Missouri

Assessment Program

Grade-Level Assessm

Technical Report 2012

DRAFT

Submitted to
Missouri Department of Elementary and Secondary Education
November 2012

HELP THE TEACHER HELP THE CHILD

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EXECUTIVE SUMMARY

This report is a technical summary of the 2012 operational administration of the Missouri Assessment Program (MAP). The MAP is a grade-level test in Communication Arts and Mathematics administered in Grades 3 through 8. The MAP is a grade-span test in Science administered in Grades 5 and 8. These tests are designed to measure students' knowledge of Communication Arts, Mathematics, and Science. This section provides a summary of the 2012 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/Grade-Level Expectations 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 2008, grade-span tests were administered in Science for the first time. In 2010, 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 here: http://dese.mo.gov/divimprove/assess/tech/). The MAP tests have therefore undergone multiple alignment analyses to ensure that MAP content reflects these refinements. Further details of the development of the 2010 MAP may be found in Chapter 3 of this report.

E.2 Administration

In the spring of 2012, Missouri administered grade-level MAPs in Communication Arts and Mathematics to students in Grades 3 through 8 and in Science to students in Grades 5 and 8. The MAP was administered from April 2–27, 2012. Test administration is discussed in Chapter 4 of this report.

Approximately 562 districts administered Communication Arts and Mathematics MAP tests in Grades 3 through 8. These districts also administered Science MAP tests in Grades 5 and 8. Table E.1 shows participation rates based on the census data.[1] For the purposes of this report, participation rate is defined as the percentage of students who received a valid scale score given the total number of students who received a test book. The Accountable column shows the total number of students who received a test book. The Percent Reportable column shows the percentage of students who received a scale score on MAP. Further analysis of participation rates is provided in Chapter 7 of this report.

[1] The census data used in this report does not reflect additional cleaning steps that DESE staff implements once CTB releases data to DESE; therefore, the numbers in this report may differ from those in DESE reports using their cleaned data.

E.3 Student Performance

This is the seventh year of the grade-level MAP testing programs in Communication Arts and Mathematics and the fifth year for the grade-span tests in Science. Tables E.2 and E.3 present the percentage of students classified as *Proficient* or *Advanced* in 2006 through 2012 in Communication Arts and Mathematics, respectively. Table E.4 shows the percentage of students classified as *Proficient* or *Advanced* in 2008 through 2012 on the Science MAP.

In general, small to moderate increases in the percentage of students classified as *Proficient* or *Advanced* were observed in most grades and content areas. More information on student performance may be found in Chapter 7 of this report.

E.4 Validity and Test Scores

Most sections of this technical report are designed to provide validity evidence to support the use of MAP test scores. Chapter 2 discusses the uses of MAP scores. Chapter 3 discusses the test development process used to create MAP, which is important to the content-related validity of the MAP scores. Chapter 4 presents information on test administration. Chapter 5 discusses the scoring of constructed-response items, as well as the results of the inter-rater reliability studies. Chapter 6 presents the scaling and linking procedures, as well as the results of other operational data analyses. Chapter 7 reviews the results of the 2012 operational administration and overviews the score reports sent to parents, schools, and districts. Chapter 8 highlights the standard-setting procedures used for MAP. Chapter 9 discusses reliability and construct-related validity. In this chapter, we evaluate the assumption that the content-area MAPs are unidimensional. For example, the grade-level Mathematics MAP should measure one primary dimension (Mathematics). Chapter 10 overviews the statistical and development processes used to assure fairness of the MAP for all examinees. Some analyses in this document are based on the calibration sample, while others are based on census data. The sources of data used for particular analyses are indicated throughout the Technical Report.

Table E.1: Participation Rates: All Students

Grade	Accountable in Comm. Arts	Percent Reportable in Comm. Arts	Accountable in Mathematics	Percent Reportable in Mathematics	Accountable in Science	Percent Reportable in Science
3	66323	99.7%	66323	99.8%		
4	65996	99.7%	65996	99.9%		
5	66675	99.7%	66675	99.8%	66675	99.7%
6	67342	99.7%	67342	99.8%		
7	66845	99.7%	66845	99.7%		
8	67037	99.6%	67037	99.7%	67037	99.5%

Table E.2: Percentage of Students Classified as *Proficient* or *Advanced* in 2006 through 2012 Using Census Data: Communication Arts

	Communication Arts							
Grade	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2012 – 2011**
3	42.4	42.6	40.3	40.3	43.1	43.6	45.3	1.7
4	43.8	45.1	45.1	46.3	50.9	51.9	52.2	0.3
5	45.0	47.8	48.1	48.8	51.0	51.1	51.8	0.7
6	42.2	43.6	47.4	47.7	49.6	50.5	50.2	-0.3
7	42.7	44.4	49.0	50.8	51.7	53.8	55.2	1.4
8	41.5	41.6	48.1	49.7	51.8	52.5	53.3	0.8

Table E.3: Percentage of Students Classified as *Proficient* or *Advanced* in 2006 through 2012 Using Census Data: Mathematics

	Mathematics							
Grade	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2012 – 2011**
3	43.3	45.0	43.8	44.4	47.1	49.4	51.9	2.5
4	43.4	44.5	44.2	44.4	48.4	50.5	50.5	0.0
5	43.3	46.6	45.8	47.2	51.7	52.5	54.3	1.8
6	43.9	47.8	50.7	50.1	55.4	56.9	55.7	-1.2
7	42.9	44.9	49.5	51.9	54.5	55.8	59.6	3.8
8	39.8	40.6	43.8	46.4	51.3	50.8	52.0	1.2

Table E.4: Percentage of Students Classified as *Proficient* or *Advanced* in 2008 through 2012 Using Census Data: Science

	Science					
Grade	**2008**	**2009**	**2010**	**2011**	**2012**	**2012 – 2011**
5	44.5	45.1	48.9	50.5	51.4	0.9
8	43.2	44.8	48.0	50.0	49.6	-0.4

CHAPTER 1: INTRODUCTION

The 2012 Missouri Assessment Program (MAP) marked the seventh administration of the grade-level Communication Arts and Mathematics MAP in Missouri. It was the fifth administration of the grade-span Science MAP at Grades 5 and 8. The MAP is designed to measure students' knowledge of Communication Arts, Mathematics, and Science. This report provides a technical overview of the Communication Arts, Mathematics, and Science assessments of the 2012 MAP. As such, it presents evidence for the validity of the 2012 MAP scores.

This chapter of the Technical Report serves to describe the background, history, purpose, and design of the MAP, followed by an overview of the major sections for 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, 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 in Grades 3 through 8 and once in Grades 10 through 12. It also required that states have in place Science assessments to be administered at least once in Grades 3 through 5, Grades 6 through 9, and Grades 10 through 12 by the 2007–2008 school year. 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 Department of Elementary and Secondary Education (DESE) contracted with CTB/McGraw-Hill in 2003 to expand the testing program to grade-level testing for Communication Arts and Mathematics. This contract was renewed in 2007 and extends through 2013. In the spring of 2005, Missouri administered a field test in Communication Arts and Mathematics, which was the basis for the construction of the 2006 and 2007 operational test forms.

The construction of the new Science MAP has been on a different trajectory. In 2005 DESE contracted with CTB/McGraw-Hill to construct a grade-span Science assessment in order to comply with the requirements of NCLB. In the spring of 2006, Missouri administered a field test in Science, which was the basis for the construction of the 2008 and 2010 operational Science forms. The contract to create grade-span Science assessments was renewed in 2007. This contract also extends through 2013.

In 2008 DESE together with Riverside Publishing developed End-of-Course Assessments for use at the high school level. With the development of the new test program, the MAP high school assessments were discontinued. The final administration of the MAP high school assessments was in the spring of 2008.

Table 1.2 shows a timeline of the development history of the NCLB-compliant testing program.

1.2 Purpose of the Missouri Assessment Program

The MAP is designed to measure how well students acquire the skills and knowledge described in Missouri's Grade-Level Expectations (GLEs). The assessments yield information on academic achievement at the student, class, school, district, and state levels. This information is used to diagnose individual student strengths and weaknesses in relation to the instruction of the GLEs and to gauge the overall quality of education throughout Missouri.

1.3 Design of the Missouri Assessment Program

The spring 2012 MAP administration consisted of 14 operational assessments. Each form contained a norm-referenced test form from which norm-referenced scores were derived. The norm-referenced items counted toward the student scale score if they could be mapped to a Missouri GLE. If an item could not be mapped to a Missouri GLE, then it did not count toward the criterion-referenced score. Table 1.3 shows the number of items that could not be mapped to a Missouri GLE. Table 1.4 provides an overview of the 2012 MAP test design.

Braille and large-print versions of each operational MAP form were constructed for each grade/content area to enable visually impaired students to participate in MAP testing. At some grade levels/content areas, it was necessary to drop items from the assessment due to difficulties associated with the Braille translation. Table 1.5 lists the number of items that were omitted from the Braille forms. Note that students taking the Braille forms were given full credit for the omitted items.

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 that confirm that the processes and procedures applied in the MAP adhered 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:

Use of Test Scores (Chapter 2)
Chapter 2 of the Technical Report discusses the concept of validity evidence. This Technical Report is comprised of evidence that supports the use of the MAP scores. In Chapter 2, we discuss some of the uses of the MAP scores.

Item and Test Development (Chapter 3)
Chapter 3 of the Technical Report provides a summary of the major test development activities that occurred to create the spring 2012 operational test forms and 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 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 Constructed-Response Items (Chapter 5)
Chapter 5 of the Technical Report describes the processes and activities for scoring constructed-response items. This chapter discusses how raters are trained and the measures for assuring 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 2012 MAP, which are comprised of three major parts: the calibration sample, the classical item analysis, and calibration, scaling, and linking using item response theory (IRT) models. This chapter describes the demographics of the calibration sample and compares it 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 and Reporting (Chapter 7)
Chapter 7 of the Technical Report contains information on the results of the spring 2012 MAP administration. Detailed summary statistics based on scale scores and achievement level information are also provided. Finally, this chapter presents information on the score reports sent to parents, schools, and districts.

Standard-Setting (Chapter 8)
Chapter 8 of the Technical Report briefly discusses standard setting. It provides an overview of the standard setting activities that occurred for the MAP.

Reliability and Validity Evidence (Chapter 9)
Chapter 9 of the Technical Report provides evidence of reliability and validity of MAP 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 validity for MAP scores.

Fairness (Chapter 10)

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

Table 1.1: Timeline of 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: Timeline of 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

Table 1.3: Number of Items That Did Not Map to a Missouri Grade-Level Expectation

Content	Grade	Number of Items
Communication Arts	5	1
	8	1
Mathematics	3	6
	4	6
	5	10
	6	5
	7	1
	8	3
Science	5	3
	8	2

Table 1.4: Spring 2012 MAP Test Design

Content	Grade	Anchor Items	Operational Items	Total Number of OP Items	Total Raw Score Points
Communication Arts	3	13	43	56	61
	4	13	43	56	61
	5	12	44	56	60
	6	12	44	56	60
	7	14	48	62	66
	8	13	47	60	64
Mathematics	3	12	43	55	59
	4	14	47	61	65
	5	12	46	58	62
	6	12	46	58	62
	7	13	48	61	65
	8	13	47	60	64
Science	5	13	42	55	68
	8	23	33	56	69

Table 1.5: Spring 2012 Items Removed from Braille Forms

Content Area	Grade	Total Number of Items
Communication Arts	3	1
	8	1
Mathematics	4	1
	5	1
	6	2
	8	2
Science	5	4
	8	1

CHAPTER 2: THE USES OF TEST SCORES

Validity is the overarching component of the MAP testing program. The following excerpt is from the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999):

> 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. This includes 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 examinees (17).

As stated by the *Standards*, the validity of a testing program hinges on the use of the test scores. *Validity evidence* that supports the uses of the MAP test scores is provided in this Technical Report. In this section, we examine some possible uses of the MAP 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 that the MAP tests measure what they are intended to measure. However, this Technical Report cannot anticipate all possible interpretations and uses of MAP 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 scores. To this end, DESE conducted a study on consequential validity that was implemented by the Assessment Resource Center (see *MAP and Missouri Schools: A Consequential Validity Study*, ARC, 2008).

2.1 Uses of Test Scores

The validity of a test score ultimately rests on how that test score is used. To understand whether a test score is being used properly, we must first understand the purpose of the test. The intended uses of MAP scores include:

- identifying students' strengths and weaknesses in Missouri's Grade-Level Expectations
- communicating expectations for all students
- evaluating school-, district-, and/or state-level programs
- informing stakeholders (teachers, school administrators, district administrators, DESE staff members, parents, and the public) on the status of the progress toward meeting academic achievement standards of the state
- meeting the requirements to measure Adequate Yearly Progress by NCLB
- meeting the requirements of the state's accountability program, Missouri School Improvement Program (MSIP)

This Technical Report refers to the use of several kinds of scores: the test-level scores (scale scores and achievement levels), Content Standard scores, and process standard 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 achievement is reported. These scores indicate, in varying ways, a student's achievement in Communication Arts, Mathematics, or Science. Test-level scores are reported at four reporting levels: the state, the school district, the school, and the student.

Custom-written portions of the MAP were directly authored by Missouri educators, edited by DESE and CTB staff, and subsequently reviewed and approved for use by Missouri educators. This procedure fosters a close relationship between the items and the Missouri Show-Me Standards from which the MAP was developed. Portions of the MAP from CTB's item pool were also aligned to Missouri Content Standards, Process Standards, and GLEs to further solidify the Show-Me Standards as the foundation of the MAP. As shown in Table 1.3 in the previous chapter, only one Grade 5 Communication Arts item, one Grade 8 Communication Arts item, three Grade 5 Science items, and two Grade 8 Science items did not map to Missouri standards. In Mathematics, the number of items that did not map to Missouri standards ranged from one (Grade 7) to 10 (Grade 5) items. Item development is described in Chapter 3; however, detailed descriptions of processes used to delineate the knowledge, skills, and abilities, including content limits and descriptions for each content area, are beyond the scope of this report.

The following sections discuss two types of test-level scores that are reported to indicate a student's achievement on the MAP: (1) the scale score and (2) its associated level of achievement.

2.2.1 Scale Scores

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

2.2.2 Levels of Achievement

A student's performance on the Communication Arts, Mathematics, or Science MAP is reported in one of four levels of achievement: *Below Basic*, *Basic*, *Proficient*, or *Advanced*. The cut scores for the levels of achievement were recommended by Missouri educators and citizens at the Bookmark Standard Setting Workshop in December 2005 for Communication Arts and Mathematics and in July 2008 for Science. The cut scores reflect the expectations of Missouri educators and citizens of what Missouri students should know and be able to do in each grade/content area. The Missouri Show-Me

Standards guided these recommendations, as did Missouri Senate Bill 1080. (See Chapter 8 of this report for a discussion of MAP standard setting). Thus, MAP achievement levels reflect the achievement standards and abilities intended by the Missouri legislature, Missouri teachers, Missouri citizens, and DESE. Descriptions of each level of achievement 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

MAP scale scores and achievement levels provide summary evidence of student achievement in Communication Arts, Mathematics, or Science. Classroom teachers may use these scores as evidence of student achievement in these content areas. At the aggregate level, district and school administrators may use this information for activities such as planning curriculum. At the state level, the aggregate test-level scale scores are used for accountability programs associated with NCLB and the MSIP. The results presented in this Technical Report provide evidence that the scale scores are a valid and reliable indicator of student performance in Communication Arts, Mathematics, and Science.

2.3 Content Standard Subscores

The Content Standard subscores indicate student performance in terms of the number- and percent-correct score for each Content Standard in Communication Arts and each GLE strand in Mathematics and Science. Starting in 2008, Content Standard subscores were reported only through DESE's Crystal Reporting system. Starting in 2012, all reporting was done through the Missouri Comprehensive Data Portal. These scores may be aggregated by the state, district, or schools to determine the mean Content Standard subscores. These means may be used as indicators of the performance of the school or district in teaching students the knowledge and skills defined for each subject area.

2.3.1 Use of the Content Standard Subscores

The purpose of reporting Content Standard subscores on MAP is to show for each student the relationship between the overall achievement being measured and the skills in each of the areas delimited by the Content Standards in Communication Arts and the GLE strands in Mathematics and Science. Teachers may use these subscores for individual students as indicators of strengths and weaknesses, but they are best corroborated by other evidence, such as homework, class participation, diagnostic test scores, or observation. Chapter 3 of this Technical Report provides evidence of content validity that supports the use of the Content Standard subscores. Chapter 9 of this Technical Report provides evidence of construct validity that further supports the use of the Content Standard subscores.

District and school administrators may compare their aggregate results with the state mean to better understand their strengths and weaknesses within a content area. Caution should be exercised when comparing Content Standard subscores between students or across years. The user should be aware that different items will comprise the Content Standards across years and that these items may vary in difficulty.

2.4 Process Standard Subscores

For each MAP content area, Process Standard and Content Standard subscores are determined from the same pool of items. These items were classified by the particular underlying processes used to teach each item's content, and each item's assigned Process Standard was verified by Missouri teachers in a Content Review workshop specifically designed to fulfill that purpose. Content Standard and Process Standard subscores generally show a directly proportional relationship because the same pool of items is used to measure both sets of standards. Process Standard subscores are only reported through the Missouri Comprehensive Data Portal.

2.4.1 Use of the Process Standard Subscores

The purpose of reporting Process Standard subscores on MAP is to show the achievement of students in each of the areas delimited by the Process Standards in Communication Arts, Mathematics, or Science. When the Process Standard processes are used to teach the subject area content, the Process Standard subscores can be said to reflect the strategies Missouri teachers want Missouri students to adopt in the learning and handling of "real world" activities.

Caution should be exercised when making comparisons of Process Standard subscores between students or across years. The user should be aware that different items will comprise the Process Standards across years and that these items may vary in difficulty.

CHAPTER 3: TEST CONTENT DEVELOPMENT

Content-related validity in achievement tests is evidenced by a correspondence between test content and a specification of the content domain. Content-related validity can be demonstrated through consistent adherence to test blueprints, through a high-quality test development process that includes review of items for accessibility to English Language Learners and students with disabilities, and through alignment studies performed by independent groups. In this section, we will provide a detailed discussion of the test development cycle, from aligning items with Missouri's rigorous Show-Me Standards and GLE strands to selecting items for the final operational test form. In particular, this section will show how MAP follows rigorous procedures to construct tests that reflect the full range of content that MAP is expected to cover.

This chapter is particularly relevant to AERA, APA, & NCME (1999) Standards 3.1, 3.2, and 3.7. It also addresses Standards 3.11, 7.4, and 7.7, which will be discussed in the pertinent sections of this chapter. Standards 3.1, 3.2, and 3.7 are from Chapter 3 of the AERA, APA, & NCME (1999) Standards, which is titled *Test Development and Revision.* Each of these Standards will be presented in this chapter, as will the way the Standard is addressed. AERA, APA, & NCME (1999) Standard 3.1 says,

> Tests and testing programs should be developed on a sound scientific basis. Test developers and publishers should compile and document adequate evidence bearing on test development.

The purpose of this chapter is to document the test development process used for MAP. In this chapter, we describe steps taken to create MAP from the development of test specifications to the selection of operational forms.

3.1 Test Specifications

AERA, APA, & NCME (1999) Standard 3.2 says,

> The purpose(s) of the test, definition of the domain, and the test specifications should be stated clearly so that judgments can be made about the appropriateness of the defined domain for the stated purpose(s) of the test and about the relation of items to the dimensions of the domain they are intended to represent.

The purpose of the test is discussed in Chapter 2. MAP domains are generally defined as the knowledge and skills that are identified within the Missouri Grade Level Expectations (GLEs) and Show-Me Standards. These frameworks are, in turn, based on prior consensus among DESE, Missouri educators, and experienced subject-matter experts that the frameworks represent 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

MAP test specifications evolve from the tension between the constraints of the assessment program and the benefits sought from the examination of students. Many of the benefits sought are not scientific in nature, nor are many of the constraints; rather, they are policy considerations. The 2012 MAP test selection specifications were finalized in August 2009 prior to test selection of the 2012 operational forms. Subsequent to test selection, all Writing Prompts and Performance Events were removed from the forms due to state budget constraints. Because of these changes, a second round of DESE review and approval of the 2012 MAP test specifications was conducted in 2011.

The MAP test specifications consist of a test blueprint and a test design for each grade level/content area. The key structural aspect of the MAP tests is the test blueprint, which specifies the target score points for each Content Standard (Table 3.1). The blueprint represents a compromise between many constraints, including the target weights for each Content Standard recommended by Missouri teachers, availability of items from field testing, and results of multiple reviews by content specialists. Test design elements include such elements as number and types of items/tasks for each of the scores reported (tasks are measured by constructed-response items in MAP). The degree to which the 2012 MAP operational forms matched the test blueprint can be assessed by comparing the targeted score point distributions defined in the test blueprint with the actual point distributions displayed in Tables 3.4–3.6. Actual point distributions on the 2012 MAP operational forms matched blueprint targets within 10%, which was the tolerance for variation approved by DESE. Note that minor changes were made to the test blueprint for the 2012 MAP to account for the removal of Writing Prompts and Performance Events.

3.2 Item Development

Item development is discussed in this section in compliance with the AERA, APA, & NCME (1999) Standards. Standard 3.7 states,

> The procedures used to develop, review, and try out items, and to select items from the item pool should be documented. If the items were classified into different categories or subtests according to the test specifications, the procedures used for classification and the appropriateness and accuracy of the classification should be documented.

Development of item content for the 2012 MAP Operational test occurred during the period 2004-2008. The plan specified two item development and selection cycles. The first cycle included item writing/passage selection workshops; a local pilot study; revision of items based on pilot results; content and bias reviews, item refinements, and form construction; subsequent rounds of formal field testing; the selection of operational forms based on statistical data from field testing; and ultimately, operational testing at grade levels 3 through 8. The second cycle (2007-2009) excluded local pilot testing and item revisions based on pilot results. Each of these steps is described in greater detail below.

3.2.1 Reading Load

AERA, APA, & NCME (1999) Standard 7.7 is particularly relevant to item development. It says,

> In testing applications where the level of linguistic or reading ability is not part of the construct of interest, the linguistic or reading demands of the test should be kept to the minimum necessary for the valid assessment of the intended construct.

MAP item development takes place within well-established content development workflow processes and methodologies. These processes include editing items for both content and style, the latter of which includes multiple reviews of each question to assure proper grammar, punctuation, and compliance to the established style. Clarity and fair access for all examinees also fall within the purview of the style reviews, which occur at scheduled milestones within the overall test development process. A thorough quality assurance review is conducted by a separate entity within the publishing division prior to the actual publication and distribution of the MAP grade-level assessments.

During item writing/content development workshops (described later), content developers are provided with specific training about how to write items that require minimal reading loads for assessing content knowledge outside of the reading/communication arts content domain. For example, Mathematics content developers are trained to recognize and eliminate excessive wordiness in question stems; likewise, Science developers are encouraged to use only strictly relevant information in their items, even for those items which require some kind of background explanation of a scenario or scientific experiment.

Once item writing workshops are complete, content development editors review all item content generated at the workshops and perform a post-workshop analysis. During this process, editors reject items which do not meet specific criteria; items which do not directly assess the intended targets or cannot be modified in such a way as to comply with the established style and quality of the existing MAP items (due to excessive wordiness, linguistic complexity, or overall fair access concerns) are summarily filtered out from the pool. Then, only the remaining material is submitted to a thorough style review.

The established MAP content development workflow calls for style reviews to occur at other milestones, which include (but are not limited to) pilot testing, formal content and bias reviews, and form selection. Style reviews also occur after the results of the Score, Revise, Rewrite workshops.

3.2.2 Item Writing

Communication Arts and Mathematics: In February 2005 and January 2007, groups comprised of Missouri educators, Regional Instructional Facilitators (RIFs), DESE staff, and CTB personnel participated in Item Writing Workshops (IWW) for Communication Arts and Mathematics at Lake of the Ozarks, Missouri. The workshops were conducted

with more than 30 teacher participants per content area. Teacher participants were selected by DESE to represent educational sites throughout Missouri. During the first day of the workshop, Communication Arts participants selected reading passages. During the next three days, Communication Arts participants used selected passages as a basis for writing constructed-response (CR) items and writing prompts that would become the pool of items for the 2008–2013 Operational forms for grades 3–8. The Mathematics participants wrote CR items and performance-event (PE) items along with scoring guides to create a pool of items for the 2008–2013 Operational forms for grades 3–8. The content developed at the workshop was based specifically upon the Missouri Show-Me Standards and GLEs. Some selected-response (SR) items were developed by CTB and reviewed by DESE after the workshops to help supplement the item pool. Items were refined after the initial item writing workshop, which led to the production of local pilot test forms.

Science: In November 2004, a group comprised of Missouri educators, RIFs, DESE staff, and CTB personnel participated in a four-day Science IWW in Columbia, Missouri. The IWW was conducted with 37 teacher participants selected by DESE on the basis of their prior experience and expertise in item development for MAP Science and to represent educational sites throughout Missouri. The purpose of the IWW was to revise existing items and write new items to ensure a well-balanced item pool for the 2008–2013 MAP Science Operational forms. The existing items came from the MAP Science item pool previously developed for operational testing at grades 3 and 7. During the first two days of the IWW, the existing items were revised to target the new MAP Science GLEs. These new GLEs were the basis for the 2008-2013 assessments, to be administered at grades 5 and 8. During the third and fourth days of the IWW, Science participants wrote new CR items and performance events. A new MAP Science performance event development template was introduced at the IWW. This template specified the types of tasks and numbers of items that comprise a performance event. Science item development was also included in the January 2007 IWW at Lake of the Ozarks and followed the same methods described for the 2004 IWW.

Overall, the IWWs in November 2004, February 2005, and January 2007 provided a basis upon which items written for the Communication Arts, Mathematics, and Science grade-level assessments could be selected for use on small-scale local pilot tests administered throughout Missouri.

3.2.3 Local Pilot Test

In March 2005 (Science) and November 2005 (Communication Arts and Mathematics), small-scale pilot tests were administered in a limited number of classrooms throughout Missouri. These pilot tests consisted of items from the November 2004 (Science) and February 2005 (Communication Arts and Mathematics) IWWs. Teachers who administered the pilot tests were generally selected by DESE from the pool of IWW participants. The items from the 2007 Item Writing Workshop were not subjected to local pilot testing.

Six Communication Arts forms per grade were piloted, consisting of approximately two SR items and six CR items each for grades 4, 5, 6, and 8. The six Communication Arts pilot forms for grades 3 and 7 each contained two SR items, four CR items, and one writing prompt. Six Mathematics forms per grade were piloted, consisting of approximately twelve SR items and two CR items each for grades 3, 5, 6, and 7. The six Mathematics pilot forms for grades 4 and 8 each contained twelve SR items, four CR items, and one performance event. Ten Science forms per grade, consisting of approximately 15 CR items, were piloted for each of grades 5 and 8. In addition to these ten pilot forms, eight performance events were piloted at each grade level.

3.2.4 Score, Revise, Rewrite Workshop

In April 2005 (Science) and February 2006 (Communication Arts and Mathematics), the items included in the 2005 local pilot tests underwent further evaluation during Score, Revise, and Rewrite (SRR) Workshops. The items from the 2007 Item Writing Workshop were not subjected to the SRR Workshops.

The purpose of the SRR Workshop was for the participants to score the items piloted in Missouri classrooms and to revise the items and rubrics/scoring guides based on the scoring process, student results, and subsequent discussion. DESE invited approximately five to seven participants per grade/content area, resulting in the direct participation of approximately 100 Missouri educators in this step of the development process. CTB and DESE personnel were present to facilitate the SRR Workshop. The participants individually scored the students' pilot forms, tallied the results, and then reviewed the items as a group. District Test Coordinators were also present and participated in the process. Overall, the goal of the workshop was to improve the item quality prior to the next step in the process, Content and Bias Review, and to ensure that quality items were developed for future use in the MAP. Most participants commented that this workshop was successful in this regard.

3.2.5 Content and Bias Review Workshop

Content and Bias Review (CBR) workshops were conducted in May 2005 (Science), May 2006 (Communication Arts and Mathematics), and June 2007 (all three content areas). DESE staff, Missouri educators, RIFs, and CTB staff participated in all meetings. The 2005 and 2006 CBRs were conducted in Columbia, Missouri, and the 2007 CBR was conducted in Jefferson City, Missouri. All three CBRs followed the same procedures. For the Content Review, DESE invited participants from educational sites throughout Missouri to review items, writing prompts, performance events, and scoring guides for content accuracy and grade-level appropriateness. In Communication Arts, participants also reviewed passages. In addition, participants in all three content areas verified each item's alignment to the Missouri curriculum by reviewing the Content Standard, Process Standard, and GLE assignment. The Content Review was accomplished over the course of one or two days and was followed by a one- or two-day Bias Review.

The Bias Review committee was comprised of representatives from various backgrounds whose purpose was to screen the items for racial, socioeconomic, gender, or other

sensitivity issues. This follows AERA, APA, & NCME (1999) Standard 7.4, which states,

> Test developers should strive to identify and eliminate language, symbols, words, phrases, and content that are generally regarded as offensive by members of racial, ethnic, gender, or other groups, except when judged to be necessary for adequate representation of the domain.

For each content area, over 30 Missouri educators participated in the process to help ensure content validity and screen items for potential bias. Review committees could revise or reject items because of issues related to possible bias. Greater than 90% of reviewed items were accepted by each review committee at each of the three CBRs. The general consensus was that the items as a group were well written and edited and that the revisions made during and after the SRR Workshop had contributed to a smooth CBR workshop. The accepted items became candidates for the next step in the process, the MAP field test.

3.3 Field Test Selection and Administration

The items approved by CBR committees became the basis for the formation of stand-alone field test forms administered in 2006 and 2007 and embedded field testing in 2008 and 2009. The custom-written material was arranged into test forms using *TerraNova* Survey as a common set of items across forms. (The same Survey form was used as the norm-referenced test (NRT) portion of the 2008 and 2009 operational tests; a new *TerraNova* Survey form was field tested in 2009 for operational use in 2010–2012. The anchor design is described in more detail in the following section.) Field test items were selected and placed into forms so that the combined coverage of the NRT and custom portions of the test met the established blueprint requirements for content coverage; each field test form was constructed using the same design.

The MAP Spring 2006 Science Field Test consisted of four parallel forms per grade level, which were administered in grades 5 and 8 in May 2006. The MAP Spring 2007 Communication Arts and Mathematics Field Tests consisted of six parallel forms per grade/content area which were successfully administered in grades 3–8 in May 2007. All field test forms were reviewed and approved by DESE prior to administration. The field tests generated item statistics that were used to select two years of parallel operational forms to be administered in 2008 and 2009. Due to budget constraints, all of the constructed response (CR) items field tested in 2009 were not scored; therefore, some of the items used operationally in 2007-2008 were made available for operational test selection in 2010–2012. The CR items not scored in 2009 are being scored in 2012 and will become available for the 2014 Operational tests.

3.4 Operational Test Selection

The use of an embedded *TerraNova* Survey provides an NRT subtest, which is a requirement of the MAP. For most grade/content areas, the intact *TerraNova* Survey

Form E was embedded in the 2012 MAP tests. Due to equating issues with Form E, *TerraNova* Survey From D was used as the NRT subtest for Grade 8 Science.

The use of the *TerraNova* Survey and its match to the Missouri standards plays an important role in planning for the entire development process leading up to the time of test selection. This is because the test blueprint is applied to the entire test, which includes both the NRT and custom portions. As an NRT product, *TerraNova* items are pre-classified to an existing set of *TerraNova* Reading, Language, Mathematics, or Science standards.[2] In many cases, the match of *TerraNova* items to the Missouri GLEs could be considered equivalent; nevertheless, the item development process provided for a DESE review of how the items in the *TerraNova* Survey were matched to the Missouri standards. The match of *TerraNova* Survey Form E items to Missouri standards was initially assessed by DESE in 2008 and then verified by DESE in September 2009 in preparation for the 2010-2012 MAP tests.

Operational item selections for 2012 were initially performed in August–September 2009 by CTB, and then repeated in August–September 2011 after removal of writing prompts and performance events. The selection process followed strict statistical criteria specified by CTB's Research department and approved by DESE. The selection criteria were based on both content requirements and statistical criteria, including the following:

1. *TerraNova* Survey Form E is the NRT subtest for all grades and content areas, with the exception of Grade 8 Science.
2. Test length and item types match the DESE-approved test design.[2]
3. Content coverage matches DESE-approved test blueprint.
4. The following items were to be avoided, whenever possible:
    a. For CR items: 3+-point items where more than 50% were able to attain the top score points
    b. p-value ≤ 0.20 or ≥ 0.90
    c. Omit rates $\geq 5\%$
    d. Poor Fit statistics (Q1)
    e. Significant DIF statistics:
        i. If an item with DIF had to be included for blueprint coverage, examine the item to determine if any content reason exists for the DIF flag (sometimes items will demonstrate statistical bias but no content reason can be determined for the bias).
        ii. Obtain DESE permission to use the DIF item (meaning someone from DESE should examine the item and agree that no content reason can be determined for the statistical bias).
5. Statistical properties of the test:
    a. ITEMWIN software must be used to select forms.

[2] It's important to note that the Communication Arts MAP is comprised of both Language and Reading items that are scaled together. In the *TerraNova* family of tests, Language and Reading are administered in a single booklet but are scaled separately.

[2] Due to DESE budget constraints, the 2010–2012 test design contained a higher proportion of selected-response (SR) items than the 2006–2009 MAP tests.

b. The Standard Error of Measurement (SEM) and Test Characteristic Curve (TCC) of the 2012 operational test must match within 5% of the 2011 MAP.

Production of the 2012 Operational test forms and ancillary materials commenced in October 2011. Items were ordered and placed into test books in preparation for operational testing, and the standard process of page reviews between CTB and DESE ensued until final approvals were in place in December 2011. Then, test books and ancillary materials were printed and distributed in support of the Spring 2012 Operational Test.

3.5 Universal Design

Grade-level assessments that are universally designed allow participation of the widest possible range of students, resulting in more valid inferences about students' performance. Universally designed grade-level assessments may reduce the need for accommodations by reducing or eliminating access barriers associated with the tests themselves. Table 3.2 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 2012 test forms.

Universal design requires that grade-level assessments need to measure the performance of students with a wide range of abilities and skill repertoires, ensuring that students with diverse learning needs receive opportunities to demonstrate competence on the same content. To accommodate the greatest number of students within MAP, the regular print assessment includes simple, clear, and intuitive instructions and procedures, maximum readability and comprehensibility, and maximum legibility. All of these design components are addressed primarily through the physical layout and formatting of the test books. The page specifications and template for test book pages 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. Written instructions in the test books 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.

The MAP test books are designed to minimize distractions and to support navigation through the test book. In Grade 3 Communication Arts, certain test item stems are read aloud to the students. In all grade levels and content areas, a "full-page stop" at the end of each testing session indicates that the students cannot turn the page until instructed by the test examiner. Right-facing pages within a session have a "go on" arrow at the bottom right-hand corner to indicate that the test session continues on the next page. Any pages that are intentionally left blank are labeled "Do Not Mark on This Page" to indicate that there are no test materials on that page.

3.6 Accommodations

Students with disabilities or who are English Language Learners may be provided test administration accommodation 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 on the DESE website at:

http://dese.mo.gov/divimprove/assess/documents/Grade_Level_Accommodations.pdf

Braille and large-print versions were constructed for each grade/content area to enable visually-impaired students to participate in MAP testing. 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 and teacher's notes that accompany the Braille forms. DESE conducted a review meeting with a committee of teachers in January 2012 to ensure that both the Braille and Large-Print versions of the 2012 MAP assessment would be accessible to Missouri's visually challenged students. DESE and the teacher committee made recommendations, as needed, for how to further revise the transcription to best serve the needs of visually challenged students.

While the goal is to maximize the number of items on the Braille form, it was not possible to transcribe all items into Braille as some items represent concepts that are simply not appropriate for students who take the Braille form. At some grade levels/content areas, it was necessary to omit items from the Braille version due to bias issues or excessive difficulty associated with the Braille transcription. Table 3.3 lists the items that were omitted from the 2012 Braille forms. The concerns noted by the committee for items that were dropped from the Braille forms will be brought to the attention of assessment editors and item writers to guide future item development.

3.7 Content and Process Standards

Test content evidence of validity is provided for the MAP with the specification of each of the Content and Process Standards that are influential in acquiring the skills tested in the items/tasks used in each of the MAP tests. If teachers teach using the Content and Process Standards as intended, then student performance should improve on those items that were identified as implicitly tapping these habits of mind and/or explicitly written and clearly intended to measure specific Content Standards.

AERA, APA, & NCME (1999) Standard 3.11 says,

> Test developers should document the extent to which the content domain of a test represents the defined domain and test specifications.

The 2012 MAP assessed version 2.0 of the Missouri GLEs. Prior to selecting the operational tests, CTB and DESE performed an in-depth comparison of the version 2.0 GLEs against the former version in place since 2005 (Communication Arts and Mathematics) and 2006 (Science). This comparison was conducted beginning in early 2008 through the approval of the 2010–2012 MAP test specifications. The analysis

included an alignment of the entire MAP item pool to the version 2.0 GLEs, which was reviewed and approved by DESE. The results of the comparison found that the changes to the content domain between the original GLEs and version 2.0 were limited in scope. A small number of GLEs that were formerly tested were no longer assessable on the statewide test but still present in the curriculum (denoted as "locally assessed") and a small percentage of the Mathematics GLEs were reclassified to new grade levels. These changes caused the loss of some items from the MAP item pool and resulted in the need to reuse operational items from 2008 for the 2012 MAP tests. However, the Content Standards/GLE strands used as reporting categories in the 2006–2009 MAP remained intact across grades/content areas in the version 2.0 GLEs. The conclusion from the comparison between the former GLEs and the version 2.0 GLEs was that the same overall content domains would be measured by the 2010–2012 versions of the MAP tests that were measured by the former versions (2006–2009).

Between test selection and administration of the 2012 MAP, DESE contracted an independent study to evaluate the alignment of the test forms to the version 2.0 GLEs. The study was conducted in October 2009 by the Human Resources Research Organization (HumRRO), along with Dr. Norman Webb as a subcontractor. The alignment study examined four alignment criteria:

> (1) Categorical concurrence — determines the degree of overall content coverage by the assessment for each content strand.
>
> (2) Range-of-knowledge representation — indicates the specific content expectations (e.g., standard, GLE) assessed within each strand.
>
> (3) Balance-of-knowledge representation — provides a statistical index reflecting the distribution of assessed content within each strand (i.e., how evenly the content is assessed.)
>
> (4) Depth-of-knowledge consistency — compares the cognitive complexity ratings of the items with the complexity ratings of each content standard.

The results of the alignment study suggested there were some alignment deficiencies in the 2012 MAP test forms for Communication Arts (depth-of-knowledge and balance-of-knowledge) and Science (range-of-knowledge). The depth-of-knowledge deficiency in Communication Arts is attributed mainly to the reliance on selected-response items, which contribute an average of 90% of the total score points on the test. The balance-of-knowledge deficiency in Communication Arts is attributed to a historical tendency for item writers to focus on a limited number of GLEs. New items targeting GLEs not traditionally tested in Communication Arts were written during an Item Writing Workshop in 2008, but those items were not field tested due to DESE budget constraints. The range-of-knowledge deficiency in Science is mainly attributed to a large number of GLEs at each grade level (149 and 219 assessable GLEs at Grade 5 and Grade 8, respectively). The Science test would need to include many more test items to cover at least 50% of the GLEs, which is the standard to meet the range-of-knowledge criterion. With future item and test development, DESE and CTB are committed to implementing

the recommendations of the external alignment study. These recommendations include: broadening the scope of item development so that more GLEs can be tested; increasing the cognitive complexity of new test items; and reducing the number of Science GLEs so that a greater proportion can be tested each year.

Table 3.4 provides the distribution of items and points on the 2012 MAP by Content Standard for Communication Arts. Tables 3.5 and 3.6 provide the same distribution by GLE strand for Mathematics and Science, respectively. (GLE strands are the reporting categories for these content domains; however, GLEs remain linked directly to the Content Standards.) Lastly, tables 3.7 through 3.9 show the distribution of items and points by Process Strand for Communication Arts, Mathematics, and Science, respectively.

3.8 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 CTB/McGraw-Hill in developing the MAP address multiple best practices of the test industry but, in particular, are related to the following AERA, APA, & NCME (1999) Standards:

- Standard 3.1 — Tests and testing programs should be developed on a sound scientific basis. Test developers and publishers should compile and document adequate evidence bearing on test development.
- Standard 3.2 — The purpose(s) of the test, definition of the domain, and the test specifications should be stated clearly so that judgments can be made about the appropriateness of the defined domain for the stated purpose(s) of the test and about the relation of items to the dimensions of the domain they are intended to represent.
- Standard 3.7 — The procedures used to develop, review, and try out items, and to select items from the item pool should be documented. If the items were classified into different categories or subtests according to the test specifications, the procedures used for classification and the appropriateness and accuracy of the classification should be documented.
- Standard 3.11 — Test developers should document the extent to which the content domain of a test represents the defined domain and test specifications.
- Standard 7.4 — Test developers should strive to identify and eliminate language, symbols, words, phrases, and content that are generally regarded as offensive by members of racial, ethnic, gender, or other groups, except when judged to be necessary for adequate representation of the domain.
- Standard 7.7 — In testing applications where the level of linguistic or reading ability is not part of the construct of interest, the linguistic or reading demands of the test should be kept to the minimum necessary for the valid assessment of the intended construct.

Table 3.1: 2012 MAP Test Blueprint: Target Score Points by Content Standard (Communication Arts) or GLE Strand (Mathematics and Science)

Content Area	Grade					
Content Standard/ GLE Strand	3	4	5	6	7	8
Communication Arts						
Speaking/Writing Standard English	14	9	11	12	15	14
Reading—Fiction & Nonfiction	44	50	48	48	46	50
Writing Formally & Informally	2	2	2	1	2	1
Mathematics						
Algebraic Relationships	14	14	15	12	20	20
Data and Probability	6	7	11	16	11	14
Geometric and Spatial Relationships	12	11	11	9	12	17
Measurement	11	14	11	9	9	7
Number and Operations	21	25	18	19	15	13
Science						
Matter and Energy			11			12
Force and Motion			8			7
Living Organisms			8			11
Ecology			9			8
Earth Systems			10			12
Universe			9			9
Scientific Inquiry			8			10
Science, Technology, and Human Activity			7			6

Table 3.2: 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 (e.g., all items can be Brailled).
Simple, Clear, and Intuitive Instructions and Procedures	All instructions and procedures are simple, clear, and presented in understandable language.
Maximum Readability and Comprehensibility	A variety of 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, to tables, figures, and illustrations, and to response formats.

Table 3.3: Items Omitted from the MAP Spring 2012 Braille Version

Grade	Content Area	Type	Session	Item
3	Communication Arts	SR	2	3
4	Mathematics	CR	3	2
5	Mathematics	CR	3	2
	Science	CR	1	9
		SR	2	8
		SR	2	19
		SR	2	23
6	Mathematics	CR	3	4
		SR	3	11
8	Communication Arts	SR	2	30
	Mathematics	SR	2	17
		SR	3	6
	Science	SR	2	4

Table 3.4: MAP 2012 Content Standard Item/Point Distributions, Communication Arts

Grade	Content Standard	TN NRT Items	SR Items	CR/PE Items	Total Items	SR Points	CR/PE Points	Total Points	% of Total Points
3	Reading Fiction/Poetry/Drama	23	4		27	27		27	44%
	Reading Nonfiction	7	2	4	13	9	8	17	28%
	Speaking/Writing Standard English		15		15	15		15	25%
	Writing Formally & Informally			1	1		2	2	3%
	Combined Reading from Standards 2 & 3	30	6	4	40	36	8	44	72%
	Total	30	21	5	56	51	10	61	100%
4	Reading Fiction/Poetry/Drama	15			15	15		15	25%
	Reading Nonfiction	18	6	4	28	24	8	32	52%
	Speaking/Writing Standard English		12		12	12		12	20%
	Writing Formally & Informally			1	1		2	2	3%
	Combined Reading from Standards 2 & 3	33	6	4	43	39	8	47	77%
	Total	33	18	5	56	51	10	61	100%
5	Reading Fiction/Poetry/Drama	16			16	16		16	27%
	Reading Nonfiction	16	7	4	27	23	8	31	52%
	Speaking/Writing Standard English		12		12	12		12	20%
	Writing Formally & Informally			1	1		1	1	2%
	Combined Reading from Standards 2 & 3	32	7	4	43	39	8	47	78%
	Total	32	19	5	56	51	9	60	100%
6	Reading Fiction/Poetry/Drama	15	2	4	21	17	8	25	42%
	Reading Nonfiction	18	4		22	22		22	37%
	Speaking/Writing Standard English		12		12	12		12	20%
	Writing Formally & Informally			1	1		1	1	2%
	Combined Reading from Standards 2 & 3	33	6	4	43	39	8	47	78%
	Total	33	18	5	56	51	9	60	100%
7	Reading Fiction/Poetry/Drama	13	7	4	24	20	8	28	42%
	Reading Nonfiction	20			20	20		20	30%
	Speaking/Writing Standard English		16		16	16		16	24%
	Writing Formally & Informally			2	2		2	2	3%
	Combined Reading from Standards 2 & 3	33	7	4	44	40	8	48	73%
	Total	33	23	6	62	56	10	66	100%
8	Reading Fiction/Poetry/Drama	15	5		20	20		20	31%
	Reading Nonfiction	17	2	4	23	19	8	27	42%
	Speaking/Writing Standard English		16		16	16		16	25%
	Writing Formally & Informally			1	1		1	1	2%
	Combined Reading from Standards 2 & 3	32	7	4	43	39	8	47	73%
	Total	32	23	5	60	55	9	64	100%

Table 3.5: MAP 2012 GLE Strand Item/Point Distributions, Mathematics

Grade	GLE Strand	TN NRT Items	SR Items	CR/PE Items	Total Items	SR Points	CR/PE Points	Total Points	% of Total Points
3	Algebraic Relationships	4	6	1	11	10	2	12	20%
	Data and Probability	3	1	1	5	4	2	6	10%
	Geometric and Spatial Relationships	4	8		12	12		12	20%
	Measurement	1	7	1	9	8	2	10	17%
	Number and Operations	12	5	1	18	17	2	19	32%
	Total	24	27	4	55	51	8	59	100%
4	Algebraic Relationships	5	5		10	10		10	15%
	Data and Probability	4	1	1	6	5	2	7	11%
	Geometric and Spatial Relationships	2	6	1	9	8	2	10	15%
	Measurement	3	9	1	13	12	2	14	22%
	Number and Operations	12	10	1	23	22	2	24	37%
	Total	26	31	4	61	57	8	65	100%
5	Algebraic Relationships	5	7	1	13	12	2	14	23%
	Data and Probability	2	8		10	10		10	16%
	Geometric and Spatial Relationships	2	7	1	10	9	2	11	18%
	Measurement	3	6	1	10	9	2	11	18%
	Number and Operations	10	4	1	15	14	2	16	26%
	Total	22	32	4	58	54	8	62	100%
6	Algebraic Relationships	5	5	1	11	10	2	12	19%
	Data and Probability	4	11		15	15		15	24%
	Geometric and Spatial Relationships	4	3	1	8	7	2	9	15%
	Measurement	1	6	1	8	7	2	9	15%
	Number and Operations	12	3	1	16	15	2	17	27%
	Total	26	28	4	58	54	8	62	100%
7	Algebraic Relationships	5	12	1	18	17	2	19	29%
	Data and Probability	5	4	1	10	9	2	11	17%
	Geometric and Spatial Relationships	6	4	1	11	10	2	12	18%
	Measurement	1	6	1	8	7	2	9	14%
	Number and Operations	14			14	14		14	22%
	Total	31	26	4	61	57	8	65	100%
8	Algebraic Relationships	5	12	1	18	17	2	19	30%
	Data and Probability	4	7	1	12	11	2	13	20%
	Geometric and Spatial Relationships	4	6	1	11	10	2	12	19%
	Measurement	2	3	1	6	5	2	7	11%
	Number and Operations	13			13	13		13	20%
	Total	28	28	4	60	56	8	64	100%

Table 3.6: MAP 2012 GLE Strand Item/Point Distributions, Science

Grade	GLE Strand	TN NRT Items	SR Items	CR/PE Items	Total Items	SR Points	CR/PE Points	Total Points	% of Total Points
5	Characteristics of Living Organisms	2	2	2	6	4	4	8	12%
	Earth's Processes	2	5	1	8	7	2	9	13%
	Force and Motion		1	4	5	1	8	9	13%
	Interactions of Organisms	3	4	1	8	7	2	9	13%
	Matter and Energy	6	2	1	9	8	2	10	15%
	Scientific Inquiry	6	2		8	8		8	12%
	Technology and the Environment	2	2	1	5	4	2	6	9%
	The Universe	1	2	3	6	3	6	9	13%
	Total	22	20	13	55	42	26	68	100%
8	Characteristics of Living Organisms	3	1	3	7	4	6	10	14%
	Earth's Processes	5	2	2	9	7	4	11	16%
	Force and Motion	3	2	1	6	5	2	7	10%
	Interactions of Organisms	2	5		7	7		7	10%
	Matter and Energy	2	4	2	8	6	4	10	14%
	Scientific Inquiry	7	2		9	9		9	13%
	Technology and the Environment	1	1	3	5	2	6	8	12%
	The Universe		3	2	5	3	4	7	10%
	Total	23	20	13	56	43	26	69	100%

Table 3.7: MAP 2012 Number of Items/Points Measuring Process Standards, Communication Arts

Grade Level	Process Standard	NRT Items	SR Items	CR Items	Total Items	SR Points	CR Points	Total Points
3	1.5	9			9	9		9
	1.6	15	3	1	19	18	2	20
	2.1			1	1		2	2
	2.2		15		15	15		15
	2.4	1			1	1		1
	3.1		1		1	1		1
	3.5	5	2	3	10	7	6	13
4	1.5	4			4	4		4
	1.6	20	2		22	22		22
	2.1			1	1		2	2
	2.2		12		12	12		12
	2.4	1	1	2	4	2	4	6
	3.5	8	3	2	13	11	4	15
5	1.4	1			1	1		1
	1.5	8	1		9	9		9
	1.6	14	3	2	19	17	4	21
	1.7		1	1	2	1	2	3
	1.8			1	1		1	1
	2.2		12		12	12		12
	2.4		1	1	2	1	2	3
	3.4	1			1	1		1
	3.5	8	1		9	9		9
6	1.5	12			12	12		12
	1.6	13	4		17	17		17
	1.8			1	1		1	1
	2.2		12		12	12		12
	2.4	1		1	2	1	2	3
	3.1			1	1		2	2
	3.5	7	2	2	11	9	4	13
7	1.5	6			6	6		6
	1.6	21	2		23	23		23
	1.8			1	1		1	1
	2.1		1	1	2	1	1	2
	2.2		15		15	15		15
	2.4	1	1	2	4	2	4	6
	3.1	1			1	1		1
	3.5	4	4	2	10	8	4	12
8	1.5	4			4	4		4
	1.6	21	4	1	26	25	2	27
	2.1		2	1	3	2	1	3
	2.2		14		14	14		14
	2.4	1			1	1		1
	3.1		1		1	1		1
	3.5	6	2	3	11	8	6	14

Table 3.8: MAP 2012 Number of Items/Points Measuring Process Standards, Mathematics

Grade Level	Process Standard	NRT Items	SR Items	CR Items	Total Items	SR Points	CR Points	Total Points
3	1.6	2	7	1	10	9	2	11
	1.10	15	14	2	31	29	4	33
	3.2	7	6	1	14	13	2	15
4	1.2	1	1		2	2		2
	1.6	5	9		14	14		14
	1.8			1	1		2	2
	1.10	11	12	3	26	23	6	29
	3.2	9	6		15	15		15
	3.6		3		3	3		3
5	1.2		3		3	3		3
	1.6	5	15	3	23	20	6	26
	1.10	11	5	1	17	16	2	18
	3.2	5	3		8	8		8
	3.3		4		4	4		4
	3.5	1	2		3	3		3
6	1.2		1		1	1		1
	1.6	3	2	1	6	5	2	7
	1.8		2		2	2		2
	1.10	8	9	2	19	17	4	21
	3.1	5	3		8	8		8
	3.2	6	4	1	11	10	2	12
	3.3	4	4		8	8		8
	3.5		2		2	2		2
	3.6		1		1	1		1
7	1.6	4	13	2	19	17	4	21
	1.8	2	1		3	3		3
	1.10	9	1	2	12	10	4	14
	3.1	6			6	6		6
	3.2	7	5		12	12		12
	3.3	3	3		6	6		6
	3.5		1		1	1		1
	3.6		1		1	1		1
	3.8		1		1	1		1
8	1.6	3	4		7	7		7
	1.8	1	2		3	3		3
	1.10	4	3	1	8	7	2	9
	3.1	6	2		8	8		8
	3.2	4	5	1	10	9	2	11
	3.3	7	6	1	14	13	2	15
	3.5	1	2		3	3		3
	3.6	1	4	1	6	5	2	7
	3.8	1			1	1		1

Table 3.9: MAP 2012 Number of Items/Points Measuring Process Standards, Science

Grade Level	Process Standard	NRT Items	SR Items	CR Items	Total Items	SR Points	CR Points	Total Points
5	1.3	2	1		3	3		3
	1.5	5	1	1	7	6	2	8
	1.6	3	5	6	14	8	12	20
	1.10	12	13	6	31	25	12	37
8	1.3	1		1	2	1	2	3
	1.5	3		1	4	3	2	5
	1.6	3	2	7	12	5	14	19
	1.8		1		1	1		1
	1.10	16	17	4	37	33	8	41

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 *Standards* (1999), the "usefulness and interpretability of test scores require that a test be administered and scored according to the developer's instructions" (61). 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 (1999) Standards 3.19, 3.20, 5.1, 5.2, 5.3, 5.4, 5.6, and 5.7 in the MAP program. Each standard will be explicated within the relevant section of this chapter.

4.1 Training of Districts

To ensure that the Missouri Assessment Program's Grade-Level Assessments are administered and scored in accordance with the department'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 CTB/McGraw-Hill. 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 to 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. The Department also provides assistance with and interpretation of Grade-Level Assessment data and test results.

The 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 2011.

Appendix A of this report contains DESE's presentations on the *Test Coordinator's Manual* and the *Examiner's Manual*. During these presentations, the Assistant Director of Assessment walked the District Test Coordinators and other Department staff through an annotated version of the *Test Coordinator's Manual* and the *Examiner'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 (1999) Standards related to test administration procedures.

For the spring 2012 test administration, CTB/McGraw-Hill produced two types of administration manuals: the *Test Coordinator's Manual* and the *Examiner's Manual*. DESE Curriculum and Assessment staff review provide feedback 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 MAP and any changes made to MAP for 2012. 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. These steps are:

Step 1: Review Testing Materials
Step 2: Distribute Testing Materials
Step 3: Collect Testing Materials
Step 4: Check the Organization of Materials Collected
Step 5: Check the Student Information Sheet (SIS)
Step 6: Check the Group Information Sheet (GIS)
Step 7: Complete the School/Group List
Step 8: Organize Materials for the District Test Coordinator
Step 9: Package and Ship Testing Materials

The *Examiner's Manual*s are specific to each grade. The MAP *Examiner's Manual*s also outline steps that should be followed when administering MAP. These steps include:

Step 1: Prepare for Testing
Step 2: Organize Your Classroom
Step 3: Check Your Testing Materials
Step 4: Before Testing
Step 5: Administer the Assessments
Step 6: Invalidations and Make-Ups
Step 7: After Testing: Student Status Coding
Step 8: Assemble Materials for Return

These steps provide instructions on pre-test and post-test procedures, such as:

- Test security
- Standardized testing protocols for norm-referenced information

- Using student barcode labels
- Completing the student information sheet, including recording test accommodations

This section presents the AERA, APA, & NCME (1999) Standards relevant to test administration and how information in the MAP *Examiner's Manual*s and *Test Coordinator Manual* address these Standards.

Standard 3.19 *The directions for test administration should be presented with sufficient clarity and emphasis so that it is possible for others to replicate adequately the administration conditions under which the data on reliability and validity, and, where appropriate, norms were obtained.*

The MAP *Examiner's Manual*s provide 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*s describe the following: the materials that the examiner and students need for testing; how to verify that pre-coded student information on student barcode labels is correct; how to fill out the Student Information Sheet if the student barcode label is incorrect; how to prepare the testing environment; the test schedule, including testing times; and how to administer the tests.

Standard 3.20 *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 material, practice or sample questions, criteria for scoring, and a representative item identified with each major area in the test's classification or domain should be provided to the test takers prior to the administration of the test or included in the testing material as part of the standard administration instructions.*

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.

Sample test items are provided in each content area to familiarize students with how to fill in answers. Sample items are also provided in the *Examiner's Manual*s.

Standard 5.1 *Test administrators should follow carefully the standardized procedures for administration and scoring specified by the test developer, unless the situation or a test taker's disability dictates that an exception should be made.*

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 – 27, 2012. The *Examiner's*

*Manual*s contain the schedule for timing each test session and whether timing is to be strictly enforced. The test timing schedule is presented in Table 4.1.

Standard 5.2 *Modifications or disruptions of standardized test administration procedures or scoring should be documented.*

Department staff administer reports on testing concerns which have 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 or nodding the head; using a calculator on parts of the test where it is not allowed; allowing too much time on *TerraNova* sections of the test; allowing students to correct or complete answers after tests have been returned to the teacher; splitting sessions into two parts; ignoring the standardized directions in the test books; reading the Communication Arts 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 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 allegation. 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 Grade-Level Assessment Quality Assurance District Response Report is sent for the superintendent to use for replying to the allegation. This report is shown in Figure 4.2.

Standard 5.4 *The testing environment should furnish reasonable comfort with minimal distractions.*

Step 2 in the *Examiner's Manual* overviews the steps that teachers should take to prepare their classroom for administering the MAP test. These include:

- Plan for the distribution and collection of materials.
- 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 are out of the students' view.
- When administering the timed portion of the test, write on the board the starting and stopping times for the test.

Standard 5.6 *Reasonable efforts should be made to assure the integrity of test scores by eliminating opportunities for test takers to attain scores by fraudulent means.*

The *Examiner's Manual* and *Test Coordinator's Manual* present instructions for post-test activities to ensure that test materials are handled properly and to ensure the integrity of student information and test scores. Detailed instructions guide test examiners in completing required information on students' scannable test books. For students who were 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 to a regular-edition test book exactly as they responded in the large print or Braille test book.

Standard 5.7 *Test users have the responsibility of protecting the security of test materials at all times.*

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 CTB/McGraw-Hill for scanning and scoring. DESE curriculum and assessment staff have opportunities to review, provide feedback, and have final approval. The purpose of the instructions is to ensure that used and unused test materials are properly accounted for and student answer documents are organized properly for return shipment. Proper organization of materials and accurate completion of the school/group list document contributes to accurate score reports and helps in delivery of such reports in a timely manner.

4.2.2 Security Forms

As soon as test books are received by a district, the district test coordinator assures that the first and last security barcode on the tests match the packing list they received. The district test coordinator then packages the tests to be sent to schools. Upon returning tests to CTB/McGraw-Hill, school and district test coordinators are required to complete and submit a *Test Book Accountability Form* that details the number of scorable and nonscorable books returned. This form also requires that districts/schools document nonstandard situations, including lost, damaged, destroyed, extra, or missing test books. The *Test Book 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 MAP score reports from the 2012 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 *Test Examiner Manuals* and *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.

4.4 Test Administration

The 2012 test was administered to students within the state testing window of April 2 – 27, 2012. Systems 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 Time

Each section of each content area test was timed to provide sufficient time for students to attempt all items. The *Examiner's Manual*s provided examiners with timing guidelines for the custom portions of MAP. Strict timing guidelines were given for the norm-referenced portions of the test. For MAP's custom sessions, examiners were instructed to allow students to complete the assessment if s/he was making adequate progress. For the norm-referenced portion of the test, students received an accommodation for additional time if so needed and documented on their individualized education plan. The timing schedule of the MAP is presented in Table 4.1.

4.4.2 Accommodations

Accommodations are allowed on MAP. Test accommodations may be used with students who qualify under IDEA and have an IEP or Section 504 of the Americans' with Disabilities Act and have a 504 plan, or who are identified as an English Language Learner. 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, and NCME (1999) Standard 5.3, states:

> When formal procedures have been established for requesting and receiving accommodation, test takers should be informed of these procedures in advance of testing.

In compliance with this, the grade-specific MAP *Examiner's Manual* contains the list of accommodations permissible for the MAP assessments. The table of accommodations presented in the *Examiner's Manual* is shown in Tables 4.2 and 4.3. 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 Communication Arts test or paraphrasing any of the tests. Detailed information regarding testing accommodations can be found at the DESE website:

http://dese.mo.gov/divimprove/assess/ancillaries.html

Braille and large print forms are provided to students with vision disabilities.

Tables 4.4 through 4.6 summarize the numbers of reportable students receiving accommodations by accommodation type for the 2012 MAP, the Braille edition of the 2012 MAP, and the large print edition of the 2012 MAP. The analyses in Tables 4.4 through 4.6 are based on census data and include only those students who received accommodations and received a scale score on the Communication Arts, Mathematics, or Science MAP.

In 2012, the setting and timing accommodations appear to be the most frequently used for the Communication Arts, Mathematics, and Science MAP. For the Science and Mathematics MAP, having the test read aloud was also among the more frequently used accommodations. For the Mathematics MAP, using calculators was also among the more frequently used accommodations.

On the Braille and large print editions of MAP, the setting and timing accommodations are again among the most frequently used accommodations. Common accommodations for both the Braille and large print editions include using a scribe for the Communication Arts, Mathematics, and Science MAPs, having the test read aloud for the Mathematics and Science MAPs, and using a calculator for the Mathematics MAP.

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 program 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 accommodations, and by providing guidance on appropriate interpretations of the test results. These communication and training efforts by DESE and the ancillary information developed by CTB/McGraw-Hill address multiple best practices of the testing industry but in particular are related to the following *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999):

- Standard 3.19— The directions for test administration should be presented with sufficient clarity and emphasis so that it is possible for others to replicate

adequately the administration conditions under which the data on reliability and validity, and, where appropriate, norms were obtained.

- Standard 3.20— 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 material, practice or sample questions, criteria for scoring, and a representative item identified with each major area in the test's classification or domain should be provided to the test takers prior to the administration of the test or included in the testing material as part of the standard administration instructions.
- Standard 5.1—Test administrators should follow carefully the standardized procedures for administration and scoring specified by the test developer, unless the situation or a test taker's disability dictates that an exception should be made.
- Standard 5.2— Modifications or disruptions of standardized test administration procedures or scoring should be documented.
- Standard 5.3—When formal procedures have been established for requesting and receiving accommodation, test takers should be informed of these procedures in advance of testing.
- Standard 5.4—The testing environment should furnish reasonable comfort with minimal distractions.
- Standard 5.6—Reasonable efforts should be made to assure the integrity of test scores by eliminating opportunities for test takers to attain scores by fraudulent means.
- Standard 5.7—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)

Grade	Session	Communication Arts	Mathematics	Science
3	1	45–55*	25–35*	
	2	51**	50**	
	3	15–20	25–35	
4	1	45–55*	25–35*	
	2	51**	50**	
	3	15–20	25–35	
5	1	45–55*	25–35*	50–70*
	2	50**	50**	45***
	3	15–20	25–35	
6	1	45–55*	25–35*	
	2	51**	50**	
	3	15–20	25–35	
7	1	45–55*	25–35*	
	2	51**	50**	
	3	15–20	25–35	
8	1	45–55*	25–35*	50–70*
	2	51**	50**	45***
	3	15–20	25–35	

*Session 1 allows an additional 10 minutes, if needed (not included in these test times)
**Strictly timed TerraNova sessions (all other sessions include time ranges as guidelines only)
***Includes 25 minutes of strictly timed TerraNova items plus 20 minutes for custom items

Table 4.2: MAP Accommodations for Students Who Are English Language Learners

Accommodations List for Students Who Are English Language Learners (ELL) The following are the only accommodations allowed for ELL students:			
Code	**Invalidates**	**Administration Accommodations**	**Description**
04	√	Oral reading of assessment *(Not permissible for Communication Arts Assessment)* (See Note 1.)	The Test Examiner reads items verbatim to the student in an isolated setting so that other students will not benefit or be disturbed.
11	√	Oral reading in native language *(Not permissible for Communication Arts Assessment)* (See Note 1.)	
		Timing Accommodations	**Description**
20		Extended time to complete strictly timed sessions (See Note 2.)	ELL students may need to complete the assessments over more than one test period.
21		Administer test using more than allotted periods	Dates for taking the Grade-Level Assessments must occur within the testing window.
22		Other: Specify	Other timing accommodations.
		Response Accommodations	**Description**
35		Use of scribe to record student response in test book	The student conveys verbal responses to a scribe in an isolated, individual setting so that other students cannot benefit or be disturbed. The scribe cannot suggest ideas, words, or concepts. The scribe records the student's answers verbatim. The student should indicate capitalization and punctuation if language mechanics are being assessed.
		Oral response	The student provides an oral response to the Test Examiner.
43	√	Use of bilingual dictionary *(Not permissible for Communication Arts Assessment)* (See Note 1.)	
		Setting Accommodations	**Description**
50		Testing individually	The room should be free of noises, conversation, and distractions from adjoining rooms. Individual testing is appropriate when, for example, responses are given orally or questions are paraphrased.
51		Testing with small groups	The location should be free of noises, conversation, and distractions from adjoining rooms. Students may not interact with one another about questions or answers. The Test Examiner must be present at all times. Testing in small groups is not appropriate for students who give responses orally or require paraphrasing of questions.
53		Other: Specify	Other setting accommodations.

NOTES
Note 1: *Oral reading, oral reading in native language, or signing during any Communication Arts Assessment will result in the LOSS (Lowest Obtainable Scale Score). The use of any dictionary during the Communication Arts Assessment will result in the LOSS (Lowest Obtainable Scale Score).*
Note 2: *If used, the student score cannot be compared with scores generated under standard conditions.*

Table 4.3: MAP Accommodations for Students with Disabilities

Accommodations List for Students with Disabilities			
Code	**Invalidates**	**Administration Accommodations**	**Description**
01		Braille edition of assessment	Braille editions of the assessment require special processing. Consult the Braille edition test materials for specific instructions.
02		Large Print edition of assessment	Large Print editions of the assessment require special processing. Consult the Large Print test materials for specific instructions.
04	√	Oral reading of assessment (See Note 1.)	The Test Examiner reads items verbatim to the student in an isolated setting so that other students will not benefit or be disturbed.
04		Oral reading of assessment to Blind/Partial Sight students (See Note 1.)	The Test Examiner reads items verbatim to the student who cannot read Braille in an isolated setting so that other students will not benefit or be disturbed.
05		Signing (See Note 1.)	A certified sign language interpreter or deaf education instructor may sign directions for the Communication Arts Assessments. The Mathematics and Science Assessments may have both directions and the test items signed for students.
06	√	Paraphrasing (See Note 2.)	The Test Examiner paraphrases questions to help student understanding in an isolated setting. Terms may be defined as long as they: 1) are not the actual concept or content being assessed, 2) would not give clues, or 3) would not disclose the answer.
10		**Other administration accommodations**	
		Use of assistive devices	An assistive device that permits a student to read and/or respond to the assessment is used. Examples of assistive devices include computers that assist students with fine-motor problems, text enlargers that enable students to independently read and answer test questions, or augmentative communication devices.
		Use of visual aids: Specify	Visual aids include any type of optical or non-optical devices used to enhance visual capability. Examples of visual aids include bold-line felt-tip markers, lamps, filters, bold-lined paper, writing guides, or other adaptations that alter the visual environment by adjusting the space, illumination, color, contrast, or other physical features of the environment.
		Timing Accommodations	**Description**
20		Extend time to complete strictly timed sessions (See Note 3.)	Extended time to complete strictly timed sessions is allowed for a student whose disability may cause him/her to be unable to meet time constraints.
21		Administer assessment using more than allotted periods	Students with disabilities may need to complete the assessments over more than one test period as a result of fatigue and/or loss of concentration. Some students may require additional breaks. Dates for taking the Grade-Level Assessment must occur within the testing window.
22		Other: Specify	Other timing accommodations
		Response Accommodations	**Description**
35		Use of scribe to record student response in test book	The student conveys verbally or signs responses to a scribe in an isolated, individual setting so that other students cannot benefit or be disturbed. The scribe cannot suggest ideas, words, or concepts. The scribe records the student's answers verbatim. The student should indicate capitalization and punctuation if language mechanics are being assessed.
		Student taped response	The student speaks responses into a tape recorder in an isolated setting so that other students cannot benefit or be disturbed. The Test Examiner must be present at all times.
		Signed response	The student uses sign language to convey responses. A certified sign language interpreter or deaf education instructor records responses.
		Pointing to respond	The student points to correct responses and the administrator records responses in the Grade-Level Assessment test book.
		Oral response	The student provides oral responses to the Test Examiner.

NOTES
Note 1: *Oral reading, oral reading in native language, or signing during the Communication Arts Assessment will result in the LOSS (Lowest Obtainable Scale Score). The use of any dictionary during the Communication Arts Assessment will result in the LOSS (Lowest Obtainable Scale Score). Students identified as blind/visually impaired (who do not read Braille) may use the oral reading accommodation if it is their primary instructional method.*
Note 2: *Paraphrasing test questions invalidates all Grade-Level Assessment student scores for accountability purposes.*
Note 3: *If used, the student score cannot be compared with scores generated under standard conditions.*

Table 4.3: MAP Accommodations for Students with Disabilities (cont'd)

Accommodations List for Students with Disabilities			
Code	**Invalidates**	**Administration Accommodations**	**Description**
		Use of a Brailler	A student records responses using a Brailler. Examples of a Brailler include a Braillewriter, a slate and stylus, or an electronic Brailler note taker. Responses must be transcribed into the appropriate test book.
		Use of a communication device	The student uses a communication device to provide responses to the Test Examiner. Responses must be transcribed into the appropriate test book.
		Use of a computer/word processor/typewriter to respond	The student uses a computer/word processor to write the responses. (Provide a non-networked computer to avoid inappropriate use of the computer to access answers.) The student uses a typewriter to write the responses. Responses must be transcribed into the appropriate test book.
39		Use of a calculator/math table/ abacus	In sessions of the Grade-Level Assessment where calculators are allowed, the accommodation code should not be marked. The use of a calculator represents an accommodation when it is used on a section of the assessment for which calculator use is not allowed. Students may use talking calculators, but only in an isolated setting. Students may use tables to assist in simple addition, subtraction, multiplication, and division facts using whole numbers. Students may use an abacus to perform mathematical computations by sliding beads along rods.
44		Other: Specify (See Note 4.)	Other response accommodations
		Setting Accommodations	**Description**
50		Testing individually	The location should be free of noises, conversation, and distractions from adjoining rooms. Individual testing is appropriate when, for example, responses are given orally or questions are paraphrased.
51		Testing in small groups	The location should be free of noises, conversation, and distractions from adjoining rooms. Students may not interact with one another about questions or answers. The Test Examiner must be present at all times. Testing in small groups is not appropriate for students who give responses orally or require paraphrasing of questions.
53		Other: Specify	Other setting accommodations

NOTES
Note 4: *Use of magnifying equipment, amplification equipment, graph paper, and testing with the teacher facing the student are not listed as accommodations because these are no longer required to be reported as accommodations for the Grade-Level Assessments.*

Table 4.4: Number and Percent of Students Receiving Accommodations by Accommodation Type, MAP 2012 Regular Edition

		Communication Arts		Mathematics		Science	
Grade	**Accommodation**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
3	Regular Edition	66088	100.00%	66154	100.00%		
	Oral reading	44	0.07%	5019	7.59%		
	Oral reading blind	5	0.01%	0	0.00%		
	Signing of assessment	1	0.00%	13	0.02%		
	Paraphrasing	2	0.00%	1	0.00%		
	Other reading	61	0.09%	44	0.07%		
	Oral reading in native language	12	0.02%	240	0.36%		
	Extend time—*TerraNova* session	3659	5.54%	3602	5.44%		
	Administer using > allotted periods	3151	4.77%	3057	4.62%		
	Other timing	516	0.78%	518	0.78%		
	Use of scribe	1645	2.49%	1431	2.16%		
	Use of calculator, math table, etc.	96	0.15%	1661	2.51%		
	Use of bilingual dictionary	2	0.00%	19	0.03%		
	Other response	76	0.11%	58	0.09%		
	Testing individually	2347	3.55%	2125	3.21%		
	Testing in small group	4894	7.41%	5169	7.81%		
	Other setting	438	0.66%	432	0.65%		
4	Regular Edition	65770	100.00%	65855	100.00%		
	Oral reading	41	0.06%	5210	7.91%		
	Oral reading blind	4	0.01%	0	0.00%		
	Signing of assessment	0	0.00%	13	0.02%		
	Paraphrasing	0	0.00%	1	0.00%		
	Other reading	72	0.11%	36	0.05%		
	Oral reading in native language	17	0.03%	243	0.37%		
	Extend time—*TerraNova* session	3759	5.72%	3838	5.83%		
	Administer using > allotted periods	3482	5.29%	3462	5.26%		
	Other timing	593	0.90%	581	0.88%		
	Use of scribe	1702	2.59%	1422	2.16%		
	Use of calculator, math table, etc.	48	0.07%	2125	3.23%		
	Use of bilingual dictionary	3	0.00%	17	0.03%		
	Other response	77	0.12%	63	0.10%		
	Testing individually	2481	3.77%	2231	3.39%		
	Testing in small group	5182	7.88%	5526	8.39%		
	Other setting	426	0.65%	428	0.65%		
5	Regular Edition	66419	100.00%	66473	100.00%	66440	100.00%
	Oral reading	20	0.03%	5353	8.05%	5145	7.74%
	Oral reading blind	6	0.01%	0	0.00%	0	0.00%
	Signing of assessment	1	0.00%	5	0.01%	5	0.01%
	Paraphrasing	1	0.00%	1	0.00%	0	0.00%
	Other reading	47	0.07%	38	0.06%	30	0.05%

Table 4.4: Number and Percent of Students Receiving Accommodations by Accommodation Type, MAP 2012 Regular Edition (Cont'd)

		Communication Arts		Mathematics		Science	
Grade	**Accommodation**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
5	Oral reading in native language	16	0.02%	160	0.24%	137	0.21%
	Extend time—*TerraNova* session	3881	5.84%	3882	5.84%	3617	5.44%
	Administer using > allotted periods	3625	5.46%	3627	5.46%	3446	5.19%
	Other timing	704	1.06%	669	1.01%	624	0.94%
	Use of scribe	1546	2.33%	1305	1.96%	1448	2.18%
	Use of calculator, math table, etc.	61	0.09%	2707	4.07%	881	1.33%
	Use of bilingual dictionary	1	0.00%	24	0.04%	25	0.04%
	Other response	91	0.14%	74	0.11%	66	0.10%
	Testing individually	2270	3.42%	1942	2.92%	1923	2.89%
	Testing in small group	5480	8.25%	5915	8.90%	5550	8.35%
	Other setting	403	0.61%	385	0.58%	344	0.52%
6	Regular Edition	67127	100.00%	67191	100.00%		
	Oral reading	50	0.07%	4623	6.88%		
	Oral reading blind	6	0.01%	0	0.00%		
	Signing of assessment	1	0.00%	12	0.02%		
	Paraphrasing	0	0.00%	0	0.00%		
	Other reading	48	0.07%	29	0.04%		
	Oral reading in native language	14	0.02%	179	0.27%		
	Extend time—*TerraNova* session	3277	4.88%	3318	4.94%		
	Administer using > allotted periods	3015	4.49%	3072	4.57%		
	Other timing	590	0.88%	555	0.83%		
	Use of scribe	1174	1.75%	907	1.35%		
	Use of calculator, math table, etc.	105	0.16%	3252	4.84%		
	Use of bilingual dictionary	1	0.00%	69	0.10%		
	Other response	47	0.07%	40	0.06%		
	Testing individually	1741	2.59%	1463	2.18%		
	Testing in small group	5533	8.24%	6015	8.95%		
	Other setting	300	0.45%	291	0.43%		
7	Regular Edition	66570	100.00%	66604	100.00%		
	Oral reading	26	0.04%	3796	5.70%		
	Oral reading blind	5	0.01%	0	0.00%		
	Signing of assessment	0	0.00%	6	0.01%		
	Paraphrasing	0	0.00%	0	0.00%		
	Other reading	59	0.09%	17	0.03%		
	Oral reading in native language	5	0.01%	145	0.22%		
	Extend time—*TerraNova* session	2737	4.11%	2731	4.10%		
	Administer using > allotted periods	2553	3.84%	2528	3.80%		
	Other timing	592	0.89%	591	0.89%		
	Use of scribe	805	1.21%	544	0.82%		
	Use of calculator, math table, etc.	124	0.19%	3362	5.05%		
	Use of bilingual dictionary	0	0.00%	68	0.10%		

Table 4.4: Number and Percent of Students Receiving Accommodations by Accommodation Type, MAP 2012 Regular Edition (Cont'd)

Grade	Accommodation	Communication Arts		Mathematics		Science	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
7	Other response	47	0.07%	35	0.05%		
	Testing individually	1196	1.80%	940	1.41%		
	Testing in small group	5498	8.26%	5801	8.71%		
	Other setting	200	0.30%	206	0.31%		
8	Regular Edition	66709	100.00%	66764	100.00%	66680	100.00%
	Oral reading	36	0.05%	3741	5.60%	3621	5.43%
	Oral reading blind	9	0.01%	0	0.00%	0	0.00%
	Signing of assessment	0	0.00%	6	0.01%	6	0.01%
	Paraphrasing	2	0.00%	1	0.00%	3	0.00%
	Other reading	46	0.07%	14	0.02%	14	0.02%
	Oral reading in native language	5	0.01%	109	0.16%	87	0.13%
	Extend time—*TerraNova* session	2564	3.84%	2572	3.85%	2416	3.62%
	Administer using > allotted periods	2415	3.62%	2434	3.65%	2291	3.44%
	Other timing	542	0.81%	553	0.83%	540	0.81%
	Use of scribe	656	0.98%	493	0.74%	617	0.93%
	Use of calculator, math table, etc.	171	0.26%	3511	5.26%	1918	2.88%
	Use of bilingual dictionary	1	0.00%	75	0.11%	62	0.09%
	Other response	58	0.09%	44	0.07%	46	0.07%
	Testing individually	1034	1.55%	865	1.30%	904	1.36%
	Testing in small group	5542	8.31%	5837	8.74%	5526	8.29%
	Other setting	160	0.24%	166	0.25%	164	0.25%

Table 4.5: Number and Percent of Students Receiving Accommodations by Accommodation Type, MAP 2012 Braille Edition

		Communication Arts		Mathematics		Science	
Grade	**Accommodation**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
3	Braille Edition	4	100.00%	4	100.00%		
	Oral reading	0	0.00%	2	50.00%		
	Oral reading blind	2	50.00%	0	0.00%		
	Signing of assessment	0	0.00%	0	0.00%		
	Paraphrasing	0	0.00%	1	25.00%		
	Other reading	0	0.00%	1	25.00%		
	Oral reading in native language	0	0.00%	1	25.00%		
	Extend time—*TerraNova* session	3	75.00%	1	25.00%		
	Administer using > allotted periods	2	50.00%	3	75.00%		
	Other timing	1	25.00%	0	0.00%		
	Use of scribe	3	75.00%	2	50.00%		
	Use of calculator, math table, etc.	1	25.00%	2	50.00%		
	Use of bilingual dictionary	0	0.00%	0	0.00%		
	Other response	0	0.00%	0	0.00%		
	Testing individually	3	75.00%	2	50.00%		
	Testing in small group	1	25.00%	0	0.00%		
	Other setting	0	0.00%	1	25.00%		
4	Braille Edition	9	100.00%	8	100.00%		
	Oral reading	0	0.00%	3	37.50%		
	Oral reading blind	1	11.11%	0	0.00%		
	Signing of assessment	0	0.00%	0	0.00%		
	Paraphrasing	0	0.00%	0	0.00%		
	Other reading	0	0.00%	0	0.00%		
	Oral reading in native language	0	0.00%	0	0.00%		
	Extend time—*TerraNova* session	5	55.56%	6	75.00%		
	Administer using > allotted periods	5	55.56%	5	62.50%		
	Other timing	1	11.11%	0	0.00%		
	Use of scribe	5	55.56%	5	62.50%		
	Use of calculator, math table, etc.	1	11.11%	2	25.00%		
	Use of bilingual dictionary	0	0.00%	0	0.00%		
	Other response	1	11.11%	2	25.00%		
	Testing individually	8	88.89%	7	87.50%		
	Testing in small group	0	0.00%	0	0.00%		
	Other setting	0	0.00%	0	0.00%		
5	Braille Edition	8	100.00%	8	100.00%	7	100.00%
	Oral reading	0	0.00%	2	25.00%	2	28.57%
	Oral reading blind	0	0.00%	0	0.00%	0	0.00%
	Signing of assessment	0	0.00%	0	0.00%	0	0.00%
	Paraphrasing	0	0.00%	0	0.00%	0	0.00%
	Other reading	1	12.50%	1	12.50%	1	14.29%

Table 4.5: Number and Percent of Students Receiving Accommodations by Accommodation Type, MAP 2012 Braille Edition (Cont'd)

		Communication Arts		Mathematics		Science	
Grade	**Accommodation**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
5	Oral reading in native language	0	0.00%	0	0.00%	0	0.00%
	Extend time—*TerraNova* session	4	50.00%	4	50.00%	4	57.14%
	Administer using > allotted periods	4	50.00%	4	50.00%	4	57.14%
	Other timing	0	0.00%	0	0.00%	0	0.00%
	Use of scribe	7	87.50%	7	87.50%	7	100.00%
	Use of calculator, math table, etc.	1	12.50%	3	37.50%	2	28.57%
	Use of bilingual dictionary	0	0.00%	0	0.00%	0	0.00%
	Other response	0	0.00%	1	12.50%	1	14.29%
	Testing individually	5	62.50%	5	62.50%	5	71.43%
	Testing in small group	1	12.50%	1	12.50%	1	14.29%
	Other setting	0	0.00%	0	0.00%	0	0.00%
6	Braille Edition	5	100.00%	5	100.00%		
	Oral reading	0	0.00%	2	40.00%		
	Oral reading blind	2	40.00%	0	0.00%		
	Signing of assessment	0	0.00%	0	0.00%		
	Paraphrasing	0	0.00%	0	0.00%		
	Other reading	1	20.00%	1	20.00%		
	Oral reading in native language	0	0.00%	0	0.00%		
	Extend time—*TerraNova* session	3	60.00%	3	60.00%		
	Administer using > allotted periods	3	60.00%	3	60.00%		
	Other timing	0	0.00%	0	0.00%		
	Use of scribe	2	40.00%	2	40.00%		
	Use of calculator, math table, etc.	1	20.00%	3	60.00%		
	Use of bilingual dictionary	0	0.00%	0	0.00%		
	Other response	0	0.00%	0	0.00%		
	Testing individually	4	80.00%	4	80.00%		
	Testing in small group	0	0.00%	0	0.00%		
	Other setting	0	0.00%	0	0.00%		
7	Braille Edition	5	100.00%	5	100.00%		
	Oral reading	0	0.00%	2	40.00%		
	Oral reading blind	1	20.00%	0	0.00%		
	Signing of assessment	0	0.00%	0	0.00%		
	Paraphrasing	0	0.00%	0	0.00%		
	Other reading	0	0.00%	0	0.00%		
	Oral reading in native language	0	0.00%	0	0.00%		
	Extend time—*TerraNova* session	5	100.00%	5	100.00%		
	Administer using > allotted periods	3	60.00%	3	60.00%		
	Other timing	0	0.00%	0	0.00%		
	Use of scribe	4	80.00%	4	80.00%		
	Use of calculator, math table, etc.	1	20.00%	4	80.00%		
	Use of bilingual dictionary	0	0.00%	0	0.00%		

Table 4.5: Number and Percent of Students Receiving Accommodations by Accommodation Type, MAP 2012 Braille Edition (Cont'd)

		Communication Arts		Mathematics		Science	
Grade	**Accommodation**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
7	Other response	1	20.00%	1	20.00%		
	Testing individually	4	80.00%	4	80.00%		
	Testing in small group	1	20.00%	1	20.00%		
	Other setting	1	20.00%	1	20.00%		
8	Braille Edition	7	100.00%	5	100.00%	6	100.00%
	Oral reading	1	14.29%	1	20.00%	2	33.33%
	Oral reading blind	1	14.29%	0	0.00%	0	0.00%
	Signing of assessment	0	0.00%	0	0.00%	0	0.00%
	Paraphrasing	0	0.00%	0	0.00%	0	0.00%
	Other reading	1	14.29%	0	0.00%	1	16.67%
	Oral reading in native language	0	0.00%	0	0.00%	0	0.00%
	Extend time—*TerraNova* session	4	57.14%	2	40.00%	3	50.00%
	Administer using > allotted periods	4	57.14%	2	40.00%	3	50.00%
	Other timing	0	0.00%	0	0.00%	0	0.00%
	Use of scribe	4	57.14%	3	60.00%	3	50.00%
	Use of calculator, math table, etc.	1	14.29%	3	60.00%	2	33.33%
	Use of bilingual dictionary	0	0.00%	0	0.00%	0	0.00%
	Other response	1	14.29%	0	0.00%	1	16.67%
	Testing individually	4	57.14%	2	40.00%	4	66.67%
	Testing in small group	2	28.57%	2	40.00%	1	16.67%
	Other setting	1	14.29%	1	20.00%	1	16.67%

Table 4.6: Number and Percent of Students Receiving Accommodations by Accommodation Type, MAP 2012 Large Print Edition

		Communication Arts		Mathematics		Science	
Grade	**Accommodation**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
3	Large Print Edition	55	100.00%	56	100.00%		
	Oral reading	0	0.00%	26	46.43%		
	Oral reading blind	0	0.00%	0	0.00%		
	Signing of assessment	0	0.00%	0	0.00%		
	Paraphrasing	0	0.00%	0	0.00%		
	Other reading	1	1.82%	0	0.00%		
	Oral reading in native language	0	0.00%	0	0.00%		
	Extend time—T*erraNova* session	25	45.45%	24	42.86%		
	Administer using > allotted periods	23	41.82%	21	37.50%		
	Other timing	1	1.82%	1	1.79%		
	Use of scribe	26	47.27%	26	46.43%		
	Use of calculator, math table, etc.	1	1.82%	9	16.07%		
	Use of bilingual dictionary	0	0.00%	0	0.00%		
	Other response	2	3.64%	2	3.57%		
	Testing individually	30	54.55%	29	51.79%		
	Testing in small group	20	36.36%	21	37.50%		
	Other setting	4	7.27%	3	5.36%		
4	Large Print Edition	49	100.00%	46	100.00%		
	Oral reading	1	2.04%	18	39.13%		
	Oral reading blind	1	2.04%	0	0.00%		
	Signing of assessment	0	0.00%	1	2.17%		
	Paraphrasing	0	0.00%	0	0.00%		
	Other reading	4	8.16%	4	8.70%		
	Oral reading in native language	0	0.00%	1	2.17%		
	Extend time—*TerraNova* session	17	34.69%	17	36.96%		
	Administer using > allotted periods	22	44.90%	19	41.30%		
	Other timing	2	4.08%	2	4.35%		
	Use of scribe	21	42.86%	21	45.65%		
	Use of calculator, math table, etc.	1	2.04%	12	26.09%		
	Use of bilingual dictionary	0	0.00%	0	0.00%		
	Other response	0	0.00%	0	0.00%		
	Testing individually	22	44.90%	20	43.48%		
	Testing in small group	19	38.78%	19	41.30%		
	Other setting	5	10.20%	4	8.70%		
5	Large Print Edition	44	100.00%	44	100.00%	46	100.00%
	Oral reading	0	0.00%	19	43.18%	19	41.30%
	Oral reading blind	0	0.00%	0	0.00%	0	0.00%
	Signing of assessment	0	0.00%	0	0.00%	0	0.00%
	Paraphrasing	0	0.00%	0	0.00%	0	0.00%
	Other reading	2	4.55%	0	0.00%	1	2.17%

Table 4.6: Number and Percent of Students Receiving Accommodations by Accommodation Type, MAP 2012 Large Print Edition (Cont'd)

		Communication Arts		Mathematics		Science	
Grade	**Accommodation**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
5	Oral reading in native language	0	0.00%	0	0.00%	0	0.00%
	Extend time—*TerraNova* session	19	43.18%	16	36.36%	17	36.96%
	Administer using > allotted periods	21	47.73%	20	45.45%	22	47.83%
	Other timing	2	4.55%	2	4.55%	2	4.35%
	Use of scribe	18	40.91%	19	43.18%	20	43.48%
	Use of calculator, math table, etc.	3	6.82%	16	36.36%	7	15.22%
	Use of bilingual dictionary	0	0.00%	0	0.00%	0	0.00%
	Other response	2	4.55%	2	4.55%	2	4.35%
	Testing individually	16	36.36%	17	38.64%	17	36.96%
	Testing in small group	23	52.27%	21	47.73%	23	50.00%
	Other setting	2	4.55%	2	4.55%	2	4.35%
6	Large Print Edition	42	100.00%	42	100.00%		
	Oral reading	1	2.38%	21	50.00%		
	Oral reading blind	4	9.52%	0	0.00%		
	Signing of assessment	0	0.00%	0	0.00%		
	Paraphrasing	0	0.00%	0	0.00%		
	Other reading	0	0.00%	0	0.00%		
	Oral reading in native language	0	0.00%	0	0.00%		
	Extend time—*TerraNova* session	16	38.10%	17	40.48%		
	Administer using > allotted periods	17	40.48%	18	42.86%		
	Other timing	4	9.52%	4	9.52%		
	Use of scribe	17	40.48%	17	40.48%		
	Use of calculator, math table, etc.	1	2.38%	19	45.24%		
	Use of bilingual dictionary	0	0.00%	0	0.00%		
	Other response	1	2.38%	1	2.38%		
	Testing individually	15	35.71%	13	30.95%		
	Testing in small group	20	47.62%	23	54.76%		
	Other setting	2	4.76%	2	4.76%		
7	Large Print Edition	45	100.00%	45	100.00%		
	Oral reading	0	0.00%	12	26.67%		
	Oral reading blind	1	2.22%	0	0.00%		
	Signing of assessment	0	0.00%	0	0.00%		
	Paraphrasing	0	0.00%	0	0.00%		
	Other reading	2	4.44%	2	4.44%		
	Oral reading in native language	0	0.00%	1	2.22%		
	Extend time—*TerraNova* session	14	31.11%	14	31.11%		
	Administer using > allotted periods	11	24.44%	11	24.44%		
	Other timing	0	0.00%	0	0.00%		
	Use of scribe	13	28.89%	11	24.44%		
	Use of calculator, math table, etc.	0	0.00%	12	26.67%		
	Use of bilingual dictionary	0	0.00%	0	0.00%		

Table 4.6: Number and Percent of Students Receiving Accommodations by Accommodation Type, MAP 2012 Large Print Edition (Cont'd)

		Communication Arts		Mathematics		Science	
Grade	**Accommodation**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
7	Other response	0	0.00%	0	0.00%		
	Testing individually	16	35.56%	15	33.33%		
	Testing in small group	21	46.67%	22	48.89%		
	Other setting	1	2.22%	0	0.00%		
8	Large Print Edition	40	100.00%	40	100.00%	38	100.00%
	Oral reading	2	5.00%	13	32.50%	12	31.58%
	Oral reading blind	1	2.50%	0	0.00%	0	0.00%
	Signing of assessment	0	0.00%	0	0.00%	0	0.00%
	Paraphrasing	0	0.00%	0	0.00%	0	0.00%
	Other reading	2	5.00%	1	2.50%	1	2.63%
	Oral reading in native language	0	0.00%	0	0.00%	2	5.26%
	Extend time—*TerraNova* session	16	40.00%	17	42.50%	15	39.47%
	Administer using > allotted periods	12	30.00%	12	30.00%	12	31.58%
	Other timing	2	5.00%	2	5.00%	2	5.26%
	Use of scribe	18	45.00%	20	50.00%	20	52.63%
	Use of calculator, math table, etc.	3	7.50%	17	42.50%	8	21.05%
	Use of bilingual dictionary	0	0.00%	0	0.00%	1	2.63%
	Other response	1	2.50%	0	0.00%	0	0.00%
	Testing individually	20	50.00%	20	50.00%	21	55.26%
	Testing in small group	12	30.00%	11	27.50%	10	26.32%
	Other setting	2	5.00%	2	5.00%	2	5.26%

Figure 4.1: Sample Script of Examiner's Manual

Directions for Administering the Mathematics Assessment

SESSION 1

Prior to testing, punch out only the ruler and pattern blocks from the sheet of provided manipulatives. Do not punch out or distribute the squares.

