Missouri
End-of-Course Assessments

Missouri Department of Elementary and Secondary Education

Technical Report
Phase II Assessments
2010–2011

English I
Algebra II
Geometry
Government
American History

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LIST OF ABBREVIATIONS

Below is a list of abbreviations that appear frequently in this technical report.

ALD .....Achievement-Level Descriptor
AMO .....Additional Materials Order
ARC .....Assessment Resource Center
AYP.....Adequate Yearly Progress
CCSSO.....Council of Chief State School Officers
CLE .....Course-Level Expectation
CMS .....Content Management System
CSEM .....Conditional Standard Error of Measurement
CTT .....Classical Test Theory
DESE.....Department of Elementary and Secondary Education
DIF .....Differential Item Functioning
DOK.....Depth of Knowledge
EFT .....Embedded Field Test
EOC.....End-of-Course
FRL .....Free and Reduced Lunch
FT.....Field Test
GLE.....Grade-Level Expectation
GRF.....General Research File
IAP .....Individualized Accommodation Program
IDEA .....Individuals with Disabilities Education Act
IEP.....Individualized Education Program
IPASS.....Image-Based Performance Assessment Scoring System
IRT .....Item Response Theory
ITS.....Internet Testing Systems
LEP .....Limited English Proficient
LOSS.....Lowest Obtainable Scale Score
MAP.....Missouri Assessment Program
MH .....Mantel-Haenszel procedure
MOSIS .....Missouri Student Information System
MS .....Mean Square
NCLB.....No Child Left Behind
PCA.....Principal Components Analysis
PE.....Performance Event
RIF .....Regional Instructional Facilitator
RSS .....Riverside Scoring Service®
SE .....Standard Error
SEM.....Standard Error of Measurement
SR.....Selected Response
TAC.....Technical Advisory Committee
TCC.....Test Characteristic Curve
TDS.....Test Development Specialist
WP.....Writing Prompt

EXECUTIVE SUMMARY

This document provides a technical summary of the 2010–2011 administrations of the Missouri End-of-Course (MO EOC) Assessments in English I, Algebra II, Geometry, Government, and American History. The criterion-referenced MO EOC Assessments are designed to assess students' knowledge of Missouri's Course-Level Expectations (CLEs) in these five content areas. The 2009–2010 school year marked the first operational administration of the assessments.

E.1 Background

In 1993, the Missouri legislature passed the Outstanding Schools Act (Senate Bill 380), requiring the Missouri State Board of Education to adopt challenging academic performance standards that define the skills and competencies necessary for students to successfully advance through the public school system, prepare for post-secondary education and the workplace, and participate as citizens in a democratic society. The Missouri State Board of Education formally adopted the academic standards known as the Show-Me Standards in January 1996.

In addition to mandating the development of rigorous academic standards, the Outstanding Schools Act of 1993 required the development and implementation of a comprehensive, primarily performance-based assessment program to measure student proficiency in the knowledge, skills, and competencies identified in the standards. Upon adoption of the standards in 1996, Missouri began developing the Missouri Assessment Program (MAP).

In January 2007, the Missouri State Board of Education approved a plan to replace the MAP for high school students with MO EOC Assessments beginning with English II, Algebra I, and Biology in the 2008–2009 school year. The remaining EOC Assessments (English I, Algebra II, Geometry, Government, and American History) were added the following year.

E.2 Administration

The MO EOC Assessments are administered in summer, fall, and spring windows each year. Because the No Child Left Behind Act (NCLB) goal for every school in the state is Proficient as defined by the Missouri State Board of Education, EOC testing is conducted as close as possible to the end of each course to allow school staff and students the greatest opportunity to achieve the goal of proficiency.

The scope of this technical report includes the Summer 2010, Fall 2010 and Spring 2011 assessments..

District- and state-level reports for the MO EOC Assessments are produced and distributed following each Spring administration. The score reports for the 2010–2011 assessment year contained information from the Summer 2010, Fall 2010 and Spring 2011 assessments. In future years, reports will continue to include information from the previous year's Summer, Fall, and Spring administrations.

E.3 Student Performance

A MO EOC Assessment score describes the relationship of student performance to a defined level of achievement. Achievement-level descriptors (ALDs) associated with each level provide details about the content expectations that students at that level meet or exceed. Missouri uses four achievement levels for the EOC Assessments: Below Basic, Basic, Proficient, and Advanced.

Table E.1 displays the percentage of students at each achievement level for the Summer 2010, Fall 2010 and Spring 2011 MO EOC Assessments.

Table E.1: Percentage of Students at Each Achievement Level

Test Period	Achievement Level	English I	Algebra II	Geometry	Government	Am. History
Summer 2010	Below Basic	18.9	34.5	41.9	20.1	56.5
	Basic	41.3	54.9	41.5	34.5	17.4
	Proficient	32.7	8.8	14.8	27.9	21.7
	Advanced	7.1	1.8	1.7	17.5	4.3
Fall 2010	Below Basic	12.2	9.0	16.3	9.0	26.1
	Basic	26.6	30.3	25.9	37.2	25.3
	Proficient	35.5	44.2	36.6	42.1	35.4
	Advanced	25.7	16.4	21.3	11.6	13.2
Spring 2011	Below Basic	10.8	8.5	16.3	7.5	24.3
	Basic	30.9	38.2	33.7	31.6	25.4
	Proficient	38.4	41.7	39.4	44.2	37.9
	Advanced	19.8	11.6	10.6	16.7	12.4

E.4 Evidence Supporting the Validity of Inferences from the MO EOC Assessment Scores

The MO EOC Assessments are part of an integrated program of testing, accountability, and curricular and instructional support. This technical report provides extensive detail about the development and operation of EOC Assessments. While a section of this report is devoted specifically to the documentation of validity evidence for the MO EOC Assessment scores, all information contained in the report ultimately contributes to the argument for the validity of the scores for their intended purposes.

A summary of the information contained in this report follows.

Chapter 1: Introduction

Chapter 1 provides background information about the MAP in general as well as some context for the MO EOC Assessments. Additionally, the chapter provides information about the organizational support provided by each contractor and subcontractor for the MO EOC Assessment program. The chapter ends with a statement of purpose for this technical report

Chapter 2: Test Development

Chapter 2 contains thorough descriptions of each step in the development process for the MO EOC Assessments, including test design, test specifications and target point distributions, test blueprints, item writing, content and bias review procedures, test form assembly, and statistical item review. The evidence provided in this chapter is important to the content-related validity of the MO EOC Assessment scores. Additionally, the chapter covers principles of universal design and outlines the quality control processes employed throughout the test development process.

Chapter 3: Achievement-Level Setting

Chapter 3 details each step in the planning and execution of the November 2009 standard-setting event that resulted in the cut scores for each of the MO EOC achievement levels. Chapter 3 covers selection of participants, development of ALDs, an overview of the methodology and considerations for the data that were available at the time of the standard-setting event, detailed information about each step in the process, and standard-setting results. Additionally, the chapter contains many appendices with examples of the materials that participants used during the standard-setting event.

Chapter 4: Item Analysis

Chapter 4 contains summary information, including item difficulty and discrimination indices, at the item level for each content area. The chapter also contains information on omit rates for the Summer 2010, Fall 2010 and Spring 2011 operational items, as well as differential item functioning (DIF) analyses performed on the Spring 2009 field-test and Spring 2010 embedded field-test data.

Chapter 5: Test Administration

Chapter 5 contains information about the paper-and-pencil and online administration of the MO EOC Assessments, beginning with a description of students for whom the assessments are appropriate. Following this, the details of the administration are summarized. This summary includes a description of how the materials are distributed and how Test Examiners are trained, as well as information about the organization of the assessments, preparation of students to take the assessments, and directions for administration. Next, the chapter includes information about the accommodations allowed on the MO EOC Assessments. Finally, the chapter briefly describes how materials are submitted for processing and scoring.

Chapter 6: Scanning, Scoring, and Quality Control Procedures

Chapter 6 covers the processes involved with scanning, scoring, and controlling the quality of the resulting score information for the selected response items on the MO EOC Assessments. The chapter contains detailed information on how the Riverside Scoring Service® (RSS) prepared the MO EOC selected response items for processing, including a check of scanning procedures prior to receipt of materials. Also, it details how the materials were handled from the time they were received and processed at the RSS on through to report generation.

Chapter 7: Scaling and Equating

Chapter 7 begins with an introduction to the item response theory (IRT) model used for the scaling and equating of the MO EOC Assessments. The actual scaling and equating procedures are described in detail, including the calibration of the 2009 standalone field-test items, steps undertaken to establish a base scale for the MO EOC Assessments, examination of the stability of the linking items, steps taken to recenter the 2009 item bank, and steps taken to bring Spring 2010 and 2011 field-test items onto the base scale. This chapter also includes information about the Summer 2010, Fall 2010 and Spring 2011 operational forms, a description of the IRT model assumptions, and evidence of data-to-model fit.

Chapter 8: Reporting

Chapter 8 contains information about the reports Riverside Publishing produced for the MO EOC Assessments, including the Individual Student Report and Student Score Label. A brief summary of state-produced reports is also included.

Chapter 9: Summary Statistics

Chapter 9 provides descriptive statistics for raw scores and scale scores for the MO EOC Assessments. Raw score statistics are summarized by test administration, content area, and cluster. Scale score statistics are summarized for each content area and are also broken down by gender, ethnicity, migrant status, free and reduced lunch (FRL), limited English proficient, Title I, Individualized Education Program, and accommodations.

Chapter 10: Reliability

Chapter 10 begins by defining reliability and providing an overview of reliability estimation techniques. Raw-score internal consistency reliability coefficients are presented for all students and for each demographic group. Conditional standard errors of measurement (*CSEM*s) are also presented at each scale-score cut point.

Chapter 11: Validity

Chapter 11 provides evidence supporting the validity of the MO EOC Assessments for their intended purposes. After a brief introduction to the validity evidence for the MO EOC Assessments, the chapter documents more specific evidence related to test content, the internal structure of the assessments, and other types of validity evidence proposed by the *Standards for Educational and Psychological Testing* (AERA, APA, and NCME 1999). The chapter summarizes and reiterates validity evidence presented in earlier chapters in addition to providing new information not presented elsewhere. It provides a

thorough argument supporting the validity of the MO EOC Assessments for measuring Missouri students' mastery of the CLEs, for identifying students' strengths and weaknesses, for serving as a basis for evaluating accountability plans, and for program evaluation.

CHAPTER 1: INTRODUCTION

1.1 History of Missouri's End-of-Course Assessments

In 1993, the Missouri legislature passed the Outstanding Schools Act (Senate Bill 380), requiring the Missouri State Board of Education to adopt challenging academic performance standards defining the skills and competencies necessary for students to successfully advance through the public school system, prepare for post-secondary education and the workplace, and participate as citizens in a democratic society. The Missouri State Board of Education formally adopted the academic standards known as the Show-Me Standards in January 1996.

These 73 standards are organized around four broad goals that address application, communication, problem solving, and responsible decision–making. Thirty-three process standards emphasize the importance of engaging students of all ages in hands-on, active learning and integrating practical, challenging learning across all content areas. An additional 40 content standards define the academic skills and knowledge that provide the foundation for student learning in six content areas: Communication Arts, Mathematics, Science, Social Studies, Fine Arts, and Health/Physical Education. Content standards serve as the vehicle through which students demonstrate proficiency in the broader process standards. The Show-Me Standards are available for review on the Missouri Department of Elementary and Secondary Education's (DESE) website at http://dese.mo.gov/standards/index.html.

In 2001, DESE developed Grade-Level Expectations (GLEs) to assist districts in articulating the Show-Me Standards across grade levels and content areas. GLEs have been developed for Mathematics, Communication Arts, Science, Social Studies, Physical Education, Health, Music, Visual Arts, and Theater. GLEs are available for review on the DESE website at http://dese.mo.gov/divimprove/curriculum/GLE/index.html.

In addition to mandating the development of rigorous academic standards, the Outstanding Schools Act of 1993 also required the development and implementation of a comprehensive assessment program to measure student proficiency in the knowledge, skills, and competencies identified within the standards. Upon adoption of the standards in 1996, Missouri began developing the Missouri Assessment Program (MAP) in collaboration with contractor, CTB/McGraw-Hill.

The Missouri State Board of Education adopted the purposes listed below to serve as guiding principles for development of the MAP:

- Improving students' acquisition of important knowledge, skills, and competencies
- Monitoring the performance of Missouri's educational system
- Empowering students and their families to improve their educational prospects
- Supporting the teaching and learning process

The first MAP assessments administered to students statewide were grade-span Mathematics assessments in grades 4, 8, and 10 in spring 1998. A voluntary grade-span Communication Arts Assessment for students in grades 3, 7, and 11 was also administered in spring 1998 and became mandatory in spring 1999. Required Science and Social Studies grade-span assessments (grades 3, 7, and 10, and grades 4, 8, and 11, respectively) were added to the program in subsequent years. A voluntary Health/Physical Education assessment was available in 2000 and required until spring 2002, and a Fine Arts assessment was field tested in 2001. Due to budget constraints, Fine Arts assessment development was suspended and Health/Physical Education Assessment was discontinued. Science and Social Studies grade span assessments returned to voluntary status in spring 2003. Social Studies assessments were discontinued in spring 2008 and required assessments in Science were implemented in grades 5, 8, and 11 to comply with NCLB requirements.

