name suffix. E.g. Jr, Sr Supported Characters : A-Z, a-z, 0-9, "-", "_", "'", ":", space	
410	419	10	Birth Date	mmddyyyy Month = Jan = '01', Feb = '02', Mar = '03', Apr = '04', May = '05', June = '06', July = '07', Aug = '08', Sept = '09', Oct = '10', Nov = '11', Dec = '12' Day = 01 to 31 Year = Each position: 0-9	
420	420	1	Gender	F = Female, M = Male	
421	421	1	RaceEthnicity	A = Asian B = Black H = Hispanic I = Indian (American Indian or Alaskan Native) W = White P = Native Hawaiian or Other Pacific Islander M = Multi-Racial	
422	423	1	Filler 1 and 2	blank	Reserved for future use
424	433	1	State Use 1 through 10	Y if marked, Blank if not marked.	Will be blank for all; not currently used.
434	435	2	Period	01-10, blank	From the Precode File.

MO MAP GLA Spring 2018 GRF Layout_v1.2					
Start	End	Len	Field	Valid Values	Comments/Description
			<b>CONTENT AREA INFORMATION</b>		
436	437	2	Content Code	01 = English Language Arts, 02 = Mathematics, 03 = Science	
438	443	6	Content Form	IDEAS six-digit <b>base</b> Form ID, blank	Form is at the Content level.
444	503	60	ExaminerFirstName	Supported Characters : A-Z, a-z, 0-9, "-", "_", "'", ":", space	From the Test Session Name in eDIRECT.
504	563	60	ExaminerLastName	Supported Characters : A-Z, a-z, 0-9, "-", "_", "'", ":", space	From the Test Session Name in eDIRECT.
564	633	70	ExaminerEmail	Up to 70 characters, valid email format (xxx@xxx.xxx), Blank if no email included.	
634	648	15	Content Export Date Time	YYYYMMDDHHMMSS (24 Hr Time Frame in GMT Format)	(24 HOUR FORMAT - IF MORE THAN ONE RECORD IN OUR PROCESSING WE KEEP THE LATEST RECEIVED RECORD) <b>NOTE: The first 14 positions will have the DateTime stamp, starting at position 634, and the very last position in the field (15) is blank.</b>
649	658	10	Test Date (MMDDCCYY)	MMDDCCYY	This date is the generic first date of the testing window.
659	659	1	Precode Flag	Y = yes, blank = no	Only set to "Y" if the student comes in on a precode file. Blank if student was manually entered.
660	709	50	Filler	blank	Reserved for future use
			<b>Accommodations and Universal Tools</b>		
710	710	1	Accommodation Braille (A012)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science. Grades = 3-8. Code A012 refers to Braille administered via Paper format
711	711	1	Accommodation Large Print (A021)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8. Paper format only
712	712	1	Filler	blank	Reserved for future use

MO MAP GLA Spring 2018 GRF Layout_v1.2					
Start	End	Len	Field	Valid Values	Comments/Description
713	713	1	Accommodation Sign Language (A052)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
714	714	1	Accommodation Paper Based Assessment (A102)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
715	715	1	Accommodation Specialized Calculator (For Calculator Allowed Items Only) (A396)	Blank = Not Indicated Y = Indicated	Content Area = Math only Grades = 3-8
716	716	1	Accommodation Alternate Response Options (A441)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
717	717	1	Universal Tool Bilingual Dictionary (S431)	Blank= Not Indicated Y = Indicated	Content Area = ELA, Math, Science Grades = 3-8
718	718	1	Filler	blank	Reserved for future use
719	719	1	Filler	blank	Reserved for future use
720	720	1	Universal Tool Color Contrast - Paper (S102)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
721	721	1	Universal Tool Color Overlay (S103)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8. Paper
722	722	1	Universal Tool Magnification - Assistive Technology (S105)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
723	723	1	Filler	blank	Reserved for future use
724	724	1	Universal Tool Masking - Paper (S107)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
725	725	1	Universal Tool Read-Aloud (For all items in any subject, Not Including ELA Reading Passages) - Text-To-Speech (S041)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
726	726	1	Universal Tool Read-Aloud (For all items in any subject,-Not Including ELA Reading Passages) - Assistive Technology (S042)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
727	727	1	Universal Tool Read-Aloud (For all items in any subject,-Not Including ELA Reading Passages) - Native Language (S111)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
728	728	1	Universal Tool Scribe (S351)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8

MO MAP GLA Spring 2018 GRF Layout_v1.2					
Start	End	Len	Field	Valid Values	Comments/Description
729	729	1	Universal Tool Separate Setting (S501)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
730	730	1	Universal Tool Translation (S109)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
731	731	1	Accommodation Read Aloud (ELA Reading Passages) - Text-To-Speech ( <b>GRADES 6-8</b> ) (A043)	Blank = Not Indicated Y = Indicated	Content Area = ELA only Grades = 6-8
732	732	1	Accommodation Read Aloud (ELA Reading Passages) - Text-To-Speech ( <b>GRADES 3-5 ONLY</b> ) (A040) <b>**INVALIDATION ELA**</b>	Blank = Not Indicated Y = Indicated	Content Area = ELA only Grades = 3-5
733	733	1	Accommodation Read-Aloud (ELA Reading Passages) - Human Reader ( <b>GRADES 3-5 ONLY</b> ) (A041) <b>**INVALIDATION ELA**</b>	Blank = Not Indicated Y = Indicated	Content Area = ELA only Grades = 3-5
734	734	1	Accommodation Read-Aloud (ELA Reading Passages) - Assistive Technology ( <b>GRADES 3-5 ONLY</b> ) (A042) <b>**INVALIDATION ELA**</b>	Blank = Not Indicated Y = Indicated	Content Area = ELA only Grades = 3-5
735	735	1	Accommodation Read-Aloud (ELA Reading Passages) - Native Language ( <b>GRADES 3-5 ONLY</b> ) (A111) <b>**INVALIDATION ELA**</b>	Blank = Not Indicated Y = Indicated	Content Area = ELA only Grades = 3-5
736	736	1	Universal Tool Read-Aloud (For all items in any subject, Not Including ELA Reading Passages) - Human Reader (S043)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
737	737	1	Accommodation Read-Aloud (ELA Reading Passages) - Assistive Technology ( <b>GRADES 6-8</b> ) (A044)	Blank = Not Indicated Y = Indicated	Content Area = ELA only Grades = 6-8
738	738	1	Accommodation Read-Aloud (ELA Reading Passages) - Human Reader ( <b>GRADES 6-8</b> ) (A045)	Blank = Not Indicated Y = Indicated	Content Area = ELA only Grades = 6-8

MO MAP GLA Spring 2018 GRF Layout_v1.2					
Start	End	Len	Field	Valid Values	Comments/Description
739	739	1	Accommodation Read-Aloud (ELA Reading Passages) - Native Language ( <b>GRADES 6-8</b> ) (A112)	Blank = Not Indicated Y = Indicated	Content Area = ELA only Grades = 6-8
740	740	1	Accommodation Read-Aloud (ELA Reading Passages -Blind Students (A046)	Blank = Not Indicated Y = Indicated	Content Area = ELA only Grades = 6-8
741	741	1	Accommodation Speech-To-Text - Assistive Technology (A352)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
742	742	1	Accommodation Abacus (A391)	Blank = Not Indicated Y = Indicated	Content Areas = Math, Science only Grades = 3-8
743	743	1	Accommodation Calculator (For Non-Calculator Allowed Items Only) ( <b>GRADE 3 ONLY</b> ) (A392) <b>**INVALIDATION MATH**</b>	Blank = Not Indicated Y = Indicated	Content Area = Math only Grade = 3
744	744	1	Accommodation Calculator (For Non-Calculator Allowed Items Only) ( <b>GRADES 4-8</b> ) (A393)	Blank = Not Indicated Y = Indicated	Content Area = Math only Grades = 4-8
745	745	1	Accommodation Multiplication Table ( <b>GRADE 3 ONLY</b> ) (A394) <b>** INVALIDATION MATH**</b>	Blank = Not Indicated Y = Indicated	Content Area = Math only Grade = 3
746	746	1	Accommodation Multiplication Table ( <b>GRADES 4-8</b> ) (A395)	Blank = Not Indicated Y = Indicated	Content Area = Math, Science only Grades = 4-8
747	747	1	Universal Tool Non-Accommodation Paper Based Assessment (S112)	Blank = Not Indicated Y = Indicated	Content Areas = ELA, Math, Science Grades = 3-8
748	767	20	Filler	blank	Reserved for future use
			<b>Teacher Invalidations</b>		
768	768	1	Teacher Invalidation	Blank = No Invalidation marked Y = Invalidated	"Teacher Invalidation" are populated from eDIRECT. When invalidation is marked this will invalidate the content area for all sessions.
			<b>Absent</b>		
769	769	1	Absent	Blank = Not Marked, Y = Marked	Absent populated from eDIRECT
770	818	49	Blank for Future Use	Filler	Blank for future use

MO MAP GLA Spring 2018 GRF Layout_v1.2					
Start	End	Len	Field	Valid Values	Comments/Description
			<b>Item Responses</b>		
819	839	21	Content Area Title	"English Language Arts", "Mathematics", "Science"	
840	939	100	Item Responses for Session 1	0-9, ABCDE, Z, V, S blank	For all Item Response Strings, Item sequence in string = item sequence in test map. For <b>operational</b> MC item responses: Correct = A, B, C, D; Incorrect = 1, 2, 3, 4; Omit/blank = 0 All other <b>operational</b> item types will be represented with a numeric score value or a condition code. <b>Field Test items = Z</b> <b>Vertical Linking items = V</b> <b>WP items with a score of "10" = S</b>
940	1039	100	Item Responses for Session 2	0-9, ABCDE, Z, V blank	
1040	1139	100	Item Responses for Session 3	0-9, ABCDE, Z, V blank	
1140	1239	100	Item Responses for Session 4	0-9, ABCDE, Z, V blank	
			<b>Item Scores</b>		
1240	1242	3	Total Raw Score	0-100, blank	Raw Score for MC Items + Raw Score for CR Items (including WP) + Raw Score for TE Items
1243	1243	1	Completion Criteria	N = not met, Y = met	(Completion Criteria Met = Valid Attempt)
1244	1247	4	Percent Correct	0.0 - 100, blank	Whole Number plus one decimal position (99.9). Percent Correct = Total Raw Score / Total Raw Score Possible. Report to the tenth. No decimal point for 100. Rounding rules: round up from anything half-way between tenths (for example, 22.25 rounds to 22.3)
1248	1251	4	Scale Score	0000-9999, blank	
1252	1252	1	Content Achievement Level	Values 0, 2-5 0 = if Absent or EL (Level Not Determined) 2 = Below Basic or Invalidated Test 3 = Basic 4 = Proficient 5 = Advanced	
1253	1282	30	Blank for Future Use	Filler	Reserved for future use

MO MAP GLA Spring 2018 GRF Layout_v1.2					
Start	End	Len	Field	Valid Values	Comments/Description
			<b>MLS Score Data</b>		
1283	1286	4	Reporting Category #1	1	For all reporting categories, ReportingCategory_Code from mapping.
1287	1290	4	Reporting Category #1 Pts. Earned	0.0 - 100, blank	For all reporting categories , Reporting Category # Pts. Earned = Raw Score for the reporting category / Total Raw Score Possible for the reporting category.
1291	1294	4	Reporting Category #2	2	
1295	1298	4	Reporting Category #2 Pts. Earned	0.0 - 100, blank	
1299	1302	4	Reporting Category #3	3	
1303	1306	4	Reporting Category #3 Pts. Earned	0.0 - 100, blank	
1307	1310	4	Reporting Category #4	4, blank	Math Grade 8 has three reporting categories.
1311	1314	4	Reporting Category #4 Pts. Earned	0.0 - 100, blank	
1315	1346	4	Reporting Category #5 through #8	Same as above (two variables per category)	
1347	1350	4	Content Category #1	##, blank	For all content categories, Content Category_Code from mapping.
1351	1354	4	Content Category #1 Pts. Earned	0.0 - 100, blank	For all content categories, Content Category # Pts. Earned = Raw Score for the content category/ Total Raw Score Possible for the content category.
1355	1358	4	Content Category #2	##, blank	
1359	1362	4	Content Category #2 Pts. Earned	0.0 - 100, blank	
1363	1366	4	Content Category #3	##, blank	
1367	1370	4	Content Category #3 Pts. Earned	0.0 - 100, blank	
1371	1458	4	Content Category #4 through #14	Same as above (two variables per category)	
			<b>English Learner (EL)-Absent</b>		
1459	1459	1	EL-Absent	Blank = Not Marked, Y = Marked	EL populated from eDIRECT; will follow the same logic as a student identified as absent.

MO MAP GLA Spring 2018 GRF Layout_v1.2					
Start	End	Len	Field	Valid Values	Comments/Description
			<b>Item Scores (Continued)</b>		
1460	1463	4	Scale Score SEM Upper	0000-9999, blank	
1464	1467	4	Scale Score SEM Lower	0000-9999, blank	
			<b>MLS Score Data (Continued)</b>		
1468	1471	4	Reporting Category #1 Scale Score	0000-9999, blank	For all reporting categories, Reporting Category Scale Score
1472	1475	4	Reporting Category #1 Scale Score SEM Upper	0000-9999, blank	For all reporting categories, Reporting Category Standard Error of Measurement (SEM) Upper
1476	1479	4	Reporting Category #1 Scale Score SEM Lower	0000-9999, blank	For all reporting categories, Reporting Category Standard Error of Measurement (SEM) Lower
1480	1483	4	Reporting Category #1 Scale Score of a Just Proficient Student	0000-9999, blank	For all reporting categories, Reporting Category Scale Score of a Just Proficient Student.
1484	1487	4	Reporting Category #2 Scale Score	0000-9999, blank	
1488	1491	4	Reporting Category #2 Scale Score SEM Upper	0000-9999, blank	
1492	1495	4	Reporting Category #2 Scale Score SEM Lower	0000-9999, blank	
1496	1499	4	Reporting Category #2 Scale Score of a Just Proficient Student	0000-9999, blank	
1500	1503	4	Reporting Category #3 Scale Score	0000-9999, blank	
1504	1507	4	Reporting Category #3 Scale Score SEM Upper	0000-9999, blank	
1508	1511	4	Reporting Category #3 Scale Score SEM Lower	0000-9999, blank	
1512	1515	4	Reporting Category #3 Scale Score of a Just Proficient Student	0000-9999, blank	
1516	1519	4	Reporting Category #4 Scale Score	0000-9999, blank	
1520	1523	4	Reporting Category #4 Scale Score SEM Upper	0000-9999, blank	
1524	1527	4	Reporting Category #4 Scale Score SEM Lower	0000-9999, blank	
1528	1531	4	Reporting Category #4 Scale Score of a Just Proficient Student	0000-9999, blank	
1532	1595	4	Reporting Category #5 through #8 (Scale Score, SEM Upper, SEM Lower, Scale Score of a Just Proficient Student)	Same as above (four variables per category)	

## **Appendix E: Conditional Standard Error of Measurement with Cut Scores**

Figure E1: CSEM Curve with Cut Scores: ELA Grade 3, Form A

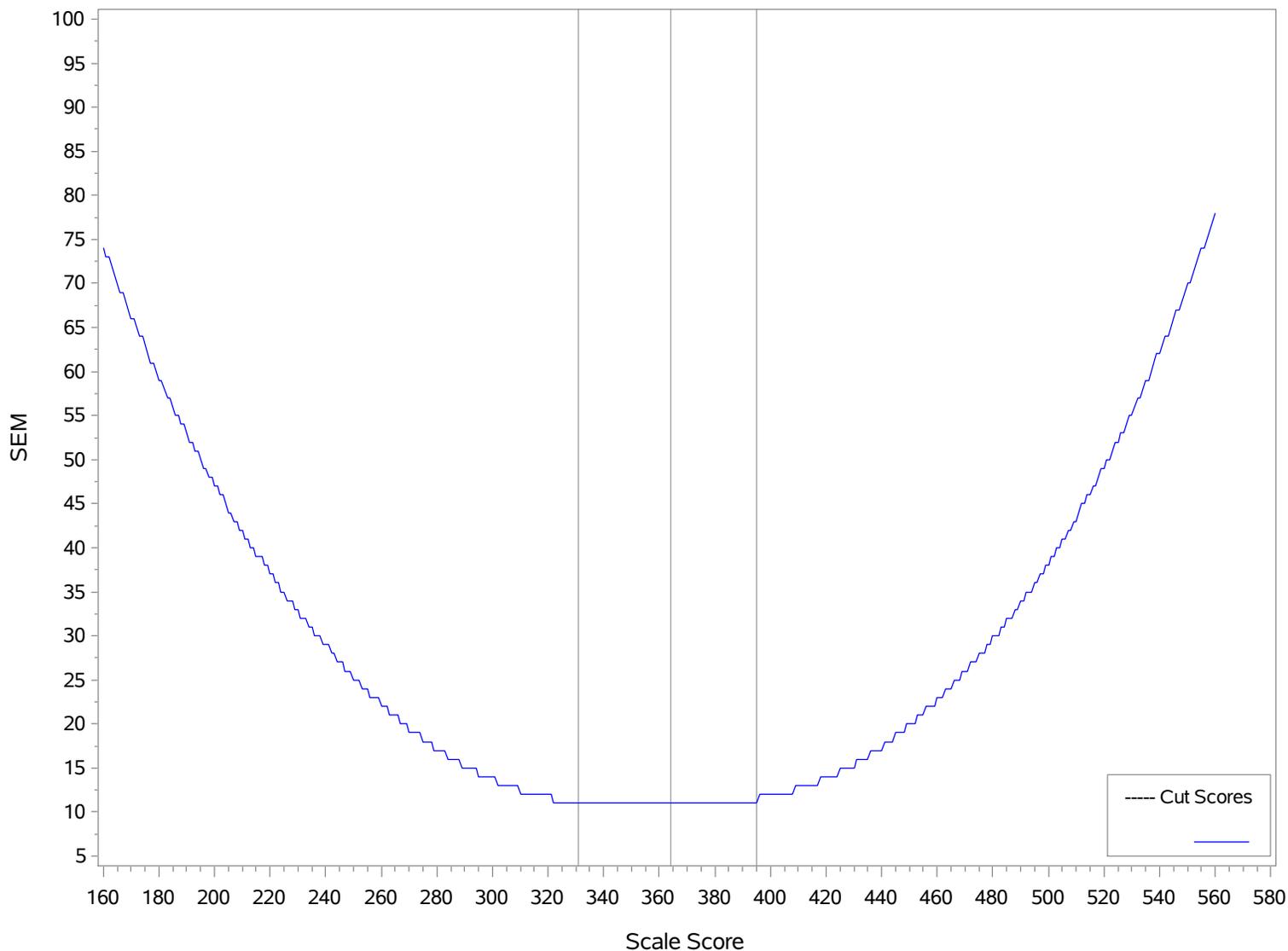


Figure E2: CSEM Curve with Cut Scores: ELA Grade 3, Form B

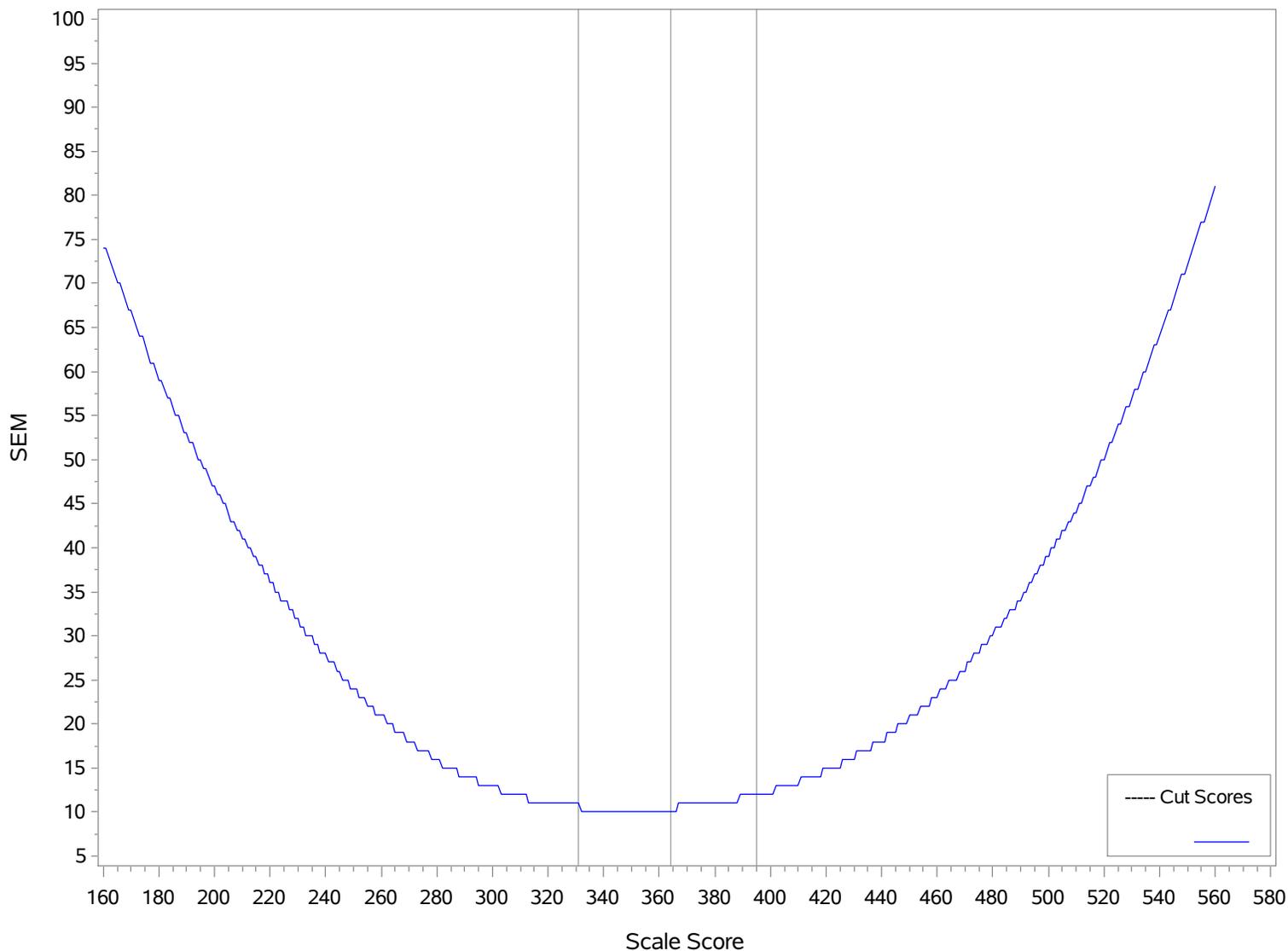
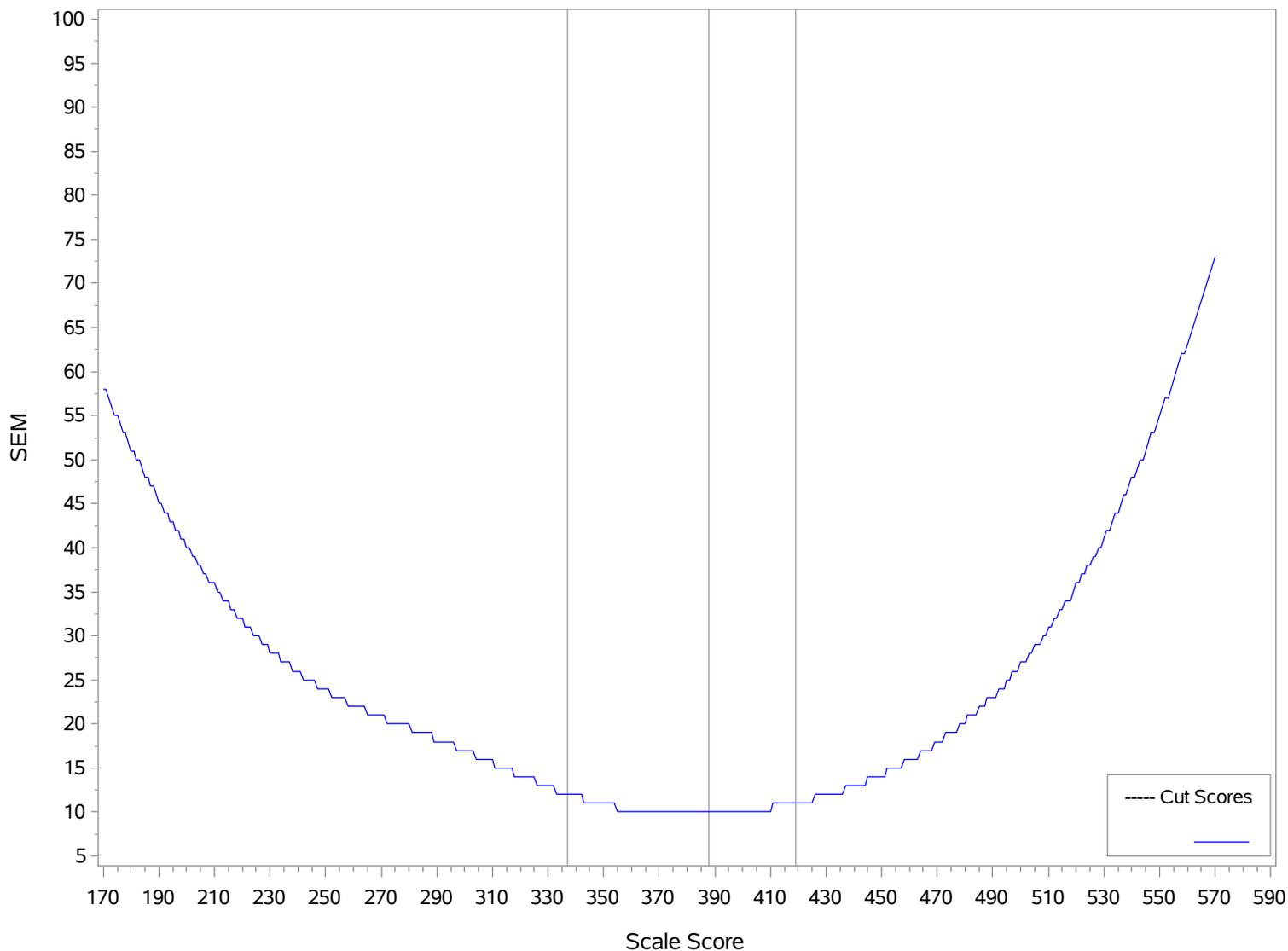