If this is the first day of testing:

- *Distribute the test books. Ensure that each student writes his or her name and district/school on the test book cover. (If this is not the first day of testing, make sure each student has his or her own test book.)*
- *Ensure that all students use nonmechanical No. 2 pencils. This is a* ***REQUIREMENT****.*
- *Take a moment to have each student look through the test book.*
- *Hold up a student's test book and point out the STOP pages. Tell the students that whenever they see one of the STOP pages, they should not continue.*
- *Distribute manipulatives. Distribute clean scratch paper at the beginning of each testing session or part. Scratch paper may include grid or unlabeled graph paper. Collect all used scratch paper at the end of each testing session or part. Give all used scratch paper to the School Test Coordinator to be securely destroyed. Teachers may keep the manipulatives after the test is administered if students have not written on them.*
- *Hold up the manipulatives. Hold up this page and show students the pictures of the ruler and the pattern blocks.*

SAY

This picture means that you will use your ruler.

This picture means that you will use your pattern blocks.

In Session 1 of the Mathematics Assessment, you may use these manipulatives. You may not need to use either of them.

For the questions in Session 1, you will select from a list of given answer choices. Use scratch, grid, or unlabeled graph paper to work the problems. Remember to fill in the circle in the test book that goes with the answer you choose. Be sure to fill in the circle completely and make your mark solid and dark.

You should read each question very carefully and do your best to answer clearly and completely. Your score on these

SAY

questions will depend on how well you follow directions and show your understanding of mathematics.

Figure 4.2: District Report Form

MISSOURI DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION
Office of College and Career Readiness – Assessment Section

Quality Assurance Concern District Response

(To be completed by school district personnel)

☐ Grade-Level ☐ End-of-Course ☐ ACCESS for ELL ☐ MAP-Alternate (Check one)

SCHOOL DISTRICT NAME:	COUNTY-DISTRICT CODE:	BUILDING NAME:	BUILDING CODE:
DISTRICT CONTACT NAME:	DISTRICT CONTACT PHONE NUMBER:	GRADE LEVEL:	DISTRICT RESPONSE DUE DATE:

District / School Use Only:

Please email the completed form to assessment@dese.mo.gov. The response is due within one month from date of your letter.

Explanation:
Please explain in detail the district response to the concern noted and the manner in which it has been/will be addressed to prevent future recurrence. Use additional sheets if necessary.

If the concern is student related, include the student's name and MOSIS ID on a separate sheet of paper and attach to this form.

PRINCIPAL NAME (TYPE OR PRINT):	
PRINCIPAL SIGNATURE:	DATE
SUPERINTENDENT NAME (TYPE OR PRINT):	
SIGNATURE OF SUPERINTENDENT	DATE

MO 500-2906 (02-11)

Figure 4.3: Test Book Accountability Form

MAP 2012 GRADE-LEVEL ASSESSMENTS – TEST BOOK ACCOUNTABILITY FORM

District Name: _____ **District #:** _____

School Name: _____ **School #:** _____

This form provides start-to-finish accountability for the Grade-Level Assessment test books assigned to your school.

School Coordinator:

1. Complete the table below, providing any additional information on the back as required. Be sure to sign at the bottom of the page.
2. Include Braille, Large Print and accompanying standard editions on Lines 4, 6 and 7.
3. Retain a copy of this form for your own records, along with a photocopy of the security barcode ranges printed on the test book packages.
4. Return the completed form to your District Coordinator.

District Coordinator:

5. Complete a copy of this form for District Overage, providing any additional information on the back as required.
6. Fax the forms for all schools in your district to CTB - **Fax # 866-405-4086**. CTB may contact you to clarify any discrepancies on your schools' forms.

	TEST BOOKS RECEIVED	GR 3	GR 4	GR 5	GR 6	GR 7	GR 8
(1)	Number of test books listed on packing list	+	+	+	+	+	+
(2)	Test books missing from shipment (Fill out A on back)	–	–	–	–	–	–
(3)	Extra books received in shipment (Fill out B on back)	+	+	+	+	+	+
(4)	Additional books from district office (Fill out C on back)	+	+	+	+	+	+
(5)	**Total test books received (Add lines 1, 3 and 4; then subtract line 2)**						
	TEST BOOKS RETURNED	**GR 3**	**GR 4**	**GR 5**	**GR 6**	**GR 7**	**GR 8**
(6)	Number of tests administered	+	+	+	+	+	+
(7)	Number of unused test books (inc. Braille/LP)	+	+	+	+	+	+
(8)	**Total test books returned (Sum of lines 6 and 7)**						
	TEST BOOKS NOT RETURNED	**GR 3**	**GR 4**	**GR 5**	**GR 6**	**GR 7**	**GR 8**
(9)	Test books securely destroyed (Fill out D on back)	+	+	+	+	+	+
(10)	Test books unaccounted for (Fill out D on back)	+	+	+	+	+	+
(11)	**Total test books not returned (Sum of lines 9 - 10)**						

I confirm that Line 5 = Line 8 + Line 11.

School Test Coordinator: _____ Date Faxed: _____

Print Name: _____

A. Security barcode numbers of test books missing from shipment	B. Security barcode numbers of extra test books (not on packing list) received in shipment	C. Security barcode numbers of additional test books from district office, Braille or LP

D.	
Security barcode numbers of lost or securely destroyed test books	**Explanation**

CHAPTER 5: CONSTRUCTED-RESPONSE SCORING

In this section, we first describe the scoring process used for MAP. In particular, we focus on the MAP handscoring process. At the end of this section, we describe and report the results of the inter-rater reliability study conducted on the handscoring of MAP constructed-response items.

Chapter 5 adheres to AERA, APA, & NCME Standards 3.22, 3.23, and 5.9. Each of these Standards will be presented in the pertinent section of this chapter. Standard 3.22 provides some general guidance for Chapter 5:

> Procedures for scoring and, if relevant, scoring criteria should be presented by the test developer in sufficient detail and clarity to maximize the accuracy of scoring. Instructions for using rating scores or for deriving scores obtained by coding, scaling, or classifying constructed responses should be clear. This is especially critical if tests can be scored locally.

Chapter 5 explains the procedures used for scoring the MAP constructed-response items. The scoring criteria used for each item is not presented in this chapter to preserve the integrity of the items for future use.

5.1 MAP Scoring Process

Multiple-choice items were scored by CTB using electronic scanning equipment. Constructed-response items were scored by human raters who were trained by CTB.

5.1.1 Selection of Scoring Evaluators

AERA, APA, & NCME (1999) Standard 3.23 specifies:

> The process for selecting, training, and qualifying scorers should be documented by the test developer. The training materials, such as the scoring rubrics and examples of test takers' responses that illustrate the levels on the score scale, and the procedures for training scorers should result in a degree of agreement among scorers that allows for the scores to be interpreted as originally intended by the test developer. Scorer reliability and potential drift over time in raters' scoring standards should be evaluated and reported by the person(s) responsible for conducting the training session.

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

CTB/McGraw-Hill and Kelly Services strive to develop a highly qualified, experienced core of evaluators so that the integrity of all projects is appropriately maintained.

Recruitment
The MAP 2012 project was staffed with a large number of returning evaluators and team leaders who had previous experience with MAP and other handscoring projects. Kelly Services also recruited new team leaders and evaluators for employment. Recruitment sources included advertisements in newspapers in Indianapolis, Indiana; Centennial, Colorado, and nearby areas; and Internet sources.

CTB requires that all evaluators and team leaders possess a bachelor's degree or higher. Kelly Services carefully screened all new applicants and required them to produce either a transcript or a copy of the degree. Kelly Services 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 during this process. Kelly Services verified that 100% of all potential evaluators met the degree requirement. All experienced evaluators and team leaders had already successfully completed the screening process.

The Interview Process
All potential evaluators 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.

Kelly Services interviewed each applicant and determined the applicant's suitability for a specific content area and grade level. Applicants with strong leadership skills were questioned further to determine whether they were qualified to be team leaders.

When Kelly Services determined applicants were qualified, the applicants were recommended for employment. All assignments were made according to availability and suitability. Before being hired, all employees were required to read, agree to, and sign a nondisclosure agreement outlining the CTB/McGraw-Hill business ethics and security procedures.

5.1.2 Handscoring Training Process

Training Material Development
All materials necessary for scoring were developed by CTB. These materials included the scoring guides and training papers used to complete the handscoring of constructed-response and extended-response items (writing essays and performance events).

Missouri operational items have been previously field tested. Prior to actual scoring, handscoring supervisors assembled materials based on the rubrics. Student answer documents were randomly sampled to ensure that a representative sample of possible responses was used. Supervisors selected anchor papers and training papers and recommended clarifications to rubrics. All materials were presented during the Training Material Review Meeting (TMRM), and scores and annotations were approved by DESE participants.

From that point, training and qualifying materials were developed based on the rubric and scoring philosophies discussed during the TMRM.

Training Material Review Meeting
CTB prepared all anchors, scoring guides, and student response samples for DESE and Missouri participant review. Each response was scored and annotated by DESE participants.

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

All readers were trained and qualified in a specific Rater Item Block (RIB) consisting of one item to be scored, except in Grades 5 and 8 Science where there was one multi-item RIB. Evaluators were trained using the following steps:

- Reviewing constructed-response items
- Reviewing rubrics
- Reviewing anchor papers
- Explaining scoring strategies, followed by a question-and-answer period
- Scoring a training set, followed by sharing established scores
- Scoring additional training sets
- Qualifying Round 1
- Qualifying Round 2 (if necessary)
- Explaining condition codes and sensitive paper procedures
- Explaining nonstandard response or computer-generated response (nsr/cgr) procedures
- Explaining unscannable image procedures

All evaluators were trained and qualified using the same procedures and criteria. Qualification standards for every item were predetermined by DESE. In order to score an item, readers must have met the specific standards for that item. The qualification standards were:

- 4-point item: 80% qualification
- 3-point item: 80% qualification
- 2-point item: 90% qualification
- 1-point item: 100% qualification

5.1.3 Monitoring the Scoring Process

AERA, APA, & NCME (1999) Standard 5.9 says:

> When test scoring involves human judgment, scoring rubrics should specify criteria for scoring. Adherence to established scoring criteria should be monitored and checked regularly. Monitoring procedures should be documented.

Section 5.1.3 explains the monitoring procedures that CTB uses to ensure that handscoring evaluators 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. These rubrics will not be presented here in order to preserve the integrity of the items for use in future MAP forms.

Daily Accuracy Checks
Throughout the course of handscoring, calibration sets of pre-scored papers (checksets/validity sets) were administered daily to each scorer to monitor scoring accuracy and to maintain a consistent focus on the established rubrics and guidelines. Checksets were executed via imaging software that provided images in such a way that the reader did not know when a checkset was administered.

In addition to the checkset process, CTB's handscoring protocol included the use of read-behinds. The read-behind was another valuable rater-reliability monitoring technique that allowed a team leader to review a reader's scored documents and provide feedback and counseling as appropriate.

Approximately 5% of Communication Arts, Mathematics, and Science papers were scored by a second reader to establish inter-rater reliability statistics for all constructed-response items. This procedure is called a "double-blind read," because the second reader does not know the first reader's score.

Recalibration of Raters
Recalibration in handscoring refers to the process in which scorers/raters who begin to drift away from scoring accuracy are realigned to correct scoring. After a thorough review of the rubric, anchors, and training papers, a recalibration round is administered to a reader who has drifted; accuracy on this round must meet or exceed the qualification rate. A scorer who continues to exhibit drift is released.

5.1.4 Security

Security guards were on site whenever employees were present in the building. All employees were issued photo 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 Inter-Rater Reliability

Approximately 5% of the papers in Communication Arts, Mathematics, and Science 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 perfect agreement and adjacent agreement between the two readers was examined.

For each item, a weighted kappa was calculated to reflect the level of improvement beyond the chance level in the consistency of scoring. These weighted kappa values are presented in Tables 5.1 to 5.3. To aid in the interpretation of Kappa, 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

Almost all Communication Arts, Mathematics, and Science items show good inter-rater agreement. As shown in Table 5.1, raters demonstrated at least 95% perfect and adjacent agreement for all Communication Arts items. Except for one item, the strength of the inter-rater agreement may be interpreted as good or very good as indicated by the weighted Kappa values. One Grade 3 item (Session 1, Item 3) had a weighted Kappa value that indicates only moderate agreement between the raters.

As shown in Table 5.2, raters demonstrated at or above 97% perfect and adjacent agreement for all Mathematics items. The weighted Kappa values indicate that there was very good inter-rater agreement for all Mathematics items.

As shown in Table 5.3, raters demonstrated at or above 97% perfect and adjacent agreement for all Science items. The weighted Kappa statistic indicates good or very good inter-rater agreement for all Science items.

5.3 Summary

The information presented in this chapter summarizes the steps taken by CTB to ensure accuracy in the handscoring process. The inter-rater reliability statistics presented in Section 5.2 demonstrate that the items are scored reliably. These efforts by CTB address multiple best practices of the testing industry but are particularly related to AERA, APA, & NCME (1999) Standards 3.22, 3.23, and 5.9.:

- Standard 3.22—Procedures for scoring and, if relevant, scoring criteria should be presented by the test developer in sufficient detail and clarity to maximize the

accuracy of scoring. Instructions for using rating scores or for deriving scores obtained by coding, scaling, or classifying constructed responses should be clear. This is especially critical if tests can be scored locally.

- Standard 3.23—The process for selecting, training, and qualifying scorers should be documented by the test developer. The training materials, such as the scoring rubrics and examples of test takers' responses that illustrate the levels on the score scale, and the procedures for training scorers should result in a degree of agreement among scorers that allows for the scores to be interpreted as originally intended by the test developer. Scorer reliability and potential drift over time in raters' scoring standards should be evaluated and reported by the person(s) responsible for conducting the training session.
- Standard 5.9—When test scoring involves human judgment, scoring rubrics should specify criteria for scoring. Adherence to established scoring criteria should be monitored and checked regularly. Monitoring procedures should be documented.

Table 5.1: Inter-Rater Reliability, Communication Arts

Grade	Session	Item #	# Points	% Perfect	% Adjacent	% Perfect & Adjacent*	Weighted Kappa
3	1	3	2	75	25	100	0.60
	1	4	2	83	16	99	0.77
	1	5	2	83	16	100	0.78
	1	6A	2	84	15	99	0.79
	1	6B	2	89	11	99	0.70
4	1	3	2	89	10	100	0.92
	1	4	2	88	11	99	0.89
	1	5	2	86	13	99	0.86
	1	6A	2	85	15	99	0.85
	1	6B	2	92	7	100	0.81
5	1	3	2	74	24	98	0.73
	1	4	2	86	13	99	0.84
	1	5	2	79	19	98	0.77
	1	6A	2	95	5	100	0.94
	1	6B	1	98	2	100	0.94
6	1	3	2	85	14	100	0.82
	1	4	2	82	17	99	0.83
	1	5A	2	80	19	99	0.82
	1	5B	1	97	3	100	0.94
	1	6	2	86	13	99	0.87
7	1	3	2	77	20	98	0.79
	1	4	2	71	28	98	0.72
	1	5A	2	75	23	97	0.73
	1	5B	1	89	11	100	0.73
	1	6A	2	84	15	99	0.87
	1	6B	1	90	10	100	0.62
8	1	3	2	94	1	95	0.87
	1	4	2	75	22	97	0.74
	1	5	2	77	20	97	0.75
	1	6A	2	82	17	99	0.81
	1	6B	1	96	4	100	0.93

* The percent perfect & adjacent may not add up to 100 for 1-point items due to the percent discrepant. The percent discrepant includes the cases where one rater assigned a score and the other rater assigned a condition code. With 2- or more point items, it also refers to the cases where the assigned score varied by more than 1 point.

Table 5.2: Inter-Rater Reliability, Mathematics

Grade	Session	Item #	# Points	% Perfect	% Adjacent	% Perfect & Adjacent*	Weighted Kappa
3	3	1	2	91	8	99	0.90
	3	2	2	93	7	100	0.93
	3	3	2	95	5	100	0.97
	3	4	2	95	5	100	0.96
4	3	1	2	98	2	100	0.97
	3	2	2	94	5	99	0.91
	3	3	2	94	6	100	0.91
	3	4	2	88	11	100	0.92
5	3	1	2	99	1	100	0.99
	3	2	2	84	13	97	0.82
	3	3	2	97	3	100	0.97
	3	4	2	97	2	99	0.97
6	3	1	2	91	9	100	0.90
	3	2	2	96	3	100	0.96
	3	3	2	89	11	100	0.88
	3	4	2	97	3	100	0.96
7	3	1	2	95	5	100	0.96
	3	2	2	96	4	100	0.97
	3	3	2	95	5	100	0.94
	3	4	2	96	4	100	0.97
8	3	1	2	87	13	100	0.86
	3	2	2	93	6	99	0.95
	3	3	2	98	2	99	0.98
	3	4	2	97	3	100	0.96

* The percent perfect & adjacent may not add up to 100 for 1-point items due to the percent discrepant. The percent discrepant includes the cases where one rater assigned a score and the other rater assigned a condition code. With 2- or more point items, it also refers to the cases where the assigned score varied by more than 1 point.

Table 5.3: Inter-Rater Reliability, Science

Grade	Session	Item #	# Points	% Perfect	% Adjacent	% Perfect & Adjacent*	Weighted Kappa
	1	1	2	98	1	99	0.97
	1	2	2	74	23	97	0.74
	1	3	2	98	1	99	0.97
	1	4	2	83	17	100	0.81
	1	5	2	90	10	100	0.90
	1	6	2	92	8	100	0.93
5	1	7	2	86	13	100	0.89
	1	8	2	84	15	99	0.82
	1	9	2	81	18	99	0.78
	1	10	2	89	10	99	0.85
	1	11	2	85	14	99	0.71
	1	12	2	95	5	100	0.94
	1	13	2	92	8	100	0.93
	1	1	2	81	19	100	0.63
	1	2	2	95	4	99	0.97
	1	3	2	87	13	100	0.86
	1	4	2	87	12	99	0.89
	1	5	2	90	10	100	0.91
	1	6	2	85	13	99	0.83
8	1	7	2	76	22	98	0.76
	1	8	2	82	17	99	0.82
	1	9	2	85	14	99	0.74
	1	10	2	85	14	99	0.79
	1	11	2	76	22	98	0.77
	1	12	2	95	5	100	0.92
	1	13	2	92	7	99	0.87

CHAPTER 6: OPERATIONAL DATA ANALYSES

This chapter of the MAP Technical Report describes the analyses that occurred on the operational data. These analyses include a classical item analysis and examination of the raw scores and an IRT analysis involving calibrating, scaling, and linking. All of these analyses were conducted using the calibration sample.

In this section, we first discuss the calibration sample. Next, we present the classical item statistics, including aggregate raw score statistics and individual item-level statistics. Then, we discuss the IRT models used for calibrating the data and address how well these models fit the Missouri data. If the IRT models fit the empirical item response distributions for the population for which we want to make generalizations (i.e., Missouri students), 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 MAP are presented. Finally, we provide a general overview of scaling and discuss the methods used to link the MAP results to the *TerraNova* scale.

Chapter 6 demonstrates adherence in the MAP program to AERA, APA, & NCME (1999) Standards 1.5, 2.8, 3.18, 4.2, 4.11, 4.13, and 6.4. Each standard will be explicated within the appropriate section of this chapter. Standard 6.4 provides general guidance that is relevant to this chapter. It states:

> The population for whom the test is intended and the test specifications should be documented. If applicable, the item pool and scale development procedures should be described in the relevant test manuals. If normative data are provided, 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.

In section 6.1, we will discuss the calibration sample and compare it to the general population. The test specifications and item pool are discussed in Chapter 3. The scale development procedures are discussed in section 6.4 of this chapter. Information regarding reported data is discussed in detail in Chapter 7. Information on the normative data may be found in the *TerraNova, Third Edition: Technical Addendum Forms E and F* (2009).

6.1 Calibration Sample

In this section we describe the calibration sample in adherence to Standard 1.5 of the AERA, APA, & NCME (1999) Standards. Standard 1.5 states:

> The composition of any sample of examinees from which validity evidence is obtained should be described in as much detail as is practical, including major relevant sociodemographic and developmental characteristics.

In 2012 the grade-level calibration samples were comprised of at least 80% of the total student population for that grade. Several large school districts were identified for

inclusion in the 80% sample. These districts are listed in Table 6.1. Data from these districts had to be included in the calibration sample before data analyses procedures could begin. These large districts were identified because past data processing has demonstrated that large districts often return data at the end of the data-return window while small districts often return data early in the data-return window. Since the calibration sample was going to be based on the first 80% of data to be returned, it was important to identify large districts to ensure the calibration data were representative of the state.

Tables 6.2 through 6.4 examine the representativeness of the calibration sample compared to the census data. These tables demonstrate that the calibration sample was representative of the state.

6.2 Classical Item Statistics

In this section, we present summary test statistics for each grade/content area MAP. This is followed by item-level statistics for each grade/content area MAP.

6.2.1 Test-Level Statistics

Tables 6.5 through 6.7 present the number of items and score points on each test, as well as the mean and standard deviation of the raw scores, *p*-values, and item-total correlations (also known as item discrimination values) for each grade level of Communication Arts, Mathematics, and Science, respectively.

The mean *p*-value is the average of all item *p*-values of a specific grade/content area. The mean item-total correlation (R_{it}) is the average of all item biserial correlations of a specific grade/content area. The *p*-value and item-total correlation are explained in the next section.

6.2.2 Item-Level Statistics

Tables 6.8 through 6.13 present the item statistics for each item by grade/content area. The tables include test session, item booklet number and part (if applicable), *p*-values, item-total correlations (R_{it}), and omit rates for each item by grade/content area.

p-value: The *p*-value is a measure of item difficulty. For a multiple-choice 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.

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 demonstrated in Table 6.5, the average *p*-values associated with the Communication Arts MAP range from .70 (Grade 8) to .78 (Grade 4). The average *p*-values associated

with the Mathematics MAP (Table 6.6) range from .61 (Grade 8) to .82 (Grade 3). The average *p*-values associated with the Science MAP (Table 6.7) range from .63 (Grade 8) to .67 (Grade 5).

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 students in the center of the distribution. Having a range of *p*-values also helps to prevent floor and/or ceiling effects so that the test does not have large numbers of students at the minimum or maximum possible scores. The Communication Arts MAP has items with *p*-values ranging from the low 0.20s to the 0.90s (see Tables 6.8 through 6.13). The *p*-values on the Mathematics MAP tend to range from the 0.10s and 0.20s to the 0.90s (see Tables 6.8 through 6.13). The Science MAP has items with *p*-values ranging from 0.10s to the 0.90s (see Tables 6.10 and 6.13). Such a broad range of *p*-values, which indicates the items measure well throughout the range of skills at a given grade, supports the accuracy of the MAP test scores.

Item-Total Correlations: An item-total correlation is the correlation between an item and the total test score, where the item score is included in the total score. It indicates how well an item differentiates between low- and high-achieving students. In general, items with correlations below .20 are said to be poorly discriminating. The majority of the items in the MAP had item-test correlations above this threshold. Any item with an item-total correlation below the .20 threshold was further analyzed to assure that the item was correctly keyed.

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 Standards 2.8 and 3.18 of the AERA, APA, & NCME (1999) *Standards*. Both standards are concerned with speededness of a test. Standard 2.8 states:

> Test users should be informed about the degree to which rate of work may affect examinee performance.

The results in this section will show that, overall, student test scores are not adversely affected by the rate at which they complete the test. In general, students have ample time to complete all sections of the test. Related to this, Standard 3.18 states:

> For tests that have time limits, test development research should examine the degree to which scores include a speed component and evaluate the appropriateness of that component, given the domain the test is designed to measure.

Again, the results presented in Tables 6.8 through 6.13 show that the majority of tests did not have a speed component. These results are particularly relevant to the *TerraNova* component of the test, which is a strictly timed administration. The results of our analyses suggest that the majority of students were able to complete the test in the prescribed amount of time.

6.3 Item Response Theory

A marginal maximum-likelihood procedure was used to simultaneously estimate the item parameters using the 3PL/2PPC IRT models (Bock & Aitkin, 1981; Thissen, 1982). Under the 3PL model, the probability that a student with trait or scale score θ 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 θ will respond in category *k* to partial-credit item *j* is

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

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

The summary output of the 3PL and 2PPC models is in two different metrics. The location and discrimination parameters for the MC items are in the traditional 3PL metric and are labeled *b* and *a*, respectively. In the 2PPC model, *f* (alpha) and *g* (gamma) are analogous to *b* and *a*, where alpha is the discrimination parameter and gamma over alpha (*g*/*f*) is the location where adjacent trace lines cross on the ability scale. Because of the different metrics used, the 3PL parameters *b* and *a* are not directly comparable to the 2PPC parameters *f* and *g*; however, they can be converted to a common metric. The two metrics are related by $b = g/f$ and $a = f / 1.7$ (Burket, 1995). 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.

6.3.1 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 on the basis of their $\hat{\theta}$ values and sorted into ten cells, with ten percent 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, and the approximate chi-square statistic

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

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

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

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

Thirteen MAP operational items were flagged for poor fit. In Communication Arts, one item was flagged for poor fit in Grades 3, 4, 5, and 7, and two items were flagged for poor fit in Grade 8. In Mathematics, one item was flagged for poor fit in Grades 3, 5, and 7, and two items were flagged for poor fit in Grade 6. In Science, one item was flagged for poor fit in Grades 5 and 8. Table 6.14 shows the chi-square statistic and the *Z*-statistic for each flagged item. The average percent 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.

Each of the flagged items 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. In almost all cases for which model misfit occurs, relatively few students occupy these scale score ranges which are 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.

Figures 6.1 to 6.13 show the item characteristic curves for the misfitting MAP items. The smooth line in each of these figures represents the predicted relationship between examinee performance on the item and examinee ability, and the jagged line represents

the observed relationship.[3] Large differences between the two lines indicate poor fit. Each figure also shows the distribution of theta scores, so that the fit between observed and predicted performance at different ability levels can be interpreted in light of the overall distribution of examinees.

With large numbers of observations such as there are for the Missouri calibration samples, items may be flagged for statistically significant differences; however, these differences may not be of practical importance. In the case of the 13 MAP items flagged for misfit, the differences do not seem to 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. A large number of misfitting items in an assessment would indicate that caution should be exercised in the interpretation of the overall score. No MAP test had more than two items flagged for misfit.

Figure 6.1 presents the ICC for Session 2, Item 34 (SR item) on the Grade 3 Communication Arts test. As shown, there is poor fit at the lower end of the ability range.

Figure 6.2 presents the ICC for Session 2, Item 30 (SR item) on the Grade 4 Communication Arts test. There is poor fit throughout the ability range.

Figure 6.3 presents the ICC for Session 1, Item 3 (2-point CR item) on the Grade 5 Communication Arts test. There is poor fit at the lower end of the ability distribution for level 1. There is poor fit at the lower and upper end of the ability range for level 2. There is poor fit at the upper end of the ability distribution for level 3.

Figure 6.4 presents the ICC for Session 2, Item 28 (SR item) on the Grade 7 Communication Arts test. There is poor fit at the lower and upper ends of the ability range.

Figure 6.5 presents the ICC for Session 2, Item 7 (SR item) on the Grade 8 Communication Arts test. There is poor fit at the lower end of the ability range.

Figure 6.6 presents the ICC for Session 2, Item 12 (SR item) on the Grade 8 Communication Arts test. There is poor fit throughout the ability distribution.

Figure 6.7 presents the ICC for Session 3, Item 4 (2-point CR item) on the Grade 3 Mathematics test. There is poor fit at the lower and upper end of the ability distribution for level 2. There is poor fit at the upper end of the ability distribution for level 3.

Figure 6.8 presents the ICC for Session 3, Item 3 (2-point CR item) on the Grade 5 Mathematics test. As shown, there is good fit throughout the ability distribution for levels 1 and 3. There is poor fit in the middle of the distribution for level 2.

[3] For constructed-response items, there will be one graph for each score level. For example, a 2-point item will have three graphs for 0, 1, and 2 score points.

Figure 6.9 presents the ICC for Session 1, Item 17 (SR item) on the Grade 6 Mathematics test. There is poor fit throughout the ability distribution.

Figure 6.10 presents the ICC for Session 3, Item 1 (2-point CR item) on the Grade 6 Mathematics test. As shown, there is poor fit at the lower end of the ability distribution for level 1 and throughout the ability distribution for levels 2 and 3.

Figure 6.11 presents the ICC for Session 3, Item 1 (2-point CR item) on the Grade 7 Mathematics test. There is good fit throughout the ability distribution for level 1. There is poor fit at the upper end of the ability distribution for levels 2 and 3.

Figure 6.12 presents the ICC for Session 1, Item 4 (2-point CR item) on the Grade 5 Science test. As shown, there is slightly poor fit at the lower end of the ability distribution for level 1, throughout the ability distribution for level 2, and at the upper end of the ability distribution for level 3.

Figure 6.13 presents the ICC for Session 1, Item 9 (2-point CR item) on the Grade 8 Science test. There is poor fit at the lower and upper end of the ability distribution for level 2. There is poor fit at the upper end of the ability distribution for level 3.

6.4 Scaling

The purpose of scaling a test is to enhance its validity 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 4.2 of the AERA, APA, & NCME (1999) *Standards*, which states:

> The construction of scales used for reporting scores should be described clearly in the test documents.

The MAP scores are produced using the three-parameter logistic, two-parameter partial credit (3PL/2PPC) IRT model (explained previously) that assumes 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).

Scaling and linking of complex assessment data were performed using PARDUX (Burket, 1995), which is proprietary software developed by CTB/McGraw-Hill. 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. PARDUX is also used to link the scales developed by two calibrations through the common-item procedure developed by Stocking & Lord (1983).

6.4.1 Linking Methods

CTB uses a common-item, non-equivalent groups design to link the current year's assessment to the established MAP scale. The embedded *TerraNova* form serves as the anchor set, and the non-equivalent groups are comprised of at least 80% of the census data in each grade. After the initial IRT item calibration, item parameters were linked to the MAP scale using the Stocking & Lord (1983) equating procedure.

Standard 4.11 of the AERA, APA, & NCME (1999) *Standards* states:

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

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

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

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

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

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

The standard error of the equating (SEE) is difficult and cumbersome to estimate for IRT equating procedures like Stocking and Lord (Kolen & Brennan, 1995; Michaelides & Haertel, 2004). The estimation of the SEE is beyond the scope of this report. It is anticipated that the SEE would be small because 80% of the census data is used for the purposes of linking each year. The large sample size (64,000 +) should ensure that the equating estimates are fairly stable.

6.4.2 Anchor Items

AERA, APA, & NCME (1999) Standard 4.13 requires information about the anchors, stating:

> In equating studies that employ an anchor test design, the characteristics of the anchor test and its similarity to the forms being equated should be presented,

including both content specifications and empirically determined relationships among test scores. If anchor items are used, as in some IRT-based and classical equating studies, the representativeness and psychometric characteristics of anchor items should be presented.

Appendix B provides further details on the psychometric characteristics of the anchor items.

6.4.3 Vertical Scale

The scale on which the MAP scale scores are reported is based in part on the *TerraNova* standardized achievement test, which makes it possible to report national percentile scores in addition to the criterion-referenced scale scores of MAP. Although the MAP scale is unique to Missouri, the characteristic growth seen on the scale from grade to grade for the standardized test has been utilized and built upon to give MAP its vertical scale characteristics. The vertical scale is sometimes referred to as a growth scale.

Evidence of the validity of the MAP growth scale is provided by the increase of the scale score at selected percentiles as grade level increases. Figures 6.14, 6.15, and 6.16 display the scale scores for several points on the score distributions for each grade of the Communication Arts, Mathematics, and Science MAP, respectively. These scale scores indicate the growth, or change, in score by grade at the 1st, 5th, 10th, 25th, 50th, 75th, 90th, 95th, and 99th percentiles. Ideally, the scale score associated with each percentile will increase from grade to grade. Figure 6.14 shows the selected percentiles for the Communication Arts MAP. Considering all but the 1st and 99th percentiles, the scale scores progress upward from Grades 3 through 5 and then flatten from Grades 5 to 6 before continuing to progress upward again from Grade 7 to 8. At the 1st and 5th percentiles, there is a decrease in scale score from Grades 6 to 7. At the 75th, 90th, and 95th percentiles, there is a decrease in scale score from Grades 5 to 6. At the 99th percentile, there is a decrease in scale score from Grades 4 to 6.

Figure 6.15 shows the selected percentiles for the Mathematics MAP. Except for the 1st and 99th percentiles, there is an upward progression of scale scores across all grades. At the 1st percentile, there is a decrease in scale score between Grades 6 and 7. At the 99th percentile, there is a decrease in scale scores between Grades 3 and 4.

Figure 6.16 shows the selected percentiles for the Science MAP. There is an upward progression of scale scores across the two Science grades.

Figures 6.17 to 6.19 show the TCCs by grade for the MAP Communication Arts, Mathematics, and Science assessments, respectively. Because these tests were linked to the *TerraNova* scale, they have an underlying vertical scale. By plotting the TCCs together, we can demonstrate that the tests increase in difficulty as the grade levels increase. Figure 6.17 shows that the TCCs for Communication Arts for Grades 5, 6, and 7 overlap. The Grade 5 and 6 TCCs are very close and cross over each other at the upper end of the TCCs. The Grade 7 TCC crosses the Grade 5 and 6 TCCs at the lower end. During the selection of the forms, the pre-equated TCCs were examined and efforts were

made to further separate the Grades 5 through 7 TCCs while, at the same time, protecting against scale drift. The available item pool was insufficient to create tests that resulted in the optimal increases in test difficulty. For Grade 7, the mean scale score is higher than Grades 5 and 6. The Grades 5 and 6 mean scale scores were nearly identical. DESE continues to work on differentiating skills in these grades, which may help pull apart the Grades 5 and 6 TCCs.

For both Mathematics (Figure 6.18) and Science (Figure 6.19), the TCCs indicate that test difficulty increases with grade level.

6.4.4 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. Also, 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 LOSS and the HOSS. Table 6.15 shows the LOSS and HOSS values used for each grade of the Communication Arts, Mathematics, and Science MAPs.

6.5 Item-Pattern Scoring

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.

Using item-pattern scoring, a student's scale score is based on the student's responses to each item (his/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.

The procedures applied here are similar to those followed in the development of the *TerraNova* and *TerraNova* 2nd edition tests. For additional information on the technical details of the item-pattern scoring, readers can also refer to Yen & Candell (1991) and to the technical report for *TerraNova* 2nd Edition (CTB/McGraw-Hill, 2003).

6.6 Summary

In summary, the overall purpose of the operational data analysis is to ensure that the test items, as well as the overall test, are functioning appropriately. It also helps maintain the test scale across the years so that test results may be appropriately compared across years. The data analyses undertaken by CTB/McGraw-Hill address multiple best practices of

the testing industry but, in particular, are related to the following *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999):

- Standard 1.5—The composition of any sample of examinees from which validity evidence is obtained should be described in as much detail as is practical, including major relevant sociodemographic and developmental characteristics.
- Standard 2.8—Test users should be informed about the degree to which rate of work may affect examinee performance.
- Standard 3.18—For tests that have time limits, test development research should examine the degree to which scores include a speed component and evaluate the appropriateness of that component, given the domain the test is designed to measure.
- Standard 4.2—The construction of scales used for reporting scores should be described clearly in the test documents.
- Standard 4.11—When claims of form-to-form score equivalence are based on equating procedures, detailed technical information should be provided on the method by which equating functions or other linkages were established and on the accuracy of equating functions.
- Standard 4.13—In equating studies that employ an anchor test design, the characteristics of the anchor test and its similarity to the forms being equated should be presented, including both content specifications and empirically determined relationships among test scores. If anchor items are used, as in some IRT-based and classical equating studies, the representativeness and psychometric characteristics of anchor items should be presented.
- Standard 6.4—The population for who the test is intended and the test specifications should be documented. If applicable, the item pool and scale development procedures should be described in the relevant test manuals. If normative data are provided, 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: Large Districts That Were Included in the 80% Calibration Sample

District Name
Columbia
St Joseph
North Kansas
Springfield
Blue Springs
Lee's Summit
Kansas City
Fort Zumwalt
Francis Howell
Hazelwood
Ferguson Florrisant
Rockwood
Mehlville
Parkway
St. Louis City

Table 6.2: Summary of Calibration and Census Data: Communication Arts

	Communication Arts, Grade 3				
	Calibration Sample		Census Data		Diff (Calib % - Census %)
	N	%	N	%	
All Students	64811		66147		
Gender					
Male	33149	51.15	33822	51.13	0.02
Female	31585	48.73	32247	48.75	-0.02
Unknown	77	0.12	78	0.12	0.00
Race/Ethnicity					
White	47386	73.11	48497	73.32	-0.21
Black	10850	16.74	10976	16.59	0.15
Hispanic	3517	5.43	3565	5.39	0.04
Asian/Pacific Islander	1485	2.29	1495	2.26	0.03
Native American/Alaskan	288	0.44	294	0.44	0.00
Other	1209	1.87	1243	1.88	-0.01
Unknown	76	0.12	77	0.12	0.00
	Communication Arts, Grade 4				
All Students	64593		65828		
Gender					
Male	33034	51.14	33693	51.18	-0.04
Female	31506	48.78	32080	48.73	0.05
Unknown	53	0.08	55	0.08	0.00
Race/Ethnicity					
White	47339	73.29	48349	73.45	-0.16
Black	10939	16.94	11072	16.82	0.12
Hispanic	3398	5.26	3438	5.22	0.04
Asian/Pacific Islander	1398	2.16	1412	2.14	0.02
Native American/Alaskan	284	0.44	304	0.46	-0.02
Other	1178	1.82	1194	1.81	0.01
Unknown	57	0.09	59	0.09	0.00
	Communication Arts, Grade 5				
All Students	65158		66470		
Gender					
Male	32956	50.58	33647	50.62	-0.04
Female	32135	49.32	32752	49.27	0.05
Unknown	67	0.10	71	0.11	-0.01
Race/Ethnicity					
White	48156	73.91	49277	74.13	-0.22
Black	10972	16.84	11077	16.66	0.18
Hispanic	3258	5.00	3295	4.96	0.04
Asian/Pacific Islander	1334	2.05	1345	2.02	0.03
Native American/Alaskan	253	0.39	278	0.42	-0.03
Other	1122	1.72	1131	1.70	0.02
Unknown	63	0.10	67	0.10	0.00

Table 6.2: Summary of Calibration and Census Data: Communication Arts (Cont'd)

	Communication Arts, Grade 6				
	Calibration Sample		Census Data		Diff (Calib % - Census %)
	N	%	N	%	
All Students	65538		67173		
Gender					
Male	33626	51.31	34503	51.36	-0.05
Female	31855	48.61	32611	48.55	0.06
Unknown	57	0.09	59	0.09	0.00
Race/Ethnicity					
White	48513	74.02	49912	74.30	-0.28
Black	11233	17.14	11375	16.93	0.21
Hispanic	3090	4.71	3130	4.66	0.05
Asian/Pacific Islander	1338	2.04	1349	2.01	0.03
Native American/Alaskan	279	0.43	301	0.45	-0.02
Other	1025	1.56	1045	1.56	0.00
Unknown	60	0.09	61	0.09	0.00
	Communication Arts, Grade 7				
All Students	64932		66620		
Gender					
Male	33240	51.19	34109	51.20	-0.01
Female	31616	48.69	32429	48.68	0.01
Unknown	76	0.12	82	0.12	0.00
Race/Ethnicity					
White	48249	74.31	49756	74.69	-0.38
Black	11114	17.12	11235	16.86	0.26
Hispanic	2963	4.56	2988	4.49	0.07
Asian/Pacific Islander	1231	1.90	1241	1.86	0.04
Native American/Alaskan	310	0.48	315	0.47	0.01
Other	991	1.53	1005	1.51	0.02
Unknown	74	0.11	80	0.12	-0.01
	Communication Arts, Grade 8				
All Students	64726		66755		
Gender					
Male	33156	51.23	34203	51.24	-0.01
Female	31486	48.65	32465	48.63	0.02
Unknown	84	0.13	87	0.13	0.00
Race/Ethnicity					
White	48200	74.47	50005	74.91	-0.44
Black	11085	17.13	11217	16.80	0.33
Hispanic	2870	4.43	2905	4.35	0.08
Asian/Pacific Islander	1231	1.90	1249	1.87	0.03
Native American/Alaskan	293	0.45	311	0.47	-0.02
Other	962	1.49	980	1.47	0.02
Unknown	85	0.13	88	0.13	0.00

Table 6.3: Summary of Calibration and Census Data: Mathematics

	Mathematics, Grade 3				
	Calibration Sample		Census Data		Diff (Calib % - Census %)
	N	%	N	%	
All Students	64939		66213		
Gender					
Male	33226	51.16	33856	51.13	0.03
Female	31634	48.71	32277	48.75	-0.04
Unknown	79	0.12	80	0.12	0.00
Race/Ethnicity					
White	47425	73.03	48491	73.23	-0.20
Black	10856	16.72	10973	16.57	0.15
Hispanic	3555	5.47	3597	5.43	0.04
Asian/Pacific Islander	1527	2.35	1536	2.32	0.03
Native American/Alaskan	288	0.44	294	0.44	0.00
Other	1211	1.86	1244	1.88	-0.02
Unknown	77	0.12	78	0.12	0.00
	Mathematics, Grade 4				
All Students	64737		65909		
Gender					
Male	33115	51.15	33735	51.18	-0.03
Female	31568	48.76	32119	48.73	0.03
Unknown	54	0.08	55	0.08	0.00
Race/Ethnicity					
White	47371	73.17	48347	73.35	-0.18
Black	10967	16.94	11081	16.81	0.13
Hispanic	3438	5.31	3472	5.27	0.04
Asian/Pacific Islander	1438	2.22	1450	2.20	0.02
Native American/Alaskan	285	0.44	305	0.46	-0.02
Other	1180	1.82	1195	1.81	0.01
Unknown	58	0.09	59	0.09	0.00
	Mathematics, Grade 5				
All Students	65251		66524		
Gender					
Male	33002	50.58	33667	50.61	-0.03
Female	32179	49.32	32783	49.28	0.04
Unknown	70	0.11	74	0.11	0.00
Race/Ethnicity					
White	48169	73.82	49268	74.06	-0.24
Black	10989	16.84	11083	16.66	0.18
Hispanic	3282	5.03	3314	4.98	0.05
Asian/Pacific Islander	1370	2.10	1381	2.08	0.02
Native American/Alaskan	253	0.39	278	0.42	-0.03
Other	1124	1.72	1132	1.70	0.02
Unknown	64	0.10	68	0.10	0.00

Table 6.3: Summary of Calibration and Census Data: Mathematics (Cont'd)

	Mathematics, Grade 6				
	Calibration Sample		Census Data		Diff (Calib % - Census %)
	N	%	N	%	
All Students	65665		67237		
Gender					
Male	33696	51.32	34532	51.36	-0.04
Female	31911	48.60	32645	48.55	0.05
Unknown	58	0.09	60	0.09	0.00
Race/Ethnicity					
White	48558	73.95	49914	74.24	-0.29
Black	11253	17.14	11381	16.93	0.21
Hispanic	3123	4.76	3159	4.70	0.06
Asian/Pacific Islander	1362	2.07	1373	2.04	0.03
Native American/Alaskan	280	0.43	302	0.45	-0.02
Other	1027	1.56	1045	1.55	0.01
Unknown	62	0.09	63	0.09	0.00
	Mathematics, Grade 7				
All Students	64987		66654		
Gender					
Male	33263	51.18	34118	51.19	-0.01
Female	31647	48.70	32453	48.69	0.01
Unknown	77	0.12	83	0.12	0.00
Race/Ethnicity					
White	48255	74.25	49750	74.64	-0.39
Black	11119	17.11	11230	16.85	0.26
Hispanic	2985	4.59	3010	4.52	0.07
Asian/Pacific Islander	1252	1.93	1263	1.89	0.04
Native American/Alaskan	310	0.48	315	0.47	0.01
Other	991	1.52	1005	1.51	0.01
Unknown	75	0.12	81	0.12	0.00
	Mathematics, Grade 8				
All Students	64809		66808		
Gender					
Male	33211	51.24	34235	51.24	0.00
Female	31515	48.63	32488	48.63	0.00
Unknown	83	0.13	85	0.13	0.00
Race/Ethnicity					
White	48228	74.42	50010	74.86	-0.44
Black	11097	17.12	11224	16.80	0.32
Hispanic	2897	4.47	2931	4.39	0.08
Asian/Pacific Islander	1247	1.92	1266	1.89	0.03
Native American/Alaskan	293	0.45	311	0.47	-0.02
Other	963	1.49	980	1.47	0.02
Unknown	84	0.13	86	0.13	0.00

Table 6.4: Summary of Calibration and Census Data: Science

	Science, Grade 5				
	Calibration Sample		Census Data		Diff (Calib % - Census %)
	N	%	N	%	
All Students	65226		66492		
Gender					
Male	32993	50.58	33656	50.62	-0.04
Female	32164	49.31	32763	49.27	0.04
Unknown	69	0.11	73	0.11	0.00
Race/Ethnicity					
White	48148	73.82	49243	74.06	-0.24
Black	10987	16.84	11078	16.66	0.18
Hispanic	3285	5.04	3316	4.99	0.05
Asian/Pacific Islander	1371	2.10	1382	2.08	0.02
Native American/Alaskan	253	0.39	278	0.42	-0.03
Other	1119	1.72	1128	1.70	0.02
Unknown	63	0.10	67	0.10	0.00
	Science, Grade 8				
All Students	64733		66724		
Gender					
Male	33160	51.23	34177	51.22	0.01
Female	31489	48.64	32460	48.65	-0.01
Unknown	84	0.13	87	0.13	0.00
Race/Ethnicity					
White	48178	74.43	49955	74.87	-0.44
Black	11075	17.11	11200	16.79	0.32
Hispanic	2893	4.47	2926	4.39	0.08
Asian/Pacific Islander	1248	1.93	1266	1.90	0.03
Native American/Alaskan	293	0.45	311	0.47	-0.02
Other	961	1.48	978	1.47	0.01
Unknown	85	0.13	88	0.13	0.00

Table 6.5: MAP Means, Standard Deviations for Raw Scores, *p*-values, Item-Total Correlation (R_{it}): Communication Arts 2012

Grade	Total Items	Total Points	Mean Raw Score (SD)	Mean *p*-value (SD)	Mean R_{it} (SD)
3	56	61	45.98 (9.61)	0.76 (0.15)	0.38 (0.08)
4	56	61	46.05 (9.97)	0.78 (0.15)	0.40 (0.09)
5	56	60	42.68 (10.10)	0.73 (0.16)	0.38 (0.10)
6	56	60	41.96 (10.33)	0.71 (0.15)	0.38 (0.08)
7	62	66	46.33 (10.94)	0.71 (0.16)	0.36 (0.11)
8	60	64	44.13 (11.22)	0.70 (0.16)	0.38 (0.10)

Table 6.6: MAP Means, Standard Deviations for Raw Scores, *p*-values, Item-Total Correlation (R_{it}): Mathematics 2012

Grade	Total Items	Total Points	Mean Raw Score (SD)	Mean *p*-value (SD)	Mean R_{it} (SD)
3	55	59	47.25 (9.51)	0.82 (0.13)	0.40 (0.08)
4	61	65	48.43 (11.19)	0.75 (0.13)	0.39 (0.09)
5	58	62	44.96 (10.82)	0.73 (0.15)	0.38 (0.12)
6	58	62	43.25 (10.64)	0.70 (0.16)	0.38 (0.09)
7	61	65	42.33 (12.20)	0.66 (0.14)	0.38 (0.11)
8	60	64	38.21 (12.16)	0.61 (0.17)	0.38 (0.09)

Table 6.7: MAP Means, Standard Deviations for Raw Scores, *p*-values, Item-Total Correlation (R_{it}): Science 2012

Grade	Total Items	Total Points	Mean Raw Score (SD)	Mean *p*-value (SD)	Mean R_{it} (SD)
5	55	68	42.58 (11.06)	0.67 (0.19)	0.36 (0.08)
8	56	69	39.03 (11.32)	0.63 (0.23)	0.36 (0.09)

Table 6.8: Item Statistics: Grade 3

Communication Arts					Mathematics				
Session	**Item**	***p*-value**	**R_{it}**	**Omit Rate**	**Session**	**Item**	***p*-value**	**R_{it}**	**Omit Rate**
1	1	0.86	0.36	0.05	1	1	0.59	0.40	0.07
1	2	0.65	0.38	0.06	1	2	0.87	0.34	0.23
1	3	0.60	0.29	0.35	1	3	0.89	0.40	0.11
1	4	0.74	0.42	0.37	1	4	0.87	0.48	0.19
1	5	0.54	0.41	0.59	1	5	0.93	0.39	0.15
1	6A	0.82	0.44	0.60	1	6	0.88	0.34	0.14
1	6B	0.92	0.48	0.55	1	7	0.93	0.39	0.24
1	7	0.83	0.29	0.48	1	8	0.84	0.46	0.52
1	8	0.83	0.44	0.53	1	9	0.72	0.13	0.80
1	9	0.63	0.33	0.55	1	10	0.74	0.30	0.20
1	10	0.70	0.27	0.56	1	11	0.79	0.46	0.37
1	11	0.45	0.20	0.54	1	12	0.96	0.35	0.17
1	12	0.41	0.20	0.54	1	13	0.82	0.37	0.25
2	1	0.98	0.33	0.09	1	14	0.95	0.26	0.13
2	2	0.95	0.45	0.17	1	15	0.86	0.50	0.14
2	3	0.90	0.35	0.44	1	16	0.80	0.45	0.61
2	4	0.81	0.43	0.42	1	17	0.91	0.38	0.14
2	5	0.92	0.41	0.69	1	18	0.90	0.39	0.16
2	6	0.90	0.19	0.17	1	19	0.87	0.41	0.28
2	7	0.66	0.19	0.21	2	1	0.90	0.28	0.12
2	8	0.89	0.44	0.39	2	4	0.81	0.39	0.73
2	9	0.65	0.38	0.87	2	5	0.95	0.35	0.81
2	10	0.90	0.48	0.69	2	6	0.71	0.41	0.94
2	11	0.86	0.42	2.83	2	7	0.58	0.48	1.37
2	12	0.69	0.29	3.22	2	8	0.89	0.36	1.14
2	13	0.83	0.46	0.17	2	9	0.78	0.47	1.45
2	14	0.92	0.45	0.28	2	10	0.92	0.37	0.10
2	15	0.81	0.50	0.51	2	11	0.95	0.39	0.16
2	16	0.62	0.35	0.80	2	12	0.93	0.39	0.15
2	17	0.81	0.34	0.42	2	13	0.91	0.43	0.21
2	18	0.71	0.42	0.61	2	14	0.88	0.42	0.23
2	19	0.85	0.42	0.87	2	15	0.70	0.39	0.38
2	20	0.80	0.33	0.15	2	16	0.85	0.39	2.04
2	21	0.77	0.34	0.29	2	17	0.89	0.44	0.53
2	22	0.73	0.45	0.29	2	19	0.87	0.33	0.56

Table 6.8: Item Statistics: Grade 3 (Cont'd)

Communication Arts					Mathematics				
Session	**Item**	***p*-value**	**R_{it}**	**Omit Rate**	**Session**	**Item**	***p*-value**	**R_{it}**	**Omit Rate**
2	23	0.65	0.39	0.54	2	20	0.80	0.48	0.29
2	24	0.41	0.22	0.23	2	21	0.93	0.42	0.39
2	25	0.88	0.46	0.33	2	22	0.75	0.36	0.89
2	26	0.86	0.47	0.54	2	23	0.89	0.51	0.67
2	27	0.64	0.47	0.71	2	24	0.70	0.52	0.27
2	28	0.75	0.32	0.87	2	25	0.49	0.30	0.31
2	29	0.97	0.37	0.21	2	26	0.90	0.42	0.35
2	30	0.76	0.47	0.26	2	30	0.78	0.34	0.38
2	31	0.86	0.45	0.40	3	1	0.74	0.61	0.15
2	32	0.61	0.31	0.70	3	2	0.72	0.50	0.23
2	33	0.88	0.41	0.37	3	3	0.56	0.61	0.28
2	34	0.80	0.43	0.62	3	4	0.47	0.49	0.35
2	35	0.44	0.23	0.88	3	5	0.52	0.40	0.34
2	36	0.63	0.36	1.21	3	6	0.94	0.35	0.19
2	37	0.93	0.37	0.73	3	7	0.83	0.37	0.29
2	38	0.88	0.51	0.94	3	8	0.96	0.40	0.33
2	39	0.76	0.38	1.08	3	9	0.92	0.36	0.29
3	1	0.52	0.39	0.11	3	10	0.60	0.28	0.30
3	2	0.84	0.47	0.16	3	11	0.93	0.31	0.21
3	3	0.80	0.45	0.33	3	12	0.88	0.43	0.25
3	4	0.87	0.44	0.54					

Table 6.9: Item Statistics: Grade 4

Communication Arts					Mathematics				
Session	**Item**	***p*-value**	**R_{it}**	**Omit Rate**	**Session**	**Item**	***p*-value**	**R_{it}**	**Omit Rate**
1	1	0.66	0.33	0.07	1	1	0.86	0.42	0.09
1	2	0.72	0.33	0.08	1	2	0.69	0.50	0.08
1	3	0.49	0.38	0.42	1	3	0.62	0.44	0.10
1	4	0.49	0.39	0.39	1	4	0.52	0.31	0.30
1	5	0.55	0.37	0.23	1	5	0.59	0.44	0.22
1	6A	0.45	0.42	0.45	1	6	0.92	0.24	0.17
1	6B	0.93	0.46	0.44	1	7	0.59	0.46	0.34
1	7	0.91	0.39	0.17	1	8	0.77	0.26	0.27
1	8	0.56	0.19	0.24	1	9	0.65	0.49	0.53
1	9	0.59	0.34	0.23	1	10	0.69	0.35	0.15
1	10	0.75	0.38	0.83	1	11	0.80	0.52	0.27
1	11	0.75	0.36	0.87	1	12	0.72	0.33	0.11
1	12	0.21	0.05	0.87	1	13	0.95	0.27	0.17
2	1	0.93	0.40	0.10	1	14	0.74	0.48	0.41
2	2	0.86	0.47	0.12	1	15	0.51	0.25	0.39
2	3	0.81	0.45	0.11	1	16	0.73	0.12	0.95
2	4	0.90	0.43	0.18	1	17	0.56	0.41	0.13
2	5	0.73	0.44	0.23	1	18	0.75	0.50	0.31
2	6	0.82	0.50	0.72	1	19	0.63	0.49	0.19
2	7	0.94	0.40	0.14	1	20	0.58	0.25	0.23
2	8	0.78	0.48	0.45	1	21	0.62	0.46	0.23
2	9	0.65	0.37	0.29	2	1	0.87	0.23	0.15
2	10	0.86	0.50	0.52	2	2	0.73	0.37	0.31
2	11	0.95	0.31	0.40	2	3	0.70	0.36	0.87
2	12	0.92	0.36	0.42	2	4	0.58	0.43	1.36
2	13	0.80	0.30	0.53	2	5	0.69	0.50	0.73
2	14	0.88	0.49	0.88	2	6	0.77	0.34	0.88
2	15	0.78	0.40	1.12	2	8	0.84	0.27	1.69
2	16	0.76	0.43	1.31	2	9	0.79	0.56	2.11
2	17	0.70	0.28	1.66	2	10	0.79	0.43	2.28
2	18	0.67	0.31	1.81	2	12	0.86	0.37	0.14
2	19	0.74	0.43	1.94	2	13	0.75	0.36	0.30
2	20	0.87	0.50	0.11	2	14	0.92	0.25	0.12
2	21	0.96	0.43	0.19	2	15	0.89	0.28	0.19
2	22	0.89	0.52	0.21	2	16	0.89	0.34	0.19

Table 6.9: Item Statistics: Grade 4 (Cont'd)

Communication Arts					Mathematics				
Session	**Item**	***p*-value**	**R_{it}**	**Omit Rate**	**Session**	**Item**	***p*-value**	**R_{it}**	**Omit Rate**
2	23	0.53	0.25	0.34	2	18	0.80	0.48	0.29
2	24	0.83	0.41	1.24	2	19	0.86	0.36	0.23
2	25	0.96	0.45	0.20	2	20	0.86	0.28	0.17
2	26	0.96	0.45	0.15	2	21	0.90	0.39	0.31
2	27	0.91	0.50	0.22	2	22	0.72	0.42	0.42
2	28	0.61	0.40	0.27	2	23	0.95	0.41	0.30
2	29	0.83	0.53	4.41	2	24	0.84	0.51	0.88
2	30	0.81	0.31	0.21	2	25	0.92	0.39	0.23
2	31	0.68	0.38	0.75	2	26	0.90	0.41	0.35
2	32	0.73	0.46	0.43	2	27	0.70	0.33	0.29
2	33	0.76	0.57	0.38	2	30	0.84	0.40	0.90
2	34	0.79	0.36	0.49	2	31	0.85	0.43	0.21
2	35	0.76	0.49	1.26	3	1	0.74	0.52	0.14
2	36	0.92	0.29	0.79	3	2	0.82	0.36	0.31
2	37	0.88	0.49	0.64	3	3	0.82	0.44	0.22
2	38	0.87	0.50	0.77	3	4	0.51	0.50	0.27
2	39	0.87	0.51	0.85	3	5	0.93	0.34	0.23
3	1	0.80	0.47	0.15	3	6	0.60	0.38	0.40
3	2	0.86	0.32	0.22	3	7	0.82	0.45	0.70
3	3	0.93	0.43	0.30	3	8	0.94	0.28	0.25
3	4	0.86	0.46	0.31	3	9	0.76	0.35	0.44
					3	10	0.61	0.41	0.97
					3	11	0.54	0.33	0.89
					3	12	0.74	0.34	0.22
					3	13	0.55	0.44	0.50
					3	14	0.69	0.55	0.35

Table 6.10: Item Statistics: Grade 5

Communication Arts					Mathematics					Science				
Session	Item	*p*-value	R_{it}	Omit Rate	Session	Item	*p*-value	R_{it}	Omit Rate	Session	Item	*p*-value	R_{it}	Omit Rate
1	1	0.60	0.27	0.04	1	1	0.84	0.36	0.07	1	1	0.82	0.34	0.15
1	2	0.69	0.21	0.08	1	2	0.70	0.43	0.15	1	2	0.44	0.41	0.74
1	3	0.57	0.37	0.22	1	3	0.60	0.43	0.25	1	3	0.72	0.41	0.17
1	4	0.71	0.43	0.21	1	4	0.55	0.50	0.20	1	4	0.54	0.51	0.14
1	5	0.33	0.37	0.21	1	5	0.30	0.06	0.25	1	5	0.51	0.51	0.12
1	6A	0.41	0.44	0.35	1	6	0.53	0.26	0.13	1	6	0.45	0.43	0.35
1	6B	0.75	0.10	0.34	1	7	0.61	0.29	0.17	1	7	0.44	0.42	0.58
1	7	0.86	0.38	0.16	1	8	0.74	0.30	0.08	1	8	0.31	0.28	0.73
1	8	0.54	0.33	0.25	1	9	0.40	0.24	0.23	1	9	0.30	0.38	0.26
1	9	0.60	0.29	0.28	1	10	0.83	0.35	0.23	1	10	0.22	0.40	0.70
1	10	0.63	0.36	0.45	1	11	0.75	0.57	0.08	1	11	0.17	0.38	0.56
1	11	0.43	0.29	0.48	1	12	0.79	0.53	0.25	1	12	0.39	0.51	0.19
1	12	0.46	0.12	0.50	1	13	0.60	0.24	0.23	1	13	0.71	0.53	0.22
2	1	0.67	0.29	0.13	1	14	0.72	0.55	0.16	2	2	0.97	0.19	0.12
2	2	0.50	0.32	0.28	1	15	0.88	0.39	0.14	2	3	0.90	0.35	0.13
2	3	0.91	0.40	0.25	1	16	0.74	0.26	0.19	2	4	0.94	0.30	0.11
2	4	0.91	0.34	0.19	1	17	0.89	0.33	0.16	2	5	0.90	0.17	0.19
2	5	0.74	0.39	0.43	1	18	0.62	0.45	0.26	2	6	0.79	0.38	0.48
2	6	0.87	0.40	0.56	1	19	0.79	0.34	0.20	2	7	0.74	0.31	0.34
2	7	0.76	0.42	0.70	1	20	0.90	0.33	0.09	2	8	0.73	0.33	0.40
2	8	0.71	0.46	0.99	1	21	0.90	0.34	0.18	2	9	0.73	0.23	0.33
2	9	0.85	0.52	1.36	1	22	0.55	0.38	0.23	2	10	0.77	0.51	0.73
2	10	0.75	0.51	4.74	2	1	0.78	0.38	0.14	2	11	0.75	0.46	1.42
2	11	0.53	0.38	2.05	2	2	0.53	0.32	0.21	2	12	0.82	0.31	0.20
2	12	0.87	0.51	2.52	2	3	0.84	0.39	1.96	2	14	0.70	0.37	0.77
2	14	0.91	0.39	4.21	2	4	0.53	0.32	0.21	2	15	0.70	0.30	0.55
2	15	0.76	0.41	4.81	2	5	0.65	0.34	0.46	2	16	0.64	0.32	0.72
2	16	0.81	0.34	5.92	2	6	0.61	0.44	0.50	2	17	0.66	0.21	0.29
2	17	0.96	0.35	6.26	2	7	0.62	0.47	0.79	2	18	0.76	0.34	0.40
2	18	0.74	0.49	0.14	2	9	0.67	0.50	1.63	2	19	0.67	0.31	0.31
2	19	0.82	0.35	0.19	2	10	0.63	0.19	0.16	2	20	0.73	0.31	0.50
2	20	0.94	0.44	0.20	2	11	0.93	0.24	0.19	2	21	0.62	0.30	0.54
2	21	0.85	0.51	0.32	2	12	0.86	0.39	0.22	2	22	0.71	0.27	0.40
2	22	0.79	0.50	0.23	2	13	0.46	0.35	0.46	2	24	0.53	0.32	0.46
2	23	0.56	0.39	0.28	2	14	0.64	0.61	0.23	2	25	0.45	0.34	0.55

Table 6.10: Item Statistics: Grade 5 (Cont'd)

Communication Arts					Mathematics					Science				
Session	Item	*p*-value	R_{it}	Omit Rate	Session	Item	*p*-value	R_{it}	Omit Rate	Session	Item	*p*-value	R_{it}	Omit Rate
2	24	0.79	0.46	0.39	2	15	0.89	0.46	0.58	2	26	0.84	0.46	0.16
2	25	0.98	0.27	0.20	2	19	0.81	0.37	0.37	2	27	0.90	0.31	0.14
2	26	0.93	0.39	0.28	2	21	0.83	0.54	0.36	2	28	0.70	0.34	1.47
2	27	0.65	0.32	0.38	2	22	0.99	0.22	0.36	2	29	0.91	0.26	0.15
2	28	0.31	0.06	0.35	2	23	0.67	0.44	0.23	2	30	0.92	0.37	0.35
2	29	0.92	0.41	0.21	2	25	0.74	0.47	0.20	2	31	0.82	0.34	0.26
2	30	0.88	0.51	0.37	2	26	0.98	0.25	0.31	2	32	0.83	0.46	0.48
2	31	0.74	0.43	0.21	2	29	0.93	0.30	0.35	2	33	0.79	0.41	0.29
2	32	0.91	0.42	0.24	2	30	0.91	0.30	0.30	2	34	0.62	0.25	0.31
2	33	0.70	0.45	0.36	3	1	0.87	0.54	0.25	2	35	0.44	0.30	1.04
2	34	0.71	0.39	0.30	3	2	0.60	0.39	0.25	2	36	0.62	0.41	1.38
2	35	0.72	0.44	0.41	3	3	0.74	0.63	0.53	2	37	0.78	0.31	0.34
2	36	0.76	0.49	0.52	3	4	0.75	0.62	0.53	2	38	0.59	0.32	0.21
2	37	0.79	0.46	0.81	3	5	0.88	0.33	0.24	2	39	0.61	0.36	1.01
2	38	0.75	0.47	0.62	3	6	0.77	0.27	0.24	2	40	0.53	0.28	1.25
2	39	0.72	0.39	0.88	3	7	0.87	0.52	0.50	2	41	0.46	0.41	2.64
3	1	0.88	0.39	0.47	3	8	0.83	0.36	0.46	2	42	0.73	0.44	0.20
3	2	0.86	0.42	1.49	3	9	0.44	0.26	0.43	2	43	0.79	0.31	0.55
3	3	0.80	0.40	0.16	3	10	0.83	0.54	0.33	2	44	0.83	0.49	0.27
3	4	0.69	0.33	0.21	3	11	0.89	0.40	0.34	2	45	0.79	0.38	0.26
3	5	0.78	0.37	0.19	3	12	0.74	0.36	0.66					
					3	13	0.50	0.26	0.29					
					3	14	0.72	0.48	0.31					

Table 6.11: Item Statistics: Grade 6

Communication Arts					Mathematics				
Session	**Item**	***p*-value**	**R_{it}**	**Omit Rate**	**Session**	**Item**	***p*-value**	**R_{it}**	**Omit Rate**
1	1	0.82	0.34	0.07	1	1	0.87	0.36	0.11
1	2	0.79	0.39	0.07	1	2	0.61	0.27	0.29
1	3	0.76	0.40	0.22	1	3	0.68	0.28	0.14
1	4	0.46	0.34	0.16	1	4	0.68	0.26	0.37
1	5A	0.55	0.48	0.75	1	5	0.78	0.43	0.22
1	5B	0.71	0.39	0.70	1	6	0.70	0.21	0.26
1	6	0.58	0.43	0.58	1	7	0.81	0.24	0.35
1	7	0.65	0.29	0.28	1	8	0.91	0.36	0.11
1	8	0.61	0.26	0.30	1	9	0.64	0.51	0.18
1	9	0.49	0.29	0.41	1	10	0.78	0.34	0.13
1	10	0.83	0.38	0.30	1	11	0.74	0.45	0.23
1	11	0.54	0.14	0.34	1	12	0.81	0.47	0.28
1	12	0.61	0.37	0.32	1	13	0.75	0.36	0.29
2	1	0.65	0.41	0.12	1	14	0.62	0.41	0.21
2	2	0.90	0.31	0.25	1	15	0.52	0.30	0.73
2	3	0.92	0.34	0.11	1	16	0.43	0.38	0.17
2	4	0.64	0.45	0.18	1	17	0.66	0.22	0.14
2	5	0.48	0.32	0.14	1	18	0.52	0.33	0.20
2	6	0.42	0.30	0.16	1	19	0.63	0.37	0.20
2	7	0.81	0.46	0.29	2	1	0.83	0.23	0.10
2	8	0.76	0.35	0.37	2	2	0.82	0.30	0.17
2	9	0.88	0.34	0.16	2	3	0.76	0.46	1.40
2	10	0.63	0.25	0.17	2	4	0.68	0.41	0.28
2	11	0.87	0.34	0.20	2	5	0.69	0.41	0.60
2	12	0.87	0.26	0.16	2	6	0.73	0.47	0.60
2	13	0.77	0.40	0.29	2	7	0.73	0.41	1.01
2	14	0.85	0.35	0.33	2	8	0.43	0.41	1.13
2	15	0.77	0.47	0.49	2	9	0.59	0.24	1.70
2	16	0.86	0.48	0.62	2	10	0.88	0.31	0.10
2	17	0.90	0.45	0.71	2	11	0.89	0.43	0.12
2	18	0.78	0.51	0.68	2	12	0.47	0.45	0.16
2	19	0.55	0.48	0.98	2	13	0.58	0.50	0.25
2	20	0.87	0.44	0.99	2	14	0.82	0.49	0.54
2	21	0.70	0.41	1.25	2	15	0.79	0.50	0.61
2	22	0.52	0.24	1.47	2	16	0.91	0.41	0.22

Table 6.11: Item Statistics: Grade 6 (Cont'd)

Communication Arts					Mathematics				
Session	**Item**	***p*-value**	**R_{it}**	**Omit Rate**	**Session**	**Item**	***p*-value**	**R_{it}**	**Omit Rate**
2	23	0.77	0.33	1.76	2	17	0.93	0.22	0.21
2	24	0.86	0.51	0.25	2	19	0.57	0.48	0.45
2	25	0.77	0.21	0.29	2	20	0.44	0.42	0.36
2	26	0.89	0.47	0.46	2	22	0.62	0.36	0.33
2	27	0.49	0.32	3.04	2	23	0.86	0.42	0.36
2	28	0.82	0.38	4.43	2	25	0.92	0.38	0.49
2	29	0.66	0.39	0.28	2	26	0.51	0.40	0.35
2	30	0.89	0.47	0.51	2	27	0.93	0.39	0.26
2	31	0.54	0.31	0.33	2	28	0.67	0.44	0.28
2	32	0.52	0.37	0.52	2	31	0.68	0.50	0.42
2	33	0.80	0.43	0.65	3	1	0.42	0.34	0.49
2	34	0.65	0.45	0.74	3	2	0.80	0.47	0.22
2	35	0.79	0.48	0.84	3	3	0.51	0.52	0.35
2	36	0.54	0.28	0.85	3	4	0.83	0.43	0.39
2	37	0.87	0.41	1.14	3	5	0.77	0.50	0.26
2	38	0.59	0.37	1.38	3	6	0.94	0.30	0.27
2	39	0.66	0.37	1.66	3	7	0.34	0.25	0.48
3	1	0.80	0.38	0.18	3	8	0.37	0.27	0.38
3	2	0.41	0.35	0.19	3	9	0.63	0.10	0.38
3	3	0.85	0.39	0.19	3	10	0.70	0.39	0.39
3	4	0.89	0.42	0.19	3	11	0.86	0.47	0.30
					3	12	0.90	0.39	0.35
					3	13	0.94	0.37	0.46

Table 6.12: Item Statistics: Grade 7

Communication Arts					Mathematics				
Session	**Item**	***p*-value**	**R_{it}**	**Omit Rate**	**Session**	**Item**	***p*-value**	**R_{it}**	**Omit Rate**
1	1	0.67	0.18	0.07	1	1	0.64	0.30	0.16
1	2	0.73	0.37	0.08	1	2	0.60	0.24	0.15
1	3	0.57	0.42	0.52	1	3	0.77	0.38	0.11
1	4	0.50	0.41	0.45	1	4	0.50	0.24	0.34
1	5A	0.71	0.44	1.37	1	5	0.83	0.26	0.19
1	5B	0.72	0.43	1.37	1	6	0.61	0.42	0.22
1	6A	0.71	0.53	0.81	1	7	0.57	0.36	0.26
1	6B	0.86	0.38	0.81	1	8	0.83	0.36	0.21
1	7	0.84	0.32	0.14	1	9	0.48	0.43	0.34
1	8	0.82	0.26	0.29	1	10	0.54	0.22	0.22
1	9	0.81	0.32	0.18	1	11	0.55	0.49	0.20
1	10	0.55	0.19	1.55	1	12	0.67	0.48	0.27
1	11	0.60	0.38	0.26	1	13	0.57	0.32	0.18
1	12	0.74	0.42	0.41	1	14	0.40	0.23	0.27
1	13	0.50	0.27	0.64	1	15	0.78	0.49	0.15
1	14	0.20	0.12	0.61	1	16	0.69	0.50	0.20
1	15	0.36	0.03	0.51	1	17	0.67	0.43	0.22
1	16	0.37	0.23	0.60	1	18	0.45	0.27	0.40
2	1	0.95	0.35	0.13	2	1	0.80	0.28	0.16
2	2	0.97	0.30	0.10	2	2	0.68	0.44	0.33
2	3	0.52	0.16	0.14	2	3	0.57	0.47	1.01
2	4	0.93	0.30	0.15	2	4	0.57	0.52	1.06
2	5	0.93	0.27	0.13	2	5	0.69	0.47	0.21
2	6	0.79	0.31	0.16	2	6	0.75	0.49	0.43
2	7	0.94	0.40	0.20	2	7	0.69	0.43	1.16
2	8	0.88	0.30	0.10	2	8	0.74	0.34	0.73
2	9	0.65	0.31	0.17	2	9	0.75	0.50	1.19
2	10	0.71	0.23	0.37	2	10	0.84	0.37	0.24
2	11	0.86	0.25	0.15	2	11	0.75	0.46	0.15
2	12	0.54	0.30	0.18	2	12	0.77	0.52	0.21
2	13	0.89	0.39	0.22	2	13	0.82	0.38	0.33
2	14	0.73	0.38	0.41	2	14	0.71	0.45	0.52
2	15	0.86	0.40	0.44	2	15	0.72	0.20	0.56
2	16	0.66	0.37	0.66	2	16	0.96	0.13	0.16
2	17	0.49	0.25	0.67	2	17	0.59	0.47	1.84