Through the spring 2005 administration, the MAP statewide assessment program included grade-span tests in the following grade levels/subject areas:

- Mathematics at grades 4, 8, and 10
- Communication Arts at grades 3, 7, and 11
- Science at grades 3, 7, and 10 (required spring 1998 through spring 2002; returned to voluntary status in spring 2003)
- Social Studies at grades 4, 8, and 11 (required spring 1999 through spring 2002; returned to voluntary status in spring 2003))

All MAP assessments included three types of items: selected response (SR), constructed response (CR), and Performance Events (PE). For all content areas, MAP assessments included selected response items from the TerraNova Survey Edition. CR and PE items were custom-developed with significant input from Missouri educators.

During the initial MAP development/implementation period, DESE developed two to four equivalent forms for each content area/grade level assessment, using the first form for a voluntary testing cycle and administering the next form(s) in subsequent years. Early in the development phase, DESE tried out new items using separate field tests that usually occurred in the fall of the school year. As the program continued, each test form contained embedded field test (EFT) items. Small-scale pilots continued, as well.

As each content area/grade level assessment was administered, DESE used the Bookmark approach to set achievement levels, defining student performance through spring 2005 as Advanced, Proficient, Nearing Proficiency, Progressing, or Step 1.

After nearly a decade of MAP administration, new federal and state legislation prompted change in the program. To comply with requirements of the No Child Left Behind Act (NCLB) legislation, Missouri's assessment program needed to incorporate Mathematics and Communication Arts assessments in all elementary and middle school grade levels (grades 3 through 8) and at one high school grade level. As a result, new grade-level assessments were developed for both content areas. These assessments were administered for the first time in spring 2006.

Additional NCLB requirements necessitated the addition of a mandatory science assessment once in the elementary grade range, once in the middle school grade range, and once in the high school grade range, beginning in spring 2008. The voluntary Science assessment in grades 3, 7, and 10 became a requirement and was moved to grades 5, 8, and 11. The voluntary Social Studies MAP assessment was eliminated following the spring 2007 administration. Missouri's assessment system changed further in 2008–2009 when high school content area MAP assessments were replaced by End-of-Course (EOC) Assessments.

1.2 Brief Description of Missouri's Current Assessment System

The current MAP system includes the following assessment components for elementary and middle school:

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

The EOC Assessments administered in 2010-2011 included:

Phase I Assessments for:

- English II
- Algebra I
- Biology

Phase II Assessments for:

- English I
- Algebra II
- Geometry
- Government
- American History

In addition, the statewide assessment program currently includes the Missouri Assessment Program–Alternate (MAP-A) for students with severe cognitive disabilities, WIDA ACCESS for ELLs, and a Personal Finance assessment for high school students who do not enroll in a personal finance course or who are receiving personal finance credit for embedded coursework.

1.3 Summary of the MO EOC Assessments

In response to feedback from Missouri districts regarding large-scale assessments for high school, the Missouri End-of-Course (MO EOC) Assessments were developed and first administered in 2008 for English II, Algebra I, and Biology. The Phase II MO EOC Assessments listed above were developed and first administered in 2009. The MO EOC Assessments were created to address the needs of Missouri districts, schools, teachers, and students, while also meeting state and federal requirements. The Missouri State Board of Education identified the following purposes for the Missouri EOC Assessments:

- Measuring and reflecting students' mastery toward post-secondary readiness
- Identifying students' strengths and weaknesses
- Communicating expectations for all students
- Serving as the basis for state and national accountability plans
- Evaluating programs

Course-Level Expectations (CLEs) outline the ideas, concepts, and skills that form the foundation for each EOC subject area that is assessed. The CLEs are independent of student grade level. Because a course such as Algebra I could be delivered at any grade level, CLEs replace the GLEs. This replacement is necessary because each EOC Assessment is more specific and tailored to each EOC subject area. Districts can offer courses with different titles that cover the same CLEs.

Each Phase II MO EOC Assessment includes only SR items. An SR item presents students with a question followed by four response options. PE or CR items are not included on the Phase II Assessments. All Phase II MO EOC Assessments were offered only in online administration modes for the 2010-2011 school year.

1.4 Testing, Reporting, and Accountability

Evidence of students' progress in meeting the Show-Me Standards/CLEs is obtained from the MO EOC Assessments. These assessments provide the data that DESE uses to inform students, parents, the public, and the state legislature about students' performance; to help make informed decisions about educational issues; and to drive student services throughout the state.

The MO EOC Assessment reports provide useful information for determining the performance of students in a particular school and classroom. These reports help identify students who are below Proficient in a particular test area so that the school may determine a course of action that will meet the students' specific needs. Additionally, districts may use locally designed assessments, aligned to the Show-Me Standards/CLEs, to provide more detailed information for each student in specific test areas.

Testing for the MO EOC Assessments is conducted during three state-designated windows each year. Test windows are available for Summer, Fall, and Spring. Per contract requirements, however, paper reports for all administrations are provided only after the Spring testing window each year. (Teachers may use an online interface to access student raw scores for the SR items.)

Data for this technical report were collected during Summer 2010, Fall 2010 and Spring 2011 operational administrations. Data analyses for the total assessed population, which includes students who have not yet reached the secondary level, are based on a combination of assessment results as well as demographic criteria.

1.5 MO EOC Assessments Organizational Support

DESE coordinates the development and implementation of the MO EOC Assessments. In addition to planning, scheduling, and directing all EOC activities, the staff is extensively involved in numerous test reviews, security, and quality assurance procedures. Riverside Publishing is the primary contractor working in partnership with Questar, Internet Testing

Systems (ITS), Bookette, and others. The main activities for each of these groups are outlined in Table 1.1.

Table 1.1: Main Activities for Groups Involved in MO EOC Organizational Support

Group	Responsibilities
Riverside Publishing	• Provides program management, including primary contact with DESE; coordinates all meetings; handles all administrative costs/activities; generates all program management reports and status reports • Works with DESE to develop items with Missouri educators • Creates *Test Coordinator's Manual*, *Test Examiner's Manual*, and other ancillary materials • Facilitates all review meetings with Missouri teachers and DESE • Conducts all psychometric analyses, reporting, linking/equating studies, and associated tasks, including participating in achievement-level setting • Provides all needed prepress work for program materials through camera-ready art • Produces all materials, including online, paper-and-pencil, Braille, and Large Print versions of test • Accounts for secure test books received after testing • Provides a direct customer service line, including technical support and general support to the program and customer interactions • Stores materials after testing • Participates in and presents at TAC meetings • Scores all selected response items • Produces and distributes all score reports and the *Guide for Interpreting Results* • Completes the technical report for DESE • Completes additional research studies
Questar	• Provides online enrollment and pre-ID system for use by Missouri districts • Packages and distributes all materials • Barcodes test books with security IDs • Leads facilitation and planning of achievement-level setting and provides members for the achievement-level-setting team • Contributes to the technical report • Participates in meetings with DESE, contributes to status reports, etc.

Table 1.1: Main Activities for Groups Involved in MO EOC Organizational Support (continued)

Group	Responsibilities
Internet Testing Services (ITS)	• Sets up a Missouri DESE-branded website for access to the online testing system • Provides the online test delivery of one complete form for each administration for the following content areas: English II, Algebra I, and Biology beginning in 2008, and Integrated Math II, Integrated Math III, Geometry, Algebra II, English I, American History, and Government beginning in 2009 • Provides system documentation for test administrators and the DESE website • Provides technical support from 8 A.M. to 6 P.M., Monday through Friday, for the Riverside Publishing help desk • Produces and hosts practice tests for the English II, Algebra I, and Biology content areas • Provides online tools for graphing and table creation/editing and provides an equation editor • Offers ruler and reference sheets in tests • Provides three administrations per contract year in fall, spring, and summer for all content areas • Supplies a data feed of results from ITS to Riverside Publishing
Districts	• Distribute materials to the school buildings, track all secure materials, and promptly return all materials, including answer documents, for scoring • Assist in the timely resolution of scoring alerts • Act as liaison between Riverside Publishing and buildings
School Buildings	• Administer tests, track all secure materials, and promptly return materials to districts for scoring
RR Donnelly	• Prints all nonscannable testing materials
Techniforms	• Prints all scannable test books and answer documents
Region IV, 3X	• Prints Braille and Large Print versions, respectively

1.6 Purpose of the Technical Report

The purpose of this technical report is to provide information about the technical characteristics of the 2009 field-test administration, the 2009–2010 operational administration, and the 2010-2011 operational administration of the Missouri EOC Assessments. Because this report is technical in nature and the intended audience is psychometric and educational research experts, it is best understood with a working knowledge of measurement concepts such as reliability and validity and statistical concepts such as correlation and central tendency. For some chapters, the reader is presumed to have basic familiarity with advanced topics in measurement and statistics such as item response theory (IRT).

This technical report provides extensive detail about the development and operation of the Missouri EOC Assessments. The empirical reliability of the assessments and validity of intended uses of the scores are reported explicitly in this document. While Chapter 10: Reliability is relatively straightforward, the steps in creating and operating the program

are all aspects of validity, which is discussed in Chapter 11. The validity of score use and interpretation for any assessment stems from the statement of the test's purpose and the intended use of the scores; the steps taken in designing the test; and the processes of developing the content of the test, consulting with stakeholders, communicating about the test to users, scoring and reporting, and data analysis. The careful documentation of each of these steps is a necessary piece of a comprehensive, defensible validity argument for the intended uses of the assessment scores. In short, while there is a specific chapter devoted to validity, other parts of this document provide evidence necessary to assess the validity of the Missouri EOC Assessment scores for their intended purposes.

In reading this technical report, it is critical to remember that the testing program does not exist in a vacuum; it is not just a test. It is one part of a complex network intended to help schools focus their energies on improving student learning. The MO EOC Assessments are an integrated program of testing and accountability as well as curricular and instructional support. They can be evaluated properly only within their full context.

CHAPTER 2: TEST DEVELOPMENT

2.1 Introduction

The English I, Algebra II, Geometry, Government, American History, and Integrated Mathematics II and III End-of-Course (EOC) Assessments were first administered operationally during the 2009–2010 school year. This chapter provides an overview of the development of the Missouri End-of-Course (MO EOC) Assessments, including the test specifications, item development, item review, and test forms development. According to the *Standards for Educational and Psychological Testing* (AERA, APA, and NCME 1999) (hereafter referred to as the Standards), "Important validity evidence can be obtained from an analysis of the relationship between a test's content and the construct it is intended to measure" (p. 11). Accordingly, the thorough descriptions of the test development procedures included in this chapter provide evidence to support the construct validity of the MO EOC Assessments.

2.2 Design of the MO EOC Assessments

Figure 2.1 details the design of the Spring 2009 standalone field test, Fall 2009 operational administration, and Spring 2010 operational administration with embedded field test (EFT) for English I. Figure 2.2 details the design of the Spring 2009 standalone field test, Fall 2009 operational administration, and Spring 2010 operational administration with EFTs for Algebra II, Geometry, Government, and American History. Figure 2.3 details the design of the Spring 2009, Fall 2009, and Spring 2010 Integrated Mathematics II and III assessments. It should be noted that the Missouri Department of Elementary and Secondary Education (DESE) made the determination to discontinue these two assessments because of extremely low actual enrollments for the Fall 2009 assessments and low projections of the number of students who would enroll to take these assessments in Spring 2010.

Figure 2.1: Field Test and Operational Assessment Design, English I

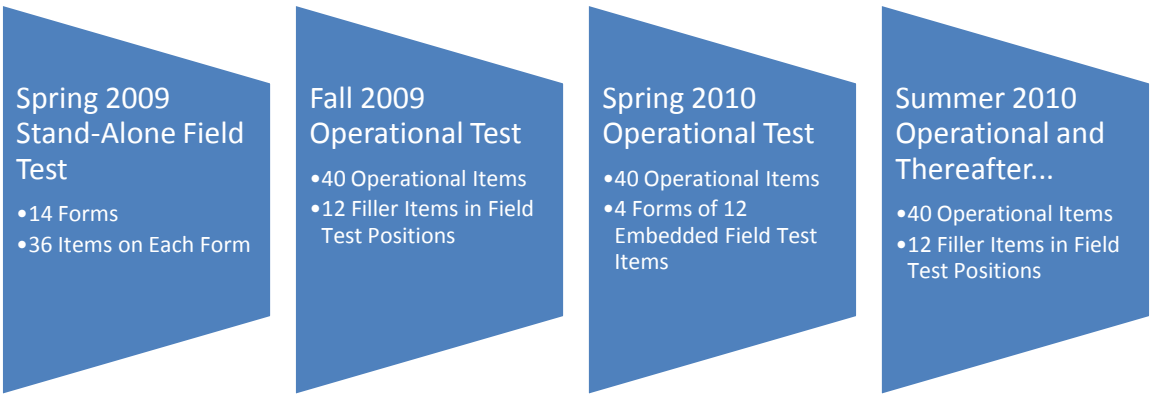

Figure 2.2: Field Test and Operational Assessment Design, Algebra II, Geometry, Government, and American History

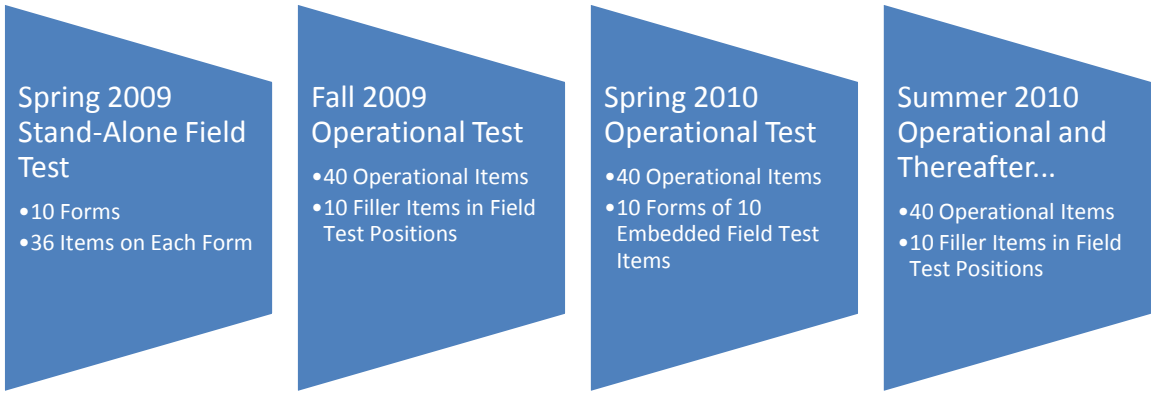

Figure 2.3: Field Test and Operational Assessment Design, Integrated Mathematics II and III

2.2.1 Spring 2009 Standalone Field Test

The Spring 2009 standalone field test provided item data to inform the 2009–2010 operational forms selection process. There were 10 unique forms of 36 items each for Algebra II, Geometry, Government, and American History. English I field tested 14 unique forms with 36 items on each form, and Integrated Mathematics II and III each piloted 4 forms with 36 items on each one. Forms for each course were spiraled at the student level across the state.