Figure E3: CSEM Curve with Cut Scores: ELA Grade 4, Form A01



**Figure E4: CSEM Curve with Cut Scores: ELA Grade 4, Form A04**

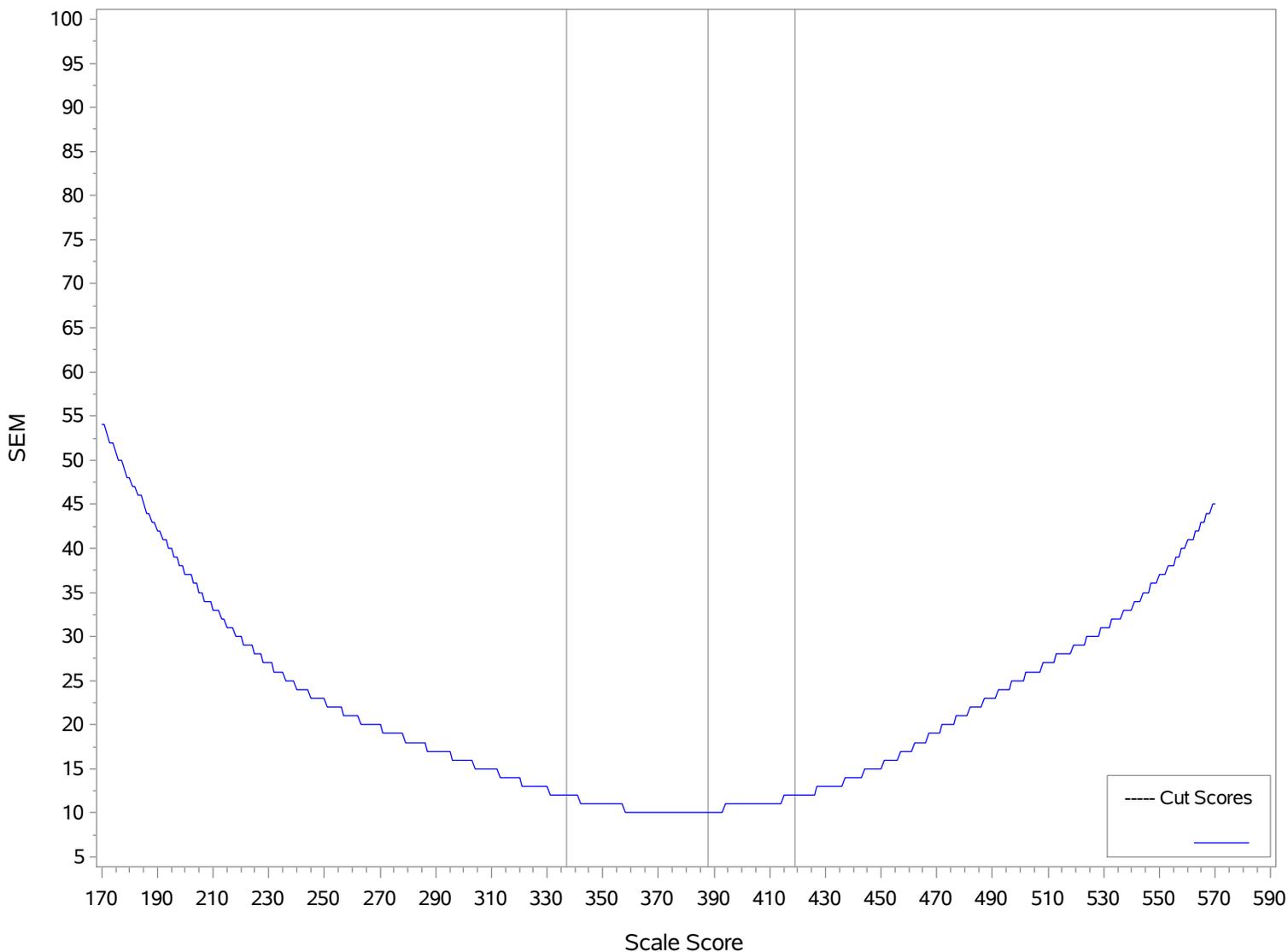
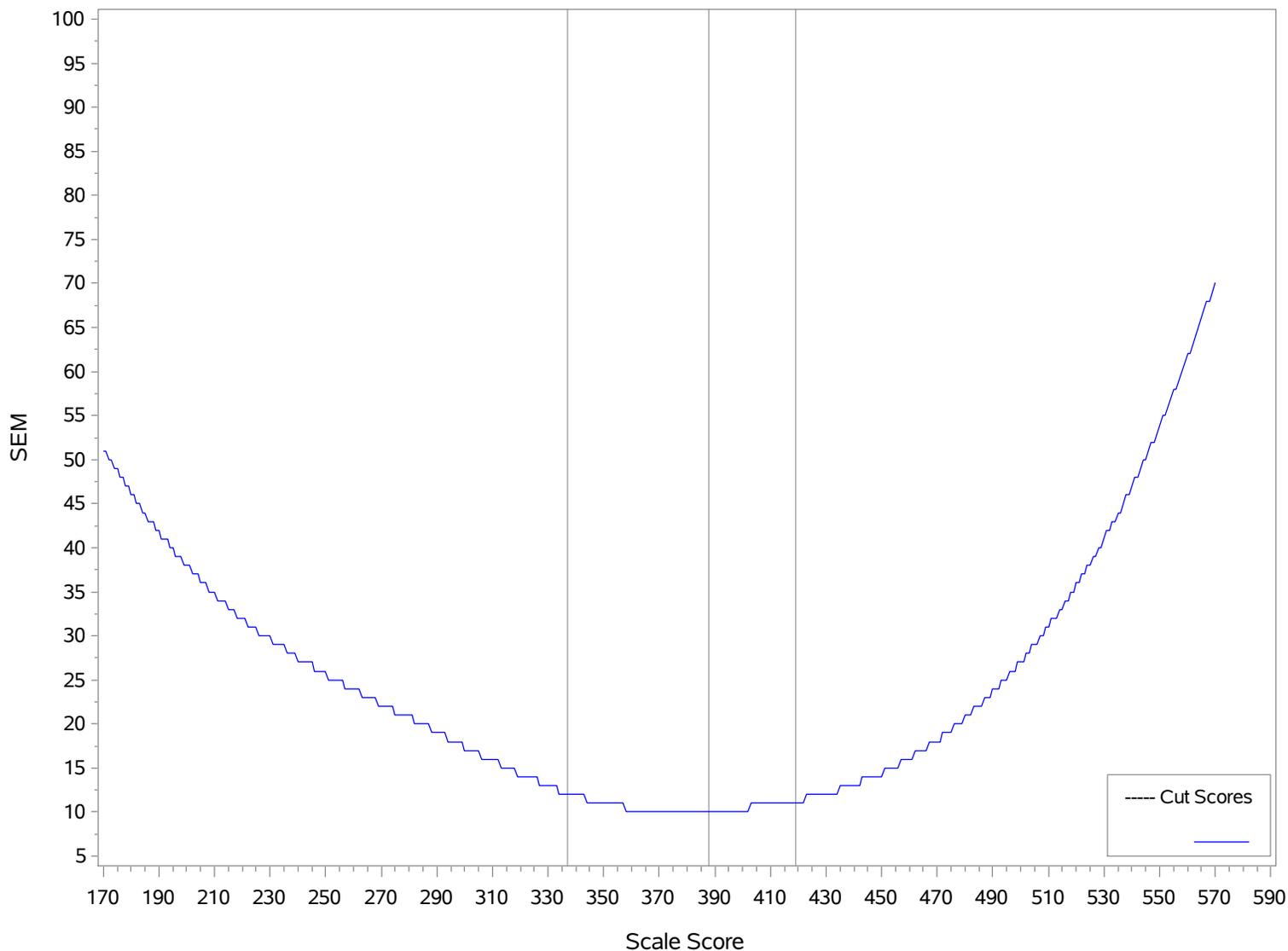
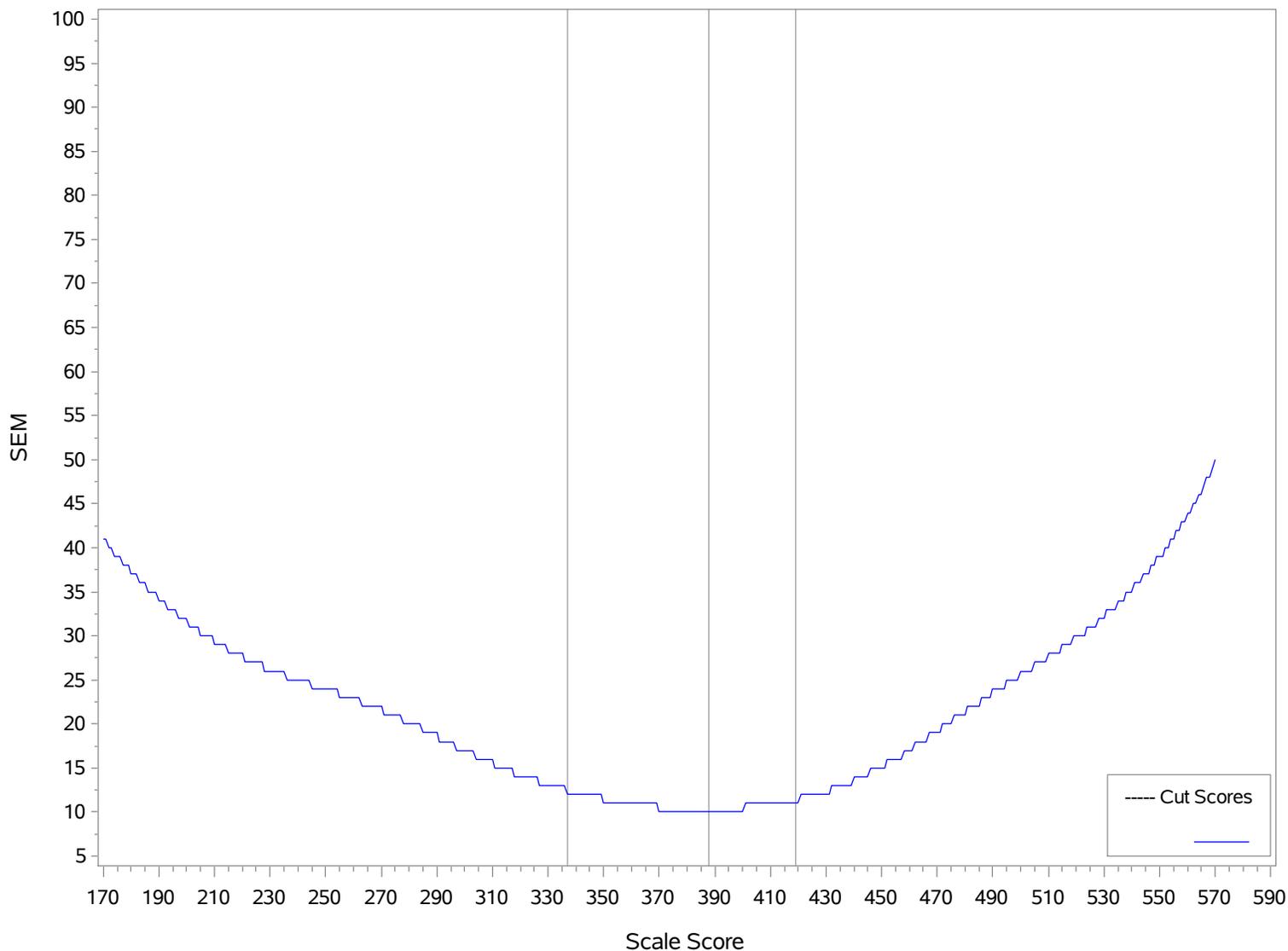


Figure E5: CSEM Curve with Cut Scores: ELA Grade 4, Form A07



**Figure E6: CSEM Curve with Cut Scores: ELA Grade 4, Form B01**



**Figure E7: CSEM Curve with Cut Scores: ELA Grade 4, Form B02**

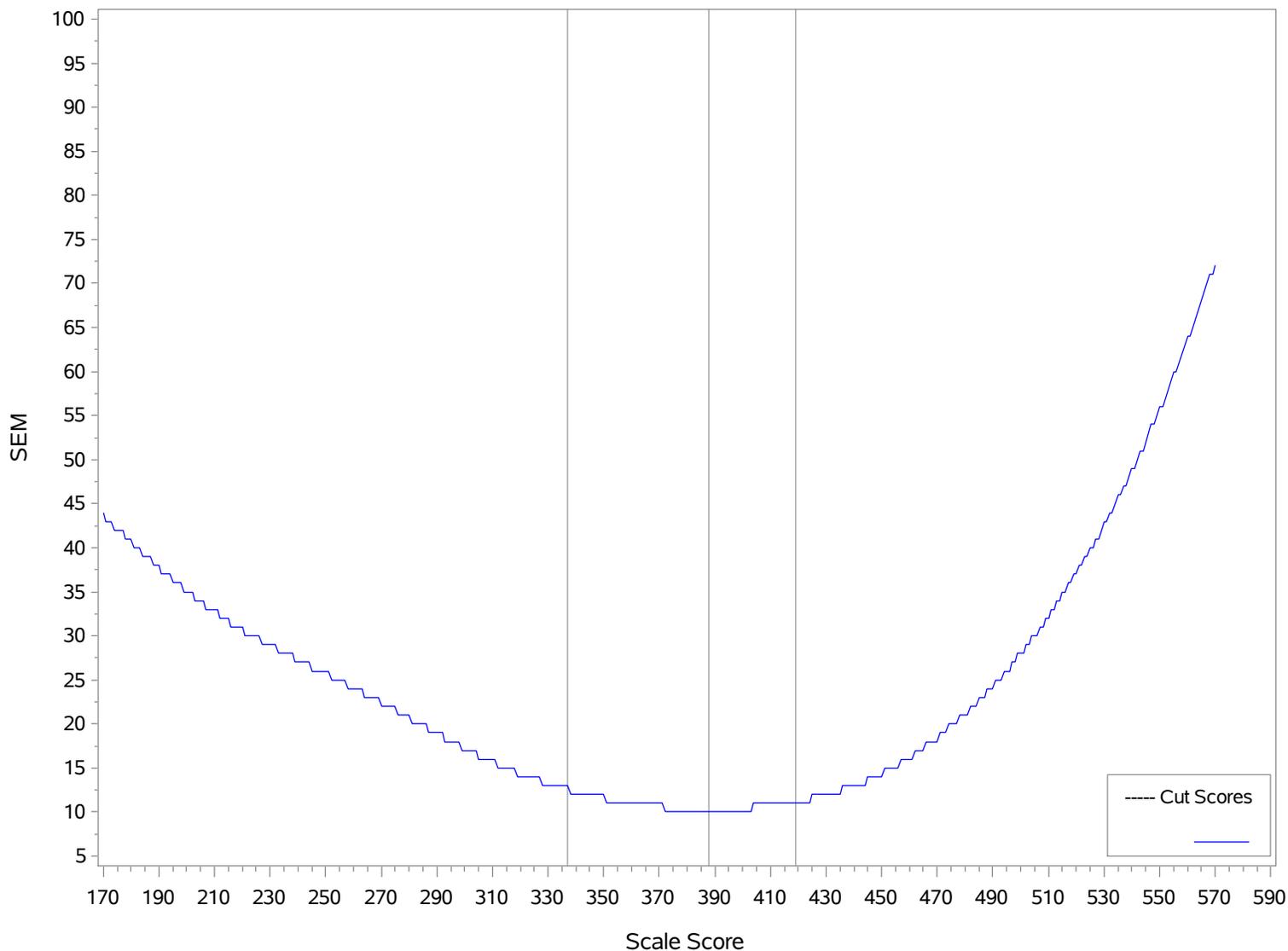


Figure E8: CSEM Curve with Cut Scores: ELA Grade 4, Form B04

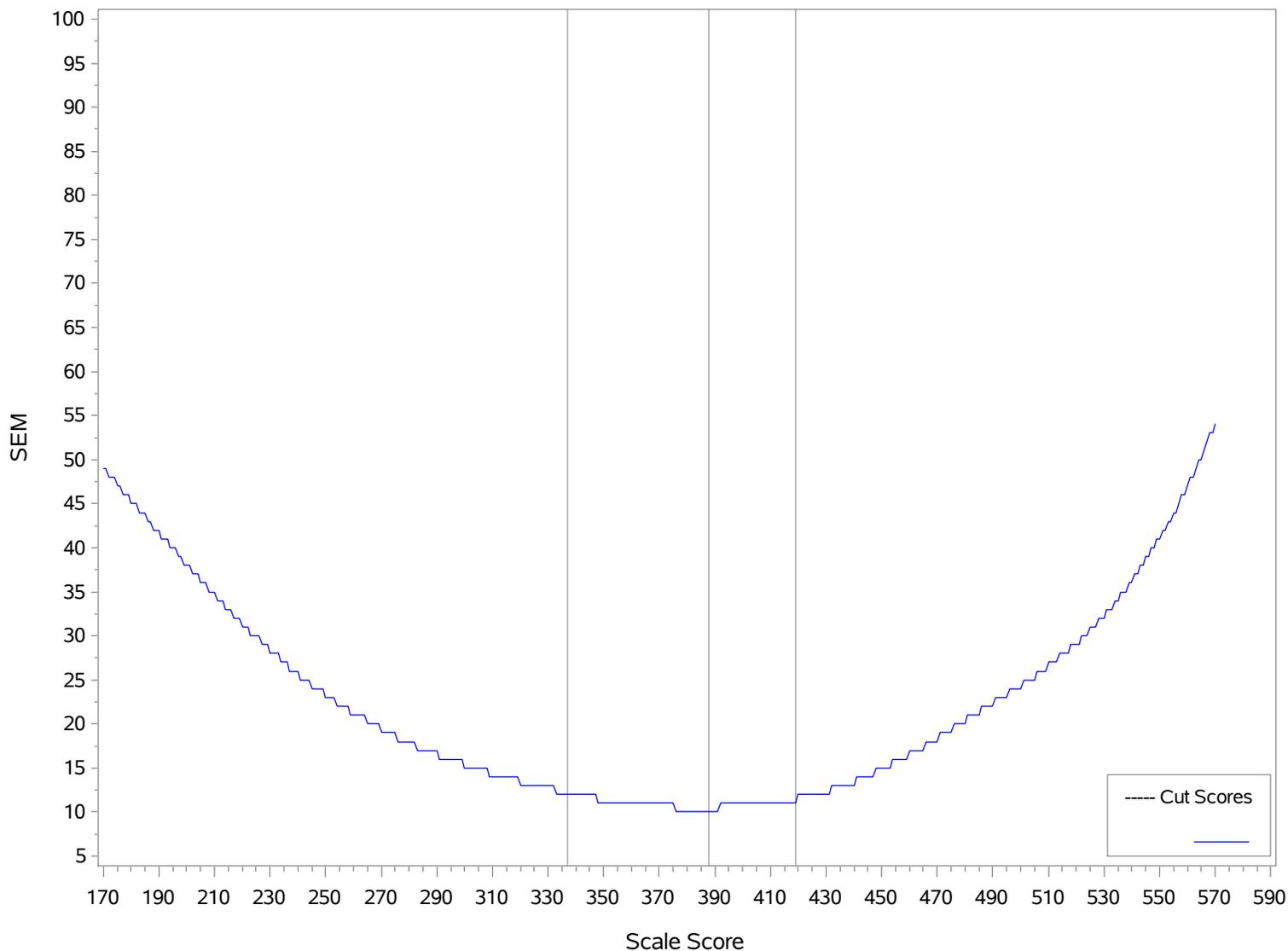
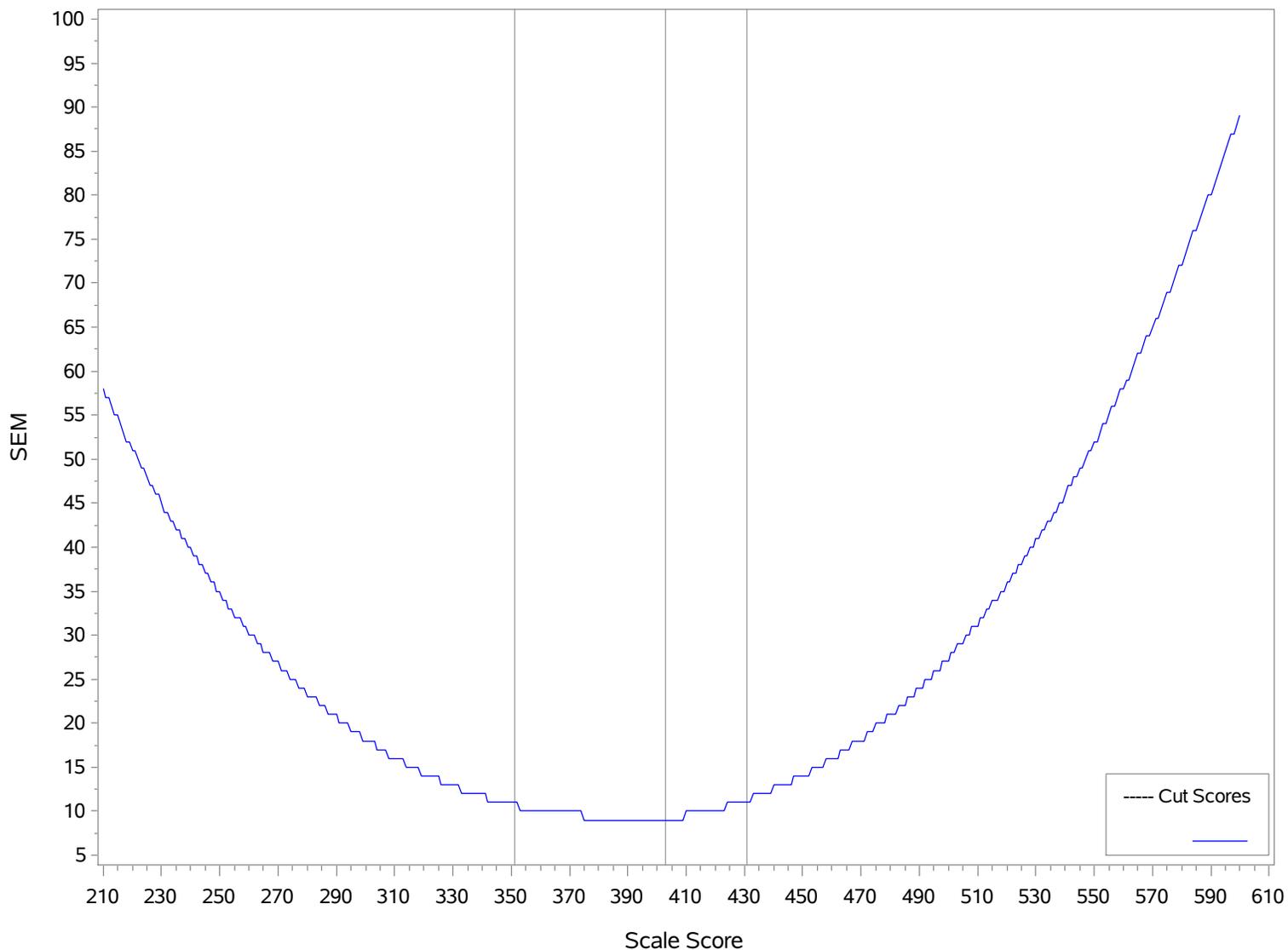