Table 6.12: Item Statistics: Grade 7 (Cont'd)

Communication Arts					Mathematics				
Session	**Item**	***p*-value**	**R_{it}**	**Omit Rate**	**Session**	**Item**	***p*-value**	**R_{it}**	**Omit Rate**
2	18	0.84	0.50	0.63	2	18	0.86	0.28	0.21
2	19	0.80	0.46	0.71	2	19	0.79	0.42	0.35
2	20	0.63	0.45	0.83	2	20	0.85	0.43	0.50
2	21	0.79	0.52	0.90	2	21	0.78	0.39	1.28
2	22	0.61	0.37	1.02	2	22	0.60	0.34	0.37
2	23	0.69	0.37	1.14	2	23	0.84	0.25	0.35
2	24	0.78	0.36	0.97	2	25	0.67	0.33	0.23
2	25	0.82	0.21	0.56	2	26	0.54	0.52	0.26
2	26	0.57	0.22	0.26	2	27	0.85	0.32	0.19
2	27	0.87	0.49	0.27	2	28	0.71	0.40	0.28
2	28	0.81	0.34	0.22	2	29	0.52	0.15	0.55
2	29	0.71	0.51	0.77	2	30	0.95	0.30	0.25
2	30	0.82	0.39	0.21	2	31	0.56	0.36	0.19
2	31	0.78	0.38	0.34	2	32	0.61	0.54	0.28
2	32	0.81	0.41	0.39	3	1	0.46	0.51	0.46
2	33	0.65	0.39	0.35	3	2	0.53	0.59	1.11
2	34	0.68	0.45	0.53	3	3	0.37	0.51	1.36
2	35	0.67	0.37	1.09	3	4	0.61	0.64	0.59
2	36	0.84	0.50	0.53	3	5	0.58	0.12	0.28
2	37	0.73	0.41	0.55	3	6	0.66	0.33	0.24
2	38	0.75	0.47	0.59	3	7	0.53	0.36	0.56
2	39	0.70	0.48	0.99	3	8	0.69	0.38	0.20
3	1	0.50	0.36	0.20	3	9	0.86	0.46	0.26
3	2	0.36	0.27	0.20	3	10	0.55	0.40	0.54
3	3	0.80	0.51	0.32	3	11	0.47	0.24	0.39
3	4	0.76	0.43	0.18	3	12	0.54	0.41	0.36
3	5	0.75	0.47	0.34					

Table 6.13: Item Statistics: Grade 8

Communication Arts					Mathematics					Science				
Session	Item	*p*-value	R_{it}	Omit Rate	Session	Item	*p*-value	R_{it}	Omit Rate	Session	Item	*p*-value	R_{it}	Omit Rate
1	1	0.87	0.46	0.08	1	1	0.77	0.33	0.16	1	1	0.20	0.42	0.90
1	2	0.89	0.42	0.14	1	2	0.34	0.08	0.18	1	2	0.69	0.57	4.65
1	3	0.70	0.37	0.55	1	3	0.82	0.17	0.13	1	3	0.26	0.44	1.12
1	4	0.35	0.40	0.59	1	4	0.61	0.24	0.17	1	4	0.37	0.43	3.24
1	5	0.63	0.52	0.78	1	5	0.53	0.46	0.27	1	5	0.34	0.53	0.21
1	6A	0.78	0.47	0.96	1	6	0.50	0.39	0.21	1	6	0.33	0.37	1.61
1	6B	0.58	0.14	0.96	1	7	0.15	0.32	0.27	1	7	0.39	0.55	4.99
1	7	0.60	0.38	0.16	1	8	0.93	0.36	0.22	1	8	0.59	0.39	2.15
1	8	0.40	0.36	0.56	1	9	0.79	0.26	0.22	1	9	0.24	0.26	2.05
1	9	0.75	0.44	0.19	1	10	0.53	0.25	0.40	1	10	0.19	0.43	1.16
1	10	0.66	0.35	1.32	1	11	0.65	0.39	0.17	1	11	0.38	0.46	4.81
1	11	0.56	0.24	2.03	1	12	0.52	0.35	0.13	1	12	0.15	0.38	3.25
1	12	0.58	0.28	0.27	1	13	0.61	0.42	0.62	1	13	0.14	0.36	2.27
1	13	0.45	0.20	0.64	1	14	0.44	0.34	0.28	2	1	0.90	0.21	0.14
1	14	0.49	0.26	0.77	1	15	0.64	0.46	0.20	2	2	0.93	0.30	0.14
1	15	0.23	0.19	0.27	1	16	0.50	0.36	0.27	2	3	0.90	0.40	0.17
1	16	0.47	0.12	0.31	1	17	0.74	0.42	0.27	2	4	0.90	0.28	0.15
2	1	0.55	0.22	0.19	1	18	0.43	0.34	0.15	2	5	0.97	0.26	0.15
2	2	0.86	0.32	0.13	1	19	0.68	0.52	0.28	2	6	0.83	0.35	0.22
2	3	0.65	0.28	0.24	2	1	0.58	0.31	0.25	2	7	0.73	0.33	0.21
2	4	0.83	0.36	0.14	2	2	0.79	0.43	0.20	2	8	0.69	0.36	0.22
2	5	0.85	0.47	0.47	2	3	0.66	0.41	0.52	2	9	0.84	0.34	0.32
2	6	0.83	0.39	0.19	2	4	0.84	0.39	0.15	2	10	0.88	0.35	0.37
2	7	0.70	0.43	0.23	2	5	0.65	0.38	0.30	2	11	0.74	0.34	0.25
2	8	0.66	0.36	0.25	2	6	0.74	0.40	0.29	2	12	0.77	0.36	0.29
2	9	0.66	0.45	0.29	2	9	0.79	0.45	0.15	2	13	0.71	0.47	0.26
2	10	0.84	0.35	0.21	2	10	0.81	0.37	0.21	2	14	0.76	0.37	0.31
2	11	0.87	0.47	0.22	2	11	0.81	0.41	0.30	2	15	0.82	0.47	0.32
2	12	0.84	0.16	0.33	2	12	0.82	0.41	0.26	2	16	0.66	0.51	0.33
2	13	0.73	0.53	0.46	2	13	0.72	0.43	0.36	2	17	0.78	0.26	0.24
2	15	0.81	0.44	0.22	2	14	0.74	0.48	1.30	2	18	0.60	0.38	5.15
2	16	0.75	0.46	0.21	2	15	0.60	0.55	0.36	2	20	0.74	0.43	0.53
2	17	0.49	0.20	0.22	2	16	0.55	0.35	0.23	2	21	0.61	0.30	0.45
2	18	0.92	0.40	0.26	2	17	0.98	0.17	0.18	2	22	0.53	0.46	0.90
2	19	0.57	0.37	0.66	2	18	0.78	0.35	0.28	2	23	0.93	0.27	0.54

Table 6.13: Item Statistics: Grade 8 (Cont'd)

Communication Arts					Mathematics					Science				
Session	Item	*p*-value	R_{it}	Omit Rate	Session	Item	*p*-value	R_{it}	Omit Rate	Session	Item	*p*-value	R_{it}	Omit Rate
2	20	0.86	0.42	0.28	2	19	0.36	0.46	0.33	2	25	0.54	0.27	0.34
2	21	0.73	0.44	0.42	2	20	0.74	0.43	0.40	2	26	0.88	0.37	0.19
2	22	0.67	0.38	0.22	2	21	0.76	0.36	0.74	2	27	0.93	0.35	0.21
2	23	0.88	0.37	0.23	2	22	0.57	0.46	1.58	2	28	0.86	0.33	0.21
2	24	0.82	0.35	0.34	2	23	0.78	0.37	0.20	2	29	0.83	0.38	0.25
2	25	0.79	0.42	0.22	2	24	0.62	0.42	0.39	2	30	0.63	0.36	0.40
2	26	0.61	0.42	0.40	2	25	0.54	0.39	0.68	2	31	0.55	0.41	0.58
2	27	0.59	0.41	0.43	2	26	0.51	0.51	0.82	2	32	0.69	0.33	0.70
2	28	0.82	0.42	0.20	2	27	0.61	0.32	0.42	2	33	0.52	0.28	0.43
2	29	0.91	0.37	0.28	2	28	0.52	0.54	0.36	2	34	0.50	0.13	0.33
2	30	0.75	0.52	0.28	2	29	0.44	0.39	0.44	2	35	0.83	0.42	0.43
2	31	0.84	0.49	0.41	2	31	0.52	0.43	0.47	2	36	0.64	0.41	0.78
2	32	0.70	0.52	1.24	3	1	0.29	0.54	1.24	2	37	0.72	0.40	0.41
2	33	0.85	0.50	1.78	3	2	0.50	0.50	2.74	2	38	0.66	0.41	0.63
2	34	0.94	0.35	0.32	3	3	0.42	0.45	0.49	2	39	0.78	0.37	0.72
2	35	0.95	0.35	0.37	3	4	0.65	0.42	0.53	2	40	0.70	0.49	2.91
2	36	0.78	0.49	0.43	3	5	0.48	0.27	0.35	2	41	0.34	0.33	3.13
2	37	0.67	0.38	0.52	3	6	0.56	0.34	0.26	2	42	0.38	0.21	3.34
2	38	0.68	0.37	0.57	3	7	0.70	0.27	0.21	2	43	0.60	0.22	0.48
2	39	0.56	0.42	0.70	3	8	0.70	0.49	0.27	2	44	0.58	0.13	0.31
3	1	0.68	0.40	0.22	3	9	0.37	0.32	0.33	2	45	0.55	0.39	0.37
3	2	0.62	0.38	0.27	3	10	0.42	0.40	0.72					
3	3	0.54	0.37	0.34	3	11	0.70	0.44	0.32					
3	4	0.51	0.30	0.34	3	12	0.45	0.33	0.34					
3	5	0.70	0.45	0.36	3	13	0.32	0.29	0.29					

Table 6.14: Item Fit Statistics for Misfitting Items

Content	Grade	Session	Item	Chi-Square	DF	Total N	Z	Ob-served	Pre-dicted	Obs-Pred
CA	3	2	34	692.55	7	64350	183.22	0.80	0.81	-0.01
CA	4	2	30	1326.06	7	64369	352.53	0.81	0.82	0.00
CA	5	1	3	1404.34	17	64979	237.93	0.57	0.57	0.00
CA	7	2	28	689.40	7	64751	182.38	0.81	0.81	0.00
CA	8	2	7	689.05	7	64557	182.28	0.70	0.71	0.00
CA	8	2	12	892.40	7	64491	236.63	0.84	0.84	0.00
MA	3	3	4	2333.66	17	63624	397.30	0.46	0.47	-0.01
MA	5	3	3	1774.64	17	64734	301.43	0.74	0.74	0.00
MA	6	1	17	671.16	7	65473	177.50	0.66	0.66	0.00
MA	6	3	1	3682.05	17	65242	628.55	0.42	0.42	0.00
MA	7	3	1	1648.08	17	64579	279.73	0.46	0.46	0.00
SC	5	1	4	1165.26	17	65132	196.92	0.54	0.54	0.00
SC	8	1	9	1063.96	17	63401	179.55	0.24	0.24	0.00

Table 6.15: LOSS and HOSS Values by Grade and Content Area

Grade	Communication Arts		Mathematics		Science	
	LOSS	HOSS	LOSS	HOSS	LOSS	HOSS
3	455	790	450	780		
4	470	820	465	805		
5	485	840	480	830	470	855
6	505	855	495	845		
7	515	865	510	860		
8	530	875	525	885	540	895

Figure 6.1: Item Characteristic Curve for Grade 3 Communication Arts, Session 2 Item 34

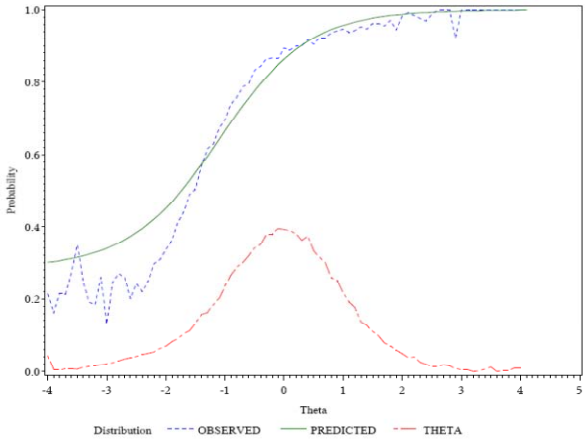


Figure 6.2: Item Characteristic Curve for Grade 4 Communication Arts, Session 2 Item 30

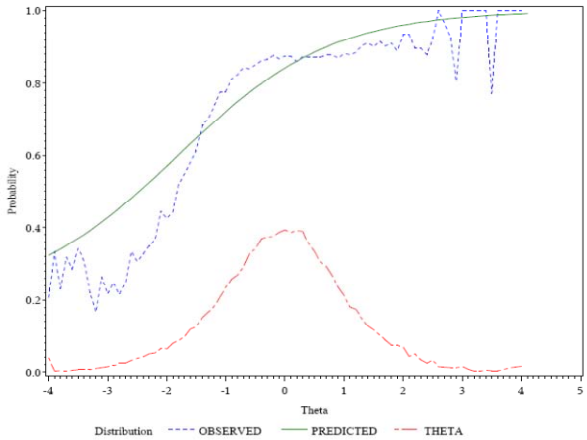


Figure 6.3: Item Characteristic Curve for Grade 5 Communication Arts, Session 1 Item 3

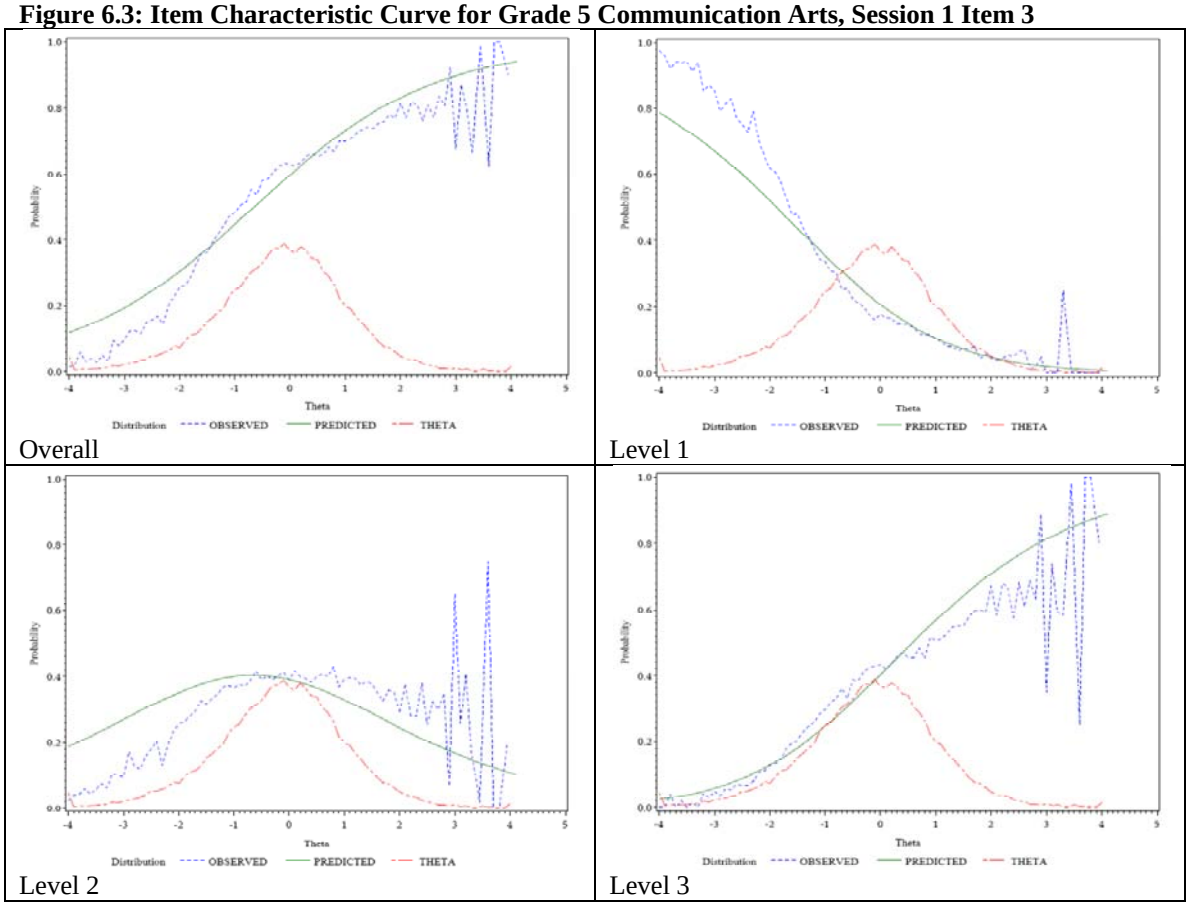


Figure 6.4: Item Characteristic Curve for Grade 7 Communication Arts, Session 2 Item 28

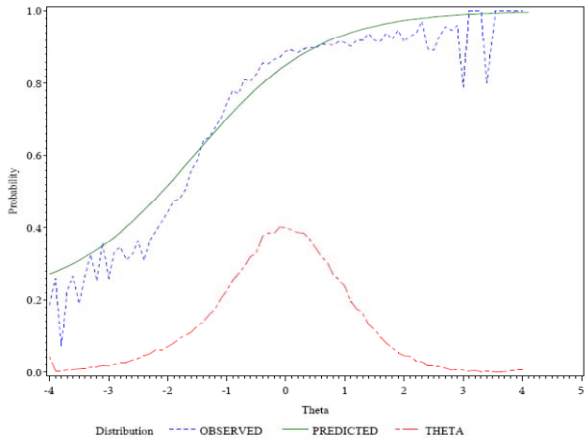


Figure 6.5: Item Characteristic Curve for Grade 8 Communication Arts, Session 2 Item 7

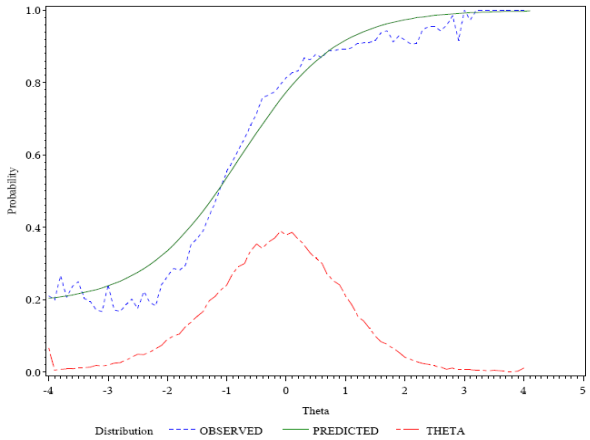


Figure 6.6: Item Characteristic Curve for Grade 8 Communication Arts, Session 2 Item 12

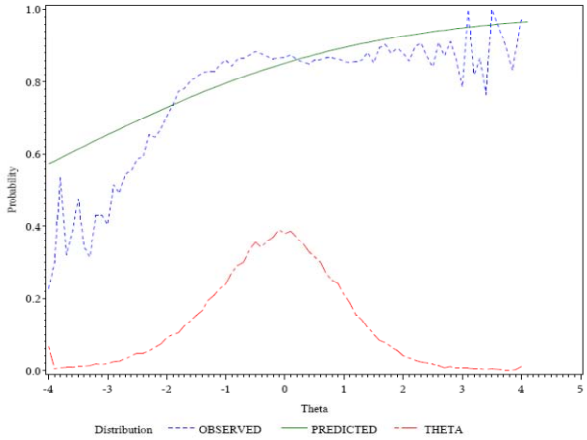


Figure 6.7: Item Characteristic Curve for Grade 3 Mathematics, Session 3 Item 4

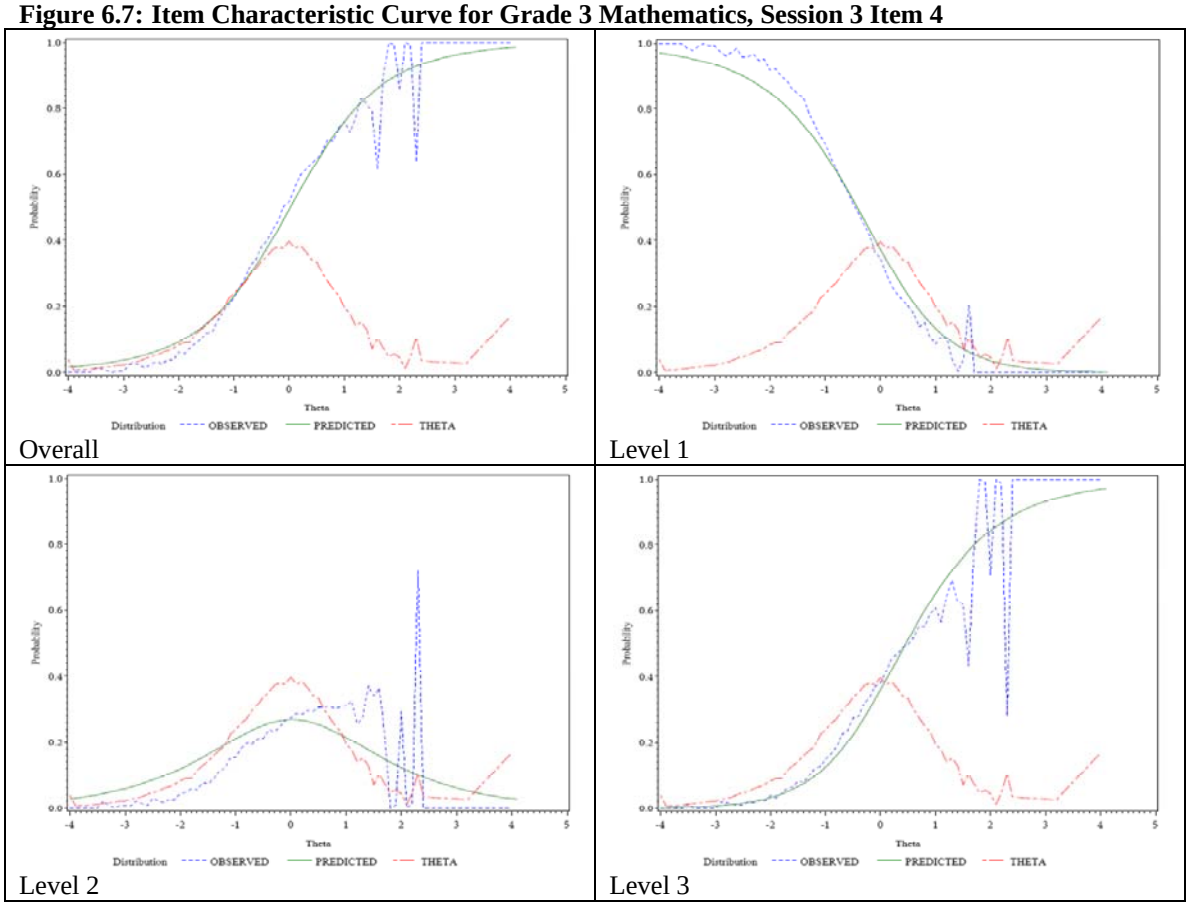


Figure 6.8: Item Characteristic Curve for Grade 5 Mathematics, Session 3 Item 3

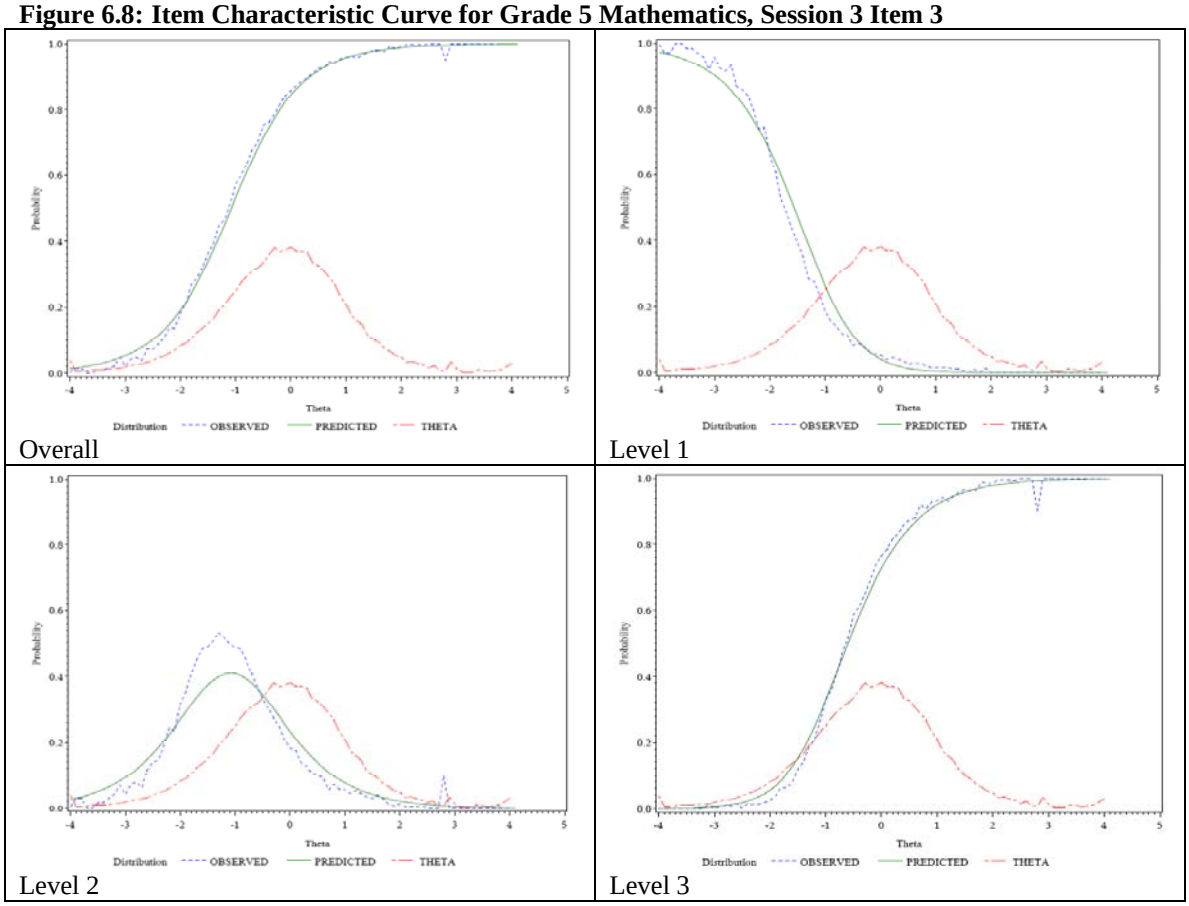


Figure 6.9: Item Characteristic Curve for Grade 6 Mathematics, Session 1 Item 17

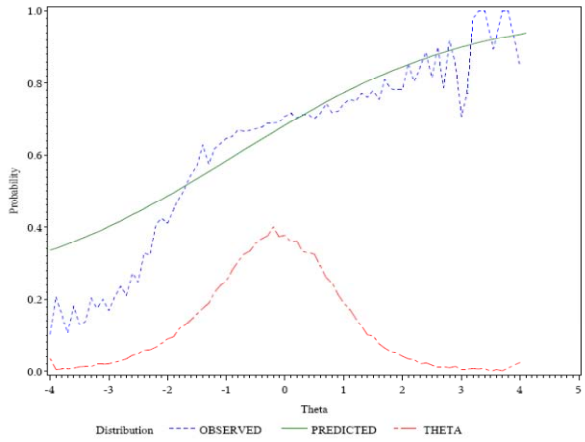


Figure 6.10: Item Characteristic Curve for Grade 6 Mathematics, Session 3 Item 1

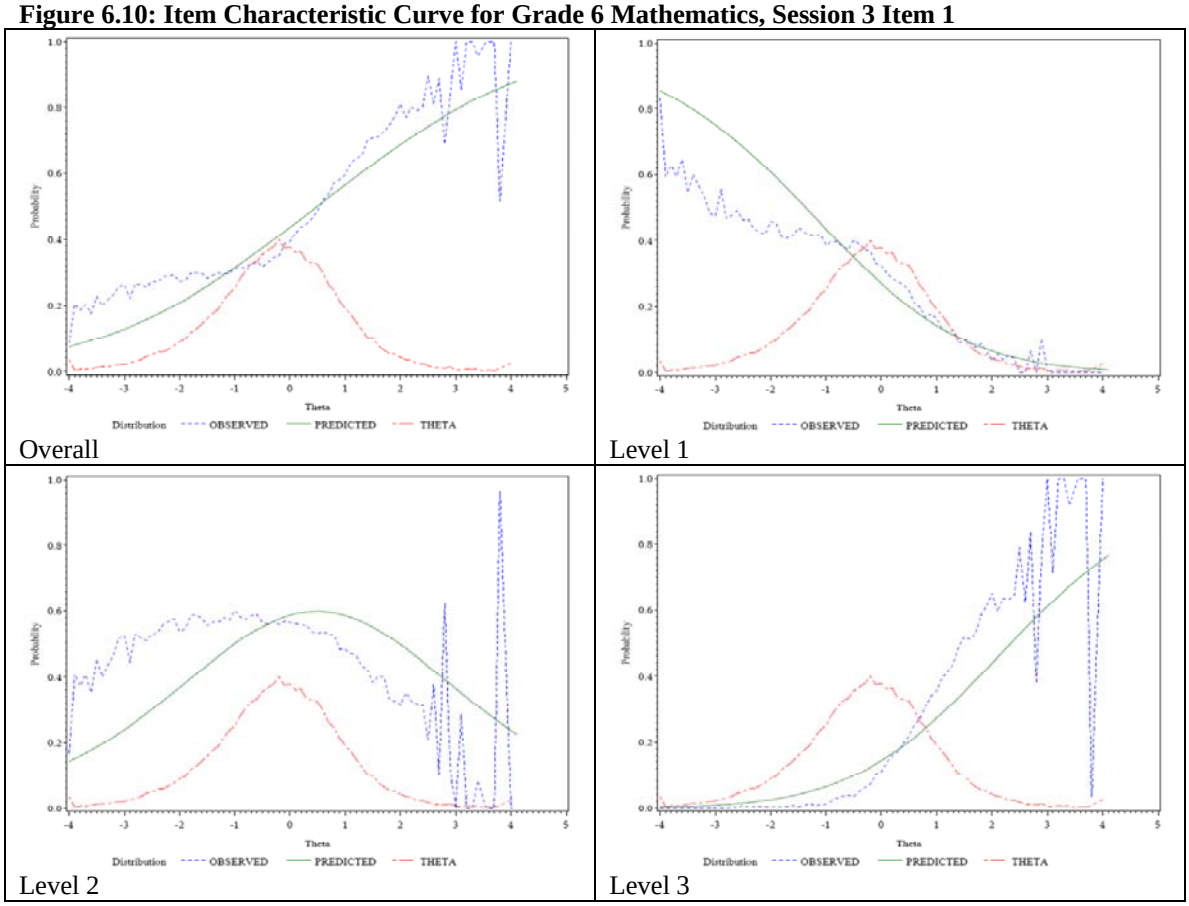


Figure 6.11: Item Characteristic Curve for Grade 7 Mathematics, Session 3 Item 1

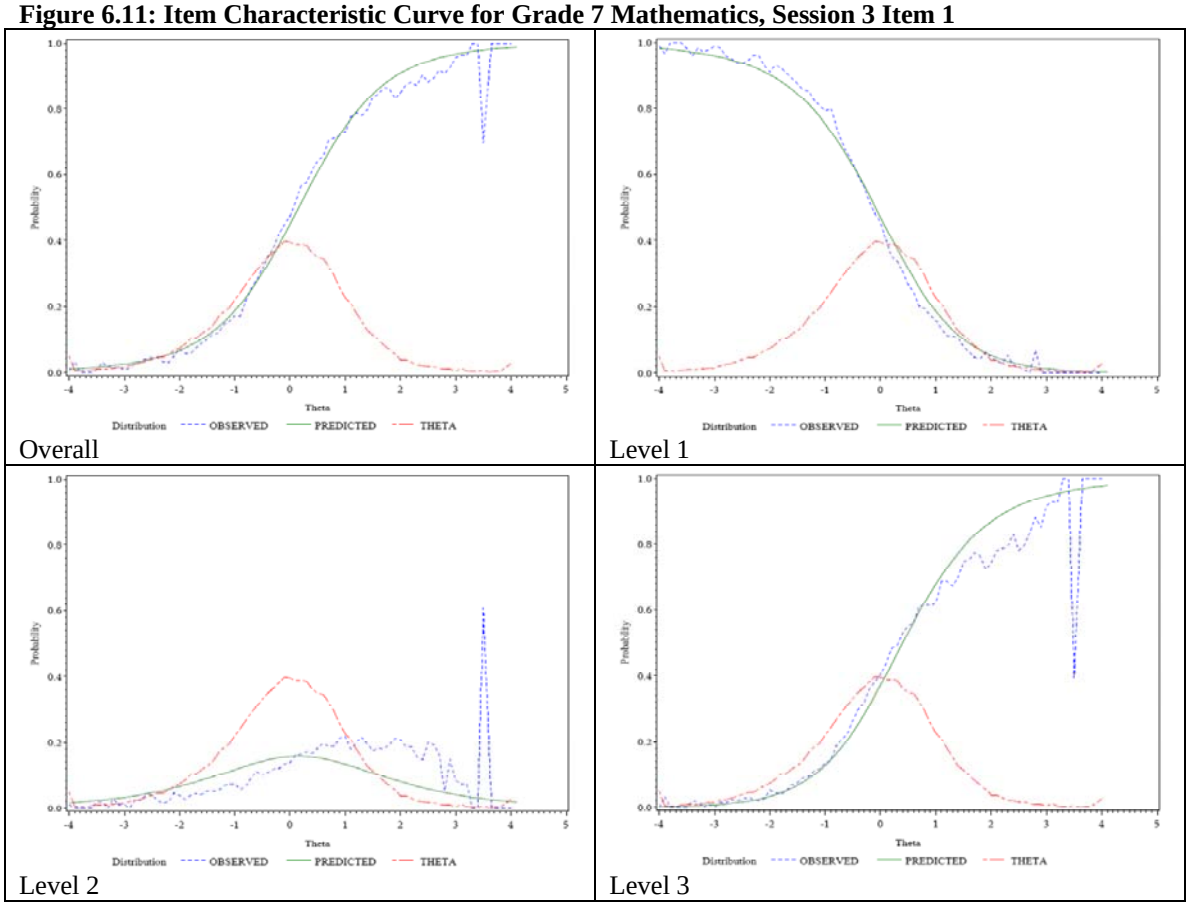


Figure 6.12: Item Characteristic Curve for Grade 5 Science, Session 1 Item 4

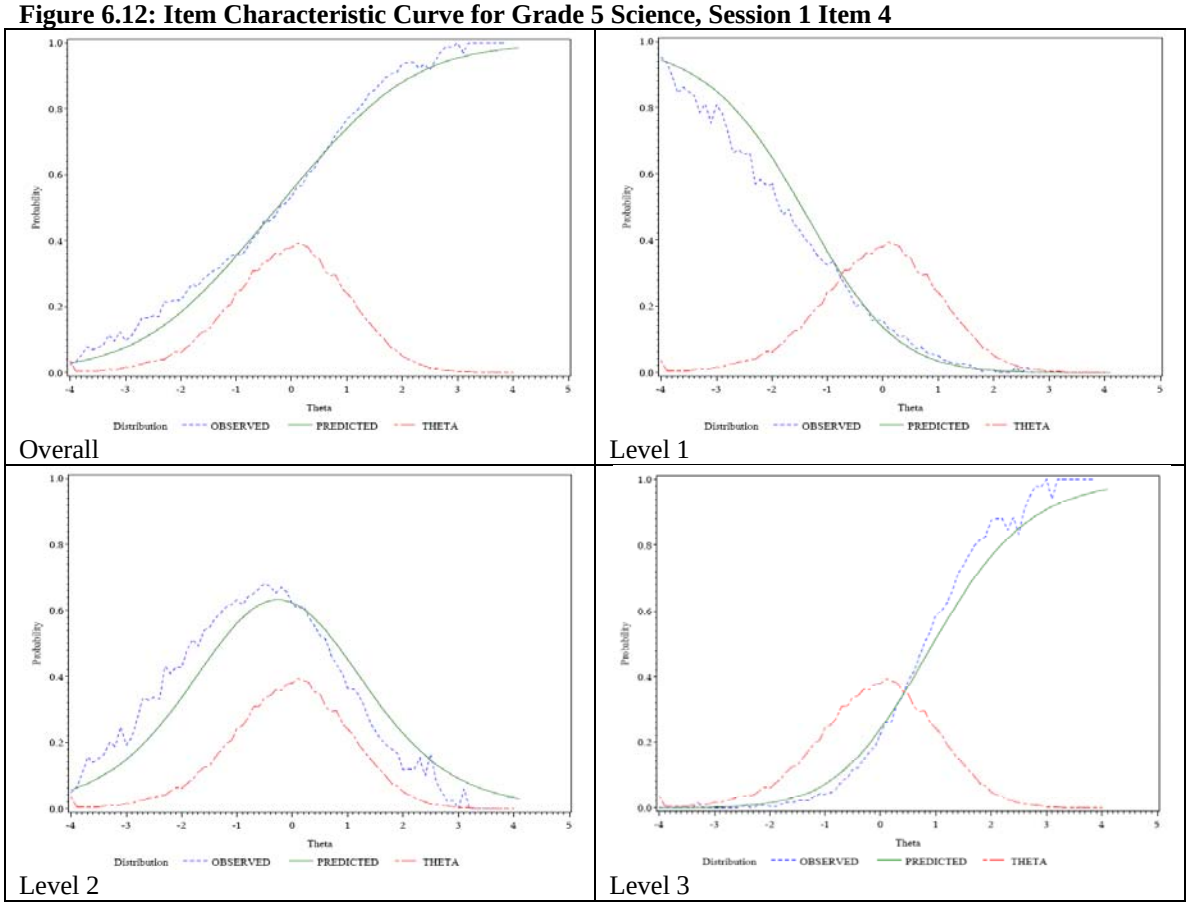


Figure 6.13: Item Characteristic Curve for Grade 8 Science, Session 1 Item 9

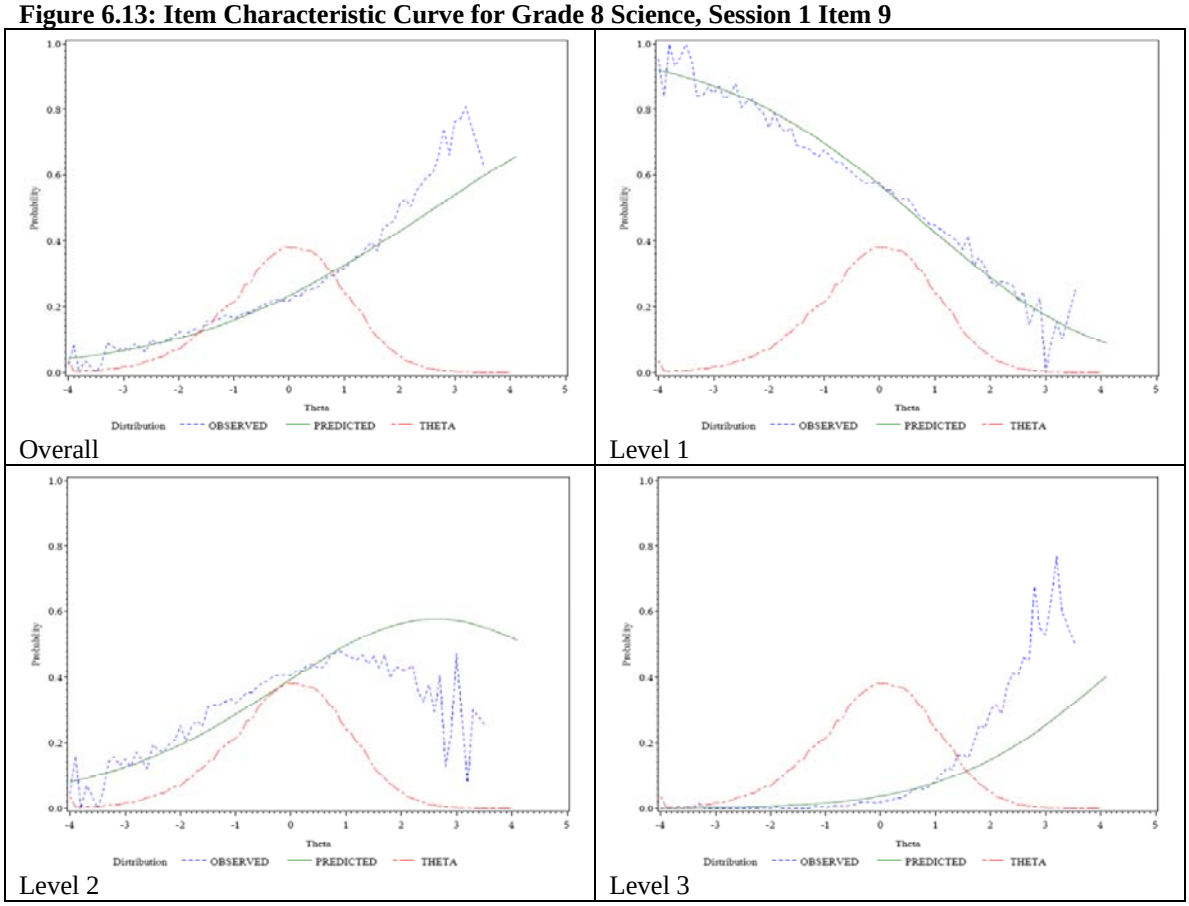


Figure 6.14: Cross-Grade Articulation of Scale Scores at Selected Percentiles, Communication Arts MAP

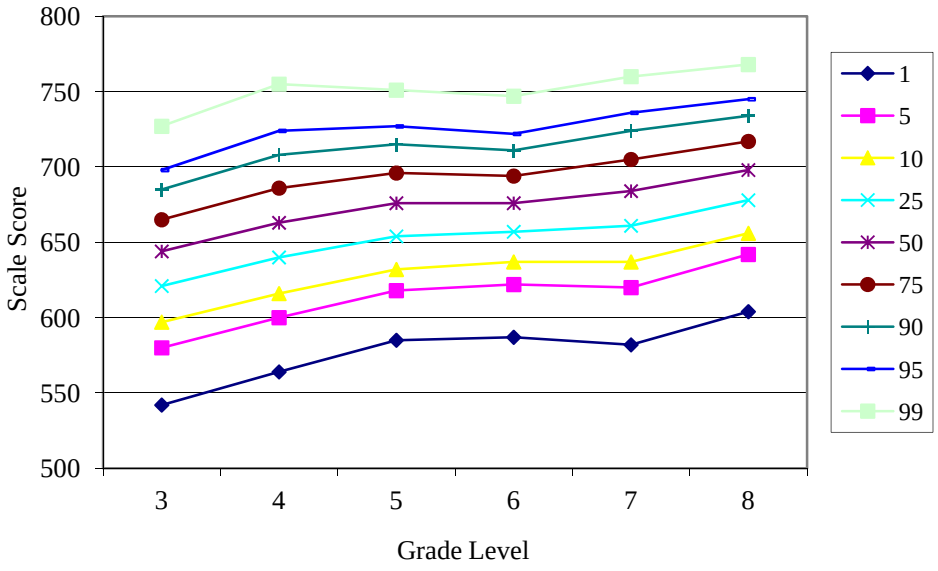


Figure 6.15: Cross-Grade Articulation of Scale Scores at Selected Percentiles, Mathematics MAP

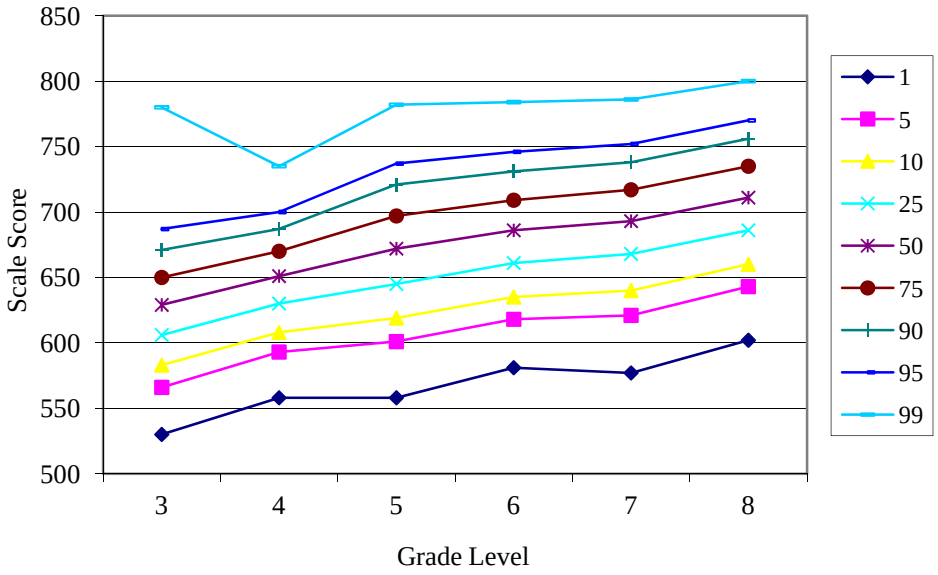


Figure 6.16: Cross-Grade Articulation of Scale Scores at Selected Percentiles, Science MAP

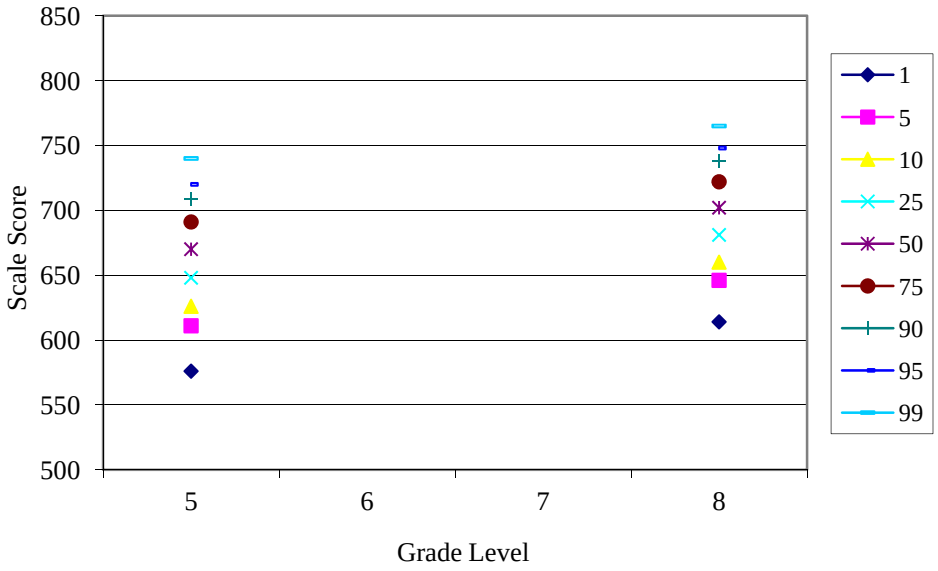


Figure 6.17: Communication Arts Test Characteristic Curves by Grade, 2012

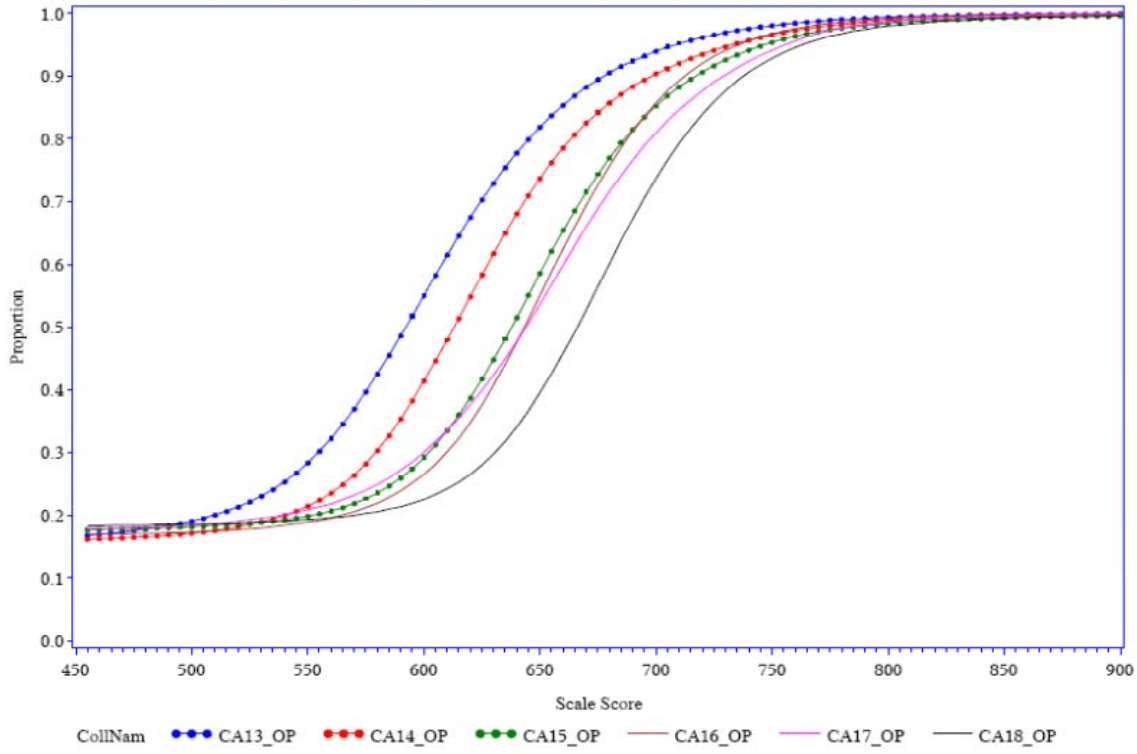


Figure 6.18: Mathematics Test Characteristic Curves by Grade, 2012

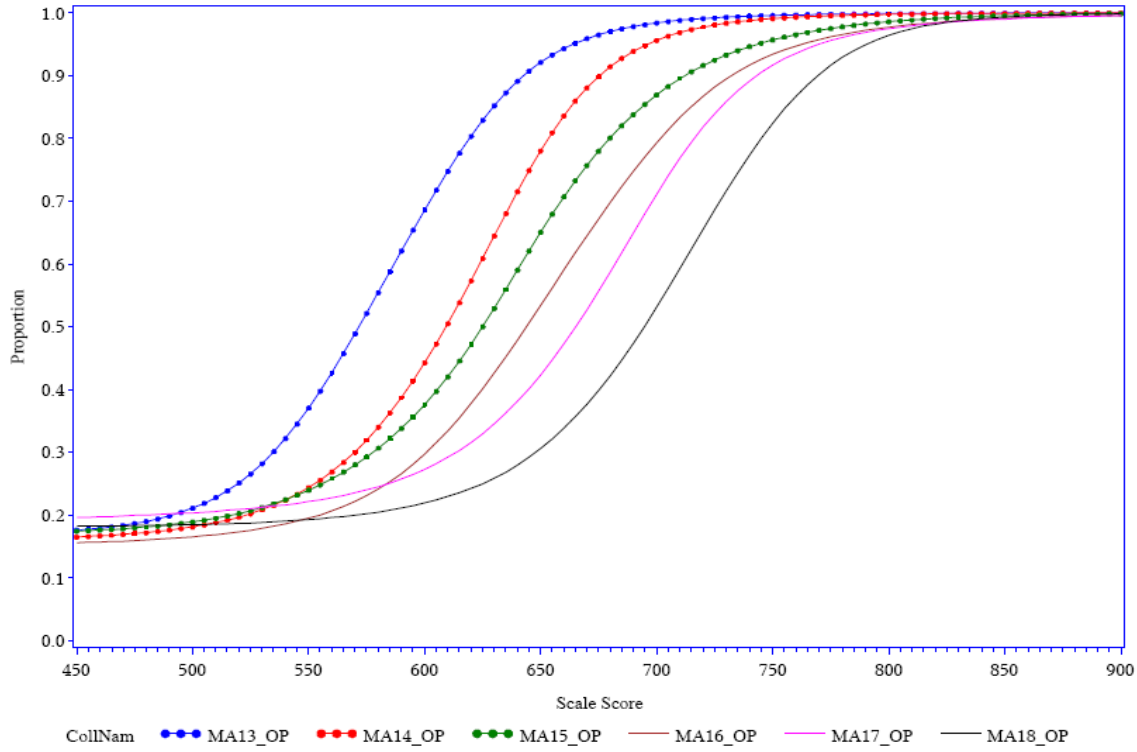
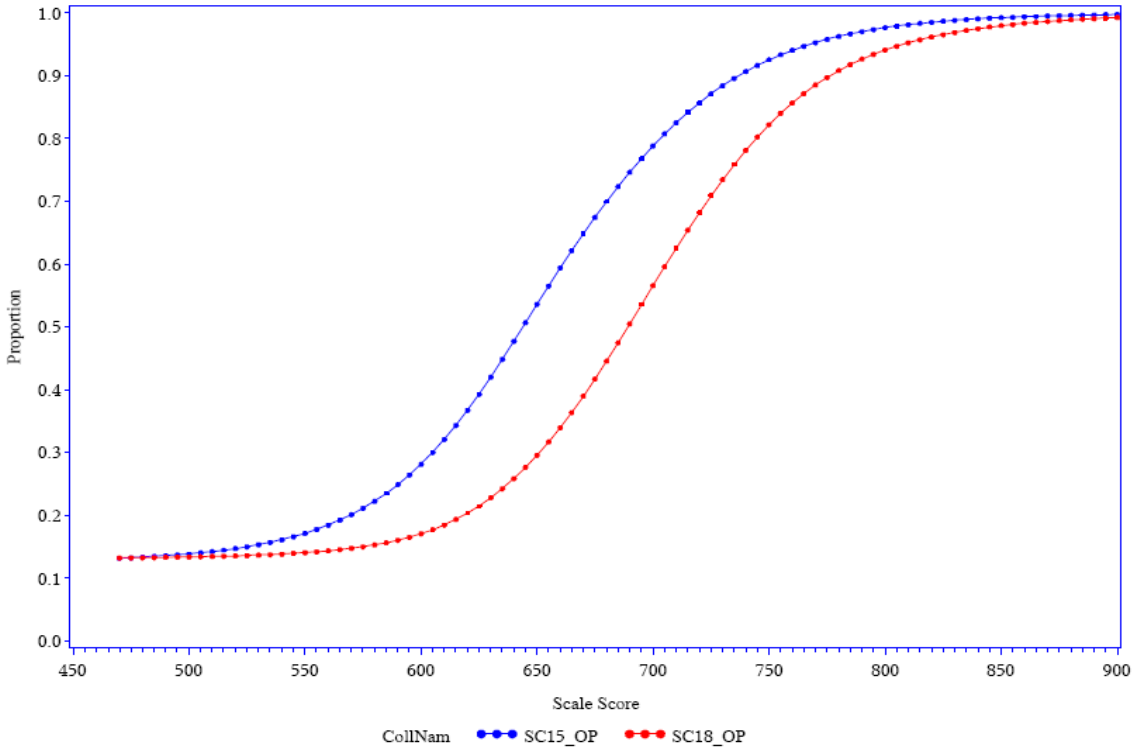


Figure 6.19: Science Test Characteristic Curves by Grade, 2012



CHAPTER 7: TEST RESULTS

This chapter of the Technical Report contains information on the results of the spring 2012 administration of the 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: *Below Basic, Basic, Proficient,* and *Advanced.*

While the scale score provides an essential quantitative reference to student performance, the performance level information speaks directly to requirements of the NCLB Act, as well as plainly outlining 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 (1999) standards addressed in Chapter 7 are 4.1, 5.10, 6.2, and 13.19. Each standard will be presented in the pertinent section of this chapter.

Results presented below are based on 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 following tables are presented as evidence of reliability and validity of the scores from the MAP assessments and should not be used for state accountability purposes.

7.1 Student Participation

The following are subgroups reported during the administration of MAP (other demographic information is collected separately and merged into MAP data after CTB sends DESE the General Research File):

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

For the purposes of this report, participation rate is defined as the percentage of students who received a valid scale score given the total number of students who received a test book. These participation 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. Accountable students include all students for whom a test book was submitted. These include students who should have received a MAP scale score but who did not take the test and could not be assigned a scale score.

7.2 Current Administration Data

The Communication Arts and Mathematics MAP assessments were administered to students in Grades 3 through 8. The Science MAP assessments were administered to students in Grades 5 and 8.

Tables 7.11 through 7.13 provide a summary of the scale scores based on the state population for the 2012 administration of the MAP. In compliance with AERA, APA, & NCME (1999) Standard 13.19, these tables present the number of students, mean and standard deviation of scale scores, and scale scores at specific percentile points. Standard 13.19 states:

> In educational settings, when average or summary scores for groups of students are reported, they should be supplemented with additional information about the sample size and shape or dispersion of score distributions.

7.3 Cross-Year, Cross-Sectional Comparisons

It is often desirable to examine the scores of students across time. The data in this section compare student performance on the MAP using census data from 2006 through 2012. It should be noted that beginning in 2008, invalidated students were assigned to the LOSS and to the *Below Basic* achievement level. Prior to 2008, invalidated students did not receive a scale score.

Table 7.14 shows the state-level means for all grades from 2006 through 2010 for Communication Arts and Mathematics and from 2008 through 2010 for Science. The Science MAP was administered for the first time in 2008. As shown in Table 7.14, the mean scale scores in all grades and content areas increased from 2011 to 2012 except for Grade 4 Mathematics, Grade 6 Communication Arts, and Grade 6 Mathematics which decreased slightly (by less than one scale score point).

Table 7.15 shows the percentage of students in each achievement level in 2006 through 2012 on the Communication Arts test. The percentages at or above *Proficient* increased from 2011 to 2012 except for Grade 6 where the percentage of students at or above *Proficient* decreased slightly.

Table 7.16 shows the percentage of students in each achievement level in 2006 through 2012 on the Mathematics test. As compared to 2011, increases in the percentage of students at or above *Proficient* were observed in all grades in 2012 except for Grade 4 where the percentage of students at or above *Proficient* stayed the same and Grade 6 where the percentage of students at or above *Proficient* decreased slightly.

Table 7.17 shows the percentage of students in each achievement level in 2008 through 2012 on the Science test. In Grade 5, the percentage of students at or above *Proficient* increased from 2011 to 2012 and in Grade 8, the percentage of students at or above *Proficient* decreased slightly.

7.4 Reports

Score reports are the primary means of communicating test scores to relevant district personnel (i.e., testing coordinators or superintendents), teachers, and parents. AERA, APA, and NCME (1999) Standard 5.10 states:

> When test score information is released to students, parents, legal representatives, teachers, clients, or the media, those responsible for testing programs should provide appropriate interpretations. The interpretations should describe in simple language what the test covers, what scores mean, the precision of the scores, common misinterpretations of test scores, and how scores will be used.

Standard 4.1 is related in that it says:

> Test documents should provide test users with clear explanations of the meaning and intended interpretations of derived score scales, as well as their limitations.

Interpretations related to the test scores are disseminated in two ways: (1) the individual score report, and (2) the *Guide to Interpreting Results* (CTB/McGraw-Hill, 2012).

In addition to providing interpretation, it is important that the information is understandable by the target audience. Standard 6.2 of the AERA, APA, & NCME (1999) *Standards* states:

> Test documents should be complete, accurate, and clearly written so that the intended reader can readily understand the content.

The staffs at DESE and CTB strive to create documents that will be 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 2008, the individual MAP student reports were redesigned so that they were more parent-friendly. These changes included improved interpretations of the MAP scale score, *TerraNova* scale score, and Lexile score. Starting in 2010, Lexile scores were no longer reported. In addition, the state mean score is now provided, as are activities that parents may engage in to help their children improve their skills within the content area, in accordance with the Missouri Curriculum Framework. The new score reports also simplify the way in which the scale score and performance level are presented and interpreted. Starting in 2008, parents no longer receive scores for content/knowledge standards or for process/performance standards.

The *Guide to Interpreting Results* is intended for use by school and district personnel so that they can interpret their score reports. It provides a context for the score reports in that it outlines the history and purpose of MAP. It also overviews the Missouri Show-Me Standards and GLE Strands. It provides greater detail on the types of scores reported on

the individual student report, and it provides all of the abbreviated achievement level descriptors (ALDs), as well as the web location of the detailed ALDs. Finally, it outlines each piece of the individual student report and overviews the student label. The *Guide to Interpreting Results* is located on DESE's website at:

http://dese.mo.gov/divimprove/assess/map/

7.4.1 Description of Each Type of Report

In this section, descriptions for the following reports are provided: Individual Student Report, Student Score Label, Missouri Comprehensive Data System, District Performance Summary Reports, and School Performance Summary Reports. Table 7.18 shows each report type and for whom the report is intended.

Individual Student Report

One copy of the Individual Student Report (ISR) is provided to schools to be sent home to the parents. On the left side of the page, results for a given content area are shown, including the student's MAP scale score, the state mean MAP scale score, the National Percentile score from the *TerraNova* section of MAP, and a brief definition of the National Percentile.

In the middle of the page, the student's scale score is shown again along with the achievement level associated with that scale score. This is followed by a brief explanation of what the achievement level means. When a student does not receive a scale score, then he or she will receive either "Level Not Determined" (LND) or "Invalidated" in place of the MAP scale score. No achievement level is assigned for the LND students. Invalidated students are assigned to the LOSS and to the *Below Basic* achievement level. A brief explanation accompanies the meaning of LND or invalidated.

On the right side of the page are recommended activities based on the child's achievement level. These are generic activities that are targeted to all students within an achievement level, not specific activities targeted for the individual student.
A sample report is provided in Appendix C, Figure C.1.

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 for each of the content areas administered within a grade. The label lists the student's scale score and National Percentile for each content area.

CTB/McGraw-Hill provided multiple labels per student submitted for scoring. The labels are provided in print only. A sample report is provided in Appendix C, Figure C.2.

Missouri Comprehensive Data System

Schools and districts are able to 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 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.

A detailed discussion of all reports is beyond the scope of this document. Only those reports that are first-level analyses of MAP data will be discussed. The AYP reports also will not be discussed nor will some of the Administrative Reports, including the Level Not Determined and Map Alternate reports. Examples of all reports discussed are provided in Appendix C.

The MCDS is accessed through DESE's website. Each school and/or district is assigned a user name and password so that it can access the site.

Administrative Reports

These reports provide student-level test data. Based on only the MAP test results, three reports are generated: MAP Scale Score Summary, MAP Student Demographic, and Student Achievement Level.

MAP Scale Score Summary: This report lists each student in the school or district along with his/her MOSIS ID, birth date, MAP scale score, achievement level, and *TerraNova* National Percentile. An example is included in Appendix C, Figure C.3.

MAP Student Demographic: This report lists each student in the school or district along with their date of birth (DOB), content area, district ID, and relevant demographic information, including the student's race; the student's disability diagnosis; if the student has been in the district for less than a year; if the student has been in the building for less than a year; if the student is Limited English Proficiency (LEP); if the student qualifies for free and reduced lunch (SES); if the student has an individualized education plan (IEP); if the student is an English-language learner (ELL)/LEP who has been in the school for less than one year and in the country for less than three years; if the student is an LEP/ELL Title 3, the number of months the LEP/ELL student has been in the U.S.; if the student took MAP-A; and if the student is Title I. An example is included in Appendix C, Figure C.4.

Student Achievement Level: This report lists all of the students in a school or district along with the year of testing, content area, grade level, achievement level, and MOSIS ID. An example is included in Appendix C, Figure C.5.

Achievement Level–4 Levels

These reports contain summary information on school or district performance in terms of the four MAP achievement levels.

Achievement Level 4 Report: This report summarizes the number and percentage of students in each achievement level. This report is comprised of multiple columns, including: Total; grade/subject; year; number of reportable (REP) students; number of accountable (ACC) students; number and percentage of students whose achievement level was not determined (LND); number and percentage of students classified in the *Below Basic* (BB) achievement level; number and percentage of students classified in the *Basic* achievement level; number and percentage of students classified in the *Proficient* (Prof) achievement level; number and percentage of students classified in the *Advanced* (Adv) achievement level; MAP index score; mean MAP scale score; and the median *TerraNova* national percentile. The first column, Total, shows if aggregated or disaggregated information is being shown. An example is included in Appendix C, Figure C.6.

Content Standard

The content standard reports summarize information about the content standards (CS).

Content Standards Summary: This report has 14 columns: content area; grade level; category/type; year; percentage of points earned on content standard 1 (CS-1); points possible (PP) on CS-1; percentage of points earned on CS-2; PP on CS-2; percentage of points earned on CS-3; PP on CS-3; percentage of points earned on CS-4; PP on CS-4; percentage of points earned on CS-5; and PP on CS-5. The category/type column indicates if the data is aggregated or disaggregated data. An example is included in Appendix C, Figure C.7.

Item Analysis Expanded

This set of reports provides detailed item-level results for the school or district aggregated either by the content standard or process standard.

Content Standard IBD Extended: The Content Standard Item Benchmark Descriptions (IBD) Extended report contains item-level detail aggregated by content standard. The report is comprised of nine columns: standard, code for the grade-level expectation (GLE), description of the GLE, depth of knowledge (DOK) of the item, session/item number where the item was in the operational test, question type (QT), points possible for the item, average points (avg) earned by students in the district on that item, and percentage of points earned by the students in the district on that item. An example is included in Appendix C, Figure C.8.

Goal Process Standard IBD Extended: The Goal Process Standard Item Benchmark Descriptions (IBD) Extended report contains item-level detail aggregated by the goal process standard. The report is comprised of 10 columns: goal, standard description (desc.), code for the grade-level expectation (GLE), description of the GLE, depth of knowledge (DOK) of the item, session by item number, question type (QT), points possible for the item, the average points (avg pts) earned by students in the district on that item, and percentage of points earned by the students in the district on that item. An example is included in Appendix C, Figure C.9.

School/District Summary Reports

CTB provides DESE with school and district summary reports for each school and district in the state. These reports are intended for the sole use of DESE and are not distributed to schools and districts. These reports provide performance information for all students within a school or district who took the MAP.

The school or district is listed in the left-most column along with the purpose of the report. The main section of the Summary Report consists of a table that divides students from the school or district into achievement levels. The *Reportable* column shows the number of students with valid MAP scale scores. The *Accountable* column should equal the grade-level enrollment at the time the MAP was administered.

Within both the *Reportable* and *Accountable* columns, students are categorized as *Advanced, Proficient, Basic,* or *Below Basic.* The number and percentage of students falling into each achievement level is reported. A short description of the knowledge skills and abilities associated with each achievement level is also reported. Students who are not assigned to an achievement level will be classified as *Level Not Determined.* A short descriptor is also associated with this categorization.

Below this table, the norm-referenced summary statistics are reported for each school or district. The norm-referenced information includes the National Percentile (NP) associated with the Mean Normal Curve Equivalent, the median NP, and the number of students with *TerraNova* scores.

On the back of these reports, the terms *Reportable* and *Accountable* are defined.
A sample of the School/District Summary Report is provided in Appendix C, Figure C.10.

7.5 Data Structures

A data file referred to as General Research File (GRF) was provided to DESE by CTB/McGraw-Hill. It contains one record for every test book submitted; each record contains demographic information for each student as well as item responses, raw score, content and process standard raw scores, and scale score data for each content area.

7.5.1 General Research File

The layout for a state level GRF is included in Appendix C.

7.6 Interpreting Test Results

Individual Student Reports and Student Labels
The *Guide to Interpreting Results* was written for Missouri teachers and administrators who receive score reports from the 2012 administration of the MAP. The *Guide to Interpreting Results* was developed collaboratively by CTB/McGraw-Hill and DESE staff. DESE staff had opportunities to review, provide feedback, and give final approval.

This guide has six sections. The first section presents an overview of key terms and test related concepts. The second section presents the Show-Me Content Standards/GLE Strands. The third section presents the Show-Me Performance Standards. The fourth section discusses assessment terms and the types of scores that will be presented on the score reports. The fifth section presents the achievement-level descriptors for all grade/content areas. Finally, the sixth section presents sample score reports.

The 2012 edition is available on the DESE website at:

http://dese.mo.gov/divimprove/assess/grade_level_manuals.htmlhtml

7.7 Summary

In summary, the overall purpose of reporting test results is to communicate various aggregations of 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 CTB/McGraw-Hill address multiple best practices of the testing industry but, in particular, are related to the following *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999):

- Standard 4.1—Test documents should provide test users with clear explanations of the meaning and intended interpretations of derived score scales, as well as their limitations.
- Standard 5.10—When test score information is released to students, parents, legal representatives, teachers, clients, or the media, those responsible for testing programs should provide appropriate interpretations. The interpretations should describe in simple language what the test covers, what scores mean, the precision of the scores, common misinterpretations of test scores, and how scores will be used.
- Standard 6.2—Test documents should be complete, accurate, and clearly written so that the intended reader can readily understand the content.
- Standard 13.19—In educational settings, when average or summary scores for groups of students are reported, they should be supplemented with additional information about the sample size and shape or dispersion of score distributions.

Table 7.1: Participation Rates: All Students

Grade	Accountable in Comm. Arts	Percent Reportable in Comm. Arts	Accountable in Mathematics	Percent Reportable in Mathematics	Accountable in Science	Percent Reportable in Science
3	66323	99.7%	66323	99.8%		
4	65996	99.7%	65996	99.9%		
5	66675	99.7%	66675	99.8%	66675	99.7%
6	67342	99.7%	67342	99.8%		
7	66845	99.7%	66845	99.7%		
8	67037	99.6%	67037	99.7%	67037	99.5%

Table 7.2: Participation Rates: Males

Grade	Accountable in Comm. Arts	Percent Reportable in Comm. Arts	Accountable in Mathematics	Percent Reportable in Mathematics	Accountable in Science	Percent Reportable in Science
3	33911	99.7%	33911	99.8%		
4	33781	99.7%	33781	99.9%		
5	33746	99.7%	33746	99.8%	33746	99.7%
6	34595	99.7%	34595	99.8%		
7	34241	99.6%	34241	99.6%		
8	34365	99.5%	34365	99.6%	34365	99.5%

Table 7.3: Participation Rates: Females

Grade	Accountable in Comm. Arts	Percent Reportable in Comm. Arts	Accountable in Mathematics	Percent Reportable in Mathematics	Accountable in Science	Percent Reportable in Science
3	32331	99.7%	32331	99.8%		
4	32157	99.8%	32157	99.9%		
5	32846	99.7%	32846	99.8%	32846	99.7%
6	32684	99.8%	32684	99.9%		
7	32520	99.7%	32520	99.8%		
8	32575	99.7%	32575	99.7%	32575	99.6%

Table 7.4: Participation Rates: White

Grade	Accountable in Comm. Arts	Percent Reportable in Comm. Arts	Accountable in Mathematics	Percent Reportable in Mathematics	Accountable in Science	Percent Reportable in Science
3	48556	99.9%	48556	99.9%		
4	48402	99.9%	48402	99.9%		
5	49362	99.8%	49362	99.8%	49362	99.8%
6	49975	99.9%	49975	99.9%		
7	49868	99.8%	49868	99.8%		
8	50144	99.7%	50144	99.7%	50144	99.6%

Table 7.5: Participation Rates: Black

Grade	Accountable in Comm. Arts	Percent Reportable in Comm. Arts	Accountable in Mathematics	Percent Reportable in Mathematics	Accountable in Science	Percent Reportable in Science
3	11008	99.7%	11008	99.7%		
4	11099	99.8%	11099	99.8%		
5	11122	99.6%	11122	99.6%	11122	99.6%
6	11410	99.7%	11410	99.7%		
7	11285	99.6%	11285	99.5%		
8	11288	99.4%	11288	99.4%	11288	99.2%

Table 7.6: Participation Rates: Hispanic

Grade	Accountable in Comm. Arts	Percent Reportable in Comm. Arts	Accountable in Mathematics	Percent Reportable in Mathematics	Accountable in Science	Percent Reportable in Science
3	3603	98.9%	3603	99.8%		
4	3478	98.8%	3478	99.8%		
5	3321	99.2%	3321	99.8%	3321	99.8%
6	3168	98.8%	3168	99.7%		
7	3021	98.9%	3021	99.6%		
8	2945	98.6%	2945	99.5%	2945	99.4%

Table 7.7: Participation Rates: Asian/Pacific Islander

Grade	Accountable in Comm. Arts	Percent Reportable in Comm. Arts	Accountable in Mathematics	Percent Reportable in Mathematics	Accountable in Science	Percent Reportable in Science
3	1536	97.3%	1536	100.0%		
4	1452	97.2%	1452	99.9%		
5	1383	97.3%	1383	99.9%	1383	99.9%
6	1374	98.2%	1374	99.9%		
7	1265	98.1%	1265	99.8%		
8	1269	98.4%	1269	99.8%	1269	99.8%

Table 7.8: Participation Rates: Native American/Alaskan

Grade	Accountable in Comm. Arts	Percent Reportable in Comm. Arts	Accountable in Mathematics	Percent Reportable in Mathematics	Accountable in Science	Percent Reportable in Science
3	296	99.3%	296	99.3%		
4	306	99.3%	306	99.7%		
5	278	100.0%	278	100.0%	278	100.0%
6	303	99.3%	303	99.7%		
7	317	99.4%	317	99.4%		
8	311	100.0%	311	100.0%	311	100.0%

Table 7.9: Participation Rates: Other Ethnicity

Grade	Accountable in Comm. Arts	Percent Reportable in Comm. Arts	Accountable in Mathematics	Percent Reportable in Mathematics	Accountable in Science	Percent Reportable in Science
3	1245	99.8%	1245	99.9%		
4	1197	99.7%	1197	99.8%		
5	1132	99.9%	1132	100.0%	1132	99.6%
6	1046	99.9%	1046	99.9%		
7	1006	99.9%	1006	99.9%		
8	982	99.8%	982	99.8%	982	99.6%

Table 7.10: Participation Rates: Students Receiving Accommodations

Grade	Accountable in Comm. Arts	Percent Reportable in Comm. Arts	Accountable in Mathematics	Percent Reportable in Mathematics	Accountable in Science	Percent Reportable in Science
3	7046	99.9%	7268	99.9%		
4	7431	99.9%	7635	99.9%		
5	7591	99.8%	7838	99.9%	7464	99.9%
6	7377	99.8%	7662	99.9%		
7	7024	99.6%	7211	99.9%		
8	6847	99.8%	7095	99.8%	6813	99.6%

Table 7.11: Summary Statistics for Communication Arts

Grade	N	Mean	Std. Dev.	Scale Scores by Percentiles				
				10	25	50	75	90
3	66,147	641.78	37.66	597	621	644	665	685
4	65,828	662.31	39.33	616	640	663	686	708
5	66,470	674.16	35.44	632	654	676	696	715
6	67,173	674.33	32.83	637	657	676	694	711
7	66,620	681.73	36.19	637	661	684	705	724
8	66,755	695.89	33.52	657	678	698	717	734

Table 7.12: Summary Statistics for Mathematics

Grade	N	Mean	Std. Dev.	Scale Scores by Percentiles				
				10	25	50	75	90
3	66,213	628.65	39.78	583	606	629	650	671
4	65,909	649.36	34.88	608	630	651	670	687
5	66,524	670.61	42.80	619	645	672	697	721
6	67,237	684.43	40.19	635	661	686	709	731
7	66,654	691.18	41.51	640	668	693	717	738
8	66,808	709.57	40.20	660	686	711	735	756

Table 7.13: Summary Statistics for Science

Grade	N	Mean	Std. Dev.	Scale Scores by Percentiles				
				10	25	50	75	90
5	66,492	667.99	34.23	626	648	670	691	709
8	66,724	700.18	31.92	660	681	702	722	738

Table 7.14: Comparison of State-Level Means, 2006 through 2012 Census Data

		Communication Arts			Mathematics			Science		
Grade	**Year**	**N**	**Mean SS**	**S.D. SS**	**N**	**Mean SS**	**S.D. SS**	**N**	**Mean SS**	**S.D. SS**
	2006	64,486	639.86	36.84	64,763	621.59	39.11			
	2007	66,347	639.58	38.04	66,640	622.40	38.72			
	2008	66,179	637.60	37.54	66,258	621.65	36.92			
3	2009	67,163	637.43	38.18	67,232	621.67	36.76			
	2010	66,751	640.27	36.63	66,814	624.89	39.28			
	2011	66,196	641.19	36.52	66,258	627.03	39.69			
	2012	66,147	641.78	37.66	66,213	628.65	39.78			
	2006	65,179	654.55	38.56	65,306	643.88	37.07			
	2007	65,274	656.11	39.51	65,363	644.47	36.56			
	2008	66,873	655.61	33.63	66,944	644.18	34.19			
4	2009	66,490	656.77	33.41	66,587	644.20	33.89			
	2010	67,301	661.34	38.95	67,394	647.59	34.01			
	2011	66,748	662.18	38.23	66,881	649.68	34.87			
	2012	65,828	662.31	39.33	65,909	649.36	34.88			
	2006	66,007	668.18	37.09	66,123	660.06	39.99			
	2007	65,461	671.01	37.14	65,498	663.21	41.50			
	2008	65,544	671.48	33.71	65,636	661.43	40.73	65,586	661.64	31.52
5	2009	67,083	671.58	32.84	67,155	662.07	40.52	67,118	662.22	30.40
	2010	66,500	673.65	35.33	66,580	667.70	41.74	66,558	664.76	32.48
	2011	67,052	673.68	34.85	67,124	669.05	42.48	67,196	666.04	33.43
	2012	66,470	674.16	35.44	66,524	670.61	42.80	66,492	667.99	34.23
	2006	66,948	666.85	33.70	67,017	673.30	39.80			
	2007	66,247	667.99	34.63	66,332	676.31	41.75			
	2008	65,672	671.27	33.50	65,716	678.46	41.13			
6	2009	65,716	671.67	33.04	65,755	678.87	39.56			
	2010	67,260	674.18	33.12	67,315	683.36	39.48			
	2011	66,443	675.02	32.81	66,476	684.95	39.80			
	2012	67,173	674.33	32.83	67,237	684.43	40.19			
	2006	70,290	671.63	37.06	70,698	675.38	41.27			
	2007	67,167	672.11	36.26	67,554	677.41	42.62			
	2008	66,701	675.87	35.08	66,727	681.15	41.38			
7	2009	66,316	677.68	34.75	66,330	683.63	40.72			
	2010	66,034	678.85	36.25	66,052	686.51	40.28			
	2011	67,257	680.56	36.61	67,294	687.53	40.73			
	2012	66,620	681.73	36.19	66,654	691.18	41.51			

Table 7.14: Comparison of State-Level Means, 2006 through 2012 Census Data (Cont'd)

		Communication Arts			Mathematics			Science		
Grade	**Year**	**N**	**Mean SS**	**S.D. SS**	**N**	**Mean SS**	**S.D. SS**	**N**	**Mean SS**	**S.D. SS**
	2006	72,483	686.85	37.87	72,542	697.73	40.37			
	2007	70,187	686.90	37.54	70,204	698.33	41.98			
	2008	67,278	691.05	33.57	67,312	701.30	39.40	67,209	694.36	30.67
8	2009	66,741	692.56	33.31	66,770	703.60	38.63	66,702	695.65	30.94
	2010	66,139	694.28	34.01	66,166	707.98	40.04	66,101	698.28	31.07
	2011	65,905	695.11	34.10	65,956	708.40	40.12	65,828	700.05	30.98
	2012	66,755	695.89	33.52	66,808	709.57	40.20	66,724	700.18	31.92

Table 7.15: Comparison of Percentage of Students in each Achievement Level, Communication Arts 2006 through 2012 Census Data

Grade	Year	N	No Level	Below Basic	Basic	Proficient	Advanced	Prof & Adv
3	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
4	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
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
6	2006	67,709	1.1	11.9	44.8	31.6	10.6	42.2
	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
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

Table 7.15: Comparison of Percentage of Students in each Achievement Level, Communication Arts 2006 through 2012 Census Data (Cont'd)

Grade	Year	N	No Level	Below Basic	Basic	Proficient	Advanced	Prof & Adv
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

Table 7.16: Comparison of Percentage of Students in each Achievement Level, Mathematics 2006 through 2012 Census Data

Grade	Year	N	No Level	Below Basic	Basic	Proficient	Advanced	Prof & Adv
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
4	2006	65,845	0.8	8.3	47.5	34.4	9.0	43.4
	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
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
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
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

Table 7.16: Comparison of Percentage of Students in Each Achievement Level, Mathematics 2006 through 2012 Census Data (Cont'd)

Grade	Year	N	No Level	Below Basic	Basic	Proficient	Advanced	Prof & Adv
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

Table 7.17: Comparison of Percentage of Students in Each Achievement Level, Science 2008 through 2012 Census Data

Grade	Year	N	No Level	Below Basic	Basic	Proficient	Advanced	Prof & Adv
5	2008	65,734	0.2	11.2	44.0	29.6	14.9	44.5
	2009	67,307	0.3	10.6	44.1	30.3	14.8	45.1
	2010	66,730	0.3	10.4	40.5	29.6	19.3	48.9
	2011	67,461	0.4	10.0	39.1	29.5	21.0	50.5
	2012	66,675	0.3	9.8	38.5	27.2	24.3	51.4
8	2008	67,574	0.5	19.3	37.0	36.7	6.5	43.2
	2009	67,077	0.6	18.2	36.5	37.2	7.6	44.8
	2010	66,463	0.5	16.4	35.1	38.4	9.6	48.0
	2011	66,205	0.6	15.7	33.7	38.6	11.4	50.0
	2012	67,037	0.5	16.1	33.8	37.0	12.6	49.6

Table 7.18: Summary of Score Reports for Spring 2012

Score Report		Paper Report		Electronic Report		
		Parent	Teacher	Principal	System	DESE
Student Score Labels			X			
Individual Student Report		X				
Performance Summary Report	School Performance Summary Report					X
	District Performance Summary Report					X
	Crystal Reports			X	X	

CHAPTER 8: ACHIEVEMENT-LEVEL SETTING

A Bookmark standard setting was held in 2005 to establish cut scores for the Communication Arts and Mathematics MAPs. Another Bookmark standard setting was held in 2008 to establish cut scores for the Science MAP. In this chapter, we briefly describe the MAP achievement-level setting, and we present the cut scores established and the achievement-level descriptors derived from the achievement-level setting.