2.2.2 Fall 2009 Operational Administration

The Fall 2009 administration consisted of seven operational assessments. English I consisted of one 52-item selected response (SR) form. Algebra II, Geometry, Government, American History, and Integrated Mathematics II and III consisted of one 50-item SR form each. In addition to the 40 scored items, each Algebra II, Geometry, Government, American History, and Integrated Mathematics II and III test book in the Fall 2009 administration contained a set of 10 EFT items. The English I test book contained 12 EFT items in addition to the 40 scored items.

2.2.3 Spring 2010 Operational Administration

The Spring 2010 assessments consisted of seven operational assessments. For all seven assessments, the forms consisted of 40 operational SR items. For English I, there were 4 unique sets of 12 EFT items. For Algebra II, Geometry, Government, and American History there were 10 unique sets of 10 field-test items. There was one form each of Integrated Mathematics II and III with online administration only. As previously noted, because these assessments were discontinued by DESE, districts never accessed the online Integrated Mathematics II and III assessments in spring 2010.

2.2.4 Summer 2010 Operational Administration

The Summer 2010 assessments consisted of five operational assessments with filler items in the EFT slots. There was one form for each course except Integrated Mathematics II and III.

2.2.5 Fall 2010 Operational Administration

The Fall 2010 administration consisted of five operational assessments. English I consisted of one 52-item selected response (SR) form. Algebra II, Geometry, Government, and American History consisted of one 50-item SR form each. Each Algebra II, Geometry, Government, and American History assessment consisted of 40 operational items and 10 filler item in the EFT slots. The English I test book contained 12 filler items in the EFT slots in addition to 40 scored items.

2.2.6 Spring 2011 Operational Administration

The Spring 2011 assessments consisted of five operational assessments. Each Algebra II, Geometry, Government, and American History assessment consisted of 40 operational items and 10 filler item in the EFT slots. The English I test book contained 12 filler items in the EFT slots in addition to 40 scored items.

2.2.7 Released Forms

In addition to the operational forms, DESE and Riverside Publishing also worked together to construct “released” forms for each operational assessment. These forms were posted on the DESE website in August 2009. They were constructed to mirror the test content of the actual operational forms (minus the EFT items) to allow Missouri teachers, parents, and students the opportunity to review the new format and representative content of the EOC Assessments. Although these forms were constructed to parallel the operational forms, the items in these released forms were never used on an operational EOC Assessment.

2.3 Test Blueprints

The test blueprint specifies the relative percentages of items in each high-level content strand. This document helps ensure that each strand is represented by the minimum number of points (8) for student score reports.

Riverside Publishing content experts worked with DESE to develop blueprints for each course before item writing began in fall 2008. Blueprint development was guided by the Missouri Show-Me Standards.

Tables 2.1 through 2.5 outline the test construction blueprints for English I, Algebra II, Geometry, Integrated Mathematics II, Integrated Mathematics III, American History, and Government.

Table 2.1: Test Construction Blueprint for English I

Big Idea	Target # of Points	Point Range*	Target % Total Points	Minimum Emphasis	Maximum Emphasis
1. Develop and apply skills and strategies to the reading process	15	13–17	38%	**33%**	**43%**
2. Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama from a variety of cultures and times	12	10–14	30%	**25%**	**35%**
3. Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction (such as biographies, newspapers, technical manuals) from a variety of cultures and times	13	11–15	32%	**28%**	**38%**
Total	40	40	100%		

Note: Total score points for each content strand may vary depending on which passages are selected for a particular administration. The percentage of total score points from each content strand (emphasis) will fall within the blueprint range described above.

* The minimum number of points in each strand will be 8.

This blueprint was built under the following assumptions:

1. The reading passages will generally be balanced between nonfiction and fiction. A slight imbalance may occur if an odd number of passages appears on the operational test.
2. Content strand 1 has a larger percentage of total points because it can be assessed using both fiction and nonfiction passages.

Table 2.2: Test Construction Blueprint for Algebra II

Content Strand	Target # of Points	Point Range	Target % Total	Minimum Emphasis	Maximum Emphasis
Number and Operations	8	7–9	20%	**17.5%**	**22.5%**
Algebraic Relationships	22	20–24	55%	**50%**	**60%**
Data and Probability	10	9–11	25%	**22.5%**	**27.5%**
Total	40	40	100%		

Table 2.3: Test Construction Blueprint for Geometry

Content Strand	Target # of Points	Point Range	Target % Total	Minimum Emphasis	Maximum Emphasis
Algebraic Relationships	8	7–10	20%	**18%**	**25%**
Geometric and Spatial	24	22–24	60%	**55%**	**60%**
Measurement	8	7–9	20%	**18%**	**23%**
Total	40	40	100%		

Table 2.4: Test Construction Blueprint for American History

Reporting Categories (all within Strand 3)	Target # of Points	10% Tolerance	Point Range	Target % Total	Minimum Emphasis	Maximum Emphasis
Government	8	0.8	7–9	20%	**18%**	**23%**
History	16	1.6	14–18	40%	**35%**	**45%**
Economics	8	0.8	7–9	20%	**18%**	**23%**
Geography	8	0.8	7–9	20%	**18%**	**23%**
Totals	40		40	100%		

Reporting Categories

- CLEs within 3a. A, I, N, W, and X will report under History.
- CLEs within 3a. K and M will report under Government.
- CLEs within 3a. J, O, P, and R will report under Economics.
- CLEs within 3a. U and V will report under Geography.

Table 2.5: Test Construction Blueprint for Government

Content Strand	Target # Points	10% tolerance	Point Range	Target % Total	Minimum Emphasis	Maximum Emphasis
Principles of Constitutional Democracy	20	2.0	18–22	50%	**45%**	**55%**
Principles and Processes of Governance Systems	20	2.0	18–22	50%	**45%**	**55%**
Totals	40		40	100%		

2.4 Test Specifications

Standard 1.6[1] specifically addresses the appropriateness of test content and its relationship to a solid validity argument. Additionally, Standard 3.3[2] defines "test specifications" and provides examples of the type of information that should be included in a specification document. The test specifications describe the content and format of the test and delineate the ideal number of items and points assessed for each Course-Level Expectation (CLE). This section details the development and use of the test specification documents for the MO EOC Assessments.

In 2008, Riverside Publishing content experts developed draft test specifications for each course. These draft test specifications were subsequently reviewed and approved by MO DESE. The specifications were finalized in fall 2008, before the development of items for field-test forms.

The test specification document serves as the foundation for all test item development. The material in the test specifications is designed for use by Riverside Publishing content experts and MO DESE to construct tests containing the following items:

- Aligned to the Missouri CLEs
- Aligned to Norman Webb's depth of knowledge (DOK) cognitive levels
- SR
- Standalone and passage-based

Detailed descriptions of the test content measured in English I, Algebra II, Geometry, Integrated Mathematics II and III, American History, and Government are presented in the following sections.

2.4.1 English I

The English I MO EOC Assessment measures students' achievement in reading. All administrations of the test contain commissioned passages that comprise both fiction and nonfiction and cover a wide range of genres, including poems, short stories, newspaper articles, historical fiction, functional texts, and webpages. The questions associated with each passage are in SR format. There are 40 SR items on the English I Assessment.

Table 2.6 contains targets for the CLE point distribution on the English I operational forms. Some of the CLE point targets may not be met because the use of a passage or scenario is not conducive to items written to the CLE. Some Big Ideas are not represented in this chart because they are not assessed at this course level.

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[1] **Standard 1.6:** When the validation rests in part of the appropriateness of test content, the procedures followed in specifying and generating test content should be described and justified in reference to the construct the test is intended to measure or the domain it is intended to represent. If the definition of the content sampled incorporates criteria such as importance, frequency, or criticality, these criteria should also be clearly explained and justified (p. 18).

[2] **Standard 3.3:** The test specifications should be documented, along with their rationale and the process by which they were developed. The test specifications should define the content of the test, the proposed number of items, the item formats, the desired psychometric properties of the items, and the item and section arrangement. They should also specify the amount of time for testing, directions to the test takers, procedures to be used for test administration and scoring, and other relevant information (p. 43).

Tables 2.7 through 2.12 contain actual point distributions for the administered operational forms.

Table 2.6: Target Point Distributions for the English I Operational Forms

Big Idea	Concept	CLE	DOK	Range/CLE
1. Develop and apply skills and strategies to the reading process	E. Vocabulary	Develop vocabulary through text, using a. roots and affixes b. context clues c. glossary, dictionary, and thesaurus	2	4–6
	H. Post Reading	Apply post-reading skills to comprehend, interpret, analyze, and evaluate text: a. identify and explain the relationship between the main idea and supporting details d. draw conclusions e. paraphrase f. summarize	3	6–9
	I. Making Connections	Compare, contrast, analyze, and evaluate connections a. text to text (information and relationships in various fiction and nonfiction works)	3	2–3
2. Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama from a variety of cultures and times	A. Text Features	Analyze and evaluate the text features in grade-level text	3	2–3
	B. Literary Techniques	Identify and, explain literary techniques, emphasizing a. irony b. imagery c. repeated sound, line, or phrase d. analyze literary techniques previously introduced	3	3–4
	C. Literary Elements	Use details from text(s) to a. demonstrate comprehension skills previously introduced b. analyze character, plot, setting, point of view c. analyze the development of a theme across genres d. evaluate the effect of author's style	3	4–7

Table 2.6: Target Point Distributions for the English I Operational Forms (continued)

Big Idea	Concept	CLE	DOK	Range/CLE
3. Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction (such as biographies, newspapers, technical manuals) from a variety of cultures and times	A. Text Features	Explain, analyze and evaluate the author's use of text features to clarify meaning	3	2–3
	B. Literary Techniques	Identify, explain, and analyze literary techniques in nonfiction, emphasizing a. irony b. imagery c. repeated sound, line, or phrase d. figurative language and sound devices previously introduced	3	3–4
	C. Text Structures	Use details from informational and persuasive text(s) to a. identify and explain the organizational patterns b. analyze and evaluate effectiveness of word choice c. analyze and evaluate for accuracy and adequacy of evidence d. analyze and evaluate point of view e. analyze and evaluate author's viewpoint/perspective f. evaluate proposed solutions g. demonstrate comprehension skills previously introduced	3	5–7

Table 2.7: Actual Point Distributions for the Summer 2009 English I Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
1. Develop and apply skills and strategies to the reading process	13–17	13–17	15	15
2. Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama	10–14	10–14	14	14
3. Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction	11–15	11–15	11	11
Total Items	**40**	**40**	**40**	**40**

Table 2.8: Actual Point Distributions for the Fall 2009 English I Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
1. Develop and apply skills and strategies to the reading process	13–17	13–17	17	17
2. Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama	10–14	10–14	9	9
3. Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction	11–15	11–15	14	14
Total Items	**40**	**40**	**40**	**40**

Table 2.9: Actual Point Distributions for the Spring 2010 English I Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
1. Develop and apply skills and strategies to the reading process	13–17	13–17	14	14
2. Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama	10–14	10–14	11	11
3. Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction	11–15	11–15	15	15
Total Items	**40**	**40**	**40**	**40**

Table 2.10: Actual Point Distributions for the Summer 2010 English I Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
1. Develop and apply skills and strategies to the reading process	13–17	13–17	16	16
2. Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama	10–14	10–14	12	12
3. Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction	11–15	11–15	12	12
Total Items	**40**	**40**	**40**	**40**

Table 2.11: Actual Point Distributions for the Fall 2010 English I Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
1. Develop and apply skills and strategies to the reading process	13–17	13–17	12	12
2. Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama	10–14	10–14	16	16
3. Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction	11–15	11–15	12	12
Total Items	**40**	**40**	**40**	**40**

Table 2.12: Actual Point Distributions for the Spring 2011 English I Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
1. Develop and apply skills and strategies to the reading process	13–17	13–17	14	14
2. Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama	10–14	10–14	14	14
3. Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction	11–15	11–15	12	12
Total Items	**40**	**40**	**40**	**40**

2.4.2 Algebra II

The Algebra II EOC Assessment measures students' ability to solve problems by applying mathematical concepts. The three strands assessed on the Algebra II Assessment are as follows:

- Numbers and Operations
- Algebraic Relationships
- Data and Probability

The 40 SR questions are aligned to the strands listed above. Table 2.13 contains targets for the CLE point distribution on the Algebra II operational forms. Some Big Ideas are not represented in this table because they are not assessed at this course level. Tables 2.14 through 2.19 contain actual point distributions for the administered operational forms.