Figure E9: CSEM Curve with Cut Scores: ELA Grade 5, Form A



**Figure E10: CSEM Curve with Cut Scores: ELA Grade 5, Form B**

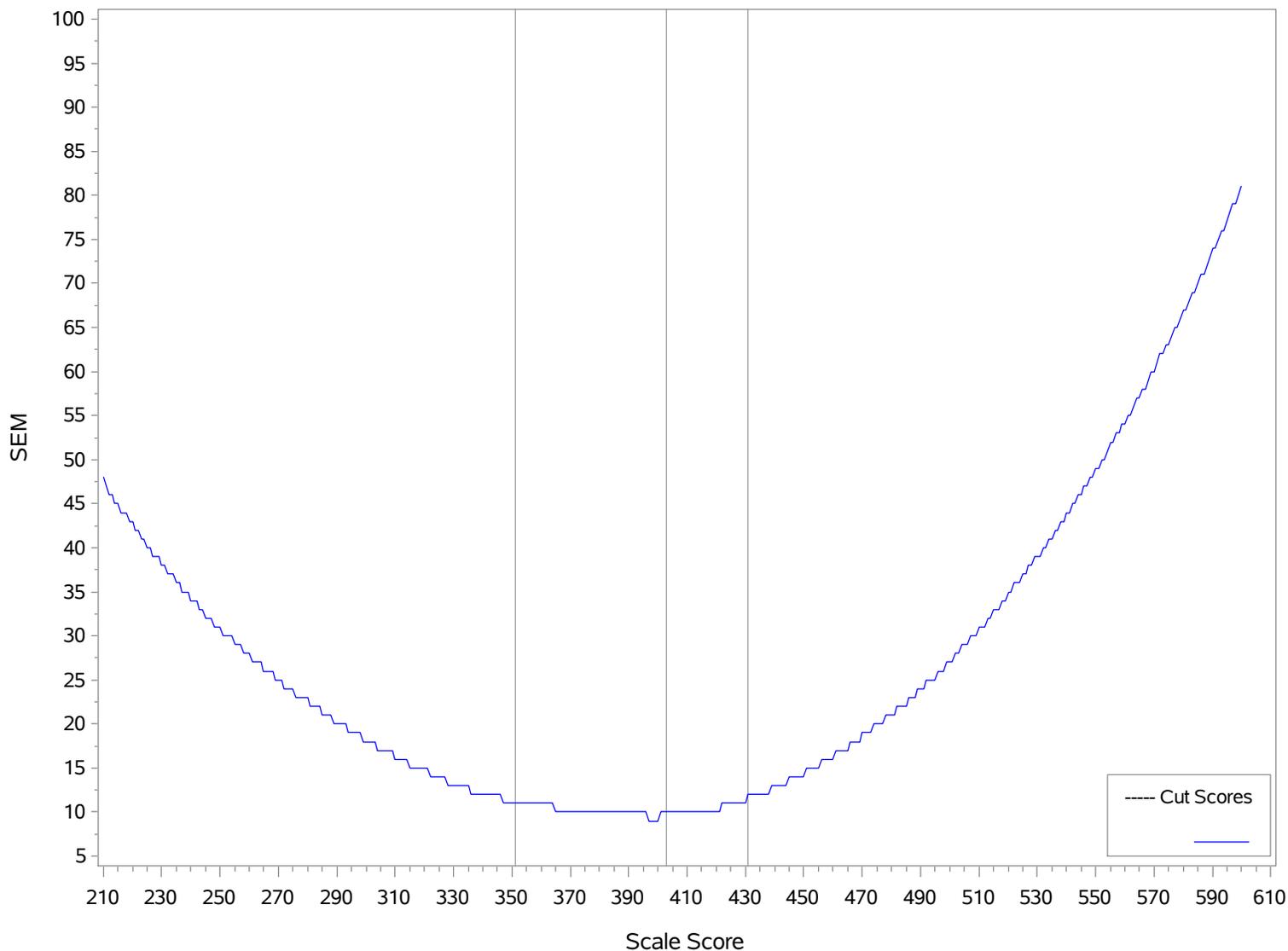
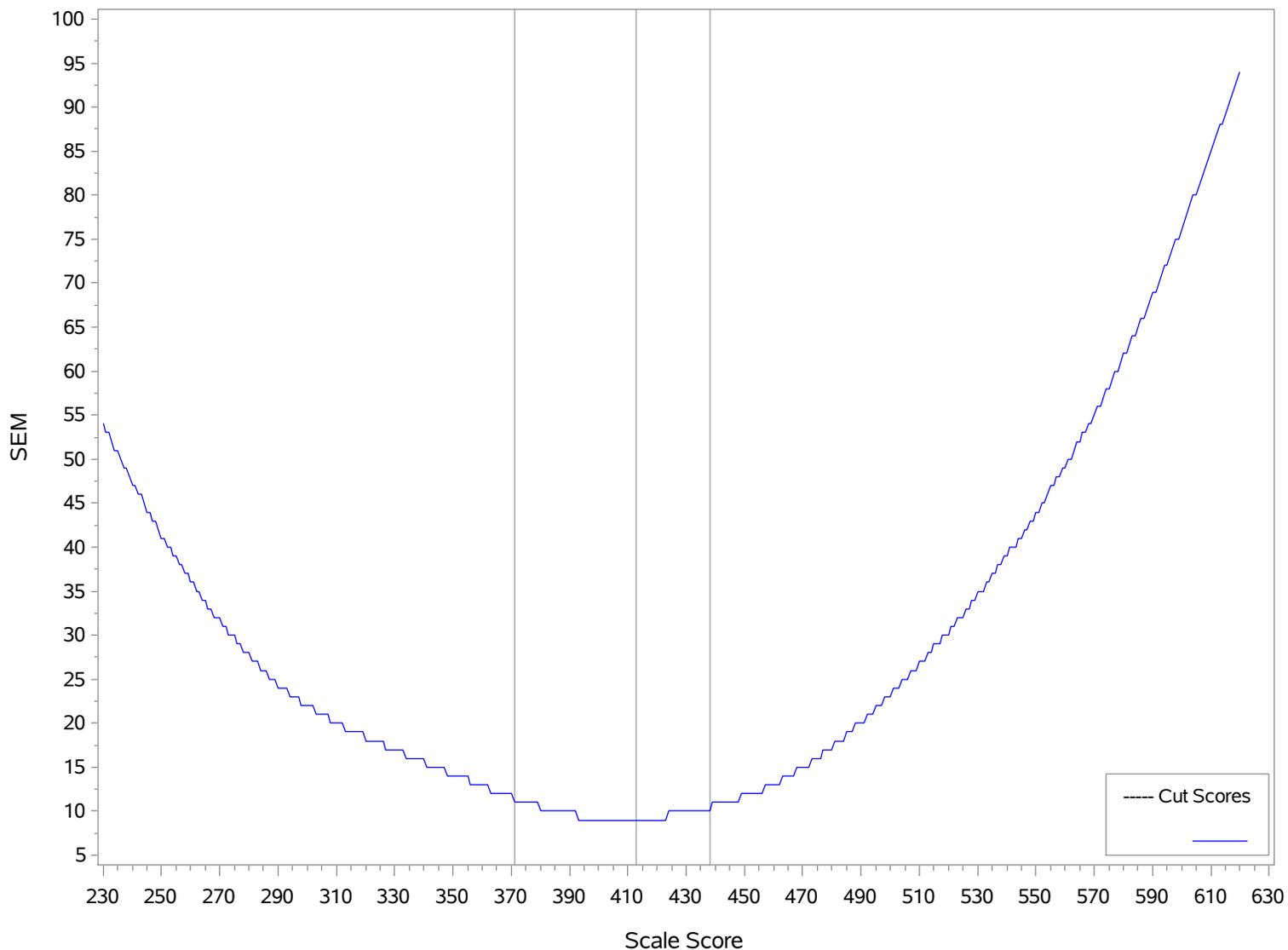


Figure E11: CSEM Curve with Cut Scores: ELA Grade 6, Form A



**Figure E12: CSEM Curve with Cut Scores: ELA Grade 6, Form B**

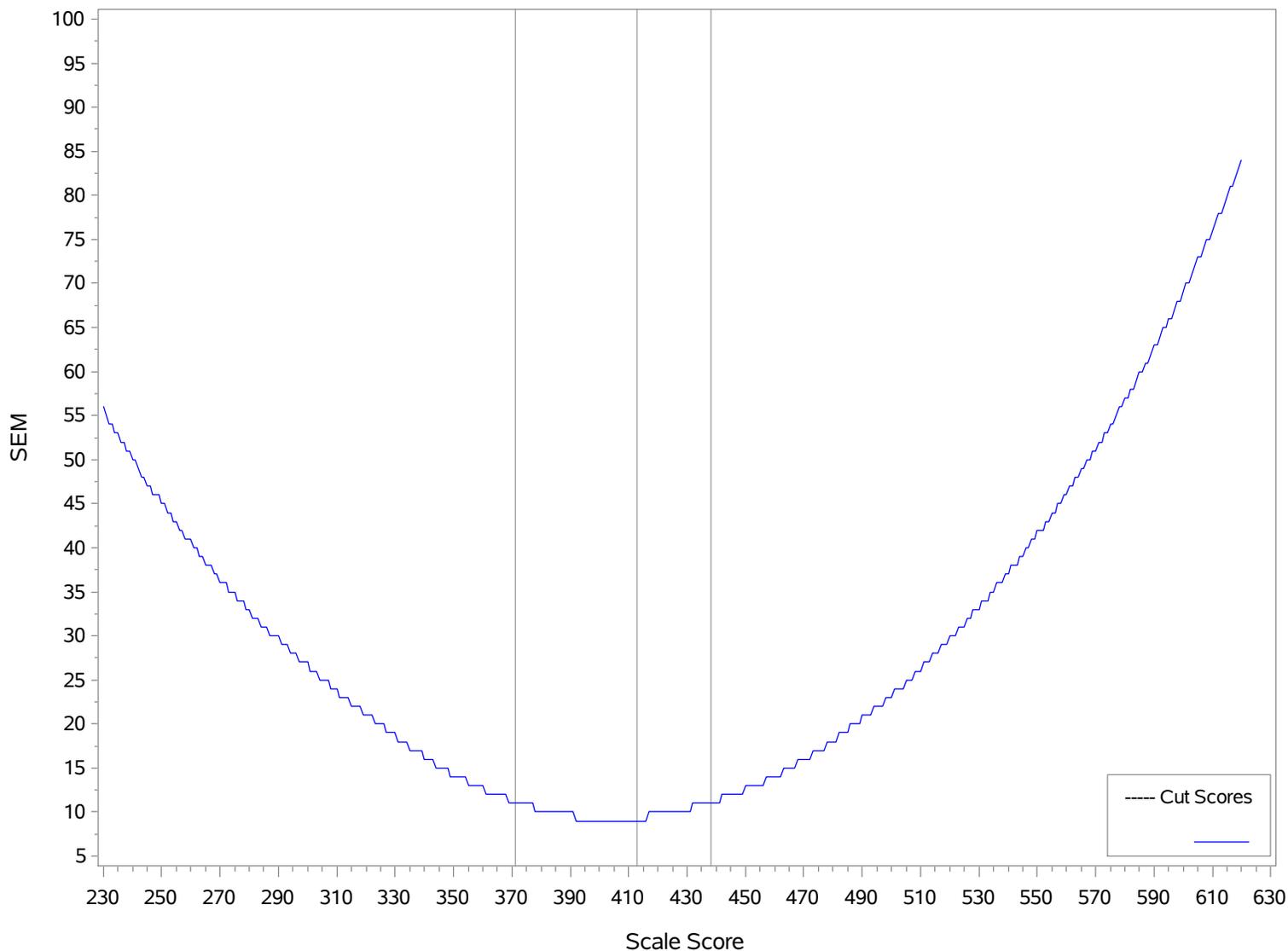


Figure E13: CSEM Curve with Cut Scores: ELA Grade 7, Form A

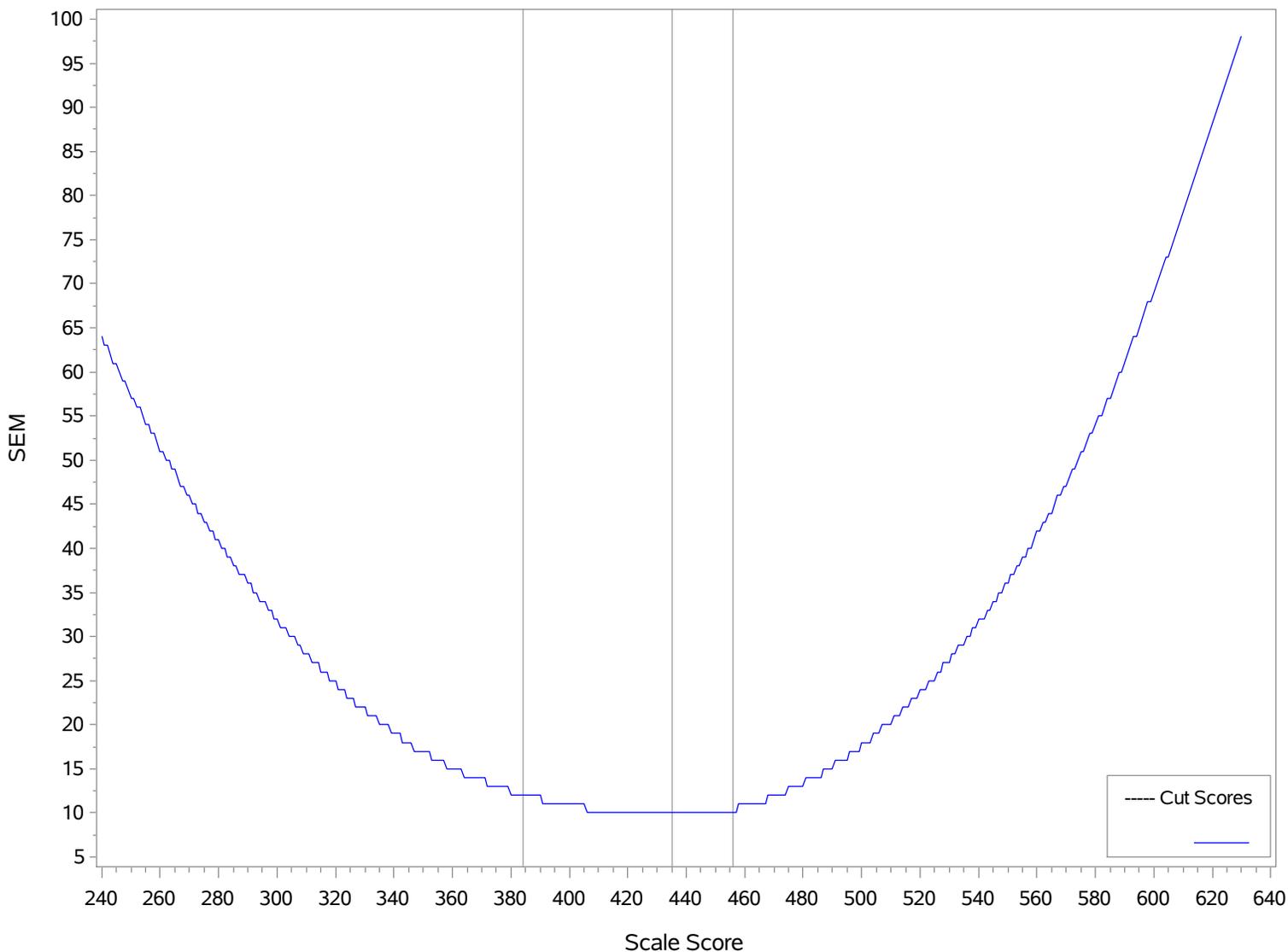
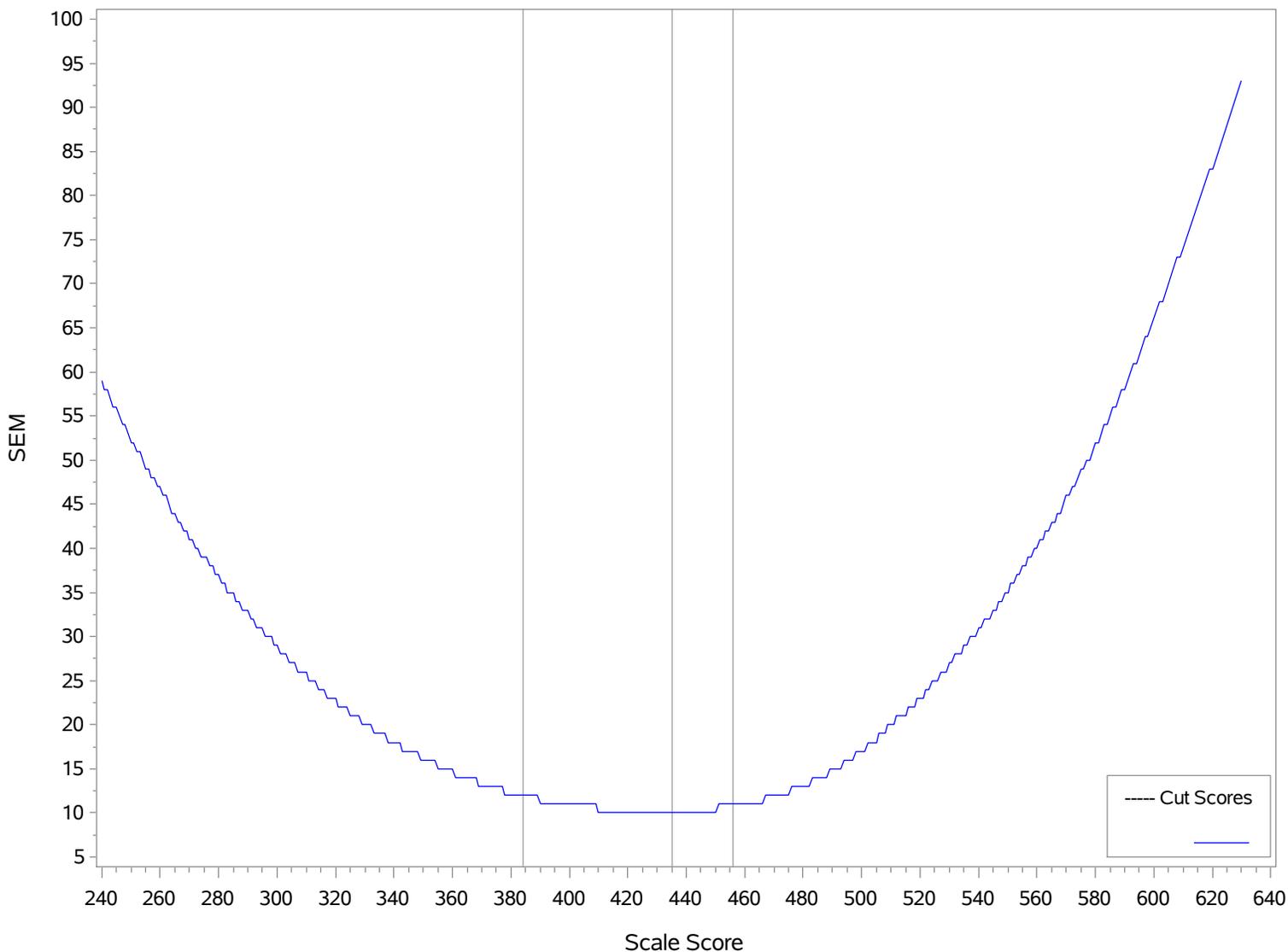


Figure E14: CSEM Curve with Cut Scores: ELA Grade 7, Form B



**Figure E15: CSEM Curve with Cut Scores: ELA Grade 8, Form A01**

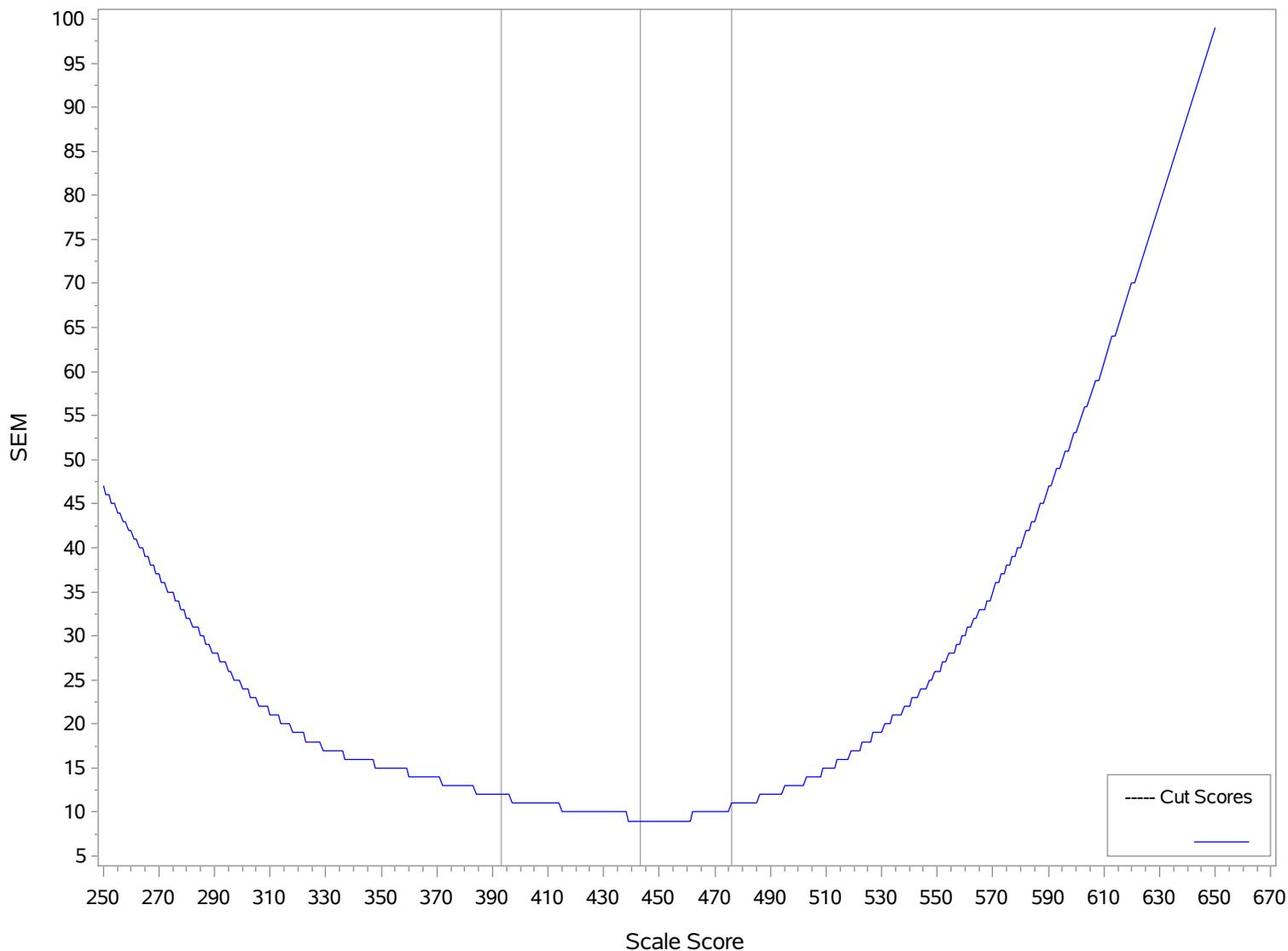
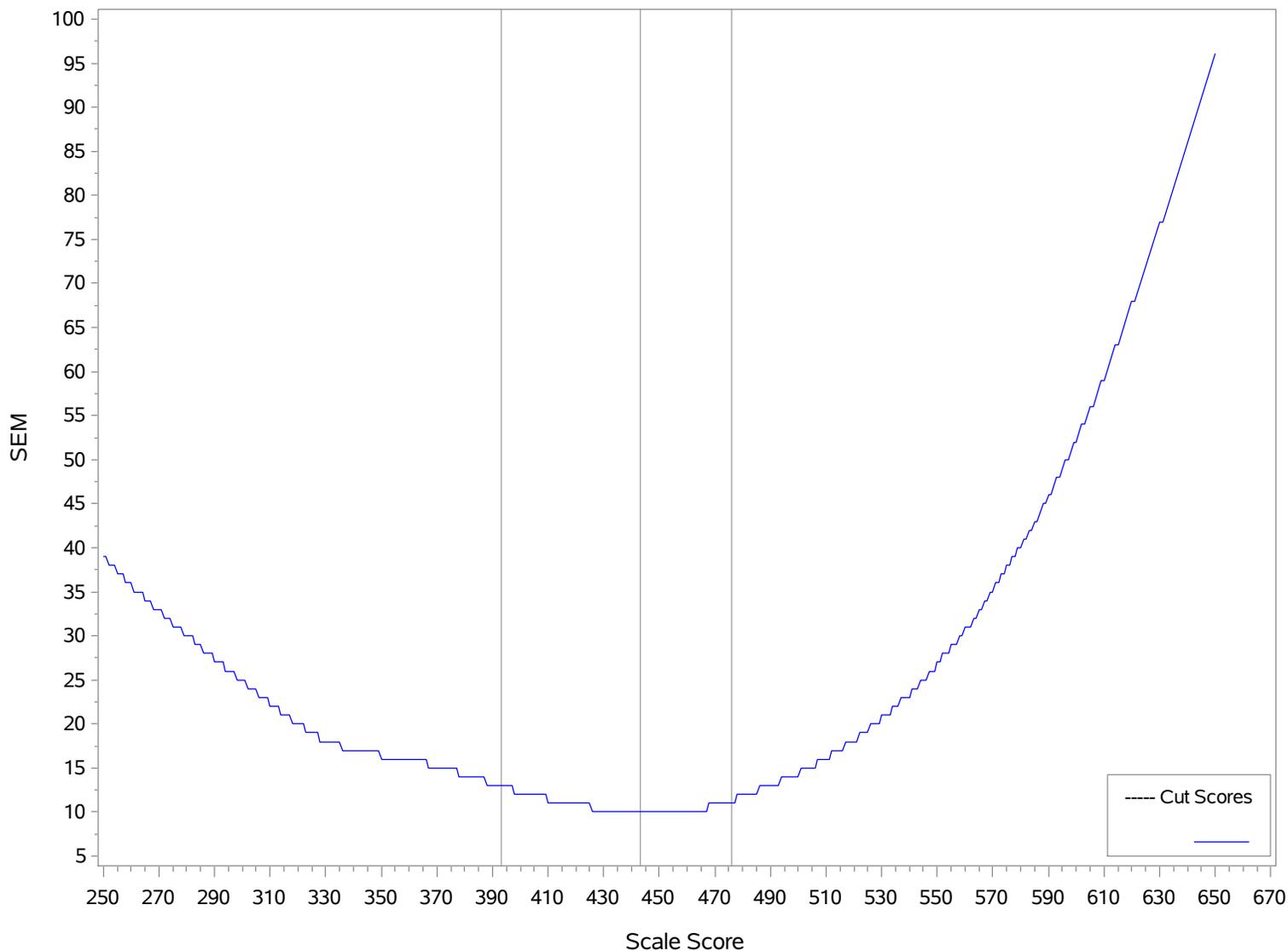
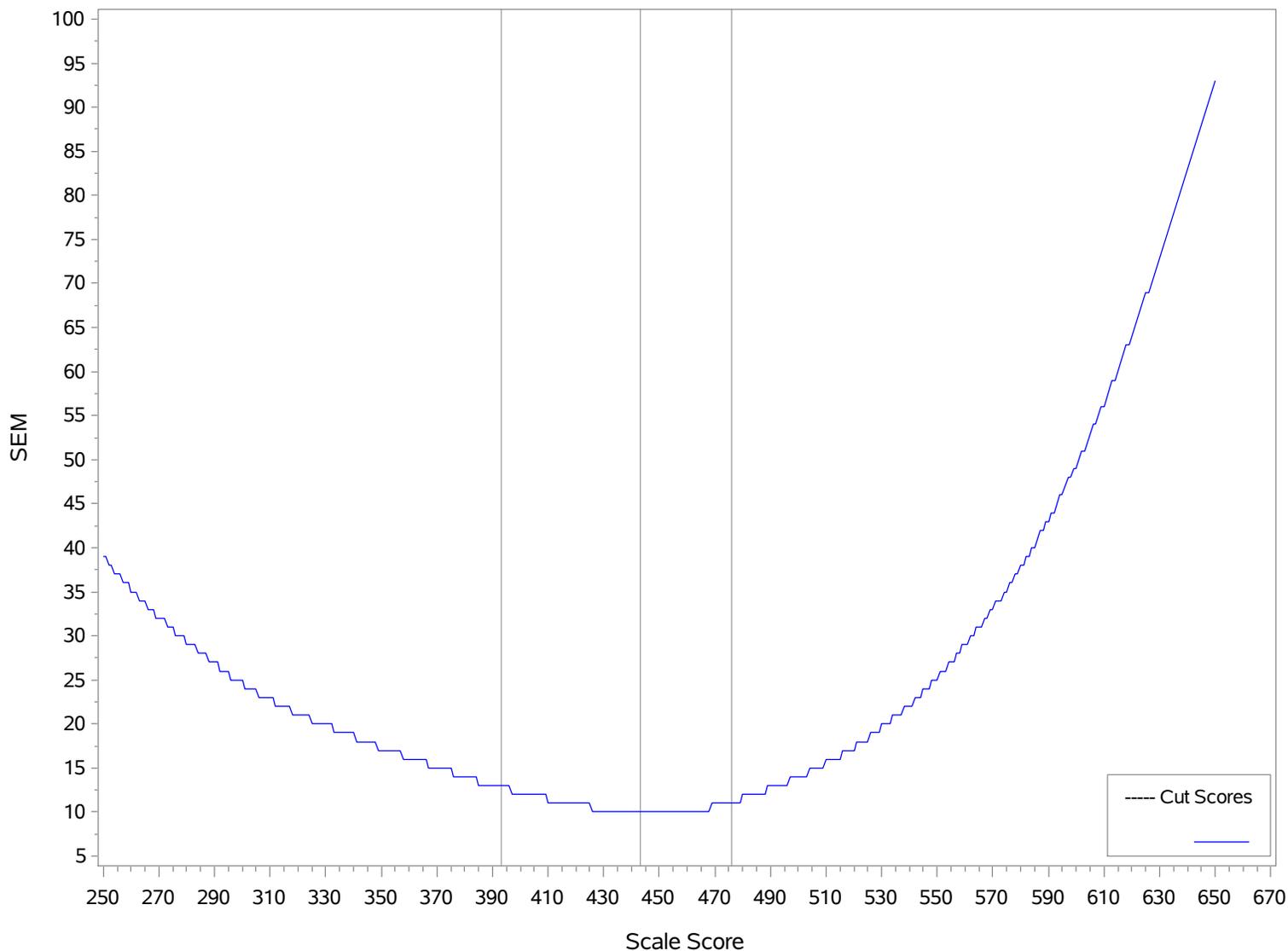