A detailed discussion of the Communication Arts and Mathematics achievement-level setting may be found in the *Missouri Assessment Program Final Bookmark Standard Setting Technical Report* (2005). A detailed discussion of the Science achievement-level setting may be found in the *Missouri Assessment Program Bookmark Standard Setting Technical Report 2008 for Missouri Achievement-Level Setting Grades 5, 8, and 11 Science* (2008). These Technical Reports address AERA, APA, and NCME Standard 4.19:

> When proposed score interpretation involves one or more cut scores, the rationale and procedures used for establishing cut scores should be clearly documented.

We briefly overview the rationale and procedures used for MAP standard setting below.

In terms of the validity of the MAP scores, it is essential to understand that descriptors and cut scores are established in a collaborative, participatory process, largely driven by the input of Missouri teachers and educators. The descriptors clearly establish, in plain language, the proper frame of reference for understanding how to interpret test scores, and cut scores in particular.

8.1 Legislation Affecting MAP Standard Setting

A modified Bookmark Standard Setting Procedure (BSSP) was used to establish cut scores for the Communication Arts and Mathematics MAPs for Grades 3 through 8 and high school and for Science for Grades 5, 8, and 11. A modification of the Bookmark was used to meet the requirements of Senate Bill 1080, which requires that cut scores be established for the MAPs that are like the cut scores established for the National Assessment of Educational Progress (NAEP).

Senate Bill 1080 was interpreted such that the *Proficient* achievement level met, but did not exceed, the NAEP performance standards. In other words, the percentage of students who attain *Proficient* on the MAP should be similar to or slightly higher than the percentage attaining *Proficient* on NAEP. The percentage of students in the other three achievement levels would be allowed to vary between NAEP and the MAP.

For the purposes of the MAP standard setting, participants were allowed to recommend *Proficient* cut scores within a pre-specified range. This range was based on the percentage of students who could be classified as either *Proficient* or *Advanced.* For Communication Arts and Mathematics, no fewer than 26% and no more than 44% of

students could be classified as *Proficient* or *Advanced*. For Science, no fewer than 27% of and no more than 48% of students could be classified as *Proficient* or *Advanced*.

The pre-specified range was determined using the results from NAEP and MAP. For all three subject areas, the high end of the range (in terms of scale score points) was based on NAEP results. This was the lowest percentage of students classified as *Proficient* or *Advanced* on the NAEP test for Grades 4 and 8 Reading, Mathematics, and Science using both national and state data.

The low end of the range (in terms of scale score points) was based on the 2005 MAP results for the Communication Arts and Mathematics standard setting and on the 2007 MAP results for Science. This was the highest percentage of students classified as *Proficient* or *Advanced* on the previous years' tests.

8.2 Bookmark Standard Setting Procedure

A modified BSSP was used to establish cut scores on the Communication Arts, Mathematics, and Science MAP. At both workshops, the BSSP involved three rounds of discussion and voting. AERA, APA, & NCME (1999) Standard 4.21 says

> When cut scores defining pass-fail or proficiency categories are based on direct judgments about the adequacy of item or test performances or performance levels, the judgmental process should be designed so that judges can bring their knowledge and experience to bear in a reasonable way.

The Technical Reports associated with each standard setting give detailed reports of the standard setting design and procedure. Here, we discuss the major activities of the three rounds.

Round 1: In this round, panelists discussed target students (the students for whom they were placing cut scores), took the test, studied and discussed the test items in order of difficulty, and made initial recommendations of cut scores.

Round 2: In this round, panelists were shown their Round 1 recommendations and the percentage of students in each achievement level as a result of their Round 1 recommendations. They discussed their Round 1 recommendations for cut scores and made another recommendation based on their Round 2 discussions.

Round 3: In this round, panelists were shown their Round 2 recommendations and the percentage of students in each achievement level as a result of their Round 2 recommendations. They discussed their Round 2 recommendations for cut scores and made another recommendation based on their Round 3 discussions.

Following Round 3, panelists wrote draft achievement-level descriptors which were later edited by CTB and DESE staff.

The Missouri State Board of Education approved the cut scores as recommended by the standard-setting panelists.

8.3 Cut Scores

In this section, we present the cut scores for each grade/content area of MAP. Tables 8.1 through 8.3 show the cut scores for Communication Arts, Mathematics, and Science, respectively. Please note that we only present the cut scores for Grades 3 through 8. The high school MAPs are no longer part of the assessment system.

8.4 Achievement-Level Descriptors

In Appendix D of this report, we present the short achievement-level descriptors that were drafted during the standard setting and finalized between CTB and DESE staff after the standard setting. We only present the short achievement-level descriptors for those grades that are currently part of the MAP.

8.5 Summary

This chapter presented a brief overview of the standard setting process used for the grade-level MAPs, as well as the rationale behind the standard setting. The standard settings are addressed in more detail in the relevant Technical Reports. The standard settings undertaken by CTB/McGraw-Hill address the following *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999):

- Standard 4.19—When proposed score interpretation involves one or more cut scores, the rationale and procedures used for establishing cut scores should be clearly documented.
- Standard 4.21—When cut scores defining pass-fail or proficiency categories are based on direct judgments about the adequacy of item or test performances or performance levels, the judgmental process should be designed so that judges can bring their knowledge and experience to bear in a reasonable way.

Table 8.1: Communication Arts Cut Scores

Grade	Cut Scores		
	Basic	Proficient	Advanced
3	592	648	673
4	612	662	691
5	625	675	702
6	631	676	704
7	634	680	712
8	639	696	723

Table 8.2: Mathematics Cut Scores

Grade	Cut Scores		
	Basic	Proficient	Advanced
3	568	628	667
4	596	651	688
5	605	668	706
6	628	681	721
7	640	685	724
8	670	710	741

Table 8.3: Science Cut Scores

Grade	Cut Scores		
	Basic	Proficient	Advanced
5	626	669	692
8	671	703	735

CHAPTER 9: EVIDENCE OF CONSTRUCT-RELATED VALIDITY

Evidence for construct-related validity—the meaning of test scores and the inferences they support—is the central concept underlying the MAP validation process. In this section, CTB presents evidence of construct-related validity through studies of test reliability, convergent validity, and divergent validity. All analyses in this section are based on census data.

Chapter 9 of this report demonstrates the adherence to AERA, APA, & NCME (1999) Standards 1.11, 1.18, 2.1, 2.2, 2.4, 2.14, and 2.15. 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) 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 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 be untimed), 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. MAP is designed to represent the Show-Me Standards/GLE strands. Specification and review, in which test blueprints are developed and reviewed, are primary steps in the development process designed to ensure that content is appropriately represented.

9.2 Reliability

Reliability refers to the consistency of the 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, and 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 not sufficient condition of validity.

The AERA, APA, & NCME (1999) *Standards* indicates:

> . . . reliability evidence may be reported in terms of variances or standard deviations of measurement errors, in terms of one or more coefficients, or in terms of IRT-based test information functions (27).

In accordance with the AERA, APA, & NCME (1999) *Standards* and in developing and maintaining tests of the highest quality, CTB 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 achievement-level classifications.

There are several specific AERA, APA, & NCME (1999) standards that this chapter addresses. These include Standards 2.1, 2.2, and 2.4, each articulated below.

Standard 2.1 *For each total score, subscore, or combination of scores that is to be interpreted, estimates of relevant reliabilities and standard errors of measurement or test information functions should be reported.*

The total score reliabilities are discussed in 9.2.1. of this chapter. The subscore reliabilities and SEMs are presented in Section 9.4.3. The SEM of the total score is discussed in Section 9.2.2.

Standard 2.2 *The standard error of measurement, both overall and conditional (if relevant), should be reported both in raw score or original scale units and in units of each derived score recommended for use in test interpretation.*

The overall SEM is discussed in Section 9.2.2 and is reported in scale score units. The conditional SEM is discussed in Section 9.2.3.

Standard 2.4 *Each method of quantifying the precision or consistency of scores should be described clearly and expressed in terms of statistics appropriate to the method. The sampling procedures used to select examinees for reliability analyses and descriptive statistics on these samples should be reported.*

Section 9.2 discusses different ways of measuring test reliability, including reliability of raw scores, overall SEM, IRT-based conditional SEM, and decision consistency of achievement-level classifications. The sample on which these statistics are computed is discussed in Section 6.1 of Chapter 6.

9.2.1 Test Reliability

The reliability of raw scores on the MAP tests 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, 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

$$\alpha = \frac{n}{n-1}\left[1 - \frac{\sum_{i=1}^{n} \sigma_i^2}{\sigma_X^2}\right], \tag{9.1}$$

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

Total test reliability measures, such as Cronbach's coefficient alpha

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

The reliability coefficients for the MAP are reported in Tables 9.1, 9.2, and 9.3 for Communication Arts, Mathematics, and Science, respectively. These reliability coefficients were computed using the census data. All reliability statistics are 0.90 or greater for all tests, indicating acceptable reliability. 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:

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

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

The overall SEM is expressed in scale score units and is a test level statistic. The SEM is summarized in Table 9.4 with respect to all students and each subgroup.

9.2.3 Conditional Standard Error of Measurement

In contrast to SEM, the conditional standard errors of measurement (CSEM) express the degree of measurement error in scale score units and are conditioned on the ability of the student. We report the CSEM in support of AERA, APA, & NCME (1999) Standard 2.14, which states:

> Conditional standard errors of measurement should be reported at several score levels if constancy cannot be assumed. Where cut scores are specified for selection or classification, the standard errors of measurement should be reported in the vicinity of the cut scores.

In further compliance with Standard 2.14, the CSEM of each cut score is reported in Table 9.5.

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):

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

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

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

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 smaller 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 9.5 and range from 8 to 17 scale score points.

Figures 9.1 through 9.3 display the CSEM curves for each grade/content area. 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 9.1 through 9.3 demonstrate that the tests are designed so that measurement error is minimized in the middle of the scale range where the majority of students are located.

9.2.4 Classification Accuracy and Consistency

The *Standards* (AERA, APA, & NCME, 1999) also make reference to an additional measurement concern that bears on evidence for validity:

> Some authorities have proposed that a semantic distinction be made between "reliability of scores" and "degree of agreement in classification." The former term would be reserved for analysis of score variation under repeated measurement. The term *classification consistency* . . . , rather than reliability, would be used in discussions of consistency of classification. Adoption of such usage would make it clear that the importance of an error of any given size depends on the proximity of the examinee's score to the cut score.

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 (1999) Standard 2.15, which states:

> When a test or combination of measures is used to make categorical decisions, estimates should be provided of the percentage of examinees who would be classified in the same way on two applications of the procedure, using the same form or alternate forms of the instrument.

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 their 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 3×3 contingency table.

Example of Contingency Table with 2 Cut Scores

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

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

- Step 1: Obtain item parameters (**I**) and ability distribution weight ($\hat{g}(\theta)$) at each quadrature point from a single test.
- Step 2: Compute two raw scores at each quadrature point. At a given quadrature point θ_i, generate two sets of item responses using the item parameters from a test form, assuming that the same test form was administered twice to an examinee with the true ability θ_i.
- Step 3: Construct a classification matrix at each quadrature point. Determine the joint event for the cells in table above using the raw scores obtained from Step 2.
- Step 4: Repeat Steps 2 and 3 *R* times and get average values over *R* replications.
- Step 5: Multiply 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 scores) and quadrature point (true score).

Tables 9.6 and 9.7 show the results for the 2012 MAP classification analyses. Classification consistency and classification accuracy conditioned on performance level (Table 9.6) and on cut score (Table 9.7) are presented. As can be seen in Table 9.6, classification accuracy conditioned on achievement level ranged from 0.60 to 0.90, and classification consistency conditioned on achievement level ranged from 0.49 to 0.85. The magnitude of classification consistency and accuracy measures is influenced by key features of the test design including the number of items, the number of cut scores, and the reliability and associated SEM.

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 9.7 shows the classification accuracy and consistency estimates when conditioned on MAP cut scores. The classification accuracy statistics are at or above 0.90 while the classification consistency statistics are at or above 0.85. These results suggest that consistent and accurate performance level classifications are being made for students in Missouri based on the MAP.

9.2.5 Convergent Validity

Convergent validity is a subtype of construct validity that can be estimated by the extent to which measures of constructs that theoretically should be related to each other are, in fact, observed as related to each other. 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 should only measure Mathematics, not Science, Language, or Reading.

This technical report summarizes additional statistics that contribute to construct validity (Cronbach's coefficient alpha reported previously in this section and item fit reported in Chapter 6). The internal consistency coefficient (Cronbach's alpha) reported above is a measure of item homogeneity. In order for a group of items to be homogeneous, they must measure the same construct (construct validity) or represent the same content domain (content validity). Because IRT models were used to calibrate test items and to report student scores, item fit is also relevant to construct validity. The extent to which test items function as the IRT model prescribes is relevant to the validation of test scores. As shown in Chapter 6, only 13 items total were flagged for poor model/data fit across all 14 grade/content area MAPs.

9.3 Principal Components Analysis

As another measure of construct validity, CTB 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 comprising MAP in each grade/content area measure a single content domain. For example, Mathematics items should measure Mathematics ability and not Reading skills. Standard 1.11 of the AERA, APA, & NCME (1999) Standards says,

> If the rationale for a test use or interpretation depends on premises about the relationship among parts of the test, evidence concerning internal structure should be provided.

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 principal components factor analysis was conducted on each grade/content area MAP. 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 grade/content area MAPs, 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. All of the MAP subject area tests exhibit first principal components accounting for more than 16% of the test variance (see Tables 9.8 through 9.10). To further investigate the unidimensionality of the Communication Arts, Mathematics, and Science tests, the ratio of the first eigenvalue to the second eigenvalue was explored (see Tables 9.8 through 9.10). These ratios show that the first eigenvalue is at least five times as large as the second eigenvalue for all of the grade/content areas. This substantial difference in magnitude indicates that one factor appears to be dominant and that the Communication Arts, Mathematics, and Science tests are essentially unidimensional.

This evidence supports the claim that there is a dominant dimension underlying the items/tasks in each test and that scores from each test represent performance 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 Content Standard

Three sets of analyses were conducted for the Content Standard level in another attempt to assess the construct validity of MAP. First, the reliability of each Content Standard was computed. Second, correlation coefficients that measure the relationship between the Content Standards were computed. Finally, the SEM was computed for each reportable Content Standard.

9.4.1 Reliability of Content Standards

Cronbach's (1951) coefficient alpha was computed for each of the Content Standards by grade/content area using the census data. Tables 9.11 through 9.13 report the reliability statistics along the diagonal of each matrix for each grade/content area. Reliability indices, such as Cronbach's coefficient alpha, are a function of the number of test items.

It is expected that coefficient alpha would be low for a Content Standard assessed by a small number of items (e.g., Writing Formally and Informally).

9.4.2 Correlations among Content Standard Subscores

In this section, we measure the strength of the interrelationships among the Content Standards by computing correlation between the Content Standards. Tables 9.11 through 9.13 report the uncorrected Pearson product-moment (PPM) correlation coefficients, as well as the PPM corrected for attenuation (CAPPM), in addition to the reliability coefficients described above. The PPM among the Content Standard subscores is presented below the diagonal portion of the matrix, the CAPPM is presented above the diagonal portion of the matrix, and the reliability coefficients are shown on the diagonal in each table.

The uncorrected PPM in Tables 9.11 through 9.13 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. Overall, the PPM coefficients show that performance on one Content Standard is moderately to strongly related to performance on another Content Standard within the same content area. As noted above, the value of the correlation coefficients will be affected by the limited number of items measuring each Content Standard. So, caution should be used when comparing the PPM coefficients measuring the relationships between Content Standards to those measuring the relationships between content areas (Table 9.17). We expect to see a more modest relationship (smaller correlation coefficients) reported between the Content Standards as a consequence of the lower number of items measuring each Content Standard (e.g., Writing Formally and Informally). The PPM between two Content Standard subscores may be artificially low because of measurement error.

AERA, APA, & NCME (1999) Standard 1.18, states:

> 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.

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

$$CAPPM = \frac{r_{xy}}{\sqrt{r_{xx} r_{yy}}}, \tag{9.5}$$

where r_{xy} is the PPM between two Content Standards, r_{xx} is the reliability of one of those Content Standards, and r_{yy} is the reliability for the other Content Standard.

Across all tables, the CAPPM indicate strong relationships between the Content Standards. In some cases, the CAPPM is greater than 1.0. "Disattenuated values greater than 1.00 indicate that measurement error is not randomly distributed" (Schumacker, 1996). The strong relationships suggested by the CAPPM in Tables 9.11 through 9.13 are

further evidence of the validity of the test construct. Since the overall content area is comprised of the Content Standard subscores and the content area is expected to measure a single dimension, we would expect that these subscores are also highly related.

9.4.3 Standard Error of Measurement of Content Standards

In this chapter, we report the SEM associated with each of the Content Standards in Tables 9.14 through 9.16 for Communication Arts, Mathematics, and Science, respectively. These SEMs are reported in the percent correct metric as Content Standards are reported in that metric.

9.5 Divergent (Discriminant) Validity

Measures of different constructs should not be highly correlated with each other. Divergent validity is a subtype of construct validity that 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 validity.

To assess the divergent validity of the MAP tests, correlations were computed between the Communication Arts, Mathematics, and Science scale scores for students who took more than one MAP subject area test in 2012. These correlations are based on the census data and the results are shown in Table 9.17. The correlation coefficients ranged from 0.69 (between Communication Arts and Mathematics in Grade 3) to 0.79 (between Communication Arts and Science, and Mathematics and Science in Grade 8). The correlation coefficients suggest that individual student scores for Communication Arts, Mathematics, and Science are moderately to highly related. The correlation coefficients between Science and the other two content areas in grade 8 suggest that the Science grade 8 MAP is highly related to the Communication Arts and Mathematics grade 8 MAP. The tests are not perfectly related to each other, suggesting that different constructs are being tapped; however, the test scores do appear at least moderately related to one another, suggesting they are tapping into a similar knowledge base. This is especially true of the Science grade 8 test. The Science MAP is comprised of many constructed-response items, which may help account for its relationship with the Communication Arts test. The Science MAP tests similar thinking skills and item types as are found in the Mathematics MAP, which may help account for the strong correlation between the Science and Mathematics grade 8 test scores.

9.6 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 program 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 accommodations, and providing guidance on appropriate interpretations of the test results. These communication and training efforts by DESE and the ancillary information developed by CTB/McGraw-Hill address multiple best practices of the testing industry but, in particular, are related to the following *Standards for Educational and Psychological Testing* (1999):

- Standard 1.11—If the rational for a test use or interpretation depends on premises about the relationship among parts of the test, evidence concerning internal structure should be provided.
- Standard 1.18—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.
- Standard 2.1—For each total score, subscore, or combination of scores that is to be interpreted, estimates of relevant reliabilities and standard errors of measurement or test information functions should be reported.
- Standard 2.2—The standard error of measurement, both overall and conditional (if relevant), should be reported both in raw score or original scale units and in units of each derived score recommended for use in test interpretation.
- Standard 2.4—Each method of quantifying the precision or consistency of scores should be described clearly and expressed in terms of statistics appropriate to the method. The sampling procedures used to select examinees for reliability analyses and descriptive statistics on these samples should be reported.
- Standard 2.14—Conditional standard errors of measurement should be reported at several score levels if constancy cannot be assumed. Where cut scores are specified for selection or classification, the standard errors of measurement should be reported in the vicinity of the cut scores.
- Standard 2.15—When a test or combination of measures is used to make categorical decisions, estimates should be provided of the percentage of examinees who would be classified in the same way on two applications of the procedure, using the same form or alternate forms of the instrument.

Table 9.1: Reliability in Communication Arts

Grade	Number of Items	Number of Score Points	Cronbach's Alpha
3	56	61	0.91
4	56	61	0.91
5	56	60	0.91
6	56	60	0.91
7	62	66	0.91
8	60	64	0.91

Table 9.2: Reliability in Mathematics

Grade	Number of Items	Number of Score Points	Cronbach's Alpha
3	55	59	0.91
4	61	65	0.92
5	58	62	0.91
6	58	62	0.91
7	61	65	0.92
8	60	64	0.92

Table 9.3: Reliability in Science

Grade	Number of Items	Number of Score Points	Cronbach's Alpha
5	55	68	0.90
8	56	69	0.91

Table 9.4: SEM by Subgroup

Grade	Category	Group	CA SEM	MA SEM	SC SEM
3	**Overall**		11.30	11.94	
	Ethnicity	White (not Hispanic)	11.62	11.98	
		Black (not Hispanic)	11.57	10.45	
		Hispanic	10.98	11.14	
		Asian/Pacific Islander	12.13	13.88	
		Native American	11.30	11.45	
		Other	11.01	11.25	
	Gender	Male	11.52	11.45	
		Female	11.46	11.70	
	Accommo-dations	No	11.32	12.01	
		Yes	12.20	10.38	
4	**Overall**		11.80	9.87	
	Ethnicity	White (not Hispanic)	11.81	9.77	
		Black (not Hispanic)	11.27	10.20	
		Hispanic	11.53	9.58	
		Asian/Pacific Islander	12.52	10.50	
		Native American	10.74	9.40	
		Other	11.41	9.83	
	Gender	Male	11.34	10.04	
		Female	11.96	9.67	
	Accommo-dations	No	11.77	9.83	
		Yes	12.23	10.35	
5	**Overall**		10.63	12.84	10.82
	Ethnicity	White (not Hispanic)	10.60	12.78	10.69
		Black (not Hispanic)	10.94	12.25	11.74
		Hispanic	10.71	11.87	10.56
		Asian/Pacific Islander	12.17	13.81	11.43
		Native American	10.13	12.58	10.33
		Other	10.92	12.46	11.27
	Gender	Male	10.91	12.47	11.22
		Female	10.78	12.41	10.88
	Accommo-dations	No	10.41	12.60	10.65
		Yes	13.25	13.23	12.28
6	**Overall**		9.85	12.06	
	Ethnicity	White (not Hispanic)	9.86	11.97	
		Black (not Hispanic)	10.41	12.10	
		Hispanic	10.10	11.60	
		Asian/Pacific Islander	10.71	12.61	
		Native American	9.74	11.54	
		Other	10.21	11.89	
	Gender	Male	10.03	11.80	
		Female	9.96	11.52	
	Accommo-dations	No	9.57	11.71	
		Yes	12.11	12.88	

Table 9.4: SEM by Subgroup (Cont'd)

Grade	Category	Group	CA SEM	MA SEM	SC SEM
7	**Overall**		10.86	11.74	
	Ethnicity	White (not Hispanic)	10.83	11.61	
		Black (not Hispanic)	11.53	12.56	
		Hispanic	11.07	12.05	
		Asian/Pacific Islander	11.94	12.87	
		Native American	10.42	11.92	
		Other	10.86	11.24	
	Gender	Male	11.07	12.21	
		Female	11.31	11.19	
	Accommo-dations	No	10.80	11.50	
		Yes	12.25	14.07	
8	**Overall**		10.05	11.37	9.58
	Ethnicity	White (not Hispanic)	9.98	11.25	9.57
		Black (not Hispanic)	10.34	12.82	10.66
		Hispanic	9.90	11.82	9.97
		Asian/Pacific Islander	10.46	12.27	10.21
		Native American	10.40	11.91	9.65
		Other	10.09	11.64	9.84
	Gender	Male	9.90	11.83	10.02
		Female	9.88	11.51	9.56
	Accommo-dations	No	9.82	11.12	9.78
		Yes	12.98	15.15	11.55

Table 9.5: Conditional Standard Error of Measurement at the Basic, Proficient, & Advanced Cut Scores

Content Area	Grade	Basic		Proficient		Advanced	
		Cut Score	CSEM	Cut Score	CSEM	Cut Score	CSEM
Communication Arts	3	592	9	648	11	673	14
	4	612	8	662	10	691	15
	5	625	9	675	9	702	12
	6	631	8	676	8	704	11
	7	634	10	680	9	712	11
	8	639	11	696	8	723	10
Mathematics	3	568	9	628	9	667	17
	4	596	9	651	8	688	13
	5	605	12	668	10	706	14
	6	628	11	681	10	721	12
	7	640	12	685	8	724	10
	8	670	12	710	8	741	8
Science	5	626	10	669	9	692	10
	8	671	9	703	8	735	9

Table 9.6: Decision Accuracy and Consistency Conditioned on Level of Achievement

Content Area	Grade	Accuracy					Consistency			
		Below Basic	Basic	Prof.	Adv.		Below Basic	Basic	Prof.	Adv.
Communication Arts	3	0.90	0.87	0.60	0.81		0.81	0.81	0.49	0.72
	4	0.86	0.84	0.66	0.86		0.81	0.78	0.55	0.75
	5	0.88	0.85	0.69	0.87		0.81	0.80	0.59	0.75
	6	0.86	0.85	0.75	0.87		0.79	0.79	0.66	0.70
	7	0.84	0.86	0.76	0.84		0.80	0.80	0.66	0.75
	8	0.81	0.87	0.77	0.86		0.71	0.85	0.67	0.72
Mathematics	3	0.84	0.88	0.73	0.81		0.81	0.82	0.67	0.63
	4	0.85	0.87	0.82	0.82		0.76	0.85	0.74	0.65
	5	0.84	0.85	0.78	0.85		0.76	0.81	0.69	0.75
	6	0.86	0.83	0.81	0.83		0.79	0.79	0.72	0.73
	7	0.86	0.81	0.82	0.88		0.77	0.77	0.77	0.79
	8	0.86	0.79	0.80	0.90		0.79	0.74	0.72	0.84
Science	5	0.86	0.84	0.66	0.87		0.75	0.76	0.59	0.79
	8	0.88	0.78	0.81	0.83		0.80	0.71	0.73	0.71

Table 9.7: Decision Accuracy and Consistency at Achievement Cut Points

Content Area	Grade	Accuracy				Consistency		
		Below Basic/ Basic	Basic/ Prof.	Prof./Adv.		Below Basic/ Basic	Basic/ Prof.	Prof./Adv.
Communication Arts	3	0.98	0.90	0.91		0.97	0.85	0.87
	4	0.98	0.91	0.90		0.97	0.86	0.87
	5	0.98	0.91	0.91		0.97	0.87	0.88
	6	0.98	0.91	0.93		0.97	0.87	0.89
	7	0.97	0.92	0.92		0.96	0.89	0.89
	8	0.98	0.92	0.93		0.97	0.89	0.89
Mathematics	3	0.98	0.91	0.92		0.98	0.87	0.89
	4	0.98	0.92	0.94		0.97	0.89	0.91
	5	0.98	0.92	0.93		0.97	0.89	0.90
	6	0.98	0.92	0.93		0.96	0.88	0.90
	7	0.97	0.93	0.94		0.95	0.91	0.91
	8	0.95	0.93	0.95		0.93	0.90	0.92
Science	5	0.97	0.91	0.92		0.95	0.88	0.89
	8	0.95	0.92	0.94		0.93	0.88	0.92

Table 9.8: Principal Component Analysis for Communication Arts

Grade	Eigenvalue	Percent of Variance Explained	Cumulative Percent of Variance Explained
Grade 3			
First Component	10.57	18.88	18.88
Second Component	1.57	2.80	21.67
Ratio (First/Second)	6.75		
Grade 4			
First Component	11.57	20.65	20.65
Second Component	1.75	3.13	23.78
Ratio (First/Second)	6.61		
Grade 5			
First Component	10.64	19.00	19.00
Second Component	1.67	2.98	21.98
Ratio (First/Second)	6.37		
Grade 6			
First Component	10.10	18.04	18.04
Second Component	1.53	2.73	20.77
Ratio (First/Second)	6.61		
Grade 7			
First Component	10.46	16.86	16.86
Second Component	1.68	2.72	19.58
Ratio (First/Second)	6.21		
Grade 8			
First Component	10.93	18.22	18.22
Second Component	1.72	2.87	21.09
Ratio (First/Second)	6.35		

Table 9.9: Principal Component Analysis for Mathematics

Grade	Eigenvalue	Percent of Variance Explained	Cumulative Percent of Variance Explained
Grade 3			
First Component	10.89	19.80	19.80
Second Component	1.71	3.12	22.91
Ratio (First/Second)	6.35		
Grade 4			
First Component	11.33	18.58	18.58
Second Component	1.68	2.76	21.34
Ratio (First/Second)	6.74		
Grade 5			
First Component	10.94	18.86	18.86
Second Component	1.70	2.93	21.78
Ratio (First/Second)	6.44		
Grade 6			
First Component	10.46	18.03	18.03
Second Component	1.80	3.11	21.14
Ratio (First/Second)	5.80		
Grade 7			
First Component	11.34	18.59	18.59
Second Component	1.65	2.70	21.29
Ratio (First/Second)	6.88		
Grade 8			
First Component	10.92	18.21	18.21
Second Component	1.72	2.87	21.07
Ratio (First/Second)	6.35		

Table 9.10: Principal Component Analysis for Science

Grade	Eigenvalue	Percent of Variance Explained	Cumulative Percent of Variance Explained
Grade 5			
First Component	9.14	16.63	16.63
Second Component	1.46	2.66	19.29
Ratio (First/Second)	6.25		
Grade 8			
First Component	9.72	17.35	17.35
Second Component	1.74	3.11	20.46
Ratio (First/Second)	5.58		

Table 9.11: Reliability (Diagonal) of Each Content Standard, Uncorrected Correlation Coefficient (below Diagonal) and Corrected Correlation Coefficient (above Diagonal) among Content Standards: Communication Arts

Grade	No.	Content Standard	Number of Items	1	2	3	4	5
3	1	Speaking/Writing Standard English	15	0.73	0.93	0.90		0.92
	2	Reading Fiction/Poetry/Drama	27	0.72	0.82	0.97		1.13
	3	Reading Nonfiction	13	0.66	0.76	0.75		1.12
	4	Writing Formally/Informally	NR*					
	5	Combined Reading	40	0.74	0.96	0.91		0.88
4	1	Speaking/Writing Standard English	12	0.64	0.86	0.87		0.87
	2	Reading Fiction/Poetry/Drama	15	0.62	0.82	0.96		1.06
	3	Reading Nonfiction	28	0.64	0.80	0.84		1.12
	4	Writing Formally/Informally	NR*					
	5	Combined Reading	43	0.66	0.91	0.98		0.90
5	1	Speaking/Writing Standard English	12	0.58	0.85	0.93		0.92
	2	Reading Fiction/Poetry/Drama	16	0.58	0.80	0.92		1.05
	3	Reading Nonfiction	27	0.65	0.76	0.85		1.11
	4	Writing Formally/Informally	NR*					
	5	Combined Reading	43	0.66	0.89	0.97		0.90
6	1	Speaking/Writing Standard English	12	0.63	0.87	0.92		0.90
	2	Reading Fiction/Poetry/Drama	21	0.61	0.80	0.95		1.12
	3	Reading Nonfiction	22	0.66	0.77	0.82		1.10
	4	Writing Formally/Informally	NR*					
	5	Combined Reading	43	0.68	0.94	0.94		0.89
7	1	Speaking/Writing Standard English	16	0.65	0.90	0.91		0.91
	2	Reading Fiction/Poetry/Drama	24	0.65	0.80	0.96		1.13
	3	Reading Nonfiction	20	0.66	0.77	0.80		1.10
	4	Writing Formally/Informally	NR*					
	5	Combined Reading	44	0.69	0.96	0.92		0.89
8	1	Speaking/Writing Standard English	16	0.68	0.89	0.89		0.90
	2	Reading Fiction/Poetry/Drama	20	0.66	0.80	0.96		1.09
	3	Reading Nonfiction	23	0.67	0.78	0.84		1.10
	4	Writing Formally/Informally	NR*					
	5	Combined Reading	43	0.71	0.93	0.96		0.90

*NR=Not Reported

Table 9.12: Reliability (Diagonal) of Each Content Standard, and Uncorrected Correlation Coefficient (below Diagonal) and Corrected Correlation Coefficient (above Diagonal) among Content Standards: Mathematics

Grade	No.	Content Standard	Number of Items	1	2	3	4	5
3	1	Number and Operations	18	0.80	1.00	0.89	1.03	1.06
	2	Algebraic Relationship	11	0.74	0.69	0.91	1.02	1.05
	3	Geometric and Spatial	12	0.63	0.59	0.62	0.91	0.98
	4	Measurement	9	0.75	0.69	0.58	0.66	1.08
	5	Data and Probability	5	0.69	0.63	0.56	0.64	0.53
4	1	Number and Operations	23	0.82	0.97	0.88	0.93	0.98
	2	Algebraic Relationship	10	0.74	0.71	0.88	0.92	0.97
	3	Geometric and Spatial	9	0.61	0.56	0.58	0.90	0.91
	4	Measurement	13	0.73	0.67	0.59	0.74	0.92
	5	Data and Probability	6	0.65	0.60	0.51	0.58	0.54
5	1	Number and Operations	15	0.78	0.99	0.87	0.99	0.91
	2	Algebraic Relationship	13	0.77	0.78	0.90	0.99	0.96
	3	Geometric and Spatial	10	0.57	0.59	0.56	0.91	0.91
	4	Measurement	10	0.71	0.71	0.55	0.66	0.91
	5	Data and Probability	10	0.62	0.65	0.53	0.57	0.59
6	1	Number and Operations	16	0.76	0.98	0.92	0.98	0.94
	2	Algebraic Relationship	11	0.69	0.66	0.98	1.01	0.98
	3	Geometric and Spatial	8	0.60	0.59	0.56	0.98	0.97
	4	Measurement	8	0.66	0.64	0.58	0.61	1.00
	5	Data and Probability	15	0.70	0.68	0.62	0.67	0.73
7	1	Number and Operations	14	0.79	0.93	0.93	0.95	0.95
	2	Algebraic Relationship	18	0.72	0.75	0.96	0.95	0.99
	3	Geometric and Spatial	11	0.67	0.67	0.66	0.98	0.99
	4	Measurement	8	0.69	0.68	0.65	0.67	0.98
	5	Data and Probability	10	0.66	0.68	0.63	0.63	0.62
8	1	Number and Operations	13	0.74	0.94	0.93	0.93	0.98
	2	Algebraic Relationship	18	0.72	0.80	0.96	0.94	0.99
	3	Geometric and Spatial	11	0.63	0.67	0.62	0.98	0.98
	4	Measurement	6	0.61	0.64	0.59	0.57	0.97
	5	Data and Probability	12	0.69	0.72	0.63	0.60	0.67

*NR=Not Reported

Table 9.13: Reliability (Diagonal) of Each Content Standard, and Uncorrected Correlation Coefficient (below Diagonal) and Corrected Correlation Coefficient (above Diagonal) among Content Standards: Science

Grade	No.	Content Standard	Number of Items	1	2	3	4	5	6	7	8
5	1	Matter and Energy	9	0.54	0.98	0.96	0.96	0.98	0.98	0.91	1.00
	2	Force and Motion	5	0.53	0.53	0.97	0.94	0.97	1.02	0.91	0.97
	3	Characteristics of Living Organisms	6	0.50	0.49	0.49	1.00	0.96	0.97	0.91	1.04
	4	Interactions of Organisms	8	0.57	0.56	0.57	0.66	0.96	0.97	0.92	1.06
	5	Earth's Processes	8	0.52	0.50	0.48	0.56	0.51	0.98	0.91	1.03
	6	The Universe	6	0.54	0.56	0.51	0.59	0.52	0.56	0.93	1.01
	7	Scientific Inquiry	8	0.48	0.48	0.46	0.54	0.47	0.50	0.52	0.98
	8	Technology and the Environment	5	0.50	0.48	0.49	0.58	0.50	0.51	0.48	0.46
8	1	Matter and Energy	8	0.58	1.10	1.01	0.97	0.99	0.97	0.95	0.98
	2	Force and Motion	6	0.52	0.39	1.00	0.96	1.01	0.98	0.99	0.97
	3	Characteristics of Living Organisms	7	0.58	0.47	0.57	0.99	0.99	0.91	0.94	1.03
	4	Interactions of Organisms	7	0.57	0.46	0.58	0.60	0.99	0.87	0.97	1.02
	5	Earth's Processes	9	0.58	0.48	0.57	0.59	0.59	0.89	0.97	1.00
	6	The Universe	5	0.54	0.45	0.50	0.49	0.50	0.53	0.81	0.85
	7	Scientific Inquiry	9	0.56	0.48	0.55	0.58	0.58	0.45	0.60	0.97
	8	Technology and the Environment	5	0.56	0.45	0.58	0.59	0.57	0.46	0.57	0.56

Table 9.14: Mean, Standard Deviation, and Standard Error of Measurement (SEM) of Communication Arts Content Standards

Grade	Content Standard	Mean	Std. Deviation	SEM
3	1	73.00	19.16	9.96
	2	77.03	16.80	7.13
	3	72.69	18.15	9.08
	5	75.35	16.29	5.64
4	1	76.88	16.43	9.86
	2	83.59	19.70	8.36
	3	69.99	18.42	7.37
	5	74.33	17.96	5.68
5	1	68.13	17.45	11.31
	2	76.32	20.38	9.11
	3	69.42	18.90	7.32
	5	71.77	18.29	5.78
6	1	68.21	19.93	12.12
	2	68.61	18.59	8.31
	3	72.33	19.66	8.34
	5	70.35	17.96	5.96
7	1	62.81	17.82	10.54
	2	71.17	18.07	8.08
	3	74.00	19.52	8.73
	5	72.35	17.60	5.84
8	1	56.54	19.67	11.13
	2	72.21	19.69	8.81
	3	74.37	19.56	7.82
	5	73.45	18.55	5.87

Table 9.15: Mean, Standard Deviation, and Standard Error of Measurement (SEM) of Mathematics Content Standards

Grade	Content Standard	Mean	Std. Deviation	SEM
3	1	79.02	18.52	8.28
	2	77.42	19.58	10.90
	3	82.57	15.83	9.76
	4	78.81	20.64	12.04
	5	85.93	20.48	14.04
4	1	77.03	18.07	7.67
	2	77.10	21.58	11.62
	3	76.04	18.89	12.24
	4	67.17	22.54	11.49
	5	74.60	22.23	15.08
5	1	72.22	20.88	9.79
	2	72.21	22.13	10.38
	3	76.09	17.70	11.74
	4	65.95	23.02	13.42
	5	76.55	18.06	11.56
6	1	65.29	20.30	9.94
	2	66.70	20.06	11.70
	3	70.48	20.22	13.41
	4	72.86	21.94	13.70
	5	75.16	18.86	9.80
7	1	69.29	23.32	10.69
	2	56.48	21.13	10.57
	3	72.81	20.17	11.76
	4	65.95	25.77	14.80
	5	65.92	19.31	11.90
8	1	68.33	22.23	11.34
	2	55.01	21.78	9.74
	3	56.49	21.03	12.96
	4	56.14	24.86	16.30
	5	63.06	22.10	12.70

Table 9.16: Mean, Standard Deviation, and Standard Error of Measurement (SEM) of Science Content Standards

Grade	Content Standard	Mean	Std. Deviation	SEM
5	1	60.84	19.96	13.54
	2	46.22	22.59	15.49
	3	71.09	20.50	14.64
	4	70.00	22.76	13.27
	5	57.97	20.88	14.62
	6	50.15	21.98	14.58
	7	76.20	19.42	13.45
	8	75.33	22.94	16.86
8	1	55.36	20.55	13.32
	2	55.10	22.85	17.85
	3	48.63	20.43	13.40
	4	63.15	25.08	15.86
	5	55.57	17.70	11.33
	6	34.89	22.54	15.45
	7	78.87	18.81	11.90
	8	59.42	24.82	16.46

Table 9.17: Inter-Correlation of Communication Arts, Mathematics, and Science Scale Scores

Grade	CA/MA	CA/SC	MA/SC
3	0.69	-	-
4	0.71	-	-
5	0.74	0.77	0.77
6	0.74	-	-
7	0.76	-	-
8	0.75	0.79	0.79

Figure 9.1: CSEM Curves Communication Arts, Grades 3–8

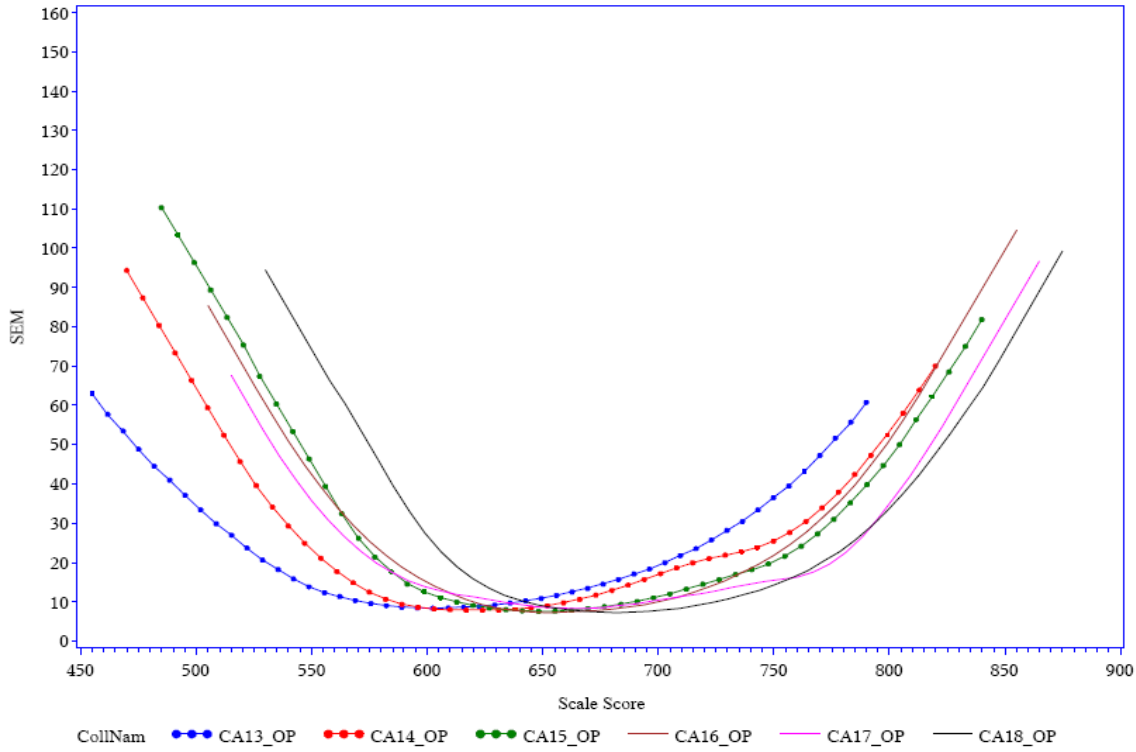


Figure 9.2: CSEM Curves Mathematics, Grades 3–8

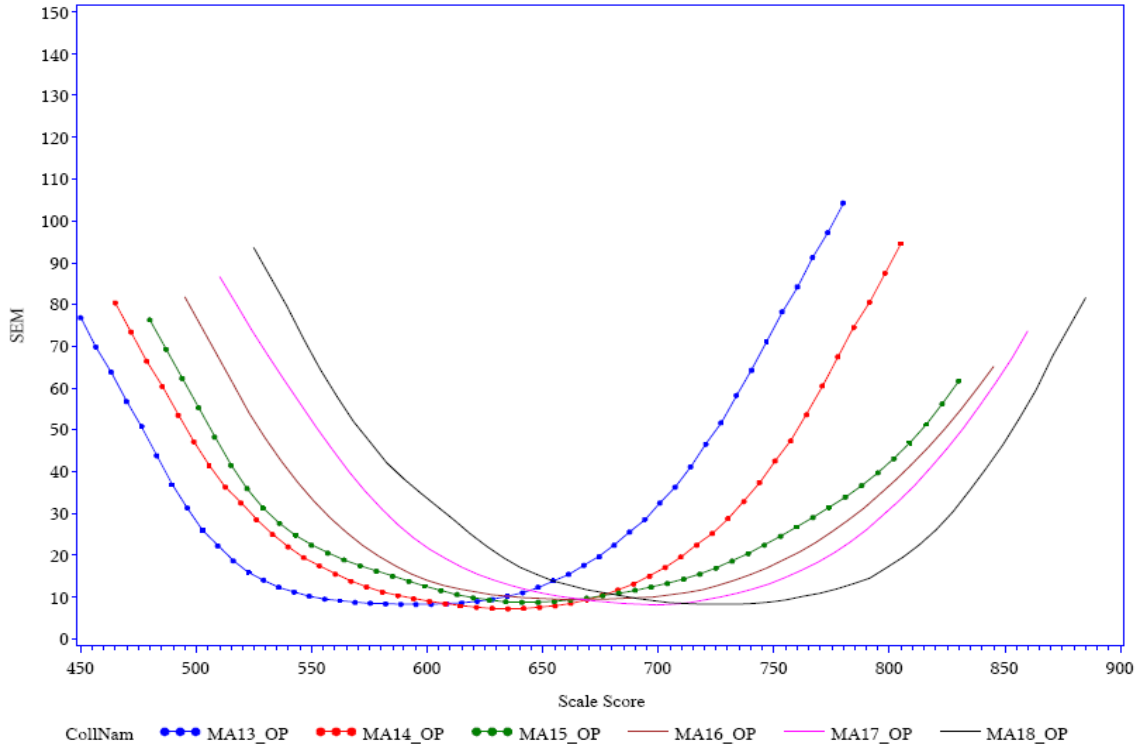
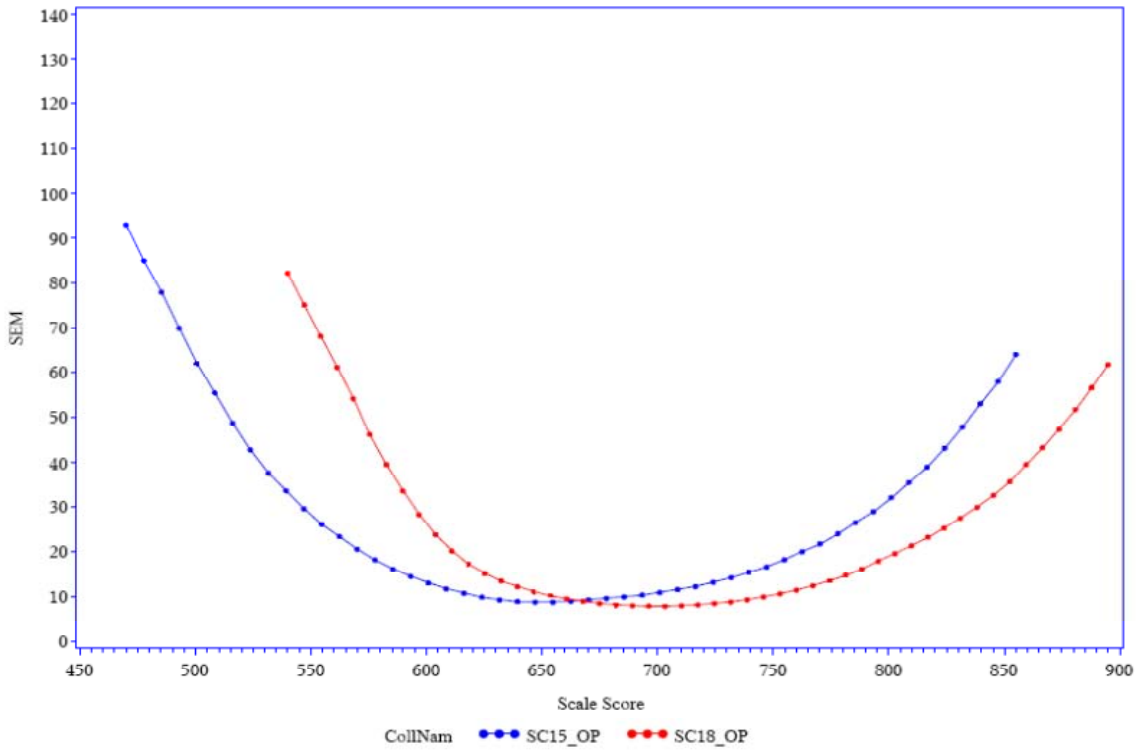


Figure 9.3: CSEM Curves Science, Grades 5 and 8



CHAPTER 10: FAIRNESS

As noted in the *Standards* (AERA, APA, & NCME, 1999), 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 MAP. It should be noted that differences in test performance among subgroups does not mean that a test is unfair—it simply means that groups perform differentially 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 (1999) Standards 7.1, 7.2, 7.3, and 7.4. Standards 7.1 through 7.4 are from Chapter 7 of the AERA, APA, & NCME (1999) *Standards*, which is titled "Fairness in Testing and Test Use." Each of these standards will be presented as will the way the standard is addressed in this chapter.

Standard 7.1 *When credible research reports that test scores differ in meaning across examinee subgroups for the type of test in question, then to the extent feasible, the same forms of validity evidence collected for the examinee population as a whole should also be collected for each relevant subgroup. Subgroups may be found to differ with respect to appropriateness of test content, internal structure of test responses, the relation of test scores to other variables, or the response processes employed by individual examinees. Any such findings should receive due consideration in the interpretation and use of scores as well as in the subsequent test revisions.*

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, CTB has several steps that are followed in item development and selections as is explicated in Section 10.1 of this chapter. Also, DESE conducts content and bias reviews on items as explained in Chapter 3.

Standard 7.2 *When credible research reports differences in the effects of construct-irrelevant variance across subgroups of test takers on performance on some part of the test, the test should be used if at all only for those subgroups for which evidence indicates that valid inferences can be drawn from test scores.*

Again, there is no research on MAP showing differences in the effects of construct-irrelevant variance across subgroups; however, DESE and CTB undertake steps to minimize construct-irrelevant variance through the test development process outlined in Section 10.1 of this chapter and explained in detail in Chapter 3.

Standard 7.3 *When credible research reports that differential item functioning exists across age, gender, racial/ethnic, cultural, disability, and/or linguistic groups in the population of test takers in the content domain measured by the test, test developers should conduct appropriate studies when feasible. Such research should seek to detect*

and eliminate aspects of test design, content, and format that might bias test scores for particular groups.

CTB conducts DIF studies following the operational administration of MAP. During the field-test phase of the project, items flagged for DIF will be further examined for possible bias. Items flagged for bias will be removed from the item pool. Section 10.2 of this chapter explains the steps taken to evaluate MAP items through the use of DIF.

Standard 7.4 *Test developers should strive to identify and eliminate language, symbols, words, phrases, and content that are generally regarded as offensive by members of racial, ethnic, gender, or other groups, except when judged to be necessary for adequate representation of the domain.*

Section 10.1 of this chapter is directly relevant to Standard 7.4. In this section, we explain the steps taken by CTB to minimize words, phrases, and content that may be regarded as offensive by members of particular demographic subgroups. Section 3.2.5 of Chapter 3 discusses the Content and Bias Review conducted for MAP. This review is also critical in fulfilling Standard 7.4.

10.1 Minimizing Bias through Careful 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 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 from the items, the possibility of bias is reduced.

Second, item writers and test developers followed several published guidelines for reducing or eliminating bias. These included *Guidelines for Bias-Free Publishing* (Macmillan/McGraw-Hill, 1993a) and *Reflecting Diversity: Multicultural Guidelines for Educational Publishing Professionals* (Macmillan/McGraw-Hill, 1993b). Test developers reviewed the items and other testing materials with these guidelines in mind. Internal editorial reviews were conducted by at least three different people: a content editor who directly supervised the item writers, a style editor, and a content supervisor. The final test was again reviewed by at least these same people and was also subjected to an independent review by a quality assurance editor.

Third, careful attention is given to item statistics 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 this may indicate that an item is tapping an ability that is irrelevant to the construct being measured. DIF statistics are also examined during test construction. Items that have exhibited significant DIF against one or more subgroups are removed from further consideration unless it is essential to include them in order to meet content specifications.

Additional steps to reduce bias, including the use of Bias Review committees comprised 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 performs better or worse than expected on each item as compared to the reference group. The DIF procedures used and the results of these analyses are detailed in this section.

The position of CTB/McGraw-Hill 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 this bias, CTB/McGraw-Hill 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 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 (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 kth level of the matching variable. Note that the MH statistic is sensitive to N 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 (ETS) first developed the MH-D DIF statistic. To compute delta, alpha (the odds ratio) is first computed as:

$$\alpha_{MH} = \frac{\sum_{k=1}^{K} N_{r1k} N_{f0k} / N_k}{\sum_{k=1}^{K} N_{f1k} N_{r0k} / N_k},$$

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 as:

$$\text{MH-D DIF} = -2.35 \ln(\alpha_{MH}).$$

For selected-response items, the MH (χ^2_{MH}) statistic was used to evaluate potential DIF items. In the MH procedure, subgroups are matched by their raw total test score, using a contingency table with K ability levels. When applying the MH procedure, the log-odds ratio α is assumed to be constant across the K matched levels. The χ^2_{MH}, then, estimates a pooled common-odds ratio. Taking the natural logarithm of the common-odds ratio and its confidence limits and multiplying these with the constant –2.35, the resulting values may then be placed on the MH delta metric (Δ_{MH}) for interpretive purposes. Items were flagged for DIF using the following criteria:

- Moderate DIF: Significant MH chi-square statistic ($p < 0.05$) and $1.0 \leq |\text{MH D-DIF}| < 1.5$
- Large DIF: Significant Mantel-Haenszel 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 will be 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 (Zwick et al., 1993):

$$SMD = p_{Fk}\left(\sum_k m_{Fk} - \sum_k m_{Rk}\right),$$

where p_{Fk} = proportion of the focal group members at the kth level of the matching variable, $m_{Fk} = 1/N_{F1k}$, and $m_{Rk} = 1/N_{R1k}$. Items are flagged using the same rules that are used in NAEP:

- Moderate DIF: If the MH statistic is significant ($p < .05$) and $|ES|$ is between 0.17 and 0.25.
- Large DIF: If the MH statistic is significant ($p < .05$) and $|ES| \geq 0.25$.

A positive DIF value indicates that the item favors the focal group, while a negative value indicates that the item disadvantages the focal group. Tables 10.1, 10.2, and 10.3 show the DIF results for the following subgroups:

- ***Gender***: Focal group is Females; Reference group is Males.

- ***Ethnicity***: Focal groups are Black, Hispanic, Asian/Pacific Islander, Native American/Alaskan, Other; Reference group is White.

- ***Accommodations***: Focal group is students who received one or more testing accommodations; 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 DIF analyses are not performed for subgroups of less than 100. In these cases, the statistical procedures do not have sufficient power to detect differences should they exist.

Tables 10.1, 10.2, and 10.3 summarize the number of DIF flags by grade for each focal group. They also show the number of items on each test as well as the sample size of each subgroup. For example, in Grade 6 Communication Arts (see Table 10.1), there was one item flagged for DIF for the accommodated subgroup. In this case, the flagged item exhibited moderate negative DIF. Three items were flagged for DIF for the female subgroup: two items exhibited moderate negative DIF while one exhibited moderate positive DIF. One item was flagged for moderate positive DIF in favor of the Black subgroup. One item was flagged for moderate negative DIF against the Hispanic subgroup. Three items were flagged for DIF for the Asian/Pacific Islander subgroup: two items exhibited moderate negative DIF while one exhibited moderate positive DIF.

Finally, one item was flagged for large positive DIF in favor of the Native American/Alaskan subgroup.

Again, any items included on the MAP (including those items flagged for DIF) have been thoroughly reviewed for content and bias by Missouri teachers, DESE staff, and CTB Content Development staff. Further, these items were reviewed for possible DIF flags during the field test stage of test development. The DIF flags found on the operational assessment 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). All items flagged for DIF in the tables stated above had been thoroughly reviewed before inclusion on the operational MAP to insure that they do not tap knowledge or specific ability irrelevant to the construct the test intends to measure. Items are not necessarily suppressed from operational scoring if they are flagged for DIF.

10.3 Evaluating Bias through Impact Analysis

The impact of achievement testing on minorities can be determined and reported in the form of average scores and also in terms of test score reliability. Tables 10.4 through 10.9 present the number of students, scale score means and standard deviations, effect size (Cohen's *d*), and test form reliability statistics (Coefficient Alpha, see Chapter 9) for various subgroups of interest.

10.3.1 Reliability

Tables 10.4 through 10.9 show the test reliability for the various subgroups of interest. This analysis shows that the test reliability is of acceptable magnitude for all of the subgroups.

10.3.2 Effect Size

One way to evaluate the magnitude of the differences is to calculate the effect size. Cohen's *d* was used to calculate the effect size. Cohen's *d* is given by the formula:

$$d = \frac{\overline{x_a} - \overline{x_b}}{\sqrt{\dfrac{(n_a - 1)s_a^2 + (n_b - 1)s_b^2}{(n_a + n_b) - 2}}},$$

where $\overline{x_a}$ is the mean score of group A, $\overline{x_b}$ is the mean score of group B, s_a^2 is the variance of group A, s_b^2 is the variance of group B, n_a is the number of students in group A, and n_b is the number of students in group B.

Cohen's *d*, then, expresses the difference in group means in terms of the standard deviation. For example if *d*=.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*=.20 is a small effect size, *d*=.50 is a medium effect size, and *d*=.80 is a large effect size.

Using Cohen's (1988) guidelines, certain trends become apparent in Tables 10.4 through 10.9. On the Communication Arts test in all grades, there are small differences in mean test scores between girls and boys where girls outperform boys. On the Communication Arts, Mathematics, and Science tests in all grades, there is a large difference between the mean test scores of accommodated and non-accommodated students where accommodated students underperform non-accommodated students.

There is a medium difference in mean Communication Arts test scores of Black students compared to White students where Black students underperform White students in all grades. There is a small difference between the mean test scores of Hispanic and White students where Hispanics underperform White students on Communication Arts in all grades. Similarly, there is a small difference between the mean test scores of Native Americans and White students where Native Americans underperform White students on Communication Arts in all grades except Grade 6. There is a small difference in the mean Communication Arts test scores where Asian/Pacific Islander students outperform White students in Grades 5, 7, and 8.

There is a medium difference between the mean Mathematics tests scores of Black and White students where Black students underperform White students in all grades, except Grades 7 and 8 where there is a large difference between mean test scores. There is a small difference in mean Mathematics test scores of Hispanic students compared to White students in all grades where Hispanic students underperform White students. There is a small difference between the mean test scores of Native American students compared to White students where Native American students underperform White students in all grades. Finally, there is a small difference between the mean Mathematics test scores of Asian/Pacific Islander students where Asian/Pacific Islander students outperform White students in all grades, except Grade 7 where there is a medium difference between mean test scores.

There is a large difference between the mean Science test scores of Black students compared to White students in Grades 5 and 8 where Black students underperform White students. There is a medium difference between mean Science test scores of Hispanic students compared to White students in Grades 5 and 8 where Hispanic students underperform White students. There is a small difference between the mean Science test scores of Native American students compared to White students in Grade 8 where Native American students underperform White 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 addresses multiple best practices of the testing industry, and in particular are related to the following *Standards for Educational and Psychological Testing* (AERA, APA, & NCME,1999):

- Standard 7.1—When credible research reports that test scores differ in meaning across examinee subgroups for the type of test in question, then to the extent feasible, the same forms of validity evidence collected for the examinee population as a whole should also be collected for each relevant subgroup. Subgroups may be found to differ with respect to appropriateness of test content, internal structure of test responses, the relation of test scores to other variables, or the response processes employed by individual examinees. Any such findings should receive due consideration in the interpretation and use of scores, as well as in the subsequent test revisions.
- Standard 7.2—When credible research reports differences in the effects of construct-irrelevant variance across subgroups of test takers on performance on some part of the test, the test should be used if at all only for those subgroups for which evidence indicates that valid inferences can be drawn from test scores.
- Standard 7.3—When credible research reports that differential item functioning exists across age, gender, racial/ethnic, cultural, disability, and/or linguistic groups in the population of test takers in the content domain measured by the test, test developers should conduct appropriate studies when feasible. Such research should seek to detect and eliminate aspects of test design, content, and format that might bias test scores for particular groups.
- Standard 7.4—Test developers should strive to identify and eliminate language, symbols, words, phrases, and content that are generally regarded as offensive by members of racial, ethnic, gender, or other groups, except when judged to be necessary for adequate representation of the domain.

Table 10.1: 2012 MAP DIF Statistics: Number of Flagged Items, Communication Arts

Grade	Group	Sample Size	Large Negative	Moderate Negative	Moderate Positive	Large Positive	Number of Items
3	Accommodated	6845		1			56
	Asian/Pacific Islander	1485	2	6			56
	Native American/Alaskan	288			1		56
	Black (not Hispanic)	10850	1	1			56
	Hispanic	3517		1			56
	Other	1209					56
	Female	31585		1			56
4	Accommodated	7230					56
	Asian/Pacific Islander	1398	1	3	4	1	56
	Native American/Alaskan	284	1		2		56
	Black (not Hispanic)	10939					56
	Hispanic	3398		1			56
	Other	1178			1		56
	Female	31506		2		1	56
5	Accommodated	7397		2	1		56
	Asian/Pacific Islander	1334	2	1	3		56
	Native American/Alaskan	253					56
	Black (not Hispanic)	10972					56
	Hispanic	3258		3			56
	Other	1122					56
	Female	32135		1			56
6	Accommodated	7124		1			56
	Asian/Pacific Islander	1338		2	1		56
	Native American/Alaskan	279				1	56
	Black (not Hispanic)	11233			1		56
	Hispanic	3090		1			56
	Other	1025					56
	Female	31855		2	1		56
7	Accommodated	6760					62
	Asian/Pacific Islander	1231	1	1	5		62
	Native American/Alaskan	310					62
	Black (not Hispanic)	11114		1			62
	Hispanic	2963					62
	Other	991					62
	Female	31616		2		1	62
8	Accommodated	6612		1			60
	Asian/Pacific Islander	1231	1	6	5		60
	Native American/Alaskan	293					60
	Black (not Hispanic)	11085	1	3		1	60
	Hispanic	2870					60
	Other	962				1	60
	Female	31486	1	3	4		60

Table 10.2: 2012 MAP DIF Statistics: Number of Flagged Items, Mathematics

Grade	Group	Sample Size	Large Negative	Moderate Negative	Moderate Positive	Large Positive	Number of Items
	Accommodated	7127			1		55
	Asian/Pacific Islander	1527		2	2		55
	Native American/Alaskan	288					55
3	Black (not Hispanic)	10856		1			55
	Hispanic	3555					55
	Other	1211					55
	Female	31634					55
	Accommodated	7497		1			61
	Asian/Pacific Islander	1438		2	3		61
	Native American/Alaskan	285					61
4	Black (not Hispanic)	10967		2			61
	Hispanic	3438		1			61
	Other	1180					61
	Female	31568		1			61
	Accommodated	7687		1	2		58
	Asian/Pacific Islander	1370	1	3	3		58
	Native American/Alaskan	253			1		58
5	Black (not Hispanic)	10989		1	2		58
	Hispanic	3282	1		1		58
	Other	1124					58
	Female	32179		2	2		58
	Accommodated	7477			4		58
	Asian/Pacific Islander	1362	1	3	2		58
	Native American/Alaskan	280				1	58
6	Black (not Hispanic)	11253		3	1		58
	Hispanic	3123	1				58
	Other	1027					58
	Female	31911	1	3	1		58
	Accommodated	6984			1	3	61
	Asian/Pacific Islander	1252		3	2		61
	Native American/Alaskan	310		1			61
7	Black (not Hispanic)	11119	1	3	1		61
	Hispanic	2985		1			61
	Other	991					61
	Female	31647		1	1		61
	Accommodated	6891	1		2		60
	Asian/Pacific Islander	1247	2		2		60
	Native American/Alaskan	293					60
8	Black (not Hispanic)	11097		2			60
	Hispanic	2897		1			60
	Other	963					60
	Female	31515		1	1		60

Table 10.3: 2012 MAP DIF Statistics: Number of Flagged Items, Science

Grade	Group	Sample Size	Large Negative	Moderate Negative	Moderate Positive	Large Positive	Number of Items
5	Accommodated	7317					55
	Asian/Pacific Islander	1371		3	2		55
	Native American/Alaskan	253		1			55
	Black (not Hispanic)	10987		3	1		55
	Hispanic	3285		1	1		55
	Other	1119					55
	Female	32164		1	3		55
8	Accommodated	6600	1	1			56
	Asian/Pacific Islander	1248		2		2	56
	Native American/Alaskan	293					56
	Black (not Hispanic)	11075			2		56
	Hispanic	2893			1	1	56
	Other	961					56
	Female	31489		5	2	1	56

Table 10.4: Impact Analysis, Grade 3

Content Area	Category	Group	N	Mean	Std. Dev.	Effect Size	Coefficient Alpha
Communication Arts	Ethnicity	White (not Hispanic)	48497	646.99	35.05		0.89
		Black (not Hispanic)	10976	621.32	40.90	0.71	0.92
		Hispanic	3565	630.84	36.60	0.46	0.91
		Asian/Pacific Islander	1495	651.39	40.45	-0.12	0.91
		Native American	294	639.64	35.74	0.21	0.90
		Other	1243	640.59	36.68	0.18	0.91
	Gender	Male	33822	637.31	38.41		0.91
		Female	32247	646.52	36.24	-0.25	0.90
	Accommo-dations	No	59111	646.41	34.13		0.89
		Yes	7036	602.91	43.14	1.24	0.92
Mathematics	Ethnicity	White (not Hispanic)	48491	633.87	37.87		0.90
		Black (not Hispanic)	10973	606.49	39.51	0.72	0.93
		Hispanic	3597	620.33	37.15	0.36	0.91
		Asian/Pacific Islander	1536	646.91	46.25	-0.34	0.91
		Native American	294	626.25	38.17	0.20	0.91
		Other	1244	623.83	37.52	0.27	0.91
	Gender	Male	33856	628.67	40.47		0.92
		Female	32277	628.68	39.01	0.00	0.91
	Accommo-dations	No	58979	632.63	37.99		0.90
		Yes	7234	596.21	39.25	0.96	0.93

Table 10.5: Impact Analysis, Grade 4

Content Area	Category	Group	N	Mean	Std. Dev.	Effect Size	Coefficient Alpha
Communication Arts	Ethnicity	White (not Hispanic)	48349	667.60	37.34		0.90
		Black (not Hispanic)	11072	641.16	39.85	0.70	0.92
		Hispanic	3438	651.54	38.42	0.43	0.91
		Asian/Pacific Islander	1412	674.52	44.25	-0.18	0.92
		Native American	304	658.11	35.78	0.25	0.91
		Other	1194	662.79	36.09	0.13	0.90
	Gender	Male	33693	657.39	40.09		0.92
		Female	32080	667.50	37.81	-0.26	0.90
	Accommo-dations	No	58405	667.57	35.50		0.89
		Yes	7423	620.90	43.25	1.28	0.92
Mathematics	Ethnicity	White (not Hispanic)	48347	654.13	32.58		0.91
		Black (not Hispanic)	11081	628.59	36.08	0.77	0.92
		Hispanic	3472	643.48	33.85	0.33	0.92
		Asian/Pacific Islander	1450	666.60	39.68	-0.38	0.93
		Native American	305	645.13	33.23	0.28	0.92
		Other	1195	647.06	32.76	0.22	0.91
	Gender	Male	33735	648.48	35.50		0.92
		Female	32119	650.30	34.17	-0.05	0.92
	Accommo-dations	No	58315	653.18	32.77		0.91
		Yes	7594	620.05	36.60	1.00	0.92

Table 10.6: Impact Analysis, Grade 5

Content Area	Category	Group	N	Mean	Std. Dev.	Effect Size	Coefficient Alpha
Communication Arts	Ethnicity	White (not Hispanic)	49277	678.75	33.54		0.90
		Black (not Hispanic)	11077	655.14	36.48	0.69	0.91
		Hispanic	3295	664.46	33.85	0.43	0.90
		Asian/Pacific Islander	1345	687.92	40.55	-0.27	0.91
		Native American	278	672.10	32.02	0.20	0.90
		Other	1131	674.13	34.52	0.14	0.90
	Gender	Male	33647	670.59	36.35		0.91
		Female	32752	677.88	34.08	-0.21	0.90
	Accommo-dations	No	58891	679.01	31.39		0.89
		Yes	7579	636.50	41.91	1.30	0.90
Mathematics	Ethnicity	White (not Hispanic)	49268	676.24	40.42		0.90
		Black (not Hispanic)	11083	645.78	43.30	0.74	0.92
		Hispanic	3314	661.45	39.57	0.37	0.91
		Asian/Pacific Islander	1381	694.22	48.83	-0.44	0.92
		Native American	278	666.12	39.79	0.25	0.90
		Other	1132	669.07	41.54	0.18	0.91
	Gender	Male	33667	670.26	44.10		0.92
		Female	32783	671.02	41.35	-0.02	0.91
	Accommo-dations	No	58725	675.77	39.85		0.90
		Yes	7799	631.69	44.11	1.09	0.91
Science	Ethnicity	White (not Hispanic)	49243	674.44	30.87		0.88
		Black (not Hispanic)	11078	641.73	35.41	1.03	0.89
		Hispanic	3316	657.05	31.84	0.56	0.89
		Asian/Pacific Islander	1382	677.54	36.13	-0.10	0.90
		Native American	278	666.84	29.81	0.25	0.88
		Other	1128	666.57	33.99	0.25	0.89
	Gender	Male	33656	669.18	35.49		0.90
		Female	32763	666.83	32.80	0.07	0.89
	Accommo-dations	No	59076	671.57	32.12		0.89
		Yes	7416	639.49	37.02	0.98	0.89

Table 10.7: Impact Analysis, Grade 6

Content Area	Category	Group	N	Mean	Std. Dev.	Effect Size	Coefficient Alpha
Communication Arts	Ethnicity	White (not Hispanic)	49912	678.74	31.18		0.90
		Black (not Hispanic)	11375	656.31	32.92	0.71	0.90
		Hispanic	3130	666.51	30.46	0.39	0.89
		Asian/Pacific Islander	1349	683.52	37.86	-0.15	0.92
		Native American	301	672.74	32.48	0.19	0.91
		Other	1045	673.72	34.03	0.16	0.91
	Gender	Male	34503	670.08	33.44		0.91
		Female	32611	678.88	31.49	-0.27	0.90
	Accommo-dations	No	59810	678.97	28.87		0.89
		Yes	7363	636.63	38.29	1.41	0.90
Mathematics	Ethnicity	White (not Hispanic)	49914	689.98	37.85		0.90
		Black (not Hispanic)	11381	660.43	40.34	0.77	0.91
		Hispanic	3159	676.77	36.67	0.35	0.90
		Asian/Pacific Islander	1373	704.59	47.65	-0.38	0.93
		Native American	302	679.31	36.48	0.28	0.90
		Other	1045	681.29	39.62	0.23	0.91
	Gender	Male	34532	682.92	41.71		0.92
		Female	32645	686.09	38.41	-0.08	0.91
	Accommo-dations	No	59615	689.64	37.02		0.90
		Yes	7622	643.70	40.74	1.23	0.90

Table 10.8: Impact Analysis, Grade 7

Content Area	Category	Group	N	Mean	Std. Dev.	Effect Size	Coefficient Alpha
Communication Arts	Ethnicity	White (not Hispanic)	49756	686.54	34.25		0.90
		Black (not Hispanic)	11235	661.28	36.47	0.73	0.90
		Hispanic	2988	672.95	35.00	0.40	0.90
		Asian/Pacific Islander	1241	696.51	42.20	-0.29	0.92
		Native American	315	677.77	36.85	0.26	0.92
		Other	1005	682.52	34.34	0.12	0.90
	Gender	Male	34109	675.20	36.91		0.91
		Female	32429	688.63	34.09	-0.38	0.89
	Accommo-dations	No	59623	686.63	32.55		0.89
		Yes	6997	640.03	38.73	1.40	0.90
Mathematics	Ethnicity	White (not Hispanic)	49750	697.05	38.71		0.91
		Black (not Hispanic)	11230	665.11	41.86	0.81	0.91
		Hispanic	3010	682.86	40.18	0.37	0.91
		Asian/Pacific Islander	1263	716.35	48.66	-0.50	0.93
		Native American	315	683.43	42.13	0.35	0.92
		Other	1005	689.91	39.73	0.18	0.92
	Gender	Male	34118	689.29	43.15		0.92
		Female	32453	693.24	39.57	-0.10	0.92
	Accommo-dations	No	59508	696.28	38.35		0.91
		Yes	7146	648.69	42.43	1.23	0.89

Table 10.9: Impact Analysis, Grade 8

Content Area	Category	Group	N	Mean	Std. Dev.	Effect Size	Coefficient Alpha
Communication Arts	Ethnicity	White (not Hispanic)	50005	700.44	31.55		0.90
		Black (not Hispanic)	11217	676.59	34.48	0.74	0.91
		Hispanic	2905	688.01	31.32	0.39	0.90
		Asian/Pacific Islander	1249	707.52	39.55	-0.22	0.93
		Native American	311	693.02	30.02	0.24	0.88
		Other	980	696.13	31.90	0.14	0.90
	Gender	Male	34203	691.91	35.02		0.92
		Female	32465	700.14	31.25	-0.25	0.90
	Accommo-dations	No	59926	700.41	29.61		0.89
		Yes	6829	656.21	39.15	1.44	0.89
Mathematics	Ethnicity	White (not Hispanic)	50010	715.31	37.50		0.91
		Black (not Hispanic)	11224	684.05	40.53	0.82	0.90
		Hispanic	2931	701.89	37.39	0.36	0.90
		Asian/Pacific Islander	1266	731.57	50.07	-0.43	0.94
		Native American	311	704.63	35.92	0.28	0.89
		Other	980	707.77	38.79	0.20	0.91
	Gender	Male	34235	708.74	41.81		0.92
		Female	32488	710.52	38.35	-0.04	0.91
	Accommo-dations	No	59764	714.60	37.06		0.91
		Yes	7044	666.88	40.50	1.27	0.86
Science	Ethnicity	White (not Hispanic)	49955	706.21	28.87		0.89
		Black (not Hispanic)	11200	675.03	32.13	1.06	0.89
		Hispanic	2926	691.63	30.05	0.50	0.89
		Asian/Pacific Islander	1266	707.29	36.10	-0.04	0.92
		Native American	311	696.75	27.86	0.33	0.88
		Other	978	700.57	29.66	0.20	0.89
	Gender	Male	34177	700.82	33.39		0.91
		Female	32460	699.57	30.22	0.04	0.90
	Accommo-dations	No	59980	703.78	29.48		0.89
		Yes	6744	668.22	34.84	1.18	0.89

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Appendix A

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DESE Training on Test Coordinator's Manual

Missouri Assessment Program
Grade-Level Assessments

Test Coordinator's Manual

Spring 2012

Missouri Department of Elementary and Secondary Education

2702928

Schedule of Important Dates for the Spring 2012 Testing Program

The Spring 2012 Missouri Assessment Program (MAP) Grade-Level Assessments include the following three required content areas:

Required
Communication Arts for Grades 3–8
Mathematics for Grades 3–8
Science for Grades 5 and 8

Arrival of Materials

March 12–March 16, 2012 .....Testing Materials Arrive in Districts

Testing Window

April 2–April 27, 2012.....Administer Assessments

Testing Materials

April 13, 2012 .....Deadline for Ordering Additional Testing Materials **Without Incurring Additional Shipping Costs**

April 23, 2012 (1:00 P.M. Central Time) .....Final Deadline for Ordering Additional Testing Materials. **NOTE:** If testing materials are ordered after April 13, the district is responsible for paying the shipping costs.

Return of Materials

April 30, 2012.....Deadline to Schedule Pickup of Testing Materials

Test Results

August 2012 .....Reports Shipped to Districts

HELP THE TEACHER HELP THE CHILD

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CTB dedicated MAP Service Line: 1-800-544-9868 (Hours: 7:30 A.M. to 6:30 P.M. Central Time, Monday – Friday)
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Partners in the Missouri Assessment Program

A Message from the CTB/McGraw-Hill Scoring Process Team

Because we know time is valuable and we appreciate our customers, we at CTB/McGraw-Hill are working to make the scoring process as fast and efficient as possible.

This manual is designed to help organize and assemble the MAP Grade-Level Assessment testing materials. We have described the steps that should be followed in the receiving, securing, distributing, and packing process to ensure that the testing program is successful for students, teachers, and schools.

If you need additional information, please call us and we will help in any way we can.

1-800-544-9868
7:30 A.M. to 6:30 P.M. Central Time, Monday – Friday

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Introduction

The primary purpose of this *Test Coordinator's Manual* is to provide instructions to District Test Coordinators (DTCs) and School Test Coordinators (STCs) for receiving, securing, distributing, and returning testing materials to CTB/McGraw-Hill for scoring. Additionally, instructions for handling issues such as absences, out-of-district testing, barcode labels, test invalidations, etc., are included.

Pretest and Post-test instructions are listed separately for the DTC and the STC under each of the main steps. The DTCs and STCs should read **ALL** sections of this manual to thoroughly understand each other's roles and responsibilities. If the district does not have Test Coordinators at the school/building level, the DTC should assume both roles. All communication from the district should be funneled through the DTC. If the DTC is unable to answer a particular question, the DTC should call CTB's dedicated MAP Grade-Level Assessment Service Line at 1-800-544-9868.

The DTC is responsible for preparing all Test Examiners for test administration. Although brief instructions for the Test Examiners are found in this manual, the primary source of this training is found in the *Examiner's Manuals*. Each grade has a separate manual with pertinent and explicit instructions that the DTC will use to prepare Test Examiners.

The following content areas are **required tests for all school districts** in Grades 3–8. Reports will be produced for all three content areas.

- Communication Arts Assessments in Grades 3–8
- Mathematics Assessments in Grades 3–8
- Science Assessments in Grades 5 and 8

Calculator Policy has more clarification listed on slide 30 of the training for DTCs & STCs

Summary of Changes for 2012

Every year some changes occur that affect test administration. The list below does not include all of the minor edits to clarify language or processes. This list should be used only as a quick reference. The following changes are reflected throughout this *Test Coordinator's Manual* (TCM):

- A new "Test Security" section has been added to the TCM and each *Examiner's Manual*.
- Blank labels are now integrated within the student barcode labels.
- Writing Prompts and Performance Events are not being administered and have been removed from the test books.
- The policy regarding calculators has been clarified.
- A new section has been added to the TCM to address test books with loose or missing pages. Refer to "Test Books with Defective Pages" in Step 2 of the manual for details.

Points of Emphasis for 2012

- A district must **NOT** affix any self-printed labels to any test books. Use only those provided in the Test Coordinator's Kit. No district-created labels can be used.

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If any other lead type is used, scoring may be affected.

- Draft paper for Communication Arts must **NOT** be used. In the past, draft paper was used only with Writing Prompts, which are not included in the 2012 assessments.
- **ONLY nonmechanical No. 2 pencils** can be used for the assessments. If any other type of lead is used, each answer will have to be traced using a nonmechanical No. 2 pencil to be scored. **Do not use alternatives such as No. 2.5 pencils!**
- When packaging materials for shipment back to CTB, do **NOT** place used and unused test books in the same box. However, return all unused materials in the same box, regardless of grade level.

Test Security

Test security and ethical testing practices continue to be of **PARAMOUNT** importance.

Test security includes, but is not limited to, the following:

District Policy

- **MUST** be in place for each district and charter school (**State Board requirement**)

Training

- **MUST** include watching Missouri Department of Elementary and Secondary Education (DESE) training webinars and reading the appropriate *Examiner's Manual* and *Test Coordinator's Manual*
- District-level training may supplement but not replace official DESE training.
- The following list of people must receive training:
  a. District Test Coordinator
  b. School Test Coordinators
  c. General Classroom Test Examiners
  d. Special Education Test Examiners
  e. Homebound or out-of-district student Test Examiners
  f. Translators
  g. Transcribers
  h. Proctors
  i. Other district staff who have responsibilities in testing

Classroom and Testing Materials/Tools

- Cover, remove, or ensure that all content-related information is out of the students' view before beginning the testing session.
- Use **ONLY** the content- or process-related materials or tools that are listed in the *Examiner's Manual* for each grade.
- When not in use, test books and manipulatives must be stored in a secure locked location **outside** of the classroom.
- During a testing day, when students are not testing, test books must also be removed from view and kept secure.
- After testing, all used scratch, grid, or unlabeled graph paper must be collected and returned to the STC to be securely destroyed.

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- Electronic communication, including cellular and imaging devices, **must not** be accessible during any portion of the testing session. These types of devices must be turned off and not readily visible at any time during the testing session.

Practices for Test Examiners and Proctors

- Do **NOT** review the test books before, during, or after testing.
- Do **NOT** paraphrase the item directions for students.
- Do **NOT** react verbally or non-verbally to students' answers, or otherwise potentially cue students in any way.
- Do **NOT** allow test books to be transported by students or made accessible to personnel not responsible for testing.