Table 2.13: Target Point Distributions for the Algebra II Operational Forms

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
Numbers and Operations	1. Understand numbers, ways of representing numbers, relationships among numbers, and number systems	A. Read, write, and compare numbers	Compare and order rational and irrational numbers, including finding their approximate locations on a number line	1	3–4
		B. Represent and use real numbers	Use real numbers and various models, drawings, etc. to solve problems	3	4–5
Algebraic Relationships	1. Understand patterns, relations, and functions	B. Create and analyze patterns	Generalize patterns using explicitly or recursively defined functions	2	2–3
		C. Classify objects and representations	Compare and contrast various forms of representations of patterns	3	2–3
		D. Identify and compare functions	Compare properties of linear, exponential, logarithmic, and rational functions	2	2–3
		E. Describe the effects of parameter changes	Describe the effects of parameter changes on functions	2	2–3
	2. Represent and analyze mathematical situations and structures using algebraic symbols	A. Represent mathematical situations	Use symbolic algebra to represent and solve problems that involve exponential, quadratic and logarithmic relationships	3	2–3
		B. Describe and use mathematical manipulation	Describe and use algebraic manipulations, inverse, or composition of functions	2	1–2
		C. Use equivalent forms	Use and solve equivalent forms of equations and inequalities	2	2–3
		D. Use systems	Use and solve systems of linear and quadratic equations or inequalities with two variables	3	2–3
	3. Use mathematical models to represent and understand quantitative relationships	A. Use mathematical models	Identify quantitative relationships and determine the type(s) of functions that might model the situation to solve the problem	2	2–3
	4. Analyze change in various contexts	A. Analyze change	Analyze exponential and logarithmic functions by investigating rates of change, intercepts, and asymptotes	3	3–4

Table 2.13: Target Point Distributions for the Algebra II Operational Forms (continued)

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
Data and Probability	1. Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them	C. Represent and interpret data	Select and use appropriate graphical representation of data and, given one-variable quantitative data, describe its shape and calculate summary statistics	3	2–3
	2. Select and use appropriate statistical methods to analyze data	A. Describe and analyze data	Apply statistical measures of center to solve problems	3	2–3
		C. Represent data algebraically	Given a scatterplot, determine the type of function which models the data	2	1–2
	4. Understand and apply basic concepts of probability	A. Apply basic concepts of probability	Describe the concepts of sample space and probability distribution	2	1–2
		B. Use and describe compound events	Use and describe the concepts of conditional probability and independent events and how to compute the probability of a compound event	2	2–3

Table 2.14: Actual Point Distributions for the Summer 2009 Algebra II Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Numbers and Operations	7–9	7–9	8	8
Algebraic Relationships	20–30	20–30	22	22
Data and Probability	10–13	10–13	10	10
Total Items	**40**	**40**	**40**	**40**

Table 2.15: Actual Point Distributions for the Fall 2009 Algebra II Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Numbers and Operations	7–9	7–9	8	8
Algebraic Relationships	20–30	20–30	22	22
Data and Probability	10–13	10–13	10	10
Total Items	**40**	**40**	**40**	**40**

Table 2.16: Actual Point Distributions for the Spring 2010 Algebra II Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Numbers and Operations	7–9	7–9	8	8
Algebraic Relationships	20–30	20–30	22	22
Data and Probability	10–13	10–13	10	10
Total Items	**40**	**40**	**40**	**40**

Table 2.17: Actual Point Distributions for the Summer 2010 Algebra II Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Number and Operations	7–9	7–9	9	9
Algebraic Relationships	20–30	20–30	22	22
Data and Probability	10–13	10–13	9	9
Total Items	**40**	**40**	**40**	**40**

Table 2.18: Actual Point Distributions for the Fall 2010 Algebra II Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Numbers and Operations	7–9	7–9	9	9
Algebraic Relationships	20–30	20–30	22	22
Data and Probability	10–13	10–13	9	9
Total Items	**40**	**40**	**40**	**40**

Table 2.19: Actual Point Distributions for the Spring 2011 Algebra II Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Numbers and Operations	7–9	7–9	9	9
Algebraic Relationships	20–30	20–30	22	22
Data and Probability	10–13	10–13	9	9
Total Items	**40**	**40**	**40**	**40**

2.4.3 Geometry

The Geometry EOC Assessment measures students' ability to solve problems by applying mathematical concepts. The three strands assessed on the Geometry Assessment are as follows:

- Algebraic Relationships
- Geometric and Spatial Relationships
- Measurement

The 40 SR questions are aligned to the strands listed above. Table 2.20 contains targets for the CLE point distribution on the Geometry operational forms. Some Big Ideas are not represented in this table because they are not assessed at this course level. Tables 2.21 through 2.26 contain actual point distributions for the operational forms.

Table 2.20: Target Point Distributions for the Geometry Operational Forms

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
Algebraic Relationships	1. Understand patterns, relations, and functions	B. Create and analyze patterns	Generalize patterns using explicitly or recursively defined functions	2	1–2
		C. Classify objects and representations	Compare and contrast various forms of representations of patterns	3	1–2
		D. Identify and compare functions	Understand and compare the properties of linear and nonlinear functions	2	1–2
	2. Represent and analyze mathematical situations and structures using algebraic symbols	B. Describe and use mathematical manipulation	Apply appropriate properties of exponents to simplify expressions and solve equations	2	1–2
	3. Use mathematical models to represent and understand quantitative relationships	A. Use mathematical models	Identify quantitative relationships and determine the type(s) of functions that might model the situation to solve the problem	2	2–3
	4. Analyze change in various contexts	A. Analyze change	Analyze linear and quadratic functions by investigating rates of change, intercepts, and zeros	3	2–3

Table 2.20: Target Point Distributions for the Geometry Operational Forms (continued)

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
Geometric and Spatial Relationships	1. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships	A. Describe and use geometric relationships	Use inductive and deductive reasoning to establish the validity of geometric conjectures, prove theorems, and critique arguments made by others	3	6–7
	2. Specify locations and describe spatial relationships using coordinate geometry and other representational systems	A. Use coordinate systems	Make conjectures and solve problems involving two-dimensional objects represented with Cartesian coordinates	3	6–7
	3. Apply transformations and use symmetry to analyze mathematical situations	A. Use transformations on objects	Use and apply constructions and the coordinate plane to represent translations, reflections, rotations, and dilations of objects	2	3–4
		C. Use symmetry	Identify types of symmetries of two- and three-dimensional figures	2	3–4
	4. Use visualization, spatial reasoning, and geometric modeling to solve problems	A. Recognize and draw three-dimensional representations	Draw and use vertex-edge graphs or networks to find optimal solutions and draw representations of three-dimensional geometric objects from different perspectives	3	4–5
		B. Draw and use visual models	Draw or use visual models to represent and solve problems	3	
Measurement	2. Apply appropriate techniques, tools, and formulas to determine measurements	B. Use angle measurement	Solve problems of angle measure, including those involving triangles or other polygons and of parallel lines cut by a transversal	2	4–5
		C. Apply geometric measurements	Determine the surface area and volume of geometric figures, including cones, spheres, and cylinders	2	3–4
		E. Use relationships within a measurement system	Use unit analysis to solve problems	2	

Table 2.21: Actual Point Distributions for the Summer 2009 Geometry Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Algebraic Relationships	7–12	7–12	8	8
Geometric and Spatial Relationships	22–27	22–27	24	24
Measurement	7–9	7–9	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.22: Actual Point Distributions for the Fall 2009 Geometry Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Algebraic Relationships	7–12	7–12	8	8
Geometric and Spatial Relationships	22–27	22–27	24	24
Measurement	7–9	7–9	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.23: Actual Point Distributions for the Spring 2010 Geometry Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Algebraic Relationships	7–12	7–12	8	8
Geometric and Spatial Relationships	22–27	22–27	24	24
Measurement	7–9	7–9	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.24: Actual Point Distributions for the Summer 2010 Geometry Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Algebraic Relationships	7–12	7–12	8	8
Geometric and Spatial Relationships	22–27	22–27	24	24
Measurement	7–9	7–9	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.25: Actual Point Distributions for the Fall 2010 Geometry Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Algebraic Relationships	7–12	7–12	8	8
Geometric and Spatial Relationships	22–27	22–27	24	24
Measurement	7–9	7–9	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.26: Actual Point Distributions for the Spring 2011 Geometry Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Algebraic Relationships	7–12	7–12	8	8
Geometric and Spatial Relationships	22–27	22–27	24	24
Measurement	7–9	7–9	8	8
Total Items	**40**	**40**	**40**	**40**

2.4.4 Integrated Mathematics II

The Integrated Mathematics II EOC Assessment measures students' ability to solve problems by applying mathematical concepts. The four strands assessed on the Mathematics II Assessment are as follows:

- Numbers and Operations
- Algebraic Relationships
- Geometric and Spatial Relationships
- Data and Probability

The 40 SR questions are aligned to the strands listed above. Table 2.27 contains targets for the CLE point distribution on the Integrated Mathematics II operational forms. Some Big Ideas are not represented in this table because they are not assessed at this course level. Tables 2.28 through 2.30 contain actual point distributions for the operational forms.

Table 2.27: Target Point Distributions for the Integrated Mathematics II Operational Forms

Strand	Big Idea	Concept	CLE	DOK Level	Range/ CLE
Numbers and Operations	1. Understand numbers, ways of representing numbers, relationships among numbers, and number systems	A. Read, write, and compare numbers	Compare and order rational and irrational numbers, including finding their approximate locations on a number line	1	2–3
		B. Represent and use real numbers	Use real numbers and various models, drawings, etc. to solve problems	3	3–4
	2. Understand meanings of operations and how they relate to one another	C. Apply properties of operations	Apply properties of exponents to simplify expressions or solve equations	2	2–3
Algebraic Relationships	1. Understand patterns, relations, and functions	B. Create and analyze patterns	Generalize patterns using explicitly or recursively defined functions	2	1–2
		C. Classify objects and representations	Compare and contrast various forms of representations of patterns	3	1–2
		D. Identify and compare functions	Understand and compare the properties of linear, exponential, and quadratic functions (include domain and range)	2	2–3
		E. Describe the effects of parameter changes	Describe the effects of parameter changes on quadratic and exponential functions	2	1–2
	2. Represent and analyze mathematical situations and structures using algebraic symbols	A. Represent mathematical situations	Use symbolic algebra to represent and solve problems that involve quadratic relationships, including recursive relationships	3	2–3
		B. Describe and use mathematical manipulation	Describe and use algebraic manipulations, including factoring and rules of integer exponents	2	2–3
		C. Use equivalent forms	Use and solve equivalent forms of equations and inequalities (piece-wise and quadratic)	2	1–2
		D. Use systems	Use and solve systems of linear equations or inequalities with two variables	2	1–2
	3. Use mathematical models to represent and understand quantitative relationships	A. Use mathematical models	Identify quantitative relationships and determine the type(s) of functions that might model the situation to solve the problem	2	1–2
	4. Analyze change in various contexts	A. Analyze change	Analyze quadratic functions by investigating rates of change, intercepts, and zeros	3	2–3

Table 2.27: Target Point Distributions for the Integrated Mathematics II Operational Forms (continued)

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
Geometric and Spatial Relationships	1. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships	A. Describe and use geometric relationships	Use trigonometric relationships with right triangles to determine lengths and angle measures	2	1–2
	2. Specify locations and describe spatial relationships using coordinate geometry and other representational systems	A. Use coordinate systems	Make conjectures and solve problems involving two-dimensional objects represented with Cartesian coordinates	3	2–3
	3. Apply transformations and use symmetry to analyze mathematical situations	A. Use transformations on objects	Use and apply constructions and matrices to represent translations, reflections, rotations, and dilations	2	2–3
		B. Use transformations on functions	Translate, dilate, and reflect quadratic and exponential functions	2	2–3
Data and Probability	2. Select and use appropriate statistical methods to analyze data	A. Describe and analyze data	Apply statistical concepts to solve problems and distinguish between a statistic and a parameter	3	2–3
		C. Represent data algebraically	Given a scatterplot, determine the type of function which models the data	2	1–2
	4. Understand and apply basic concepts of probability	A. Apply basic concepts of probability	Describe the concepts of sample space and probability distribution	2	2–3
		B. Use and describe compound events	Use and describe the concepts of conditional probability and independent events	2	2–3

Table 2.28: Actual Point Distributions for the Summer 2009 Integrated Mathematics II Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Numbers and Operations	7–10	8	8	8
Algebraic Relationships	14–24	14–24	16	16
Geometric and Spatial Relationships	7–11	7–11	8	8
Data and Probability	7–11	7–11	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.29: Actual Point Distributions for the Fall 2009 Integrated Mathematics II Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Numbers and Operations	7–10	8	8	8
Algebraic Relationships	14–24	14–24	16	16
Geometric and Spatial Relationships	7–11	7–11	8	8
Data and Probability	7–11	7–11	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.30: Actual Point Distributions for the Spring 2010 Integrated Mathematics II Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Numbers and Operations	7–10	8	8	8
Algebraic Relationships	14–24	14–24	16	16
Geometric and Spatial Relationships	7–11	7–11	8	8
Data and Probability	7–11	7–11	8	8
Total Items	**40**	**40**	**40**	**40**

2.4.5 Integrated Mathematics III

The Integrated Mathematics III EOC Assessment measures students' ability to solve problems by applying mathematical concepts. The four strands assessed on the Mathematics III Assessment are as follows:

- Numbers and Operations
- Algebraic Relationships
- Geometric and Spatial Relationships
- Data and Probability

The 40 SR questions are aligned to the strands listed above. Table 2.31 contains targets for the CLE point distribution on the Integrated Mathematics III operational forms. Some Big Ideas are not represented in this table because they are not assessed at this course level. Tables 2.32 through 2.34 contain actual point distributions for the operational forms.