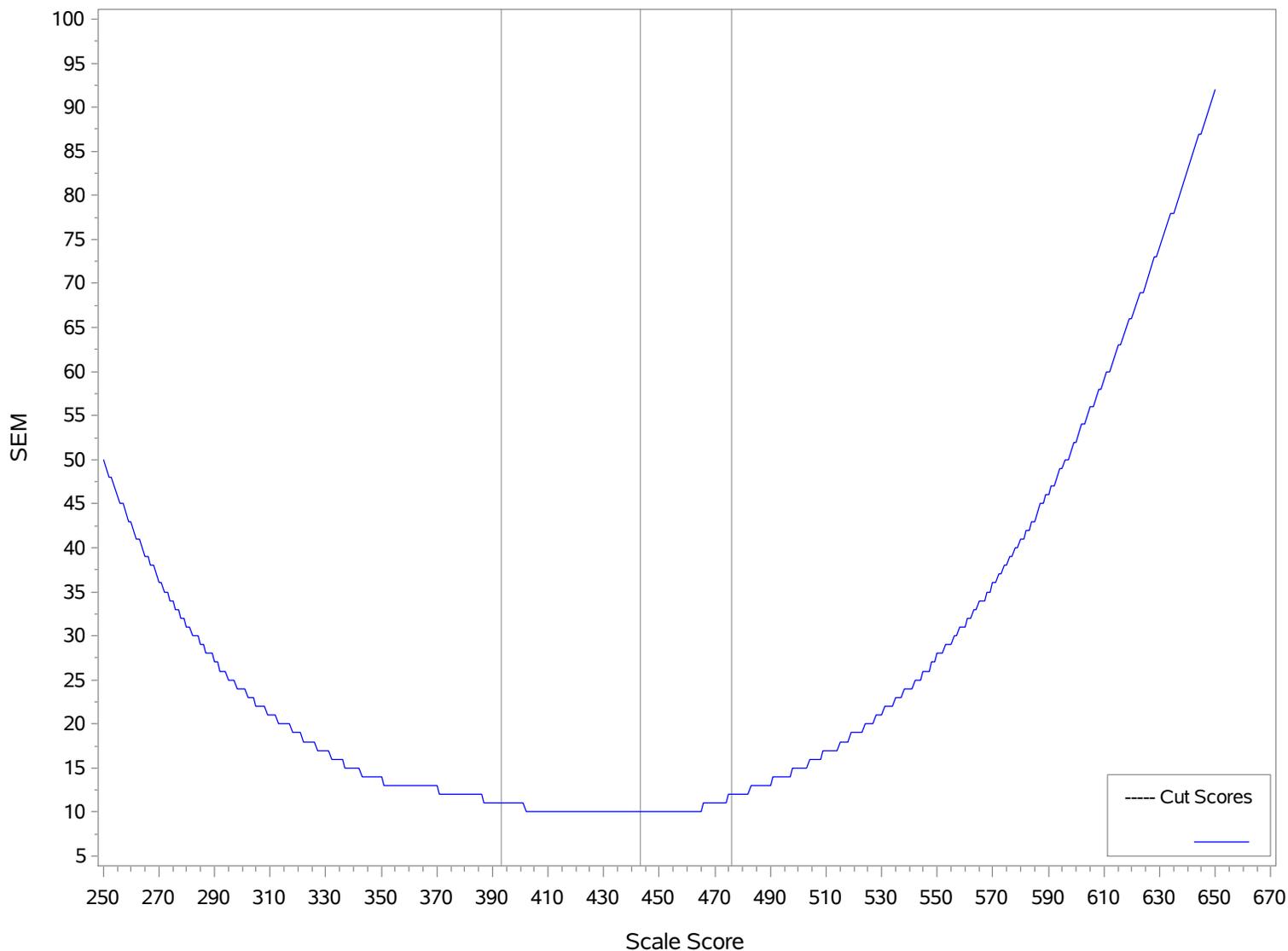
Figure E16: CSEM Curve with Cut Scores: ELA Grade 8, Form A03



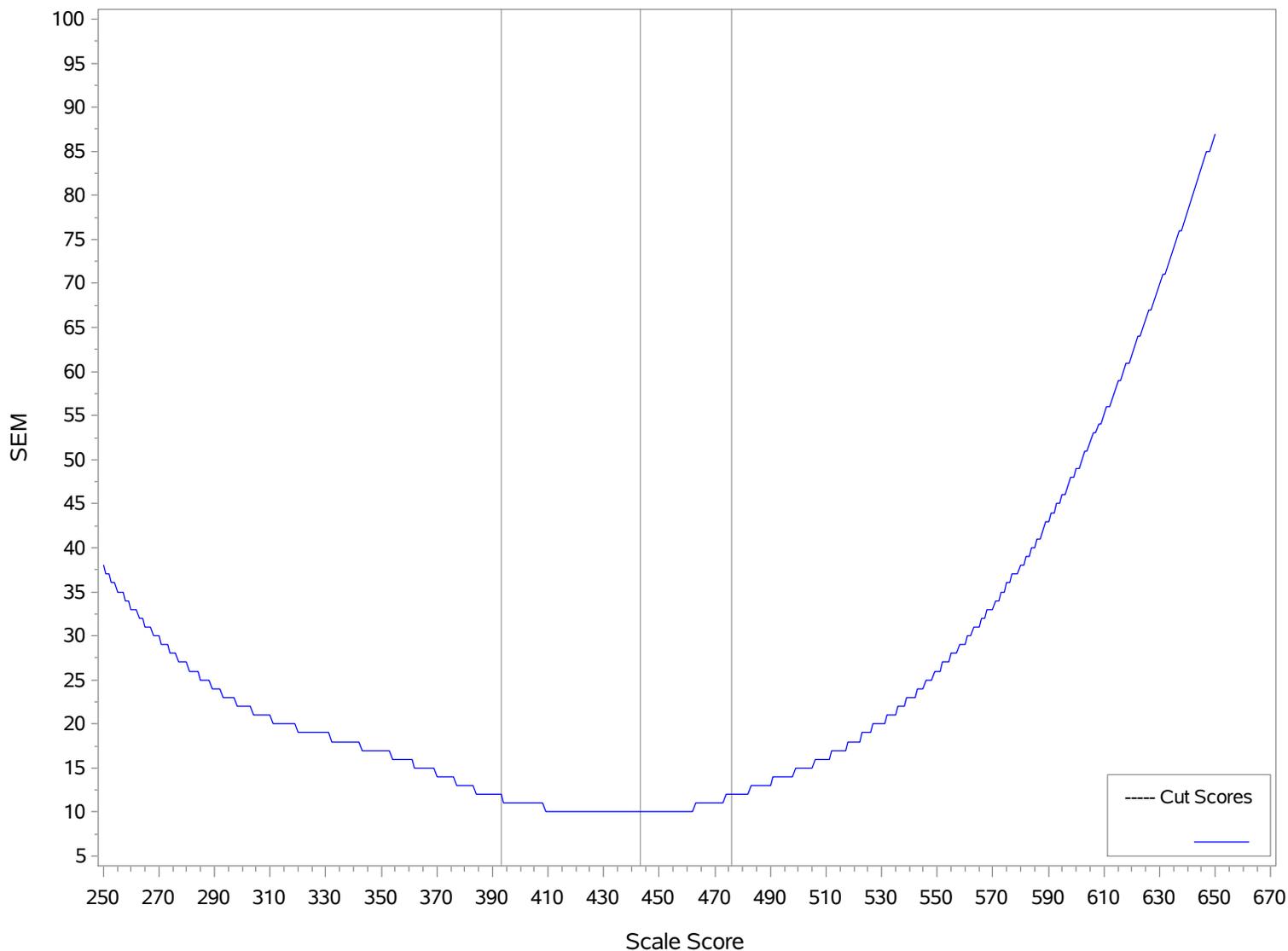
**Figure E17: CSEM Curve with Cut Scores: ELA Grade 8, Form A05**



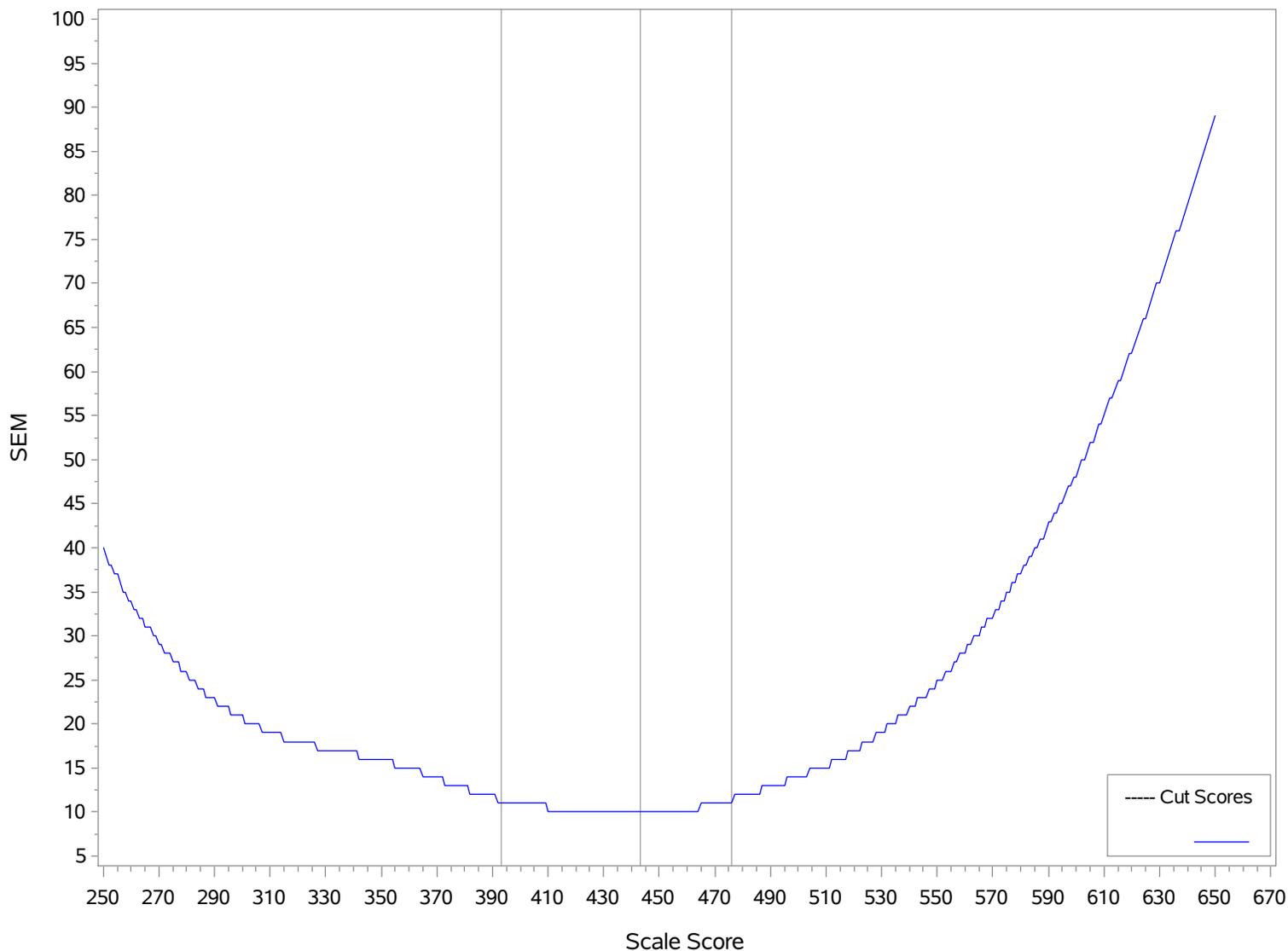
**Figure E18: CSEM Curve with Cut Scores: ELA Grade 8, Form B01**



**Figure E19: CSEM Curve with Cut Scores: ELA Grade 8, Form B02**



**Figure E20: CSEM Curve with Cut Scores: ELA Grade 8, Form B04**



**Figure E21: CSEM Curve with Cut Scores: Mathematics Grade 3, Form A**

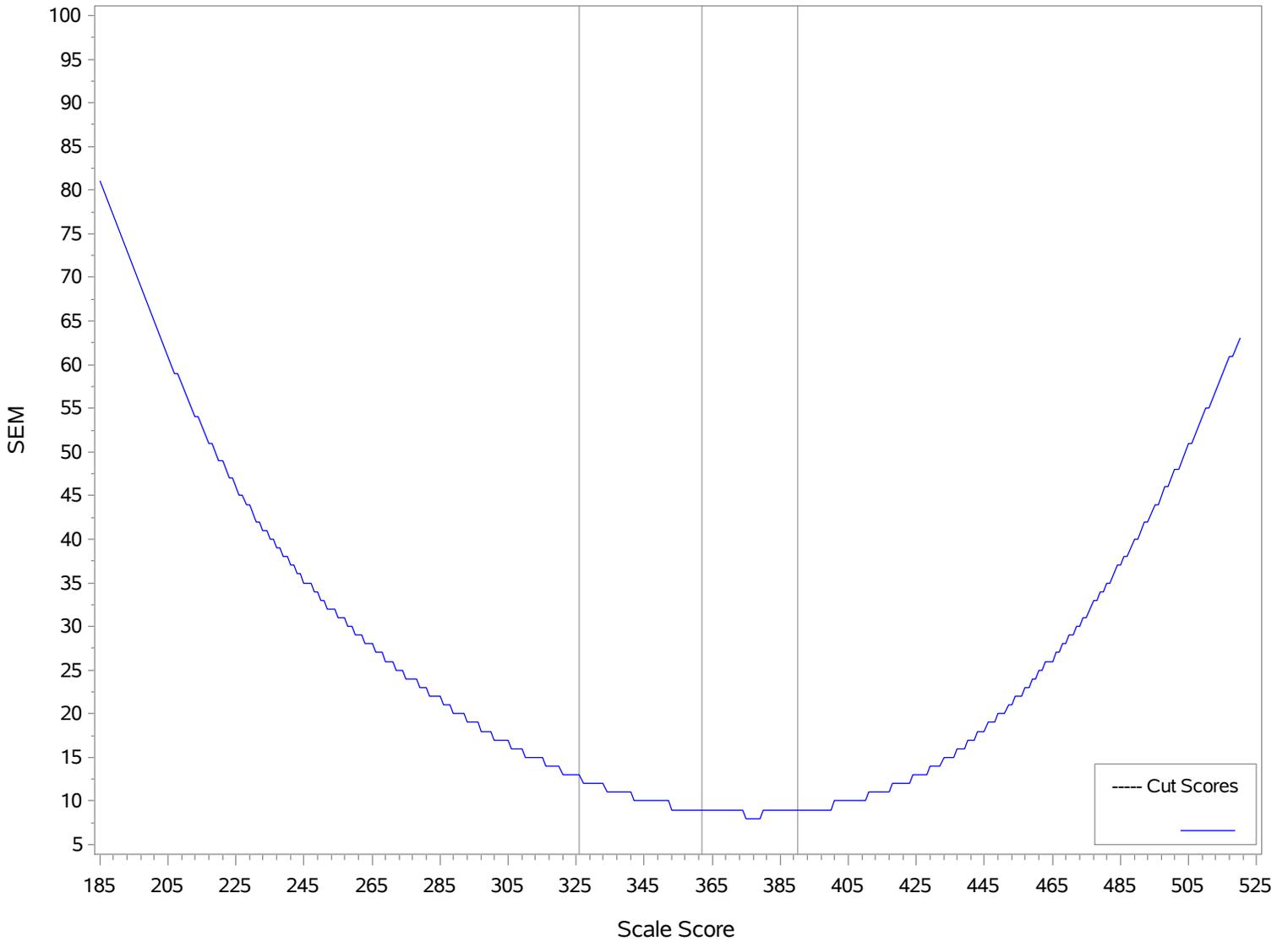
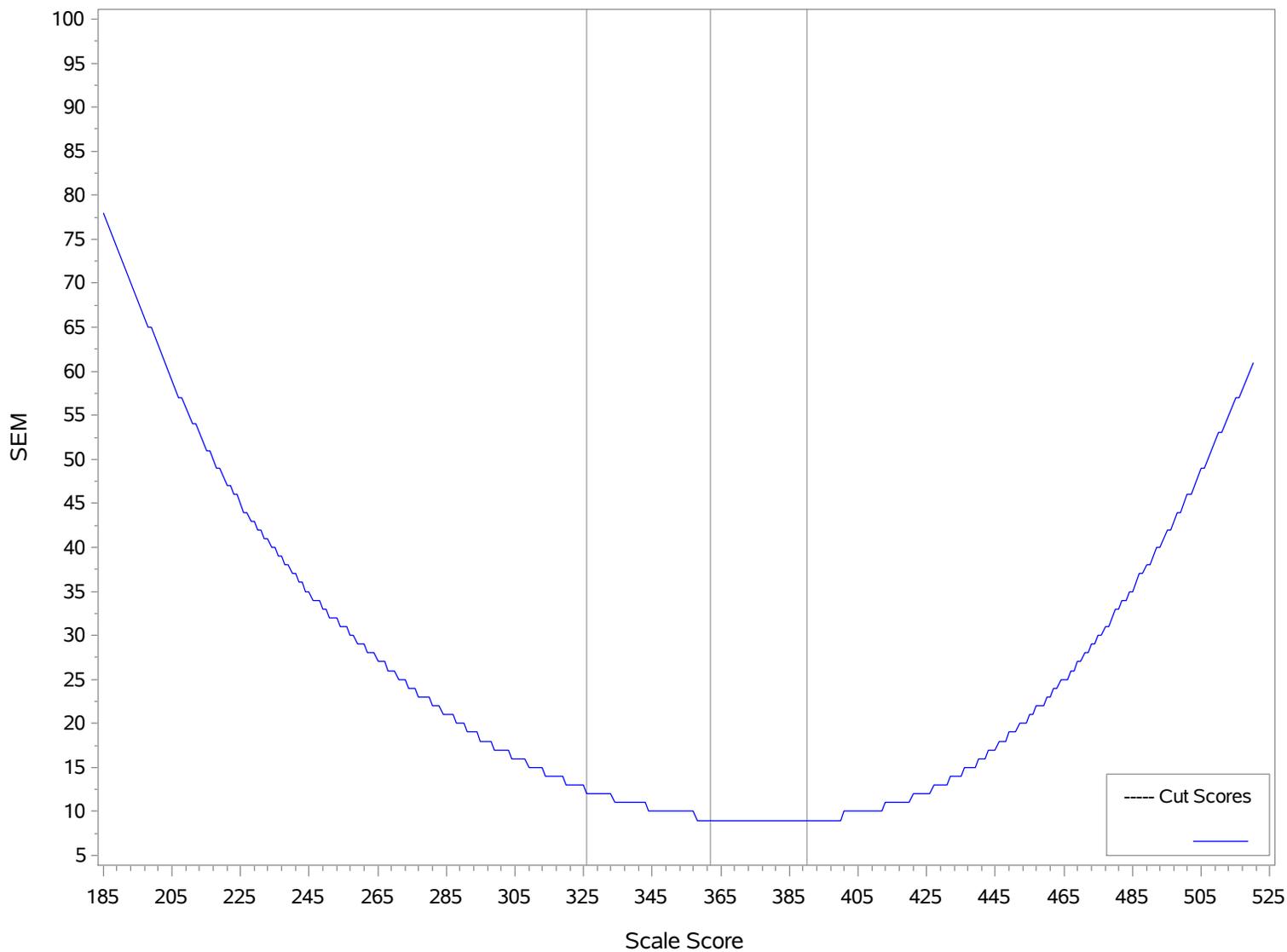
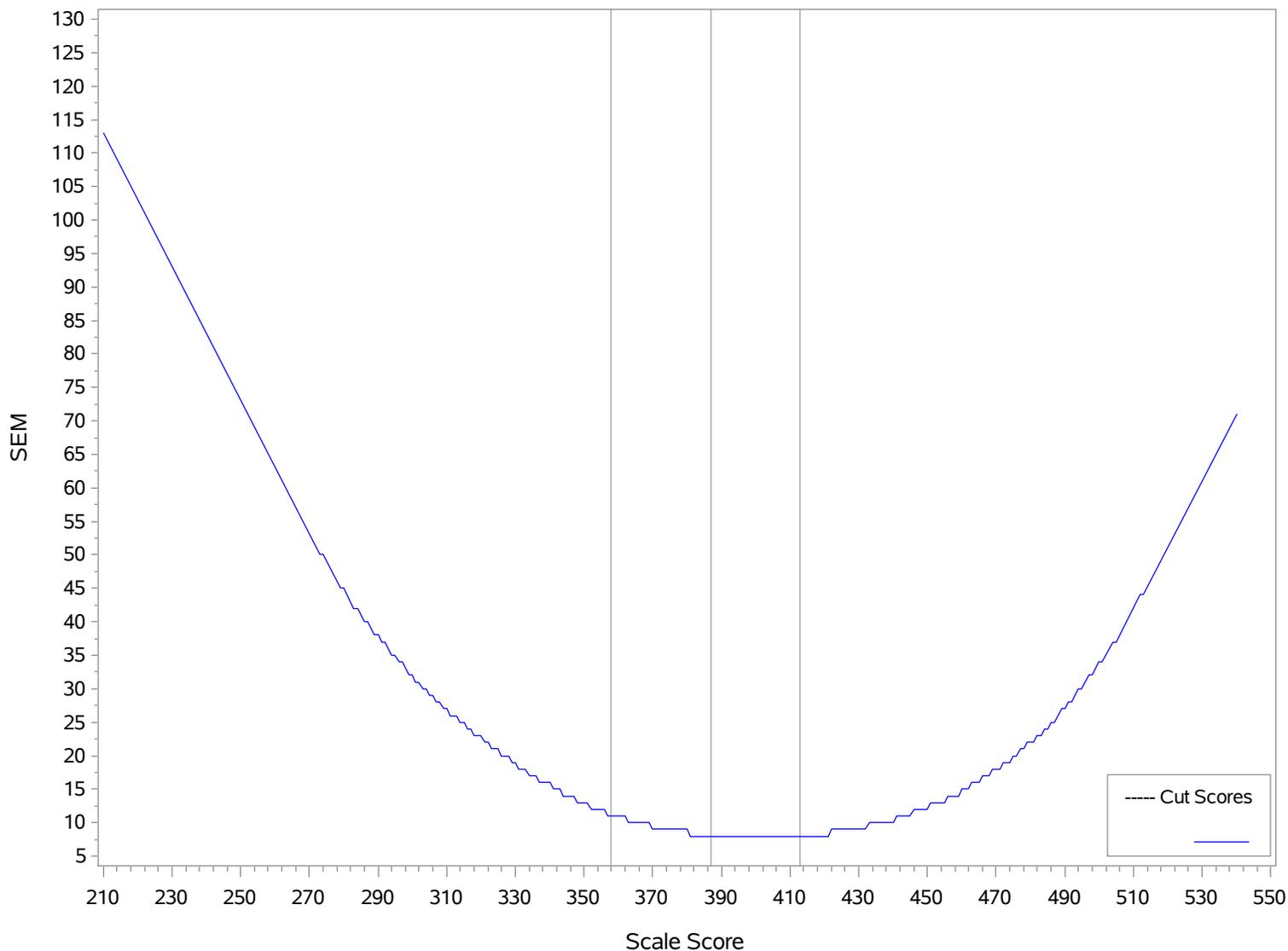