Practices for All District Administrative Staff

- Do **NOT** score, photocopy, duplicate, or scan test books.
- Do **NOT** edit student responses in any way.
- Only the student can answer his or her test items and only during the testing sessions.
- Do **NOT** return a test book with unanswered items to any student to finish or to edit incomplete/ inaccurate answers.
- Do **NOT** assist students with any item-related questions other than to ensure that the students understand the general test directions.
- **Both written and verbal discussion of specific Grade-Level Assessment items breaches the security and integrity of the test and may result in invalidation or loss of scores for accountability purposes.**

Special Circumstances

- Translators and transcribers may need to review the test books and student work prior to testing.
- Any student's test book that must be transcribed must be done so in a timely, secure manner.

Guidelines for Testing Special Populations

IEP Students

Individualized Education Program (IEP) students are classified as disabled under the Individuals with Disabilities Education Act (IDEA) and have IEPs. All decisions regarding how a student with a disability will participate in the Missouri Assessment Program are made by the student's IEP team and documented in the IEP. Students with disabilities must take all content-area assessments administered by the district (or portions of each content-area assessment as determined by the IEP team) **or** the MAP-Alternate (MAP-A) Assessment.

The IEP team has the responsibility and the authority to determine individual accommodations that students need in order to support and ensure their participation in the Grade-Level Assessments.

Accommodation code definitions can be found on the DESE website at http://dese.mo.gov/divimprove/assess/documents/Grade_Level_Accommodations.pdf. Inappropriate use of accommodation codes can invalidate a student's test results.

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Missouri Assessment Program-Alternate (MAP-A)

A very small number of students may have cognitive disabilities that are so severe that they are unable to test with the general population, even with accommodations. These students will participate in the Missouri Assessment Program-Alternate (MAP-A).

For additional information regarding students with disabilities, contact the DESE Office of Special Education at 573-751-5739. Also, additional assistance in determining student eligibility is available on the Department website at http://dese.mo.gov/divimprove/assess/documents/map-a_eligibility_criteria.pdf.

English Language Learners

All English Language Learners (ELLs) must participate in all required Grade-Level Assessments. However, ELLs who have been in the United States 12 cumulative months or less at the time of administration of the assessments may be exempted from taking the Communication Arts Assessment. All ELLs must participate in the Mathematics and Science Assessments, regardless of the length of time they have been in the United States.

Use of Translators

Federal provisions allow district staff the flexibility to read the Mathematics and Science Assessments (but not the Communication Arts Assessments) to ELLs in their native languages. However, for all assessments, including Communication Arts, ELLs can give their responses orally or in writing in their native languages. Their responses must be translated into English and then transcribed in the test book. Refer to the Accommodations List in the *Examiner's Manual* for students who are ELLs (Use of scribe to record student response in test book). The translation and transcription must be an accurate interpretation of the student's responses.

Translators must be trained in administering the Grade-Level Assessments and have access to the *Examiner's Manuals* and student test books to read and review in a secure environment before test administration. Translators must ensure that testing materials are kept secure at all times. No secure testing materials may be copied or duplicated at any time for any purpose or made accessible to personnel not responsible for testing. When not in use, test books must be kept in a locked room or cabinet in the school building to prevent unauthorized access. All test materials must be returned to the School Test Coordinator after use.

Large Print and Braille Procedures

Student responses in both Large Print and Braille edition test books must be transcribed into the regular test book that is included in the Large Print and Braille Kit in order for the students to receive appropriate Grade-Level Assessment scores. Follow Step 1 in the *Examiner's Manual* for specific instructions on Large Print and Braille procedures.

After the Examiner transcribes student responses into a regular test book, the Large Print and Braille edition test books should be marked "Contents transcribed to a regular test book. DO NOT SCORE" and returned to CTB/McGraw-Hill with the unused/do-not-score testing materials. Follow the instructions in Step 9 of this manual for packaging and shipping the regular testing materials to CTB/McGraw-Hill.

Braille test books are handled differently from regular test books. Refer to the BRAILLE OMIT RETURN INSTRUCTION SHEET included in the Braille testing materials for information on handling and packaging Braille test books.

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Further Information on Special Populations

Specific instructions on accounting for IEP and ELL students can be found in Step 7 of the *Examiner's Manuals*. Individual Accommodation Program (IAP 504) students can receive the same accommodations as IEP students. For further questions about testing special populations of students, contact the Assessment Section in the Office of College and Career Readiness of DESE at 573-751-3545.

Guidelines for Other Testing Circumstances

Foreign Exchange Students

Foreign exchange students are allowed, but are not required, to take the Grade-Level Assessments. This is a district decision.

Missouri Virtual Instruction Program (MoVIP)

Missouri students enrolled in MoVIP are required to participate in the Grade-Level Assessments. For further inquiries regarding MoVIP participation, contact MoVIP at 573-751-2453.

Homebound Students

Homebound students must take the Grade-Level Assessments if they are receiving homebound services. Homebound students may be tested at home or school at the discretion of the district. Test Examiners of homebound students must receive training in the administration of the Grade-Level Assessments. Test Examiners are responsible for ensuring the security of the testing materials between testing sessions and for returning those materials to the STC.

Homeschooled Students

Homeschooled students may take part in the Grade-Level Assessments at the local district's discretion. Homeschooled students participating in the Grade-Level Assessments must take the tests at the local school with district-approved procedures in place. Test books for homeschooled students are handled differently from regular test books. Perform the following tasks to ensure proper processing of test books for homeschooled students:

- Each homeschooled student must be entered on his or her own Group Information Sheet (GIS).
- On the GIS, on the "Teacher" line, write HOMESCHOOLED.
- On the GIS, under the "Special Codes" section, in Column V, fill in the "2" bubble.

Homeschooled students should not be included in the Missouri Student Information System (MOSIS) Phase III Student Precode Roster and should not have student barcode labels.

Students Testing Out-of-District

All students enrolled in the district must be tested. This includes students receiving services in off-site locations (e.g., other districts, private agencies, correctional facilities, etc.). The DTC from the district where the student resides must deliver the appropriate number and type of test books and any ancillary testing materials (e.g., manuals and manipulatives) to the serving districts/agencies prior to the first day of testing. Write the student's name and district/school on the lines provided on the front cover of the test book before delivering it to the off-site location. This identification will help ensure the correct test book is returned to the district after off-site testing is complete. The barcode label can be affixed after the test book

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is returned to the DTC. See "Instructions for the District Test Coordinator" at the beginning of Step 2 of this manual regarding security barcodes and the consecutive numbering of each test book.

After testing, the completed materials must be returned to the district of residence where the GIS will be completed and placed with the test book(s) in the envelopes provided. The GIS is precoded with the district of residence's county, district, and school codes and determines where students' results will be reported. To ensure accurate reporting, the GIS from the district of residence must be placed on top of the test book(s) and must be included with that district's shipment to CTB/McGraw-Hill for scoring.

Students Who Move Before or During the Test Administration

The "Not Enrolled" bubble on the SIS should be used for a student who enters into the assessment and moves, either out of the district or from school to school within a district. Barcode labels received for students who move prior to the test administration window and do not enter into the assessment can be securely destroyed. Do not mail to or share test books with other schools or districts.

How to Handle Different Types of Student Absences

The following table lists how to handle different types of student absences during Grade-Level Assessments:

If...	then...
a student is absent for **ALL** sessions of **ALL** content-area assessments and unable to test in make-up sessions (the student did not engage in the test):	1. Write the student's name on the front of an unused test book. 2. Attach the barcode label unless any information on the label is incorrect. Securely destroy the incorrect label and bubble in all information on the Student Information Sheet (SIS). 3. Bubble the "Absent Sessions" bubble for **ALL** sessions for **ALL** content areas on the SIS. 4. Process the test book with test books to be scored. Treat it like a completed test book.
a student is absent for one (or more) sessions of one (or more) content-area assessment(s) and unable to test in make-up sessions:	1. Ensure the incomplete test book either has an affixed, correct barcode label or a completed SIS. 2. Bubble only appropriate "Absent Sessions" for appropriate content-area assessment(s). 3. Process the student's test book with test books to be scored. Treat it like a completed test book.
a student is absent for **ALL** sessions of one (or more) content-area assessment(s) and unable to test in make-up sessions:	1. Ensure the incomplete test book either has an affixed, correct barcode label or a completed SIS. 2. Bubble **ALL** "Absent Sessions" for appropriate content-area assessment(s). 3. Process the student's test book with test books to be scored. Treat it like a completed test book.

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Make-up Sessions

Make-up sessions should be scheduled for students who are absent during one or more sessions of the Grade-Level Assessments. If a student is absent and unable to take the test during either the regular or make-up testing window, then follow the procedures above for handling absences.

Invalidation Procedures

Neither a student's behavior during testing nor the judgment of a student's effort during testing can invalidate a student's test.

The following table lists several reasons why a Grade-Level Assessment will be invalidated. Some invalidation reasons apply specifically to the Communication Arts Assessment. Other invalidation reasons affect all content areas. Reasons for invalidating the test:

If...	then...
a student is discovered cheating:	Bubble "Teacher Invalidation" under the Content Area on the SIS. Cheating is the only time the "Teacher Invalidation" bubble is used. This code applies to all content-area assessments. Refer to the directions following this table for notifying DESE.
a Test Examiner reads any part of the Communication Arts Assessment to a student:	Bubble "04 Oral reading – invalidates CA." This code applies to all sessions of the Communication Arts Assessment.
a Test Examiner signs any part of the Communication Arts Assessment to a student:	Bubble "05 Signing of assessment – invalidates CA." This code applies to all sessions of the Communication Arts Assessment.
a Test Examiner paraphrases the test questions in any content area:	Bubble "06 Paraphrasing – invalidates all tests." This code applies to all content-area assessments.
a Test Examiner reads any part of the Communication Arts Assessment to a student in the student's native language:	Bubble "11 Oral reading in native language – invalidates CA." This code applies to all sessions of the Communication Arts Assessment.
a student uses a bilingual dictionary for any part of the Communication Arts Assessment:	Bubble "43 Use of bilingual dictionary – invalidates CA."

Teacher Invalidation Bubble

When 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. Invalidated test books are returned to CTB/McGraw-Hill. An invalidated test book with a correct label (or a completed SIS, if necessary) is included with the testing materials to be scored.

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❏ 3. A district invalidation letter on district letterhead and signed by the superintendent is sent to Accountability Data at the following address:

Attn: Accountability Data
Office of Data System Management
P.O. Box 480
Jefferson City, MO 65102

❏ 4. The district invalidation letter should include the following information:

a. Student Name
b. MOSIS ID
c. Date of Birth
d. Grade
e. County District Code
f. School Code
g. Content Area
h. The reason the testing session is being invalidated/description of the incident

❏ 5. The district copies the letter and files it for any future reference.

Literacy-Based Passages

DESE is aware that passages may be selected from familiar literature. During the Communication Arts Assessment, if students recognize a passage from their district's literacy program, advise students to complete the items.

Electronic Equipment

Electronic communication and imaging devices must not be accessible during the entire testing session. Such items include, but are not limited to:

- cellular/mobile phones
- electronic music players
- digital cameras or any imaging device
- handheld scanners
- portable gaming devices
- any device that can connect to the Internet

By design, the items on the assessments do not require the use of a calculator to solve them. If the district chooses to allow students to use a calculator, a four-function calculator is all that is needed, and it can be used **only where specified in the *Examiner's Manual*.** 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 have Internet connectivity, or be able to connect to anyone inside or outside of the classroom during testing.

In addition, calculators cannot contain stored equations or functions at the time of Grade-Level Mathematics Assessment. Test Examiners must ensure and verify that every calculator that has the ability to store functions and equations (e.g., a graphing or scientific calculator) has its memory cleared before each Mathematics Assessment is begun and after each Mathematics Assessment is completed.

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Test Coordinators' Roles

▶ Checklist for the District Test Coordinator

In addition to other responsibilities, the DTC must perform the following procedures:

❏ 1. View all DESE-provided, standardized Grade-Level Assessment manuals training and stay informed of all communication on the Department website.

❏ 2. Be responsible for training all School Test Coordinators (STCs), Test Examiners, and other responsible district staff on testing procedures. Use DESE-provided, standardized training.

❏ 3. Deliver *Examiner's Manuals* to the STCs.

❏ 4. Ensure that STCs provide Test Examiners with timely access to the *Examiner's Manual* for their grades. *Examiner's Manuals* are not secure materials and are posted on the Department website at http://dese.mo.gov/divimprove/assess/grade_level_manuals.html.

❏ 5. Ensure that STCs restrict access to all secure testing materials prior to testing. This includes student test books and manipulatives. Emphasize to all STCs, Test Examiners, and other staff that they must not review the test books prior to, during, or after testing. The test books are secure materials, and this security must be observed at all times. When not in use, test books must be kept in a locked room or cabinet outside of the classroom in the school building to prevent unauthorized access. All test books must be returned to the DTC after the Grade-Level Assessment is administered.

❏ 6. Ensure that tests that need to be transcribed are kept secure and transcribed as soon as possible after testing.

❏ 7. Maintain the district's testing schedule and be prepared to provide it to DESE upon request. If the testing schedule changes in any way, the DTC is responsible for updating this information.

❏ 8. Organize and deliver testing materials for individual schools in the district.

❏ 9. Check with the STCs to ensure that they have sufficient quantities of testing materials and place an order for additional materials, if needed. Please note the deadline for ordering any test materials without incurring additional shipping costs for the district.

❏ 10. Track test books sent to the STCs from district overage. **Note:** The district's 5% overage of test materials can be found beginning in Box 1 of X of the test materials shipment.

❏ 11. Distribute testing materials to out-of-district schools following the procedures outlined in Step 2 of this manual prior to the testing period, and collect and label test books after testing is complete.

❏ 12. Assign responsibility for completing MOSIS IDs, student status codes, and accommodation codes. (See Step 5 of this manual for detailed information).

❏ 13. Assign responsibility for reviewing rosters of precoded student information for accuracy.

❏ 14. Collect and account for all testing materials from each school in the district and any out-of-district schools where the students attend alternative (supplemental) programs.

❏ 15. Consolidate testing materials after test administration.

❏ 16. Check the returned Test Book Accountability Forms. Verify any missing barcode numbers on the Test Book Accountability Forms. Fax all Test Book Accountability Forms for all schools to CTB/McGraw-Hill using the number provided on the form. Retain the original forms for the district's records.

❏ 17. Assemble testing materials for return shipment.

❏ 18. Arrange for shipment of testing materials to CTB/McGraw-Hill for scoring.

❏ 19. Fax Missing Test Materials Forms to DESE and CTB/McGraw-Hill to document any security barcode discrepancies.

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▶ Checklist for the School Test Coordinator

In addition to other responsibilities, the STC must perform the following procedures:

❏ 1. Attend all Grade-Level Assessment manuals training provided by the DTC and stay informed of all communication from the DTC regarding the assessment.

❏ 2. Be responsible for training all Test Examiners and other responsible district staff on testing procedures. Use DESE-provided, standardized training.

❏ 3. Give Test Examiners timely access to the *Examiner's Manual* for their grade. Test Examiners must have time to read the manual, resolve their questions about testing procedures, and be well prepared to carry out their responsibilities in test administration. All district staff are responsible for ensuring that testing procedures in the *Examiner's Manual* are followed.

❏ 4. Restrict access to all secure testing materials prior to testing. This includes student test books. **Emphasize to all Test Examiners and other staff that they must not review the test books prior to, during, or after testing. The test books are secure materials, and this security must be observed at all times. When not in use, test books must be kept in a locked room or cabinet outside of the classroom in the school building to prevent unauthorized access. All test books must be returned to the DTC after the Grade-Level Assessment is administered.**

❏ 5. Ensure that any tests that need to be transcribed are kept secure and transcribed as soon as possible after testing.

❏ 6. Provide the DTC with the school's testing schedule **prior** to testing. If the testing schedule changes in any way, the STC is responsible for updating the DTC.

❏ 7. Check the Student Precode Roster and verify receipt of all student barcode labels.

❏ 8. Distribute the Student Precode Roster and student barcode labels to Test Examiners.

❏ 9. Ensure that all Test Examiners know that student name labels created by districts may **NOT** be used as a substitution for writing the "Student Name" and "District/School" lines on the front cover of the test book or for a missing or incorrect student barcode label.

❏ 10. Ensure that all Test Examiners know that **ONLY** nonmechanical No. 2 pencils **must** be used to complete the Grade-Level Assessments. If any other type of lead is used, each answer will have to be traced using a nonmechanical No. 2 pencil to be scored. **Do not use alternatives such as No. 2.5 pencils!** Some nonmechanical No. 2 pencils have erasers that damage test books.

❏ 11. Ensure that all Test Examiners know that mechanical pencils, pens, highlighters, crayons, colored pencils, and correction fluid **cannot** be used on the test books. If these are used, the student's test must be transcribed into a new test book using a nonmechanical No. 2 pencil.

❏ 12. Ensure that the Student Information Sheet (SIS) is accurately completed (if applicable).

❏ 13. Collect and check testing materials after test administration.

❏ 14. Complete and maintain the Test Book Accountability Form for return to the DTC.

❏ 15. Complete and check the Group Information Sheets (GISs).

❏ 16. Complete the School/Group List(s).

❏ 17. Pack and transport testing materials to the DTC.

❏ 18. Ensure that only one book per student is returned to DTC. If a student tests in multiple books, the responses must be transcribed into a single book of the same form.

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▶ Handling of Student Barcode Labels

- The Test Coordinator's Kit contains student barcode labels. Carefully follow the instructions for handling student barcode labels. Failure to do so could result in incorrect assessment results and inaccurate biographical information on reports.
- CTB will provide one biographical master label and two student barcode labels for each student. These labels are printed by CTB, using student information provided by districts to DESE via the MOSIS precode file. Check each student's biographical label for accuracy against the Student Precode Roster that lists the complete barcode information for each student. After test administration is complete, extra barcode labels should be securely destroyed at the district. **(See the following page for the correct placement of the student barcode label.)**

Note: Not all student biographical data from the precode file is printed on the student label. The Student Precode Roster should be used for a complete check of biographical data.

- Affix the student barcode label to the designated area on the front cover of the student's test book if the following biographical information is accurate: Student Name, MOSIS State ID, Birth Date, Gender, Race.
- If any of the preceding information is inaccurate, **do not use the student barcode label.** Instead, fill in **all** applicable sections of the SIS on the inside front cover of the test book and securely destroy the inaccurate barcode label. The student's name and MOSIS ID **must** be written in the boxes. Any inaccurate information in the district's local student information system and MOSIS must be updated with the new, accurate information for the student.

Exceptions

- If a student barcode label has already been affixed to a test book and the label is subsequently determined to be inaccurate for any reason, place **two** blank labels ***over*** the incorrect label. Then bubble all the information on the SIS.
- If a label for one student has been affixed to a test book completed by a different student, place one blank label over the incorrect label; then affix the correct student barcode label over the blank label.

Note: Blank labels are now integrated within the student barcode labels. Only these blank labels are to be used in handling the exceptions described above.

- If a student has no barcode label, notify the local student data management person to enroll/submit the student in core data. Then bubble all the biographical information on the SIS and **leave the barcode area blank.** Nothing should be written in that area—no teacher name, no school name, etc. Ensure that the student's name, district, and school information are written on the front of the book.

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▶ Handling of Student Barcode Labels

Biographical master label
(Do **not** affix)

Student barcode label
(Affix as shown)

Student barcode label

WILLIAMS SUZANNE

MOSIS ID: 0123456789
SCHOOL: ADAIR CO ELE 4020
DISTRICT: ADAIR CO. R 001090
GRADE: 03
BIRTHDATE: XX/XX/XX
GENDER:
RACE:
MAP12 OP BARCODE NO.: 00001651

DO NOT USE ON BOOK

WILLIAMS SUZANNE
ADAIR CO ELE 4020
ADAIR CO. R 001090
GRADE: 03
MOSIS: 0123456789
BIRTHDATE: XX/XX/XX

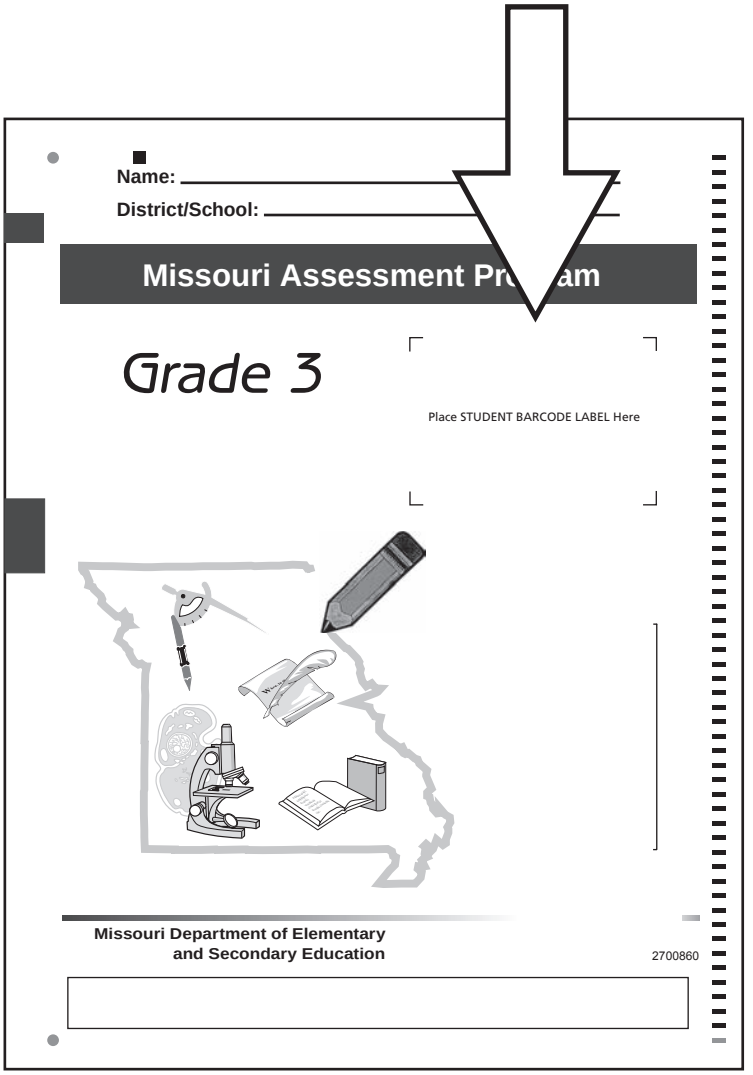
MAP12 OPERATIONAL
00001651

WILLIAMS SUZANNE
ADAIR CO ELE 4020
ADAIR CO. R 001090
GRADE: 03
MOSIS: 0123456789
BIRTHDATE: XX/XX/XX

MAP12 OPERATIONAL
00001651

Test Book Cover (student barcode label positioning)

AFFIX



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Step 1 Review Testing Materials

▶ Instructions for the District Test Coordinator

The Test Coordinator's Kit

The Test Coordinator's Kit includes one District Test Coordinator's Package and a School Test Coordinator's Package for each of the schools in the district.

The **DTC's Package** contains the following:

❏ 1. District Packing List

❏ 2. District Cover Letter

❏ 3. Test Book Accountability Form

❏ 4. Add/Short Form—District

❏ 5. Missing Test Materials Form

❏ 6. Student Barcode Label Instruction Sheet

❏ 7. Blank District Return Shipping Labels, To-Be-Scored Materials—Blue

❏ 8. Blank District Return Shipping Labels, Unused/Do-Not-Score—White

❏ 9. *Test Coordinator's Manuals*

Each **STC's Package** contains the following:

❏ 1. School Packing List

❏ 2. School Cover Letter

❏ 3. Add/Short Form—School

❏ 4. School Group Lists, to be completed by the STC after test administration

❏ 5. Group Information Sheet (GIS)

❏ 6. *Test Coordinator's Manuals* for the STC, which may be photocopied for the Test Examiners

❏ 7. Return Shipping Labels, To-Be-Scored Materials—Blue

❏ 8. Return Shipping Labels, Unused/Do-Not-Score—White

❏ 9. Student Barcode Label Instruction Sheet

❏ 10. Student Precode Roster

❏ 11. Student Barcode Labels

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The Testing Materials

Examiner's Manuals are shrink-wrapped with the test book packages.

The testing materials will be packaged by school and shipped to the district's office or to the shipping address indicated during the online enrollment process. The testing materials shipment will include *Examiner's Manuals*, test books, large white envelopes, and ancillary testing materials.

Verifying Shipment of the Test Coordinator's Kit and Testing Materials

Locate the packing list for each shipment, and compare the materials on the packing list with the materials in the shipment.

- **Test Coordinator's Kit:** If the quantities on the Test Coordinator's Kit packing list do not match the quantities received or if more materials are needed, complete the MAP Spring 2012 Test Coordinator's Kit Add/Short Form and fax it to the number shown on the form.

- **Testing Materials:** If the quantities on the testing materials packing list do not match the quantities received, immediately report the discrepancy to the MAP Service Line at 1-800-544-9868. Order more materials if needed. If enough materials were received, proceed with test preparations.

  NOTE: Some non-secure materials that do not require scanning are posted to the DESE website. The documents listed below can also be accessed at http://dese.mo.gov/divimprove/assess/grade_level_manuals.html.

  - District Add/Short Form
  - School/Group List (SGL)
  - Various Cover Letters
  - Missing Test Materials Form
  - School Add/Short Form
  - Student Barcode Label Instruction Sheet
  - *Test Coordinator's Manual*
  - *Examiner's Manual*
  - Special Handling Form

  NOTE: Manipulatives are shrink-wrapped in the middle of the test book packages.

MAP Grade-Level Assessments Spring 2012 — Ordering Additional Testing Materials			
Start Date	**End Date**	**Shipping Mode**	**Shipping Costs**
March 16	April 13	UPS Ground Service*	CTB
April 16	April 23 1:00 P.M. (CT)	Next-day or Second-day Service	District

*All shipments will be sent via UPS Ground. If a district requires next-day or second-day service, the district will be responsible for the cost of expedited shipping.

To order expedited shipping, call the MAP Service Line at 1-800-544-9868 and provide a purchase order number when placing the order.

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Step 2 Distribute Testing Materials

▶ Instructions for the District Test Coordinator

Security Barcode

The MAP Grade-Level Assessment test books are secure materials. All test books, including Large Print and Braille editions, are barcoded for security and inventory purposes. A unique security barcode number is printed vertically in the lower right-hand corner of the front cover of every test book. Test books returned to CTB/McGraw-Hill are inventoried, and missing books are reported to DESE by inventory barcode number, district name, and school name. The following information is designed to help DTCs, STCs, and Test Examiners inventory Grade-Level Assessment test books and ensure a 100% rate of return of all test books to CTB/McGraw-Hill.

Test Book Accountability Form Instructions

These instructions are a guide to using the Test Book Accountability Form.

Each School Test Coordinator will need his/her own copy of the form. One paper copy of the form is in the Test Coordinator's Kit. The form can also be downloaded at http://dese.mo.gov/divimprove/assess/grade_level_resources.html.

After downloading, the STC can complete the form using the embedded Excel formulas to help with the accounting process. Once completed, the form can be printed and faxed. Make a copy for district records.

If using the paper copy included in the Test Coordinator's Kit, the DTC will need to make **one** copy of the Test Book Accountability Form for **each** STC in his or her district. The pretest administration roles and responsibilities of DTCs, STCs, and Test Examiners are described below.

Pretest Administration

District Test Coordinator
Before distributing copies of the Test Book Accountability Form to the STCs, complete the following steps **for each school** in the district:

1. Confirm the box count (e.g., Box 1 of 5 through Box 5 of 5) of the testing materials shipment from CTB/McGraw-Hill.
2. Without opening the shrink-wrapped bundles of test books, verify the barcode range of the bundles. All Grade-Level Assessment test books have unique security barcode numbers printed vertically in the lower right-hand corner of the front cover. The shrink-wrapped bundles of test books have labels that list the barcode range included in each package.

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Check the barcode number of the test book at the top of the bundle and the barcode number of the test book at the bottom of the bundle against the label on the shrink-wrapped bundle.

3. For record-keeping purposes, note the ranges of barcodes issued to each school. This information will be needed to verify the Test Book Accountability Forms completed by the schools. Keep a record of test book barcode numbers for students who are being tested out-of-district.
4. Report any discrepancies to the CTB dedicated MAP Service Line at 1-800-544-9868, between the hours of 7:30 A.M. and 6:30 P.M. (CT), Monday–Friday.

The DTC is also responsible for verifying that each STC has sufficient testing materials to administer the test. If a DTC is not available, the STC must perform this function. If an STC does not have sufficient testing materials, the DTC is responsible for ensuring that the STC uses all of the test books for the STC's school first before distributing the district overage to the STC. The DTC must track the overage test books sent to the STC on the Test Book Accountability Form. Once the district test book overage is depleted, the DTC should order additional test books for the school. If additional test books are requested after the original shipment of testing materials is received, confirm this by recording the number of additional test materials needed by grade in the "Additional books" row of the Test Book Accountability Form. Please be aware of all deadlines for ordering additional materials, including the deadline for ordering any test materials without the district incurring additional shipping costs.

School Test Coordinator

The STC should complete the following steps:

1. Open the shrink-wrapped bundles of test books.
2. Verify that all the test books are in sequential barcode order (e.g., 00000-01, 00000-02, etc.).
3. Verify that the barcode numbers printed on the test books match the numbers listed on the labels on the shrink-wrapped packages of books (located in Box 1 of the school's shipment).
4. On the Test Book Accountability Form, note the number of test books listed on the packing list for each grade (Line 1 of form), the number of test books missing, if any (Line 2 of form), and the number of extra test books received, if any (Line 3 of form).
5. Keep a record of test book barcode numbers for students who are being tested out-of-district. Document any barcode discrepancies on the back of the form.
6. Notify the DTC immediately of any discrepancies.

Do not distribute the Test Book Accountability Form or copies of the form to Test Examiners. The STC maintains the form during test administration and returns it with the testing materials to the DTC.

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Test Examiner

Each Test Examiner should complete the following steps:

1. Count the number of books received.
2. Document this information in preparation for returning the test books to the STC.

Post-Test Administration

Test Examiner

1. Assemble and organize testing materials for return to the STC following the directions in the appropriate Spring 2012 Missouri Assessment Program *Examiner's Manual*.
2. Count the number of test books and compare the total with the pretest figure. Check test books to verify that the unused/do-not-score books and Large Print and Braille versions of the test books are accounted for. Verify that either the student barcode label is on the test book or the SIS fields are completed.
3. If a discrepancy exists between the pretest and post-test totals, collate the used and unused/do-not-score test books in sequential barcode number order.
4. Separate to-be-scored test books from unused/do-not-score test books.
5. Sort to-be-scored test books by grade level.
6. Place the to-be-scored test books in the large white envelopes.
7. Contact the STC for guidance regarding the handling of missing or contaminated books.

School Test Coordinator (Refer to Step 3 of this manual for detailed instructions.)

After receiving all test books from each Test Examiner, complete the following steps:

1. Collect, check, and verify that all test books (including Large Print and Braille editions) have been returned. Ensure that missing or contaminated test books have been documented. Check to ensure that the correct test books for students who were tested out-of-district are received.
2. On Line 4, account for the school and/or district overage test books used. On Lines 6 and 7, record the number of scorable tests administered and the number of unused/do-not-score books for each grade.
3. Place the envelopes with the to-be-scored test books in the shipping boxes provided by CTB/McGraw-Hill and affix the to-be-scored return shipping labels to the boxes. DO NOT include any unused/do-not-score materials in these boxes.
4. Place the unused/do-not-score test books in a separate shipping box provided by CTB/McGraw-Hill and affix the Unused/Do-Not-Score return shipping label to the box. Return any do-not-score books (transcribed, damaged, defective, etc.) along with the unused test books. DO NOT include any to-be-scored test materials in these boxes.
5. Return the boxes with the to-be-scored and the do-not-score test books to the DTC.

Combining unused/do-not-score test books with to-be-scored test books will delay scoring and reporting.

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The STC is responsible for a 100% rate of return of all test books, used and unused. Any unresolved security barcode discrepancies (e.g., missing or unaccounted-for test books) must be clearly documented on Lines 9 and 10 of the Test Book Accountability Form.

Return the Test Book Accountability Form and any documentation to the DTC to fax to CTB/McGraw Hill. For record-keeping purposes, retain a copy of the Test Book Accountability Form and a copy of any documentation and letters pertaining to contaminated test books. For more information regarding the handling and documentation of contaminated test books, refer to the last section of these instructions.

Note: Do not seal the envelopes! For more information regarding the return of testing materials to the DTC, see Step 8 of this manual.

District Test Coordinator

After receiving the Test Book Accountability Form and testing materials from each STC in the district and any information pertaining to contaminated test books and documented discrepancies, complete the following steps:

1. Verify that a Test Book Accountability Form has been received from each school, that each form accounts for the disposition of all books issued, and that each form is signed by the STC.
2. Fax all Test Book Accountability Forms for the district to the CTB/McGraw-Hill fax number listed on the form.
3. Verify that any contaminated test books have been clearly documented according to the following procedure.

Contaminated Test Books

If a test book is contaminated, the Test Examiner should notify the STC. Contaminated test books, as defined in the Glossary, should **not** be returned to CTB/McGraw-Hill. An STC or DTC must transcribe the information into a new test book (when transcribing, ensure that the correct test form is used). This procedure follows security protocol. The contaminated test books must be securely destroyed **AT THE TEST SITE.** A Missing Test Materials Form (included in the DTC Package) must be completed and faxed to CTB and DESE to account for the contaminated book.

The STC should provide the DTC with the following information for inclusion on the form:

- an explanation of what happened to the test book
- security barcode number (write or cut-and-paste it onto the letter). This is the code beginning with two letters, followed by six numbers, printed vertically below the barcode on the book cover. Be sure to use this number and **not** the number from the student barcode label.
- school name
- school code
- student's name
- grade level
- test book edition (regular, Large Print, or Braille)

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4. Package all testing materials for return to CTB/McGraw-Hill. (Follow the directions in Step 9 of this manual.)
5. Fax copies of all documentation relating to contaminated books to CTB/McGraw-Hill and DESE.

NEW PROCESS

Test Books with Defective Pages

Very rarely, several test books may have manufacturing issues, such as loose or missing pages. If this happens for 20 or more test books, complete the new "Special Handling Form" and place it on top of the affected books. Rubber-band the form and the books together before returning them to CTB. For any amount less than 20 test books, transcribe all student responses to test books with no issues. The Special Handling Form with instructions is posted to the DESE website at the following link: http://dese.mo.gov/divimprove/assess/grade_level_manuals.html.

Ordering Additional Materials

The final day to request additional materials is April 23, 2012, by 1:00 P.M. (CT). Note: April 13 is the deadline for ordering any test materials without the district incurring additional shipping costs.

The DTC is responsible for contacting each STC prior to the ordering deadline to verify that sufficient quantities of Grade-Level Assessment testing materials have been received. Each school will automatically receive a 5% overage of test materials that can be found beginning in Box 1.

The DTC must use all of the school and district test book overages before ordering additional testing materials. Once both the school and district test book overages are depleted, the DTC may order additional testing materials. When the STC returns the Test Book Accountability Form with the testing materials, the additional materials must be accounted for on Line 4 of the form.

Do not mail or share test books across schools. If a test book is loaned to a school and later determined missing, the original school will be responsible for the missing book. Testing materials are to be inventoried both upon receipt and following test administration. If any testing materials are missing, contact CTB/McGraw-Hill immediately. **Only the DTC should contact the CTB dedicated MAP Service Line at 1-800-544-9868.**

Securing Testing Materials

School personnel responsible for testing must ensure that all testing materials are secure at all times. No secure testing materials may be copied or duplicated at any time for any purpose or made accessible to personnel not responsible for testing. When not in use, secure materials must be kept in a locked room or cabinet in the school building to prevent unauthorized access.

After verifying that each school has a secure area where testing materials can be stored, the DTC can distribute the STCs' Packages and testing materials to the STCs. Ask the STCs to distribute the *Examiner's Manuals* as soon as possible to allow the Test Examiners adequate time to prepare for administering the tests. *Examiner's Manuals* are not secure materials. Arrange with STCs for the collection of the student draft work for secure destruction by the district.

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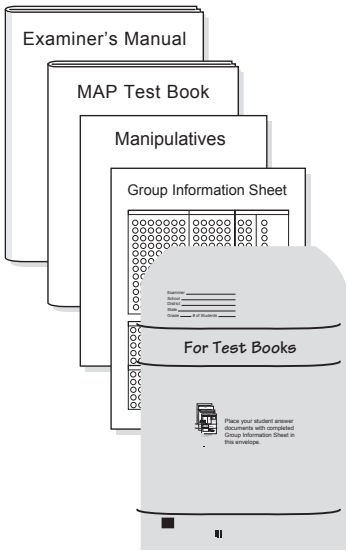

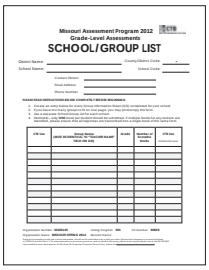

If a school in the district does **not** have a secure storage area, the testing materials for that school must be secured at the district office. Emphasize to the Test Examiners that they cannot review the student test books prior to, during, or after testing. The materials are secure, and this security must be observed at all times. Ensure that security procedures are followed for test administration for out-of-district and homebound students. For more information, see "Students Testing Out-of-District" and "Homebound Students" in the Guidelines for Other Testing Circumstances section of this manual.

For students who attend an out-of-district school for an alternative (supplemental) program, deliver the appropriate number and type of test books and any ancillary testing materials, such as manipulatives, to the students' out-of-district school(s) prior to the first day of testing. Keep a record of the test book barcode numbers for the out-of-district students, and check to ensure that the correct test books are returned after testing is finished. Make arrangements to have the testing materials returned to the STC after the students have completed testing. For more information, see "Students Testing Out-of-District" in Guidelines for Other Testing Circumstances, in this manual.

Keep the DTC's Package for use after the test administration. Shipping materials contained in the package are needed to return the testing materials to CTB/McGraw-Hill for scoring.

The green-shaded boxes in which the testing materials arrived should be **SAVED** for return shipment to CTB/McGraw-Hill. Returning testing materials in these green-shaded boxes will ensure that they are scored as quickly as possible. Additional boxes may be ordered by contacting the CTB dedicated MAP Service Line at 1-800-544-9868.

▶ Instructions for the School Test Coordinator

The STC should check the materials upon receipt from the DTC. The STC should check the Student Precode Roster for accuracy. The Student Precode Roster displays all biographical data from the precoded file, which makes it a better verification tool than the student barcode labels.

Examiner's Manuals are not secure materials and should be delivered to the Test Examiners as soon as possible to allow them time to become familiar with the procedures. Shortly before the first testing session, distribute the test books to each Test Examiner. Emphasize again to Test Examiners that they must **not** review the test books prior to, during, or after testing. The test books are secure materials, and this security should be observed at all times.

Each Test Examiner should have the following:

- the appropriate *Examiner's Manual* for the grade level being tested.
- the appropriate quantity and type of test books and any ancillary testing materials, such as manipulatives. Manipulatives are shrink-wrapped in the

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NOTE: The GIS is a scannable document and cannot be photocopied. If more GISs are needed, contact the DTC IMMEDIATELY to request additional GIS forms. Additional forms must be both ordered and printed in time to meet the deadline for the return of materials. The DTC will use the MAP Spring 2012 Test Coordinator's Kit Add/Short Form to obtain additional copies of the document. The final deadline to order additional materials is April 23, 1:00 P.M. (CT). **Note:** April 13 is the deadline for ordering any test materials without the district incurring additional shipping costs.

middle of each test book package. Check the Test Material cover memo for a list of manipulatives for each grade of Mathematics.

- student barcode labels for each student (if district provided precode data to DESE).
- one precoded GIS for **each** grade. Special Education students **do not** need to be processed under separate GISs (their SpEd status is stored in their individual student data). These students can be included under the regular GIS for their school and grade.
- the appropriate quantity of large white envelopes. Each envelope will hold approximately 5–10 test books, depending on grade level.

Retain the School/Group List(s) for use after test administration.

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Step 3 Collect Testing Materials

▶ Instructions for the School Test Coordinator

Immediately after the testing has been completed, the STC collects all materials from each Test Examiner and asks for a count of students who were absent for any testing sessions. The STC should check the accuracy of the student barcode labels by validating all biographical data on the student barcode label. Remind Test Examiners that **all used and unused test books must be returned** to CTB/McGraw-Hill except for contaminated test books, which should be destroyed after following procedures in Step 2 of this manual.

The STC should ensure that:

- a test book is returned **for every eligible student**. This includes students with one or more invalidated sessions, students with incomplete testing sessions, students who never tested but were eligible to test (absent all sessions), and students who took an accommodated version of the assessment. After accounting for and transcribing a contaminated test book, do NOT return it to CTB or DESE. Securely destroy it at the testing site.
- only one test book is returned for each student. If a student inadvertently tests in multiple books, the responses must be transcribed into a single book of the same form. See Step 4 for instructions on how to handle test books that have been transcribed.
- each student has written his or her name legibly on the front cover of the test book. The district and school name must be written legibly on the front of the test book.
- all unused/do-not-score test books are collected and accounted for.
- all Large Print and/or Braille editions are transcribed into the regular edition test books included in the Large Print and Braille Kit.
- all completed GISs are collected.
- all security barcode discrepancies are documented on the Test Book Accountability Form.
- test books completed using any writing instrument other than a nonmechanical No. 2 pencil (e.g., highlighters, ink pens, and colored pencils) are transcribed with a nonmechanical No. 2 pencil to other test books of the same form for scoring.
- test books completed using any lead other than nonmechanical No. 2 lead have each answer traced using a nonmechanical No. 2 pencil to be scored accurately. **Do not use alternatives such as No. 2.5 pencils!**

ONLY use No.2 lead is scannable -- no other lead type can be used.

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- all erasing is thorough: all student responses written on the coding tracks in the margins of the pages are erased and transcribed verbatim onto the response line; all stray marks on the coding tracks are erased. Erasing all pencil underlining is no longer necessary. However, look for and remove any stray marks or smudges where student responses are scored.
- student barcode labels are on the test books in the designated area.
- student information on the SIS is complete and accurate if a barcode label is not used.
- all Mathematics Assessment scratch, grid, or graph paper is collected after testing and securely destroyed.
- all *Examiner's Manuals* are collected and destroyed. *Examiner's Manuals* are not secure materials and do not have to be shredded.

Although not secure, please ensure that manuals are destroyed so that they are not confused with next year's testing materials. Manuals remain on the Department website until the following year's manuals are posted.

Remind Test Examiners that **all test books** must be returned to CTB/ McGraw-Hill except for contaminated test books, which should be destroyed after following procedures in Step 2 of this manual. Contact any Test Examiner who delays in returning the group's testing materials. Discard all unused large white envelopes and ancillary materials. Securely destroy extra or unused student barcode labels at the end of the testing window.

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Step 4 Check the Organization of Materials Collected

▶ Instructions for the School Test Coordinator

The *Examiner's Manual* provides instructions to the Test Examiners for organizing materials after testing. These instructions are repeated below so that the organization of materials collected from each Test Examiner can be checked. As documents are checked, maintain this organization.

The large white envelopes should contain the following items in the order indicated here (refer to the illustration in Step 6 of this manual):

1. A completed GIS for **each** group.
2. MAP Grade-Level Assessment test books with a student barcode label or a completed SIS for each student.

For each invalidated test, the test book with a student barcode label or a completed SIS must be placed in the envelope.

Information requested on the front of the envelope must be completed. If multiple envelopes are needed to hold materials for large groups, the envelopes should be bundled together and marked on the front, upper-left corner "1 of X," "2 of X," "3 of X," and so forth (with "X" being the total number of envelopes).

The envelopes should remain unsealed so that the DTC can verify the contents and then seal the envelopes.

securely destroyed means shreading

After test administration, all used scratch and grid paper must be **securely** destroyed. Do NOT return any of these items in the return shipment to CTB/McGraw-Hill. If the manipulatives have not been written on, they may be kept for classroom use.

Note: Each year new sets of manipulatives are packaged with the test books. Students must use only the appropriate grade-level manipulatives provided with each year's test books.

Unused/do-not-score test books should be placed directly into the shipping box provided by CTB/McGraw-Hill, with a white "UNUSED/DO-NOT-SCORE" label affixed to the outside of the box. Large Print and Braille edition test books marked **"Contents transcribed to a regular test book. DO NOT SCORE"** should be placed in the box with the unused/do-not-score test books.

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For "do-not-score" test books, use a black marker to write a large "DO NOT SCORE" across the front and back if:

- any biographical information is coded but the book should not be scored.
- the test book is damaged and should not be scored. However, after transcribing a contaminated test, securely destroy it at the testing site.
- the test book is written in another language.
- the test book has manufacturing errors and should not be scored.

After "DO NOT SCORE" has been written across the front and back of the test book, place the book with the unused/do-not-score materials.

If a student takes a test in more than one book, ensure that all student responses are transcribed verbatim into only one test book of the same form. The book containing the transcribed responses will be scored and should be returned with the scorable test books. Write the following on the front cover of the original test book: **"Contents transcribed to another regular test book. DO NOT SCORE."** Then return this test book with the unused/do-not-score test books.

If a test book has missing, damaged, or upside-down pages or if an SIS is damaged or torn, ensure that all student responses are transcribed verbatim into another regular edition test book of the same form. A test book that contains missing, damaged, or upside-down pages should be marked appropriately on the front cover with a black marker. For example, write **"Contents transcribed to another regular test book. DO NOT SCORE"** on the front cover of a test book with missing pages. Return the damaged books (but not contaminated test books) with the unused/do-not-score test books.

If any alternative response sheets are in the test books—for example, computer-generated responses—transcribe them verbatim into the test books. Alternative response sheets cannot be scored. Only responses in regular edition test books will be scored.

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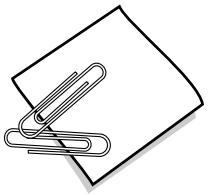
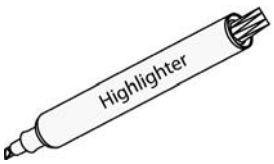
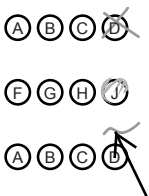
Physical Condition

Some conditions interfere with the scoring process. Check each SIS and each test book for the following:







If any of these are found . . .	do this:
"sticky" notes extra paper paper clips staples tape of any kind	Remove them. Securely destroy any sticky notes or extra paper that contain test or item information.*
highlighting, ink, or colored-pencil marks	Copy completely all student responses from a test book with highlighting or colored pencil or ink marks into a clean, unused test book. Test books with highlighting or colored pencil or ink marks cannot be machine-scanned, and the student will not receive a score. Use a nonmechanical No. 2 pencil. Use a soft eraser.** Mark responses with solid, dark, filled-in circles.
light marks incomplete erasures stray marks smudges	Erase marks or make light marks heavier as needed.***
SIS and/or test book torn or damaged	Completely copy responses from a damaged test book into a clean, unused test book, using a nonmechanical No. 2 pencil. **Damaged test books cannot be machine-scanned, and the student will not receive a score.** Use a soft eraser.** Mark responses with solid, dark, filled-in circles.

using a soft eraser is important for thorough erasures. Smudged erasures are harder to scan

Stray marks in the answers choices MUST be removed. However, underlining, check marks, circles, etc. in the stem or item passage do not have to be removed. However, ONLY use No 2 pencils for the underlining, etc.

*Failure to remove these items could delay the delivery of the final reports.

**Be aware that some No. 2 pencils have erasers that damage test books.

***Any stray marks or smudges from incomplete erasures may have an impact on the scoring of the items.

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Step 5 Check the Student Information Sheet (SIS)

▶ Instructions for the School Test Coordinator

While checking the materials, keep each Test Examiner's materials together as a group.

Student Information Sheet (SIS)

The SIS of the test book must be completed:

- if a precoded student barcode label is NOT being used, or
- if a student's data on the precoded roster is not accurate.

Certain biographical data is not shown on the student barcode label due to privacy considerations and a small print area. Therefore, do a complete check of biographical data on the Student Precode Roster.

REMINDER: ***DO NOT use the student barcode label*** if any of the following items are incorrect on the Student Precode Roster:

- **STUDENT NAME**
- **BIRTH DATE**
- **RACE/ETHNICITY**
- **GENDER**
- **MOSIS STATE ID**

Instead, fill in all the sections of the SIS for that student as described on the following pages.

ELL students will have a test book for at least mathematics (and science in grades 5 & 8) even if they qualify to be exempt from C.A.

To account for all students, a test book with a student barcode label or a completed SIS must be turned in for **every** eligible student, except MAP-A students. English Language Learner (ELL) students who have been in the United States 12 cumulative months or less at the time of administration of Grade-Level Assessments may be exempted from taking the Communication Arts Assessment only. All other content areas must be assessed.

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MISSOURI STUDENT INFORMATION SHEET

1 STUDENT NAME

Last | First | MI

2 BIRTH DATE

Month	Day	Year
Jan	00	00
Feb	11	1
Mar	22	2
Apr	33	3
May	4	4
Jun	5	5
Jul	6	6
Aug	7	7
Sep	8	8
Oct	9	99
Nov		
Dec		

3 RACE/ETHNICITY

(Fill in only one)

- 0 American Indian/Alaskan Native
- 1 Asian
- 2 Paciȧc Islander
- 3 Black (not Hispanic)
- 4 Hispanic
- 5 White (not Hispanic)
- 6 Other

4 GENDER

Female Male

5 MOSIS STATE ID

*If a pre-coded label is used, the following data cannot be modiȧed: **Student Name, Birth Date, Race/Ethnicity, Gender, and MOSIS State ID.** If any of the above information is incorrect, do not use label. Instead, ȧll out all sections of this page.

STATE USE

0 1 2 3 4 5 6 7 8 9

6 COMMUNICATION ARTS

Accommodations (Fill in all that apply)

- 01 Braille edition
- 02 Large print edition
- 04 Oral reading—**invalidates CA**
- 04 Oral reading—Blind/Partial Sight
- 05 Signing of assessment—**invalidates CA**
- 06 Paraphrasing—**invalidates all tests**
- 10 Other administration
- 11 Oral reading in native language—**invalidates CA**
- 20 Extend time—*TerraNova* session
- 21 Administer using > allotted periods
- 22 Other timing
- 35 Use of scribe
- 39 Use of calculator, math tables, etc.
- 43 Use of bilingual dictionary—**invalidates CA**
- 44 Other response
- 50 Testing individually
- 51 Testing in small group
- 53 Other setting

Teacher Invalidation Sessions	Absent Sessions	Not Enrolled
1 2 3	1 2 3	

MATHEMATICS

Accommodations (Fill in all that apply)

- 01 Braille edition
- 02 Large print edition
- 04 Oral reading
- 05 Signing of assessment
- 06 Paraphrasing—**invalidates all tests**
- 10 Other administration
- 11 Oral reading in native language
- 20 Extend time—*TerraNova* session
- 21 Administer using > allotted periods
- 22 Other timing
- 35 Use of scribe
- 39 Use of calculator, math tables, etc.
- 43 Use of bilingual dictionary
- 44 Other response
- 50 Testing individually
- 51 Testing in small group
- 53 Other setting

Teacher Invalidation Sessions	Absent Sessions	Not Enrolled
1 2 3	1 2 3	

SCIENCE

Accommodations (Fill in all that apply)

- 01 Braille edition
- 02 Large print edition
- 04 Oral reading
- 05 Signing of assessment
- 06 Paraphrasing—**invalidates all tests**
- 10 Other administration
- 11 Oral reading in native language
- 20 Extend time—*TerraNova* session
- 21 Administer using > allotted periods
- 22 Other timing
- 35 Use of scribe
- 39 Use of calculator, math tables, etc.
- 43 Use of bilingual dictionary
- 44 Other response
- 50 Testing individually
- 51 Testing in small group
- 53 Other setting

Teacher Invalidation Sessions	Absent Sessions	Not Enrolled
1 2	1 2	

7 8 9

Student Information Sheet

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When checking this . . .	look for this:
1 Student's Last Name, First Name, and Middle Initial	Letters must be printed, one per box, above the lettered circles. Under each box, the circle with the same letter must be filled in. If the letters in the student name exceed the number of boxes, then complete as many letters in the first and last names as possible.
2 Student's Birth Date	The circles corresponding to the student's month, day, and year of birth must be filled in. (If the "Day" is not a two-digit number, the number should be preceded by a zero.)
3 Race/Ethnicity	The circle corresponding to the student's ethnic origin must be filled in.
4 Gender	The circle indicating the student's gender must be filled in.
5 MOSIS State ID	Numbers must be printed, one per box, above the numbered circles. Under each box, the circle with the same number must be filled in.
6 Accommodations	The appropriate circle(s) must be filled in, if applicable. Refer to the *Examiner's Manual* for detailed instructions.
7 Teacher Invalidation	The appropriate circle must be filled in if a student is caught cheating.
8 Absent	The appropriate circles must be filled in, if applicable.
9 Not Enrolled	This circle must be filled in, if applicable.

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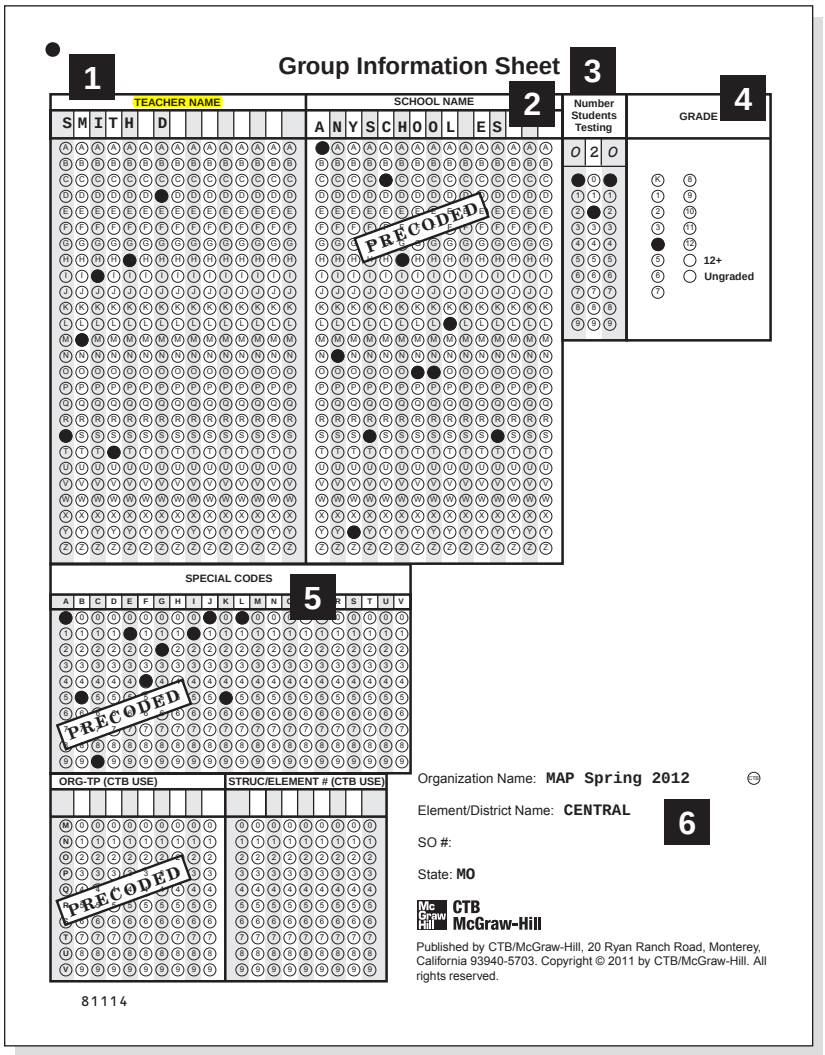
Step 6 Check the Group Information Sheet (GIS)

▶ Instructions for the School Test Coordinator

The Group Information Sheet (GIS) provides data that appear on the reports. A GIS must be submitted for each grade level. **A complete and accurate GIS must be placed on top of each stack of test books whose scores are to be reported together.** Some information may be filled in already (precoded), whereas other information must be hand-entered. Check both the precoded and hand-entered material for accuracy. If any precoded information is not accurate, notify the DTC. **Note that the GIS is a scannable document and cannot be photocopied.** If a district receives an insufficient number of preprinted GIS forms, the DTC should **immediately** order more forms so that materials can be processed appropriately. A sample GIS is shown below. Instructions for checking the GIS are on the next page.

Teacher Name field may be used for any Group Name as long as it matches the Group Name used on the School/Group List.



GIS to accompany test books

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When checking this . . .	look for this:
1 Teacher Name (or Group Name)	The name that you put under the "Teacher Name" field becomes the group identifier. The group name must be printed in the boxes in the "Teacher Name" field. "Nancy Jones," "grade three," or "third hour" are examples for this field. Under each box, the corresponding circle must be filled in. Whatever identifier the school chooses must be entered in the "Teacher Name" field and will be attached to the student's record for all content areas.
2 School Name	In most cases, the school name is precoded. If not, the school name must be printed in the boxes, and the corresponding circles filled in.
3 Number of Students Testing	The number of students whose test books are grouped with this GIS must be printed in the boxes, and the corresponding circles filled in. Use leading zeros, if needed. For example, to indicate 20 students, write and fill in 020. Remember, in order to account for all students, a **test book with a completed SIS** (located on the inside front cover) or a **test book with a student barcode label** must be turned in for every eligible student, except MAP-A.
4 Grade	The correct circle for the grade must be filled in.
5 Special Codes	This information is precoded with the county, district, and school code numbers. The county code number is in columns A, B, and C. The district code number is in columns E, F, and G. The school code number is in columns I, J, K, and L.
6 Organization Name, Element/District Name, SO# (Scoring Order), and State	This information is precoded.

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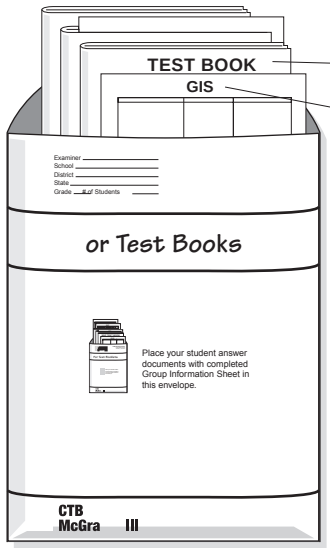
After checking the GISs for accuracy, place the following items in the large white envelopes in this order:

1. GIS for the class/group
2. MAP Grade-Level Assessment test books—each with a student barcode label or a completed SIS



2. Test books—each with a student barcode label or a completed SIS

1. GIS for class/group—the GIS goes only in the first envelope for large groups of students

Each envelope will hold approximately 5–10 test books, depending on grade level. If a Test Examiner has more than one envelope, put the GIS in the Test Examiner's **first envelope** with as many test books as will fit. If multiple envelopes are needed, label the upper left corner of each envelope "1 of X," "2 of X," "3 of X," and so forth (with "X" being the total number of envelopes). (Detailed instructions for the proper handling of the Large Print and Braille editions of the test books are included in the Large Print and Braille Kit. Also see Step 1 in the *Examiner's Manuals*.)

Be sure to complete all information requested on the large white envelope to avoid delays in scoring.

IMPORTANT: DO NOT seal the envelope. The DTC will verify the contents before sealing it.

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Step 7 Complete the School/Group List

▶ Instructions for the School Test Coordinator

The School/Group List is CTB/McGraw-Hill's way of double-checking that all scorable test books are received. The STC should have received one School/Group List for the school. A School/Group List form can be used for all content areas and may be photocopied as many times as necessary.

Every GIS completed for the school should have an entry on the School/Group List. (See "Testing Group" in the Glossary.) The district name, school name, county code number, district code number, and school code number have been precoded on the School/Group List. Write the name, email address, and telephone number of the contact person in the spaces provided. List each testing group in the school. The "GROUP NAME" on the School/Group List must be identical to the "TEACHER NAME" on the GIS. For each group, indicate the grade number and the number of scorable books being returned. All Test Examiners must put test books behind one GIS form for the grade level.

The School/Group List may be photocopied if additional space is needed to accommodate the school. Keep a copy of each School/Group List for your records.

A sample School/Group List is shown on the next page with instructions following.

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Missouri Assessment Program 2012
Grade-Level Assessments

SCHOOL/GROUP LIST

District Name: 1 _____ County/District Code: 3 _____

School Name: 2 _____ School Code: 4 _____

Contact Person: _____

5 Email Address: _____

Phone Number: _____

PLEASE READ INSTRUCTIONS BELOW COMPLETELY BEFORE BEGINNING:

1. Create an entry below for every Group Information Sheet (GIS) completed for your school.
2. If you have too many groups to fit on one page, you may photocopy this form.
3. Use a separate School/Group List for each school.
4. Reminder—only **ONE** book per student should be submitted. If multiple books for any student are identified, please ensure that all responses are transcribed into a single book of the same form.

CTB Use	Group Name 6 (MUST BE IDENTICAL TO "TEACHER NAME" FIELD ON GIS)	Grade	Number of Scorable Books	CTB Use Did Not Receive
	Mary Jennetton	3	20	
	Donald McCurney	3	26	
	D. Smith	4	20	
	Fredrickson, John	4	23	
	Litchfield 1st	5	24	
	Litchfield 2nd	5	26	
	1st hr Brecken.	6	21	
	2nd hr Brecken.	6	22	
	Mrs. J. Brown	7	26	
	Mr. John Brooks	7	25	
	Johnson, Lisa	8	26	
	Pinney, Susan	8	20	

Organization Number: **M020120** Testing Program: **001** SO Number: **60829**

Organization Name: **MISSOURI SPRING 2012** Element Name:

Thank you for providing us with your contact information. We will use this information only to fulfill your order. We store this information in a secure database at CTB/McGraw-Hill in the U.S. For more information on our privacy practices, send an email to the privacy official at privacyofficer@ctb.com or call 831.538.9547. If you would like more information on The McGraw-Hill Companies Customer Privacy Policy, please visit http://www.mcgraw-hill.com/privacy.html

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In this area . . .	do this:
1 District Name	Check that the district name has been precoded.
2 School Name	Check that the school name has been precoded.
3 County/District Code	Check that the county and district codes have been precoded.
4 School Code	Check that the school code has been precoded.
5 Contact Person, Email Address, Phone Number	Provide a contact person's name, email address, and phone number. The contact person is usually the STC.
6 Group Name, Grade, Number of Scorable Books	List the following information: • each teacher or testing group's name **exactly** as it appears in the "Teacher Name" field on each GIS. If they are not identical, score reports will be affected. • grade level. • total number of scorable books being returned, in the Number of Scorable Books column. **NOTE:** In order to account for all students, a **test book with a completed SIS** or a **test book with a student barcode label** must be received for every eligible student, except MAP-A.

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Step 8 Organize Materials for the District Test Coordinator

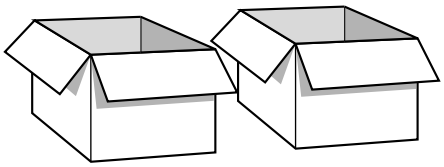
▶ Instructions for the School Test Coordinator

Make sure that all testing materials are received from each Test Examiner in the school. Contact any Test Examiner who delays returning student testing materials.

Once the MAP School/Group List(s) is completed, the STC's last task is to deliver the test materials to the DTC.

Follow these guidelines for packaging testing materials for the DTC:

1 OBTAIN BOXES

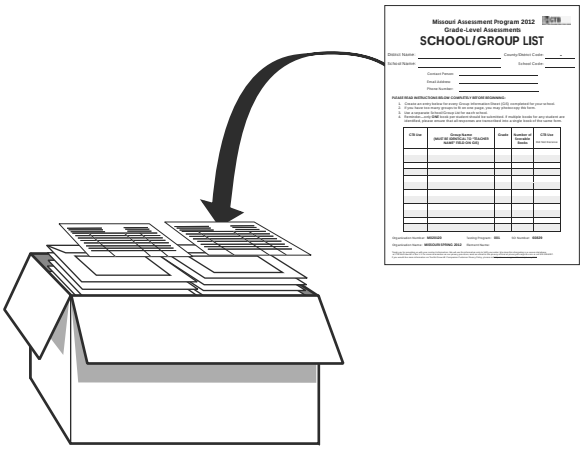


REUSE the boxes in which the testing materials arrived. Test materials must be returned in the CTB/McGraw-Hill boxes with green shading. Additional CTB boxes can be ordered by contacting the CTB dedicated MAP Service Line at 1-800-544-9868.

Prior to packing test materials, securely tape the bottom of each box to prevent breakage. Reinforce all bottom seams, following an "H" pattern.

2 PACKAGE SCORABLE MATERIALS

Place the following materials in boxes in the order specified below, with the first items listed on the top in Box 1.



- **School/Group List(s)**
- The large white envelopes of test materials, organized by grade in ascending order and accompanied by GIS forms, completed as described in Step 6 of this manual.

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3 PACKAGE UNUSED/DO-NOT-SCORE TEST BOOKS

Pack all **unused/do-not-score** test books ***in their own box***, separate from the used test books. Unused/do-not-score books must be returned in the shipping boxes provided by CTB/McGraw-Hill.

DO NOT include scorable test books in the same box with unused/do-not-score test books. Unused/do-not-score test books are processed separately and at a later date than the to-be-scored test books. Combining these books can delay scoring and reporting.

Exception: ALL used and unused Large Print and Braille edition test books **must** be included with the unused/do-not-score test books. (Remember, if a student used one of these types of books, it must be transcribed into a regular book that is included in the Large Print and Braille Kit.)

4 AFFIX SHIPPING LABELS

Blue Label - scorable test books

White label - unused/nonscorable

- Affix the **blue shipping labels** to the boxes containing test books to be scored. Labels should be placed on the side of the box, in the white space marked "PLACE CTB/MCGRAW-HILL BARCODE RETURN LABEL HERE." Do **not** place the label on the top of the box.
- Affix the **white shipping labels** to the boxes containing unused/do-not-score materials inventory. Labels should be placed on the side of the box, in the white space marked "PLACE CTB/MCGRAW-HILL BARCODE RETURN LABEL HERE." Do **not** place the label on the top of the box.
- **Number each set of boxes separately for each school, using the color-coded shipping labels provided** (e.g., "1 of X," "2 of X," etc., for the blue shipping labels and "1 of X," "2 of X," etc., for the white shipping labels, where "X" is the total number of boxes per school).
- Complete all of the information requested on the labels.

Return shipping labels are scannable and cannot be photocopied. **Blue labels and white labels are NOT interchangeable.** If more return shipping labels of either color are needed, contact CTB customer service.

5 SEND MATERIALS TO THE DISTRICT TEST COORDINATOR

- Do not seal the white envelopes or the boxes of test books.
- The DTC will review the contents of each box.

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Step 9 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.

Blue "TO-BE-SCORED" labels must be used for materials to be scored. White "UNUSED/DO-NOT-SCORE" labels must be used for unused/do-not-score materials. DO NOT combine to-be-scored and unused/do-not-score materials in a single box.

Do **not** return the following to CTB/McGraw-Hill:

- *Test Coordinator's Manual*
- *Examiner's Manuals* (destroy by district)
- unused GISs
- unused School/Group Lists
- unused return shipping labels
- unused student barcode labels (must be **securely** destroyed by district)
- unused white envelopes
- manipulatives (**securely** destroy any manipulatives with student writing on them)
- scratch and/or grid paper used for Mathematics Assessment (must be **securely** destroyed by district)
- Test Book Accountability forms (keep for your records)
- Missing Test Materials form (keep for your records)

Fax this form -- do NOT ship

Check all materials from the STCs to ensure they have correctly followed the procedure described in Step 8 of this manual.

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Make sure all materials being shipped are tightly packed and are securely taped shut.

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." Damaged books may not scan properly, resulting in delayed release of testing results.

2 SEAL BOXES

Seal each box securely with packing tape to reinforce the top and side seams of the boxes. This will prevent damage to the boxes and subsequent loss of test materials.

3 SCHEDULE TESTING MATERIAL PICKUP

NEW last year

The DTC will schedule the pickup of MAP Grade-Level Assessment testing materials by contacting CTB's logistics vendor, Assessment Distribution Services (ADS). Schedule the pickup no later than April 30, 2012. Please allow 1–3 days for pickup of your test materials. The pickup must be scheduled by the due date to facilitate processing of test materials in preparation for report production.

Test materials must be returned via ADS in order to ensure secure tracking of materials. No third-party carriers may be used without prior approval from CTB.

Materials must be returned in a single shipment unless prior arrangements are made with CTB.

Instructions for scheduling the pickup of MAP Grade-Level Assessment testing materials:

1. Contact ADS at 1-800-840-9965.
2. Inform ADS that you are calling to request pickup of MAP Grade-Level Assessment testing materials.
3. Provide your box counts per label color to ADS.
4. Confirm your pickup address with ADS.

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5. Provide relevant pickup information to ADS (location of boxes within site, parking or loading issues, hours of operation, etc.).

6. Confirm your email address with ADS.

Once your phone request is complete, you will receive a confirmation email from ADS. The driver will bring the Bill of Lading (BOL) and will verify the box count on the BOL. If there is a discrepancy, adjust the BOL accordingly with the driver. Once the BOL is correct, both parties will sign it.

Note: For security purposes, do not leave boxes on the dock while waiting for materials pickup.

If you have any questions regarding the pickup of materials, call ADS for assistance at 1-800-840-9965.

Note: If you have any questions outside of the pickup process, call the CTB dedicated MAP Service Line at 1-800-544-9868.

4 FAX TEST BOOK ACCOUNTABILITY FORMS TO CTB

After you have confirmed that you have received completed, signed Test Book Accountability Forms from each school, fax them to CTB at the fax number listed on the form.

5 QUESTIONS

For answers to any questions regarding the return procedures described in this manual, call the CTB dedicated MAP Service Line at 1-800-544-9868.

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Glossary

Bookmark

A bookmark is simply a piece of blank paper used to mark the place in the test book where the student is to begin the next session of testing. This is an optional tool.

Contaminated Test Books

A test book is considered *contaminated* if it cannot be returned for scanning 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 a test book is contaminated, the Test Examiner should notify the School Test Coordinator for instructions for handling the contaminated materials since ALL test books must be accounted for. Contaminated test books should not be returned to CTB/McGraw-Hill. They must be securely destroyed at the test site. A Missing Test Materials Form (included in the District Test Coordinator's Kit) must be completed and faxed to CTB and DESE to account for the contaminated book.

Department of Elementary and Secondary Education (DESE)

The Office of College and Career Readiness, Assessment Section at DESE can be reached at 573-751-3545. The Special Education Division can be reached at 573-751-5739.

District Test Coordinator (DTC)

This is the only person who should be calling CTB, the Department, or ADS

The District Test Coordinator receives, checks, distributes, collects, assembles, and ships district testing materials. The DTC is responsible for ensuring that all Test Examiners are trained annually in test administration. The DTC is also responsible for test security. Other responsibilities are outlined in this manual.

Examiner's Manual

Each *Examiner's Manual* provides specific test administration instructions for a specific grade level for Communication Arts, Mathematics, and Science. *Examiner's Manuals* are included with the shipment of test books. *Examiner's Manuals* are not secure and can be found on the DESE website at http://dese.mo.gov/divimprove/assess/grade_level_manuals.html. ***Examiner's Manuals* are updated annually, so it is important for all Test Examiners to read the manual each year.**

Group Information Sheet (GIS)

The GIS provides CTB/McGraw-Hill with testing-group data that will appear on reports. One GIS is supplied for each school, grade, and group. The GIS is a scannable document and cannot be copied. Districts can order additional GISs as needed.

Homebound Students

Homebound students receiving services must be tested. The students are tested at home or at school. Test Examiners of homebound students must receive training in the administration of the MAP Grade-Level Assessments. Test Examiners are responsible for ensuring the security of testing materials between testing sessions and for returning those materials to the STC.

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Homeschooled Students

Homeschooled students must be tested in MAP Grade-Level Assessment content areas in which they are enrolled in the district. The students may take part in the MAP Grade-Level Assessments at the local district's discretion if they are not receiving any services. Homeschooled students participating in the MAP Grade-Level Assessments must take the tests at the local school.

Test books for homeschooled students are handled differently from regular test books. Perform the following tasks to ensure proper processing of test books for homeschooled students:

- Each homeschooled student must be entered on his or her own GIS.
- On the GIS, on the "Teacher" line, write HOMESCHOOLED.
- On the GIS, under the "Special Codes" section, in Column V, fill in the "2" bubble.

Large Print and Braille

Versions of the MAP Grade-Level Assessment that are produced to meet the accommodation needs of visually impaired students.

Large White Envelopes

Large white envelopes are provided to each Test Examiner. After testing, each testing group's materials should be organized according to the directions in Step 6 of this manual and placed in the large white envelopes for return to CTB/McGraw-Hill.

Level Not Determined (LND)

This designation is for students who did not receive a MAP Grade-Level Assessment score for any one of the following reasons:

- A blank test book is returned to CTB/McGraw-Hill with a student barcode label affixed or a completed SIS.
- A student does not attempt any items in one or more content areas of the MAP Grade-Level Assessment.
- A student is absent all sessions.

For more information, refer to the MAP Technical Report on the DESE website at http://www.dese.mo.gov/divimprove/assess/tech/.

Lowest Obtainable Scale Score (LOSS)

Within each grade and content area, a LOSS is established for students whose score is below the level expected by guessing. For more information, please refer to the most recent MAP Technical Report, which can be found on the DESE website at http://www.dese.mo.gov/divimprove/assess/tech/.

Manipulatives

Punch-out items such as rulers, protractors, and other objects that may be provided for the Mathematics and Science Assessments. The Large Print and Braille manipulatives are shipped with the individual Large Print and Braille tests. The Large Print and Braille manipulatives or the equivalent classroom version may be used by students taking the Large Print or Braille version of the test.

Only DTC should call this line

Missouri Assessment Program Service Line

Questions regarding the Spring 2012 testing administration of the MAP Grade-Level Assessments can be answered by calling 1-800-544-9868, 7:30 A.M.–6:30 P.M. (CT), Monday–Friday.

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MOSIS

Missouri Student Information System is a student-level record system that contains a randomly generated state identification number for every student receiving service in the public schools.

Nonmechanical No. 2 Pencil

A nonmechanical No. 2 pencil contains the preferred amount of graphite to be "read" by electronic scanning equipment. For the Grade-Level Assessments, only nonmechanical No. 2 pencils can be properly imaged for electronic scoring.

Not Enrolled

Use for students who move before or during the test administration window.

Precoded

"Precoded" refers to machine-scannable barcode labels or bubbles that are filled in mechanically by CTB/McGraw-Hill.

School/Group List

The School/Group List is CTB/McGraw-Hill's way of double-checking that all testing materials are received. All GISs for a school must have an entry on the School/Group List.

School Test Coordinator (STC)

The School Test Coordinator distributes testing materials to Test Examiners, collects and checks materials, and forwards them to the DTC for shipping.

Security Barcode

Comes on test book cover when test books are delivered

Each MAP Grade-Level Assessment test book has a unique security barcode number printed vertically in the lower right-hand corner of the front cover. The barcode is used to number each test book consecutively and to track test books shipped to the districts.

Shipping Labels

Color-coded shipping labels are provided in both the District and School Test Coordinator Kits. The School labels are preprinted with both District and School information. The District labels are preprinted with district information only (with space to write in school information).

Student Barcode Label

The student barcode label is a precoded label that contains a student's identification and limited student biographical information. These labels are provided by CTB only if the district submitted a precoded file to DESE via the MOSIS precode system. If the district did not submit a precoded file or if the information is incorrect, the SIS on the inside front cover of the test book must be completed. For security reasons, not all of the information a district provides in its precoded file is displayed on the printed barcode label.

Student Information Sheet (SIS)

The SIS is located on the inside front cover of each student test book. This sheet captures limited student biographical information as well as accommodation codes, status codes, and other important testing information.

Test Book Accountability Form

The Test Book Accountability Form accounts for all books distributed to a school, whether scorable, unused, missing, damaged, or destroyed, and requires the School Test Coordinator's signature.

Test Coordinator's Manual

This *Test Coordinator's Manual* describes both the DTC's and the STC's roles in the MAP Grade-Level Assessment test administration.

CTB dedicated MAP Service Line: 1-800-544-9868 (Hours: 7:30 A.M. to 6:30 P.M. Central Time, Monday – Friday)
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Testing Group

When a Test Examiner administers the MAP Grade-Level Assessments to a group of students, that group is considered a testing group. The GIS is completed for one grade level per building and should include information for each teacher, group, grade, or school. For accountability data purposes, reports will reflect testing-group information as indicated on the GIS by the local district. In addition, STCs need to ensure that every GIS completed for their school has an entry on the School/Group List. (See "Complete the School/Group List" in Step 7 of this manual.)

Reports are affected by the way these are completed.

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DESE Training on Test Examiner's Manual

Missouri Assessment Program

Examiner's Manual

Grade 5

Communication Arts, Mathematics, and Science Assessments

Spring 2012

Missouri Department of Elementary
and Secondary Education

2702924

Overview

This manual has been constructed so that a Test Examiner who administers more than one content area need not read portions of this manual more than once. Steps 1 through 4 and Steps 6 through 8 contain approximately the same information for all content areas. Step 5 of this manual contains test administration directions specific to each content area. Preview the Glossary for an explanation of terms.

The **Missouri Assessment Program (MAP)** is one of several educational reforms mandated by the Outstanding Schools Act of 1993. As a result of this Act, the State Board of Education directed the Missouri Department of Elementary and Secondary Education (DESE) to identify the knowledge, skills, and competencies that Missouri students should acquire by the time they complete high school and to evaluate student progress toward those academic standards. DESE worked with teachers, school administrators, parents, and business professionals throughout the state to develop the Show-Me Standards and the Grade-Level Expectations (GLEs). The Department has worked with the same constituencies to develop an assessment system that evaluates students' proficiencies represented by the Show-Me Standards and the GLEs.

The Spring 2012 Grade-Level Assessments include the following:

Required

Communication Arts Assessment for Grades 3–8
Mathematics Assessment for Grades 3–8
Science Assessment for Grades 5 and 8

Each assessment requires two to three hours of test administration time and may include two types of test items: **selected response items** and **constructed response items.**

The **selected response (also known as multiple choice) items** present students with a question followed by four or five response options. Selected response items from *TerraNova*™, a nationally normed test developed by CTB/McGraw-Hill, are used for the following:

- Communication Arts, Session 2, all grades
- Mathematics, Session 2, all grades
- Science, Session 2, Grades 5 and 8

The **constructed response items** require students to supply (rather than select) an appropriate response. Students are asked to show their work when answering questions. In addition to measuring students' content knowledge, constructed response items provide information about how students arrive at their answers.

The Department uses the information obtained through Grade-Level Assessments to monitor the progress of Missouri's students toward meeting the Show-Me Standards in order to inform the public and the state legislature about students' performance and to help make informed decisions about educational issues. The data generated from Grade-Level Assessments are analyzed to help improve the services provided to each student in the state.

HELP THE TEACHER HELP THE CHILD

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The *Examiner's Manuals* are NOT secure documents. All teachers and administrators should read this entire manual before administering the test.

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TEST SECURITY

This is a new section that combines all previous security directives.

Test security and ethical testing practices continue to be of **PARAMOUNT** importance.

Test security includes, but is not limited to, the following:

District Policy

- **MUST** be in place for each district and charter school **(State Board requirement)**

Training

- **MUST** include watching DESE training webinars and reading the appropriate *Examiner's Manual*
- District-level training may supplement but not replace official DESE training.
- The following list of people must receive training:
  a. District Test Coordinator
  b. School Test Coordinators
  c. General Classroom Test Examiners
  d. Special Education Test Examiners
  e. Homebound or out-of-district student Test Examiners
  f. Translators
  g. Transcribers
  h. Proctors
  i. Other district staff who have responsibilities in testing

Classroom and Testing Materials/Tools

- Cover, remove, or ensure that all content-related information is out of the students' view before beginning the testing session.
- Use **ONLY** the content- or process-related materials or tools that are listed in the *Examiner's Manual* for each grade.
- When not in use, test books and manipulatives must be stored in a secure locked location **outside** of the classroom.
- During a testing day, when students are not testing, test books must also be removed from view and kept secure.
- After testing, all used scratch, grid, or unlabeled graph paper must be collected and returned to the School Test Coordinator (STC) to be securely destroyed.
- Electronic communication, including cellular and imaging devices, **must not** be accessible during any portion of the testing session. These types of devices must be turned off and not readily visible at any time during the testing session.

Practices for Test Examiners and Proctors

- Do **NOT** review the test books before, during, or after testing.
- Do **NOT** paraphrase the item directions for students.

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- Do **NOT** react verbally or non-verbally to students' answers, or otherwise potentially cue students in any way.
- Do **NOT** allow test books to be transported by students or made accessible to personnel not responsible for testing.

Practices for All District Administrative Staff

- Do **NOT** score, photocopy, duplicate, or scan test books.
- Do **NOT** edit student responses in any way.
- Only the student can answer his or her test items and only during the testing sessions.
- Do **NOT** return a test book with unanswered items to any student to finish or to edit incomplete/inaccurate answers.
- Do **NOT** assist students with any item-related questions other than to ensure that the students understand the general test directions. Assist them with test-taking procedures, but be careful not to give hints or clues that indicate an answer or help eliminate answer choices.
- **Both written and verbal discussion of specific Grade-Level Assessment items breaches the security and integrity of the test and may result in invalidation or loss of scores for accountability purposes.**

Special Circumstances

- Translators and transcribers may need to review the test books and student work prior to testing.
- Any student's test book that must be transcribed must be done so in a timely, secure manner.

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PREPARE FOR TESTING

TESTING SCHEDULE

Each content area of the Grade-Level Assessment requires between two and three hours of classroom time, depending on the individual student's ability. Additional time may be needed to complete the Student Information Sheet (SIS) for students who do not have a precoded barcode label or whose label contains any incorrect information.

TESTING SCHEDULES (in minutes)

COMMUNICATION ARTS		
SIS (if needed)		10
Session 1		45–55 (timing guideline)
		55–65
Session 2	Part 1	21 (strictly timed)
	Part 2	29 (strictly timed)
		50
Session 3		**15–20** (timing guideline)

MATHEMATICS		
SIS (if needed)		10
Session 1		25–35 (timing guideline)
		35–45
Session 2	Part 1	15 (strictly timed)
	Part 2	35 (strictly timed)
		50
Session 3		**25–35** (timing guideline)

SCIENCE		
SIS (if needed)		10
Session 1		50–70 (timing guideline)
		60–80
Session 2	Part 1	25 (strictly timed)
	Part 2	20 (timing guideline)
		45

For sessions that are not strictly timed, if a student is not finished but is making adequate progress, allow the student to finish.