Table 2.31: Target Point Distributions for the Integrated Mathematics III Operational Forms

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
Numbers and Operations	1. Understand numbers, ways of representing numbers, relationships among numbers, and number systems	A. Read, write, and compare numbers	Compare and order rational and irrational numbers, including finding their approximate locations on a number line	1	2–3
		B. Represent and use real numbers	Use real numbers and various models, drawing, etc. to solve problems	3	3–4
	2. Understand meanings of operations and how they relate to one another	C. Apply properties of operations	Apply properties of logarithms to simplify expressions or solve equations	2	2–3
Algebraic Relationships	1. Understand patterns, relations, and functions	B. Create and analyze patterns	Generalize patterns using explicitly or recursively defined functions	2	1–2
		C. Classify objects and representations	Compare and contrast various forms of representations of patterns	3	1–2
		D. Identify and compare functions	Understand and compare the properties of linear, quadratic, exponential, logarithmic, rational, and periodic functions (include asymptotes)	2	2–3
		E. Describe the effects of parameter changes	Describe the effects of parameter changes on logarithmic and exponential functions	2	1–2
	2. Represent and analyze mathematical situations and structures using algebraic symbols	A. Represent mathematical situations	Use symbolic algebra to represent and solve problems that involve exponential and logarithmic relationships, including recursive and parametric relationships	3	2–3
		B. Describe and use mathematical manipulation	Describe and use algebraic manipulations, including inverse of functions, composition of functions, and rules of exponents	2	2–3
		C. Use equivalent forms	Use and solve equivalent forms of equations and inequalities (exponential, logarithmic and rational)	2	1–2
		D. Use systems	Use and solve systems of linear and quadratic equations or inequalities with two variables	3	1–2
	3. Use mathematical models to represent and understand quantitative relationships	A. Use mathematical models	Identify quantitative relationships and determine the type(s) of functions that might model the situation to solve the problem (including recursive forms)	2	1–2
	4. Analyze change in various contexts	A. Analyze change	Analyze exponential and logarithmic functions by investigating rates of change, intercepts, and asymptotes	3	2–3

Table 2.31: Target Point Distributions for the Integrated Mathematics III Operational Forms (continued)

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
Geometric and Spatial Relationships	1. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships	A. Describe and use geometric relationships	Use inductive and deductive reasoning to determine lengths and angle measures in all types of triangles and to establish the validity of geometric conjectures, proved theorems, and critique arguments made by others	3	4–5
	3. Apply transformations and use symmetry to analyze mathematical situations	B. Use transformations on functions	Perform simple transformations and their compositions on linear, quadratic, logarithmic, and exponential functions	2	2–3
	4. Use visualization, spatial reasoning, and geometric modeling to solve problems	A. Recognize and draw three-dimensional representations	Draw representations of three-dimensional geometric objects from different perspectives using a variety of tools	3	1–2
Data and Probability	1. Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them	A. Formulate questions	Describe the characteristics of well-designed studies, including the role of randomization in survey and experimental research	3	1–2
		C. Represent and interpret data	Display and analyze bivariate data where one variable is categorical and the other is numerical	3	1–2
	2. Select and use appropriate statistical methods to analyze data	B. Compare data representations	Recognize how linear transformations of single-variable data affect shape, center, and spread	3	1–2
		C. Represent data algebraically	Create a scatterplot, describe its shape, and determine and analyze regression equations	3	1–2
	3. Develop and evaluate inferences and predictions that are based on data	A. Develop and evaluate inferences	Describe how sample statistics reflect the values of population parameters and use sampling distributions as the basis for informal reference	3	1–2
	4. Understand and apply basic concepts of probability	B. Use and describe compound events	Use and describe how to compute the probability of a compound event	2	2–3

Table 2.32: Actual Point Distributions for the Summer 2009 Integrated Mathematics III Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Numbers and Operations	7–10	7–10	8	8
Algebraic Relationships	14–24	14–24	16	16
Geometric and Spatial Relationships	7–11	7–11	8	8
Data and Probability	7–13	7–13	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.33: Actual Point Distributions for the Fall 2009 Integrated Mathematics III Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Numbers and Operations	7–10	7–10	8	8
Algebraic Relationships	14–24	14–24	16	16
Geometric and Spatial Relationships	7–11	7–11	8	8
Data and Probability	7–13	7–13	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.34: Actual Point Distributions for the Spring 2010 Integrated Mathematics III Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Numbers and Operations	7–10	7–10	8	8
Algebraic Relationships	14–24	14–24	16	16
Geometric and Spatial Relationships	7–11	7–11	8	8
Data and Probability	7–13	7–13	8	8
Total Items	**40**	**40**	**40**	**40**

2.4.6 American History

The American History assessment measures students' abilities to understand our history and participate in our civic life as citizens and consumers. The American History forms consist of 40 SR items that are aligned to Strand 3. Individual CLEs within that strand report out to the following categories:

- History
- Government
- Economics
- Geography

Table 2.35 contains targets for the CLE point distribution on the American History operational forms. Some Big Ideas are not represented in this table because they are not assessed at this course level. Tables 2.36 through 2.41 contain actual point distributions for the operational forms.

Table 2.35: Target Point Distributions for the American History Operational Forms

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
Missouri, United States, and World History	3a. Knowledge of continuity and change in the history of Missouri and the United States	A. Understand the migrations of people from many regions to North America	Describe the migrations of people from many regions of the world and the interactions of cultures and religious traditions that have contributed to America's history from Reconstruction to the present: a. motivations for immigration b. challenges to immigrants	3	3–4
		I. Political development in the United States	Analyze the evolution of American democracy, its ideas, institutions, and political processes from Reconstruction to the present, including: a. Reconstruction b. struggle for civil rights c. expanding role of government d. expanding participation in political processes	3	3–4

Table 2.35: Target Point Distributions for the American History Operational Forms (continued)

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
		J. Understanding economic concepts	Apply the following major economic concepts in the context of the historical period studied: a. natural resources, labor, and capital resources b. supply and demand (shortages and surpluses) c. business cycle d. government regulation and deregulation e. unemployment and full employment f. inflation and deflation g. savings and investment h. profit	3	2
		K. Principles and purposes of government	Explain the importance of the following principles of government since Reconstruction a. majority rule and minority rights b. constitution and civil rights c. checks and balances	2	4
		M. Processes of governmental systems	Analyze the roles and influence of political parties and interest groups since Reconstruction to the present	3	4
		N. Economic development in the United States	Describe the historical development of the American economy, including a. impact of geographic factors b. role of the frontier and agriculture c. impact of technological change and urbanization on land, resources, society, politics, and culture d. changing relationships between government and the economy	2	3–4

Table 2.35: Target Point Distributions for the American History Operational Forms (continued)

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
		O. Understanding the roles of people, business, and government in the economic system of the United States	Analyze the roles people, business, labor unions, and government play in the U.S. economy: a. how monopolies affect people's lives and how they are regulated b. how boycotts, strikes, and embargoes affect trade and people's options c. monetary policy (why the Federal Reserve System influences interest rates and money supply) d. fiscal policy (government taxation and spending)	3	2
		P. Understanding functions and effects of economic institutions	Survey the functions and effects of major economic institutions of the U.S. economy, such as corporations, labor unions, and financial institutions	2	2
		R. Understanding the roles of the government in the U.S. economy	Identify the roles of government in the U.S. economy (defining and protecting property rights, maintaining competition, promoting goals such as full employment, stable prices, growth, and justice)	2	2
		U. Understanding relationships within places	Distinguish major patterns and issues with regard to population distribution, demographics, settlements, migrations, and cultures in the United States.	2	4
		V. Understanding relationships between and among regions	List and explain criteria that give regions their identities in different periods of U.S. history. Explain how and why regions change.	2	4

Table 2.35: Target Point Distributions for the American History Operational Forms (continued)

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
		W. Foreign and domestic policy developments	Describe and evaluate the evolution of U.S. domestic and foreign policies from Reconstruction to the present, including a. isolationism b. immigration policy c. Manifest Destiny d. imperialism e. two world wars f. Cold War g. New Deal h. global interdependence	3	3–4
		X. Causes, comparisons, and results of major twentieth-century wars	Examine the wars of the twentieth century pertinent to U.S. history, including causes, comparisons, consequences, and peace efforts	2	3–4

Table 2.36: Actual Point Distributions for the Summer 2009 American History Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
History	14–18	14–18	16	16
Government	7–9	7–9	8	8
Economics	7–9	7–9	8	8
Geography	7–9	7–9	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.37: Actual Point Distributions for the Fall 2009 American History Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
History	14–18	14–18	16	16
Government	7–9	7–9	8	8
Economics	7–9	7–9	8	8
Geography	7–9	7–9	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.38: Actual Point Distributions for the Spring 2010 American History Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
History	14–18	14–18	16	16
Government	7–9	7–9	8	8
Economics	7–9	7–9	8	8
Geography	7–9	7–9	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.39: Actual Point Distributions for the Summer 2010 American History Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
History	14–18	14–18	16	16
Government	7–9	7–9	8	8
Economics	7–9	7–9	8	8
Geography	7–9	7–9	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.40: Actual Point Distributions for the Fall 2010 American History Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
History	14–18	14–18	16	16
Government	7–9	7–9	8	8
Economics	7–9	7–9	8	8
Geography	7–9	7–9	8	8
Total Items	**40**	**40**	**40**	**40**

Table 2.41: Actual Point Distributions for the Spring 2011 American History Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
History	14–18	14–18	16	16
Government	7–9	7–9	8	8
Economics	7–9	7–9	8	8
Geography	7–9	7–9	8	8
Total Items	**40**	**40**	**40**	**40**

2.4.7 Government

The Government assessment measures students' abilities to understand our history and participate in our civic life as citizens and consumers. The Government forms consist of 40 SR items that are aligned to Strands 1 and 2 as follows:

- Principles of Constitutional Democracy
- Principles and Processes of Governance Systems

Table 2.42 contains targets for the CLE point distribution on the Government operational forms. Some Big Ideas are not represented in this table because they are not assessed at this course level. Tables 2.43 through 2.48 contain actual point distributions for the operational forms.

Table 2.42: Target Point Distributions for the Government Operational Forms

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
Principles of Constitutional Democracy	1. Knowledge of the principles expressed in documents shaping constitutional democracy in the United States	A. Principles of constitutional democracy in the United States	Apply the following principles of constitutional democracy to historical and contemporary issues: a. checks and balances b. separation of powers c. federalism d. representation e. popular sovereignty f. due process of law g. judicial review	3	2–4
			Determine the civic responsibilities of individual citizens	2	2–4
			Assess the changing roles of government: a. philosophy b. limits c. duties	2	2–4
			Describe the historical foundations of the U.S. governmental system as reflected in the following documents: a. Magna Carta b. Enlightenment writings of Hobbes, Locke, Rousseau, Montesquieu, and the Social Contract Theory c. Mayflower Compact d. Declaration of Independence e. Articles of Confederation	3	2–4
			Identify and give examples of democracies and republics	2	2–4
		B. Role of citizens and government in carrying out constitutional principles	Explain the relevance and connection of constitutional principles in the following documents: a. U.S. Constitution b. Federalist Papers c. Amendments to the Constitution, emphasizing the Bill of Rights d. Key Supreme Court decisions, *Marbury v. Madison*, *McCulloch v. Maryland*, *Miranda v. Arizona*, *Plessy v. Ferguson*, *Brown v. Topeka Board of Education*	3	2–4

Table 2.42: Target Point Distributions for the Government Operational Forms (continued)

Strand	Big Idea	Concept	CLE	DOK Level	Range/CLE
Principles and Processes of Governance Systems	2. Knowledge of principles and processes of governance systems	A. Principles and purposes of government	Describe the structure of government and the purposes of laws (with emphasis on the federal and state governments) in general	1	4–5
			Explain the importance of the following principles of government: a. limited government b. majority rule and minority rights c. constitution and civil rights d. checks and balances e. merits of the above principles	2	4–5
		C. Processes of governmental systems	Explain the processes pertaining to: a. selection of political leaders (with an emphasis on presidential and parliamentary systems) b. functions and styles of leadership (including authoritarian, democratic, and laissez-faire) c. governmental systems d. how laws and rules are made, enforced, changed, and interpreted	2	4–5
			Evaluate the roles and influence of political parties and interest groups	3	4–5

Table 2.43: Actual Point Distributions for the Summer 2009 Government Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Principles of Constitutional Democracy	18–22	18–22	20	20
Principles and Processes of Governance Systems	18–22	18–22	20	20
Total Items	**40**	**40**	**40**	**40**

Table 2.44: Actual Point Distributions for the Fall 2009 Government Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Principles of Constitutional Democracy	18–22	18–22	20	20
Principles and Processes of Governance Systems	18–22	18–22	20	20
Total Items	**40**	**40**	**40**	**40**

Table 2.45: Actual Point Distributions for the Spring 2010 Government Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Principles of Constitutional Democracy	18–22	18–22	20	20
Principles and Processes of Governance Systems	18–22	18–22	20	20
Total Items	**40**	**40**	**40**	**40**

Table 2.46: Actual Point Distributions for the Summer 2010 Government Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Principles of Constitutional Democracy	18–22	18–22	20	20
Principles and Processes of Governance Systems	18–22	18–22	20	20
Total Items	**40**	**40**	**40**	**40**

Table 2.47: Actual Point Distributions for the Fall 2010 Government Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Principles of Constitutional Democracy	18–22	18–22	20	20
Principles and Processes of Governance Systems	18–22	18–22	20	20
Total Items	**40**	**40**	**40**	**40**

Table 2.48: Actual Point Distributions for the Spring 2011 Government Operational Form

Form Blueprint				
Reporting Categories	Blueprint		Actual	
	# Items	# Points	# Items	# Points
	MC	MC	MC	MC
Principles of Constitutional Democracy	18–22	18–22	20	20
Principles and Processes of Governance Systems	18–22	18–22	20	20
Total Items	**40**	**40**	**40**	**40**

2.5 Development of Test Items

Content-related evidence of validity supporting test interpretation is presented in terms of how the 2010–2011 MO EOC Assessments were assembled for English I, Algebra II, Geometry, Government, American History, and Integrated Mathematics II and III. Detailed information regarding both item-development procedures and content coverage is included in this section.