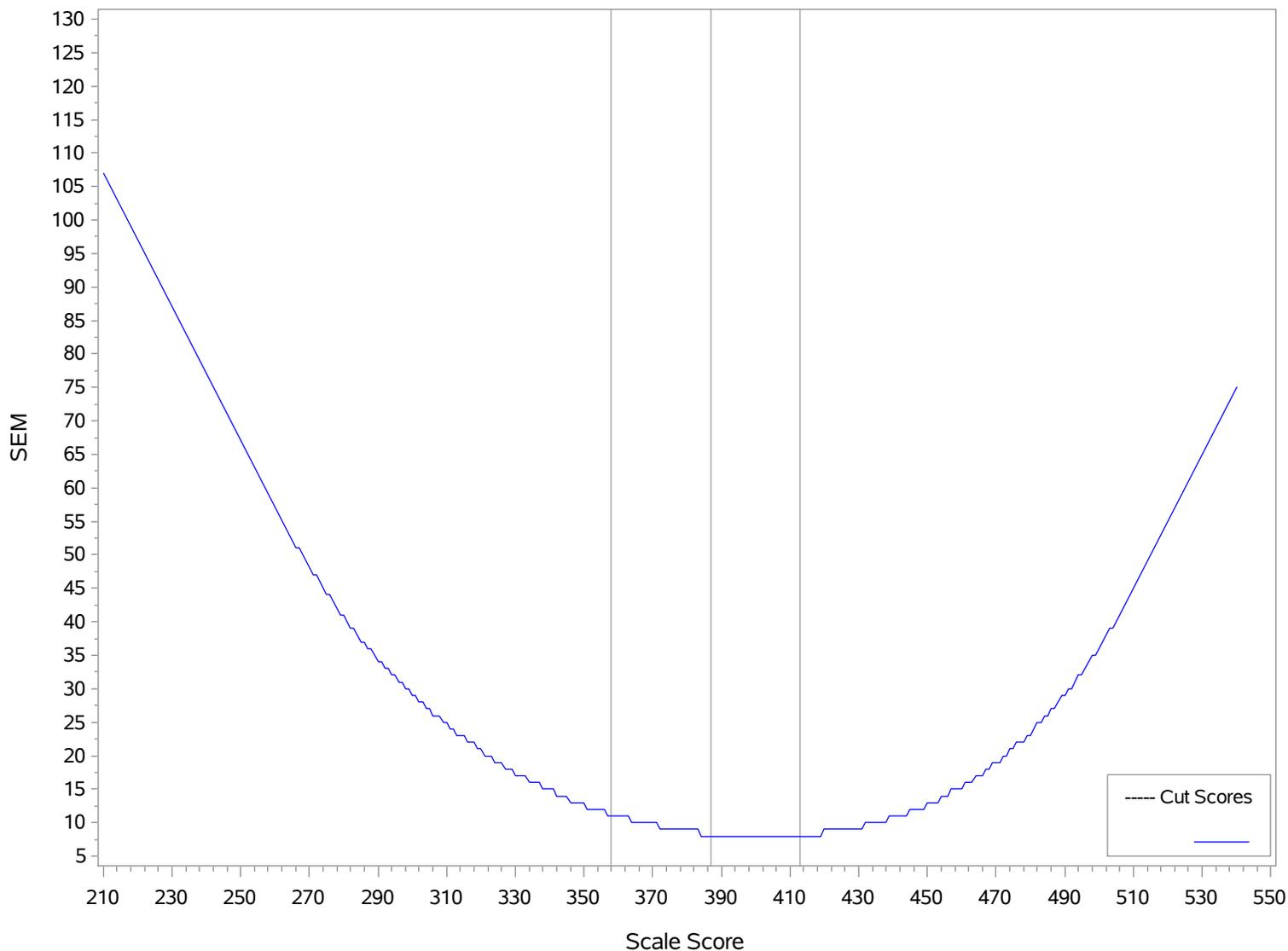
Figure E22: CSEM Curve with Cut Scores: Mathematics Grade 3, Form B



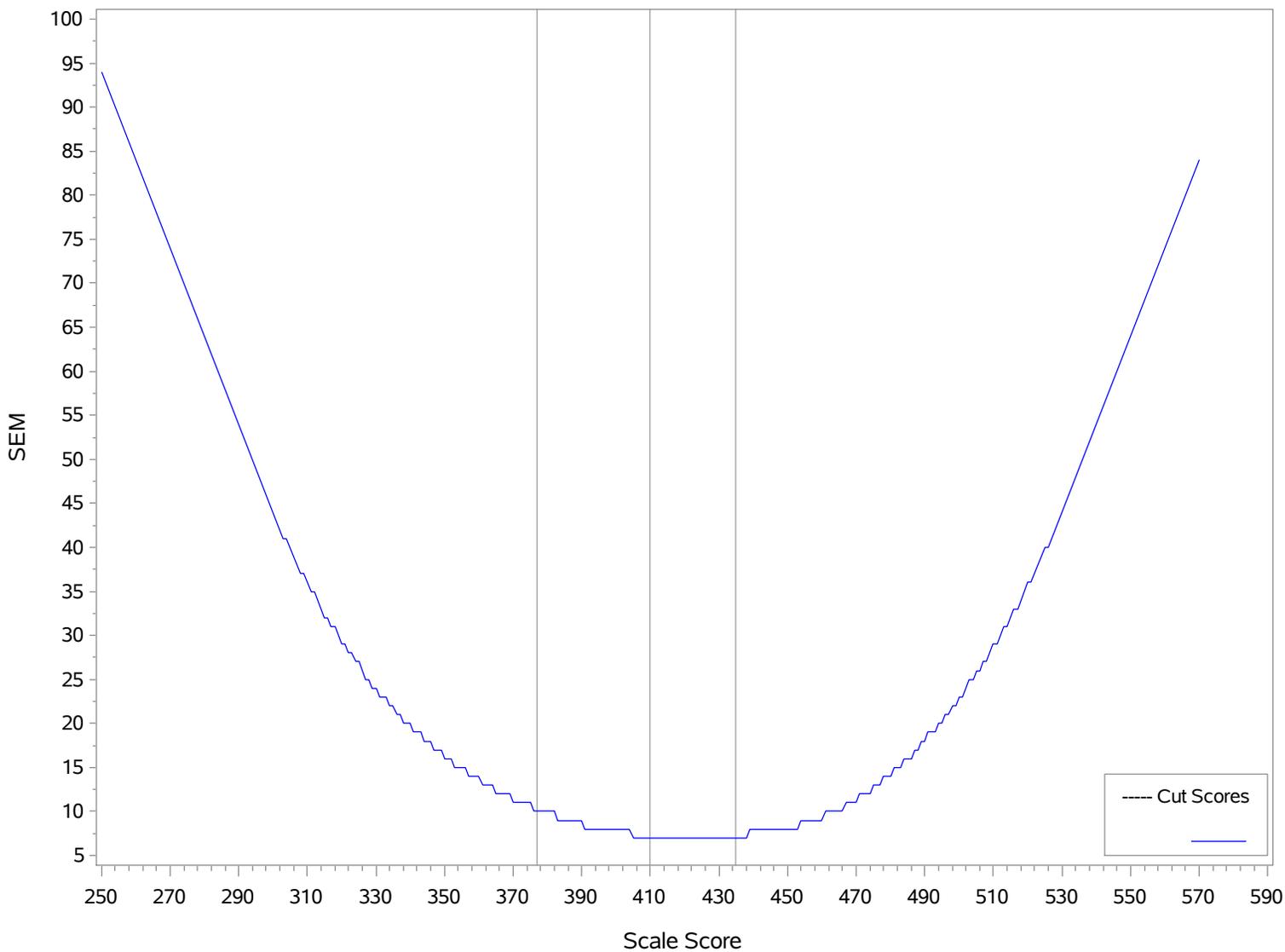
**Figure E23: CSEM Curve with Cut Scores: Mathematics Grade 4, Form A**



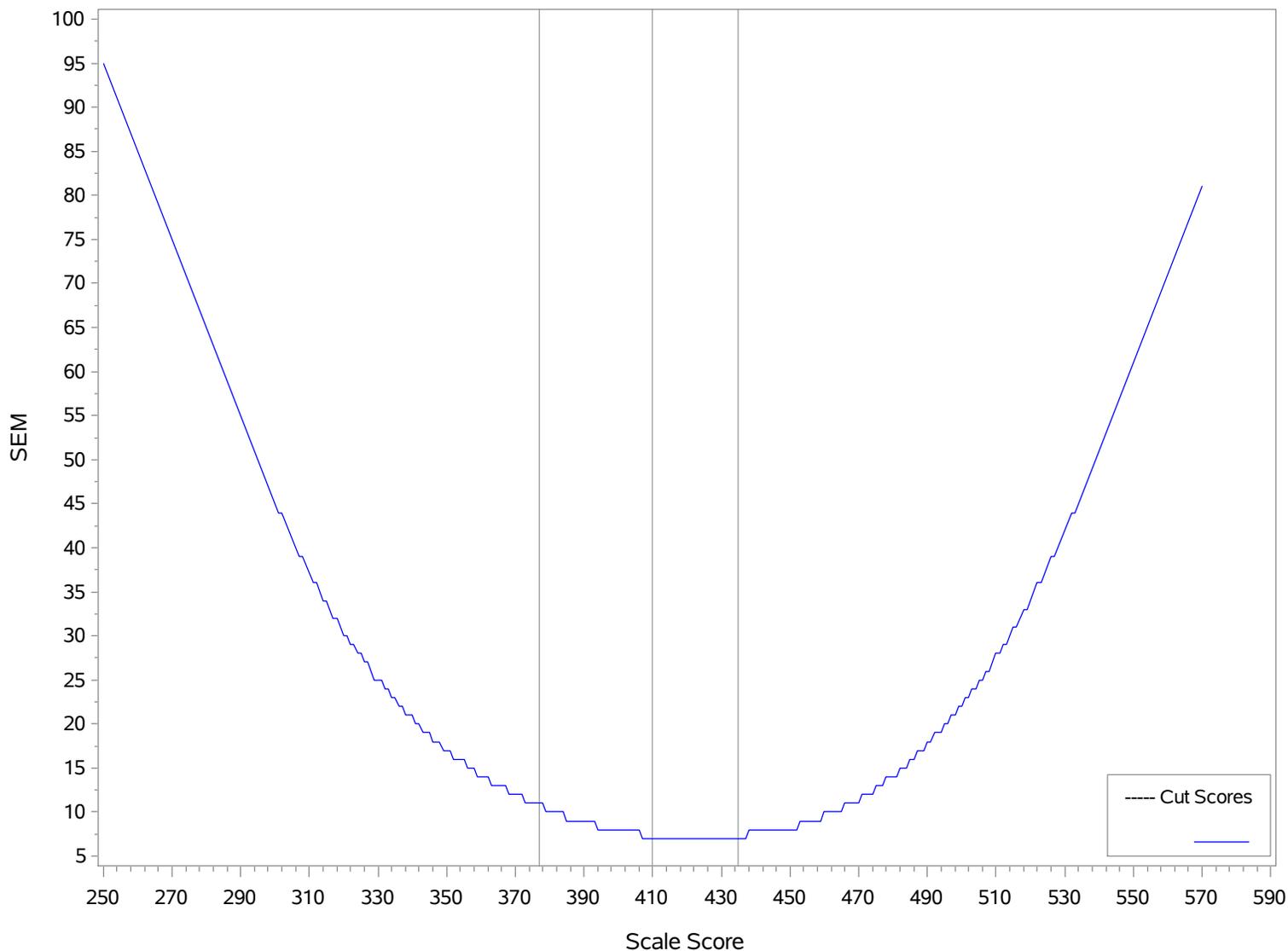
**Figure E24: CSEM Curve with Cut Scores: Mathematics Grade 4, Form B**



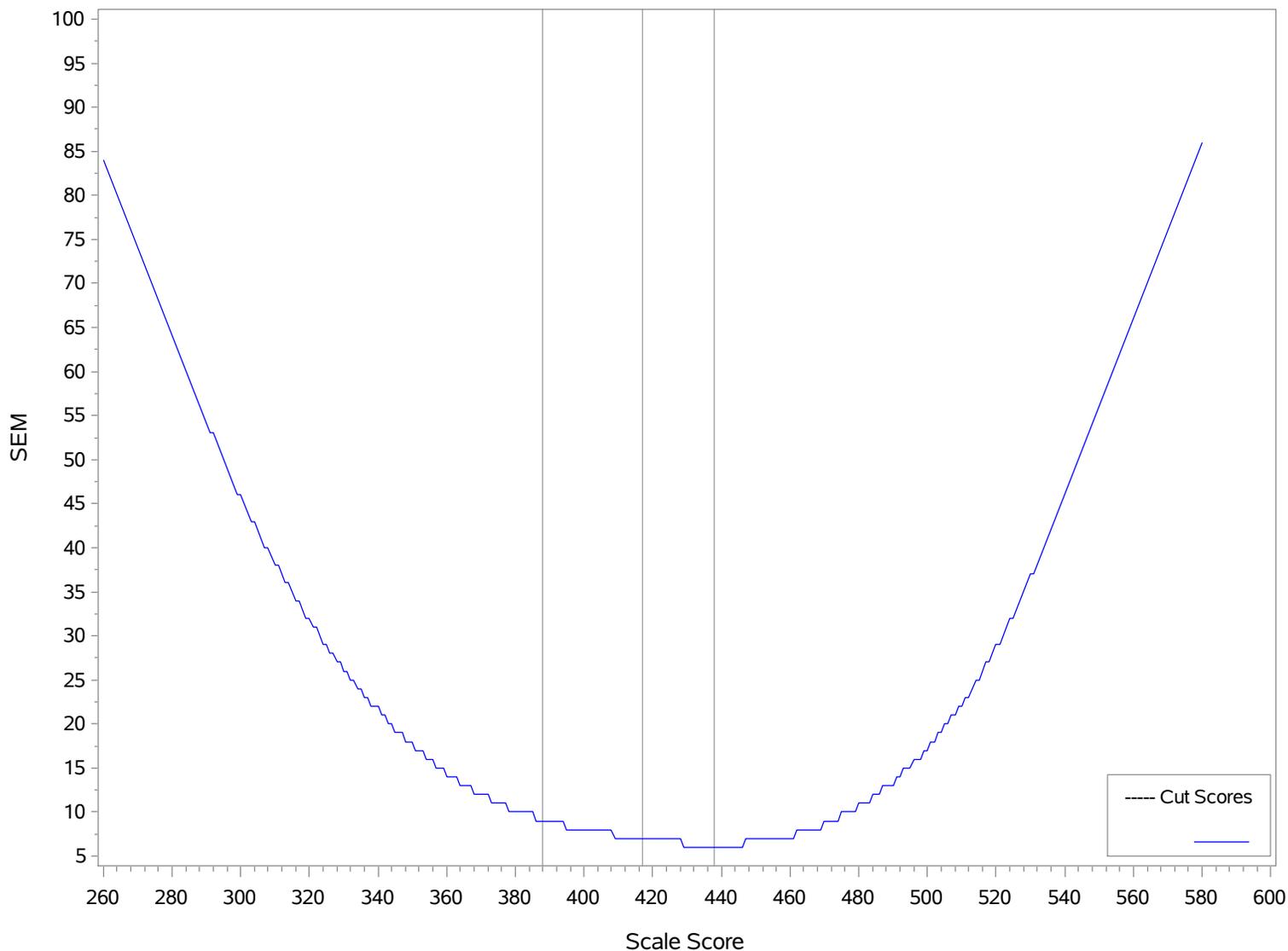
**Figure E25: CSEM Curve with Cut Scores: Mathematics Grade 5, Form A**



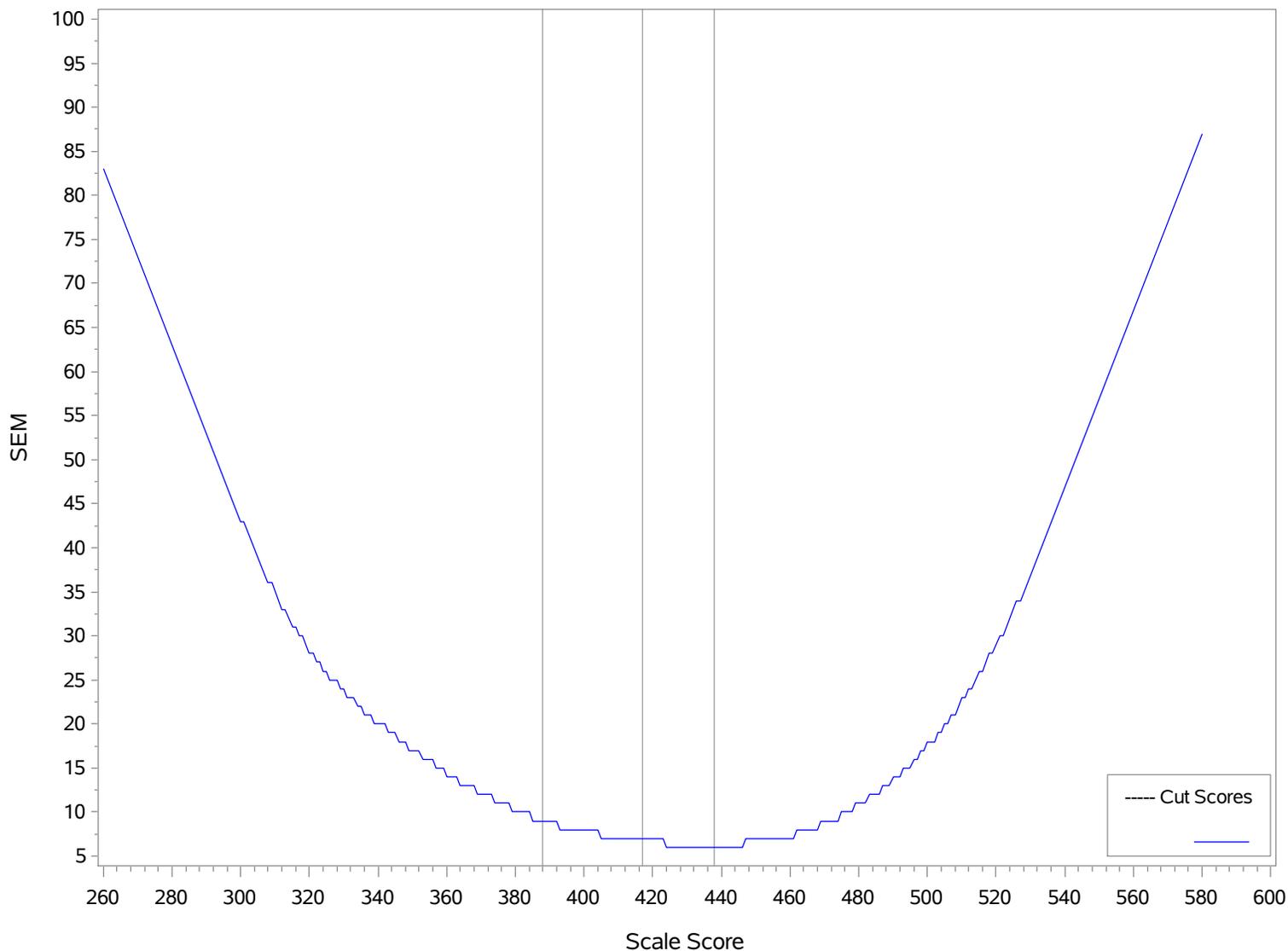
**Figure E26: CSEM Curve with Cut Scores: Mathematics Grade 5, Form B**



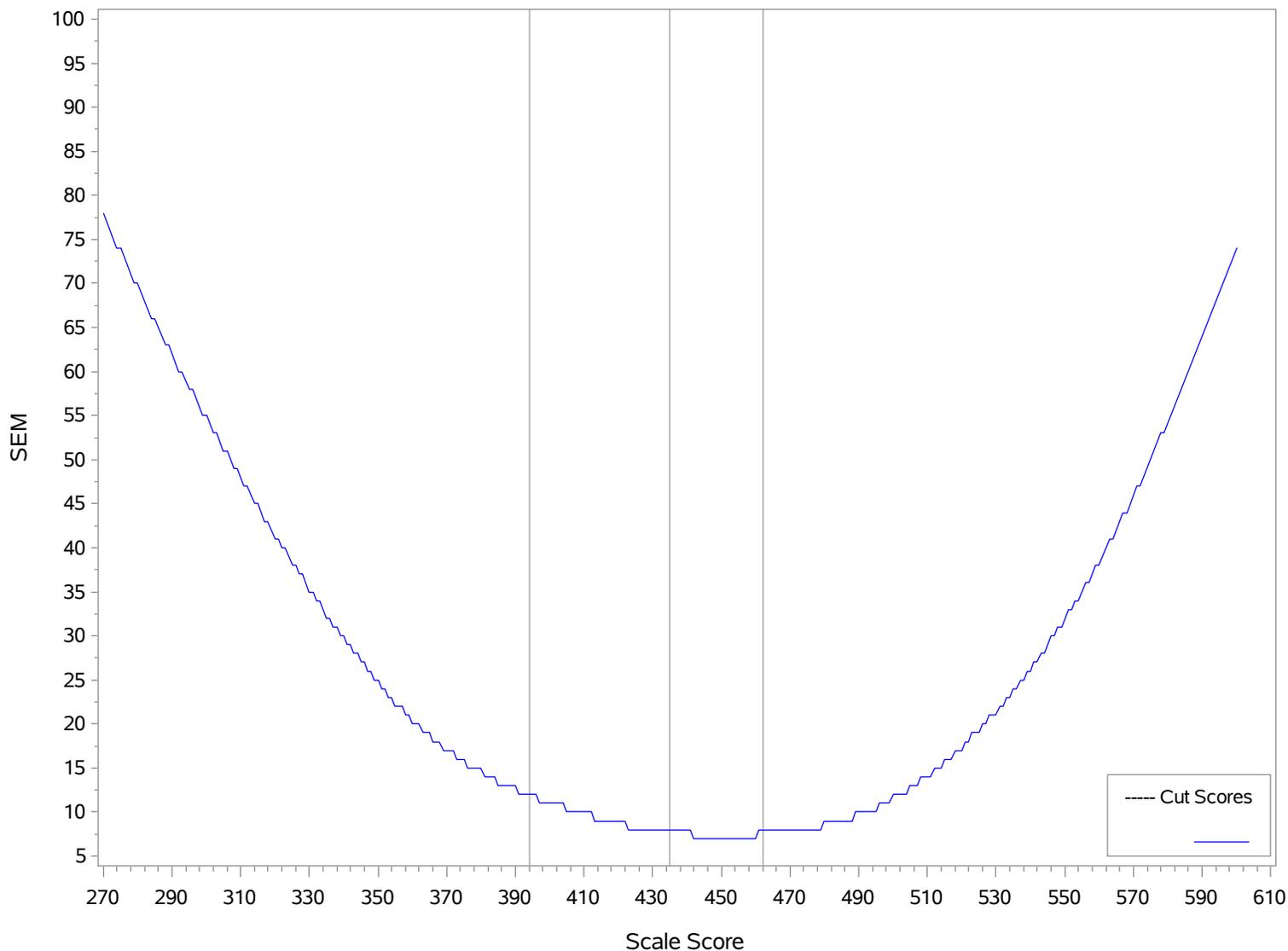
**Figure E27: CSEM Curve with Cut Scores: Mathematics Grade 6, Form A**