For strictly timed sessions, students must stop at the end of the time allowed.

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Each testing session must be completed in one sitting.

- Review the test directions in this *Examiner's Manual* in advance. *Examiner's Manuals* are not secure and can be viewed in advance. However, student test books are secure and may **not** be reviewed before, during, or after testing.
- Administer the test, if possible, during the middle of the week.
- Avoid testing on days just before or after vacations, important school functions, or holidays.
- Avoid testing just after students have had strenuous physical activity.
- Schedule testing to allow sufficient time to complete a testing session. **Each testing session must be completed in one sitting.**
- Test Examiners are encouraged to administer testing sessions in numerical order. This is considered best practice.
- Take breaks only at times specified within the testing guidelines.

Working with Proctors

Plan on allocating one proctor for every 20 students in excess of 30. (For example, 50 students would need one Test Examiner and one proctor.)

Review plans with proctors prior to testing. Proctors must receive the Test Examiners training. Proctors can help:

- arrange the testing room.
- fill in SISs, if applicable.
- distribute testing materials.
- make sure students are working in the correct place in their test books.
- prevent talking or the sharing of answers.
- collect testing materials at the end of the session.

Accommodations

Bubble the appropriate accommodations for students authorized to receive accommodations.

Students can use any accommodation that they have on their IEP. Students cannot be denied the use of any accommodation.

Students with Individualized Education Programs (IEPs) and English Language Learner (ELL) students who are authorized to receive accommodations are allowed appropriate accommodations during the Grade-Level Assessments. The appropriate accommodation bubble(s) must be completed on the Student Information Sheet. Accommodations for these students are discussed in Step 7, under "How to Fill In the Student Information Sheet."

USE STANDARDIZED TESTING PROCEDURES

Session 2 of Communication Arts, Session 2 of Mathematics, and Session 2 of Science include test items that provide norm-referenced information.

To ensure that test results are valid, reliable, and equitable, standardized tests are always administered with the same directions and time limits and scored with the same scoring criteria. If the tests are not administered with the same procedures used when the tests were standardized, valid conclusions cannot be drawn from the test results.

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- Be sure students understand the directions and the way to mark answers. Assist them with test-taking procedures, but be careful not to give hints or clues that indicate an answer or help eliminate answer choices. **Do not assist students with any question other than to ensure that they understand the general test directions.** Do not paraphrase the item directions for students.
- Encourage students to attempt all items. Tell them to read each question carefully and make their best attempt at answering. Be careful not to imply that they should guess randomly. **Tests may not be returned to students to complete or to correct incomplete or inaccurate answers.**

LARGE PRINT AND BRAILLE

When administering the test to visually impaired students, code accommodations for visually impaired students on the SIS located on the inside front cover of the regular edition test book. See Step 7 for the appropriate accommodation.

Students who take the Large Print edition mark their responses directly in the Large Print edition test books. Students who take the Braille edition use a brailling device called a *Brailler.* **Student responses in both Large Print and Braille edition test books must be transcribed verbatim to a regular edition test book in order for the student to receive a MAP Grade-Level Assessment score.** The regular edition test book that **must be used** is packaged with the Large Print and Braille Kit. Do not use any other regular edition test book.

Use only the regular edition test book and Examiner's Manual found in the Large Print and Braille Kit as references while administering the Large Print and Braille editions of the assessment to visually impaired students. Manipulatives are included with the Large Print and Braille test books. Students may use the provided manipulatives or may use the classroom form of the provided manipulatives for the Large Print and Braille tests.

After transcribing student responses into the appropriate regular edition test books, mark the cover of the Large Print and Braille edition test books with the following text: "Contents transcribed to a regular test book. DO NOT SCORE." Then return the Large Print and/or Braille edition test books to CTB/McGraw-Hill with the unused test books.

Braille test books are handled differently from regular edition test books. Refer to the BRAILLE OMIT RETURN INSTRUCTION SHEET included in the Braille testing materials for information on handling and packaging Braille test books.

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ORGANIZE YOUR CLASSROOM

- Plan for the distribution and collection of materials.
- 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 are out of the students' view.
- When administering the timed portion of the test, write on the board the starting and stopping times for the test. Ensure that all students are able to see and/or understand the time frame for each strictly timed portion of the test. DESE does not endorse, recommend, provide, or have a list of clocks or instruments that Test Examiners are permitted to use to measure and record time.

Nonmechanical No. 2 pencils must be used for all assessments. For example, answers written in ink cannot be scored.

CHECK YOUR TESTING MATERIALS

Check to be sure you have the following materials. If any materials are missing, notify the Test Coordinator.

Test Examiner Materials:

- *Examiner's Manual*
- Student barcode labels
- Test books
- Mathematics manipulatives (provided with package of test books)
- One Group Information Sheet (GIS) per Test Examiner
- Large white envelope(s)
- A box or envelope for unused test books
- Do Not Disturb sign (not provided)
- Nonmechanical No. 2 pencils (not provided) **MUST** be used. This is a **REQUIREMENT.**

Any stray lines or smudges from incomplete erasures may impact the scoring of items. Some non-mechanical No. 2 pencils have erasers that smudge, tear, and damage test books.

TEST BOOKS
Students write their answers directly in the test books for all sessions.

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- Soft erasers that do not smear or tear test books (not provided). DESE does not endorse, recommend, provide, or have a list of eraser brands that students are permitted to use.
- Mathematics scratch, grid, or unlabeled graph paper (new, unused for each session, not provided)
- Science scratch paper (not provided)
- Bookmarks (not provided)

Use only the tools listed for your grade. Do other tools may be given to students.

TOOLS

The following guidelines explain specific rules for using tools. Students may not use any content- or process-related materials except those listed in this *Examiner's Manual.* In all Grade-Level Assessments, students may be provided with bookmarks (such as paper strips or index cards) that can be placed in test books. Bookmarks can be used for each content area. No content or process information is allowed on the bookmarks. Only bookmarks that have no writing on them may be used in later testing sessions. Test Examiners may provide new clean bookmarks as needed.

Scratch paper may not be needed for all content areas or for all sessions in a content area. Used scratch paper should be collected after each session or part. Clean, unused scratch paper should be distributed for each applicable session or part. The Test Examiner may provide clean, unused scratch paper when needed. Note: After testing, scratch, grid, and unlabeled graph paper and bookmarks that have any writing on them must be collected and securely destroyed by the School Test Coordinator (STC).

Communication Arts

- Dictionaries are not permitted for any session or for any items in the Grade 5 Assessment.
- Draft or scratch paper is not permitted for any session of the Communication Arts Asssessment.

The Mathematics rulers will not be used for the Science Assessment.

Mathematics

Punch out the provided grade-level manipulatives the day before testing and distribute to students at the beginning of testing. Please note: Although these manipulatives are provided as a part of standardized testing for Grade 5, these manipulatives may not be needed for any items in this year's assessment. Unless stated otherwise in specific session directions, the use of these manipulatives by students during testing is permitted.

- Only the provided manipulatives are permitted for use during testing.

BOOKMARKS

This is an optional tool. A bookmark is simply a piece of blank paper used to mark the place in the test book where the student is to begin the next session of testing.

any questions about using a specific tool provided by the district for testing, contact the District Test Coordinator. The only materials to be provided by the district are listed on the left.

Read the Test Security section of this manual carefully before administering the assessments.

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- Clean scratch paper, grid paper, or unlabeled graph paper for each session is needed (not provided). Mathematics instructions referencing the use of scratch paper during the assessments also include the use of grid paper or unlabeled graph paper. Clean scratch paper must be distributed before and collected after each testing session or part. Used scratch paper is given to the School Test Coordinator to securely destroy.
- Calculators are **not** allowed for the Mathematics Assessment for this grade level.

Science

- Calculators are **not** allowed for the Science Assessment.
- Clean, unused scratch paper for each session is needed (not provided). Any science instructions referencing the use of scratch paper during the assessments also include the use of grid paper or unlabeled graph paper. Clean scratch paper must be distributed before and collected after each testing session or part. Used scratch paper is given to the School Test Coordinator to securely destroy.

Science Assessment will not use rulers this year.

TRACKING TEST BOOKS WITH SECURITY BARCODES

Test books are secure materials. All test books, including Large Print and Braille editions, are barcoded for security and inventory purposes. A unique security barcode number is printed vertically in the lower right-hand corner on the front cover of every test book. The security barcode is used to number each test book consecutively and track the inventory shipped to the districts.

Test books returned to CTB/McGraw-Hill are inventoried. Missing test books are reported to DESE by inventory barcode number, district name, and school name. Examiners are responsible to account for all test books received and should collaborate with the STC on the best procedures to use. Examiners help ensure a 100% rate of return of all test books to CTB/McGraw-Hill by following the procedures below.

1. Immediately count the test books when they are received from the STC. The test books are numbered sequentially.
2. After testing, count the number of test books and compare the total with the number received from the STC.
3. If any test books are missing, put the test books in sequential order. The missing barcode number can be determined from the numbers on the test books that precede and follow the gap. Report the missing barcode number(s) to the STC.

Translator

Federal provisions allow district staff the flexibility to read the Mathematics and Science Assessments (but **not** the Communication Arts Assessment) to ELL students in their native languages. In addition, for **ALL** assessments, ELL students

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can give their responses orally in their native languages. Their responses must be translated into English and then transcribed into the test book. Accommodation codes have been added to apply these accommodations for ELL students (see Accommodations List in this manual). The translation and transcription must be an accurate interpretation of the student's responses. Complete the transcription as soon as possible after test administration.

Translators must receive the same training in administering the Grade-Level Assessment as the Test Examiners and have ample time to read and review the *Examiner's Manual* before test administration. Translators may also need to preview student test books prior to testing. Student test books are secure materials. Therefore, the test book preview must be done in a secure setting, and translators must ensure that the student testing materials are kept secure at all times. Translators must read the Test Security section of this manual thoroughly. **No testing materials may be accessible to personnel not responsible for testing.** When not in use, testing materials must be kept in a locked room or cabinet outside of the classroom in the school building to prevent unauthorized access. All testing materials must be returned to the STC after use.

BEFORE TESTING

Distribute the test books. Ensure that all students have nonmechanical No. 2 pencils. Have each student print his or her name and district/school on the front cover of the test book on the lines provided. Districts **may not** create student name labels to substitute for writing the student name and district/school on the cover or to replace a precoded student barcode label that has incorrect student information.

STUDENT-IDENTIFYING INFORMATION

Some student-identifying information is captured on the student barcode label and/or the Student Information Sheet (SIS).

Using the Student Barcode Labels

The Test Examiner receives precoded student barcode labels with the testing materials. The information on the labels is provided through the school district and includes data on biographical categories.

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Prior to using the label, check the Student Precode Roster for accuracy of data.

Note: Not all student biographical data from the precode file are printed on the student label—e.g., information from a student's IEP. Use the Student Precode Roster for a complete check of biographical data.

- Affix the student barcode label to the designated area on the front cover of the student's test book if all of the information on the **barcode label** is accurate.
- If any of the information on the label is inaccurate, **do not use the student barcode label.** Instead, fill in **all** sections of the SIS on the inside front cover of the test book.

Exceptions

- If a student barcode label is already affixed to a test book and the label is subsequently determined to be inaccurate for any reason, place **two** blank labels **over** the incorrect label. Then bubble all the information on the SIS.
- If a label for one student is affixed to a test book completed by a different student, place **one** blank label over the incorrect label. Then affix the correct student barcode label over the blank label.

Note: Blank labels are now integrated within the student barcode labels. Only these blank labels are to be used in handling the exceptions described above.

- If a student has no barcode label, notify the district registrar to make sure the student is enrolled in the local student management system, has a MOSIS ID, and the student's name has been submitted in the April Student Core Submission. Then bubble all the biographical information on the SIS and **leave the barcode area blank.** Write nothing in this area—no teacher name, no school name, etc.

The Absent section is found only on the SIS on the inside front cover of the test books. See Step 6.

If an SIS or test book is torn or otherwise damaged, it will not scan properly. In such cases, transfer ALL information to another test book. See Step 8 of this manual for instructions about accounting for a damaged test book. If more than 20 test books have defective pages, contact the STC for special handling instructions.

To account for all students, turn in a test book with a barcode label or completed SIS for every eligible student, except MAP-Alternate (MAP-A) Assessment students. For detailed instructions on how to account for a student who has missed any sessions due to absence, see Steps 6 and 7 of this manual.

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How to Fill In the SIS:

Refer to the sample SIS in this manual while reading Numbers 1 through 5 below.

1. STUDENT NAME: Print the last name, first name, and middle initial in the spaces provided. If a name has more letters than available spaces, complete as many spaces as possible.

   Fill in the appropriate circle below each letter.
2. BIRTH DATE: Fill in the appropriate circles in each column for the month, day, and year of birth. If a birth day is a single digit, fill in the zero circle in the left-hand column under Day.
3. RACE/ETHNICITY: Fill in the circle (mark only one).
4. GENDER: Fill in the circle for Female or Male.
5. MOSIS STATE ID: Fill in the number from left to right. Print one number per box, above the numbered circles. Under each box, fill in the circle with the same number.

If a barcode label is missing or incorrect, be sure to complete an SIS for all students who are eligible whether they are tested or not, except MAP-A students.

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MISSOURI STUDENT INFORMATION SHEET

STUDENT NAME

Last | First | MI

BIRTH DATE

Month	Day	Year
Jan	00	00
Feb	11	1
Mar	22	2
Apr	33	3
May	4	4
Jun	5	5
Jul	6	6
Aug	7	7
Sep	8	8
Oct	9	99
Nov		
Dec		

RACE/ETHNICITY

(Fill in only one)

- 0 American Indian/Alaskan Native
- 1 Asian
- 2 Paciȧc Islander
- 3 Black (not Hispanic)
- 4 Hispanic
- 5 White (not Hispanic)
- 6 Other

GENDER

Female Male

MOSIS STATE ID

*If a pre-coded label is used, the following data cannot be modiȧed: **Student Name, Birth Date, Race/Ethnicity, Gender, and MOSIS State ID.** If any of the above information is incorrect, do not use label. Instead, ȧll out all sections of this page.

STATE USE

0 1 2 3 4 5 6 7 8 9

COMMUNICATION ARTS

Accommodations (Fill in all that apply)

- 01 Braille edition
- 02 Large print edition
- 04 Oral reading—**invalidates CA**
- 04 Oral reading—Blind/Partial Sight
- 05 Signing of assessment—**invalidates CA**
- 06 Paraphrasing—**invalidates all tests**
- 10 Other administration
- 11 Oral reading in native language—**invalidates CA**
- 20 Extend time—*TerraNova* session
- 21 Administer using > allotted periods
- 22 Other timing
- 35 Use of scribe
- 39 Use of calculator, math tables, etc.
- 43 Use of bilingual dictionary—**invalidates CA**
- 44 Other response
- 50 Testing individually
- 51 Testing in small group
- 53 Other setting

Teacher Invalidation Sessions	Absent Sessions	Not Enrolled
1 2 3	1 2 3	

MATHEMATICS

Accommodations (Fill in all that apply)

- 01 Braille edition
- 02 Large print edition
- 04 Oral reading
- 05 Signing of assessment
- 06 Paraphrasing—**invalidates all tests**
- 10 Other administration
- 11 Oral reading in native language
- 20 Extend time—*TerraNova* session
- 21 Administer using > allotted periods
- 22 Other timing
- 35 Use of scribe
- 39 Use of calculator, math tables, etc.
- 43 Use of bilingual dictionary
- 44 Other response
- 50 Testing individually
- 51 Testing in small group
- 53 Other setting

Teacher Invalidation Sessions	Absent Sessions	Not Enrolled
1 2 3	1 2 3	

SCIENCE

Accommodations (Fill in all that apply)

- 01 Braille edition
- 02 Large print edition
- 04 Oral reading
- 05 Signing of assessment
- 06 Paraphrasing—**invalidates all tests**
- 10 Other administration
- 11 Oral reading in native language
- 20 Extend time—*TerraNova* session
- 21 Administer using > allotted periods
- 22 Other timing
- 35 Use of scribe
- 39 Use of calculator, math tables, etc.
- 43 Use of bilingual dictionary
- 44 Other response
- 50 Testing individually
- 51 Testing in small group
- 53 Other setting

Teacher Invalidation Sessions	Absent Sessions	Not Enrolled
1 2	1 2	

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ADMINISTER THE ASSESSMENTS

PREPARE YOUR STUDENTS

- Help students approach the testing in a relaxed, positive way.
- Encourage and motivate students to put forth their best effort.
- Tell students that if an item seems difficult, it may be wise to skip it temporarily and go on to the next item. Before the testing period ends, they should attempt to answer all questions.
- Reassure students they will be given ample time to do their best.

With newer scanning and processing equipment, erasing all pencil underlining is no longer necessary. However, have students look for and remove any stray marks or smudges where student responses are scored. Any stray lines or smudges from incomplete erasures may impact the scoring of items. Some nonmechanical No. 2 pencils have erasers that smudge, tear, and damage test books.

If manipulatives are required, use only those provided with the 2012 testing materials from CTB/McGraw-Hill.

Specific directions for the Communication Arts Assessment begin on Page 14. Specific directions for the Mathematics Assessment begin on Page 23. Specific directions for the Science Assessment begin on Page 32.

The following symbols are used throughout the specific directions:

This SAY box precedes the directions that the Test Examiner reads aloud to the students.

*Information that is only for you and **not** to be read aloud is printed in italic type.*

This symbol accompanies anything concerning the timing of the test.

Read the Test Security section in this manual carefully before administering the assessments.

Any stray lines or smudges from incomplete erasures may impact the scoring of items. Some non-mechanical No. 2 pencils have erasers that smudge, tear, and damage test books.

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Directions for Administering the Communication Arts Assessment

SESSION 1

Any stray lines or smudges from incomplete erasures may impact the scoring of items. Some non-mechanical No. 2 pencils have erasers that smudge, tear, and damage test books.

If this is the first day of testing:

- *Distribute the test books. Ensure that each student writes his or her name and district/school on the test book cover. (If this is not the first day of testing, make sure each student has his or her own test book.)*
- *Ensure that all students use nonmechanical No. 2 pencils. This is a* ***REQUIREMENT.***
- *Take a moment to have each student look through the test book.*
- *Hold up a student's test book and point out the STOP pages. Tell the students that whenever they see one of the STOP pages, they should not continue.*

NOTE: Teachers are not to view, read, or edit students' answers, or react verbally or non-verbally to students' answers, or otherwise potentially clue students in any way.

In Session 1 of the Communication Arts Assessment, you will find two types of questions. For some questions, you will choose from a list of answers. Fill in **only** the circle that goes with the answer you choose. Fill in the circle completely and make your mark solid and dark. If you want to change the answer, completely erase the first mark you made and fill in a different circle. For the remaining questions, you will write your own answers in the test book. **For scoring purposes, write or print your answers clearly and stay within the area provided.**

You should read each question carefully and do your best to answer clearly and completely. Your score on these questions will depend on how well you show your understanding of what you read. You may choose to look over the questions **before** reading the passage. However, make sure you read the entire passage before answering the questions.

Some of the questions in this session are worth more than one point, so you can earn partial credit.

Open your test book to Session 1 of the Communication Arts Assessment. Be sure to stay on the pages that are marked "Communication Arts, Session 1" at the bottom of the page.

Hold up a student's test book so that students are sure they are on the correct page.

Check to be sure that all students are on the correct page in their test books. Hold up a student's test book so that students are sure they are on the correct page.

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Remember to read all directions and information in this part of the test book. Be sure to answer all parts of each question. Look at the bottom of each page. If a page is marked "Go On" at the bottom, turn the page and continue. When you come to the STOP page, you are finished with Session 1 of the Communication Arts Assessment.

You may go back over Session 1 of the Communication Arts Assessment and check your answers, but do not go to any other session. When you finish checking Session 1, please close your test book and sit quietly until everyone finishes.

Do you have any questions?

When you are sure that all students understand the directions, continue.

Turn the page. You may begin.

If a student does not understand a word, you may pronounce the word for the student, but do ***not*** *define, explain, or paraphrase it.*

Students are expected to complete Session 1 in 45 to 55 minutes. However, if a student is not finished in the allotted time and is making adequate progress, allow the student to finish.

When all students are finished,

Stop. You have finished Session 1 of the Communication Arts Assessment. Please look back through Session 1, but do not go to any other session. You will now make sure that all stray pencil marks have been removed and all erasures are complete, not smudged. When you finish checking Session 1, please close your test book and sit quietly until everyone finishes.

If this is the end of testing for the day, collect all testing materials and secure the materials after confirming that all test books are accounted for.

If you plan to continue testing, have students close their test books and take a short break. Have the students leave bookmarks in their test books to keep their places (optional). Resume testing when students are ready to go on.

Do NOT paraphrase test questions for students.

COMMUNICATION ARTS

Restrict pronouncing a word for a student to ONE word per sentence. Pronouncing several words or phrases is an oral reading accommodation.

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SESSION 2

READING AND LANGUAGE ARTS

If applicable, distribute the test books. Make sure each student has his or her own test book. Ensure that all students use nonmechanical No. 2 pencils. This is a ***REQUIREMENT.***

This session includes test items that provide norm-referenced information. See Step 1 for instructions on how to use standardized testing procedures.

Hold up a student's test book so that students are sure they are on the correct page.

Following the instructions exactly ensures similar testing conditions in all classrooms.

Read aloud all "SAY" test directions exactly as they are written.

Be sure students use nonmechanical No. 2 pencils. This is a REQUIREMENT.

Do NOT paraphrase test questions for students.

Open your test book to Communication Arts, Session 2. Be sure to stay on the pages that are marked "Communication Arts, Session 2" at the bottom of the page.

Check to be sure that all students are in the correct place in their test books. Hold up a student's test book so that students are sure they are on the correct page.

In Session 2, you will mark your answers in the test book. You will fill in **only** the circle that goes with the answer you choose. Be sure to fill in the circle completely and make your mark solid and dark. If you want to change an answer, completely erase the first mark you made before making a new mark.

We will begin by doing some sample questions.

SAMPLE A

Read the directions and the sample passage on Page 14 of Session 2. Then do Sample A. Stop when you have finished Sample A.

Give students time to do Sample A. Do ***not*** *read the sample aloud.*

Discuss Sample A with the students after they have had time to complete it. The correct answer for Sample A is the third choice.

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Directions Read the passage. Then do Sample A.

Sample Passage

Runners are getting faster all the time. Roger Bannister of Great Britain set a world record in 1954 when he ran a mile in just under four minutes. Since then, however, with more specialized training and improved shoes, runners have covered the same distance in even less time.

Sample A This passage is mostly about

- ○ a pair of running shoes
- ○ a new world record
- ○ runners getting faster
- ○ runners training for different races

SAMPLES B AND C

Look at Page 15 of Session 2 in your test book. Then read the directions and do Samples B and C. Stop when you have finished Samples B and C.

*Give students time to answer Samples B and C. Do **not** read the samples aloud.*

Discuss Samples B and C with the students. The correct answer for Sample B is the second choice, and the correct answer for Sample C is the first choice.

Read the Test Security section in this manual carefully before administering the assessments.

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Directions **Here is a paragraph a student wrote. There are some mistakes. Read the paragraph. Then do Samples B and C.**

[1] Last night I will make dinner for my father's birthday. [2] After we ate, we talked about the trip we will be taking in December. [3] We are planning to visit my grandmother. [4] She lives far away, and we haven't seen her in a long time.

Sample B

Choose the best way to write Sentence 1.

- ○ Last night I make dinner for my father's birthday.
- ○ Last night I made dinner for my father's birthday.
- ○ Last night I making dinner for my father's birthday.
- ○ Best as it is

Sample C

Where would the following sentence best fit in the paragraph?

I was nervous about preparing all the food, but everything turned out fine.

- ○ after Sentence 1
- ○ after Sentence 2
- ○ after Sentence 3
- after Sentence 4

SESSION 2, PART 1—21 MINUTES (STRICTLY TIMED) (Numbers 1 through 17)

Restrict pronouncing a word for a student to ONE word per sentence. Pronouncing several words or phrases is an oral reading accommodation.

Now you will do Part 1 of Session 2 of the Communication Arts Assessment, take a break, and then do Part 2.

Remember to read **all** the directions and information in this part of the test book. Look at the bottom of each page. If a page is marked "Go On" at the bottom, turn the page and continue. When you come to the STOP page, you have finished Part 1.

You may go back over Part 1 of Session 2 of the Communication Arts Assessment to check your answers, but do not go to any other session. When you finish, please close your test book and sit quietly until everyone finishes.

Do you have any questions?

When you are sure that all students understand the directions, continue.

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Turn to Page 17. I will read out loud the introduction to Part 1 of Session 2 of the test book. You may follow along silently as I read:

Here, There, and Everywhere

Have you ever gazed at the stars in wonder or written to a pen pal on the other side of the world? Perhaps you have watched the flight of birds or butterflies and wondered how far they have traveled. Here are some stories for you to read that take place here, there, and everywhere.

You will have 21 minutes to do Part 1 of Session 2. You may go over Part 1 to check your answers, but do not go to any other session. When you come to the STOP page, you have finished Part 1.

Turn the page. You may begin.

On the board, write the starting and stopping times so that students can clearly see how much time is available to answer Numbers 1 through 17.

STARTING TIME:	ADD 21 MINUTES:	STOPPING TIME:
_____	+ 21	_____

Check to be sure that students are in the right place in their test books and are filling in circles correctly.

At the stopping time,

Stop. You have finished Part 1 of Session 2 of the Communication Arts Assessment. Please look back through Part 1 of Session 2, but do not go to any other session. You will now make sure that all stray pencil marks have been removed and all erasures are complete, not smudged. Do not make any changes to your responses. When you finish checking Part 1 of Session 2, please close your test book and sit quietly until everyone finishes.

At the stopping time, you may choose to have students close their test books and take a short break (no longer than one or two minutes). Have the students leave bookmarks in their test books to keep their places (optional). Resume testing when students are ready to go on.

strictly timed

Use the board to record the starting and stopping times.

COMMUNICATION ARTS

Proceed to the next part if all students complete a timed part early.

Do NOT paraphrase test questions for students.

Hold up a student's test book so that students are sure they are on the correct page.

Restrict pronouncing a word for a student to ONE word per sentence. Pronouncing several words or phrases is an oral reading accommodation.

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SESSION 2, PART 2—29 MINUTES (STRICTLY TIMED) (Numbers 18 through 39)

Open your test book to Part 2 of Session 2 of the Communication Arts Assessment.

Check to be sure that students are on the correct page in their test books. Hold up a student's test book so that students are sure they are on the correct page.

Read the Test Security section of this manual carefully before administering the assessments.

For this part of the test you will choose one answer for each question. Remember to read **all** the directions and information in this part of the test book. Look at the bottom of each page. If a page is marked "Go On" at the bottom, turn the page and continue. When you come to the STOP page, you have finished Part 2 of Session 2.

You may go over Part 2 of Session 2 to check your answers, but do not go back to Part 1 and do not go to any other session. When you finish, please close your test book and sit quietly until everyone finishes.

Do you have any questions?

When you are sure that all students understand the directions, continue.

Strictly timed

Use the board to record the starting and stopping times.

You will have 29 minutes to do Part 2. When you come to the STOP page, you have finished Part 2 of Session 2.

You may begin.

On the board, write the starting and stopping times so that students can clearly see how much time is available to answer Numbers 18 through 39.

Do NOT paraphrase test questions for students.

STARTING TIME:	ADD 29 MINUTES:	STOPPING TIME:
_____	+ 29	_____

Restrict pronouncing a word for a student to ONE word per sentence. Pronouncing several words or phrases is an oral reading accommodation.

Check to be sure that students are in the right place in their test books and are filling in circles correctly.

At the stopping time,

Stop. You have finished Part 2 of Session 2 of the Communication Arts Assessment. Please look back through Part 2 of Session 2, but do not go back to Part 1 or to any other session. You will now make sure that all stray pencil marks have been removed and all erasures

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are complete, not smudged. Do not make any changes to your responses. When you finish checking Part 2 of Session 2, please close your test book and sit quietly until everyone finishes.

Thank you for working so hard.

If this is the end of testing for the day, collect all testing materials and secure the materials after confirming that all test books are accounted for.

If you plan to continue testing, have students close their test books and take a short break. Have the students leave bookmarks in their test books to keep their places (optional). Resume testing when students are ready to go on.

Be sure students do not write in the test book margins. Pencil marks in the margins will delay processing of test books.

COMMUNICATION ARTS

SESSION 3

If applicable, distribute the test books. Make sure each student has his or her own test book. Ensure that all students use nonmechanical No. 2 pencils. This is a ***REQUIREMENT.***

Hold up a student's test book and point out the STOP pages. Tell the students that whenever they see one of the STOP pages, they should not continue.

In Session 3 of the Communication Arts Assessment, you will choose from a list of answers. You will fill in **only** the circle that goes with the answer you choose. Be sure to fill in the circle completely and make your mark solid and dark. If you want to change an answer, completely erase the first mark you made before marking a new answer.

If you need to look back at the passage to find the answer, you may do so at any time.

Open your test book to Session 3 of the Communication Arts Assessment. Be sure to stay on the pages that are marked "Communication Arts, Session 3" at the bottom of the page.

Check to be sure that students are on the correct page in their test books. Hold up a student's test book so that students are sure they are on the correct page.

Hold up a student's test book so that students are sure they are on the correct page.

Read the Test Security section of this manual carefully before administering the assessments.

Remember to read all directions and information in this part of the test book. Look at the bottom of each page. If a page is marked "Go On" at the bottom, turn the page and continue. When you come to the STOP page, you are finished with Session 3.

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Do NOT paraphrase test questions for students.

You may go back over Session 3 of the Communication Arts Assessment and check your answers, but do not go to any other session. When you finish checking Session 3, please close your test book and sit quietly until everyone finishes.

Do you have any questions?

When you are sure that all students understand the directions, continue.

Restrict pronouncing a word for a student to ONE word per sentence. Pronouncing several words or phrases is an oral reading accommodation.

Turn the page. You may begin.

If a student does not understand a word, you may pronounce the word for the student, but do ***not*** *define, explain, or paraphrase it.*

Students are expected to complete Session 3 in 15 to 20 minutes. However, if a student is not finished in the allotted time and is making adequate progress, allow the student to finish.

Be sure students do not write in the test book margins. Pencil marks in the margins will delay processing of test books.

When all students are finished,

Stop. You have finished Session 3 of the Communication Arts Assessment. Please look back through Session 3, but do not go to any other session. You will now make sure that all stray pencil marks have been removed and all erasures are complete, not smudged. When you finish checking Session 3, please close your test book and sit quietly until everyone finishes.

Thank you for working so hard.

If this is the end of testing for the day, collect all testing materials and secure the materials after confirming that all test books are accounted for.

If you plan to continue testing, have students close their test books and take a short break. Have the students leave bookmarks in their test books to keep their places (optional). Resume testing when students are ready to go on.

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Directions for Administering the Mathematics Assessment

SESSION 1

Punch out all the provided manipulatives prior to testing.

If this is the first day of testing:

- *Distribute the test books. Ensure that each student writes his or her name and district/school on the test book cover. (If this is not the first day of testing, make sure each student has his or her own test book.)*
- *Ensure that all students use nonmechanical No. 2 pencils. This is a* ***REQUIREMENT.***
- *Take a moment to have each student look through the test book.*
- *Hold up a student's test book and point out the STOP pages. Tell the students that whenever they see one of the STOP pages, they should not continue.*
- *Distribute manipulatives. Distribute clean scratch paper at the beginning of each testing session or part. Scratch paper may include grid or unlabeled graph paper. Collect all used scratch paper at the end of each testing session or part. Give all used scratch paper to the School Test Coordinator to be securely destroyed. Teachers may keep the manipulatives after the test is administered if students have not written on them.*
- *Hold up the manipulatives. Hold up this page and show students the pictures of the ruler and the pattern blocks.*

This picture means that you will use your ruler.

This picture means that you will use your pattern blocks.

In Session 1 of the Mathematics Assessment, you may use the rulers and pattern blocks. You may not need to use either of them.

For the questions in Session 1, you will select from a list of given answer choices. Use scratch, grid, or unlabeled graph paper to work the problems. Remember to fill in the circle in the test book that goes with the answer you choose. Be sure to fill in the circle completely and make your mark solid and dark.

You should read each question very carefully and do your best to answer clearly and completely. Your score on these questions will depend on how well you follow directions and show your understanding of mathematics.

Read the Test Security section of this manual carefully before administering the assessments.

Not all test sessions will require students to use provided manipulatives.

Any stray lines or smudges from incomplete erasures may impact the scoring of items. Some non-mechanical No. 2 pencils have erasers that smudge, tear, and damage test books.

MATHEMATICS

NOTE: Teachers are not to view, read, or edit students' answers, or react verbally or non-verbally to students' answers, or otherwise potentially clue students in any way.

For selected response questions, students will do their work on scratch, grid, or unlabeled graph paper.

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Do NOT paraphrase test questions for students.

Remember, in Session 1 you should mark ONLY the answer in your test book. Use the scratch, grid, or unlabeled graph paper that I provided to figure out or solve the problem.

Open your test book to Session 1 of the Mathematics Assessment.

Check to see that all students are on the correct page in their test books. Hold up a student's test book so that students are sure they are on the correct page.

Hold up a student's test book so that students are sure they are on the correct page.

Be sure to stay on the pages that are marked "Mathematics, Session 1" at the bottom of the page. Look at the bottom of each page. If a page is marked "Go On" at the bottom, turn the page and continue. When you come to the STOP page, you are finished with Session 1. You may go back over Session 1 of the test and check your answers, but do not go to any other session. When you finish checking Session 1, please close your test book and sit quietly until everyone finishes.

Do you have any questions?

When you are sure that all students understand the directions, continue.

Restrict pronouncing a word for a student to ONE word per sentence. Pronouncing several words or phrases is an oral reading accommodation.

Turn the page. You may begin.

If a student does not understand a word, you may pronounce the word for the student, but do ***not*** *define, explain, or paraphrase it.*

Students are expected to complete Session 1 in 25 to 35 minutes. However, if a student is not finished in the allotted time and is making adequate progress, allow the student to finish.

When all students are finished,

Stop. You have finished Session 1 of the Mathematics Assessment. Please look back through Session 1, but do not go to any other session. You will now make sure that all stray pencil marks have been removed and all erasures are complete, not smudged. When you finish checking Session 1, please close your test book and sit quietly until everyone finishes.

Thank you for working so hard.

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If this is the end of testing for the day, collect all testing materials and secure the materials after confirming that all test books are accounted for.

If you plan to continue testing, have students close their test books and take a short break. Have the students leave bookmarks in their test books to keep their places (optional). Resume testing when students are ready to go on.

SESSION 2

If applicable, distribute the test books. Distribute manipulatives and scratch paper, which can include grid or unlabeled graph paper. Clean scratch paper must be distributed before and collected after both Part 1 and Part 2. Make sure each student has his or her own test book. Ensure that all students use nonmechanical No. 2 pencils. This is a ***REQUIREMENT.***

This session includes test items that provide norm-referenced information. See Step 1 for instructions on how to use standardized testing procedures.

Students should mark their responses directly in the test books.

Open your test book to Session 2 of the Mathematics Assessment. Be sure to stay on the pages that are marked "Mathematics, Session 2" at the bottom of the page.

Check to see that all students are on the correct page in their test books.

In Session 2 of the Mathematics Assessment, you may use the rulers and pattern blocks. You may not need to use either of them. You may use the scratch, grid, or unlabeled graph paper that I provided to work the mathematics problems, but remember to fill in the circle that goes with the answer you choose. Some problems may require you to simplify your answer or reduce it to lowest terms.

We will begin by doing some sample questions. For each sample, fill in the circle that goes with the answer you choose. Be sure to fill in the circle completely and make your mark solid and dark.

If you want to change an answer, completely erase the first mark you made before marking a new answer.

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SAMPLES A, B, AND C

Turn the page. Now do Samples A, B, and C for Session 2. When you have finished, stop working.

Give students time to answer Samples A, B, and C. Then discuss the samples with them. The correct answer for Sample A is choice 4, the correct answer for Sample B is choice 3, and the correct answer for Sample C is choice 1.

Read the Test Security section of this manual carefully before administering the assessments.

Directions **Work Samples A and B. Then work Sample C on Page 62.**

Sample A

$$\begin{array}{r} 68 \\ -\ 14 \\ \hline \end{array}$$

- ○ 52
- ○ 44
- ○ 46
- ○ 54
- ○ None of these

Sample B

Steve spent about $10.00 on two sale items. Which two sale items have a total cost of about $10.00?

- ○ clay and glue
- ○ glitter and clay
- ○ glitter and paint
- ○ paint and glue

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Sample C Use the inch side of your ruler to help you solve this problem.

Which of these bracelets is $3\frac{1}{2}$ inches long?

○

○

○

○

SESSION 2, PART 1—15 MINUTES (STRICTLY TIMED) (Numbers 1 through 9)

You will first do Part 1 of Session 2 of the Mathematics Assessment, take a short break, and then do Part 2.

Remember to read all directions and information in the test book. Look at the bottom of each page. If a page is marked "Go On" at the bottom, turn the page and continue. When you come to the STOP page, you have finished Part 1.

You may go back over Part 1 of Session 2 of the Mathematics Assessment and check your answers, but do not go to any other session. When you finish, please close your test book and sit quietly until everyone finishes.

Do you have any questions?

When you are sure that all students understand the directions, continue.

Turn the page and look at Number 1 in your test book. You will have 15 minutes to do Part 1. You may begin.

On the board, write the starting and stopping times so that students can clearly see how much time is available to answer Numbers 1 through 9.

MATHEMATICS

Do NOT paraphrase test questions for students.

Use the board to record the starting and stopping times.

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Restrict pronouncing a word for a student to ONE word per sentence. Pronouncing several words or phrases is an oral reading accommodation.

STARTING TIME:	ADD 15 MINUTES:	STOPPING TIME:
_____	+ 15	_____

Check to see that students are in the correct place in their test books and are filling in circles correctly.

At the stopping time,

Stop. You have finished Part 1 of Session 2 of the Mathematics Assessment. Please look back through Part 1 of Session 2, but do not go to any other session. You will now make sure that all stray pencil marks have been removed and all erasures are complete, not smudged. Do not make any changes to your responses. When you finish checking Part 1 of Session 2, please close your test book and sit quietly until everyone finishes.

At the stopping time, you may choose to have students close their test books and take a short break (no longer than one or two minutes). Have the students leave bookmarks in their test books to keep their places (optional). Collect all used scratch paper. Distribute clean scratch paper before beginning Part 2. Resume testing when students are ready to go on.

Check to see that each student has a ruler and pattern blocks.

Read the Test Security section of this manual carefully before administering the assessments.

SESSION 2, PART 2—35 MINUTES (STRICTLY TIMED) (Numbers 10 through 32)

Open your test book to Part 2 of Session 2 of the Mathematics Assessment. This part begins with Number 10.

Check to see that students are in the correct place in their test books.

Hold up a student's test book so that students are sure they are on the correct page.

Look at the bottom of each page. If a page is marked "Go On" at the bottom, turn the page and continue. Work until you see the STOP page. You may go back over Part 2 of Session 2 to check your answers, but do not go back to Part 1 and do not go to any other session.

When you finish, please close your test book and sit quietly until everyone finishes.

Do you have any questions?

When you are sure that all students understand the directions, continue.

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Look at Number 10 in your test book. You will have 35 minutes to do Part 2. You may begin.

On the board, write the starting and stopping times so that students can clearly see how much time is available to answer Numbers 10 through 32.

STARTING TIME:	ADD 35 MINUTES:	STOPPING TIME:
_____	+ 35	_____

Use the board to record the starting and stopping times.

Check to see that students are in the correct place in their test books and are filling in circles correctly.

At the stopping time,

Stop. You have finished Part 2 of Session 2 of the Mathematics Assessment. Please look back through Part 2 of Session 2, but do not go back to Part 1 or to any other session. You will now make sure that all stray pencil marks have been removed and that all erasures are complete, not smudged. Do not make any changes to your responses. When you finish checking Part 2 of Session 2, please close your test book and sit quietly until everyone finishes.

Thank you for working so hard.

If this is the end of testing for the day, collect all testing materials, including manipulatives and scratch paper, and secure the materials after confirming that all test books are accounted for.

If you plan to continue testing, collect scratch paper and have students close their test books and take a short break. Have the students leave bookmarks in their test books to keep their places (optional). Resume testing when students are ready to go on.

Distribute manipulatives along with the test books.

SESSION 3

If applicable, distribute the test books. Make sure each student has his or her own test book. Ensure that all students use nonmechanical No. 2 pencils. This is a ***REQUIREMENT.*** *Also, distribute manipulatives if students do not already have them. Clean scratch paper must be distributed before and collected after Session 3. Scratch paper may include grid or unlabeled graph paper. For some questions, a student's work and answers must be shown in the test book to earn full credit.*

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In Session 3 of the Mathematics Assessment, you will find two types of questions. For some questions, you will write your own answer rather than select from a list of given answer choices. You will do all of your work and write all of your answers to the questions directly in your test book.

For the other questions, you will choose from a list of answers. Fill in only the circle that goes with the answer you choose. Fill in the circle completely and make your mark solid and dark. If you want to change an answer, completely erase the first mark you made before marking a new answer.

You should read each question very carefully and do your best to answer clearly and completely. Your score on these questions will depend on how well you follow directions and show your understanding of mathematics. Be sure to explain your thinking—use charts, tables, diagrams, and graphs in your explanations, when appropriate—and organize your work. Your writing, spelling, and grammar will not be evaluated. Write legibly and erase completely.

Some of the questions in this session are worth more than one point. Because you can receive partial credit for these questions, show all your work in your test book. If you use the scratch paper that I provided to solve a problem or if you solve a problem in your head, you **MUST** show how you got your answer to receive full credit.

Be sure to show ALL of your work and your final answers in your test book.

Check to see that each student has scratch paper, a ruler, and pattern blocks.

Hold up the ruler and pattern blocks.

This is the ruler and these are the pattern blocks you should have. You may use the ruler and pattern blocks in Session 3. You may not need to use either of them.

Open your test book to Session 3 of the Mathematics Assessment.

Check to see that all students are on the correct page in their test books. Hold up a student's test book so that students are sure they are on the correct page.

Do NOT paraphrase test questions for students.

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Be sure to stay on the pages that are marked "Mathematics, Session 3" at the bottom of the page. Look at the bottom of each page. If a page is marked "Go On" at the bottom, turn the page and continue. When you come to the STOP page, you are finished with Session 3. You may go back over Session 3 of the test and check your answers, but do not go to any other session. When you finish checking Session 3, please close your test book and sit quietly until everyone finishes.

Hold up a student's test book so that students are sure they are on the correct page.

Do you have any questions?

When you are sure that all students understand the directions, continue.

Restrict pronouncing a word for a student to ONE word per sentence. Pronouncing several words or phrases is an oral reading accommodation.

Turn the page. You may begin.

If a student does not understand a word, you may pronounce the word for the student, but do ***not*** *define, explain, or paraphrase it.*

Make sure all students are in the correct session of the test and are using nonmechanical No. 2 pencils. This is a ***REQUIREMENT.***

Students are expected to complete Session 3 in 25 to 35 minutes. However, if a student is not finished in the allotted time and is making adequate progress, allow the student to finish.

When all students are finished,

Stop. You have finished Session 3 of the Mathematics Assessment. Please look back through Session 3, but do not go to any other session. You will now make sure that all stray pencil marks have been removed and all erasures are complete, not smudged. When you finish checking Session 3, please close your test book and sit quietly until everyone finishes.

Thank you for working so hard.

If this is the end of testing for the day, collect all testing materials and secure the materials after confirming that all test books are accounted for.

If you plan to continue testing, have students close their test books and take a short break. Have the students leave bookmarks in their test books to keep their places (optional). Resume testing when students are ready to go on.

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Directions for Administering the Science Assessment

SESSION 1

Any stray lines or smudges from incomplete erasures may impact the scoring of items. Some non-mechanical No. 2 pencils have erasers that smudge, tear, and damage test books.

No manipulatives for the Science Assessment this year.

If this is the first day of testing:

- *Distribute the test books. Ensure that each student writes his or her name and district/school on the test book cover. (If this is not the first day of testing, make sure each student has his or her own test book.)*
- *Ensure that all students use nonmechanical No. 2 pencils. This is a* ***REQUIREMENT.***
- *Distribute clean scratch paper. Any science instructions referencing the use of scratch paper during the assessments also include the use of grid or unlabeled graph paper. Collect all used scratch paper at the end of each testing session or part. Give all used scratch paper to the School Test Coordinator to be securely destroyed.*
- *Take a moment to have each student look through the test book.*
- *Hold up a student's test book and point out the STOP pages. Tell the students that whenever they see one of the STOP pages, they should not continue.*

NOTE: Teachers are not to view, read, or edit students' answers, or react verbally or non-verbally to students' answers, or otherwise potentially clue students in any way.

In Session 1 of the Science Assessment, you will write your own answers. You will do all of your work and write all of your answers directly in your test book. **For scoring purposes, write or print your answers clearly and stay within the area provided.**

You should read each question very carefully and do your best to write your answer clearly and completely. Your score on these questions will depend on how well you follow directions and show your understanding of science. Your writing, spelling, and grammar will not be evaluated. Write legibly and erase completely if necessary.

ALL of the questions in this session are worth more than one point. Partial credit may be earned for these questions.

Because you can receive partial credit for these questions, follow directions and show your work for ANY question that asks you to do so.

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Open your test book to Session 1 of the Science Assessment.

Check to see that students are on the correct page in their test books.

Be sure to stay on the pages that are marked "Science, Session 1" at the bottom of the page. Look at the bottom of each page. If a page is marked "Go On" at the bottom, turn the page and continue. When you come to the STOP page, you are finished with Session 1. You may go back over Session 1 of the Science Assessment and check your answers, but do not go to any other session. When you finish checking Session 1, please close your test book and sit quietly until everyone finishes.

Do you have any questions?

When you are sure that all students understand the directions, continue.

Turn the page. You may begin.

If a student does not understand a word, you may pronounce the word for the student, but do ***not*** *define, explain, or paraphrase it.*

Students are expected to complete Session 1 in 50 to 70 minutes. However, if a student is not finished in the allotted time and is making adequate progress, allow the student to finish.

After 30 minutes, you may choose to have students close their test books and take a short break (no longer than one or two minutes). Have them leave bookmarks in their test books to keep their places (optional).

When all students are finished,

Stop. You have finished Session 1 of the Science Assessment. Please look back through Session 1, but do not go to any other session. You will now make sure that all stray pencil marks have been removed and all erasures are complete, not smudged. When you finish checking Session 1, please close your test book and sit quietly until everyone finishes.

Thank you for working so hard.

Read the Test Security section in this manual carefully before administering the assessments.

Restrict pronouncing a word for a student to ONE word per sentence. Pronouncing several words or phrases is an oral reading accommodation.

Do NOT paraphrase test questions for students.

SCIENCE

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If this is the end of testing for the day, collect all testing materials and secure the materials after confirming that all test books are accounted for.

If you plan to continue testing, have students close their test books and take a short break. Have the students leave bookmarks in their test books to keep their places (optional). Resume testing when students are ready to go on.

SESSION 2

If applicable, distribute the test books. Distribute scratch paper, which can include grid or unlabeled graph paper. Clean scratch paper must be distributed before and collected after both Part 1 and Part 2. Make sure each student has his or her own test book. Ensure that all students use nonmechanical No. 2 pencils. This is a ***REQUIREMENT.***

This session includes test items that provide norm-referenced information. See Step 1 for instructions on how to use standardized testing procedures.

Students should mark their responses directly in the test books.

Hold up a student's test book so that students are sure they are on the correct page.

Open your test book to Session 2 of the Science Assessment. Be sure to stay on the pages that are marked "Science, Session 2" at the bottom of the page.

Check to see that all students are on the correct page in their test books.

Read the Test Security section in this manual carefully before administering the assessments.

SAMPLE A

Turn the page and look at Sample A. We will begin by doing a sample question. Fill in the circle that goes with the answer you choose. Be sure to fill in the circle completely and make your mark solid and dark.

If you want to change the answer, completely erase the first mark you made before marking a new answer.

Now do Sample A in Session 2. When you finish, stop working, but do not turn the page yet.

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Give students time to answer Sample A. Then discuss the sample with them. The correct answer for Sample A is the third choice.

Directions Read the sample and mark the correct answer.

Sample A In a contest to see who could throw a paper airplane the farthest, each person had four tries. The results are shown in the table below.

	Distances the Airplanes Flew			
	Try 1	Try 2	Try 3	Try 4
Janice	10 ft	12 ft	14 ft	10 ft
Tom	11 ft	7 ft	8 ft	9 ft
Chuck	12 ft	13 ft	16 ft	15 ft
Devra	13 ft	8 ft	10 ft	7 ft

Who won the contest?

- ○ Janice
- ○ Tom
- ○ Chuck
- ○ Devra

Do NOT paraphrase test questions for students.

Restrict pronouncing a word for a student to ONE word per sentence. Pronouncing several words or phrases is an oral reading accommodation.

SESSION 2, PART 1—25 MINUTES (STRICTLY TIMED) (Numbers 1 through 25)

You will do Part 1 of Session 2 of the Science Assessment, take a break, and then do Part 2 of Session 2.

Remember to read **all** of the directions and information in the test book. Look at the bottom of each page. If a page is marked "Go On" at the bottom, turn the page and continue. When you come to the STOP page, you have finished Part 1 of Session 2 of the Science Assessment.

You may go back over Part 1 of Session 2 and check your answers, but do not go to any other session. When you finish, please close your test book and sit quietly until everyone finishes.

Do you have any questions?

When you are sure that all students understand the directions, continue.

Turn the page and look at Number 1 in your test book. You will have 25 minutes to do Part 1. You may begin.

SCIENCE

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Use the board to record the starting and stopping times.

On the board, write the starting and stopping times so that students can clearly see how much time is available to answer Numbers 1 through 25.

STARTING TIME:	ADD 25 MINUTES:	STOPPING TIME:
_____	+ 25	_____

Check to see that all students are on the correct page in their test books and are filling in circles correctly.

At the stopping time,

Stop. You are finished with Part 1 of Session 2 of the Science Assessment. Please look back through Part 1 of Session 2, but do not go to any other session. You will now make sure that all stray pencil marks have been removed and all erasures are complete, not smudged. Do not make any changes to your responses. When you finish checking Part 1 of Session 2, please close your test book and sit quietly until everyone finishes.

At the stopping time, you may choose to have students close their test books and take a short break (no longer than one or two minutes). Have the students leave bookmarks in their test books to keep their places (optional). Resume testing when students are ready to go on.

SESSION 2, PART 2
(Numbers 26 through 45)

Open your test book to Part 2 of Session 2 of the Science Assessment.

*Check to see that students are on the correct page in their test books. Ensure that all students use nonmechanical No. 2 pencils. This is a **REQUIREMENT.** Hold up a student's test book so that students are sure they are on the correct page.*

In Part 2 of Session 2, you will mark your answers in the test book. You will fill in **only** the circle that goes with the answer you choose. Be sure to fill in the circle completely and make your mark solid and dark. If you want to change an answer, completely erase the first mark you made before marking a new answer.

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Be sure to stay on the pages that are marked "Science, Session 2" at the bottom of the page. If a page is marked "Go On" at the bottom, turn the page and continue. When you come to the STOP page, you are finished with Part 2 of Session 2. You may go back over Part 2 of Session 2 and check your answers, but do not go back to Part 1 or to any other session. When you finish checking Part 2 of Session 2, please close your test book and sit quietly until everyone finishes.

Do you have any questions?

When you are sure that all students understand the directions, continue.

Look at Number 26 in your test book. You may begin.

If a student does not understand a word, you may pronounce the word for the student, but do ***not*** *define, explain, or paraphrase it.*

Make sure all students are in the correct session of the test and using nonmechanical No. 2 pencils. This is a ***REQUIREMENT.***

Students are expected to complete Part 2 of Session 2 in 20 minutes. However, if a student is not finished in the allotted time and is making adequate progress, allow the student to finish.

When all students are finished,

Stop. You are finished with Part 2 of Session 2 of the Science Assessment. Please look back through Part 2, but do not go to any other session. You will now make sure that all stray pencil marks have been removed and all erasures are complete, not smudged. When you finish checking Part 2 of Session 2, please close your test book and sit quietly until everyone finishes.

Thank you for working so hard.

If this is the end of testing for the day, collect all testing materials and secure the materials after confirming that all test books are accounted for.

If you plan to continue testing, have students close their test books and take a short break. Have the students leave bookmarks in their test books to keep their places (optional). Resume testing when students are ready to go on.

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INVALIDATIONS AND MAKE-UPS

INVALIDATION PROCEDURES

The following table lists several reasons why a Grade-Level Assessment will be invalidated. Some invalidation reasons apply specifically to the Communication Arts Assessment. Other invalidation reasons affect all content areas. Reasons for invalidating the test:

If...	*then...*
a student is discovered cheating:	Bubble "Teacher Invalidation" under the Content Area on the SIS. Cheating is the only time the "Teacher Invalidation" bubble is used. This code applies to all content-area assessments. Refer to the directions following this table for notifying DESE.
a Test Examiner reads any part of the Communication Arts Assessment to a student:	Bubble "04 Oral reading – invalidates CA." This code applies to all sessions of the Communication Arts Assessment.
a Test Examiner signs any part of the Communication Arts Assessment to a student:	Bubble "05 Signing of assessment – invalidates CA." This code applies to all sessions of the Communication Arts Assessment.
a Test Examiner paraphrases the test questions in any content area:	Bubble "06 Paraphrasing – invalidates all tests." This code applies to all content-area assessments.
a Test Examiner reads any part of the Communication Arts Assessment to a student in the student's native language:	Bubble "11 Oral reading in native language – invalidates CA." This code applies to all sessions of the Communication Arts Assessment.
a student uses a bilingual dictionary for any part of the Communication Arts Assessment:	Bubble "43 Use of bilingual dictionary – invalidates CA." This code applies to all sessions of the Communication Arts Assessment.

Neither a student's behavior nor the judgment of a student's effort during testing can invalidate a student's test.

TEACHER INVALIDATION BUBBLE

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. Invalidated test books are returned to CTB/McGraw-Hill. An invalidated test book with a correct label (or a completed SIS, if necessary) is included with the testing materials to be scored.

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3. A district invalidation letter on district letterhead and signed by the superintendent is sent to Accountability Data at the following address:

   Attn.: Accountability Data
   Office of Data System Management
   Missouri Department of Elementary and Secondary Education
   P.O. Box 480
   Jefferson City, MO 65102

4. The district invalidation letter 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
5. The district copies the letter and files it for their records and any future reference.

HOW TO HANDLE DIFFERENT TYPES OF STUDENT ABSENCES

The following table lists how to handle different types of student absences during MAP Grade-Level Assessments:

If...	*then...*
a student is absent for **ALL** sessions of **ALL** content-area assessments and unable to test in make-up sessions (the student did not engage in the test):	1. Write the student's name on the front of an unused test book. 2. Attach the barcode label unless any information on the label is incorrect. Securely destroy the incorrect label and bubble in all information on the SIS. 3. Bubble the "Absent Sessions" bubble for **ALL** sessions for **ALL** content areas on the SIS. 4. Process the test book with test books to be scored. Treat it like a completed test book.
a student is absent for one (or more) sessions of one (or more) content-area assessment(s) and unable to test in make-up sessions:	1. Ensure the incomplete test book either has an affixed, correct barcode label or a completed SIS. 2. Bubble only appropriate "Absent Sessions" for appropriate content-area assessment(s). 3. Process the student's test book with test books to be scored. Treat it like a completed test book.
a student is absent for **ALL** sessions of one (or more) content-area assessment(s) and unable to test in make-up sessions:	1. Ensure the incomplete test book either has an affixed, correct barcode label or a completed SIS. 2. Bubble **ALL** "Absent Sessions" for appropriate content-area assessment(s). 3. Process the student's test book with the test books to be scored. Treat it like a completed test book.

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Accommodations marked "Other" will be addressed in the student's IEP.

AFTER TESTING: STUDENT STATUS CODING

HOW TO FILL IN THE STUDENT INFORMATION SHEET

After testing, the lower portion of the SIS is used for student status coding. Fill in the appropriate circle in each column for Accommodation Codes for IEP and ELL students only. Fill in the circles that best represent the accommodations under that heading. Descriptions for accommodations for students with IEPs are shown on the next pages.

*ENGLISH LANGUAGE LEARNERS: See Page 41.

*STUDENTS WITH DISABILITIES: Instructions on appropriate use and coding are provided on Page 42. (Bubble all that apply.)

*ABSENT: Fill in the appropriate circles.

*TEACHER INVALIDATION: Instructions on appropriate use and coding are provided in Step 6, Page 38.

Test Examiners or school personnel are responsible for completing the SIS after the last day of testing.

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Accommodations List for Students Who Are English Language Learners (ELL) The following are the **only** accommodations allowed for ELL students:			
Code	**Invalidates**	**Administration Accommodations**	**Description**
04	✓	Oral reading of assessment *(Not permissible for Communication Arts Assessment)* (See Note 1.)	The Test Examiner reads items verbatim to the student in an isolated setting so that other students will not benefit or be disturbed.
11	✓	Oral reading in native language *(Not permissible for Communication Arts Assessment)* (See Note 1.)	
		Timing Accommodations	**Description**
20		Extended time to complete strictly timed sessions (See Note 2.)	ELL students may need to complete the assessments over more than one test period.
21		Administer test using more than allotted periods	Dates for taking the Grade-Level Assessments must occur within the testing window.
22		Other: Specify	Other timing accommodations.
		Response Accommodations	**Description**
35		Use of scribe to record student response in test book	The student conveys verbal responses to a scribe in an isolated, individual setting so that other students cannot benefit or be disturbed. The scribe cannot suggest ideas, words, or concepts. The scribe records the student's answers verbatim. The student should indicate capitalization and punctuation if language mechanics are being assessed.
		Oral response	The student provides an oral response to the Test Examiner.
43	✓	Use of bilingual dictionary *(Not permissible for Communication Arts Assessment)* (See Note 1.)	
		Setting Accommodations	**Description**
50		Testing individually	The room should be free of noises, conversation, and distractions from adjoining rooms. Individual testing is appropriate when, for example, responses are given orally or questions are paraphrased.
51		Testing with small groups	The location should be free of noises, conversation, and distractions from adjoining rooms. Students may not interact with one another about questions or answers. The Test Examiner must be present at all times. Testing in small groups is not appropriate for students who give responses orally or require paraphrasing of questions.
53		Other: Specify	Other setting accommodations.

NOTES

Note 1: *Oral reading, oral reading in native language, or signing during any Communication Arts Assessment will result in the LOSS (Lowest Obtainable Scale Score). The use of any dictionary during the Communication Arts Assessment will result in the LOSS (Lowest Obtainable Scale Score).*

Note 2: *If used, the student score cannot be compared with scores generated under standard conditions.*

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Accommodations List for Students with Disabilities			
Code	**Invalidates**	**Administration Accommodations**	**Description**
01		Braille edition of assessment	Braille editions of the assessment require special processing. Consult the Braille edition test materials for specific instructions.
02		Large Print edition of assessment	Large Print editions of the assessment require special processing. Consult the Large Print test materials for specific instructions.
04	✓	Oral reading of assessment (See Note 1.)	The Test Examiner reads items verbatim to the student in an isolated setting so that other students will not benefit or be disturbed.
04		Oral reading of assessment to Blind/Partial Sight students (See Note 1.)	The Test Examiner reads items verbatim to the student who cannot read Braille in an isolated setting so that other students will not benefit or be disturbed.
05		Signing (See Note 1.)	A certified sign language interpreter or deaf education instructor may sign directions for the Communication Arts Assessments. The Mathematics and Science Assessments may have both directions and the test items signed for students.
06	✓	Paraphrasing (See Note 2.)	The Test Examiner paraphrases questions to help student understanding in an isolated setting. Terms may be defined as long as they: 1) are not the actual concept or content being assessed, 2) would not give clues, or 3) would not disclose the answer.
10		**Other administration accommodations**	
		Use of assistive devices	An assistive device that permits a student to read and/or respond to the assessment is used. Examples of assistive devices include computers that assist students with fine-motor problems, text enlargers that enable students to independently read and answer test questions, or augmentative communication devices.
		Use of visual aids: Specify	Visual aids include any type of optical or non-optical devices used to enhance visual capability. Examples of visual aids include bold-line felt-tip markers, lamps, filters, bold-lined paper, writing guides, or other adaptations that alter the visual environment by adjusting the space, illumination, color, contrast, or other physical features of the environment.
		Timing Accommodations	**Description**
20		Extended time to complete strictly timed sessions (See Note 3.)	Extended time to complete strictly timed sessions is allowed for a student whose disability may cause him/her to be unable to meet time constraints.
21		Administer assessment using more than allotted periods	Students with disabilities may need to complete the assessments over more than one test period as a result of fatigue and/or loss of concentration. Some students may require additional breaks. Dates for taking the Grade-Level Assessment must occur within the testing window.
22		Other: Specify	Other timing accommodations
		Response Accommodations	**Description**
35		Use of scribe to record student response in test book	The student conveys verbally or signs responses to a scribe in an isolated, individual setting so that other students cannot benefit or be disturbed. The scribe cannot suggest ideas, words, or concepts. The scribe records the student's answers verbatim. The student should indicate capitalization and punctuation if language mechanics are being assessed.
		Student taped response	The student speaks responses into a tape recorder in an isolated setting so that other students cannot benefit or be disturbed. The Test Examiner must be present at all times.
		Signed response	The student uses sign language to convey responses. A certified sign language interpreter or deaf education instructor records responses.
		Pointing to respond	The student points to correct responses and the administrator records responses in the Grade-Level Assessment test book.
		Oral response	The student provides oral responses to the Test Examiner.
		Use of a Brailler	A student records responses using a Brailler. Examples of a Brailler include a Braillewriter, a slate and stylus, or an electronic Brailler note taker. Responses must be transcribed into the appropriate test book.
		Use of a communication device	The student uses a communication device to provide responses to the Test Examiner. Responses must be transcribed into the appropriate test book.
		Use of a computer/word processor/typewriter to respond	The student uses a computer/word processor to write the responses. (Provide a non-networked computer to avoid inappropriate use of the computer to access answers.) The student uses a typewriter to write the responses. Responses must be transcribed into the appropriate test book.
39		Use of a calculator/math table/ abacus	In sessions of the Grade-Level Assessment where calculators are allowed, the accommodation code should not be marked. The use of a calculator represents an accommodation when it is used on a section of the assessment for which calculator use is not allowed. Students may use talking calculators, but only in an isolated setting. Students may use tables to assist in simple addition, subtraction, multiplication, and division facts using whole numbers. Students may use an abacus to perform mathematical computations by sliding beads along rods.
44		Other: Specify (See Note 4.)	Other response accommodations
		Setting Accommodations	**Description**
50		Testing individually	The location should be free of noises, conversation, and distractions from adjoining rooms. Individual testing is appropriate when, for example, responses are given orally or questions are paraphrased.
51		Testing in small groups	The location should be free of noises, conversation, and distractions from adjoining rooms. Students may not interact with one another about questions or answers. The Test Examiner must be present at all times. Testing in small groups is not appropriate for students who give responses orally or require paraphrasing of questions.
53		Other: Specify	Other setting accommodations

NOTES

Note 1: *Oral reading, oral reading in native language, or signing during the Communication Arts Assessment will result in the LOSS (Lowest Obtainable Scale Score). The use of any dictionary during the Communication Arts Assessment will result in the LOSS (Lowest Obtainable Scale Score). Students identified as blind/visually impaired (who do not read Braille) may use the oral reading accommodation if it is their primary instructional method.*

Note 2: *Paraphrasing test questions invalidates all Grade-Level Assessment student scores for accountability purposes.*

Note 3: *If used, the student score cannot be compared with scores generated under standard conditions.*

Note 4: *Use of magnifying equipment, amplification equipment, graph paper, and testing with the teacher facing the student are not listed as accommodations because these are no longer required to be reported as accommodations for the Grade-Level Assessments.*

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STUDENTS NOT TESTED IN THE GRADE-LEVEL ASSESSMENTS

Only two groups are **not required** to take the Grade-Level Assessment:

- **Group 1** – Students whose IEP teams have determined that MAP-A is the appropriate assessment.
- **Group 2** – English Language Learner (ELL) students who have been in the United States a cumulative twelve months or less at the time of administration of the assessments may be exempted from taking only the Communication Arts Assessment. All other content areas must be assessed.

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ASSEMBLE MATERIALS FOR RETURN

After testing is complete, check all test books for the following:

- All student barcode labels are accurate and attached correctly.
- All student-identifying information is complete and correct.
- The SIS or test book should not be damaged or torn—if either is damaged or torn, transfer all student information and answers to another test book in a secure setting. The damaged test book should be marked appropriately on the front cover with a black marker. For example, write "SIS damaged or torn" and "Contents transcribed to another regular test book. DO NOT SCORE" on the front cover. Return the damaged test book with the **unused** test books.
- All applicable accommodations are completed accurately according to the instructions in Step 7.
- All test books are completed with a nonmechanical No. 2 pencil.
- If a student completes the test using any writing instrument other than a nonmechanical No. 2 pencil, all student responses must be transcribed in a secure setting, verbatim, with a nonmechanical No. 2 pencil, into another regular edition test book. For example, a test book completed in ink should be marked appropriately on the front cover with a black marker: write "Completed in Ink" and "Contents transcribed to another regular test book. DO NOT SCORE." After transcribing all student responses to a new test book, return the old test book with the **unused** test books.
- If a student takes a test in two different test books, in a secure setting, use a nonmechanical No. 2 pencil and transcribe the answers verbatim into only one test book. The test book containing the transcribed responses will be scored. On the front cover of the incomplete test book, write "Contents transcribed to another regular test book. DO NOT SCORE" and return this test book with the **unused** test books.
- All extraneous papers and bookmarks are removed from the test books. All used scratch paper, any bookmarks, and manipulatives with writing on them should be returned to the STC to be securely destroyed.

Carefully follow procedures for test books that have been transcribed into a new test book.

Any stray lines or smudges from unclear erasures may have an impact on the scoring of the items.

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- Very rarely, several test books may have manufacturing issues, such as loose or missing pages. If this happens for 20 or more test books, contact the STC for special handling instructions. For any amount less than 20 test books, transcribe all student responses to test books with no issues.
- If any alternative response sheets are in the test books—for example, computer-generated responses—transcribe them verbatim into the test books. Alternative response sheets cannot be scored. For more information regarding response accommodations, see Step 7 in this *Examiner's Manual.*

Security Barcode

- The Test Examiner must count the number of test books (both used and unused) to determine if the total is the same as the pretest total.
- If a discrepancy occurs between the pretest and post-test totals, the Test Examiner must collate the test books in sequential barcode order before sending the test books to the STC.
- The Test Examiner must provide information regarding any missing test books (including the missing test book security barcode numbers) to the STC for inclusion on the Test Book Accountability Form.

For answers to any questions concerning this information, contact the School Test Coordinator or the District Test Coordinator.

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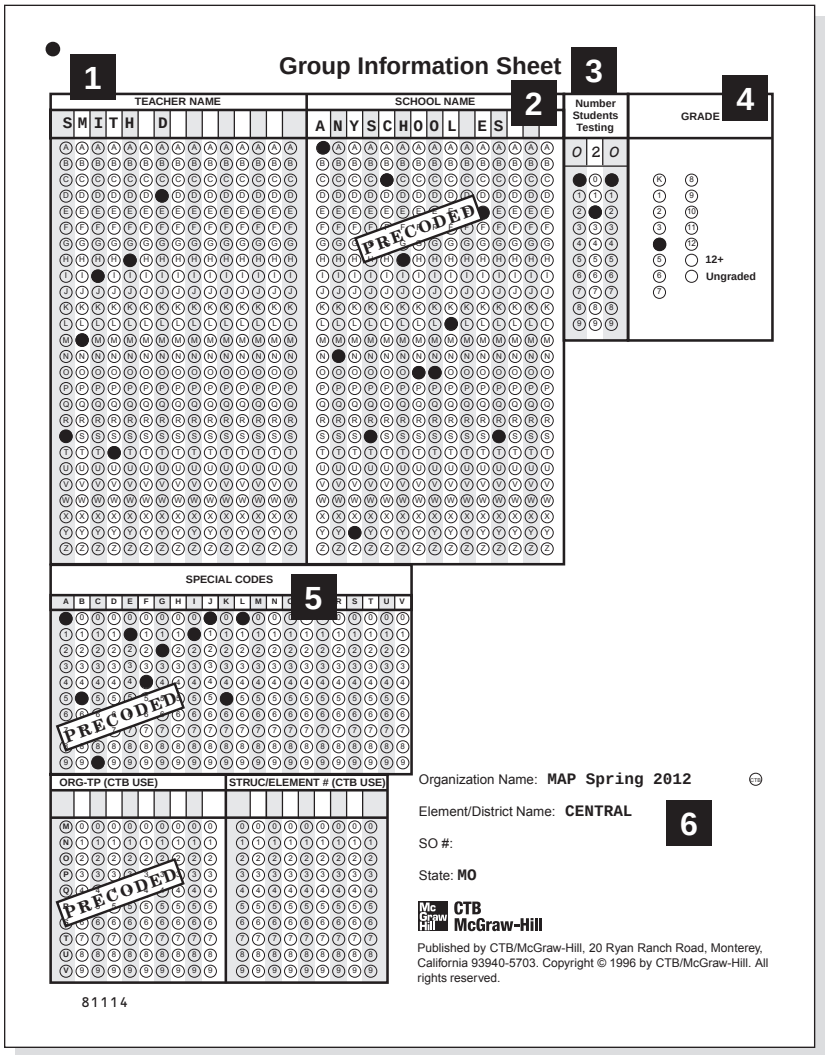
COMPLETE THE GROUP INFORMATION SHEETS

The Group Information Sheet (GIS) provides data that appear on the reports. Submit a GIS for each grade level. **Place a complete and accurate GIS on top of each stack of test books whose scores are to be reported together.** Some information may be filled in already (precoded), whereas other information must be hand-entered. Check both the precoded and hand-entered material for accuracy. If any precoded information is not accurate, notify the Test Coordinator.

Note that the GIS is a scannable document and cannot be photocopied. A sample GIS is shown below. Instructions for checking the GIS are on the next page.



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When checking this...	*look for this:*
1 Teacher Name (or Group Name)	The name that you put under the "Teacher Name" field becomes the group identifier. The group name must be printed in the boxes in the "Teacher Name" field. "Nancy Jones," "grade three," or "third hour" are examples for this field. Under each box, the corresponding circle must be filled in. Whatever identifier the school chooses must be entered in the "Teacher Name" field and will be attached to the student's record for all content areas.
2 School Name	In most cases, the school name is precoded. If not, the school name must be printed in the boxes and the corresponding circles filled in.
3 Number Students Testing	The number of students whose test books are grouped with this GIS must be printed in the boxes and the corresponding circles filled in. Use leading zeros, if needed. For example, to indicate 20 students, write and fill in 020. To account for every eligible student, a test book with either a correct student barcode label or a correctly completed SIS (located on the inside front cover of the test book) must be returned. (A test book is not required for a student who takes the MAP-A Assessment.)
4 Grade	The correct circle for the grade must be filled in.
5 Special Codes	This information is precoded with the county, district, and school code numbers. The county code number is in columns A, B, and C. The district code number is in columns E, F, and G. The school code number is in columns I, J, K, and L.
6 Organization Name, Element/District Name, SO# (Scoring Order), and State	This information is precoded.

A school may choose to identify a group of students by using teacher, grade, or group.

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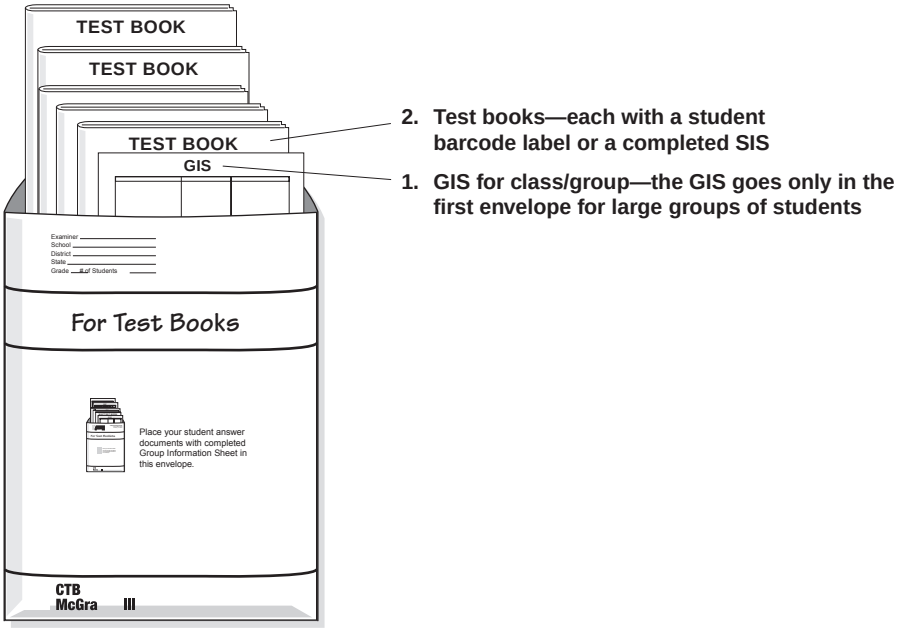
ORGANIZING MATERIALS

After checking the GISs for accuracy, place the following items in the large white envelope in this order:

1. GIS for class/group
2. Grade-Level Assessment test books—each with a student barcode label or a completed SIS on the inside front cover



Each envelope will hold approximately 5–10 test books, depending on the grade. If a Test Examiner has more than one envelope, put the GIS in the Test Examiner's **first envelope** with as many test books as will fit. If multiple envelopes are needed, label the upper-left corner of each envelope "1 of X," "2 of X," "3 of X," and so forth (with "X" being the total number of envelopes). (See the section titled "Large Print and Braille" in this manual and the instructions included in the Large Print and Braille Kit for information on the proper handling of the Large Print and Braille editions of the test books.)

Be sure to complete all information requested on the large white envelope to avoid delays in scoring.

IMPORTANT: Do not seal the envelope. The STC will verify the contents before giving the envelopes to the District Test Coordinator, who will seal them.

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Place unused DO-NOT-SCORE test books and the transcribed Large Print and Braille edition test books (marked "DO NOT SCORE") directly into a shipping box with a white "UNUSED/DO NOT SCORE" label affixed to the outside of the box.

Provide the following materials to the School Test Coordinator, keeping in mind the **district's shipping deadlines:**

- Envelope(s) containing the GIS and test books
- Box(es) containing all unused or DO-NOT-SCORE test books
- *Examiner's Manual(s)*
- Scratch paper, bookmarks, and manipulatives with writing on them

Test Examiners may retain manipulatives for use in the classroom if no writing has been added to them.

The School Test Coordinator should securely destroy scratch paper and any bookmarks or manipulatives with writing on them. *Examiner's Manuals* are not secure items but should be destroyed.

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Glossary

Bookmark

A bookmark is simply a piece of blank paper used to mark the place in the test book where the student is to begin the next session of testing. This is an optional tool.

Contaminated Test Books

A test book is considered *contaminated* if it cannot be returned for scanning 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 a test book is contaminated, the Test Examiner should notify the School Test Coordinator for instructions regarding handling the contaminated materials since ALL test books must be accounted for. Contaminated test books should not be returned to CTB/McGraw-Hill. They must be securely destroyed at the test site. A Missing Test Materials form (included in the District Test Coordinator's Kit) must be completed and faxed to CTB and DESE to account for the contaminated book(s).

District Test Coordinator (DTC)

The District Test Coordinator receives, checks, distributes, collects, assembles, and ships district testing materials. The DTC is responsible for ensuring that all Test Examiners are trained annually in test administration. The DTC is also responsible for test security. Other responsibilities are outlined in the Test Coordinator's Manual.

Group Information Sheet (GIS)

The GIS provides CTB/McGraw-Hill with testing-group data that will appear on the reports. One GIS is supplied for each school, grade, and group.

Large Print and Braille

Versions of the Grade-Level Assessment are produced to meet the accommodation needs of visually impaired students.

Large White Envelopes

Large white envelopes are provided to each Test Examiner. After testing, each testing group's materials should be organized according to the directions in Step 8 of the *Examiner's Manual* and placed in the large white envelopes for return to CTB/McGraw-Hill.

Level Not Determined (LND)

This designation is for students who did not receive a MAP Grade-Level Assessment score for any one of the following reasons:

- A blank test book is returned to CTB/McGraw-Hill with a student barcode label affixed or a completed SIS.
- A student does not attempt any items in one or more content areas of the Grade-Level Assessment.
- A student is absent all sessions.

Lowest Obtainable Scale Score (LOSS)

Within each grade and content area, a LOSS is established for students whose score is below the level expected by guessing. For more information, please refer to the most recent MAP Technical Report at http://www.dese.mo.gov/divimprove/assess/tech/.

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Manipulatives

Punch-out items such as rulers, protractors, and other objects that may be provided for the Mathematics and Science Assessments. The Large Print and Braille manipulatives are shipped with the individual Large Print and Braille tests. The Large Print and Braille manipulatives or the equivalent classroom version may be used by students taking the Large Print or Braille version of the test.

MOSIS

Missouri Student Information System is a student-level record system that contains a randomly generated state identification number for every student receiving service in the public schools.

Nonmechanical No. 2 Pencil

A nonmechanical No. 2 pencil contains the preferred amount of graphite to be "read" by electronic scanning equipment. For the Grade-Level Assessments, only nonmechanical No. 2 pencils can be properly imaged for electronic scoring. Using a nonmechanical No. 2 pencil is a **REQUIREMENT.**

Not Enrolled

Use for students who move during the test administration window.

Precoded

"Precoded" refers to machine-scannable barcode labels or bubbles that are filled in mechanically by CTB/McGraw-Hill.

School/Group List

The School/Group List is CTB/McGraw-Hill's way of double-checking that all testing materials are received. All GISs for a school must have an entry on the School/Group List.

School Test Coordinator (STC)

The School Test Coordinator distributes testing materials to Test Examiners, collects and checks materials, and forwards them to the DTC for shipping.

Security Barcode

Each MAP Grade-Level Assessment test book has a unique security barcode number on the front cover in the lower right-hand corner, printed vertically. The barcode is used to number each test book consecutively and to track test books shipped to the districts.

Student Barcode Label

The student barcode label is a precoded label that contains a student's identification and limited student biographical information. These labels are provided by CTB only if the district submitted a precode file to DESE via the MOSIS precode system. If the district did not submit a precode file or if the information is incorrect, the SIS on the inside front cover of the test book must be completed. For security reasons, not all of the information a district provides in its precode file is displayed on the printed barcode label.

Student Information Sheet (SIS)

The SIS is located on the inside front cover of each student test book. This sheet captures limited student biographical information as well as accommodation codes, status codes, and other important testing information.

Test Book Accountability Form

The Test Book Accountability Form accounts for all test books distributed to a school, whether scorable, unused, missing, damaged, or destroyed, and requires the School Test Coordinator's signature.

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HELP THE TEACHER HELP THE CHILD

20 Ryan Ranch Road
Monterey, CA 93940-5703

Grade-Level Assessments Training
for District and School Test Coordinators

OFFICE OF COLLEGE AND CAREER READINESS

Grade-Level Assessments Training for District and School Test Coordinators Spring 2012

February 2012

Missouri Department of Elementary and Secondary Education

Contact Information

2

- CTB/McGraw Hill's Special Missouri Customer Service:
  - (800) 544-9868
- The Department of Elementary and Secondary Education Assessment Section:
  - (573) 751-3545
  - assessment@dese.mo.gov
- Nancy Keating:
  - (573) 751-6731
  - nancy.keating@dese.mo.gov

Training Resources

- Today's training was prerecorded and is in "listen only" mode. To find the recording in the future, visit the webinar Web page and click on the "Recorded Webinars" button.
- This training, the presentation PowerPoint, and other training resources are available and posted to the DESE website at: http://dese.mo.gov/webinar/MonthlyArchivedWebinars.htm
- The PowerPoint and notes can be printed at any time.

Training Target and Objective

- This training targets District and School Test Coordinators (DTCs and STCs).
- The objective of this presentation is to provide statewide standardized training for MAP Grade-Level Assessments.

Agenda

- The purpose of the Test Coordinator's Manual (TCM)
- Review of important dates
- Summary of changes or additions for 2012
- Guidelines for special populations and other testing circumstances
- Difference between LOSS and LND
- The test design and time chart
- Highlights of the DTC's role during testing
- Special manuals with markup
- Survey and feedback

Purpose of the TCM

- The TCM provides detailed instructions to the DTC and the STC for receiving, securing, distributing, and returning test materials.
- This training is a supplement to the manual, emphasizing important information.

Review of Important Dates

Important Dates for Testing	
3/12 – 3/16/12	Test Materials Arrive in Districts
4/2 – 4/27/12	Grade-Level Assessment Administration Window
4/13/12 **(1:00 P.M. Central Time)**	Deadline for Additional Material Order **without** additional shipping costs
4/23/12	Final Deadline for Additional Material Order, shipping **at district expense**
4/30/12	Deadline to Schedule Pickup of Testing Materials

Summary of Changes

- Elimination of writing prompts and performance events from test books
- New Test Security section
- Blank test book labels with the regular labels
- Additional guidance regarding calculators
- New procedures for defective test books
- Points of Emphasis section

Points of Emphasis

- Self-printed or district-created labels cannot be used.
- Draft paper is not necessary and is not to be used for the Communication Arts Assessments.
- Only nonmechanical No. 2 pencils can be used.
- Scorable test books must be shipped separately from nonscorable materials, using the blue shipping labels.

Required Testing and Exceptions

- All public and charter schools are required to administer the Grade-Level Assessments in grades 3-8.
- Exceptions:
  - Students who qualify for the MAP-Alternate (MAP-A) do not take any Grade-Level Assessments.
  - English Language Learners (ELLs) that have been in U.S. 12 cumulative months or less may be exempt from Communication Arts Assessments only.