The forms for the Summer 2010, Fall 2010, and Spring 2011 administrations were constructed using items that were field tested in Spring 2009 and Spring 2010. During the process of building the forms for the 2010–2011 operational test administrations, statistical characteristics (i.e., *p*-values and point-biserial correlations) were monitored to ensure that the statistical properties of the forms were similar within each content area and across operational test forms for fall, spring, and summer.

Riverside Publishing Test Development Specialists (TDSs) created a detailed item and passage development plan based on the blueprints for each content area. The plan included the number of items necessary for each assessable CLE, as well as an outline of the review process for developed items and passages. This process included internal Riverside Publishing reviews, a DESE review on a percentage of the items, and content and bias review by Missouri educators.

2.5.1 Item Writing

The individuals who created all the test items were Missouri educators, DESE staff members, Regional Instructional Facilitators (RIF), and Riverside Publishing TDSs. English I passages were developed by item writers trained by Riverside Publishing, Riverside Publishing TDSs, and DESE staff. These passages were developed and refined prior to the item-writing workshops. Requirements to be an item writer included experience in classroom teaching and expert content knowledge.

In January 2008, Riverside Publishing conducted item-writing workshops to develop SR items for Algebra II, Geometry, Government, and American History. These workshops were conducted at the Assessment Resource Center (ARC) office space in Columbia, Missouri. Participants in the workshops included Missouri educators, DESE staff and Regional Instructional Facilitators, and Riverside Publishing TDSs. The workshops were held during a five-day period and were conducted with 15–20 teacher participants per

content area. Teacher participants were selected by DESE to represent school districts throughout Missouri.

In March 2008, Riverside Publishing conducted item-writing workshops to develop SR items for English I and Integrated Mathematics II and III. English I participants wrote SR items associated with the passages that had been developed prior to the item-writing workshops. The content developed at the both workshops was based on the Missouri Show-Me Standards and CLEs.

During the item-writing workshops, Riverside Publishing TDSs conducted training sessions with the item writers and provided instructions on avoiding bias and stereotyping of groups and individuals based on gender, race, ethnicity, religion, age, language, socioeconomic group, and disability. Riverside Publishing TDSs also trained item writers to write items that adhere to the principles of universal design, making the items accessible to the widest range of students. For example, items and passages were written using clear and concise language, and all graphics and tables were labeled and were not overly crowded with extraneous information. Instruction was also provided on developing items at particular cognitive levels based on Norman Webb's DOK levels.

Riverside Publishing TDSs trained item writers to enter content into the company's electronic Content Management System (CMS). During training, item writers wrote several items and received feedback on them. Participants also received feedback through CMS, and Riverside Publishing TDSs responded to teachers' items as they were submitted. As items were produced, they were continuously reviewed, revised, edited, and evaluated by Riverside Publishing TDSs and DESE staff. Item writers who generated high-quality work on or ahead of schedule were given additional assignments.

As items were written, they were tracked according to the item development plan. Riverside Publishing kept careful records to maintain a workflow that generated items in assessment strands and CLEs as required by the test blueprint. All items and passages went through several rounds of internal reviews, including content and editorial reviews. Riverside Publishing TDSs reviewed each item with respect to alignment, clarity, grade appropriateness, and correspondence to item specifications.

2.5.2 Universal Design

Riverside Publishing TDSs are experienced in employing the principles of universal design in item development so that all students have equal access to the assessments. Riverside Publishing included these principles when training Missouri teachers to write the test items.

According to the *NCEO Synthesis Report 44* (Thompson, Johnstone, and Thurlow 2002), there are seven elements of universally designed assessments:

1. Inclusive assessment population
2. Precisely defined constructs
3. Accessible, nonbiased items
4. Amenable to accommodations
5. Simple, clear, and intuitive instructions and procedures

6. Maximum readability and comprehensibility
7. Maximum legibility

All items for the MO EOC Assessments were developed with these elements in mind. Riverside Publishing ensured the development of MO EOC items in accordance with these principles in the following manner:

- Items were developed to include a wide array of contexts and cultures. These item types may make students feel more included, increase motivation, and avoid bias.
- The test and item specifications served as a model for precisely defining the constructs that the tests would measure. These specifications indicated to the item writer, content reviewer, and TDS exactly what was to be measured. The item could assess a particular part of a standard or a combination of elements within a standard. The reviews served as a method for eliminating items that included assessment of knowledge outside the standard. For example, a mathematics item should have nonmathematical vocabulary below grade level; otherwise, the item might also be assessing reading ability, introducing construct-irrelevant variance.
- The review of items, which was performed by reviewers who included Missouri teachers from diverse ethnic and geographic backgrounds, served to ensure that all items were accessible to as many students as possible.
- Riverside Publishing staff members trained Missouri teachers to create clear and simple instructions so that students would have a clear understanding of the task needed to answer an item. Teacher review committees had an opportunity to review the instructions to ensure that they were appropriate for the grade levels and subject areas. To ensure the appropriateness of the level of the vocabulary, *Children's Writer's Word Book* and *EDL Core Vocabulary* were employed by test developers and item review committees.
- Finally, items with text, graphics, tables, maps, and diagrams were constructed with maximum legibility.

2.5.3 Content and Bias Review Process

Standard 3.6[3] specifically addresses the importance of item review by both an examination of the item statistics and the use of expert panels of judges. This section details the steps that were taken to ensure that the items chosen for the operational forms of the MO EOC Assessments were of high technical quality and were free from bias. Content and bias reviews were conducted in July 2008 in Columbia, Missouri. The review committees included DESE staff, Missouri educators from around the state, Regional Instructional Facilitators, and Riverside Publishing staff.

The content review committees reviewed SR items using the following criteria:

[3] **Standard 3.6:** The type of items, response formats, scoring procedures, and test administration procedures should be selected based on the purposes of the test, the domain to be measured, and the intended test takers. To the extent possible, test content should be chosen to ensure that intended inferences from test scores are equally valid for members of different groups of test takers. The test review process should include empirical analyses and, when appropriate, the use of expert judges to review items and response formats. The qualifications, relevant experiences, and demographic characteristics of expert judges should also be documented (p. 44).

- Overall quality and syntactical clarity
- Content coverage and content appropriateness
- Alignment to the specified CLE
- Appropriate contexts
- One clearly correct answer and plausible distractors for SR items
- Freedom from bias or any racial, socioeconomic, gender, or other sensitivity issues

The bias review committee was held separately from the content review committee and those participants focused on reviewing items on the last criterion above. Suggestions from the bias review committee were then shared with the content review committee for their review and a determination on how to incorporate the edits.

Before reviewing the items, a group training session was held with all committee members. Riverside Publishing presented a PowerPoint that described the MO EOC program, the test development process, and the content and bias review procedures. After the large-group session, the committee members went to their respective break-out rooms to discuss the week's activities in more detail. The committee members were provided with copies of the CLEs and item specifications for the courses for the items they were to review. Each Riverside Publishing content facilitator reviewed these documents with the committee and answered any questions. The committee members were given the following checklists that could be referenced throughout the review process:

For SR items:

- ☐ Does the item assess the assigned CLE?
- ☐ Is the item clear, concise, and complete?
- ☐ Does the item contain accurate and sufficient content information?
- ☐ Is the item grade-level appropriate, and are the vocabulary and syntax appropriate for the students at the intended grade? (Reference the *EDL Core Vocabularies*.)
- ☐ Is the item fair to all students and free of bias and sensitivity issues?
- ☐ Does the item have correct punctuation, and is it grammatically correct?
- ☐ Is the item free from spelling and typographical errors?
- ☐ Is clueing avoided within an item stem and options, as well as among items?
- ☐ Does the item stand alone? (The answer to one item should not be dependent on the content of another item.)
- ☐ Are the equations, tables, charts, graphs, and other art clear, accurate, and necessary?
- ☐ Does the item have only one correct answer?
- ☐ Does the item have unique, plausible distractors containing common errors students would make?
- ☐ Are all the options parallel in form and arranged in logical order?
- ☐ Do all distractors contain clear rationale statements? (Math and Science only)

- ☐ Is the item free from absolutes ("none of the above," "all of the above") as options and free from the use of negatives ("not," "none," "except") in the stem?
- ☐ Does the item avoid repeating words from the stem in the options?
- ☐ Does the item pose a single problem (although the solution may require more than one step)?

Missouri educators participated in the review process for each content area. The committee members read and reviewed each item. Discussions were held about whether or not the items met the criteria listed above. The committees then rejected or revised any items they deemed unsatisfactory. If there was disagreement about how to proceed with an item, the Riverside Publishing facilitator polled the group and followed the direction of the majority. Approximately 98% of the items were accepted (as–is or with edits) by the content and bias committees. Table 2.41 shows the number of items that were reviewed in 2008. The accepted items were placed in a pool of items from which the 2009 standalone field-test forms were built.

To further preserve validity, all item review sessions were held in secure meeting rooms, and all materials were confidential. Committee members were required to sign confidentiality agreements so that the integrity of the test content was not compromised. Although educators were encouraged to share information with their colleagues about the process of the item review, they were made fully aware of the expectation that any information about specific items and passages was to remain secure and confidential.

Table 2.49: 2008 Content/Bias Item Review Acceptance Rates

	Total Number of Items Presented for Review	Number of Items Accepted (As Is or With Edits	Acceptance Rate (Items Accepted As Is or With Edits)
Algebra II	490	488	99.5%
Geometry	488	471	97%
English I	669	669	100%
American History	494	470	95%
Government	492	474	96%
Integrated Math II	380	380	100%
Integrated Math III	380	378	99.4%

2.6 Test Form Assembly

2.6.1 Field-Test Selection and Administration

The items accepted at the content/bias review were used to build the standalone field-test forms that were administered in spring 2009. Field-test items were selected so that each form met the established operational blueprint requirements for content coverage as closely as possible. For any standalone field-test form that deviated slightly from the blueprint, another field-test form made up for that difference, so that the entire pool of field-tested items met the blueprint requirements.

The MO EOC Spring 2009 field test consisted of 10 SR forms of 36 items each for Algebra II, Geometry, Government, and American History. English I field tested 14

unique forms with 36 items on each form, and Integrated Mathematics II and III each field tested 4 forms with 36 items on each form. All field-test forms were reviewed and approved by DESE. The forms for each course were spiraled at the student level across the State.

2.6.2 Statistical Item Review

After completion of the 2009 field-test item scoring, Riverside Publishing TDSs and psychometricians reviewed the statistical characteristics of the items. Riverside Publishing used classical item statistics, including *n*-counts, *p*-values, percentage choosing each response option, point-biserial correlations, and differential item functioning (DIF) analysis for the SR items. Additionally, the Rasch model was used for distractor analysis for the SR items.

During the data review on June 19, 2009, the Riverside Publishing Research and Test Development staff and DESE staff reviewed students' performance on the Spring 2009 field-test items. Items were carefully reviewed with respect to their statistical characteristics. Item reviewers from DESE and Riverside Publishing were provided with the following information:

- Form
- Position
- Item as it appeared in the printed books
- Item alignment to the Missouri Show-Me Standards
- The *p*-value of the correct answer and percentage of students who selected each distractor
- Point-biserial correlation of correct response and point-biserial for each distractor
- Total number of students who attempted to answer each question
- DIF using the Mantel-Haenszel (MH) (1959) procedure and Educational Testing Service (ETS) classification

Riverside Publishing and DESE staff reviewed items that were flagged because of statistics that fell outside the parameters determined by the Riverside Publishing Research staff. Table 2.42 contains the guidelines used for data review.

Table 2.50: Criteria for Flagged Items

Item Flagging Criteria	Indicates
If *p*-value of keyed response < 0.35	Difficult item
If *p*-value of keyed response > 0.95	Easy item
If *p*-value of keyed response < p-value of distractor	Possible miskey
If *p*-value of distractor > 0.35	Possible second correct option
If point-biserial of keyed response < 0.20	Poorly discriminating item
If point-biserial of a distractor is > 0.00	Possible second correct option
If ETS classification is B or C (from DIF analysis)	Possible bias in item

Each flagged item was reviewed, and then Riverside Publishing and DESE made a decision about whether the item should be accepted or rejected. The review included

items flagged with moderate to severe DIF (an ETS classification of B or C). A flagged item was accepted if the review team determined that the item was strong and tested students on content they were expected to know. Accepted items were then made available in the pool of items that could be used to create the operational forms. Items that the review team felt were biased or inappropriate for the Missouri EOC Assessments were rejected. Rejected items were removed from the item pool, making them invalid for the MO EOC Assessments. Of the 2,233 total items reviewed, 93% were accepted.

2.6.3 Operational Test Selection and Administration

In June and July 2009, Riverside Publishing TDSs selected operational items for test forms for use in 2009 and 2010. Using item response theory (IRT) item difficulty information, four equivalent operational forms were selected for each content area. These four forms are the operational component of the Fall, Spring, and Summer EFT forms, as well as the released form. The Fall form was administered in November 2009, the Spring form in April 2010, and the Summer form in June 2010.[4]

The operational form construction process was based on content requirements and statistical criteria. The steps associated with assembling test forms included the following:

1. *Determine form design.* Each form consisted of operational items and EFT items.
2. *Select items that meet content specifications.* Each form was constructed based on the test specifications for that content area. The test specifications delineated the item distribution across assessment strands. They also outlined the test length, type of items, and number of points to be assessed at each CLE.
3. *Evaluate statistical specifications, and select items to meet these specifications.* Spreadsheets (form matrices) were used to ensure that the test forms met statistical specifications. These matrices contained the following statistics: average *p*-values, point-biserial correlations, and DIF statistics. Riverside Publishing psychometricians conducted a review of the test forms to ensure equivalence of test difficulty across forms.
4. *Review and approve test forms.* Once the content and statistical specifications were met for each content area, the forms were reviewed and approved by DESE. The forms were then released for production and additional content and editorial reviews.