**Figure E28: CSEM Curve with Cut Scores: Mathematics Grade 6, Form B**



**Figure E29: CSEM Curve with Cut Scores: Mathematics Grade 7, Form A**



**Figure E30: CSEM Curve with Cut Scores: Mathematics Grade 7, Form B**

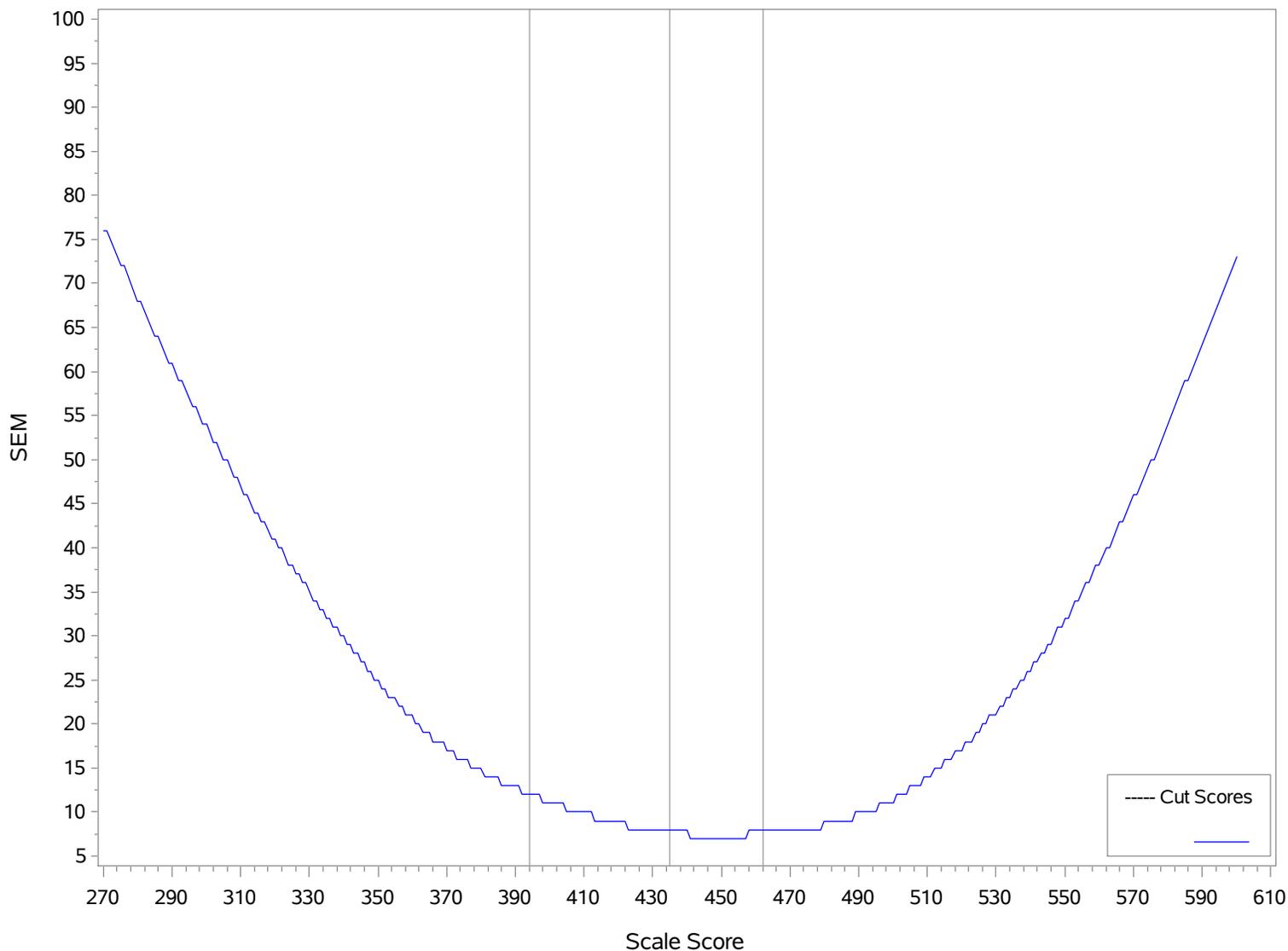


Figure E31: CSEM Curve with Cut Scores: Mathematics Grade 8, Form A

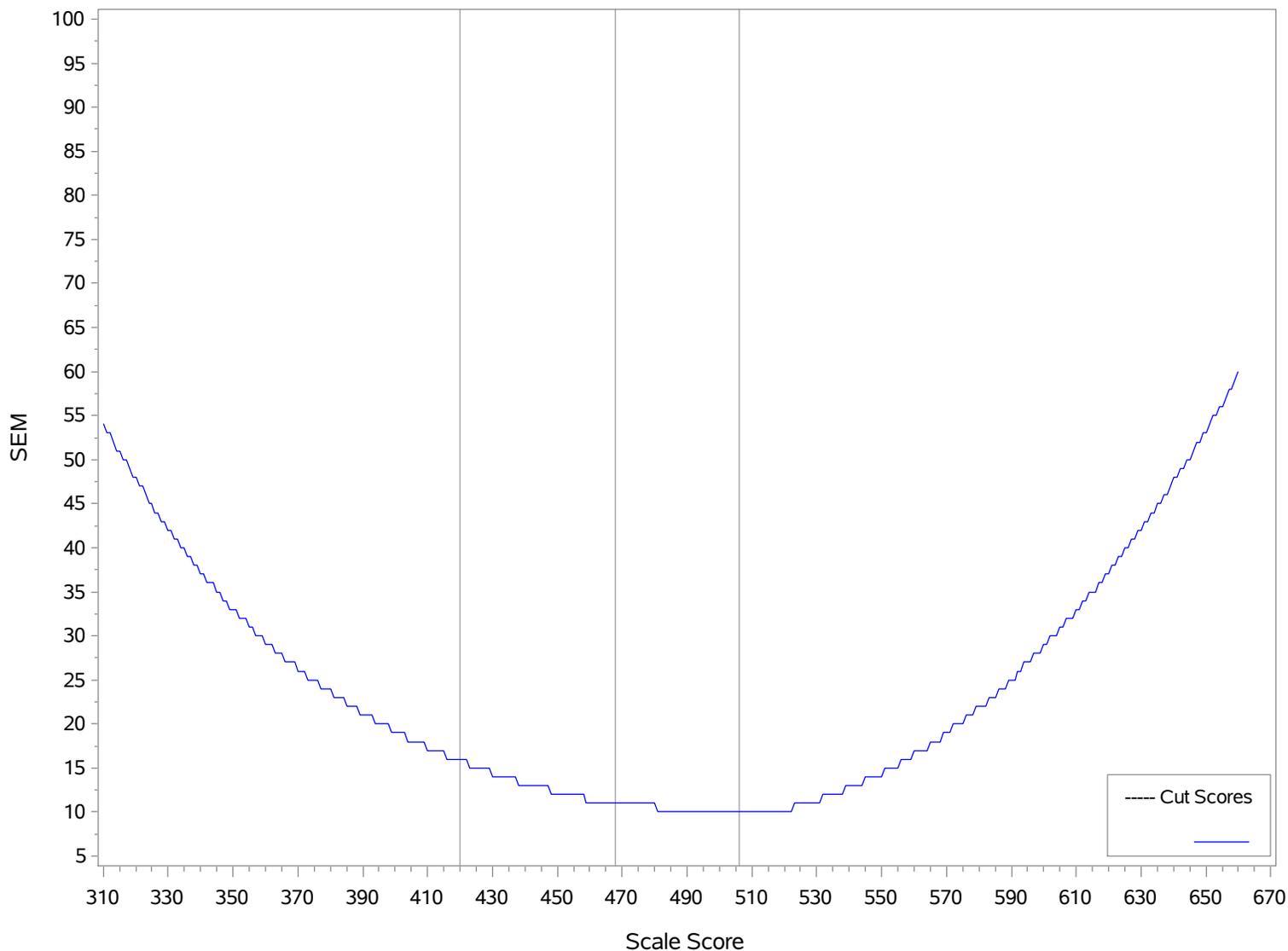
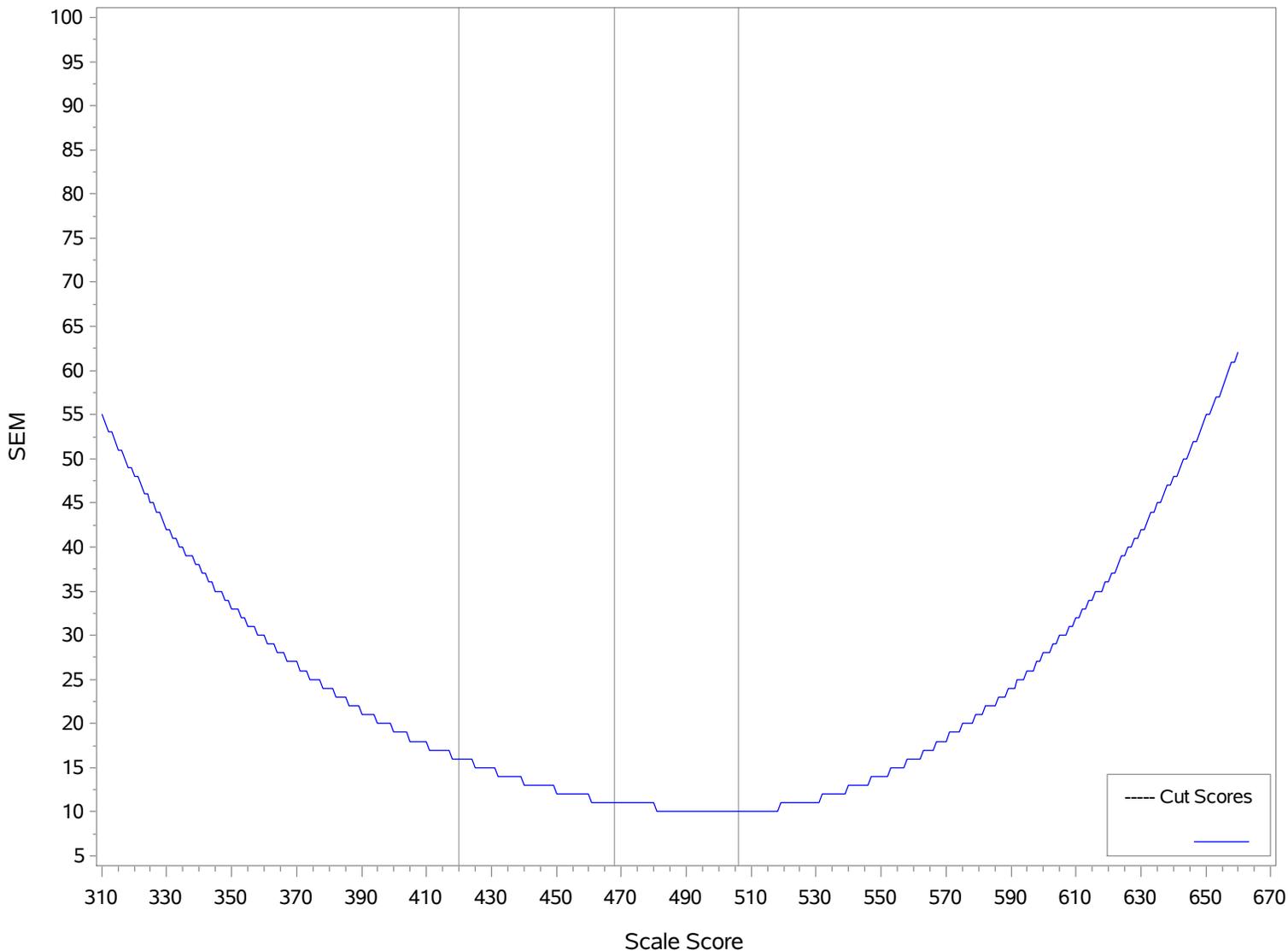


Figure E32: CSEM Curve with Cut Scores: Mathematics Grade 8, Form B



## **Appendix F: Classification Consistency and Accuracy by Subgroup**

**Table F1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts**

Grade	Form	Category	Group	Accuracy				Consistency			
				<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>	<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>
3	A01	Ethnicity	White (not Hispanic)	0.87	0.75	0.69	0.87	0.80	0.65	0.63	0.80
3	A01	Ethnicity	Asian/Pacific Islander	0.87	0.74	0.71	0.89	0.81	0.64	0.63	0.82
3	A01	Ethnicity	Black (not Hispanic)	0.91	0.76	0.69	0.85	0.87	0.65	0.62	0.71
3	A01	Ethnicity	Hispanic	0.88	0.75	0.71	0.85	0.82	0.66	0.58	0.77
3	A01	Ethnicity	Native Americans	0.90	0.75	0.71	0.86	0.82	0.68	0.61	0.77
3	A01	Ethnicity	Other	0.85	0.74	0.69	0.87	0.81	0.65	0.61	0.79
3	A01	Gender	Male	0.89	0.75	0.69	0.87	0.83	0.65	0.63	0.78
3	A01	Gender	Female	0.88	0.75	0.71	0.88	0.82	0.65	0.63	0.80
3	B01	Ethnicity	White (not Hispanic)	0.87	0.75	0.73	0.87	0.79	0.67	0.61	0.81
3	B01	Ethnicity	Asian/Pacific Islander	0.89	0.74	0.72	0.89	0.84	0.63	0.60	0.84
3	B01	Ethnicity	Black (not Hispanic)	0.92	0.76	0.73	0.83	0.88	0.68	0.61	0.72
3	B01	Ethnicity	Hispanic	0.88	0.75	0.72	0.86	0.84	0.64	0.60	0.79
3	B01	Ethnicity	Native Americans	0.82	0.76	0.70	0.90	0.67	0.69	0.62	0.82
3	B01	Ethnicity	Other	0.89	0.75	0.70	0.87	0.78	0.68	0.59	0.79
3	B01	Gender	Male	0.88	0.76	0.71	0.86	0.82	0.67	0.61	0.77
3	B01	Gender	Female	0.91	0.73	0.65	0.97	0.85	0.69	0.62	0.86
3	B01	Accommodations	Yes	0.93	0.74	0.67	0.87	0.90	0.65	0.56	0.74
4	A01	Ethnicity	White (not Hispanic)	0.83	0.83	0.72	0.90	0.75	0.79	0.64	0.80
4	A01	Ethnicity	Asian/Pacific Islander	0.85	0.82	0.70	0.88	0.75	0.77	0.62	0.82
4	A01	Ethnicity	Black (not Hispanic)	0.86	0.84	0.73	0.87	0.82	0.78	0.63	0.70
4	A01	Ethnicity	Hispanic	0.84	0.83	0.74	0.87	0.79	0.77	0.61	0.74
4	A01	Ethnicity	Native Americans	0.84	0.83	0.73	0.81	0.79	0.79	0.63	0.70
4	A01	Ethnicity	Other	0.82	0.82	0.72	0.87	0.76	0.77	0.66	0.79
4	A01	Gender	Male	0.85	0.83	0.72	0.89	0.80	0.79	0.64	0.77
4	A01	Gender	Female	0.84	0.83	0.74	0.89	0.75	0.78	0.65	0.78

**Table F1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts (cont.)**

Grade	Form	Category	Group	Accuracy				Consistency			
				<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>	<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>
4	A04	Ethnicity	White (not Hispanic)	0.80	0.80	0.71	0.89	0.71	0.73	0.65	0.80
4	A04	Ethnicity	Asian/Pacific Islander	0.75	0.80	0.72	0.89	0.67	0.71	0.61	0.84
4	A04	Ethnicity	Black (not Hispanic)	0.84	0.82	0.72	0.86	0.79	0.77	0.64	0.69
4	A04	Ethnicity	Hispanic	0.83	0.82	0.70	0.86	0.79	0.76	0.61	0.73
4	A04	Ethnicity	Other	0.79	0.81	0.72	0.88	0.68	0.77	0.59	0.80
4	A04	Gender	Male	0.84	0.81	0.71	0.87	0.76	0.74	0.59	0.79
4	A04	Gender	Female	0.79	0.80	0.72	0.89	0.72	0.73	0.66	0.80
4	A07	Ethnicity	White (not Hispanic)	0.79	0.82	0.72	0.89	0.71	0.76	0.63	0.79
4	A07	Ethnicity	Black (not Hispanic)	0.85	0.85	0.72	0.86	0.81	0.79	0.64	0.65
4	A07	Ethnicity	Hispanic	0.77	0.79	0.71	0.83	0.65	0.71	0.63	0.67
4	A07	Ethnicity	Other	0.81	0.80	0.72	0.85	0.68	0.75	0.62	0.77
4	A07	Gender	Male	0.84	0.82	0.74	0.87	0.79	0.76	0.65	0.77
4	A07	Gender	Female	0.81	0.81	0.71	0.89	0.69	0.76	0.64	0.79
4	B01	Ethnicity	White (not Hispanic)	0.86	0.81	0.73	0.87	0.78	0.75	0.65	0.76
4	B01	Ethnicity	Asian/Pacific Islander	0.89	0.81	0.73	0.90	0.78	0.74	0.64	0.81
4	B01	Ethnicity	Black (not Hispanic)	0.86	0.83	0.73	0.87	0.81	0.78	0.64	0.68
4	B01	Ethnicity	Hispanic	0.87	0.83	0.74	0.86	0.82	0.77	0.65	0.74
4	B01	Ethnicity	Native Americans	0.74	0.73	0.72	0.82	0.67	0.67	0.63	0.71
4	B01	Ethnicity	Other	0.82	0.82	0.73	0.89	0.75	0.76	0.64	0.75
4	B01	Gender	Male	0.85	0.81	0.74	0.87	0.78	0.77	0.65	0.75
4	B01	Gender	Female	0.85	0.82	0.73	0.90	0.78	0.77	0.65	0.79
4	B01	Accommodations	Yes	0.93	0.87	0.76	0.79	0.90	0.79	0.68	0.46
4	B02	Ethnicity	White (not Hispanic)	0.83	0.80	0.72	0.90	0.72	0.76	0.65	0.82
4	B02	Ethnicity	Asian/Pacific Islander	0.99	0.80	0.75	0.91	0.65	0.74	0.62	0.86
4	B02	Ethnicity	Black (not Hispanic)	0.85	0.82	0.72	0.85	0.81	0.77	0.64	0.67
4	B02	Ethnicity	Hispanic	0.85	0.80	0.71	0.87	0.72	0.72	0.62	0.76
4	B02	Ethnicity	Other	0.85	0.81	0.71	0.88	0.73	0.74	0.61	0.76
4	B02	Gender	Male	0.86	0.80	0.73	0.87	0.77	0.73	0.65	0.78
4	B02	Gender	Female	0.82	0.80	0.72	0.90	0.72	0.75	0.64	0.81

**Table F1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts (cont.)**

Grade	Form	Category	Group	Accuracy				Consistency			
				<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>	<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>
4	B04	Ethnicity	White (not Hispanic)	0.80	0.79	0.72	0.89	0.69	0.72	0.64	0.79
4	B04	Ethnicity	Asian/Pacific Islander	0.88	0.78	0.70	0.90	0.72	0.74	0.62	0.82
4	B04	Ethnicity	Black (not Hispanic)	0.85	0.82	0.73	0.84	0.80	0.77	0.62	0.69
4	B04	Ethnicity	Hispanic	0.87	0.81	0.75	0.86	0.69	0.77	0.69	0.71
4	B04	Ethnicity	Other	0.86	0.81	0.74	0.86	0.76	0.75	0.68	0.74
4	B04	Gender	Male	0.84	0.80	0.71	0.87	0.75	0.74	0.63	0.79
4	B04	Gender	Female	0.81	0.80	0.72	0.90	0.72	0.73	0.65	0.80
5	A01	Ethnicity	White (not Hispanic)	0.84	0.86	0.67	0.87	0.74	0.79	0.56	0.80
5	A01	Ethnicity	Asian/Pacific Islander	0.85	0.87	0.70	0.88	0.75	0.80	0.61	0.84
5	A01	Ethnicity	Black (not Hispanic)	0.84	0.86	0.68	0.84	0.77	0.81	0.59	0.72
5	A01	Ethnicity	Hispanic	0.84	0.87	0.72	0.82	0.76	0.79	0.64	0.72
5	A01	Ethnicity	Native Americans	0.84	0.86	0.73	0.89	0.75	0.77	0.66	0.78
5	A01	Ethnicity	Other	0.83	0.87	0.71	0.86	0.73	0.80	0.63	0.78
5	A01	Gender	Male	0.85	0.86	0.68	0.86	0.80	0.80	0.58	0.80
5	A01	Gender	Female	0.84	0.87	0.68	0.88	0.73	0.80	0.60	0.79
5	B01	Ethnicity	White (not Hispanic)	0.83	0.86	0.69	0.86	0.73	0.80	0.58	0.79
5	B01	Ethnicity	Asian/Pacific Islander	0.88	0.83	0.70	0.88	0.82	0.75	0.60	0.82
5	B01	Ethnicity	Black (not Hispanic)	0.87	0.85	0.68	0.82	0.79	0.79	0.58	0.69
5	B01	Ethnicity	Hispanic	0.95	0.81	0.56	0.99	0.85	0.85	0.63	0.86
5	B01	Ethnicity	Native Americans	0.78	0.85	0.70	0.78	0.75	0.78	0.60	0.69
5	B01	Ethnicity	Other	0.82	0.87	0.71	0.82	0.67	0.80	0.61	0.77
5	B01	Gender	Male	0.86	0.85	0.71	0.85	0.76	0.80	0.60	0.76
5	B01	Gender	Female	0.84	0.86	0.68	0.85	0.74	0.78	0.58	0.78
5	B01	Accommodations	Yes	0.90	0.85	0.64	0.86	0.86	0.79	0.55	0.77

**Table F1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts (cont.)**

Grade	Form	Category	Group	Accuracy				Consistency			
				<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>	<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>
6	A01	Ethnicity	White (not Hispanic)	0.86	0.79	0.68	0.84	0.75	0.73	0.57	0.79
6	A01	Ethnicity	Asian/Pacific Islander	0.88	0.79	0.70	0.87	0.79	0.75	0.57	0.82
6	A01	Ethnicity	Black (not Hispanic)	0.87	0.79	0.69	0.81	0.79	0.73	0.56	0.70
6	A01	Ethnicity	Hispanic	0.86	0.80	0.70	0.85	0.73	0.76	0.59	0.74
6	A01	Ethnicity	Native Americans	0.87	0.82	0.74	0.77	0.80	0.76	0.61	0.66
6	A01	Ethnicity	Other	0.87	0.79	0.70	0.84	0.73	0.77	0.56	0.77
6	A01	Gender	Male	0.87	0.79	0.72	0.84	0.81	0.74	0.56	0.77
6	A01	Gender	Female	0.85	0.78	0.68	0.84	0.75	0.73	0.56	0.78
6	A01	Accommodations	Yes	0.89	0.80	0.68	0.83	0.84	0.72	0.54	0.64
6	B01	Ethnicity	White (not Hispanic)	0.82	0.78	0.68	0.84	0.70	0.73	0.57	0.78
6	B01	Ethnicity	Asian/Pacific Islander	0.84	0.80	0.70	0.90	0.76	0.71	0.57	0.84
6	B01	Ethnicity	Black (not Hispanic)	0.85	0.79	0.69	0.80	0.77	0.75	0.55	0.71
6	B01	Ethnicity	Hispanic	0.84	0.81	0.72	0.82	0.74	0.76	0.58	0.74
6	B01	Ethnicity	Native Americans	0.82	0.82	0.70	0.86	0.73	0.77	0.60	0.71
6	B01	Ethnicity	Other	0.84	0.80	0.71	0.84	0.73	0.75	0.57	0.76
6	B01	Gender	Male	0.94	0.71	0.61	0.98	0.82	0.78	0.64	0.86
6	B01	Gender	Female	0.83	0.79	0.69	0.86	0.72	0.74	0.57	0.78
6	B01	Accommodations	Yes	0.86	0.79	0.70	0.79	0.78	0.73	0.53	0.60
7	A01	Ethnicity	White (not Hispanic)	0.71	0.86	0.63	0.68	0.71	0.77	0.51	0.70
7	A01	Ethnicity	Asian/Pacific Islander	0.78	0.82	0.64	0.90	0.75	0.75	0.47	0.87
7	A01	Ethnicity	Black (not Hispanic)	0.84	0.83	0.64	0.84	0.79	0.78	0.51	0.72
7	A01	Ethnicity	Hispanic	0.82	0.84	0.61	0.86	0.77	0.80	0.51	0.77
7	A01	Ethnicity	Native Americans	0.82	0.85	0.64	0.87	0.80	0.80	0.50	0.77
7	A01	Ethnicity	Other	0.79	0.82	0.65	0.87	0.75	0.76	0.48	0.81
7	A01	Gender	Male	0.84	0.83	0.64	0.86	0.80	0.77	0.52	0.78
7	A01	Gender	Female	0.80	0.83	0.64	0.87	0.76	0.79	0.53	0.82
7	A01	Accommodations	Yes	0.87	0.85	0.64	0.83	0.85	0.76	0.46	0.62