Testing Students with Disabilities

- A student's IEP team determines how a student with disabilities will participate in the Grade-Level Assessments.
- During the Grade-Level Assessments students must be allowed to use any accommodation specified in their IEP, even if it invalidates the assessment.
- A student with Individual Accommodation Plan (IAP 504) can receive the same accommodations as a student with an IEP.

Testing Students with Disabilities

- Off grade-level testing is not permitted, e.g., a fifth grade student who is working at a third grade level must be tested using the Grade 5 test book.
- Special Education teachers are not permitted to preview the test books to pre-select items for students. Students must have the opportunity to respond to every item, using the accommodations specified in their IEPs.

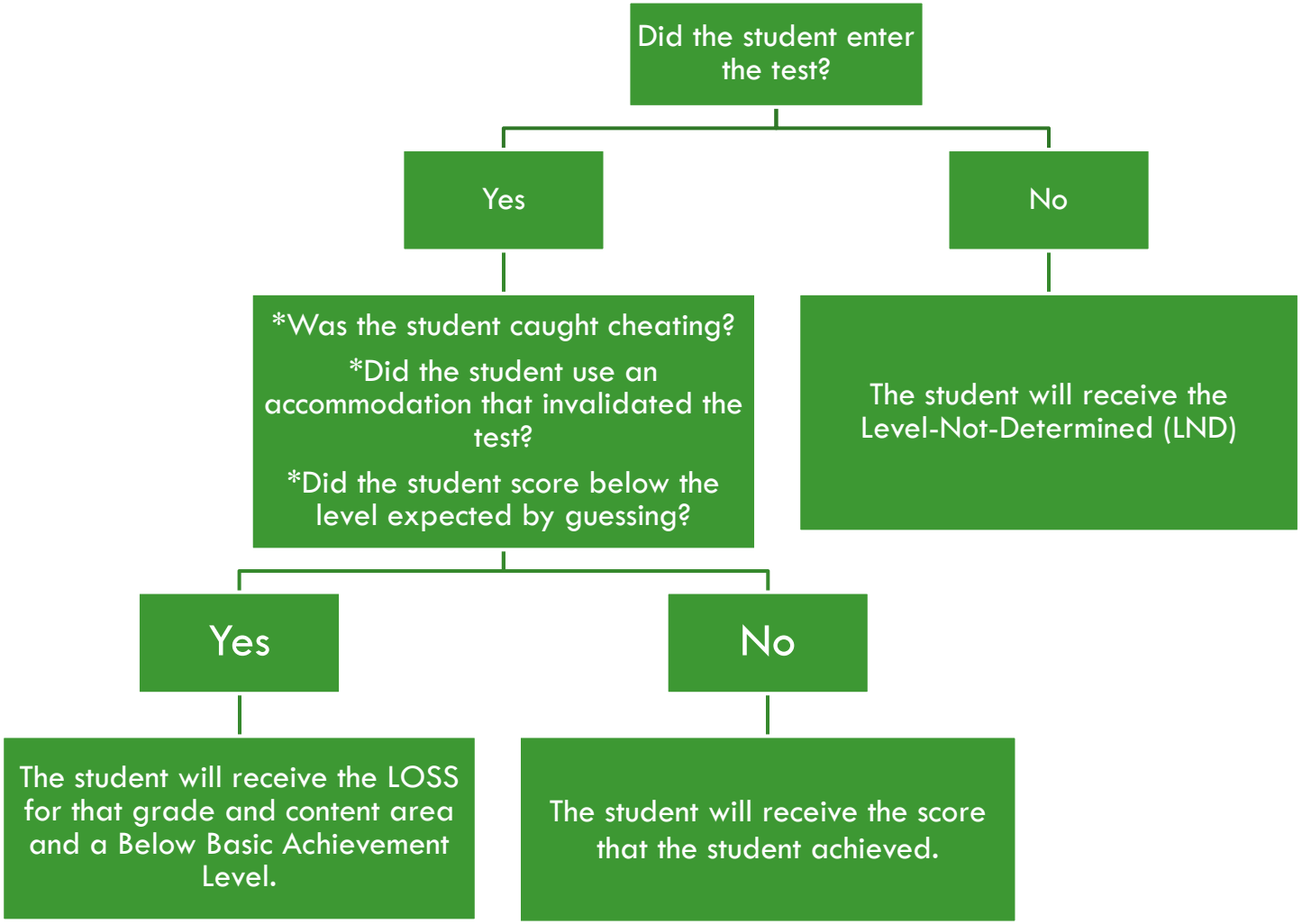
Lowest Obtainable Scale Score (LOSS)

- For each grade and content area, the LOSS is the lowest Below Basic scale score.
- A student receives the LOSS when:
  - The number of items answered correctly results in an actual scale score below the LOSS.
  - The Test Examiner invalidates the test for cheating.
  - An accommodation is used which invalidates the test.

Level-Not-Determined (LND)

- A student receives the designation of *Level-Not-Determined (LND)* for a content area when neither a score nor an achievement level can be determined:
  - A blank test book is returned to CTB/McGraw-Hill with a student barcode label affixed or a completed SIS.
  - A student does not attempt any items in one or more content areas of the assessment.
  - A student is absent for ALL sessions of a content area.

LOSS or LND


Did the student enter the test?
Yes
No
*Was the student caught cheating?
*Did the student use an accommodation that invalidated the test?
*Did the student score below the level expected by guessing?
The student will receive the Level-Not-Determined (LND)
Yes
No
The student will receive the LOSS for that grade and content area and a Below Basic Achievement Level.
The student will receive the score that the student achieved.

Item Types on 2012 Assessments

- Selected response items, also known as multiple choice questions, are in every content area for every grade.
- Constructed response items are in every content area for every grade.
- Performance events or writing prompts are NOT included in the 2012 assessments for any content or grade.

Custom and Nationally-normed Items

- Custom items were created by Missouri educators for Missouri students.
- *TerraNova™ Survey* items are from a nationally-normed test developed by CTB/McGraw-Hill and are located in:
  - Communication Arts, Session 2, all grades
  - Mathematics, Session 2, all grades
  - Science, Session 2, grades 5 and 8

Timing Guidelines

- Each content area requires two to three hours.
- More time is needed to:
  - distribute and collect testing materials
  - read instructions
  - complete any Student Information Sheet (SIS)
- Timing Chart
  - http://dese.mo.gov/divimprove/assess/documents/asmt-gl-timing-guidelines-2012.pdf

DTC Responsibilities

- Ensure Test Examiners have ample time to read manuals.
- Deliver the standardized Test Examiner training.
- Ensure students taking Braille or Large Print editions have the correct materials.
- Ensure district has a plan for students who become sick, disruptive, or need additional time.
- Securely dispose of incorrect barcode labels.
- Account for 100% of all test books, securely disposing of contaminated test books.

Additional Reminders

- Mathematics and Science Assessments do not have reference sheets.
- All test books are cellophane wrapped and bundled in quantities of 12 or 4 as needed.
- Security barcodes on the test books can be viewed without opening the cellophane covering.
- Examiner's Manuals are packaged in the middle of the shrink-wrapped bundle along with the manipulatives.
- Science Assessments will not use rulers.
- Students can be given a plain bookmark.

Preparing for Testing

- The test design, blueprint, timing guidelines, and necessary manipulatives for each grade: http://dese.mo.gov/divimprove/assess/grade_level_resources.html
- Grade-Level Expectations: http://dese.mo.gov/divimprove/curriculum/GLE/
- Released items may be found at:

  http://dese.mo.gov/divimprove/assess/grade_level_resources.html

  http://www.dese.mo.gov/divimprove/assess/Released_Items/current/ca_current_yr_index.html

  http://www.dese.mo.gov/divimprove/assess/Released_Items/archives/ca_archive/ca_archive_index.html

Mathematics Manipulatives

Manipulatives by Grade Level	
Grade 3	Ruler and Pattern Blocks (Manipulative A)
Grade 4	Ruler and Pattern Blocks (Manipulative E)
Grade 5	Ruler and Pattern Blocks (Manipulative E)
Grade 6	Ruler and Tangrams (Manipulative C)
Grade 7	Ruler and Protractor (Manipulative D)
Grade 8	Ruler and Protractor (Manipulative D)

Tools Permitted For Testing

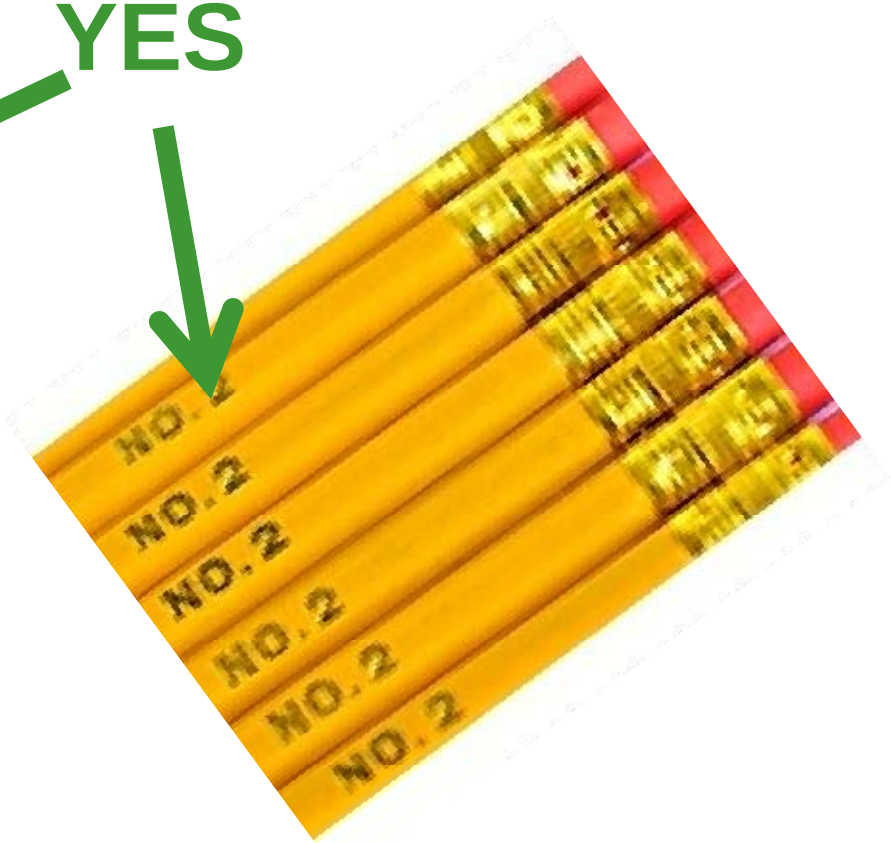
- Clean scratch, grid, or unlabeled graph paper can be used for Mathematics and/or Science assessments.
- If a tool is NOT found in the list for a content area, it is not permitted for testing unless it is specified in a student's IEP.

Marks in the Test Books

- Students may mark in a passage or the stem (question) portion of the items. Those marks do not have to be erased.
- Marks around answer bubbles, distractors, answer lines, or tracking codes must be thoroughly erased, using a soft eraser.
- Use ONLY a No. 2 nonmechanical pencil to make the marks.
- DO NOT use a highlighter, ink, crayon, or any utensils other than a nonmechanical No. 2 pencil.

ONLY Nonmechanical No. 2 Pencils

YES



ONLY Nonmechanical No. 2 Pencils

NO

Tone	U.S.
	#1
	#2
	#2½
	#3
	#4

Classroom Materials

- Any classroom materials related to the content or processes of the test must be covered, removed, or placed out of the students' view.
- Check classrooms before testing.
- If in doubt, get it out.
- Better safe than sorry.

Items Not Permitted During Testing

- Electronic communication and imaging devices
- Students' personal items, e.g. cell phones
- Electronic music players
- Digital cameras or any imaging device
- Handheld scanners
- Portable gaming devices
- Any device that can connect to the Internet

Calculator Policy

During testing, calculators:

- are not needed or required, and are not provided, endorsed, or recommended by DESE
- cannot contain stored equations or functions at the time of testing
- must be put in test mode which blocks preloaded functions and equations
- must have its memory cleared before and after each Mathematics Assessment
- cannot have Internet connectivity or connect to anyone inside or outside of the classroom

Calculator Policy (con't)

Students cannot use the following items as a computer during testing unless listed on a student's IEP:

- a calculator on a laptop or other portable computer
- pocket organizer
- cell phone
- device with a typewriter-style keyboard
- electronic writing pad
- pen-input device

Test Book Security

Student test books:

- cannot be viewed by any Test Examiner before, during, or after testing
- must be stored securely OUTSIDE of the classroom when not in use
- must be stored out of sight during testing day when students are not testing

Special Security Circumstances

- Translators may need to review the test books prior to testing.
- Transcribers must transcribe in a timely, secure manner.
- Translators and transcribers must attend training and MUST keep test security PARAMOUNT.

Forms to be Faxed

- The Test Book Accountability Form in an electronic format is on the website at:

  http://dese.mo.gov/divimprove/assess/grade_level_resources.html
- Fax the Test Book Accountability Form only to CTB.
- Fax the Missing Test Book form to both CTB and the Department.

Quality Assurance Visits

- Quality assurance monitoring is required by No Child Left Behind.
- The district's testing schedule should be prepared and kept current by the DTC.
- DTCs must keep a roster of training attendees.
- Upon Department request, some districts will provide their testing schedule and a list of training attendees.
- Follow the directions for self-monitoring provided in a separate training.

Packing and Shipping Test Books

- Before sealing the boxes, stop and double check to ensure scorable test books are NOT packaged with nonscorable testing materials.
- Use blue labels for the scorable test books.
- Use white labels for the nonscorable materials.

Training Version Manuals

- These training versions have highlighted words and sentences, sticky notes, and callout boxes to emphasize important parts of the manual.
- Grade 5 is representative of all other Grade-Level Examiner's Manuals.
- http://dese.mo.gov/webinar/documents/CoordinatorsManual2012.pdf
- http://dese.mo.gov/webinar/documents/ExaminersManual2012.pdf

Thank You for Attending Training

Please complete the survey located at:

https://www.research.net/s/DP3ZBMK

Good Luck with Spring 2012 Grade-Level Assessments.

OCR Non-Discrimination Statement

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), 6th Floor, 205 Jefferson Street, P.O. Box 480, Jefferson City, MO 65102-0480; telephone number 573-526-4757 or TTY 800-735-2966; fax number 573-522-4883; email civilrights@dese.mo.gov.

Appendix B

Missouri Assessment Program:
Anchor Evaluation for Communication Arts, Mathematics, and Science

The anchor items were evaluated immediately following the calibration and equating of the Missouri Assessment Program (MAP). This report outlines the methods used to evaluate anchor items for the MAP and the results of the analyses.

Methods Used to Evaluate Anchor Items

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

Test Characteristic Curve Method[1]

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

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

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

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

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

Differential item functioning was evaluated by examining previous (input) and transformed (estimated) item parameters. The item with an absolute difference of parameters greater than two times the root mean square deviation was flagged. The difference was also monitored by plotting input and estimated item parameters.

Item Response Theory (IRT) Item-Ability Regression Curves

We will also compute differences between the item-ability regression curves of the anchor items for 2012 compared to previous calibrations. The differences between the curves will be evaluated using the following statistics:

- UnWtd Mean = Average signed difference in estimated probability.
- UnWtd Mean Abs Dif = Average Absolute (unsigned) difference in estimated probability.

---

[1] Text explaining the Test Characteristic Curve Method, Delta-Plot Method, and Lord's Chi Square is taken from Karkee and Choi (2005). *Impact of Eliminating Anchor Items Flagged from Statistical Criteria on Test Score Classifications in Common Item Equating.* Paper presented at the American Educational Research Association, Montreal, Canada.

- UnWtd RMSD = Root mean squared difference.

Both unweighted and weighted versions of these statistics will be calculated. Unweighted differences give equal weight to differences across the ability spectrum. Weighted differences assign weights according to the number of test-takers that are impacted.

The weighted versions of these differences are:

- Wtd Mean = Weighted average signed difference in estimated probability.
- Wtd Mean Abs = Weighted average Absolute (unsigned) difference in estimated probability.
- WtdRMSD = Weighted Root mean squared difference.

For the six statistics listed above, differences greater than +.10 are considered large, and differences between +.07 and .10 are considered moderate.

Additionally, the Maximum Absolute difference (MaxAbsDifPC) will be identified. For MaxAbsDIFPC, large differences are those greater than +.15, and moderate differences are all differences between +.125 and .15.

Removal of Anchor Items

While dropping an anchor item flagged based solely on statistical criteria has its simplicity, this option may change the content coverage and equating constants, shift scale score distributions, and affect the classification of students by moving them into different proficiency levels. Before an anchor item may be dropped from an anchor set, the adequacy of the content coverage must be evaluated.

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

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

1. Items flagged using the TCC method are considered for exclusion when the correlation between the input and equated item parameters is below .90 for the *b*-parameter or below .80 for the *a*-parameter. If the exclusion of an outlying anchor item increases the correlation to above .90 for the *b*-parameter or above .80 for the *a*-parameter, then the anchor is a candidate for removal.
2. An item is a candidate for removal when it is flagged for large differences on four of the seven statistics considered when examining the differences between the IRT regression curves.
3. Removal of the item will only be considered after alternative explanations have been considered that may explain shifts in performance. For example, performance on the

anchor item may improve because of a statewide initiative emphasizing instruction on a particular set of skills. In this case, improved performance on the item represents true growth in that area. Removing the anchor item may artificially lower test scores.

4. Removal of the item may not significantly alter the content distribution of the anchor set. The distribution of the anchor items across the content standards must remain within 10% of the MAP test blueprint.
5. The number of remaining items will remain at an acceptable level of anchor set reliability. Operationally, this means the anchor set will still be representative of the total test blueprint and that the anchor may not be less than 20% of the total test length.

Results of Analyses

Neither of the analyses revealed any items that were performing in a statistically different manner from their previous administration.

Detailed Results of the Test Characteristic Curve Method

Tables 1 through 3 provide results for the TCC method. These tables summarize the following information for each grade content area: grade level, number of iterations, scaling constants (M1 and M2), and quadratic loss function (F). Within each grade level, the following information is summarized for each item parameter estimate: difference (Diff), root mean square difference (RMSD), ratio of the standard deviation (SD Ratio), and correlation (r) between input (previous) and estimated (2010) anchor parameters. All correlations of the *a*- and *b*-parameters were greater than 0.90. No items were flagged using this method.

Please note that the actual TCCs are shown in Figures 1–14. These plots are used to assess the quality of the linking results. The red, dashed TCC lines in the plots are the TCCs for the input anchor items. The blue lines are the TCCs from the 2010 MAP parameter estimates transformed to the MAP scale.[2] The closer the two TCCs are to each other at all ability levels, the more confidence we have in the equating result. In most cases, the input and estimate TCCs overlay each other, making the two curves indistinguishable.

Detailed Results Comparing the IRT Anchor Regression Curves

Tables 4 through 17 present the detailed results for the linking when the IRT Anchor Regression method is used. These tables summarize the seven statistics examined using this method. The headers in the tables are abbreviated as follows:

- UnWtd RMSD = unweighted root mean squared difference
- UnWtd Mean Abs Difference = unweighted average absolute difference in estimated probability.
- UnWtd Max = unweighted maximum absolute difference.
- UnWtd Mean = unweighted average signed difference in estimated probability.
- Wtd RMSD = weighted root mean squared difference.

[2] The *c*-parameters for the MAP test data were fixed to the original *TerraNova c*-parameters in order to provide more accurate equating results (Voelkle, Schwarz, Arenson, & Ito 2002).

- Wtd Mean Abs Difference = weighted average absolute difference in estimated probability.
- Wtd Mean = weighted average signed difference in estimated probability.

Again, for six of the statistics listed above (except for the unweighted maximum absolute difference), differences greater than $\pm$.10 were considered large, and differences greater than $\pm$.07 were considered moderate. For maximum absolute difference, large differences were those greater than $\pm$.15, and moderate differences were all differences greater than $\pm$.125. No items were flagged using this approach.

Table 1. Detailed Results from the Test Characteristic Curve Method, Communication Arts

Grade	Iterations	M1	M2	F	Par	Diff	RMSD	SD Ratio	r
3	10	31.094	645.30	0.018	a	0.000	0.001	0.953	0.997
					b	0.005	2.042	1.008	0.998
4	46	33.023	664.25	0.057	a	0.000	0.002	1.061	0.988
					b	-1.177	4.194	0.910	0.980
5	18	28.290	679.06	0.036	a	0.000	0.001	1.028	0.990
					b	-0.123	1.756	1.007	0.997
6	11	26.531	677.46	0.057	a	-0.001	0.002	1.032	0.975
					b	0.185	1.243	0.997	0.999
7	16	31.479	684.24	0.041	a	0.000	0.002	1.010	0.973
					b	0.077	2.326	0.958	0.995
8	30	27.018	700.91	0.179	a	0.000	0.001	0.998	0.997
					b	0.444	2.742	1.003	0.997

Table 2. Detailed Results from the Test Characteristic Curve Method, Mathematics

Grade	Iterations	M1	M2	F	Par	Diff	RMSD	SD Ratio	r
3	53	30.219	631.15	0.077	a	0.000	0.001	0.920	0.993
					b	-0.059	3.321	1.016	0.988
4	92	29.533	650.16	0.059	a	0.000	0.001	1.020	0.986
					b	-0.422	3.006	0.954	0.993
5	28	36.245	675.00	0.089	a	0.000	0.001	0.905	0.990
					b	-0.504	3.470	1.002	0.995
6	44	33.810	690.69	0.031	a	0.000	0.001	1.061	0.995
					b	0.544	4.204	0.998	0.992
7	11	35.631	693.46	0.145	a	-0.001	0.001	1.049	0.989
					b	0.879	4.471	0.999	0.992
8	6	33.673	715.77	0.041	a	0.000	0.002	1.050	0.979
					b	-0.369	2.640	1.007	0.998

Table 3. Detailed Results from the Test Characteristic Curve Method, Science

Grade	Iterations	M1	M2	F	Par	Diff	RMSD	SD Ratio	r
5	23	30.517	669.58	0.088	a	-0.001	0.002	0.893	0.991
					b	0.803	2.439	0.972	0.996
8	22	28.255	702.13	0.053	a	0.000	0.001	0.944	0.992
					b	-0.111	2.972	0.980	0.994

Table 4. Statistics Comparing IRT Item-Ability Regression Curves, Communication Arts, Grade 3

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.01	0.01	0.02	-0.01	0.02	0.02	-0.02
3	0.01	0.01	0.02	0.01	0.01	0.01	0.01
4	0.01	0.01	0.02	0.01	0.02	0.01	0.01
5	0.01	0.01	0.02	-0.01	0.01	0.01	-0.01
6	0.00	0.00	0.01	0.00	0.00	0.00	0.00
7	0.01	0.01	0.02	0.01	0.01	0.01	0.01
8	0.01	0.01	0.02	0.01	0.01	0.01	0.01
9	0.01	0.00	0.01	0.00	0.01	0.01	-0.01
10	0.01	0.00	0.01	0.00	0.01	0.01	0.00
11	0.00	0.00	0.01	0.00	0.00	0.00	0.00
12	0.00	0.00	0.01	0.00	0.01	0.01	-0.01
13	0.01	0.01	0.02	-0.01	0.01	0.01	-0.01

Table 5. Statistics Comparing IRT Item-Ability Regression Curves, Communication Arts, Grade 4

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.03	0.03	0.04	0.03	0.03	0.03	0.03
2	0.01	0.01	0.01	-0.01	0.01	0.01	-0.01
3	0.02	0.02	0.04	-0.02	0.03	0.03	-0.03
4	0.00	0.00	0.01	0.00	0.01	0.00	0.00
5	0.01	0.01	0.02	0.01	0.01	0.01	0.01
6	0.01	0.00	0.01	0.00	0.01	0.00	0.00
7	0.04	0.03	0.07	0.01	0.03	0.02	-0.01
8	0.01	0.01	0.01	0.00	0.01	0.01	0.01
9	0.00	0.00	0.01	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.01	0.01	0.01	0.00	0.01	0.01	0.00
12	0.01	0.01	0.02	0.00	0.01	0.01	0.01
13	0.00	0.00	0.01	0.00	0.00	0.00	0.00

Table 6. Statistics Comparing IRT Item-Ability Regression Curves, Communication Arts, Grade 5

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.01	0.01	0.01	0.00	0.01	0.01	-0.01
2	0.01	0.01	0.02	0.01	0.02	0.01	0.01
3	0.02	0.01	0.04	-0.01	0.03	0.03	-0.03
4	0.01	0.00	0.01	0.00	0.01	0.01	-0.01
5	0.01	0.01	0.01	0.00	0.01	0.01	0.01
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.01	0.00	0.02	0.00	0.01	0.01	0.01
10	0.01	0.00	0.02	0.00	0.01	0.01	-0.01
11	0.02	0.01	0.03	0.01	0.02	0.02	0.02
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 7. Statistics Comparing IRT Item-Ability Regression Curves, Communication Arts, Grade 6

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.02	0.02	0.03	0.00	0.02	0.02	0.02
2	0.01	0.01	0.02	-0.01	0.01	0.01	-0.01
3	0.01	0.01	0.03	-0.01	0.02	0.02	-0.02
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.01	0.00	0.00	0.00	0.00
6	0.01	0.01	0.02	-0.01	0.01	0.01	-0.01
7	0.00	0.00	0.01	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.01	0.01	0.02	0.01	0.01	0.01	0.01
10	0.01	0.01	0.03	0.01	0.02	0.02	0.02
11	0.00	0.00	0.01	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 8. Statistics Comparing IRT Item-Ability Regression Curves, Communication Arts, Grade 7

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.00	0.00	0.01	0.00	0.01	0.01	0.00
2	0.00	0.00	0.01	0.00	0.01	0.00	0.00
3	0.02	0.01	0.05	0.01	0.03	0.03	0.03
4	0.01	0.01	0.03	0.01	0.02	0.01	0.01
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.01	0.00	0.01	0.00	0.01	0.01	-0.01
7	0.01	0.00	0.01	0.00	0.01	0.01	-0.01
8	0.02	0.01	0.04	-0.01	0.03	0.03	-0.03
9	0.02	0.01	0.04	0.01	0.03	0.03	0.03
10	0.01	0.01	0.01	0.00	0.01	0.01	0.00
11	0.00	0.00	0.01	0.00	0.00	0.00	0.00
12	0.02	0.01	0.04	-0.01	0.03	0.03	-0.03
13	0.00	0.00	0.01	0.00	0.01	0.00	0.00
14	0.00	0.00	0.01	0.00	0.00	0.00	0.00

Table 9. Statistics Comparing IRT Item-Ability Regression Curves, Communication Arts, Grade 8

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.01	0.00	0.01	0.00	0.01	0.01	0.01
2	0.02	0.01	0.03	0.01	0.02	0.02	0.02
3	0.02	0.01	0.03	0.00	0.01	0.01	0.00
4	0.00	0.00	0.01	0.00	0.00	0.00	0.00
5	0.00	0.00	0.01	0.00	0.00	0.00	0.00
6	0.01	0.01	0.03	0.01	0.02	0.02	0.02
7	0.01	0.00	0.01	0.00	0.01	0.01	-0.01
8	0.01	0.01	0.03	0.01	0.01	0.01	0.01
9	0.01	0.00	0.01	0.00	0.01	0.01	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.01	0.00	0.02	0.00	0.01	0.01	-0.01
12	0.00	0.00	0.01	0.00	0.00	0.00	0.00
13	0.02	0.01	0.06	-0.01	0.03	0.03	-0.03

Table 10. Statistics Comparing IRT Item-Ability Regression Curves, Mathematics, Grade 3

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.00	0.00	0.01	0.00	0.01	0.01	0.01
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.02	0.02	0.03	0.02	0.02	0.02	0.02
4	0.01	0.01	0.01	0.00	0.01	0.01	0.01
5	0.01	0.01	0.02	0.01	0.01	0.01	0.01
6	0.01	0.01	0.02	-0.01	0.01	0.01	-0.01
7	0.02	0.01	0.03	-0.01	0.02	0.02	-0.02
8	0.01	0.00	0.01	0.00	0.00	0.00	0.00
9	0.02	0.01	0.04	-0.01	0.02	0.02	-0.02
10	0.03	0.02	0.07	0.02	0.03	0.02	0.02
11	0.01	0.01	0.03	-0.01	0.02	0.02	-0.01
12	0.01	0.00	0.01	0.00	0.01	0.01	-0.01

Table 11. Statistics Comparing IRT Item-Ability Regression Curves, Mathematics, Grade 4

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.02	0.01	0.04	0.01	0.01	0.01	0.01
2	0.03	0.02	0.07	0.02	0.05	0.05	0.05
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.01	0.01	0.02	-0.01	0.01	0.01	-0.01
5	0.01	0.01	0.03	-0.01	0.01	0.01	-0.01
6	0.01	0.00	0.01	0.00	0.01	0.01	-0.01
7	0.02	0.01	0.03	-0.01	0.02	0.01	-0.01
8	0.00	0.00	0.01	0.00	0.00	0.00	0.00
9	0.00	0.00	0.01	0.00	0.00	0.00	0.00
10	0.00	0.00	0.01	0.00	0.00	0.00	0.00
11	0.00	0.00	0.01	0.00	0.00	0.00	0.00
12	0.01	0.01	0.02	0.00	0.01	0.00	0.00
13	0.00	0.00	0.01	0.00	0.01	0.01	0.00
14	0.01	0.01	0.03	0.01	0.01	0.01	0.01

Table 12. Statistics Comparing IRT Item-Ability Regression Curves, Mathematics, Grade 5

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.01	0.01	0.02	0.00	0.01	0.00	0.00
2	0.00	0.00	0.01	0.00	0.01	0.01	0.00
3	0.01	0.00	0.02	0.00	0.01	0.00	0.00
4	0.02	0.02	0.03	0.01	0.02	0.02	0.02
5	0.01	0.01	0.02	-0.01	0.02	0.01	-0.01
6	0.04	0.03	0.05	0.02	0.03	0.03	0.03
7	0.01	0.01	0.02	0.01	0.01	0.01	0.01
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.01	0.01	0.02	-0.01	0.01	0.01	-0.01
10	0.01	0.01	0.01	0.00	0.01	0.01	0.00
11	0.01	0.01	0.03	-0.01	0.02	0.02	-0.02
12	0.01	0.00	0.01	0.00	0.01	0.00	0.00

Table 13. Statistics Comparing IRT Item-Ability Regression Curves, Mathematics, Grade 6

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.03	0.03	0.05	-0.03	0.04	0.04	-0.03
2	0.02	0.02	0.04	-0.01	0.02	0.02	-0.02
3	0.00	0.00	0.01	0.00	0.00	0.00	0.00
4	0.01	0.01	0.02	-0.01	0.01	0.01	-0.01
5	0.02	0.02	0.04	0.02	0.03	0.03	0.03
6	0.01	0.01	0.02	-0.01	0.01	0.01	0.00
7	0.01	0.01	0.03	-0.01	0.01	0.00	0.00
8	0.02	0.01	0.04	0.01	0.03	0.02	0.02
9	0.02	0.01	0.04	0.01	0.02	0.01	0.01
10	0.02	0.01	0.03	-0.01	0.02	0.02	-0.02
11	0.01	0.01	0.03	0.01	0.02	0.02	0.02
12	0.01	0.01	0.03	0.01	0.01	0.00	0.00

Table 14. Statistics Comparing IRT Item-Ability Regression Curves, Mathematics, Grade 7

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.02	0.01	0.05	-0.01	0.04	0.03	-0.03
2	0.00	0.00	0.01	0.00	0.00	0.00	0.00
3	0.01	0.00	0.01	0.00	0.01	0.01	-0.01
4	0.01	0.01	0.01	0.00	0.01	0.01	-0.01
5	0.01	0.01	0.02	0.01	0.01	0.01	0.00
6	0.01	0.01	0.02	-0.01	0.02	0.02	-0.02
7	0.04	0.03	0.10	0.03	0.07	0.06	0.06
8	0.01	0.01	0.02	-0.01	0.01	0.01	-0.01
9	0.00	0.00	0.01	0.00	0.00	0.00	0.00
10	0.03	0.02	0.04	-0.01	0.02	0.01	0.00
11	0.01	0.01	0.03	-0.01	0.01	0.00	0.00
12	0.02	0.01	0.04	-0.01	0.03	0.03	-0.03
13	0.03	0.02	0.10	0.02	0.06	0.05	0.05

Table 15. Statistics Comparing IRT Item-Ability Regression Curves, Mathematics, Grade 8

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.01	0.01	0.03	0.00	0.01	0.00	0.00
2	0.01	0.01	0.03	0.01	0.01	0.00	0.00
3	0.01	0.01	0.01	-0.01	0.01	0.01	-0.01
4	0.02	0.01	0.03	-0.01	0.02	0.02	-0.02
5	0.01	0.01	0.02	-0.01	0.01	0.01	-0.01
6	0.00	0.00	0.01	0.00	0.01	0.01	-0.01
7	0.01	0.00	0.02	0.00	0.01	0.01	0.01
8	0.01	0.01	0.02	0.00	0.02	0.01	-0.01
9	0.00	0.00	0.01	0.00	0.01	0.00	0.00
10	0.02	0.01	0.03	0.01	0.03	0.02	0.02
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.01	0.00	0.01	0.01	-0.01
13	0.03	0.02	0.07	0.01	0.04	0.03	0.02

Table 16. Statistics Comparing IRT Item-Ability Regression Curves, Science, Grade 5

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.01	0.01	0.02	0.00	0.01	0.01	0.00
3	0.02	0.01	0.02	0.01	0.01	0.01	0.01
4	0.01	0.00	0.02	0.00	0.01	0.01	-0.01
5	0.01	0.01	0.02	0.01	0.02	0.01	0.01
6	0.01	0.01	0.01	0.00	0.01	0.01	0.00
7	0.01	0.01	0.02	0.01	0.01	0.01	0.01
8	0.02	0.01	0.03	-0.01	0.02	0.02	-0.02
9	0.01	0.01	0.02	-0.01	0.02	0.02	-0.02
10	0.01	0.01	0.02	0.00	0.01	0.01	0.00
11	0.01	0.01	0.01	0.00	0.01	0.01	0.00
12	0.02	0.01	0.04	-0.01	0.01	0.01	0.00
13	0.01	0.01	0.02	0.00	0.01	0.00	0.00

Table 17. Statistics Comparing IRT Item-Ability Regression Curves, Science, Grade 8

Anchor Item Number	UnWtd RMSD	UnWtd Mean Abs Difference	UnWtd Max	UnWtd Mean	Wtd RMSD	Wtd Mean Abs Difference	Wtd Mean
1	0.03	0.02	0.04	-0.02	0.03	0.02	-0.02
2	0.02	0.01	0.04	0.01	0.01	0.01	0.01
3	0.01	0.00	0.02	0.00	0.01	0.00	0.00
4	0.03	0.02	0.04	0.02	0.03	0.02	0.02
5	0.01	0.00	0.02	0.00	0.00	0.00	0.00
6	0.01	0.01	0.02	0.00	0.01	0.00	0.00
7	0.01	0.00	0.01	0.00	0.01	0.00	0.00
8	0.02	0.02	0.04	-0.02	0.03	0.03	-0.03
9	0.01	0.01	0.02	0.00	0.01	0.01	-0.01
10	0.00	0.00	0.01	0.00	0.00	0.00	0.00
11	0.00	0.00	0.01	0.00	0.00	0.00	0.00
12	0.01	0.01	0.02	-0.01	0.01	0.01	-0.01
13	0.01	0.00	0.01	0.00	0.01	0.01	0.01
14	0.02	0.01	0.03	-0.01	0.02	0.02	-0.02
15	0.01	0.01	0.02	0.01	0.01	0.01	0.01
16	0.01	0.00	0.02	0.00	0.01	0.01	-0.01
17	0.02	0.02	0.02	0.01	0.02	0.02	0.02
18	0.01	0.01	0.02	0.00	0.01	0.01	-0.01
19	0.00	0.00	0.01	0.00	0.00	0.00	0.00
20	0.01	0.01	0.02	0.01	0.02	0.01	0.01
21	0.02	0.01	0.06	0.01	0.04	0.03	0.03
22	0.01	0.01	0.01	0.00	0.01	0.01	0.01
23	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Figure 1. Communication Arts, Grade 3 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

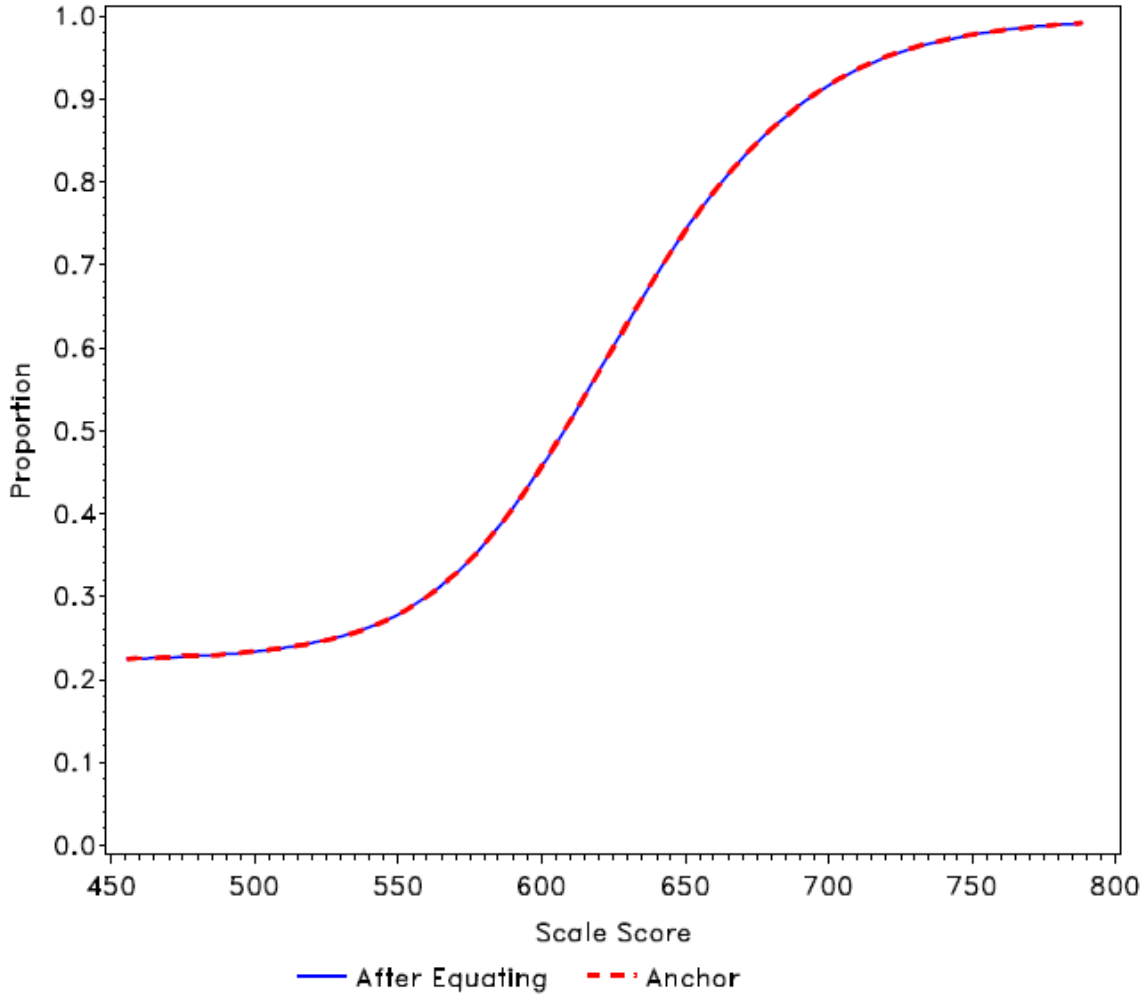


Figure 2. Communication Arts, Grade 4 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

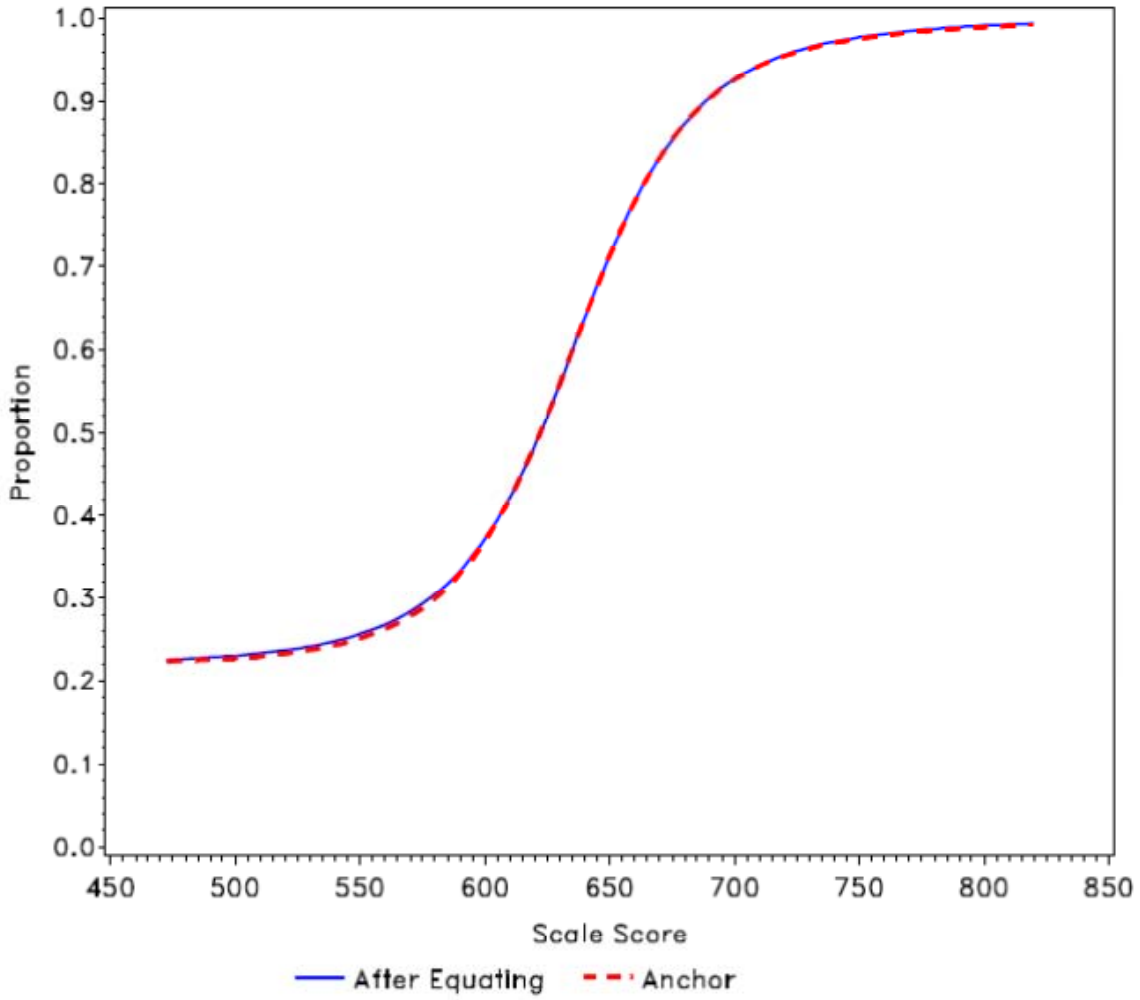


Figure 3. Communication Arts, Grade 5 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

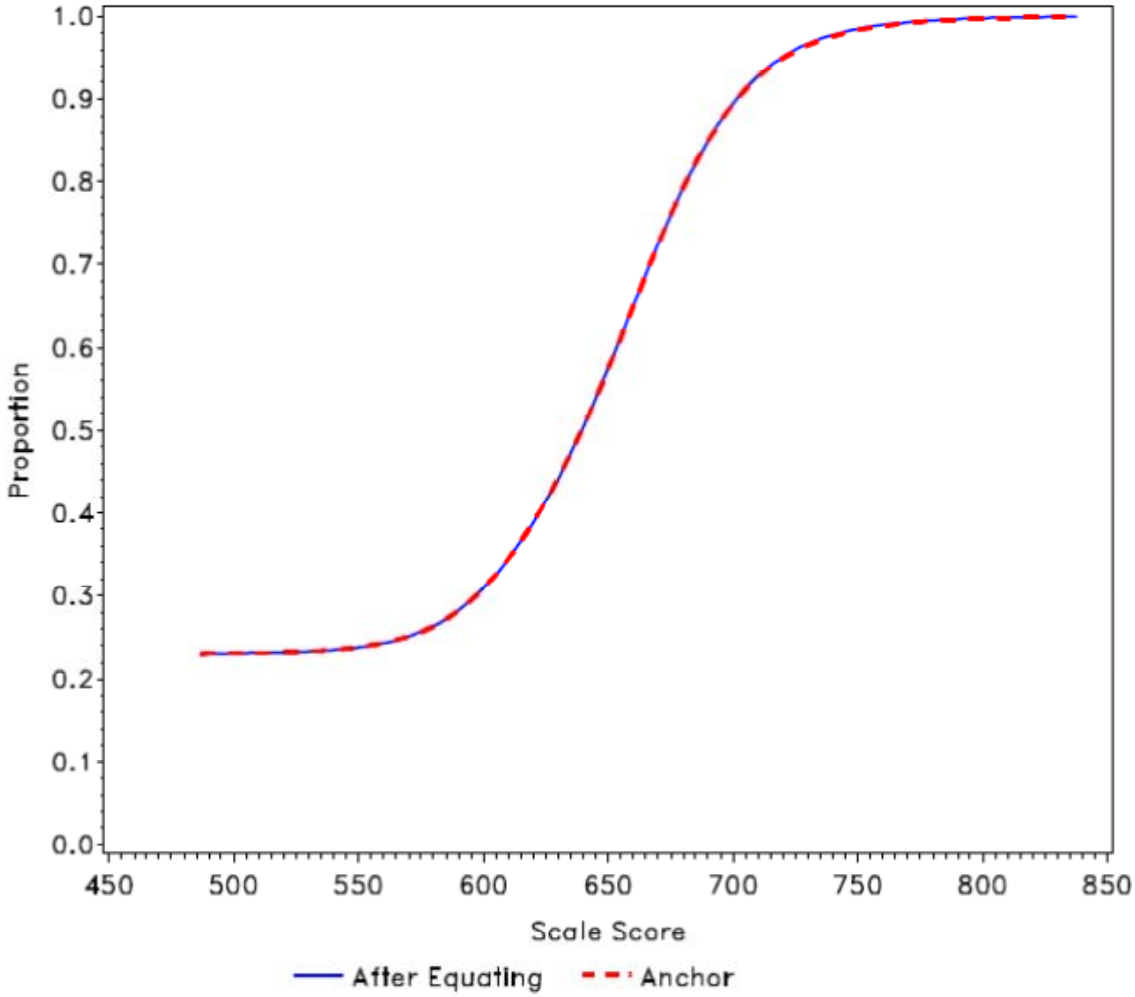


Figure 4. Communication Arts, Grade 6 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

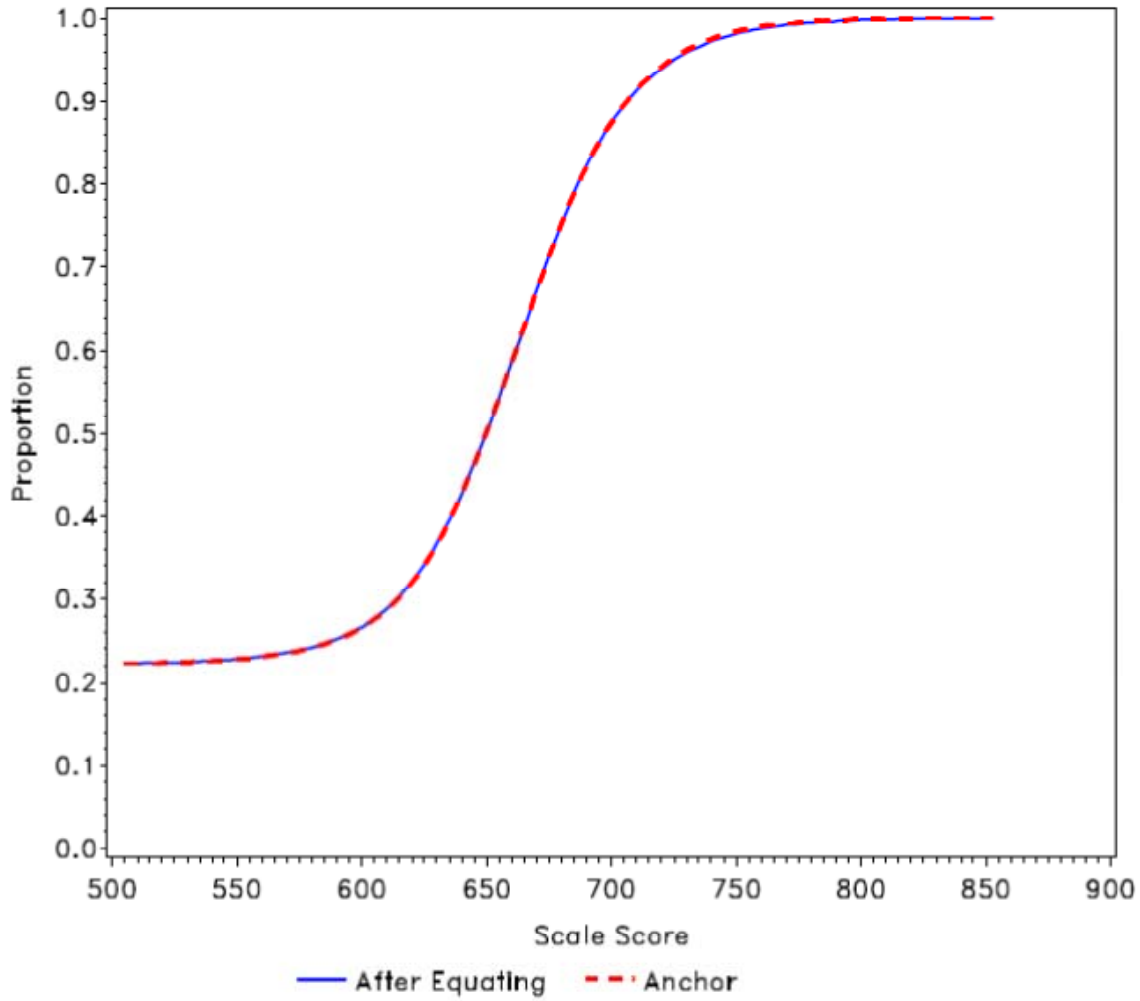


Figure 5. Communication Arts, Grade 7 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

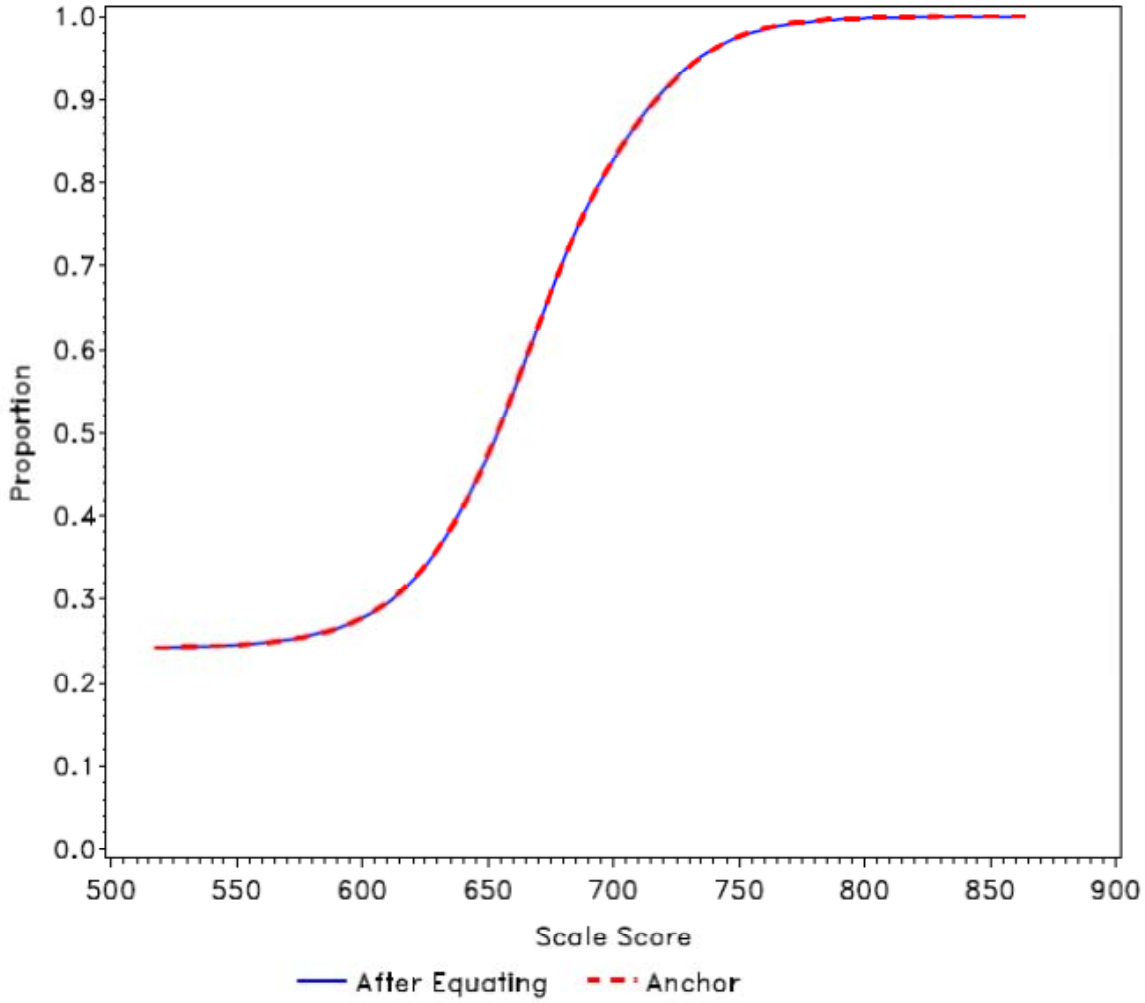


Figure 6. Communication Arts, Grade 8 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

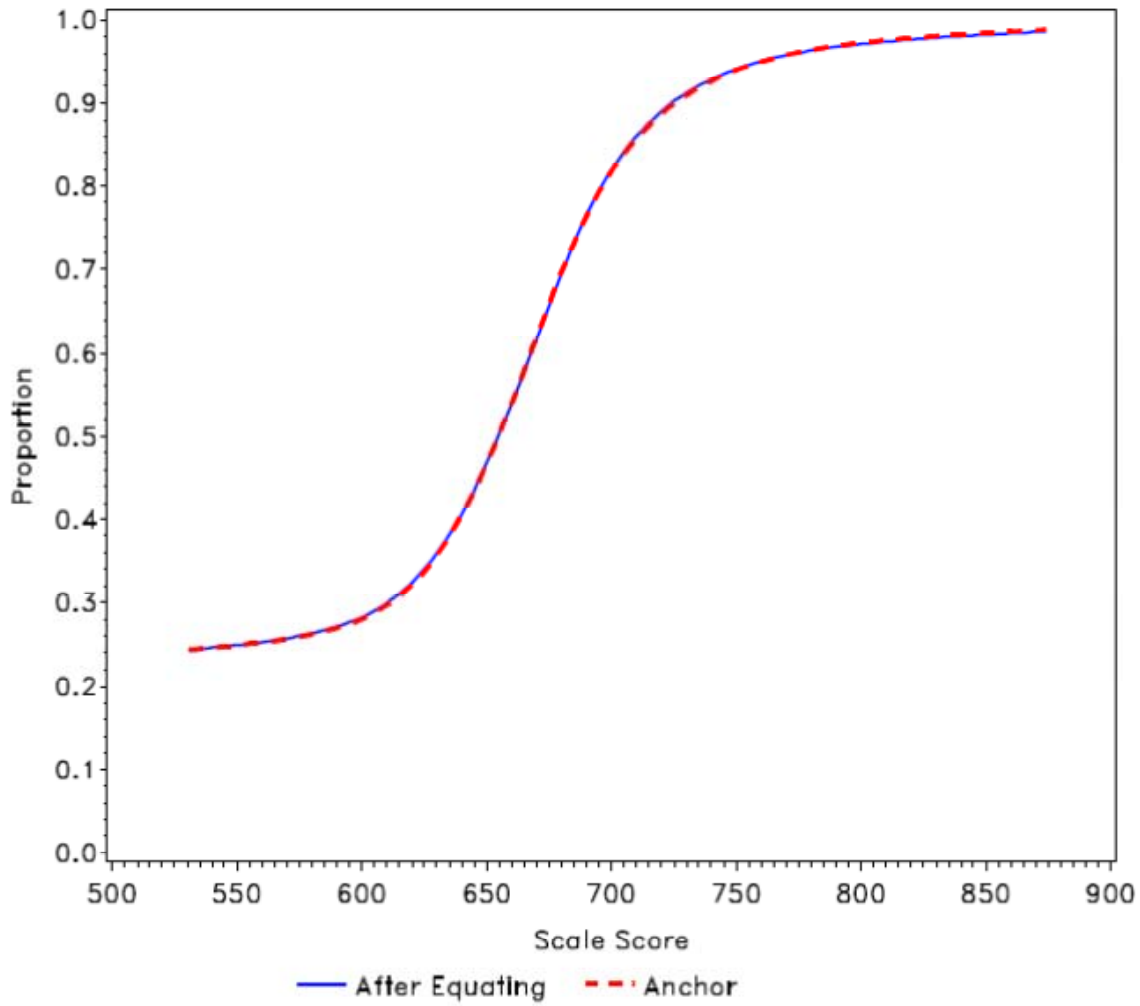


Figure 7. Mathematics, Grade 3 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

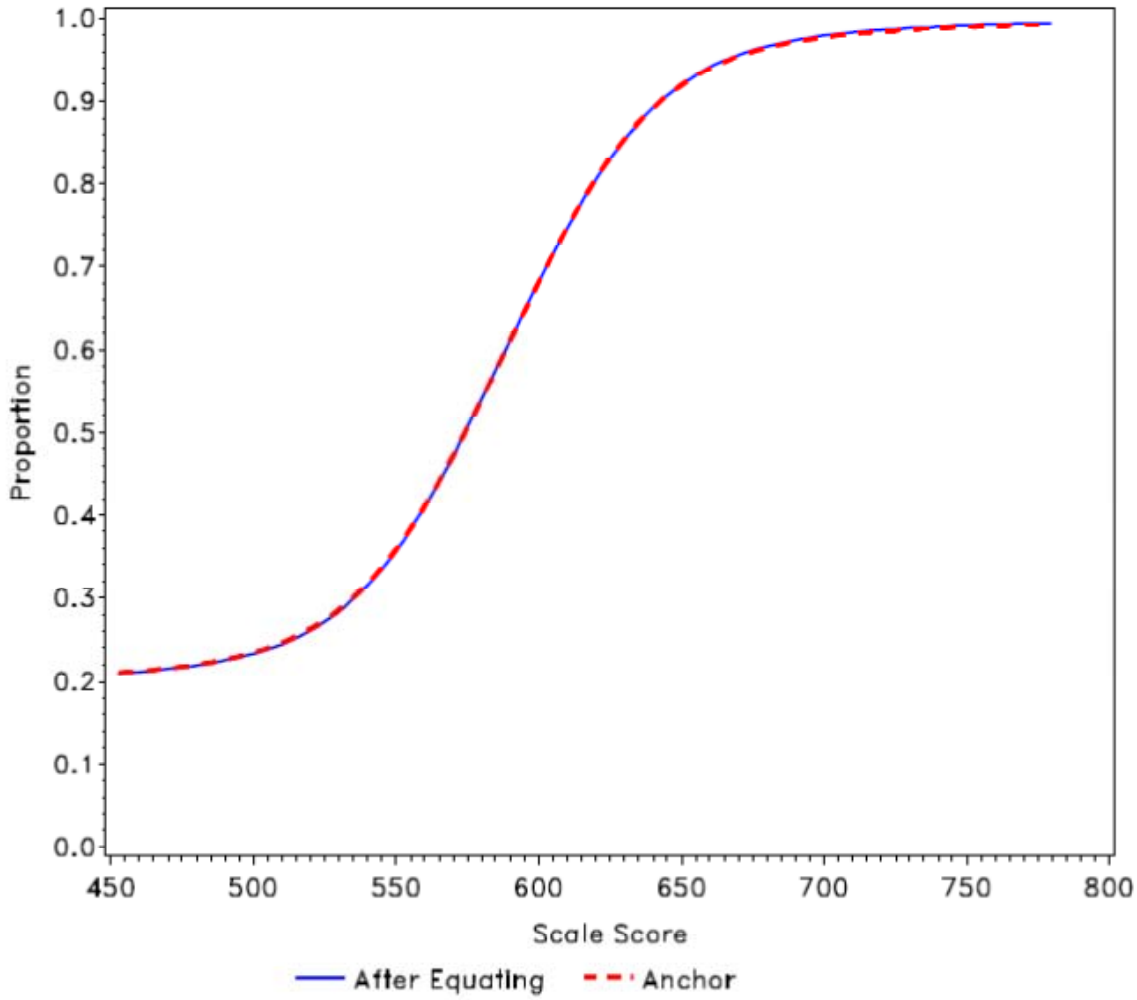


Figure 8. Mathematics, Grade 4 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

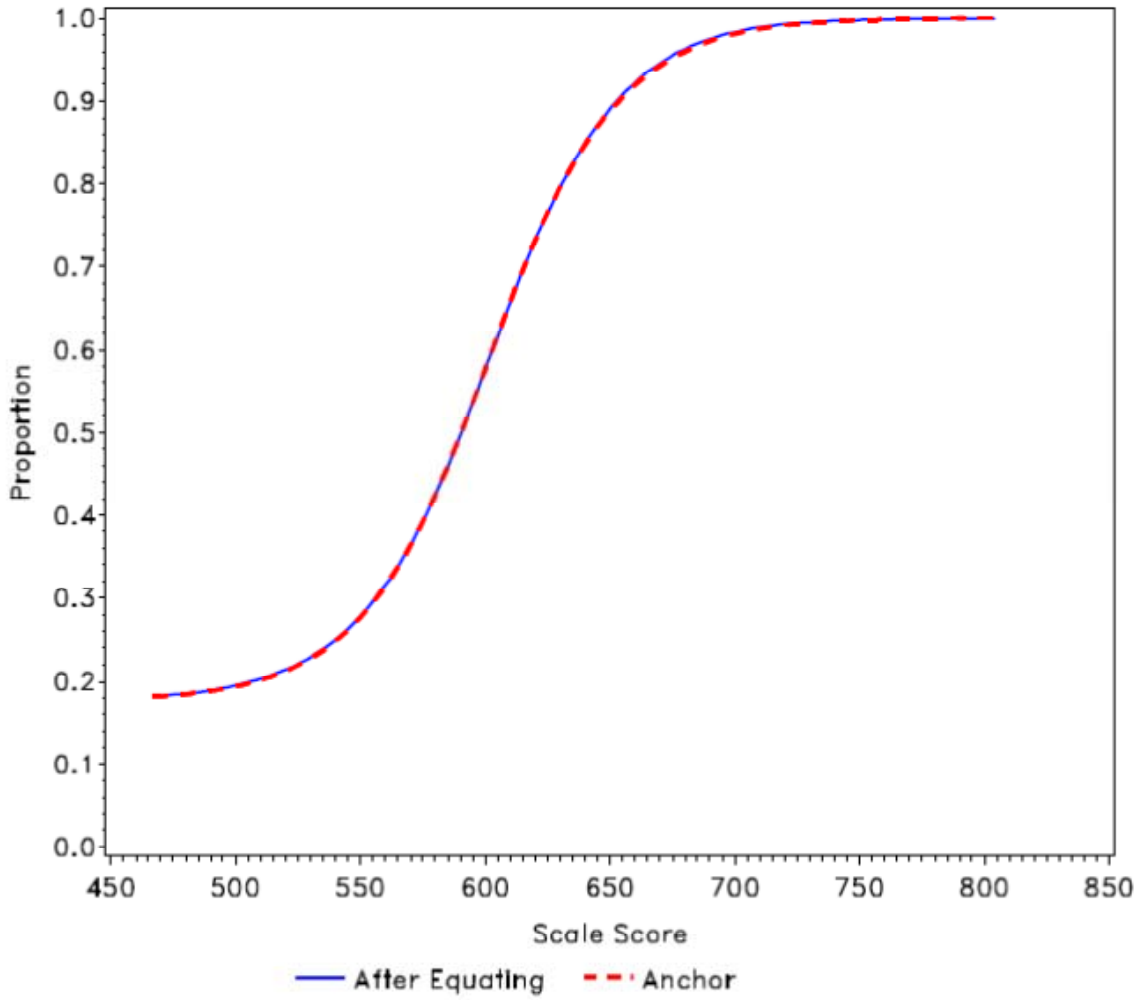


Figure 9. Mathematics, Grade 5 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

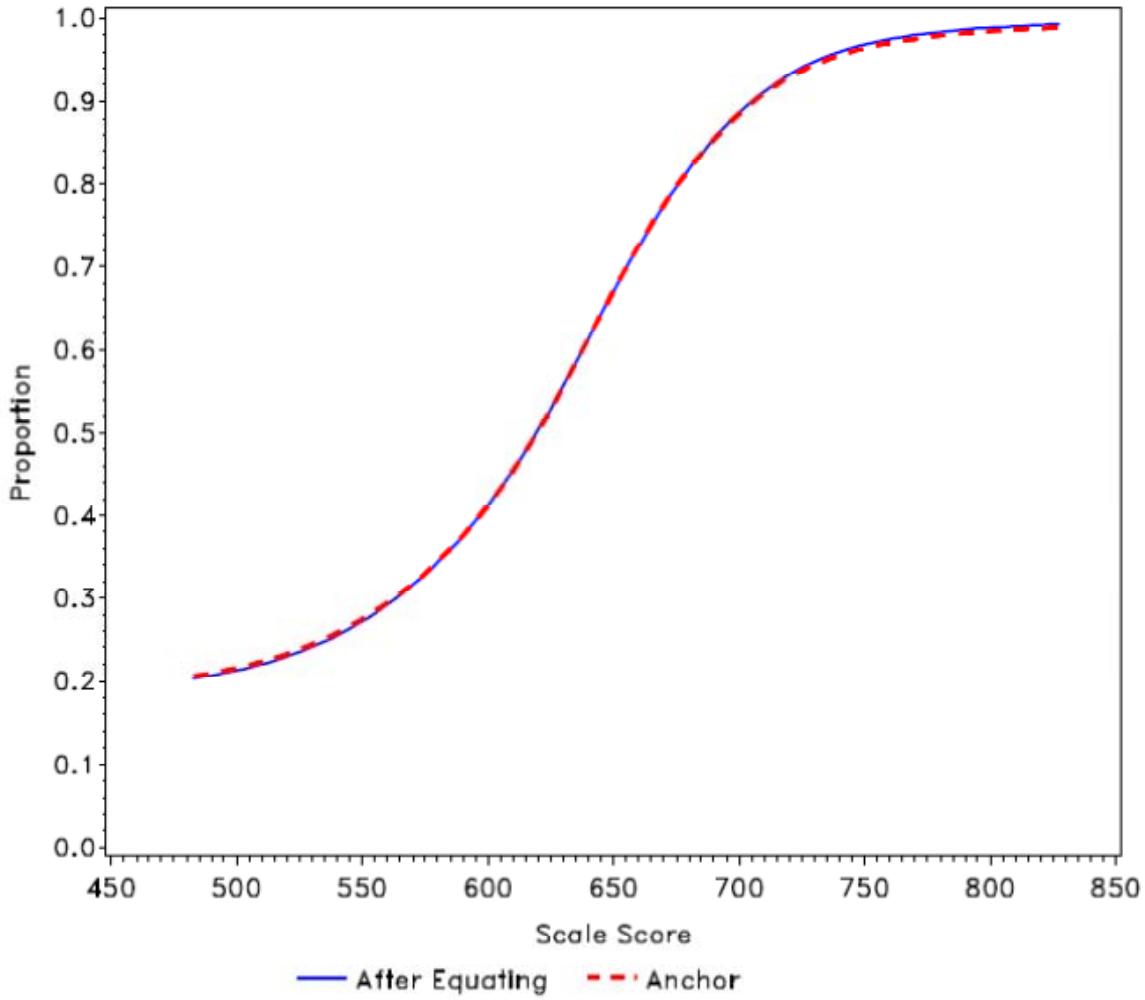


Figure 10. Mathematics, Grade 6 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

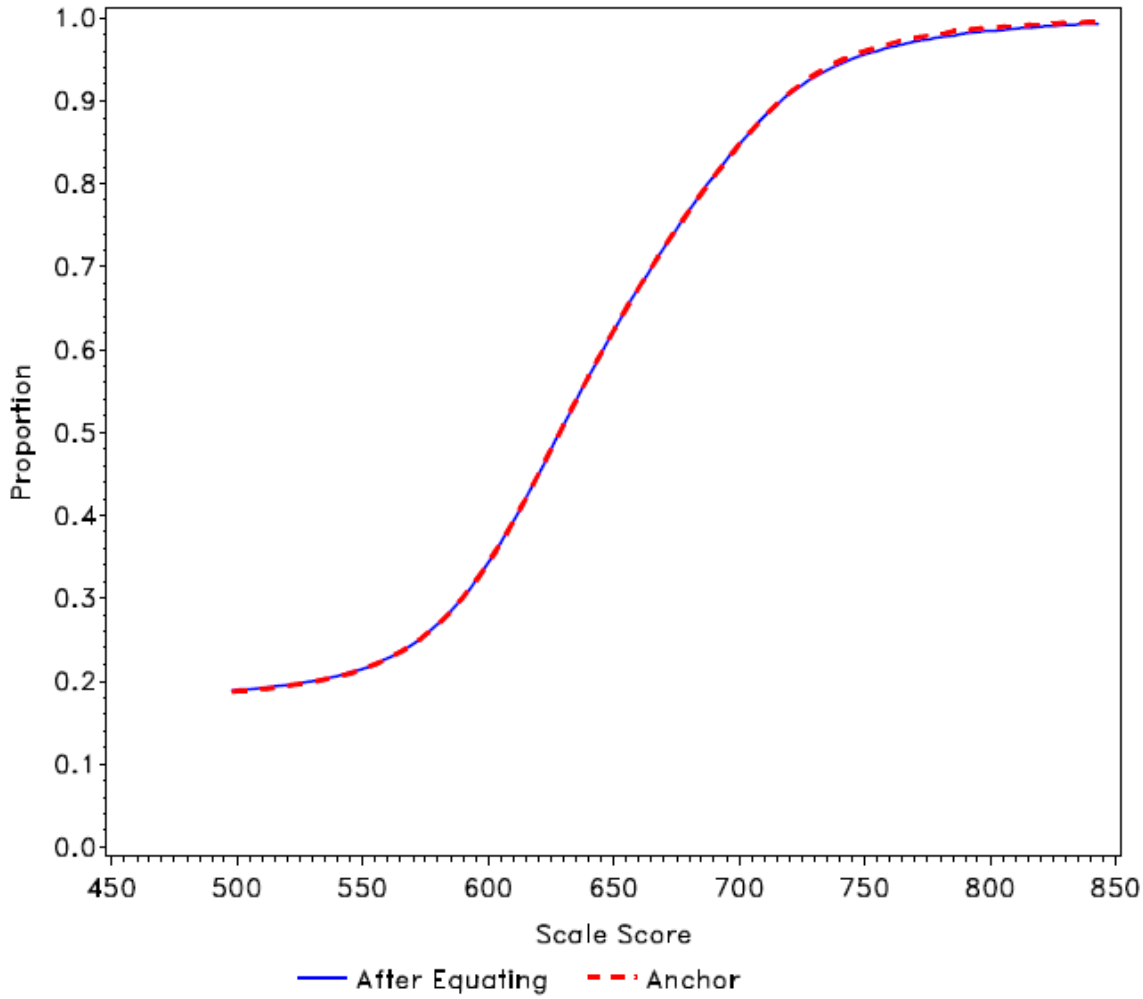


Figure 11. Mathematics, Grade 7 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

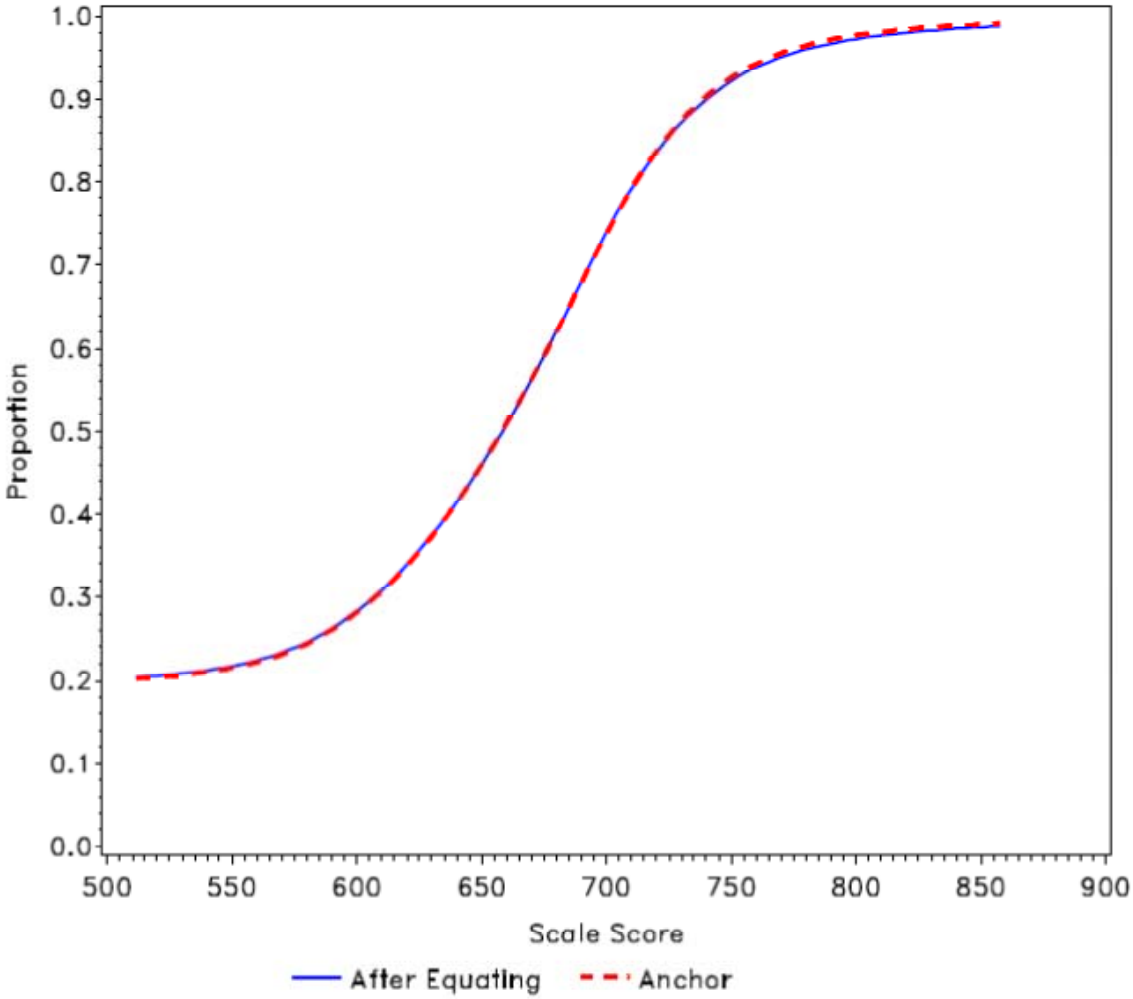


Figure 12. Mathematics, Grade 8 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

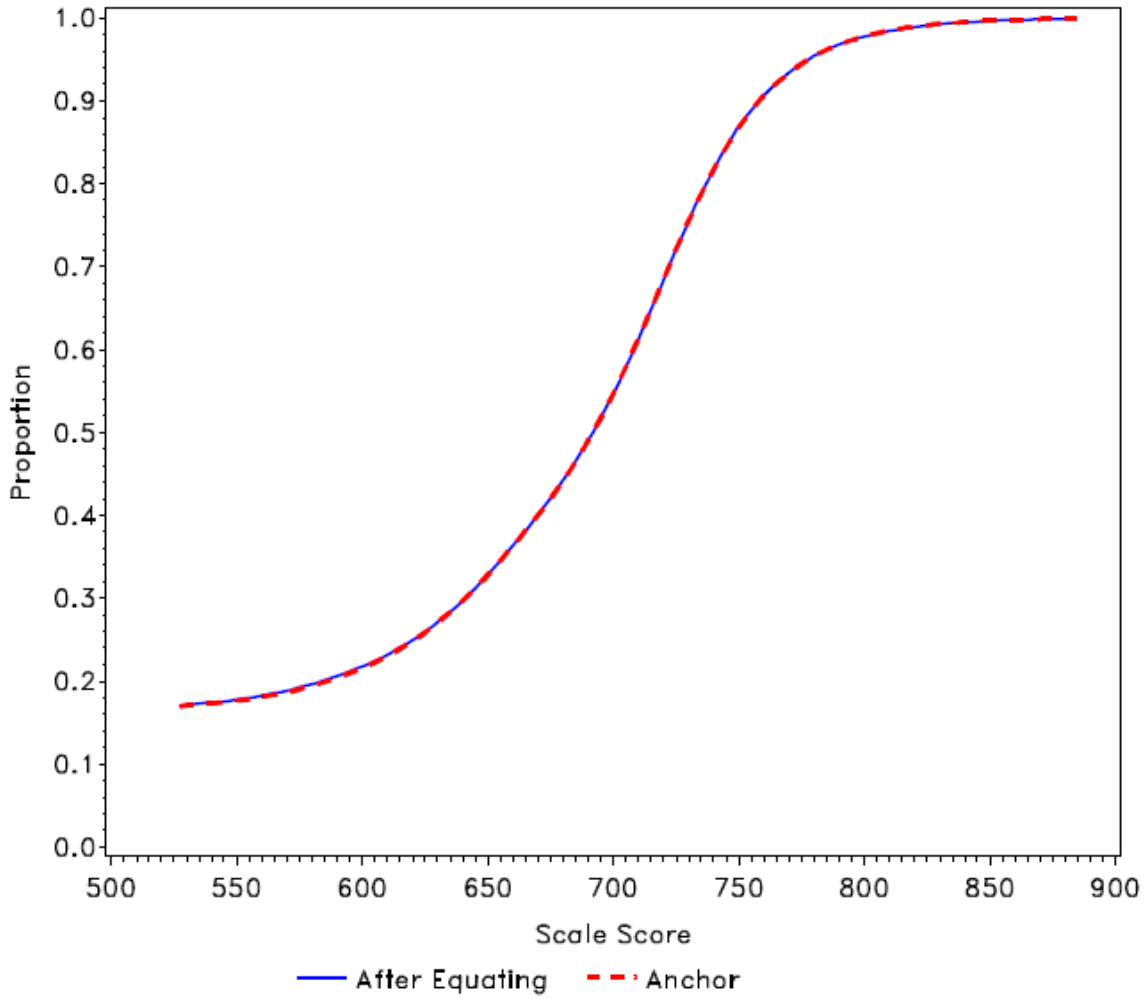


Figure 13. Science, Grade 5 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items

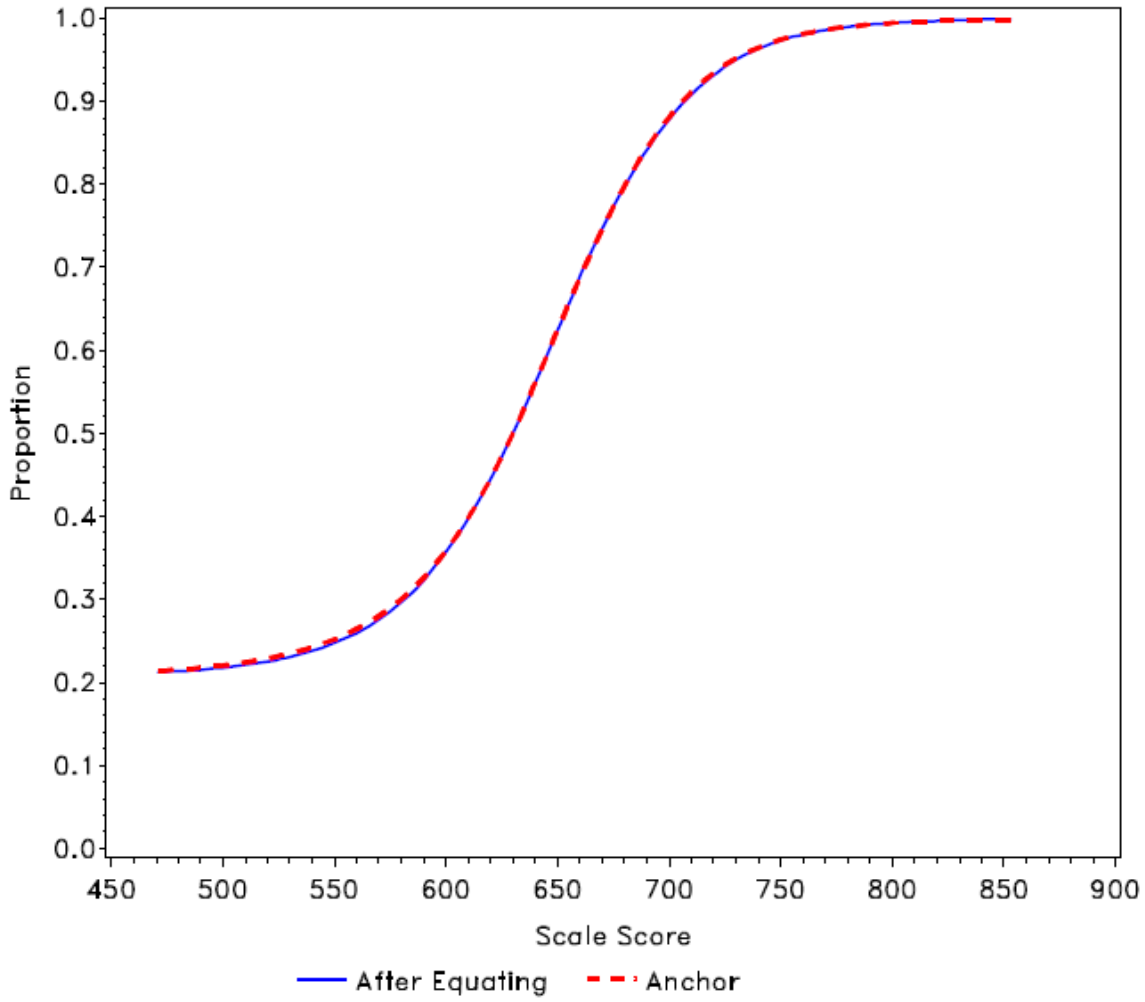
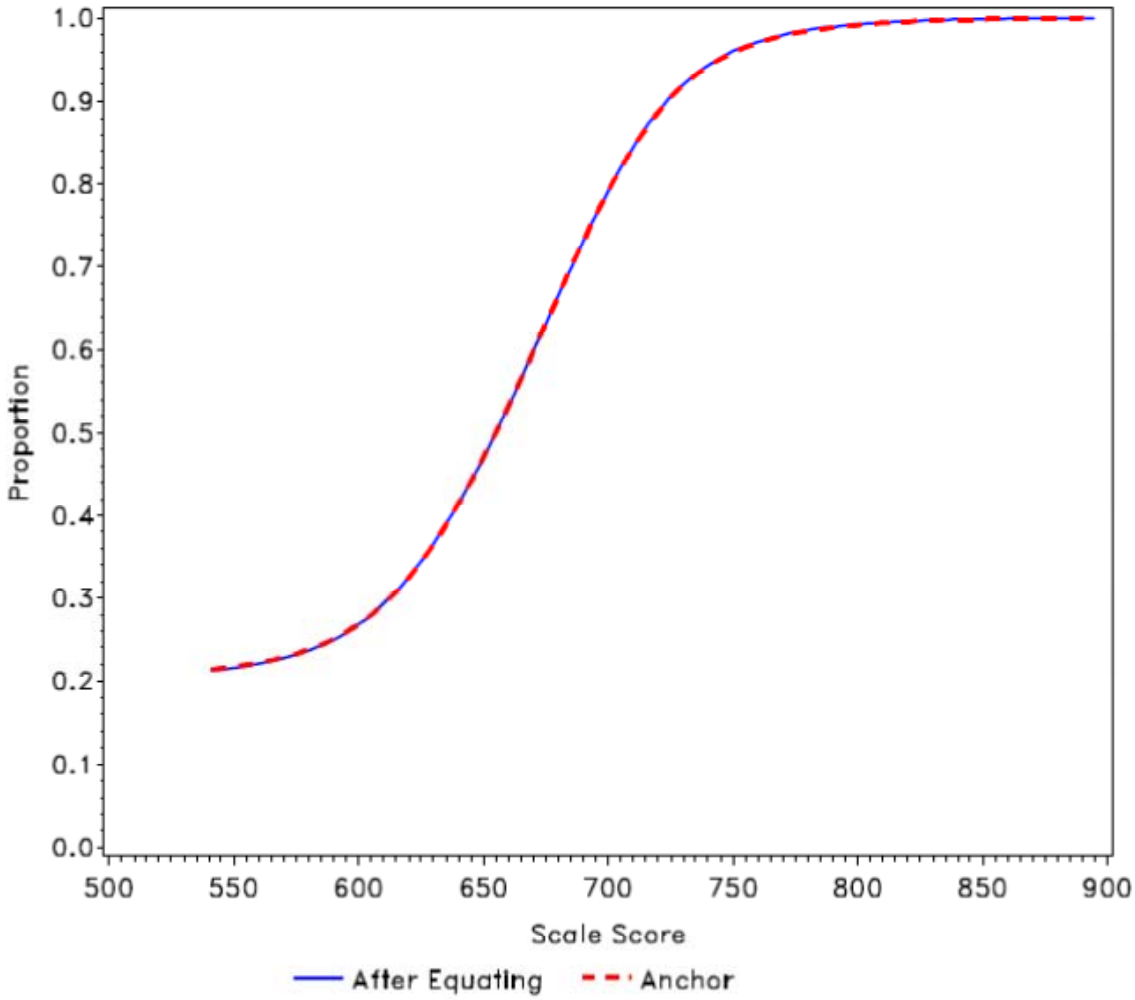


Figure 14. Science, Grade 8 Test Characteristic Curves (TCC) for the Inputted Anchor Items and for the Estimated Anchor Items



Appendix C

Examples of Score Reports…….……..…….C-1

Layout of General Research File……C-12

Examples of Score Reports

Figure C.1. Example of Missouri Assessment Program Individual Score Report

Missouri Grade-Level Assessment Program

2012 Individual Student Report

Student Report for:

Name PEGGY WEBBER

Student ID 0123456789
Birthdate MM/DD/YYYY
Grade 8
School SALEM MIDDLE SCHOOL FOR GIRLS
District CREAKLE CENTRAL SCHOOL DISTRICT

Overview of Performance

Scale Score: 639
This report provides information about achievement on the Missouri Assessment Program (MAP).