2.7 Braille and Large Print Versions

Beyond employing the principles of universal design, all operational assessments were offered in Braille and Large Print versions for visually impaired students taking the MO EOC Assessments. The Fall 2009 operational paper-and-pencil version was converted into Braille and large print to accommodate these students.

[4] The Summer 2010 administration is part of the 2010–2011 assessment year, and its results are not included in this technical report.

Once the Braille and Large Print Forms were created, two separate reviews were held on September 17 and 18, 2009, with educators from Missouri who had specialized training in working with visually impaired students.

The teachers consulted the *Large Print and Braille Style Guide*, which was also used during form composition, and relied on their own expertise to determine whether changes to directions, passages, or items were needed or whether items should be omitted. The Riverside Publishing Braille vendor (Region IV) also reviewed the forms and made recommendations based on how items, passages, and directions would be transcribed to Braille.

Riverside Publishing and DESE reviewed the recommendations from all of these sources. It was determined that no items had to be omitted to accommodate students who needed Large Print materials. For the Braille version of the form, three items from Geometry and one item from English I were removed because the content of the items prohibited transcription to Braille. Students taking the Braille form were given credit for these items. The embedded field test items were eliminated from both versions of these forms due to the irregular testing conditions and the small sample sizes for these groups. These versions of the Large Print and Braille forms were used through the Summer 2010 test administration.

2.8 Online Forms Construction

All items were written so they could be presented in the online delivery system without any alterations.

2.9 Quality Control for Test Construction

Checklists and quality control procedures accompany each stage of form development. Following is a list of some quality control procedures used during the assembly of the MO EOC Assessment forms:

- Construct forms based on all content requirements noted in the test blueprint and test specifications
- Verify correct number of items per standard or reporting category based on test blueprint
- Review items to ensure a wide sampling of the knowledge and skills being measured
- Ensure that all items have been through the appropriate review procedures and are approved for use by DESE
- Check for a variety of item topics, equal distribution of males and females, ethnicities, etc.
- Verify appropriate portions of items with and without artwork
- Check for clueing across all items on each form
- Verify equal or nearly equal distribution of answer choices for SR items
- Ensure that the test meets the required statistical specifications (i.e., that as many items as possible have *p*-values between 0.35 and 0.90 and as many items as possible have point-biserial correlations above 0.20)
- Consider any statistical flags or problems

- Check statistics to ensure that the collection of items on a given form yields an overall difficulty that falls within the specified range
- Verify that items have not been released to the public
- Verify correct answer key for each item
- Perform content review of form (senior staff)
- Perform statistical review of form (psychometrician/statistician)
- Send form to DESE for review and approval

2.10 Summary

The MO EOC Assessments in English I, Algebra II, Geometry, Government, American History, and Integrated Mathematics II and III provide an indication of student progress toward achieving the knowledge and skills identified in the Missouri Show-Me Standards. Just as the Show-Me Standards guided item development and selection process, the consideration of content played an equally important role in form development. Form development required a balance of both content coverage and item difficulty. As items were selected for inclusion on particular forms, every effort was made to balance the content coverage to ensure the items aligned to the Missouri Show-Me Standards/CLEs being assessed while simultaneously considering the overall difficulty of the form. DESE made the determination to discontinue the Integrated Mathematics II and III assessments due to extremely low actual enrollments for the Fall 2009 assessments and low projections of enrollment for Spring 2010.

CHAPTER 3: ACHIEVEMENT-LEVEL SETTING

3.1 Introduction

One purpose of assessment is to establish clear guidelines for educational decision making. By assigning meaning to test scores, standard setting allows policymakers, administrators, teachers, and parents to make statements about the level of proficiency of individual students and groups of students. The purpose of this chapter is to provide documentation of the achievement-level-setting (or standard-setting) event conducted for the Missouri End-of-Course (MO EOC) Assessments on November 2–5, 2009.

3.2 Goal of the Standard Setting

The main goal of the standard-setting event was to establish three cut scores for each test in the MO EOC Assessments:

1. The cut score that differentiates Below Basic performance from Basic performance
2. The cut score that differentiates Basic performance from Proficient performance
3. The cut score that differentiates Proficient performance from Advanced performance

In other words, the determination of three cut scores yields four performance categories for each assessment.

3.3 Overview of the Standard Setting

During the November 2009 event, achievement-level-setting activities were undertaken for five MO EOC Assessments: English I, Algebra II, Geometry, American History, and Government. These five assessments were administered operationally for the first time during the 2009–2010 school year.

It should be noted that the original plan for achievement-level setting included sessions for Integrated Math II and Integrated Math III. However, before the event, DESE made the determination to discontinue these two assessments due to extremely low actual enrollments for the Fall 2009 assessments and low projections of the number of students who would enroll to take these assessments in Spring 2010. Additionally, DESE received only five participant nominations for the Integrated Math panels, confirming the low participation in these two courses statewide.

3.4 Staff and Participants

Staff from Questar Assessment, Inc., a subcontractor to Riverside Publishing, planned and facilitated the standard-setting workshops in consultation with Riverside Publishing's MO EOC Assessment team. Questar's most experienced facilitators—Michael Beck, Sheila Potter, and Leon Dreyfus—served as facilitators for the workshops. Each of these individuals has facilitated standard-setting sessions for multiple clients for both elementary-level and high-school-level assessments.

In addition to the staff from Questar, three psychometricians from Riverside Publishing attended the workshops. Their function was to enter panelist data, produce tables and reports, and oversee data quality control as well as observe activities in each of the groups. A Riverside Publishing program manager was present for the entire workshop to assist Missouri Department of Elementary and Secondary Education (DESE) staff and the panelists with logistical issues. Content area specialists from Riverside Publishing's Content Development group were present in the five panel rooms to serve as resources for content-related questions. Finally, curriculum staff from DESE attended the standard-setting workshops to serve as content resources to the appropriate panels.

3.4.1 Participant Recruitment

In July 2009, DESE electronically distributed informational letters and panelist nomination forms to all Missouri district superintendents, Regional Professional Development Center (RPDC) directors, and selected professional educator organizations. In addition, DESE contacted the Director of the Missouri Department of Higher Education's Curriculum Alignment Initiative. The cover letters described the process and impact of the standard-setting event and provided some preliminary details such as date and location. The letters also stressed that this was a unique opportunity for panels of educators and other individuals to discuss Course-Level Expectations (CLEs) for each applicable course and to review assessment items to determine the appropriate "cut scores" for each achievement level. Each addressee was given the opportunity to nominate one or more classroom teachers, nonteacher educators, post-secondary educators, or business professionals with appropriate content knowledge to be considered for participation in the standard-setting event. The panelist nomination letters and forms were also distributed to an applicable group of education-related professional organizations in Missouri. A list of those organizations is included as Appendix A.

The requirements for participation were as follows:

For classroom teachers: The teacher must have taught the course for which he or she is being nominated to serve as a panelist for a minimum of five years. The teacher should be familiar with the Show-Me Standards and the applicable CLE. Finally, the teacher should be recognized as "outstanding" in professional performance.

For nonteacher educators and post-secondary educators: The educator may be a nonteacher educational staff member in a building or district central office or an instructor or administrator at a post-secondary institution. The educator must have familiarity with the course content for which he or she is being nominated to serve as a panelist. He or she should be familiar with the Show-Me Standards and applicable Course-Level Expectations. Finally, the educator must be recognized as "outstanding" in professional performance by the individual making the nomination.

For business professionals: The business professional must have familiarity with the content of the course for which he or she is being nominated to serve as a panelist. Additionally, the individual either should use high school course content for the applicable content area in his or her daily professional work *or* be familiar with the knowledge and skills that high school students completing the applicable courses must possess to have a firm foundation for further coursework or for the workplace. Finally,

the business professional must not be a current or former employee of the public school system.

Appendix B contains copies of the nomination letters sent to district administrators, RPDC directors, and professional educator organizations. Appendix C contains copies of the nomination forms for classroom teachers, nonteacher educators, and business professionals. Appendix D contains a copy of the panelist qualification guidelines that were mailed with the nomination packets.

3.4.2 Panel Characteristics

A total of 100 panelist nomination forms were received by DESE by September 1, 2009: 30 for English I, 18 for Algebra II, 16 for Geometry, 23 for American History, and 13 for Government. (Some individuals were nominated to serve on more than one panel. An additional five panelists were nominated to serve on Integrated Mathematics II and III panels, for which standard setting did not occur. Three of those individuals, who were all classroom teachers, were assigned to the Algebra II and Geometry panels.) From these nomination forms, DESE's Curriculum and Assessment staff members chose panelists based upon expertise, demographic characteristics, and types of schools and student populations represented.

An effort was made to ensure representation of the state's urban, suburban, and rural schools and communities, as well as to include representation from the state's 11 RPDC regions. Additionally, as much as possible given the nomination pool, an attempt was made to include panelists with expertise in working with students with special needs and English-language learner (ELL) students. By design, panel slots were heavily populated with classroom teachers. Additionally, with the exception of the American History panel, each panel included one representative of the Missouri Department of Higher Education's Curriculum Alignment Initiative. These individuals have been involved in developing draft competencies for entry into college-level coursework. Historically, DESE has had difficulty, even with targeted recruiting, with locating minority panelists to create panels that are demographically similar to Missouri's population. However, an attempt was made to include educators on each panel who work in districts that serve significant numbers of minority children.

In a few instances, more than one panelist from the same school district was nominated for the same content area. In these cases, DESE chose only one of the nominees to serve on the panel to avoid overrepresentation of any one district on the panels.

A total of 73 panelists participated in the standard-setting workshop. Three members of the English I panel and two members of the Geometry panel had participated in an earlier achievement-level-setting workshop for other Missouri assessments. A small portion (approximately 10 percent) of the panelists had worked on some phase of standards development or assessment development at the state level. The remaining panelists were involved in leadership activities in their individual districts as they implemented EOC Assessments and aligned curriculum to CLEs. More than half of each panel was made up of active classroom teachers in the relevant content area; several other panel members were nonteacher professional educators, such as administrators and curriculum coordinators. Table 3.1 contains summary information about the demographic

characteristics of each panel. Appendix E contains detailed information about the demographic characteristics of each panel.

Table 3.1: Summary of Panel Characteristics for Phase II Assessments

Category	Panel				
	English I	Algebra II	Geometry	American History	Government
Gender					
Male	2	3	6	10	6
Female	14	13	10	3	6
Race					
White	15	15	16	12	11
Other	1	1	0	1	1
Community Size					
Rural	8	10	11	8	3
Suburban	6	5	4	3	6
Urban	1	1	1	2	3
Not Applicable	1	0	0	0	0
Position					
Classroom Teacher	9	13	13	11	7
Nonteacher Educator	6	1	2	2	3
Higher Education Professional	1	2	1	0	1
Business Professional	0	0	0	0	1
RPDC Region					
Heart of Missouri	3	1	1	1	1
Kansas City	4	1	3	1	2
Missouri Western	0	0	1	0	0
Northeast	1	0	0	0	0
Northwest	0	1	0	0	0
St. Louis	3	5	2	4	5
South Central	1	2	3	3	2
Southeast	0	3	3	1	1
Southwest	2	3	2	1	1
West Central	1	0	1	2	0
Not Applicable	1	0	0	0	0
Totals	16	16	16	13	12

The MO EOC Assessments use the same achievement-level labels used for the grade-level Missouri Assessment Program (MAP): Advanced, Proficient, Basic, and Below Basic. For each of these levels, the achievement-level descriptor (ALD) describes the specific knowledge and skills that a student at that level must be able to demonstrate. As suggested by the Technical Advisory Committee (TAC), Riverside Publishing drafted ALDs and presented the drafts to DESE. Prior to the standard-setting workshop, DESE conducted sessions devoted to revising these ALDs.

3.5 Overview of Standard-Setting Activities

3.5.1 Methodology and Data Considerations

The specific methodology used for the standard-setting activities was a modified Angoff procedure, as recommended by the state's TAC. The Angoff procedure and its modifications are well-recognized and heavily researched methods for establishing student performance standards for tests such as the EOC. Missouri achievement-level-setting workshops for the grade-level MAP used an item-mapping procedure commonly known as Bookmark standard setting; however, that method requires placing the items in a difficulty-ordered item book, which necessitates that the item difficulty parameters be known. In the case of the 2009 MO EOC Assessments, because the operational assessment window had not ended at the time of the event, parameter estimates from the operational test forms were not available. Additionally, the method for and timing of this standard-setting event mirrored the Phase I event that took place in fall 2008. In that case, the standard setting was scheduled for fall due to federal submission requirements, and the modified Angoff method was used because operational data were not available at the time of the event. The modified Angoff method does not require placing the items in difficulty order; it was, therefore, a suitable choice of methods for this event.

The modified Angoff method requires three distinct rounds of panelist judgments. Between the first and second rounds, Riverside Publishing provided the panelists with item-difficulty data for their consideration. Because operational data were not available in November, the item data were derived from the Spring 2009 field-test event. Panelists were appropriately cautioned about the limitations of such data.