**Table F1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts (cont.)**

Grade	Form	Category	Group	Accuracy				Consistency			
				<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>	<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>
7	B01	Ethnicity	White (not Hispanic)	0.80	0.81	0.61	0.87	0.72	0.73	0.49	0.81
7	B01	Ethnicity	Asian/Pacific Islander	0.86	0.81	0.61	0.90	0.79	0.75	0.46	0.86
7	B01	Ethnicity	Black (not Hispanic)	0.86	0.82	0.60	0.83	0.85	0.76	0.48	0.71
7	B01	Ethnicity	Hispanic	0.83	0.82	0.60	0.85	0.78	0.77	0.47	0.74
7	B01	Ethnicity	Native Americans	0.85	0.84	0.66	0.87	0.76	0.80	0.56	0.77
7	B01	Ethnicity	Other	0.82	0.82	0.60	0.86	0.75	0.76	0.46	0.77
7	B01	Gender	Male	0.84	0.81	0.60	0.87	0.81	0.76	0.49	0.79
7	B01	Gender	Female	0.80	0.81	0.61	0.87	0.73	0.75	0.51	0.80
7	B01	Accommodations	Yes	0.82	0.85	0.62	0.79	0.81	0.78	0.51	0.63
8	A01	Ethnicity	White (not Hispanic)	0.87	0.84	0.79	0.86	0.77	0.79	0.69	0.79
8	A01	Ethnicity	Asian/Pacific Islander	0.92	0.83	0.79	0.88	0.85	0.79	0.68	0.87
8	A01	Ethnicity	Black (not Hispanic)	0.89	0.84	0.76	0.81	0.84	0.79	0.65	0.70
8	A01	Ethnicity	Hispanic	0.88	0.84	0.76	0.84	0.79	0.80	0.65	0.74
8	A01	Ethnicity	Native Americans	0.87	0.84	0.78	0.79	0.78	0.80	0.69	0.69
8	A01	Ethnicity	Other	0.84	0.83	0.77	0.84	0.76	0.78	0.68	0.75
8	A01	Gender	Male	0.87	0.83	0.78	0.85	0.80	0.78	0.72	0.77
8	A01	Gender	Female	0.87	0.83	0.77	0.85	0.78	0.78	0.68	0.79
8	A01	Accommodations	Yes	0.89	0.83	0.79	0.84	0.85	0.77	0.62	0.57
8	A03	Ethnicity	White (not Hispanic)	0.83	0.82	0.77	0.86	0.72	0.76	0.68	0.78
8	A03	Ethnicity	Asian/Pacific Islander	0.83	0.81	0.76	0.89	0.71	0.71	0.69	0.86
8	A03	Ethnicity	Black (not Hispanic)	0.86	0.82	0.77	0.82	0.80	0.76	0.65	0.73
8	A03	Ethnicity	Hispanic	0.85	0.83	0.75	0.87	0.72	0.79	0.67	0.77
8	A03	Ethnicity	Other	0.85	0.83	0.75	0.90	0.71	0.80	0.66	0.78
8	A03	Gender	Male	0.87	0.82	0.77	0.85	0.77	0.77	0.68	0.77
8	A03	Gender	Female	0.81	0.81	0.76	0.88	0.67	0.74	0.66	0.82

**Table F1. Classification Consistency and Accuracy Conditioned on Performance Level: English Language Arts (cont.)**

Grade	Form	Category	Group	Accuracy				Consistency			
				<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>	<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>
8	A05	Ethnicity	White (not Hispanic)	0.85	0.83	0.76	0.84	0.74	0.77	0.69	0.78
8	A05	Ethnicity	Asian/Pacific Islander	0.25	0.84	0.76	0.88	0.09	0.76	0.66	0.84
8	A05	Ethnicity	Black (not Hispanic)	0.87	0.83	0.77	0.81	0.81	0.79	0.66	0.73
8	A05	Ethnicity	Hispanic	0.84	0.82	0.76	0.87	0.73	0.79	0.67	0.77
8	A05	Ethnicity	Other	0.88	0.84	0.74	0.86	0.82	0.79	0.65	0.78
8	A05	Gender	Male	0.87	0.84	0.75	0.85	0.77	0.77	0.67	0.78
8	A05	Gender	Female	0.83	0.82	0.76	0.87	0.70	0.78	0.66	0.82
8	B01	Ethnicity	White (not Hispanic)	0.85	0.83	0.74	0.85	0.74	0.76	0.65	0.77
8	B01	Ethnicity	Asian/Pacific Islander	0.90	0.83	0.75	0.89	0.85	0.76	0.67	0.82
8	B01	Ethnicity	Black (not Hispanic)	0.88	0.82	0.75	0.81	0.83	0.76	0.65	0.66
8	B01	Ethnicity	Hispanic	0.88	0.84	0.77	0.83	0.84	0.76	0.68	0.72
8	B01	Ethnicity	Native Americans	0.87	0.78	0.75	0.88	0.82	0.75	0.63	0.76
8	B01	Ethnicity	Other	0.90	0.86	0.77	0.85	0.80	0.79	0.70	0.79
8	B01	Gender	Male	0.87	0.83	0.74	0.85	0.78	0.76	0.66	0.74
8	B01	Gender	Female	0.85	0.82	0.75	0.84	0.79	0.77	0.64	0.77
8	B01	Accommodations	Yes	0.87	0.84	0.73	0.81	0.84	0.77	0.62	0.58
8	B02	Ethnicity	White (not Hispanic)	0.83	0.81	0.75	0.85	0.70	0.76	0.66	0.76
8	B02	Ethnicity	Asian/Pacific Islander	0.98	0.84	0.75	0.91	0.74	0.75	0.66	0.87
8	B02	Ethnicity	Black (not Hispanic)	0.87	0.83	0.73	0.81	0.81	0.77	0.64	0.68
8	B02	Ethnicity	Hispanic	0.87	0.84	0.77	0.81	0.75	0.78	0.69	0.74
8	B02	Ethnicity	Other	0.87	0.81	0.76	0.85	0.73	0.79	0.64	0.77
8	B02	Gender	Male	0.85	0.82	0.75	0.84	0.75	0.76	0.66	0.75
8	B02	Gender	Female	0.86	0.83	0.75	0.85	0.73	0.76	0.66	0.78
8	B04	Ethnicity	White (not Hispanic)	0.83	0.81	0.75	0.85	0.71	0.75	0.65	0.76
8	B04	Ethnicity	Asian/Pacific Islander	0.89	0.85	0.73	0.87	0.84	0.76	0.62	0.83
8	B04	Ethnicity	Black (not Hispanic)	0.87	0.83	0.74	0.79	0.79	0.78	0.66	0.66
8	B04	Ethnicity	Hispanic	0.88	0.83	0.76	0.83	0.79	0.78	0.67	0.73
8	B04	Ethnicity	Other	0.82	0.81	0.72	0.87	0.66	0.78	0.63	0.77
8	B04	Gender	Male	0.87	0.82	0.74	0.84	0.75	0.77	0.63	0.76
8	B04	Gender	Female	0.84	0.81	0.75	0.83	0.72	0.76	0.66	0.76

**Table F2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts**

Grade	Form	Category	Group	Accuracy			Consistency		
				<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>	<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>
3	A01	Ethnicity	White (not Hispanic)	0.95	0.92	0.92	0.92	0.89	0.90
3	A01	Ethnicity	Asian/Pacific Islander	0.96	0.92	0.92	0.94	0.89	0.89
3	A01	Ethnicity	Black (not Hispanic)	0.92	0.94	0.97	0.88	0.91	0.95
3	A01	Ethnicity	Hispanic	0.93	0.91	0.95	0.89	0.88	0.93
3	A01	Ethnicity	Native Americans	0.92	0.93	0.95	0.89	0.90	0.93
3	A01	Ethnicity	Other	0.93	0.91	0.94	0.91	0.89	0.91
3	A01	Gender	Male	0.94	0.92	0.94	0.91	0.90	0.92
3	A01	Gender	Female	0.94	0.92	0.93	0.92	0.89	0.90
3	B01	Ethnicity	White (not Hispanic)	0.95	0.92	0.92	0.94	0.89	0.88
3	B01	Ethnicity	Asian/Pacific Islander	0.97	0.93	0.91	0.95	0.89	0.88
3	B01	Ethnicity	Black (not Hispanic)	0.93	0.94	0.96	0.90	0.91	0.95
3	B01	Ethnicity	Hispanic	0.94	0.92	0.95	0.91	0.88	0.92
3	B01	Ethnicity	Native Americans	0.93	0.93	0.93	0.90	0.90	0.89
3	B01	Ethnicity	Other	0.95	0.91	0.93	0.92	0.88	0.89
3	B01	Gender	Male	0.94	0.92	0.93	0.92	0.89	0.90
3	B01	Gender	Female	0.96	0.93	0.91	0.95	0.91	0.91
3	B01	Accommodations	Yes	0.92	0.96	0.96	0.88	0.94	0.95
4	A01	Ethnicity	White (not Hispanic)	0.96	0.92	0.93	0.95	0.89	0.90
4	A01	Ethnicity	Asian/Pacific Islander	0.97	0.93	0.91	0.95	0.90	0.89
4	A01	Ethnicity	Black (not Hispanic)	0.92	0.94	0.97	0.89	0.91	0.96
4	A01	Ethnicity	Hispanic	0.94	0.92	0.96	0.91	0.88	0.94
4	A01	Ethnicity	Native Americans	0.95	0.94	0.92	0.92	0.91	0.90
4	A01	Ethnicity	Other	0.95	0.92	0.93	0.93	0.89	0.91
4	A01	Gender	Male	0.95	0.93	0.94	0.93	0.90	0.92
4	A01	Gender	Female	0.96	0.92	0.94	0.93	0.89	0.91

**Table F2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts (cont.)**

Grade	Form	Category	Group	Accuracy			Consistency		
				<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>	<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>
4	A04	Ethnicity	White (not Hispanic)	0.98	0.91	0.91	0.97	0.87	0.88
4	A04	Ethnicity	Asian/Pacific Islander	0.98	0.94	0.89	0.97	0.91	0.85
4	A04	Ethnicity	Black (not Hispanic)	0.93	0.92	0.96	0.90	0.90	0.94
4	A04	Ethnicity	Hispanic	0.97	0.91	0.91	0.96	0.87	0.88
4	A04	Ethnicity	Other	0.97	0.90	0.93	0.95	0.87	0.90
4	A04	Gender	Male	0.97	0.91	0.91	0.95	0.87	0.88
4	A04	Gender	Female	0.97	0.91	0.92	0.96	0.87	0.89
4	A07	Ethnicity	White (not Hispanic)	0.98	0.91	0.91	0.97	0.87	0.87
4	A07	Ethnicity	Black (not Hispanic)	0.94	0.93	0.95	0.91	0.90	0.94
4	A07	Ethnicity	Hispanic	0.98	0.90	0.88	0.97	0.86	0.84
4	A07	Ethnicity	Other	0.96	0.91	0.91	0.95	0.88	0.88
4	A07	Gender	Male	0.97	0.91	0.92	0.96	0.88	0.89
4	A07	Gender	Female	0.97	0.91	0.91	0.96	0.88	0.88
4	B01	Ethnicity	White (not Hispanic)	0.97	0.91	0.92	0.95	0.88	0.89
4	B01	Ethnicity	Asian/Pacific Islander	0.97	0.94	0.91	0.95	0.90	0.88
4	B01	Ethnicity	Black (not Hispanic)	0.93	0.93	0.96	0.90	0.90	0.95
4	B01	Ethnicity	Hispanic	0.95	0.92	0.95	0.93	0.88	0.93
4	B01	Ethnicity	Native Americans	0.94	0.89	0.92	0.92	0.85	0.89
4	B01	Ethnicity	Other	0.96	0.91	0.93	0.94	0.88	0.91
4	B01	Gender	Male	0.95	0.92	0.93	0.94	0.89	0.91
4	B01	Gender	Female	0.96	0.92	0.93	0.95	0.89	0.90
4	B01	Accommodations	Yes	0.95	0.95	0.97	0.92	0.93	0.96
4	B02	Ethnicity	White (not Hispanic)	0.98	0.91	0.91	0.97	0.88	0.89
4	B02	Ethnicity	Asian/Pacific Islander	0.99	0.93	0.91	0.99	0.90	0.86
4	B02	Ethnicity	Black (not Hispanic)	0.93	0.92	0.95	0.91	0.90	0.93
4	B02	Ethnicity	Hispanic	0.96	0.90	0.92	0.94	0.85	0.90
4	B02	Ethnicity	Other	0.98	0.91	0.90	0.96	0.87	0.87
4	B02	Gender	Male	0.97	0.91	0.92	0.95	0.88	0.89
4	B02	Gender	Female	0.97	0.91	0.92	0.96	0.88	0.89

**Table F2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts (cont.)**

Grade	Form	Category	Group	Accuracy			Consistency		
				<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>	<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>
4	B04	Ethnicity	White (not Hispanic)	0.98	0.91	0.91	0.97	0.87	0.88
4	B04	Ethnicity	Asian/Pacific Islander	0.99	0.92	0.89	0.98	0.89	0.85
4	B04	Ethnicity	Black (not Hispanic)	0.93	0.92	0.96	0.90	0.89	0.95
4	B04	Ethnicity	Hispanic	0.96	0.90	0.93	0.94	0.87	0.91
4	B04	Ethnicity	Other	0.97	0.89	0.93	0.96	0.86	0.90
4	B04	Gender	Male	0.97	0.91	0.91	0.95	0.88	0.89
4	B04	Gender	Female	0.97	0.90	0.92	0.96	0.87	0.89
5	A01	Ethnicity	White (not Hispanic)	0.96	0.93	0.92	0.95	0.90	0.89
5	A01	Ethnicity	Asian/Pacific Islander	0.97	0.93	0.92	0.96	0.91	0.89
5	A01	Ethnicity	Black (not Hispanic)	0.92	0.94	0.96	0.89	0.91	0.95
5	A01	Ethnicity	Hispanic	0.95	0.93	0.94	0.92	0.90	0.92
5	A01	Ethnicity	Native Americans	0.96	0.92	0.94	0.94	0.89	0.91
5	A01	Ethnicity	Other	0.96	0.93	0.94	0.94	0.89	0.91
5	A01	Gender	Male	0.95	0.93	0.93	0.93	0.91	0.91
5	A01	Gender	Female	0.96	0.92	0.93	0.95	0.90	0.89
5	B01	Ethnicity	White (not Hispanic)	0.97	0.92	0.92	0.95	0.89	0.88
5	B01	Ethnicity	Asian/Pacific Islander	0.98	0.93	0.91	0.97	0.89	0.87
5	B01	Ethnicity	Black (not Hispanic)	0.93	0.93	0.96	0.90	0.90	0.94
5	B01	Ethnicity	Hispanic	0.97	0.93	0.89	0.96	0.92	0.93
5	B01	Ethnicity	Native Americans	0.96	0.91	0.91	0.94	0.88	0.88
5	B01	Ethnicity	Other	0.97	0.91	0.92	0.95	0.88	0.90
5	B01	Gender	Male	0.96	0.93	0.93	0.94	0.89	0.90
5	B01	Gender	Female	0.97	0.92	0.92	0.96	0.88	0.88
5	B01	Accommodations	Yes	0.92	0.95	0.98	0.88	0.94	0.97

**Table F2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts (cont.)**

Grade	Form	Category	Group	Accuracy			Consistency		
				<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>	<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>
6	A01	Ethnicity	White (not Hispanic)	0.96	0.91	0.91	0.94	0.88	0.88
6	A01	Ethnicity	Asian/Pacific Islander	0.97	0.93	0.91	0.95	0.90	0.87
6	A01	Ethnicity	Black (not Hispanic)	0.90	0.94	0.96	0.86	0.91	0.95
6	A01	Ethnicity	Hispanic	0.93	0.92	0.95	0.90	0.89	0.92
6	A01	Ethnicity	Native Americans	0.95	0.92	0.93	0.92	0.89	0.90
6	A01	Ethnicity	Other	0.95	0.92	0.93	0.92	0.89	0.90
6	A01	Gender	Male	0.94	0.92	0.94	0.92	0.89	0.90
6	A01	Gender	Female	0.95	0.91	0.92	0.93	0.88	0.89
6	A01	Accommodations	Yes	0.89	0.96	0.99	0.83	0.95	0.98
6	B01	Ethnicity	White (not Hispanic)	0.96	0.91	0.91	0.94	0.87	0.88
6	B01	Ethnicity	Asian/Pacific Islander	0.97	0.94	0.91	0.96	0.91	0.86
6	B01	Ethnicity	Black (not Hispanic)	0.91	0.93	0.96	0.87	0.90	0.94
6	B01	Ethnicity	Hispanic	0.94	0.92	0.94	0.92	0.88	0.91
6	B01	Ethnicity	Native Americans	0.96	0.90	0.92	0.95	0.85	0.89
6	B01	Ethnicity	Other	0.95	0.92	0.93	0.93	0.88	0.89
6	B01	Gender	Male	0.95	0.92	0.91	0.94	0.93	0.91
6	B01	Gender	Female	0.96	0.91	0.92	0.94	0.88	0.88
6	B01	Accommodations	Yes	0.88	0.95	0.98	0.83	0.92	0.97
7	A01	Ethnicity	White (not Hispanic)	0.94	0.90	0.90	0.93	0.87	0.88
7	A01	Ethnicity	Asian/Pacific Islander	0.96	0.93	0.93	0.95	0.90	0.89
7	A01	Ethnicity	Black (not Hispanic)	0.91	0.94	0.97	0.87	0.92	0.95
7	A01	Ethnicity	Hispanic	0.93	0.93	0.94	0.90	0.91	0.93
7	A01	Ethnicity	Native Americans	0.94	0.94	0.94	0.92	0.91	0.91
7	A01	Ethnicity	Other	0.94	0.92	0.94	0.91	0.89	0.91
7	A01	Gender	Male	0.94	0.93	0.94	0.91	0.90	0.91
7	A01	Gender	Female	0.95	0.92	0.93	0.93	0.90	0.90
7	A01	Accommodations	Yes	0.89	0.97	0.99	0.84	0.96	0.98

**Table F2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts (cont.)**

Grade	Form	Category	Group	Accuracy			Consistency		
				<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>	<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>
7	B01	Ethnicity	White (not Hispanic)	0.96	0.91	0.91	0.94	0.87	0.88
7	B01	Ethnicity	Asian/Pacific Islander	0.98	0.93	0.91	0.97	0.90	0.87
7	B01	Ethnicity	Black (not Hispanic)	0.92	0.93	0.96	0.89	0.90	0.94
7	B01	Ethnicity	Hispanic	0.94	0.91	0.93	0.92	0.89	0.90
7	B01	Ethnicity	Native Americans	0.95	0.93	0.94	0.92	0.90	0.91
7	B01	Ethnicity	Other	0.95	0.92	0.92	0.93	0.88	0.88
7	B01	Gender	Male	0.94	0.92	0.93	0.93	0.89	0.90
7	B01	Gender	Female	0.96	0.91	0.91	0.94	0.88	0.88
7	B01	Accommodations	Yes	0.88	0.96	0.98	0.85	0.94	0.97
8	A01	Ethnicity	White (not Hispanic)	0.96	0.93	0.94	0.94	0.90	0.92
8	A01	Ethnicity	Asian/Pacific Islander	0.97	0.94	0.94	0.96	0.91	0.91
8	A01	Ethnicity	Black (not Hispanic)	0.93	0.94	0.97	0.90	0.91	0.96
8	A01	Ethnicity	Hispanic	0.94	0.93	0.96	0.91	0.91	0.94
8	A01	Ethnicity	Native Americans	0.94	0.95	0.94	0.92	0.93	0.91
8	A01	Ethnicity	Other	0.94	0.94	0.94	0.92	0.91	0.92
8	A01	Gender	Male	0.94	0.94	0.96	0.91	0.91	0.94
8	A01	Gender	Female	0.96	0.92	0.94	0.94	0.89	0.92
8	A01	Accommodations	Yes	0.90	0.97	0.99	0.85	0.95	0.99
8	A03	Ethnicity	White (not Hispanic)	0.97	0.92	0.92	0.95	0.89	0.89
8	A03	Ethnicity	Asian/Pacific Islander	0.98	0.93	0.92	0.96	0.91	0.89
8	A03	Ethnicity	Black (not Hispanic)	0.93	0.92	0.97	0.89	0.90	0.95
8	A03	Ethnicity	Hispanic	0.95	0.92	0.94	0.93	0.89	0.91
8	A03	Ethnicity	Other	0.96	0.92	0.94	0.94	0.89	0.91
8	A03	Gender	Male	0.95	0.93	0.94	0.93	0.90	0.91
8	A03	Gender	Female	0.97	0.91	0.93	0.95	0.88	0.90

**Table F2. Classification Consistency and Accuracy Conditioned on Cut Scores: English Language Arts (cont.)**

Grade	Form	Category	Group	Accuracy			Consistency		
				<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>	<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>
8	A05	Ethnicity	White (not Hispanic)	0.97	0.92	0.92	0.96	0.90	0.89
8	A05	Ethnicity	Asian/Pacific Islander	0.99	0.93	0.91	0.99	0.89	0.88
8	A05	Ethnicity	Black (not Hispanic)	0.93	0.94	0.96	0.90	0.91	0.95
8	A05	Ethnicity	Hispanic	0.95	0.92	0.94	0.93	0.90	0.92
8	A05	Ethnicity	Other	0.97	0.92	0.94	0.95	0.89	0.90
8	A05	Gender	Male	0.96	0.93	0.93	0.94	0.90	0.90
8	A05	Gender	Female	0.97	0.92	0.93	0.96	0.89	0.90
8	B01	Ethnicity	White (not Hispanic)	0.96	0.92	0.93	0.94	0.89	0.90
8	B01	Ethnicity	Asian/Pacific Islander	0.97	0.94	0.92	0.96	0.92	0.88
8	B01	Ethnicity	Black (not Hispanic)	0.92	0.94	0.96	0.90	0.91	0.95
8	B01	Ethnicity	Hispanic	0.95	0.93	0.95	0.93	0.89	0.93
8	B01	Ethnicity	Native Americans	0.95	0.92	0.93	0.93	0.89	0.90
8	B01	Ethnicity	Other	0.96	0.94	0.94	0.94	0.91	0.92
8	B01	Gender	Male	0.95	0.93	0.94	0.92	0.90	0.91
8	B01	Gender	Female	0.96	0.92	0.92	0.95	0.89	0.89
8	B01	Accommodations	Yes	0.90	0.95	0.99	0.86	0.93	0.98
8	B02	Ethnicity	White (not Hispanic)	0.97	0.91	0.92	0.95	0.88	0.89
8	B02	Ethnicity	Asian/Pacific Islander	0.99	0.95	0.91	0.98	0.93	0.87
8	B02	Ethnicity	Black (not Hispanic)	0.93	0.93	0.96	0.90	0.90	0.94
8	B02	Ethnicity	Hispanic	0.96	0.92	0.93	0.95	0.89	0.90
8	B02	Ethnicity	Other	0.96	0.91	0.93	0.95	0.88	0.90
8	B02	Gender	Male	0.95	0.92	0.93	0.93	0.89	0.90
8	B02	Gender	Female	0.97	0.92	0.92	0.96	0.88	0.89
8	B04	Ethnicity	White (not Hispanic)	0.97	0.92	0.92	0.95	0.88	0.88
8	B04	Ethnicity	Asian/Pacific Islander	0.99	0.94	0.89	0.98	0.92	0.85
8	B04	Ethnicity	Black (not Hispanic)	0.92	0.94	0.96	0.90	0.91	0.94
8	B04	Ethnicity	Hispanic	0.96	0.92	0.94	0.94	0.89	0.91
8	B04	Ethnicity	Other	0.96	0.92	0.91	0.94	0.89	0.89
8	B04	Gender	Male	0.95	0.92	0.93	0.93	0.89	0.90
8	B04	Gender	Female	0.97	0.92	0.91	0.96	0.89	0.88