State Mean Score: 696
The average score of the students taking the assessment in the State.

TerraNova Score: 41
Achievement on the TerraNova test is measured by National Percentile, which ranges from the lowest (1) to the highest (99) performance nationally.

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 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, fax (573) 522-4883, email civilrights@dese.mo.gov.

To find more learning resources, visit www.dese.mo.gov/

CTB McGraw-Hill

How did your child perform in Communication Arts?

Your child received a score of 639.

One way to measure performance is by achievement levels, which are based on scale scores. Achievement levels describe what your child's score means.

Your child's achievement level is Basic.

Advanced
Scores of 723 and above demonstrate a thorough understanding of the content at this grade level.

Proficient
Scores at 696-722 demonstrate an understanding of the content expected at this grade level.

Your child's Level

Basic
Scores at 639-695 demonstrate a partial understanding of content expected at this grade level.

Below Basic
Scores of 638 and below do not demonstrate an understanding of the content expected at this grade level.

What does a level of "Basic" mean?

Reading-Students define simple vocabulary; identify main idea; draw simple conclusions; make simple inferences; recall details from text; determine reliability of resources. Writing-Students write a paragraph to a specific audience.

What you can do at home to help your child

Here are some recommended activities to improve or enrich skills based on your child's results.

Curriculum Framework:

Gather, Analyze, and Apply Information and Ideas

Essential Question: How can we analyze the messages conveyed in the media to help make decisions?

Engage your child in a dialogue to distinguish fact from opinion while you are both watching a TV commercial, reading a magazine advertisement, looking at billboards while in the car, or when you see another type of advertisement. Ask your child what message the ad is sending and what action the advertiser is trying to get you to take. Discuss where actual facts are being used and where the ad is using information that can't be proven. As an example, you and your child can compare a public service announcement on TV discussing the health risks of smoking (which is factual) with a magazine advertisement about sneakers that make you run faster (which may be an exaggeration to sell the product). Ask your child to create an advertisement that is based only on facts.

A single exam can provide only limited information. You should confirm your child's strengths and needs in these topics by reviewing classroom work, standards-based assessments, and your child's progress reports during the year.

For more resources, go to
www.dese.mo.gov/divimprove/curriculum/GLE/CAgle.html
www.dese.mo.gov/divimprove/assess/

5/30/12

CTBID: 000000000000000-00-00000-000000

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Figure C.2. Example of Missouri Assessment Program Individual Student Label

MISSOURI
ASSESSMENT PROGRAM

Dalbey,
Kori A

Grade: **8**
Test Date: **MM/DD/YY**
DOB: **MM/DD/YY**
MOSIS State ID: **0123456789**

Content Area	**Communication Arts**
Achievement Level	**Proficient**
MAP Scale Score	**696**
TerraNova NP	**59**

Figure C.3. Screen Shot of Missouri Comprehensive Data System Student Summary Report

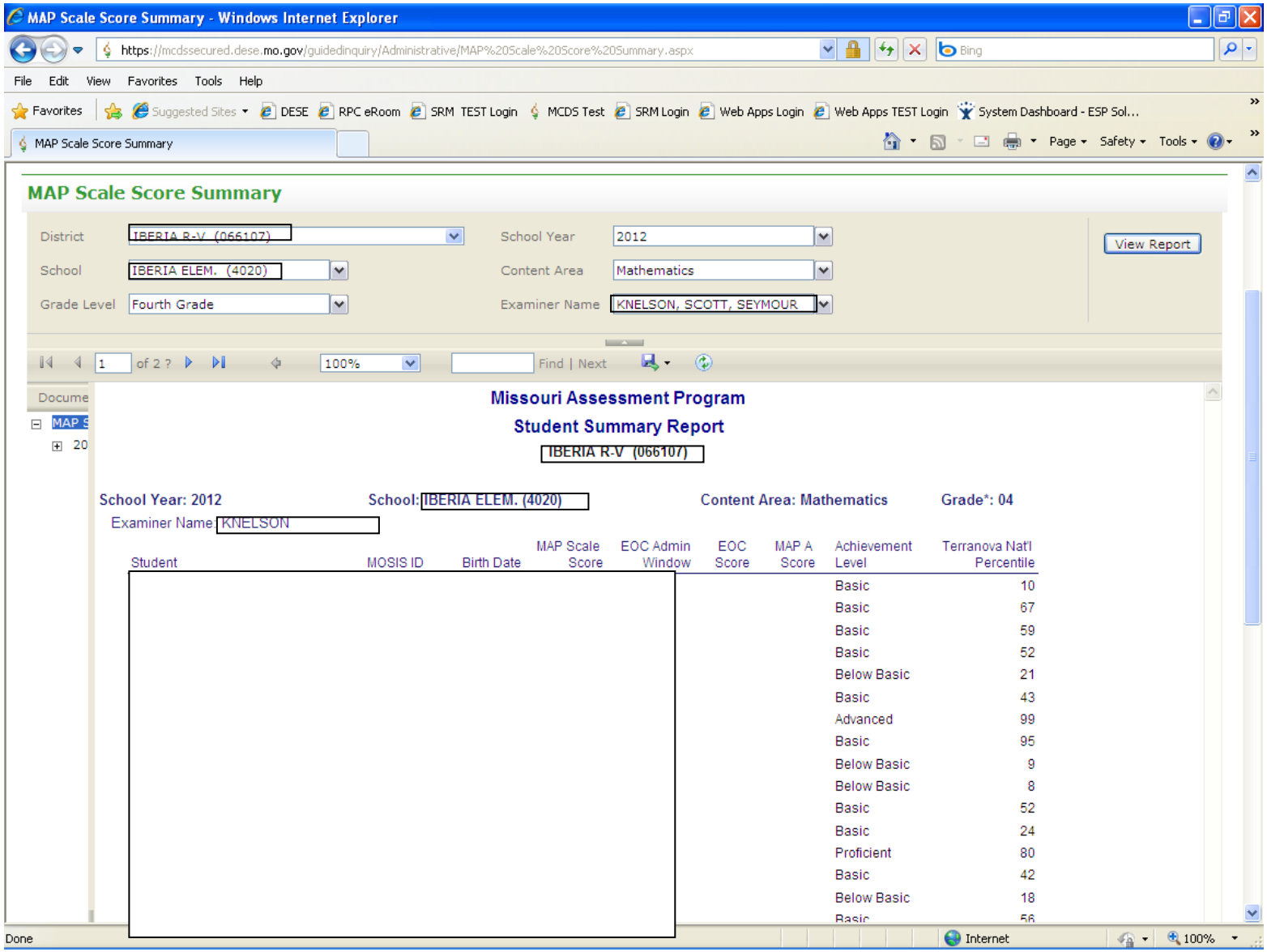
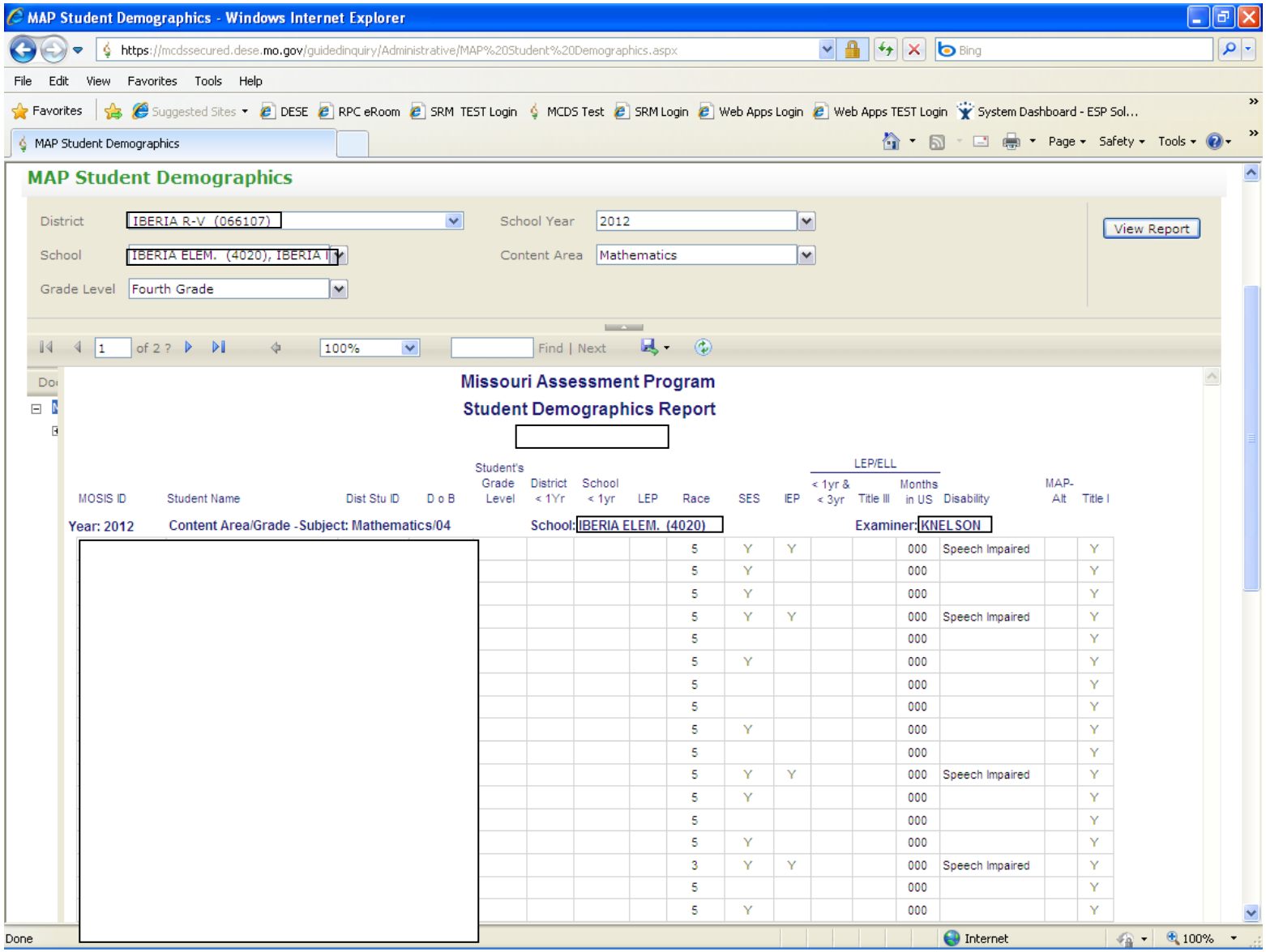


Figure C.4. Screen Shot of Missouri Comprehensive Data System Student Summary Demographic Report



MOSIS ID	Student Name	Dist Stu ID	D o B	Student's Grade Level	District < 1Yr	School < 1yr	LEP	Race	SES	IEP	LEP/ELL < 1yr & < 3yr	LEP/ELL Title III	LEP/ELL Months in US	Disability	MAP-Alt	Title I
								5	Y	Y			000	Speech Impaired		Y
								5	Y				000			Y
								5	Y				000			Y
								5	Y	Y			000	Speech Impaired		Y
								5					000			Y
								5	Y				000			Y
								5					000			Y
								5					000			Y
								5	Y				000			Y
								5					000			Y
								5	Y	Y			000	Speech Impaired		Y
								5	Y				000			Y
								5					000			Y
								5	Y				000			Y
								3	Y	Y			000	Speech Impaired		Y
								5					000			Y
								5	Y				000			Y

Figure C.5. Screen Shot of Missouri Comprehensive Data System Student Achievement Level Report

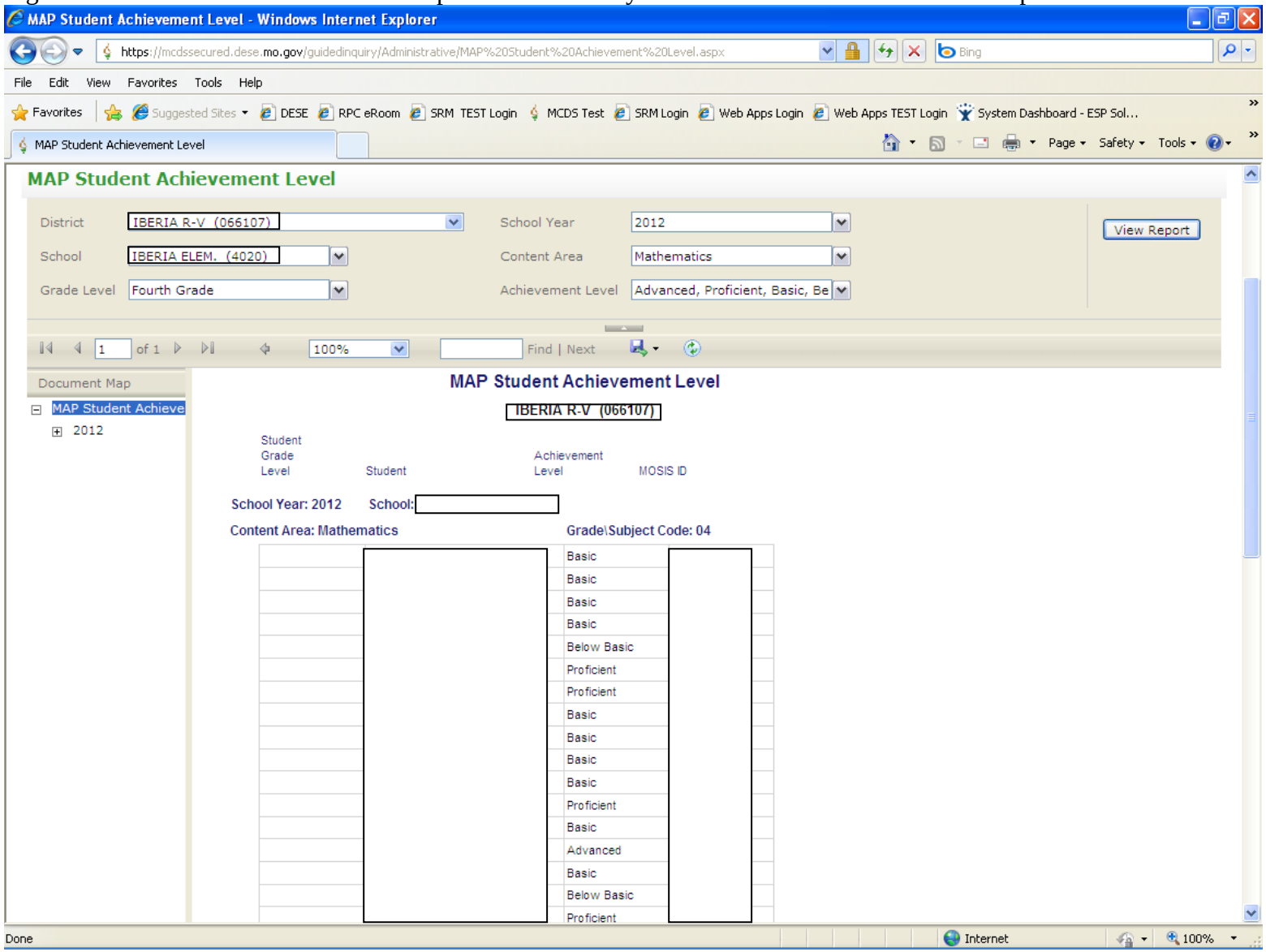
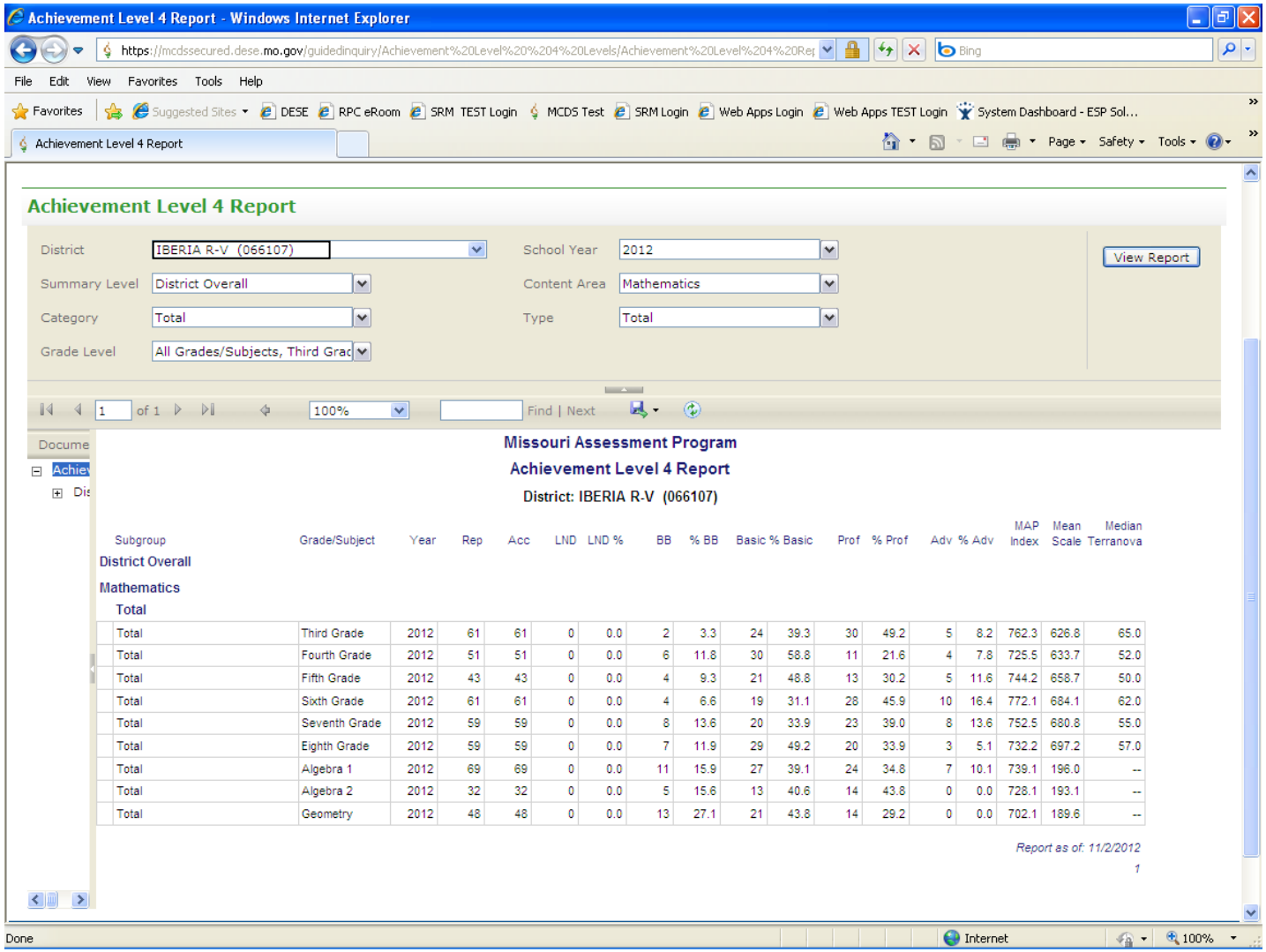


Figure C.6. Screen Shot of Missouri Comprehensive Data System Achievement Level 4 Report



Subgroup	Grade/Subject	Year	Rep	Acc	LND	LND %	BB	% BB	Basic	% Basic	Prof	% Prof	Adv	% Adv	MAP Index	Mean Scale	Median Terranova
District Overall																	
Mathematics																	
Total																	
Total	Third Grade	2012	61	61	0	0.0	2	3.3	24	39.3	30	49.2	5	8.2	762.3	626.8	65.0
Total	Fourth Grade	2012	51	51	0	0.0	6	11.8	30	58.8	11	21.6	4	7.8	725.5	633.7	52.0
Total	Fifth Grade	2012	43	43	0	0.0	4	9.3	21	48.8	13	30.2	5	11.6	744.2	658.7	50.0
Total	Sixth Grade	2012	61	61	0	0.0	4	6.6	19	31.1	28	45.9	10	16.4	772.1	684.1	62.0
Total	Seventh Grade	2012	59	59	0	0.0	8	13.6	20	33.9	23	39.0	8	13.6	752.5	680.8	55.0
Total	Eighth Grade	2012	59	59	0	0.0	7	11.9	29	49.2	20	33.9	3	5.1	732.2	697.2	57.0
Total	Algebra 1	2012	69	69	0	0.0	11	15.9	27	39.1	24	34.8	7	10.1	739.1	196.0	--
Total	Algebra 2	2012	32	32	0	0.0	5	15.6	13	40.6	14	43.8	0	0.0	728.1	193.1	--
Total	Geometry	2012	48	48	0	0.0	13	27.1	21	43.8	14	29.2	0	0.0	702.1	189.6	--

Figure C.7. Screen Shot of Missouri Comprehensive Data System Content Standard Summary Report

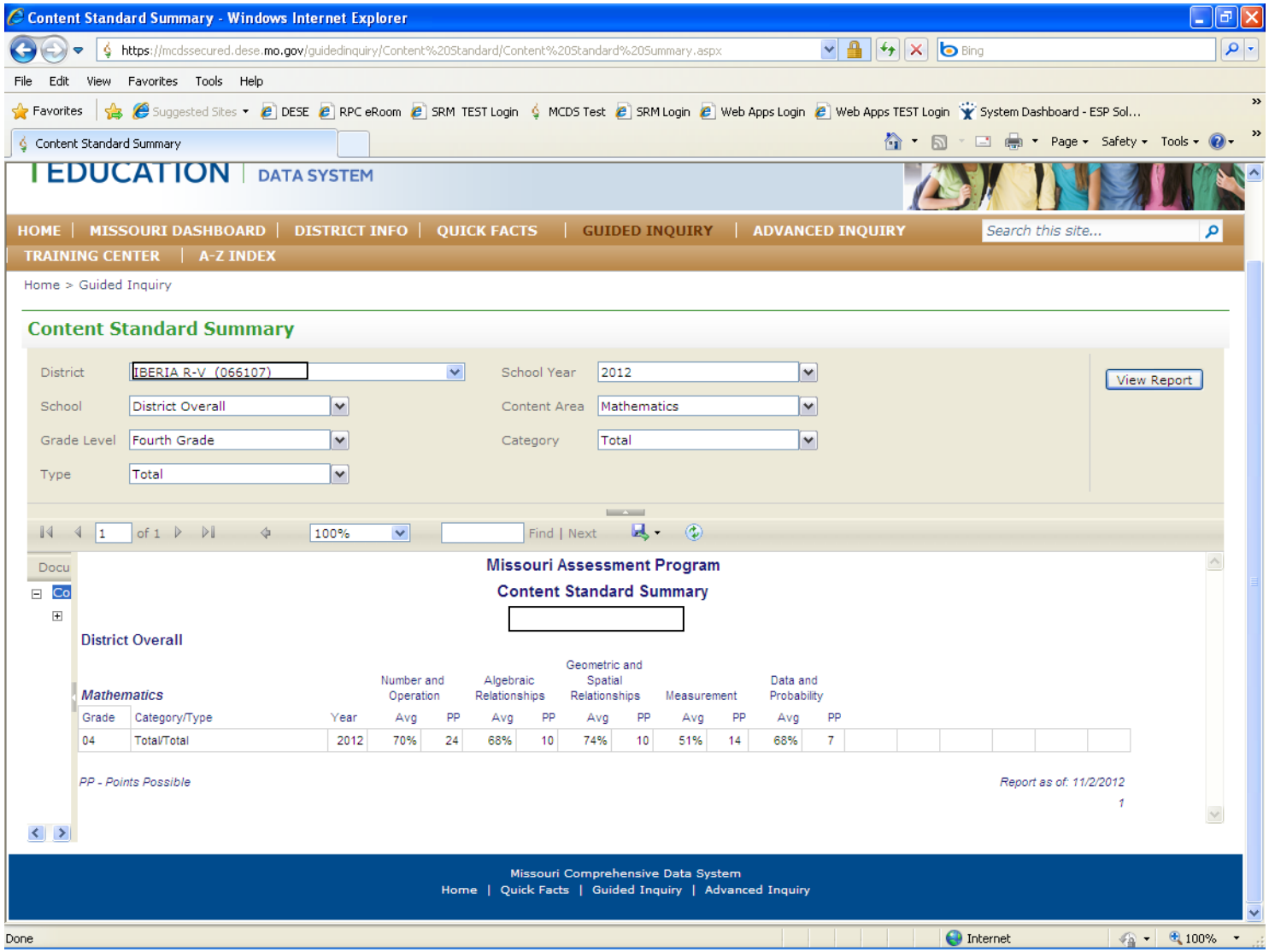
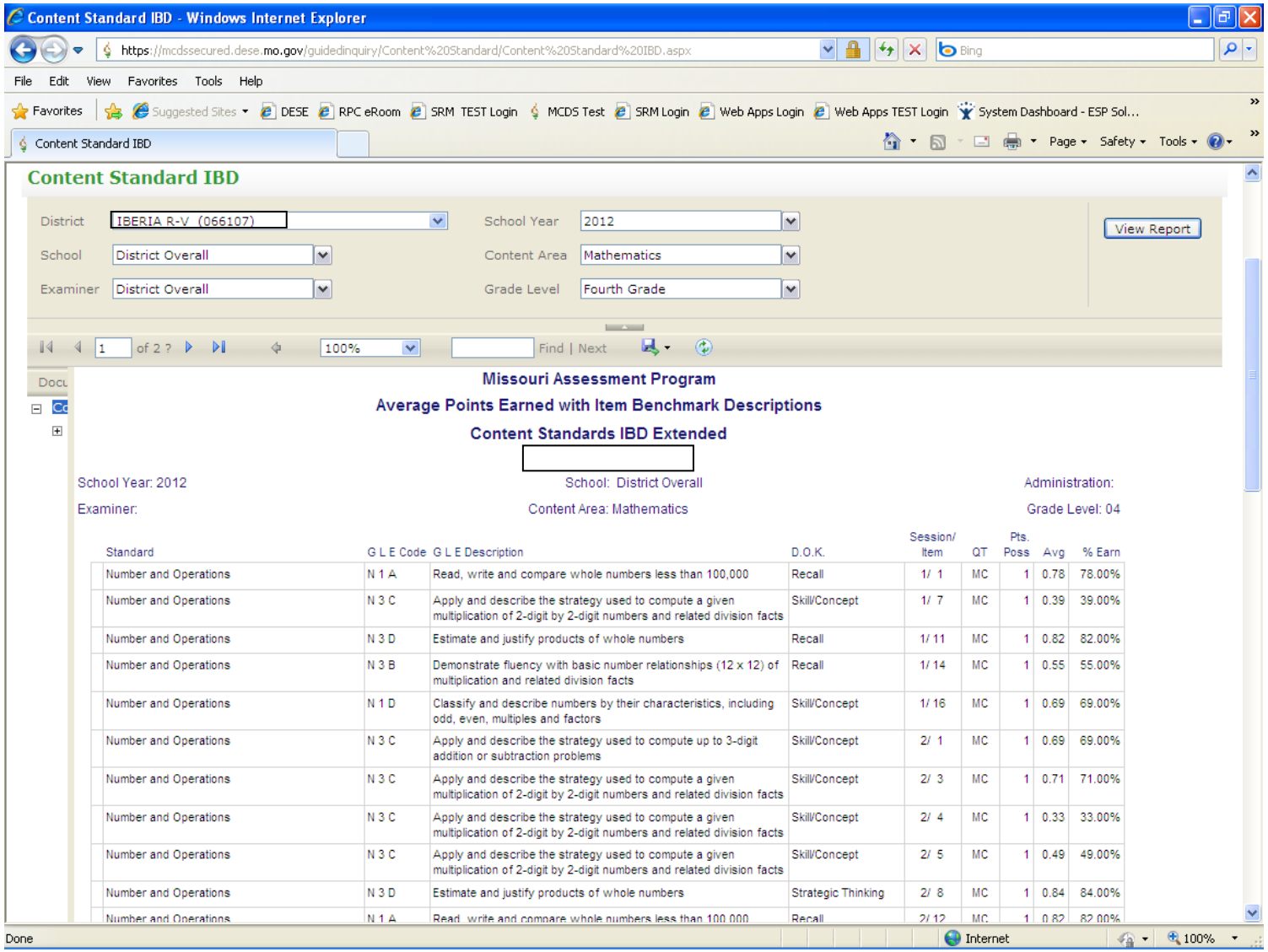
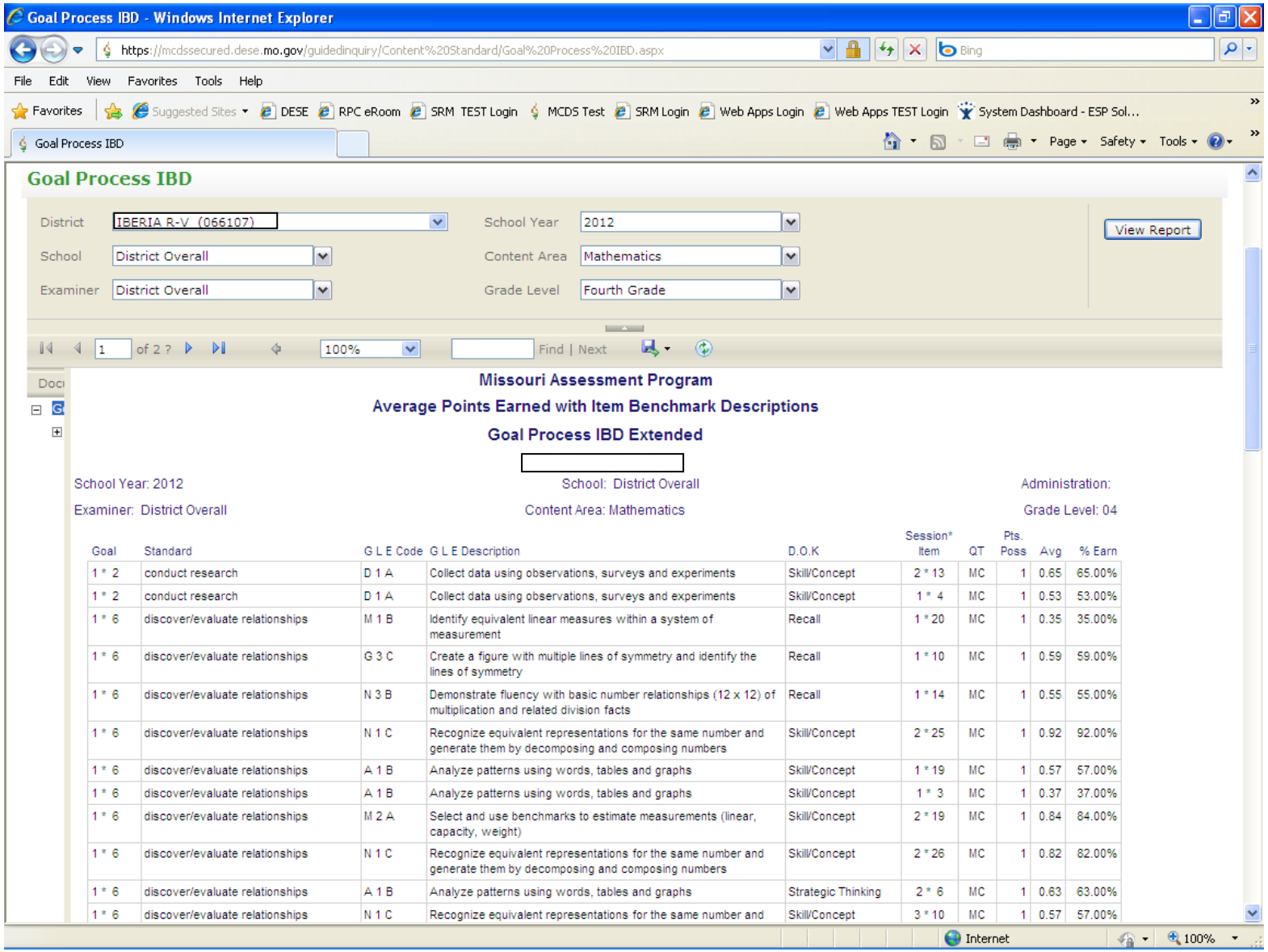


Figure C.8. Screen Shot of Missouri Comprehensive Data System Content Standard IBD Extended Report



Standard	G L E Code	G L E Description	D.O.K.	Session/ Item	QT	Pts. Poss	Avg	% Earn
Number and Operations	N 1 A	Read, write and compare whole numbers less than 100,000	Recall	1/ 1	MC	1	0.78	78.00%
Number and Operations	N 3 C	Apply and describe the strategy used to compute a given multiplication of 2-digit by 2-digit numbers and related division facts	Skill/Concept	1/ 7	MC	1	0.39	39.00%
Number and Operations	N 3 D	Estimate and justify products of whole numbers	Recall	1/ 11	MC	1	0.82	82.00%
Number and Operations	N 3 B	Demonstrate fluency with basic number relationships (12 x 12) of multiplication and related division facts	Recall	1/ 14	MC	1	0.55	55.00%
Number and Operations	N 1 D	Classify and describe numbers by their characteristics, including odd, even, multiples and factors	Skill/Concept	1/ 16	MC	1	0.69	69.00%
Number and Operations	N 3 C	Apply and describe the strategy used to compute up to 3-digit addition or subtraction problems	Skill/Concept	2/ 1	MC	1	0.69	69.00%
Number and Operations	N 3 C	Apply and describe the strategy used to compute a given multiplication of 2-digit by 2-digit numbers and related division facts	Skill/Concept	2/ 3	MC	1	0.71	71.00%
Number and Operations	N 3 C	Apply and describe the strategy used to compute a given multiplication of 2-digit by 2-digit numbers and related division facts	Skill/Concept	2/ 4	MC	1	0.33	33.00%
Number and Operations	N 3 C	Apply and describe the strategy used to compute a given multiplication of 2-digit by 2-digit numbers and related division facts	Skill/Concept	2/ 5	MC	1	0.49	49.00%
Number and Operations	N 3 D	Estimate and justify products of whole numbers	Strategic Thinking	2/ 8	MC	1	0.84	84.00%
Number and Operations	N 1 A	Read, write and compare whole numbers less than 100,000	Recall	2/ 12	MC	1	0.82	82.00%

Figure C.9. Screen Shot of Missouri Comprehensive Data System Goal Process IBD Extended Report



Goal	Standard	G L E Code	G L E Description	D.O.K	Session* Item	QT	Pts. Poss	Avg	% Earn
1 * 2	conduct research	D 1 A	Collect data using observations, surveys and experiments	Skill/Concept	2 * 13	MC	1	0.65	65.00%
1 * 2	conduct research	D 1 A	Collect data using observations, surveys and experiments	Skill/Concept	1 * 4	MC	1	0.53	53.00%
1 * 6	discover/evaluate relationships	M 1 B	Identify equivalent linear measures within a system of measurement	Recall	1 * 20	MC	1	0.35	35.00%
1 * 6	discover/evaluate relationships	G 3 C	Create a figure with multiple lines of symmetry and identify the lines of symmetry	Recall	1 * 10	MC	1	0.59	59.00%
1 * 6	discover/evaluate relationships	N 3 B	Demonstrate fluency with basic number relationships (12 x 12) of multiplication and related division facts	Recall	1 * 14	MC	1	0.55	55.00%
1 * 6	discover/evaluate relationships	N 1 C	Recognize equivalent representations for the same number and generate them by decomposing and composing numbers	Skill/Concept	2 * 25	MC	1	0.92	92.00%
1 * 6	discover/evaluate relationships	A 1 B	Analyze patterns using words, tables and graphs	Skill/Concept	1 * 19	MC	1	0.57	57.00%
1 * 6	discover/evaluate relationships	A 1 B	Analyze patterns using words, tables and graphs	Skill/Concept	1 * 3	MC	1	0.37	37.00%
1 * 6	discover/evaluate relationships	M 2 A	Select and use benchmarks to estimate measurements (linear, capacity, weight)	Skill/Concept	2 * 19	MC	1	0.84	84.00%
1 * 6	discover/evaluate relationships	N 1 C	Recognize equivalent representations for the same number and generate them by decomposing and composing numbers	Skill/Concept	2 * 26	MC	1	0.82	82.00%
1 * 6	discover/evaluate relationships	A 1 B	Analyze patterns using words, tables and graphs	Strategic Thinking	2 * 6	MC	1	0.63	63.00%
1 * 6	discover/evaluate relationships	N 1 C	Recognize equivalent representations for the same number and	Skill/Concept	3 * 10	MC	1	0.57	57.00%

Figure C.10. Example of Missouri Assessment Program Summary Report

Missouri Assessment Program

(MAP) Grade - Level

Summary Report

School: PINE VALLEY

Grade: 8

Simulated Data

Purpose
This report shows the number and percent of students locally in each of the four achievement levels. Instructional priorities can be established using this information along with other sources.

Test Date: MM/DD/YY

CODES: 048-078-2569
District: BIG CREEK
State: MISSOURI

City/State: ANYWHERE, MO

Communication Arts

Achievement Levels	Reportable	Accountable	Descriptions
ADVANCED	1% 3 Students	1% 3 Students	Reading-Students analyze complex information, author's purpose, characters; synthesize information; summarize complex ideas; make complex inferences. Writing-Students edit text correctly applying the rules/conventions of Standard English. **MAP score range: 723-875.**
PROFICIENT	10% 33 Students	9% 33 Students	Reading-Students summarize; infer vocabulary meaning and cause/effect; interpret figurative language; analyze text features; follow multi-step directions; identify author's technique; analyze text; make inferences, interpretations, predictions, comparisons, using complex material; evaluate evidence, reliability of resources. Writing-Students edit for relevant details and purpose; organize and edit text; consistently use rules/conventions of Standard English. **MAP score range: 696-722.**
BASIC	29% 96 Students	27% 96 Students	Reading-Students define simple vocabulary; identify main idea; draw simple conclusions; make simple inferences; recall details from text; determine reliability of resources. Writing-Students write a paragraph to a specific audience. **MAP score range: 639-695.**
BELOW BASIC	38% 125 Students	37% 125 Students	Reading-Students identify author's purpose, figurative language, plot, and setting; use context clues to choose vocabulary. Writing-Students create a graphic organizer; write a basic paragraph; show some awareness of audience. **MAP score range: 530-638.**
LEVEL NOT DETERMINED		6% 20 Students	Students in this category are absent or did not have a valid attempt on one or more test sessions. A valid attempt on any item of the MAP test is necessary in order to receive a MAP score. The valid attempt rules for a TerraNova score are as follows: Attempt any five items or get one correct in the TerraNova item group.
Total Number of Students	**330**	**350**	

TerraNova National Percentile

NP of Mean NCE*:	55
Median NP:	54.0
No. Students with TerraNova scores:	330

The number of students reported in each of the 4 achievement levels is the same for "Reportable" and "Accountable" because only students with a valid attempt are assigned an achievement level. The percentage of students in the Reportable column is based on the sum of all 4 achievement levels. The Accountable column adds a "Level Not Determined" that includes all students who do not have an assigned achievement level. The percentage of students is based on the sum of all 4 levels plus Level Not Determined.

*National Percentile of the Mean Normal Curve Equivalent

5/08/12

Layout of General Research File

MAP Grade-Level Assessment 2012GRF

Start	End	Len	Field	Values	Remarks
			Hierarchical Data		
1	1	1	Mode level	1 = State 2 = District 3 = School 4 = Class	CTB Use
2	11	10	Organization ID	A-Z, 0-9	CTB Use
12	41	30	Element Name - District	Any character, blank	District Name
42	43	2	Element Structure Level Number - District	02	
44	50	7	Element Number - District	0-9	
51	53	3	District/Element Special Codes A-C (Region Code)	Any character, '.'	Region Code
54	56	3	District/Element Special Codes D-F (District Code)	Any character, '.'	District Code
57	76	20	District Special Codes G-Z	Any character, '.'	CTB Use
77	78	2	Grade	03-08	
79	108	30	City	Any character, blank	
109	110	2	State	MO	
111	140	30	Element Name- School	Any character, blank	School Name
141	142	2	Element Structure Level Number - School	03	
143	149	7	Element Number - School	0-9	
150	152	3	School/Element Special Codes A-C (Region Code)	Any character, '.'	Region Code
153	155	3	School/Element Special Codes D-F (District Code)	Any character, '.'	District Code
156	159	4	School/Element Special Codes G-J (School Code)	Any character, '.'	School Code
160	175	16	School/Element Special Codes K-Z	Any character, '.'	CTB Use
176	205	30	Element Name- Class	Any character, blank	Teacher Name
206	207	2	Element Structure Level Number- Class	04	
208	214	7	Element Number-Class	0-9	
215	217	3	Class/Element Special Codes A-C (Region Code)	Any character, '.'	Region Code
218	220	3	Class/Element Special Codes D-F (District Code)	Any character, '.'	District Code
221	224	4	Class/Element Special Codes G-J (School Code)	Any character, '.'	School Code
225	240	16	Class/Element Special Codes K-Z	Any character, '.'	CTB Use
241	247	7	Student Element Number	0-9	
248	275	28	Test Name	"MAP Grade-Level Assessment"	
276	278	3	*TerraNova Form/Level* : Communication Arts	E13 = Gr. 3, E14 = Gr. 4, E15 = Gr. 5, E16 = Gr. 6, E17 = Gr. 7, E18 = Gr. 8 or blank	
279	281	3	*TerraNova Form/Level* : Mathematics	E13 = Gr. 3, E14 = Gr. 4, E15 = Gr. 5, E16 = Gr. 6, E17 = Gr. 7, E18 = Gr. 8 or blank	

Start	End	Len	Field	Values	Remarks
282	284	3	*TerraNova Form/Level* : Science	E15 = Gr. 5, D18 = Gr. 8 or blank	
285	290	6	Test Date (MMDDYY)		Input from Scoring
			Special codes (Length 26)	See Definitions tab	
291	300	10	MOSIS State ID	0-9	
301	310	10	CTB Use	'.'	
311	311	1	Race/ Ethnicity	*0 = Native American or Alaska Native* *1 = Asian* *2 = Pacific Islander* *3 = Black (not Hispanic)* *4 = Hispanic* *5 = White (not Hispanic)* *6 = Other* *'-' = multi-mark* *'.' = blank*	
312	314	3	CTB Use	'.'	
315	315	1	Filler	*Blank*	
316	316	1	CTB Use	'.'	
			User Defined Data		
			Accommodation - CA		
317	317	1	01 Braille edition	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
318	318	1	02 Large Print edition	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
319	319	1	04 Oral reading – **invalidates CA**	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
320	320	1	04 Oral reading – (Blind/Partial Sight)	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
321	321	1	05 Signing of assessment – **invalidates CA**	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
322	322	1	06 Paraphrasing – **invalidates all tests**	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
323	323	1	10 Other Administration	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	

Start	End	Len	Field	Values	Remarks
324	324	1	11 Oral reading in native language – **invalidates CA**	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
325	325	1	20 Extend time–*TerraNova* session	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
326	326	1	21 Administer using > allotted periods	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
327	327	1	22 Other timing	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
328	328	1	35 Use of scribe	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
329	329	1	39 Use of calculator, math table, etc.	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
330	330	1	43 Use of bilingual dictionary **- invalidates CA**	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
331	331	1	44 Other response	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
332	332	1	50 Testing individually	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
333	333	1	51 Testing in small group	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
334	334	1	53 Other setting	*Blank=Not Marked* *0=Marked* *(Communication Arts)*	
335	338	4	Blank for Future Use(4)		
			Accommodation - MA		
339	339	1	01 Braille edition	*Blank=Not Marked* *0=Marked* *Mathematics*	
340	340	1	02 Large Print edition	*Blank=Not Marked* *0=Marked* *Mathematics*	

Start	End	Len	Field	Values	Remarks
341	341	1	04 Oral reading	*Blank=Not Marked* *0=Marked* *Mathematics*	
342	342	1	05 Signing of assessment	*Blank=Not Marked* *0=Marked* *Mathematics*	
343	343	1	06 Paraphrasing **– invalidates all tests**	*Blank=Not Marked* *0=Marked* *Mathematics*	
344	344	1	10 Other Administration	*Blank=Not Marked* *0=Marked* *Mathematics*	
345	345	1	11 Oral reading in native language	*Blank=Not Marked* *0=Marked* *Mathematics*	
346	346	1	20 Extend time–*TerraNova* session	*Blank=Not Marked* *0=Marked* *Mathematics*	
347	347	1	21 Administer using > allotted periods	*Blank=Not Marked* *0=Marked* *Mathematics*	
348	348	1	22 Other timing	*Blank=Not Marked* *0=Marked* *Mathematics*	
349	349	1	35 Use of scribe	*Blank=Not Marked* *0=Marked* *Mathematics*	
350	350	1	39 Use of calculator, math table, etc.	*Blank=Not Marked* *0=Marked* *Mathematics*	
351	351	1	43 Use of bilingual dictionary	*Blank=Not Marked* *0=Marked* *Mathematics*	
352	352	1	44 Other response	*Blank=Not Marked* *0=Marked* *Mathematics*	
353	353	1	50 Testing individually	*Blank=Not Marked* *0=Marked* *Mathematics*	
354	354	1	51 Testing in small group	*Blank=Not Marked* *0=Marked* *Mathematics*	

Start	End	Len	Field	Values	Remarks
355	355	1	53 Other setting	*Blank=Not Marked* *0=Marked* *Mathematics*	
356	360	5	Blank for Future Use(5)		
			Accommodation - SC		
361	361	1	01 Braille edition	*Blank=Not Marked* *0=Marked* *Science*	
362	362	1	02 Large Print edition	*Blank=Not Marked* *0=Marked* *Science*	
363	363	1	04 Oral reading	*Blank=Not Marked* *0=Marked* *Science*	
364	364	1	05 Signing of assessment	*Blank=Not Marked* *0=Marked* *Science*	
365	365	1	06 Paraphrasing **– invalidates all tests**	*Blank=Not Marked* *0=Marked* *Science*	
366	366	1	10 Other Administration	*Blank=Not Marked* *0=Marked* *Science*	
367	367	1	11 Oral reading in native language	*Blank=Not Marked* *0=Marked* *Science*	
368	368	1	20 Extend time–*TerraNova* session	*Blank=Not Marked* *0=Marked* *Science*	
369	369	1	21 Administer using > allotted periods	*Blank=Not Marked* *0=Marked* *Science*	
370	370	1	22 Other timing	*Blank=Not Marked* *0=Marked* *Science*	
371	371	1	35 Use of scribe	*Blank=Not Marked* *0=Marked* *Science*	
372	372	1	39 Use of calculator, math table, etc.	*Blank=Not Marked* *0=Marked* *Science*	

Start	End	Len	Field	Values	Remarks
373	373	1	43 Use of bilingual dictionary	*Blank=Not Marked* *0=Marked* *Science*	
374	374	1	44 Other response	*Blank=Not Marked* *0=Marked* *Science*	
375	375	1	50 Testing individually	*Blank=Not Marked* *0=Marked* *Science*	
376	376	1	51 Testing in small group	*Blank=Not Marked* *0=Marked* *Science*	
377	377	1	53 Other setting	*Blank=Not Marked* *0=Marked* *Science*	
378	392	15	Blank for Future Use		
			Teacher Invalidations		
393	393	1	Teacher Invalidation_CommArts_Session 1	*Blank= No Invalidation marked* *0 = Invalidated this session*	
394	394	1	Teacher Invalidation_CommArts_Session 2	*Blank= No Invalidation marked* *0 = Invalidated this session*	
395	395	1	Teacher Invalidation_CommArts_Session 3	*Blank= No Invalidation marked* *0 = Invalidated this session*	
396	396	1	Unused		
397	397	1	Teacher Invalidation_Mathematics_Session 1	*Blank= No Invalidation marked* *0 = Invalidated this session*	
398	398	1	Teacher Invalidation_Mathematics_Session 2	*Blank= No Invalidation marked* *0 = Invalidated this session*	
399	399	1	Teacher Invalidation_Mathematics_Session 3	*Blank= No Invalidation marked* *0 = Invalidated this session*	
400	400	1	Teacher Invalidation_Science_Session 1	*Blank= No Invalidation marked* *0 = Invalidated this session*	
401	401	1	Teacher Invalidation_Science_Session 2	*Blank= No Invalidation marked* *0 = Invalidated this session*	
402	402	1	Unused		
403	407	5	Blank for Future Use(5)		
			Absent in Session		
408	408	1	CA Absent Session 1	*Blank= No Absent marked* *0 = Absent this session*	
409	409	1	CA Absent Session 2	*Blank= No Absent marked* *0 = Absent this session*	

Start	End	Len	Field	Values	Remarks
410	410	1	CA Absent Session 3	*Blank= No Absent marked* *0 = Absent this session*	
411	411	1	Unused		
412	412	1	MA Absent Session 1	*Blank= No Absent marked* *0 = Absent this session*	
413	413	1	MA Absent Session 2	*Blank= No Absent marked* *0 = Absent this session*	
414	414	1	MA Absent Session 3	*Blank= No Absent marked* *0 = Absent this session*	
415	415	1	SC Absent Session 1	*Blank= No Absent marked* *0 = Absent this session*	
416	416	1	SC Absent Session 2	*Blank= No Absent marked* *0 = Absent this session*	
417	417	1	Unused		
417	417		**Not Enrolled for Content Area**		
418	418	1	CA Not Enrolled	*Blank=Not Marked* *0=Marked* *Communication Arts*	
419	419	1	MA Not Enrolled	*Blank=Not Marked* *0=Marked* *Mathematics*	
420	420	1	SC Not Enrolled	*Blank=Not Marked* *0=Marked* *Science*	
421	423	3	Blank for Future Use(3)	*Blank*	
423	423		**Student BIO Information**		
424	431	8	Student Barcode	0-9, blank	
432	439	8	Book Lithocode	0-9, blank	
440	447	8	Book Security Barcode	A-Z, 0-9, blank	
448	453	6	Birth Date (MMDDYY)	MM=01-12, DD=0-3,&0-9, YY=0,8,9, & 0-9 blank, '-' = multi-mark	
454	454	1	Scoring: 'I' = IRT (Communication arts, Math, Science)	'I', blank	
455	456	2	Quarter-month - '30' (for TerraNova - Sessions) Communication Arts (Reading), Math, Science	30, blank	
457	471	15	Last name	A - Z, a - z, blank	
472	491	20	First Name	A - Z, a - z, blank	
492	492	1	Middle Initial	A - Z, a - z, blank	
493	496	4	Chronological Age (in months) - right aligned	0-9, blank	
497	497	1	Gender	blank=None marked, 'F'=Female 'M'=Male , '-' = both marked	

Start	End	Len	Field	Values	Remarks
498	498	1	State Use 1	0 for the Marked bubble. Blank if not marked.	
499	499	1	State Use 2	1 for the Marked bubble. Blank if not marked.	
500	500	1	State Use 3	2 for the Marked bubble. Blank if not marked.	
501	501	1	State Use 4	3 for the Marked bubble. Blank if not marked.	
502	502	1	State Use 5	4 for the Marked bubble. Blank if not marked.	
503	503	1	State Use 6	5 for the Marked bubble. Blank if not marked.	
504	504	1	State Use 7	6 for the Marked bubble. Blank if not marked.	
505	505	1	State Use 8	7 for the Marked bubble. Blank if not marked.	
506	506	1	State Use 9	8 for the Marked bubble. Blank if not marked.	
507	507	1	State Use 10	9 for the Marked bubble. Blank if not marked.	
508	527	20	Blank for Future Use(20)	blank	
528	545	18	**Content Area Title - Communication Arts**	"Communication Arts", blank	
546	548	3	1st Reportable Content Standard	Content Standard Scores - % of points earned - 000 through 100. If a student does not have a MAP Grade-Level Assessment score (a session not taken or absent or invalidated), all content standards will be reported as blanks. Content Standard scores will carry leading zeros.	
549	551	3	2nd Reportable Content Standard		
552	554	3	3rd Reportable Content Standard		
555	557	3	4th Reportable Content Standard		
558	560	3	5th ReportableContent Standard		
561	563	3	6th Reportable Content Standard		
564	566	3	7th Reportable Content Standard		
567	569	3	8th Reportable Content Standard		
570	572	3	9th Reportable Content Standard		
573	575	3	10th Reportable Content Standard		
576	590	15	Reserved - Filler	blank	
591	596	6	1st Reportable Process Standard	Process Standards Scores - % of pts. earned - 000 through 100; If a student does not have a MAP Grade-Level Assessment score (a session not taken or absent or invalidated), all process standards will be reported as blanks	
597	602	6	2nd Reportable Process Standard		
603	608	6	3rd Reportable Process Standard		
609	614	6	4th Reportable Process Standard		
615	620	6	5th Reportable Process Standard		
621	626	6	6th Reportable Process Standard		
627	632	6	7th Reportable Process Standard		
633	638	6	8th Reportable Process Standard		

Start	End	Len	Field	Values	Remarks
639	644	6	9th Reportable Process Standard	including Goal and Standard Number	
645	650	6	10th Reportable Process Standard		
651	656	6	11th Reportable Process Standard	Process Standard scores will carry leading zeros.	
657	662	6	12th Reportable Process Standard		
663	668	6	13th Reportable Process Standard	Position 1 = Goal number	
669	674	6	14th Reportable Process Standard	Positions 2 to 3 = Standard number	
675	680	6	15th Reportable Process Standard	Positions 4 to 6 = % of pts. earned	
681	681	1	Achievement Level for Comm. Arts	0, 2, 3, 4, 5, blank. See definitions	
682	684	3	MAP Scale Score	000-999, blank	
685	687	3	CTB use - TerraNova Scale score	000-999, blank	
688	691	4	CTB use - TerraNova Norm Year	"2005", blank	
692	693	2	TerraNova NP score	00-99, blank	
694	697	4	Reserved - Filler	blank	
698	698	1	MAP Test Status - Communication Arts	blank=valid test. See definitions	
699	728	30	Blank for Future Use(30)		
729	746	18	**Content Area Title - Mathematics**	"Mathematics", blank	
747	749	3	1st Reportable Content Standard	Content Standard Scores - % of points earned -	
750	752	3	2nd Reportable Content Standard	000 through 100. If a student does not have a	
753	755	3	3rd Reportable Content Standard	MAP Grade-Level Assessment score	
756	758	3	4th Reportable Content Standard	(a session not taken or absent or invalidated), all	
759	761	3	5th Reportable Content Standard	content	
762	764	3	6th Reportable Content Standard	standards will be reported as blanks.	
765	767	3	7th Reportable Content Standard	Content Standard scores will carry leading zeros	
768	770	3	8th Reportable Content Standard		
771	773	3	9th Reportable Content Standard		
774	776	3	10th ReportableContent Standard		
777	791	15	11th Reportable Content Standard		
792	797	6	1st Reportable Process Standard		
798	803	6	2nd Reportable Process Standard	Process Standards Scores - % of pts.	
804	809	6	3rd Reportable Process Standard	earned - 000 through 100;	
810	815	6	4th Reportable Process Standard		
816	821	6	5th Reportable Process Standard	If a student does not have a MAP Grade-Level	
822	827	6	6th Reportable Process Standard	Assessment score	
828	833	6	7th Reportable Process Standard	(a session not taken or absent or invalidated), all	
834	839	6	8th Reportable Process Standard	process standards will be reported as blanks	
840	845	6	9th Reportable Process Standard	including Goal and Standard Number	
846	851	6	10th Reportable Process Standard		
852	857	6	11th Reportable Process Standard	Process Standard scores will carry leading zeros.	
858	863	6	12th Reportable Process Standard		
864	869	6	13th Reportable Process Standard	Position 1 = Goal number	
870	875	6	14th Reportable Process Standard	Positions 2 to 3 = Standard number	
876	881	6	15th Reportable Process Standard	Positions 4 to 6 = % of pts. earned	
882	882	1	Achievement Level for Math	0, 2, 3, 4, 5, blank. See definitions	

Start	End	Len	Field	Values	Remarks
883	885	3	MAP Scale Score	000-999, blank	
886	888	3	CTB use - TerraNova Scale score	000-999, blank	
889	892	4	CTB use - TerraNova Norm Year	"2005", blank	
893	894	2	TerraNova NP score	00-99, blank	
895	895	1	MAP Test Status - Mathematics	blank=valid test. See definitions	
896	925	30	Blank for Future Use(30)		
926	943	18	**Content Area Title - Science**	"Science", blank	
944	946	3	1st Reportable Content Standard		
947	949	3	2nd Reportable Content Standard		
950	952	3	3rd Reportable Content Standard		
953	955	3	4th Reportable Content Standard	Content Standard Scores - % of points earned -	
956	958	3	5th Reportable Content Standard	000 through 100. If a student does not have a	
959	961	3	6th Reportable Content Standard	MAP Grade-Level Assessment score	
962	964	3	7th Reportable Content Standard	(a session not taken or absent or invalidated), all	
965	967	3	8th Reportable Content Standard	content	
968	970	3	9th Reportable Content Standard	standards will be reported as blanks.	
971	973	3	10th ReportableContent Standard	Content Standard scores will carry leading zeros.	
974	988	15	Reserved - Filler	blank	
989	994	6	1st Reportable Process Standard		
995	1000	6	2nd Reportable Process Standard	Process Standards Scores - % of pts.	
1001	1006	6	3rd Reportable Process Standard	earned - 000 through 100;	
1007	1012	6	4th Reportable Process Standard		
1013	1018	6	5th Reportable Process Standard	If a student does not have a MAP Grade-Level	
1019	1024	6	6th Reportable Process Standard	Assessment score	
1025	1030	6	7th Reportable Process Standard	(a session not taken or absent or invalidated), all	
1031	1036	6	8th Reportable Process Standard	process standards will be reported as blanks	
1037	1042	6	9th Reportable Process Standard	including Goal and Standard Number	
1043	1048	6	10th Reportable Process Standard		
1049	1054	6	11th Reportable Process Standard	Process Standard scores will carry leading zeros.	
1055	1060	6	12th Reportable Process Standard		
1061	1066	6	13th Reportable Process Standard	Position 1 = Goal number	
1067	1072	6	14th Reportable Process Standard	Positions 2 to 3 = Standard number	
1073	1078	6	15th Reportable Process Standard	Positions 4 to 6 = % of pts. earned	
1079	1079	1	Achievement Level for Science	0, 2, 3, 4, 5, blank. See Definitions tab	
1080	1082	3	MAP Scale Score	000-999, blank	
1083	1085	3	CTB use - TerraNova Scale score	000-999, blank	
1086	1089	4	CTB use - TerraNova Norm Year	"2005", blank	
1090	1091	2	TerraNova NP score	00-99, blank	
1092	1092	1	MAP Test Status - Science	blank=valid test. See Definitions tab	
1093	1122	30	Blank for Future Use(30)	blank	
			Item Response	See Definitions tab for item suppression information	
1123	1152	30	Communication Arts Session 1		

Start	End	Len	Field	Values	Remarks
1153	1212	60	Communication Arts Session 2		
1213	1272	60	Communication Arts Session 3		
1273	1292	20	Unused		
1293	1352	60	Mathematics Session 1		
1353	1412	60	Mathematics Session 2		
1413	1442	30	Mathematics Session 3		
1443	1482	40	Science Session 1		
1483	1542	60	Science Session 2		
1543	1602	60	Unused		

Appendix D

Missouri Assessment Program Achievement Level Descriptors

Achievement-Level Descriptors

Communication Arts, Abbreviated Achievement-Level Descriptors

Grade 3

Below Basic

Reading—Students locate information in text; identify an obvious main idea; define simple words and phrases. Writing—Students show minimal awareness of audience; attempt to create friendly letters.

MAP score range: 455–591.

Basic

Reading—Students make simple comparisons; recall simple sequence of events; make obvious inferences and predictions; use context clues to determine word meaning. Writing—Students use basic parts of speech correctly in simple sentences; show minimal awareness of audience and use some detail.

MAP score range: 592–647.

Proficient

Reading—Students locate/identify supporting details, obvious cause and effect; make inferences; use context clues to determine word meaning; make comparisons; recall detailed sequence of events; identify solutions and fact vs. fiction; recognize figurative language; draw obvious conclusions. Writing—Students generally use rules of Standard English; show awareness of audience and include relevant details.

MAP score range: 648–672.

Advanced

Reading—Students identify relevant/supporting information to make predictions and draw conclusions; infer word meaning; infer main idea; make complex comparisons; make complex inferences; categorize information; identify correct sequence of events. Writing—Students consistently apply rules of Standard English; have an awareness of audience; use detail effectively.

MAP score range: 673–790.

Grade 4

Below Basic

Reading—Students locate information in text; recall stated information; draw obvious conclusions; make simple comparisons and descriptions. Writing—Students write simple letters, minimally use the rules of Standard English; attempt to organize information.

MAP score range: 470–611.

Basic

Reading—Students identify appropriate details; use context clues; make obvious inferences; select vocabulary using context clues. Writing—Students write simple letters with an awareness of an intended audience and purpose; generally use the rules of Standard English.

MAP score range: 612–661.

Proficient

Reading—Students make simple inferences; recall, identify, and use relevant information; draw conclusions; explain figurative language and main idea; use context clues to select vocabulary; identify character traits, sensory details, and simple cause and effect. Writing—Students show organization and awareness of an intended audience and purpose; use the rules of Standard English; use a writing process to revise, edit, and proofread.

MAP score range: 662–690.

Advanced

Reading—Students make complex inferences and comparisons; evaluate simple information; infer cause/effect and word meaning; interpret figurative language; identify author's purpose; identify complex problems/solutions; explain complex main ideas. Writing—Students consistently use the rules of Standard English.

MAP score range: 691–820.

Grade 5

Below Basic

Reading—Students locate/identify information in text; draw simple conclusions; make obvious inferences and predictions; identify character traits. Writing—Students use correct letter writing format; partially organize information.

MAP score range: 485–624.

Basic

Reading—Students identify supporting details, problems/solutions; use context clues; make obvious inferences; give partial summary of action. Writing—Students edit for Standard English.

MAP score range: 625–674.

Proficient

Reading—Students interpret figurative language; infer main idea; identify author's purpose, point of view, the sequence of information, cause/effect, the meaning of vocabulary; summarize; distinguish between fact and opinion; draw conclusions; make inferences and comparisons; support a position. Writing—Students use the rules of Standard English; construct complex sentences; edit for appropriate support; organize information.

MAP score range: 675–701.

Advanced

Reading—Students interpret and draw conclusions from complex information; analyze complex characters; infer author's purpose and word meaning; categorize information; make simple evaluations and judgments; determine the appropriateness of a source and the accuracy of information. Writing—Students consistently use the rules of Standard English; use a writing process to organize information.

MAP score range: 702–840.

Communication Arts, Abbreviated Achievement-Level Descriptors

Grade 6

Below Basic

Reading—Students locate/identify information in text; make simple inferences; identify main idea, sensory information, figurative language, simple problems or solutions. Writing—Students show awareness of audience and letter format; use simple organizational techniques and graphic organizers; use simple rules of Standard English.

MAP score range: 505–630.

Basic

Reading—Students identify supporting information, simple cause/effect relationships, conflicts, point of view and problem-solving processes. Writing—Students use correct letter writing format; generally use the rules of Standard English including spelling; revise; have a controlling idea.

MAP score range: 631–675.

Proficient

Reading—Students identify author's purpose, supporting details, point of view; describe character traits, plot; identify problems/solutions; support a position with text-based details; draw conclusions; interpret figurative language; make inferences and predictions; locate resources. Writing—Students use the rules of Standard English; construct complex sentences; write for an audience and purpose; organize information.

MAP score range: 676–703.

Advanced

Reading—Students make complex connections; analyze complex characters; evaluate the accuracy and importance of information; draw conclusions and make inferences from complex information; analyze complex characters; determine cause and effect; paraphrase. Writing—Students demonstrate consistent use of a controlling idea and Standard English.

MAP score range: 704–855.

Grade 7

Below Basic

Reading—Students locate and apply information in text; identify figurative language, text elements, problems/solutions, and character traits; make obvious predictions. Writing—Students organize information; use some components of letter writing format; show minimal awareness of audience and purpose; minimally use rules and conventions of Standard English.

MAP score range: 515–633.

Basic

Reading—Students identify text-based details; identify main idea; make simple summaries; identify the meaning of figurative language; draw simple conclusions; make simple inferences. Writing—Students show some awareness of audience; use some relevant details; generally use the rules of Standard English.

MAP score range: 634–679.

Proficient

Reading—Students make inferences; summarize; make comparisons and predictions using complex text; analyze characters; determine word meaning, point of view, supporting information; locate resources. Writing—Students use relevant details; write for a specific audience; use rules and conventions of Standard English.

MAP score range: 680–711.

Advanced

Reading—Students interpret complex figurative language and vocabulary; support a position; make predictions; summarize, analyze, and synthesize information and techniques; paraphrase ideas. Writing—Students consistently use the rules and conventions of Standard English; use details effectively; target specific audience.

MAP score range: 712–865.

Grade 8

Below Basic

Reading—Students identify author's purpose, figurative language, plot, and setting; use context clues to choose vocabulary. Writing—Students create a graphic organizer; write a basic paragraph; show some awareness of audience.

MAP score range: 530–638.

Basic

Reading—Students define simple vocabulary; identify main idea; draw simple conclusions; make simple inferences; recall details from text; determine reliability of resources. Writing—Students write a paragraph to a specific audience.

MAP score range: 639–695.

Proficient

Reading—Students summarize; infer vocabulary meaning and cause/effect; interpret figurative language; analyze text features; follow multi-step directions; identify author's technique; analyze text; make inferences, interpretations, predictions, comparisons, using complex material; evaluate evidence, reliability of resources. Writing—Students edit for relevant details and purpose; organize and edit text; consistently use rules/conventions of Standard English.

MAP score range: 696–722.

Advanced

Reading—Students analyze complex information, author's purpose, characters; synthesize information; summarize complex ideas; make complex inferences. Writing—Students edit text correctly applying the rules/conventions of Standard English.

MAP score range: 723–875.

Mathematics, Abbreviated Achievement-Level Descriptors

Grade 3

Below Basic

Students use multiplication to model situations; recognize that addition and subtraction are inverse operations; add 2-digit numbers; apply subtraction skills; extend shapes or numbers in a pattern; use number sentences to model situations; use transformations to check congruency of shapes; recognize a line of symmetry; use an appropriate unit on a ruler to measure length; estimate length; interpret information from graphs.

MAP score range: 450–567.

Basic

Students estimate with less-than and greater-than; sort items by size; apply regrouping for adding and subtracting 3-digit numbers; order 3-digit whole numbers; count using numbers and pictures; identify and explain a pattern; use an appropriate unit of measurement; read thermometers; read analog clocks to nearest 5 minutes; use a ruler to measure to the nearest centimeter; compare data; transfer data to graphs.

MAP score range: 568–627.

Proficient

Students identify odd/even numbers; locate landmark numbers; describe change using increase/decrease; perform basic division of 2-digit whole numbers; identify and locate fractional parts; set up/solve simple word problems; recognize 2-D and 3-D shapes; combine 3-D solids; identify 2-D faces of 3-D objects; determine perimeter of polygons; identify appropriate units of measure; add monetary values up to $5.00; use calendars to determine dates; estimate length with fractions.

MAP score range: 628–666.

Advanced

Students estimate and justify results of addition/subtraction of numbers; represent a mathematical situation as a number sentence or an expression; identify multiple lines of symmetry; determine change from $5.00 including different combinations of coins; predict events as likely or unlikely.

MAP score range: 667–780.

Grade 4

Below Basic

Students write and compare decimals to the hundredths place; identify a fraction as a part of a whole; describe the results of combining shapes; identify parallel lines; estimate linear measurements; read and compare data on a bar graph; complete tables; create tables or graphs to represent data.

MAP score range: 465–595.

Basic

Students use multiplication to solve problems; analyze patterns using words, tables, and graphs; identify the missing value in a number sentence; identify 2-D and 3-D shapes and attributes; identify the results of transformations; tell time to the nearest minute; use benchmarks to estimate linear measurements; transfer numerical data to a graph; propose and justify conclusions that are based on data.

MAP score range: 596–650.

Proficient

Students compare parts of a whole as fractions; identify place value up to 6-digit whole numbers; decompose/compose whole numbers; represent multiplication using sets/arrays; divide 3-digit by 1-digit numbers; write a number sentence; describe movement on grid using geometric vocabulary; identify lines of symmetry; use standard/metric units to measure; add/subtract money values to $10.00; determine area on grid; read/interpret data on a line plot; analyze and explain data.

MAP score range: 651–687.

Advanced

Students describe constant rates of change; identify strategies to solve problems; describe numeric and geometric patterns; solve problems using graphs, tables, or number sentences; construct a figure with one line of symmetry; estimate measurement of angles; determine change from $10.00; identify equivalent linear measures within a system; count combinations of items.

MAP score range: 688–805.

Grade 5

Below Basic

Students recognize equivalent representations of numbers by composing and decomposing numbers up to 5 digits; order decimals to thousandths place; interpret place value to hundred-thousands; determine operations used in numeric patterns; use symmetry to complete figures; make generalizations about geometric patterns; describe attributes of 2-D shapes; identify data on a line graph; make and justify predictions using data; describe, compare, and organize data in a bar graph.

MAP score range: 480–604.

Basic

Students identify place value to the millions place; read, write, and compare unit fractions and decimals to the thousandths place; identify lines of symmetry; identify appropriate units of area; identify appropriate units of measure; use data to create a bar graph and perform calculations using numbers between given intervals.

MAP score range: 605–667.

Proficient

Students multiply decimals to the hundredths place; use estimation in computations; divide 3-digit by 2-digit numbers; add fractions with like denominators; solve problems involving rates of change; extend numeric patterns; complete number sentences; identify faces of 3-D and similar figures; interpret direction on a coordinate grid; calculate area using a grid; compute elapsed time in hours; analyze data in line graphs and tables; explain the probability of a simple event.

MAP score range: 668–705.

Advanced

Students use addition/subtraction of money in a real-world situation; explain and justify the results of calculations; justify and model the results of calculations involving constant rates; use number sentences to model a mathematical situation; analyze characteristics of and identify 3-D figures, quadrilaterals, and angle measures; use a coordinate grid to describe paths and determine distances between points; convert between standard units of measurement.

MAP score range: 706–830.

Mathematics, Abbreviated Achievement-Level Descriptors

Grade 6

Below Basic

Students compare and order integers, positive rational numbers, and percents; describe patterns in tables and pictures; identify properties of 2-D and 3-D shapes; identify acute, obtuse, or right angles; identify transformations of 2-D shapes; identify equivalent algebraic expressions using the associative property; read and interpret line and circle graphs.

MAP score range: 495–627.

Basic

Students generate equivalent forms of percents, fractions and decimals; determine a rule for a geometric or numeric pattern; use coordinate geometry to construct and identify 2-D shapes using ordered pairs; use models to compare and explain probabilities; estimate and interpret data in graphs.

MAP score range: 628–680.

Proficient

Students add/subtract positive rational numbers; identify least common multiple and greatest common factor; estimate quotients; determine rate of increase; analyze rates of change; use variables; compare spatial views of 3-D objects; construct polygons; describe transformations; determine area of rectangles; measure angles; convert within a system of measure; interpret and complete a table based on probability; compare/explain data; calculate measures of center.

MAP score range: 681–720.

Advanced

Students estimate and convert measurements; describe solutions to algebraic equations; recognize similarities between 2-D shapes; use properties of basic figures to draw conclusions about angle size; determine area of triangles; solve elapsed time problems; apply formula for perimeter; estimate area of a figure using a coordinate grid; interpret stem-and-leaf plots; determine appropriate data collection methods and questions; interpret data to solve problems.

MAP score range: 721–845.

Grade 7

Below Basic

Students place integers on a number line; identify shapes from a group of 2-D shapes based on a common property; transform 2-D shapes; analyze precision and accuracy using measurement tools; identify unit of measure for volume; interpret bar graphs; use representations of data from bar graphs, circle graphs, stem-and-leaf plots, and box-and-whisker plots; predict outcomes using probability.

MAP score range: 510–639.

Basic

Students multiply and divide positive rational numbers; identify bases and exponents of numbers in exponential form; recognize equivalent numerical representations; solve 2-step problems; use variables to solve inequalities and equations; analyze patterns represented numerically or graphically; read and interpret graphs.

MAP score range: 640–684.

Proficient

Students read/write numbers up to hundred-millions place; compare integers, rational numbers, percents; perform operations with mixed numbers; use circle graphs to recognize relationship of parts to whole; solve fraction/decimal/percent problems; solve proportion/scale problems; use models to solve problems; model with equations; describe and classify 2-D/3-D shapes; apply spatial reasoning to estimate area; solve time problems; solve area problems; calculate measures of center.

MAP score range: 685–723.

Advanced

Students calculate totals involving percents in multi-step problems; extend non-linear patterns; model with inequalities; apply the relationship of corresponding and similar angles; use scale factors on a grid to dilate shapes; describe corresponding angles and sides of similar polygons; solve problems using time conversions; find circumference and area of circles; make conversions using proportions.

MAP score range: 724–860.

Grade 8

Below Basic

Students generalize numeric patterns; generalize relationships between attributes of 2-D shapes; identify the results of subdividing 3-D shapes; identify 3-D figures using a 2-D representation; solve problems involving area; use scales to estimate distance; interpret graphs; find the mean value of a data set; select graphical representations of data; interpret data; make conjectures based on theoretical probability.

MAP score range: 525–669.

Basic

Students perform operations with rational numbers; solve and interpret one-step linear equations; extend geometric patterns; generalize patterns to find a specific term; identify relationships in 3-D objects; calculate the theoretical probability of an event; interpret a scatter plot to determine the relationship between two variables.

MAP score range: 670–709.

Proficient

Students identify equivalent representations of a number; identify mental strategies to solve problems; solve multi-step equations; use symbolic algebra; identify transformations; classify angles; create similar polygons; use coordinate geometry; solve problems involving area; identify appropriate units of measure; convert standard units within a system of measurement; interpret graphic organizers; calculate measures of center.

MAP score range: 710–740.

Advanced

Students estimate the value of square roots; write numbers using scientific notation; solve two-step inequalities; analyze slope and intercept in linear equations; apply the Pythagorean Theorem using coordinate geometry; identify polygons based on their attributes; identify coordinates of vertices of a transformed polygon; use a protractor to measure angles; solve problems involving surface area; select, create, and use appropriate graphical representation of data.

MAP score range: 741–885.

Science, Abbreviated Achievement-Level Descriptors

Grade 5

Below Basic

Students identify the relationship between mass and force; classify bodies of water; identify weather instruments and their uses; identify characteristics of the solar system; compare amounts/measurements given in a simple format; identify appropriate tools for simple scientific measurements; identify how technological advances may be helpful to humans.

MAP score range: 470–625.

Basic

Students explain the relationship between mass and force; describe how specialized body structures help animals survive; match environments to the plants and animals they support; identify environmental problems and find solutions; determine the appropriate scientific tool and its function in an investigation; determine how technological advances address problems and enhance life.

MAP score range: 626–668.

Proficient

Students describe changes in properties of matter; identify uses of simple machines; explain how work is done; identify forces of magnetism; describe the motion of objects; identify plant parts and their functions; classify vertebrates and invertebrates; classify producers, consumers, or decomposers; predict changes in food chains; identify the effects of human activities on other organisms; describe the Sun as a source of light and heat, or the moon as a reflector of light; explain the day/night cycle; interpret data; distinguish between man-made and natural objects; apply problem solving skills to a situation.

MAP score range: 669–691.

Advanced

Students identify energy transformations; predict the effect of heat energy on water; diagram a complete electrical circuit; predict how simple machines affect the force needed to do work; describe the effects of weathering and erosion on Earth's surface; describe relationships in weather data; explain how the Sun's position and the length and position of shadows relate to the time of day; interpret and apply knowledge from a data table; identify appropriate steps and tools in an investigation.

MAP score range: 692–855.

Grade 8

Below Basic

Students identify simple terms related to matter and energy; demonstrate beginning understanding of properties of light and how it travels; identify structures of plants and animals needed for survival; identify levels of organization in multicellular organisms; read simple graphs and make simple data comparisons.

MAP score range: 540–670.

Basic

Students identify an example of a force; demonstrate simple understanding of how traits are passed from one generation to the next; have a basic understanding of climate; identify a simple hypothesis; recognize a trend in a data table; demonstrate some awareness of how various factors influence and are influenced by science and technology.

MAP score range: 671–702.

Proficient

Students classify types of motion; calculate the speed of an object; demonstrate simple understanding of life processes; classify and/or show relationships between organisms; explain how adaptations help organisms survive; explain how species are affected by environmental change; understand and describe a food web; explain rock and fossil evidence of changes in the Earth; explain how Earth's systems interact; draw conclusions from tables or graphs; demonstrate basic understanding of the solar system; recognize the need for, and calculate, averages; use appropriate tools and methods to collect data; describe tools and discoveries that advance scientific knowledge.

MAP score range: 703–734.

Advanced

Students explain the physical and chemical properties of matter; apply knowledge of energy and energy transfer; demonstrate understanding of physical and chemical processes of organisms; evaluate the effects of balanced and unbalanced forces; predict the impact of environmental change in ecosystems; justify how adaptations help organisms survive; demonstrate understanding of the water cycle; compare and contrast weather and climate; explain the cause of seasons on Earth; demonstrate understanding of the solar system; apply the concept of light years; apply awareness of the influence of science and technology in society.

MAP score range: 735–895.