**Table F3. Classification Consistency and Accuracy Conditioned on Performance Level: Mathematics**

Grade	Form	Category	Group	Accuracy				Consistency			
				<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>	<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>
3	A01	Ethnicity	White (not Hispanic)	0.86	0.77	0.75	0.90	0.81	0.68	0.66	0.82
3	A01	Ethnicity	Asian/Pacific Islander	0.87	0.77	0.76	0.94	0.82	0.67	0.66	0.88
3	A01	Ethnicity	Black (not Hispanic)	0.90	0.77	0.74	0.87	0.89	0.66	0.63	0.76
3	A01	Ethnicity	Hispanic	0.86	0.76	0.76	0.89	0.85	0.67	0.63	0.80
3	A01	Ethnicity	Native Americans	0.89	0.73	0.79	0.84	0.86	0.64	0.67	0.78
3	A01	Ethnicity	Other	0.88	0.77	0.76	0.90	0.84	0.70	0.65	0.80
3	A01	Gender	Male	0.88	0.77	0.75	0.90	0.84	0.68	0.65	0.83
3	A01	Gender	Female	0.87	0.77	0.75	0.89	0.83	0.68	0.65	0.81
3	B01	Ethnicity	White (not Hispanic)	0.86	0.74	0.76	0.90	0.78	0.64	0.65	0.84
3	B01	Ethnicity	Asian/Pacific Islander	0.88	0.74	0.74	0.90	0.84	0.70	0.63	0.87
3	B01	Ethnicity	Black (not Hispanic)	0.89	0.75	0.79	0.87	0.86	0.66	0.64	0.77
3	B01	Ethnicity	Hispanic	0.85	0.75	0.76	0.87	0.84	0.66	0.65	0.77
3	B01	Ethnicity	Native Americans	0.88	0.76	0.77	0.89	0.85	0.65	0.66	0.82
3	B01	Ethnicity	Other	0.86	0.77	0.74	0.91	0.80	0.68	0.63	0.84
3	B01	Gender	Male	0.88	0.74	0.75	0.90	0.82	0.65	0.65	0.83
3	B01	Gender	Female	0.85	0.74	0.75	0.89	0.79	0.67	0.64	0.81
3	B01	Accommodations	Yes	0.93	0.75	0.77	0.96	0.91	0.68	0.66	0.78
4	A01	Ethnicity	White (not Hispanic)	0.89	0.74	0.73	0.91	0.81	0.64	0.67	0.84
4	A01	Ethnicity	Asian/Pacific Islander	0.90	0.71	0.71	0.93	0.82	0.65	0.64	0.90
4	A01	Ethnicity	Black (not Hispanic)	0.92	0.73	0.74	0.88	0.89	0.63	0.65	0.74
4	A01	Ethnicity	Hispanic	0.91	0.73	0.75	0.90	0.85	0.64	0.66	0.81
4	A01	Ethnicity	Native Americans	0.91	0.75	0.71	0.89	0.89	0.66	0.63	0.82
4	A01	Ethnicity	Other	0.89	0.71	0.76	0.91	0.84	0.64	0.66	0.81
4	A01	Gender	Male	0.90	0.73	0.74	0.91	0.84	0.65	0.67	0.82
4	A01	Gender	Female	0.89	0.73	0.73	0.91	0.82	0.65	0.67	0.80
4	A01	Accommodations	Yes	0.96	0.73	0.74	0.88	0.95	0.59	0.59	0.74

**Table F3. Classification Consistency and Accuracy Conditioned on Performance Level: Mathematics (cont.)**

Grade	Form	Category	Group	Accuracy				Consistency			
				<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>	<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>
4	B01	Ethnicity	White (not Hispanic)	0.87	0.75	0.73	0.91	0.77	0.64	0.68	0.83
4	B01	Ethnicity	Asian/Pacific Islander	0.89	0.72	0.75	0.94	0.80	0.64	0.67	0.91
4	B01	Ethnicity	Black (not Hispanic)	0.91	0.73	0.74	0.88	0.87	0.65	0.69	0.76
4	B01	Ethnicity	Hispanic	0.89	0.71	0.75	0.91	0.84	0.61	0.68	0.78
4	B01	Ethnicity	Native Americans	0.94	0.73	0.73	0.99	0.91	0.63	0.73	0.80
4	B01	Ethnicity	Other	0.89	0.72	0.74	0.93	0.81	0.66	0.67	0.85
4	B01	Gender	Male	0.88	0.70	0.74	0.93	0.82	0.64	0.66	0.85
4	B01	Gender	Female	0.87	0.73	0.74	0.91	0.79	0.65	0.68	0.82
4	B01	Accommodations	Yes	0.93	0.73	0.75	0.79	0.92	0.63	0.66	0.64
5	A01	Ethnicity	White (not Hispanic)	0.84	0.78	0.78	0.90	0.80	0.71	0.67	0.80
5	A01	Ethnicity	Asian/Pacific Islander	0.82	0.78	0.80	0.94	0.76	0.71	0.70	0.90
5	A01	Ethnicity	Black (not Hispanic)	0.88	0.79	0.79	0.87	0.86	0.71	0.66	0.73
5	A01	Ethnicity	Hispanic	0.85	0.80	0.78	0.89	0.82	0.73	0.67	0.79
5	A01	Ethnicity	Native Americans	0.84	0.79	0.78	0.88	0.82	0.70	0.68	0.77
5	A01	Ethnicity	Other	0.87	0.80	0.78	0.91	0.81	0.73	0.65	0.82
5	A01	Gender	Male	0.86	0.78	0.77	0.90	0.83	0.71	0.66	0.82
5	A01	Gender	Female	0.84	0.79	0.79	0.90	0.80	0.72	0.68	0.82
5	A01	Accommodations	Yes	0.97	0.80	0.82	0.98	0.96	0.73	0.72	0.83
5	B01	Ethnicity	White (not Hispanic)	0.83	0.78	0.79	0.91	0.77	0.74	0.66	0.82
5	B01	Ethnicity	Asian/Pacific Islander	0.85	0.78	0.78	0.93	0.81	0.71	0.69	0.89
5	B01	Ethnicity	Black (not Hispanic)	0.87	0.79	0.79	0.89	0.83	0.71	0.66	0.75
5	B01	Ethnicity	Hispanic	0.83	0.78	0.79	0.89	0.78	0.74	0.69	0.80
5	B01	Ethnicity	Native Americans	0.85	0.77	0.76	0.82	0.76	0.73	0.64	0.65
5	B01	Ethnicity	Other	0.83	0.76	0.77	0.90	0.76	0.71	0.69	0.78
5	B01	Gender	Male	0.85	0.77	0.77	0.91	0.79	0.72	0.66	0.84
5	B01	Gender	Female	0.83	0.77	0.77	0.90	0.76	0.72	0.67	0.81
5	B01	Accommodations	Yes	0.87	0.79	0.79	0.83	0.85	0.69	0.64	0.70

**Table F3. Classification Consistency and Accuracy Conditioned on Performance Level: Mathematics (cont.)**

Grade	Form	Category	Group	Accuracy				Consistency			
				<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>	<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>
6	A01	Ethnicity	White (not Hispanic)	0.88	0.77	0.74	0.90	0.81	0.70	0.66	0.83
6	A01	Ethnicity	Asian/Pacific Islander	0.88	0.77	0.74	0.93	0.84	0.71	0.65	0.89
6	A01	Ethnicity	Black (not Hispanic)	0.96	0.76	0.72	0.94	0.91	0.72	0.66	0.83
6	A01	Ethnicity	Hispanic	0.90	0.78	0.75	0.91	0.86	0.71	0.64	0.82
6	A01	Ethnicity	Native Americans	0.91	0.76	0.74	0.92	0.86	0.68	0.62	0.79
6	A01	Ethnicity	Other	0.90	0.76	0.74	0.91	0.84	0.69	0.65	0.84
6	A01	Gender	Male	0.90	0.77	0.74	0.90	0.85	0.69	0.66	0.83
6	A01	Gender	Female	0.89	0.77	0.74	0.90	0.82	0.70	0.66	0.82
6	A01	Accommodations	Yes	0.95	0.77	0.72	0.89	0.94	0.65	0.56	0.74
6	B01	Ethnicity	White (not Hispanic)	0.89	0.79	0.75	0.92	0.82	0.74	0.67	0.86
6	B01	Ethnicity	Asian/Pacific Islander	0.91	0.76	0.75	0.94	0.85	0.68	0.63	0.91
6	B01	Ethnicity	Black (not Hispanic)	0.92	0.78	0.76	0.89	0.88	0.70	0.66	0.81
6	B01	Ethnicity	Hispanic	0.91	0.78	0.74	0.91	0.85	0.74	0.67	0.83
6	B01	Ethnicity	Native Americans	0.85	0.77	0.79	0.93	0.80	0.68	0.72	0.88
6	B01	Ethnicity	Other	0.90	0.76	0.75	0.90	0.85	0.71	0.61	0.87
6	B01	Gender	Male	0.91	0.79	0.75	0.91	0.85	0.71	0.67	0.87
6	B01	Gender	Female	0.90	0.79	0.74	0.92	0.83	0.75	0.67	0.85
6	B01	Accommodations	Yes	0.94	0.79	0.74	0.88	0.92	0.72	0.64	0.75
7	A01	Ethnicity	White (not Hispanic)	0.87	0.81	0.77	0.89	0.81	0.76	0.70	0.82
7	A01	Ethnicity	Asian/Pacific Islander	0.87	0.81	0.76	0.93	0.81	0.73	0.66	0.89
7	A01	Ethnicity	Black (not Hispanic)	0.90	0.81	0.78	0.86	0.87	0.73	0.66	0.76
7	A01	Ethnicity	Hispanic	0.87	0.81	0.78	0.90	0.84	0.74	0.66	0.78
7	A01	Ethnicity	Native Americans	0.95	0.76	0.76	0.98	0.87	0.76	0.72	0.85
7	A01	Ethnicity	Other	0.86	0.79	0.78	0.91	0.81	0.73	0.65	0.84
7	A01	Gender	Male	0.89	0.80	0.77	0.90	0.85	0.74	0.70	0.82
7	A01	Gender	Female	0.87	0.81	0.78	0.89	0.81	0.76	0.69	0.81
7	A01	Accommodations	Yes	0.93	0.78	0.77	0.86	0.91	0.67	0.61	0.75

**Table F3. Classification Consistency and Accuracy Conditioned on Performance Level: Mathematics (cont.)**

Grade	Form	Category	Group	Accuracy				Consistency			
				<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>	<i>Below Basic</i>	<i>Basic</i>	<i>Prof.</i>	<i>Adv.</i>
7	B01	Ethnicity	White (not Hispanic)	0.86	0.80	0.78	0.89	0.77	0.75	0.71	0.83
7	B01	Ethnicity	Asian/Pacific Islander	0.90	0.82	0.77	0.93	0.80	0.76	0.67	0.90
7	B01	Ethnicity	Black (not Hispanic)	0.90	0.80	0.78	0.89	0.85	0.74	0.69	0.79
7	B01	Ethnicity	Hispanic	0.85	0.80	0.76	0.90	0.81	0.73	0.65	0.81
7	B01	Ethnicity	Native Americans	0.90	0.82	0.81	0.92	0.82	0.74	0.69	0.90
7	B01	Ethnicity	Other	0.87	0.82	0.76	0.92	0.80	0.75	0.69	0.85
7	B01	Gender	Male	0.88	0.80	0.78	0.90	0.82	0.74	0.71	0.84
7	B01	Gender	Female	0.86	0.80	0.78	0.89	0.78	0.76	0.70	0.83
7	B01	Accommodations	Yes	0.92	0.80	0.77	0.86	0.90	0.69	0.60	0.72
8	A01	Ethnicity	White (not Hispanic)	0.85	0.79	0.77	0.90	0.78	0.71	0.67	0.81
8	A01	Ethnicity	Asian/Pacific Islander	0.86	0.81	0.78	0.93	0.82	0.72	0.67	0.87
8	A01	Ethnicity	Black (not Hispanic)	0.89	0.79	0.77	0.88	0.86	0.67	0.67	0.76
8	A01	Ethnicity	Hispanic	0.87	0.78	0.77	0.90	0.83	0.70	0.66	0.76
8	A01	Ethnicity	Native Americans	0.87	0.75	0.77	0.86	0.85	0.64	0.67	0.77
8	A01	Ethnicity	Other	0.87	0.79	0.78	0.91	0.83	0.70	0.68	0.80
8	A01	Gender	Male	0.87	0.78	0.78	0.91	0.83	0.72	0.69	0.81
8	A01	Gender	Female	0.85	0.80	0.78	0.88	0.79	0.72	0.69	0.77
8	A01	Accommodations	Yes	0.91	0.78	0.76	0.93	0.90	0.58	0.65	0.84
8	B01	Ethnicity	White (not Hispanic)	0.84	0.78	0.79	0.89	0.78	0.72	0.69	0.81
8	B01	Ethnicity	Asian/Pacific Islander	0.89	0.78	0.79	0.95	0.81	0.73	0.67	0.91
8	B01	Ethnicity	Black (not Hispanic)	0.88	0.77	0.77	0.88	0.85	0.68	0.63	0.73
8	B01	Ethnicity	Hispanic	0.97	0.73	0.72	0.99	0.88	0.73	0.73	0.85
8	B01	Ethnicity	Native Americans	0.90	0.72	0.80	0.85	0.82	0.67	0.73	0.71
8	B01	Ethnicity	Other	0.87	0.77	0.76	0.93	0.82	0.70	0.66	0.78
8	B01	Gender	Male	0.87	0.78	0.77	0.89	0.83	0.69	0.69	0.80
8	B01	Gender	Female	0.85	0.77	0.78	0.90	0.76	0.70	0.66	0.79
8	B01	Accommodations	Yes	0.90	0.77	0.79	0.87	0.87	0.61	0.65	0.75

**Table F4. Classification Consistency and Accuracy Conditioned on Cut Scores: Mathematics**

Grade	Form	Category	Group	Accuracy			Consistency		
				<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>	<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>
3	A01	Ethnicity	White (not Hispanic)	0.94	0.93	0.94	0.92	0.90	0.91
3	A01	Ethnicity	Asian/Pacific Islander	0.96	0.94	0.94	0.95	0.92	0.91
3	A01	Ethnicity	Black (not Hispanic)	0.91	0.95	0.98	0.88	0.92	0.97
3	A01	Ethnicity	Hispanic	0.92	0.93	0.96	0.89	0.90	0.94
3	A01	Ethnicity	Native Americans	0.93	0.95	0.94	0.90	0.93	0.92
3	A01	Ethnicity	Other	0.93	0.94	0.95	0.91	0.92	0.92
3	A01	Gender	Male	0.94	0.94	0.94	0.92	0.91	0.92
3	A01	Gender	Female	0.94	0.94	0.94	0.91	0.91	0.92
3	B01	Ethnicity	White (not Hispanic)	0.95	0.93	0.93	0.93	0.89	0.91
3	B01	Ethnicity	Asian/Pacific Islander	0.97	0.94	0.92	0.95	0.93	0.90
3	B01	Ethnicity	Black (not Hispanic)	0.92	0.94	0.97	0.88	0.91	0.96
3	B01	Ethnicity	Hispanic	0.93	0.93	0.95	0.90	0.90	0.92
3	B01	Ethnicity	Native Americans	0.94	0.95	0.94	0.92	0.93	0.90
3	B01	Ethnicity	Other	0.94	0.93	0.95	0.91	0.90	0.92
3	B01	Gender	Male	0.95	0.93	0.94	0.92	0.90	0.92
3	B01	Gender	Female	0.94	0.92	0.93	0.92	0.89	0.91
3	B01	Accommodations	Yes	0.93	0.94	0.98	0.90	0.92	0.97
4	A01	Ethnicity	White (not Hispanic)	0.94	0.93	0.94	0.91	0.90	0.92
4	A01	Ethnicity	Asian/Pacific Islander	0.95	0.95	0.93	0.94	0.93	0.91
4	A01	Ethnicity	Black (not Hispanic)	0.91	0.95	0.98	0.87	0.93	0.97
4	A01	Ethnicity	Hispanic	0.92	0.94	0.96	0.89	0.91	0.95
4	A01	Ethnicity	Native Americans	0.94	0.94	0.94	0.92	0.91	0.93
4	A01	Ethnicity	Other	0.93	0.93	0.95	0.90	0.91	0.93
4	A01	Gender	Male	0.94	0.94	0.94	0.91	0.92	0.92
4	A01	Gender	Female	0.93	0.93	0.95	0.89	0.91	0.93
4	A01	Accommodations	Yes	0.94	0.98	0.99	0.91	0.97	0.99

**Table F4. Classification Consistency and Accuracy Conditioned on Cut Scores: Mathematics (cont.)**

Grade	Form	Category	Group	Accuracy			Consistency		
				<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>	<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>
4	B01	Ethnicity	White (not Hispanic)	0.94	0.93	0.93	0.92	0.90	0.91
4	B01	Ethnicity	Asian/Pacific Islander	0.96	0.95	0.93	0.94	0.94	0.91
4	B01	Ethnicity	Black (not Hispanic)	0.91	0.94	0.97	0.87	0.93	0.96
4	B01	Ethnicity	Hispanic	0.92	0.94	0.95	0.88	0.91	0.93
4	B01	Ethnicity	Native Americans	0.96	0.95	0.91	0.95	0.92	0.91
4	B01	Ethnicity	Other	0.94	0.93	0.95	0.91	0.91	0.93
4	B01	Gender	Male	0.93	0.93	0.94	0.92	0.90	0.92
4	B01	Gender	Female	0.93	0.93	0.94	0.90	0.90	0.92
4	B01	Accommodations	Yes	0.92	0.97	0.98	0.89	0.96	0.98
5	A01	Ethnicity	White (not Hispanic)	0.94	0.93	0.95	0.91	0.90	0.92
5	A01	Ethnicity	Asian/Pacific Islander	0.96	0.95	0.95	0.94	0.93	0.93
5	A01	Ethnicity	Black (not Hispanic)	0.90	0.95	0.98	0.87	0.93	0.97
5	A01	Ethnicity	Hispanic	0.92	0.94	0.96	0.89	0.91	0.95
5	A01	Ethnicity	Native Americans	0.92	0.94	0.96	0.89	0.91	0.94
5	A01	Ethnicity	Other	0.93	0.94	0.96	0.90	0.91	0.94
5	A01	Gender	Male	0.93	0.94	0.96	0.90	0.91	0.93
5	A01	Gender	Female	0.93	0.93	0.96	0.89	0.91	0.94
5	A01	Accommodations	Yes	0.94	0.99	0.99	0.92	0.99	0.99
5	B01	Ethnicity	White (not Hispanic)	0.94	0.93	0.95	0.92	0.89	0.92
5	B01	Ethnicity	Asian/Pacific Islander	0.97	0.95	0.94	0.95	0.93	0.91
5	B01	Ethnicity	Black (not Hispanic)	0.91	0.94	0.98	0.87	0.92	0.97
5	B01	Ethnicity	Hispanic	0.92	0.93	0.96	0.89	0.90	0.95
5	B01	Ethnicity	Native Americans	0.95	0.89	0.95	0.92	0.85	0.93
5	B01	Ethnicity	Other	0.94	0.91	0.95	0.91	0.88	0.93
5	B01	Gender	Male	0.94	0.93	0.95	0.91	0.91	0.93
5	B01	Gender	Female	0.93	0.92	0.95	0.91	0.89	0.93
5	B01	Accommodations	Yes	0.89	0.97	0.99	0.84	0.95	0.98

**Table F4. Classification Consistency and Accuracy Conditioned on Cut Scores: Mathematics (cont.)**

Grade	Form	Category	Group	Accuracy			Consistency		
				<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>	<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>
6	A01	Ethnicity	White (not Hispanic)	0.94	0.94	0.94	0.91	0.91	0.93
6	A01	Ethnicity	Asian/Pacific Islander	0.96	0.94	0.94	0.95	0.93	0.91
6	A01	Ethnicity	Black (not Hispanic)	0.92	0.96	0.98	0.89	0.95	0.98
6	A01	Ethnicity	Hispanic	0.92	0.94	0.97	0.89	0.92	0.95
6	A01	Ethnicity	Native Americans	0.93	0.93	0.96	0.90	0.90	0.95
6	A01	Ethnicity	Other	0.93	0.94	0.96	0.90	0.92	0.94
6	A01	Gender	Male	0.93	0.94	0.95	0.90	0.92	0.94
6	A01	Gender	Female	0.93	0.94	0.95	0.90	0.91	0.94
6	A01	Accommodations	Yes	0.94	0.99	0.99	0.91	0.98	0.99
6	B01	Ethnicity	White (not Hispanic)	0.95	0.93	0.95	0.93	0.91	0.93
6	B01	Ethnicity	Asian/Pacific Islander	0.97	0.95	0.94	0.95	0.93	0.92
6	B01	Ethnicity	Black (not Hispanic)	0.92	0.96	0.98	0.88	0.94	0.97
6	B01	Ethnicity	Hispanic	0.93	0.94	0.96	0.91	0.92	0.95
6	B01	Ethnicity	Native Americans	0.91	0.95	0.97	0.88	0.93	0.95
6	B01	Ethnicity	Other	0.93	0.94	0.95	0.91	0.91	0.94
6	B01	Gender	Male	0.94	0.95	0.95	0.92	0.92	0.94
6	B01	Gender	Female	0.94	0.93	0.95	0.92	0.91	0.93
6	B01	Accommodations	Yes	0.93	0.98	0.99	0.90	0.97	0.99
7	A01	Ethnicity	White (not Hispanic)	0.94	0.94	0.95	0.91	0.91	0.94
7	A01	Ethnicity	Asian/Pacific Islander	0.95	0.95	0.95	0.94	0.92	0.93
7	A01	Ethnicity	Black (not Hispanic)	0.90	0.97	0.99	0.86	0.95	0.98
7	A01	Ethnicity	Hispanic	0.91	0.94	0.97	0.88	0.92	0.96
7	A01	Ethnicity	Native Americans	0.91	0.96	0.97	0.90	0.94	0.96
7	A01	Ethnicity	Other	0.92	0.94	0.97	0.89	0.91	0.95
7	A01	Gender	Male	0.93	0.95	0.96	0.91	0.93	0.94
7	A01	Gender	Female	0.93	0.94	0.96	0.90	0.92	0.95
7	A01	Accommodations	Yes	0.91	0.99	0.99	0.87	0.98	0.99

**Table F4. Classification Consistency and Accuracy Conditioned on Cut Scores: Mathematics (cont.)**

Grade	Form	Category	Group	Accuracy			Consistency		
				<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>	<i>Below Basic/ Basic</i>	<i>Basic/ Prof.</i>	<i>Prof./ Adv.</i>
7	B01	Ethnicity	White (not Hispanic)	0.94	0.93	0.95	0.92	0.91	0.93
7	B01	Ethnicity	Asian/Pacific Islander	0.96	0.95	0.94	0.95	0.93	0.92
7	B01	Ethnicity	Black (not Hispanic)	0.90	0.96	0.99	0.86	0.95	0.98
7	B01	Ethnicity	Hispanic	0.92	0.94	0.97	0.88	0.91	0.96
7	B01	Ethnicity	Native Americans	0.94	0.93	0.98	0.91	0.89	0.97
7	B01	Ethnicity	Other	0.93	0.94	0.96	0.90	0.92	0.95
7	B01	Gender	Male	0.93	0.94	0.96	0.91	0.92	0.94
7	B01	Gender	Female	0.93	0.93	0.96	0.91	0.91	0.94
7	B01	Accommodations	Yes	0.90	0.98	0.99	0.86	0.97	0.99
8	A01	Ethnicity	White (not Hispanic)	0.91	0.93	0.97	0.88	0.90	0.96
8	A01	Ethnicity	Asian/Pacific Islander	0.94	0.94	0.96	0.92	0.91	0.94
8	A01	Ethnicity	Black (not Hispanic)	0.89	0.97	0.99	0.84	0.95	0.98
8	A01	Ethnicity	Hispanic	0.90	0.95	0.98	0.86	0.92	0.97
8	A01	Ethnicity	Native Americans	0.91	0.93	0.97	0.88	0.90	0.96
8	A01	Ethnicity	Other	0.91	0.94	0.97	0.87	0.91	0.96
8	A01	Gender	Male	0.91	0.95	0.97	0.88	0.93	0.96
8	A01	Gender	Female	0.91	0.94	0.97	0.87	0.91	0.96
8	A01	Accommodations	Yes	0.89	0.99	0.99	0.84	0.98	0.99
8	B01	Ethnicity	White (not Hispanic)	0.92	0.92	0.96	0.89	0.89	0.95
8	B01	Ethnicity	Asian/Pacific Islander	0.95	0.93	0.97	0.92	0.90	0.95
8	B01	Ethnicity	Black (not Hispanic)	0.89	0.95	0.99	0.85	0.94	0.98
8	B01	Ethnicity	Hispanic	0.90	0.96	0.97	0.89	0.94	0.97
8	B01	Ethnicity	Native Americans	0.92	0.92	0.96	0.89	0.90	0.95
8	B01	Ethnicity	Other	0.91	0.93	0.98	0.87	0.90	0.96
8	B01	Gender	Male	0.91	0.94	0.97	0.88	0.91	0.96
8	B01	Gender	Female	0.91	0.92	0.97	0.88	0.88	0.95
8	B01	Accommodations	Yes	0.89	0.98	0.99	0.83	0.97	0.99