Before the last round of judgments, Riverside Publishing staff provided the panelists with statewide impact data for the assessment. These data were intended to serve as an anchor for the panelists' recommendations. Again, because actual performance data were not available, the data were based on projected statewide score distributions generated from the Spring 2009 field-test event. It is likely that a standalone field-test event would produce lower-than-expected results due to decreased student motivation; therefore, Riverside Publishing psychometricians would consider the field-test data "lower-bound" estimates of actual student performance in an operational event. As with the item-level data estimates, the facilitators cautioned the panelists about relying too much on these impact data.

Despite the limitations of the field-test data for the standard-setting activities, we believe that providing panelists with even tentative data was desirable, both to mirror procedures used for establishing standards for previous Missouri assessments and to provide panelists with an "external reality check" on their evolving recommendations. Past

technical advisory committee discussions confirmed the use of these projected statewide impact data.

In addition to the caveats about item level data and impact data, panel facilitators clearly communicated to the panelists that the results of their standard-setting activities would be purely advisory to DESE. DESE would consider the recommendations and present them to the state board of education for approval.

3.5.2 Description of the Test Forms and Considerations

The MO EOC Phase II Assessments are composed of only selected response (multiple choice) items. DESE chose to use the MO EOC Spring 2010 operational forms for the standard-setting event. These forms were selected from the several available operational forms because they would be the most widely used in the 2009–2010 test administration year. Although the final printed test books were not available yet at the time of the event, Riverside Publishing staff presented the panelists with prototypes that contained all the test items in the same order and with the same "look and feel" as the final printed test books.

3.6 Specific Standard-Setting Activities

The Standard-Setting Session Agendas provided general guides regarding the time devoted to each activity. Copies of the agendas are included as Appendix F. Questar facilitators held closely to the times contained in the agenda. They used identical processes, including presentation slides and scripts, across all five sessions to minimize any intersession differences related to facilitator or session variance.

The following sections provide details about the processes that Questar and Riverside Publishing followed during the course of the standard-setting workshop.

3.6.1 General Process Overview

The first 90 minutes of the three-day session served as an introduction and overview to the general standard-setting processes. First, Dr. Andrea Wood, Director of Assessment for DESE, oriented the panelists to the MO EOC program and briefly outlined the session purpose and intended outcomes.

Next, Michael Beck of Questar led a general overview, "What Is Standard Setting?" Its purpose was to ensure a common understanding of the fundamental elements of the process. Mr. Beck included a brief overview of the general process of establishing student performance standards, ground rules for panelist activities, and some key elements for the panelists to focus on when attempting to set standards. Mr. Beck also advised the panelists that their work was advisory to DESE. This introduction was a high-level overview of the standard-setting process; individual facilitators provided more detail about each step in the process after the panels broke into content-specific groups. The PowerPoint slides presented during the opening session are included as Appendix G of this report.

Finally, Dr. Sheila Potter of Questar provided a general overview of ALDs and their importance to the standard-setting process. Since the panels would be reviewing, editing, and expanding on draft versions of the ALDs provided by the state, it was important for

panelists to understand the critical role of ALDs in the standard-setting process. Following this activity, panelists divided into the content-specific panel break-out rooms, where all remaining work for the sessions took place.

3.6.2 Panelists Take the Operational Assessments

After reconvening in the content-area panels, panelists first introduced themselves and signed DESE-provided confidentiality forms. Facilitators introduced themselves and reiterated the high-level standard-setting processes that Mr. Beck had discussed during the opening session. Facilitators then allowed the panelists time to take and score the Spring 2010 form of the operational assessment. For this activity, panelists had access to the test administration procedures, the actual test content, and all relevant scoring materials. Field-test items that were included in these forms were removed from the test books. Because these were "live" materials, facilitators stressed the confidentiality of all of the items.

The primary purpose of this activity was to familiarize panelists with the actual, complete assessment content before beginning the standard-setting judgments. Following this review of the tests, each panel spent a short time reacting to the assessment content: difficulty, sources of challenge, scoring issues, and general and specific reactions. This exercise provided the panelists, especially those not familiar with the MO EOC Assessments, with a context concerning the definition of Proficient as conveyed by the assessments.

3.6.3 Panelists Discuss and Fine-Tune the ALDs

At the standard-setting workshop, participants devoted a significant portion of time to fine-tuning the draft ALDs for each assessment. The facilitators provided the panelists with draft copies of the appropriate ALDs, copies of the MO EOC Assessment blueprint, and the appropriate CLEs. Using these materials as references and drawing on the expertise of the panelists, the Questar facilitators led each panel in an extended discussion and exercise to refine and elaborate each of the ALDs. Once this activity was complete, the panels relied on the resulting ALDs as a reference during the actual standard-setting activities. In addition, the panelists were allowed to make appropriate, though generally minor, revisions and refinements to the ALDs during and after the standard-setting activities.

All content-area panels began this activity with a review of the draft ALDs for the particular content area. Separate panels of Missouri educators had developed these draft ALDs during DESE-led sessions several weeks earlier. The ALD review activity was highly interactive, with panelists suggesting changes and other refinements—both substantive and editorial—to the draft ALDs. The ultimate task was to operationalize specific behaviors indicating performance at the Advanced, Proficient, Basic, and Below Basic levels in the content area. The activity involved brainstorming, with each panelist's ideas recorded and considered without expecting consensus. Panel suggestions were written on the draft ALDs, a copy of which was given to each panelist or placed on chart paper displayed around the room. Panelists were later able to refer to these pages, along with the original drafts, during the actual judgment activities. The thoroughness of the ALD refinement activities and the extent to which the panelists, individually and as a

group, internalized the ALDs significantly impacted the soundness of the subsequent standard-setting activities. For this reason, approximately one and a half hours were devoted to this activity in the session agenda.

At the conclusion of the standard-setting sessions, DESE collected the panelist recommendations for ALD revisions for consideration in the wording of the final ALDs. Appendix H contains a copy of the draft ALDs that was distributed to the panelists at the outset of the standard-setting workshop. The panels' final edits are indicated within the draft ALDs.

3.6.4 Orientation to the Modified Angoff Procedures

After completion of the ALD review activity, facilitators oriented the panels to the specific tasks involved with the modified Angoff standard-setting process. The modified Angoff process requires panelists to read and make judgments about each successive item in the test book, using the following procedures. When reading an item, panelists were to consider the item's importance in the context of the underlying CLE, the task(s) required of the student, and the item's difficulty. They were to decide what percentage of minimally Proficient students should be able to answer the item correctly. Panelists were then to decide what percentage of minimally Advanced students would answer the item correctly. Finally, they were to decide what percentage of minimally Basic students would answer the item correctly. (While the MO EOC Assessments contain four levels of student performance, cuts are made at only three locations on the score distribution.) The panelists were instructed to consider their judgments in this order—Proficient, Advanced, and Basic—as it anchors the item judgments on the most important cut, Proficient. In addition, once panelists made their judgment for the Proficient students, they had a clearer, more defined range of values to consider for the other two cuts.

The facilitators included the following important points in their presentations:

- Panelists should focus on the *threshold* of performance in each category.
- Panelists should review and recall what each performance descriptor means.
- Panelists should focus on the group of students who would take the MO EOC Assessment students statewide, not just the students in the school or district in which they work.

Finally, the facilitators explained that the panelists' judgments should be made independently and anonymously and that security of the testing materials should be maintained at all times.

The steps outlined in Sections 3.6.1 through 3.6.4 composed the activities of the first day of the workshop. The second day began with an overview of the previous day's activities and outcomes, after which panelists took a five-item selected response qualifying test concerning the standard-setting procedures they were about to use. A copy of this instrument is provided as Appendix I. This qualifying test was used to ensure that all panelists understood the importance of the ALDs and selected elements of the modified Angoff procedure before beginning the process of making item judgments.

Before moving on to the Round 1 judgments, facilitators asked the panelists to complete and sign a form indicating that they understood the information they had received and

discussed and that they felt prepared to make their Round 1 judgments. All panelists so indicated. An example of this form is included as Appendix J.

3.6.5 Round 1 Judgments

At this point, panelists were ready to make their Round 1 judgments. This work was completed anonymously (via judge identification numbers known only to the individual panelist and Riverside Publishing staff) and independently. Panelists indicated their judgments on specially designed scannable rating sheets developed for each content area. These rating sheets contained three fields for each test item: one for Basic, one for Proficient, and one for Advanced. As panelists made their judgments for each item, facilitators instructed them to "bubble in" one value for each achievement level (in other words, for Item 1, the panelist entered a number corresponding to the percentage of students expected to choose a correct answer at the minimally Basic level, a number for the minimally Proficient level, and a number for the minimally Advanced level). Panelists followed this procedure for all the test items. An example rating sheet is included as Appendix K.

Most panelists completed their first round of judgments within 60 minutes; however, there was no time limit for this activity, and some panelists required 90 minutes to complete their judgments. This is not unusual for the first round of judgments in a modified Angoff workshop; often some panelists are still struggling to understand the task at this point, thus requiring more time to make their judgments. After panelists completed their judgments, they turned in their rating sheets and were excused for the evening.

3.6.6 Feedback and Discussion of Round 1 Judgments

During the evening, the Riverside Publishing psychometricians prepared reports of the Round 1 judgment results. The next morning's session began with an overview of these reports. The first report was a table displaying all three raw score cuts as determined individually by each panelist's judgments. This table also contained the entire panel's average, median, highest, and lowest raw score cuts, as well as the standard deviation of all the panelists' judgments for each of the three raw score cuts. The second report contained a frequency display of all three cut scores (Basic, Proficient, and Advanced) recommended by each panelist. This bar graph displayed all the panelists' judgments on a single graph so that areas of dispersion or overlap in the raw cut scores would be apparent. These reports were anonymous; ID numbers, rather than names, were used to identify individual panelists.

The facilitators spent time reviewing these reports with the participants to ensure that everyone understood how to interpret the information contained in them. Using the Round 1 results, facilitators then led an extended discussion of the Round 1 judgments. Most of the work focused on the interim judgments of panelists at an individual test item level. Facilitators actively engaged all the panelists in the discussion to gauge whether they had indicated the item percentage values that they intended, that the reasoning processes they followed in making their judgments were consistent with good practice, and that the panelists clearly understood the mechanics of making item judgments. Throughout these discussions, facilitators focused on the key elements of the standard-

setting process: establishing the *threshold* of each cut, projecting the cuts for a *statewide* population of these students, and focusing on the particular *course* and *performance level* of the target populations.

Much like a jury deliberation, this discussion also allowed the panelists to hear their peers' comments and rationales for their judgments. This phase took around one hour, depending on the session; facilitators permitted discussion to continue until they perceived that all panelists were prepared to make their second round of judgments.

Next, facilitators distributed statewide item difficulty data derived from the 2008 field-test event. The derived item difficulties were item *p*-values, or the proportion of students who answered the item correctly in the 2009 field-test event. Recall from Section 3.5.1 that the data used to derive the item difficulty values were collected during a standalone field-test event. During the presentation of the item difficulty data, facilitators advised the panelists that caution should be taken in interpreting the item difficulty data, since student motivation may not have been the same as it would be on an operational assessment. Facilitators also explained that these data were relevant, but not critical, to the process of setting standards.

3.6.7 Round 2 Judgments

During Round 2, panelists again worked independently to make judgments about the percentage of students at the threshold of each achievement level who would answer each item correctly. Facilitators explained to the panelists that they were free to maintain their Round 1 judgments or to revise them as they deemed appropriate. Before beginning this round of judgments, panelists were once more reminded of the key elements of the process and were asked to focus specifically on the ALDs for their assessment. Again, there was no time limit, although this round required significantly less time than did Round 1 because the panelists more clearly understood the judgment process. In addition, they were increasingly familiar with the specific items for which they were making the judgments. Further, many panelists had begun to formulate some or all of their Round 2 item judgments during the discussion of the Round 1 results.

After panelists completed their Round 2 judgments and recorded their recommendations on their rating sheets, they submitted the forms and were excused for lunch. After all rating sheets were collected, Riverside Publishing psychometricians prepared the reports of the Round 2 judgments.

3.6.8 Feedback and Discussion of Round 2 Judgments

When the panels convened after the lunch break, facilitators presented the results of the Round 2 judgments. The reports showing the Round 2 results were used to guide another discussion of specific items. The presentation and discussion at this stage were similar to, although more focused than, those following Round 1.

Following this discussion, facilitators provided panelists with estimated statewide impact data—that is, the percentages of students statewide whose performance likely would be labeled Below Basic, Basic, Proficient, or Advanced if the panels' Round 2 judgments were adopted. The panels' median Round 2 judgments were used to determine cut scores for this report. Again, facilitators advised the panelists that the impact data were relevant to, but not essential for, setting performance standards. (This cautionary information was

especially important in the case of MO EOC Assessments, as the data were not grounded in an operational administration of the assessments.)

When facilitators were comfortable that all panelists were prepared to make their final recommendations, they proceeded to Round 3 of judgments.

3.6.9 Round 3 of Judgments, Meeting Evaluation, and Final Inspection of ALDs

For Round 3, the panelists' judgments consisted of one recommended cut score for each achievement level; panelists were not required to make item-level judgments. Panelists were given unlimited time to complete their Round 3 (final) recommendations, although most completed their judgments within 20 minutes. All panelists clearly understood that only the Round 3 judgments counted as their recommendations and that the three rounds were not combined in any way to form the proposed cuts.

After completing their final round of judgments, panelists completed a written evaluation of the process. This evaluation covered the panelists' opinions of the adequacy of the training provided and their comfort with and confidence in their judgments on a round-by-round basis. The form also contained spaces for the panelists to write other comments concerning the workshop. A copy of this evaluation is included as Appendix L of this report.

After facilitators collected the panelist evaluations, they allowed the panels time for a final review of the ALDs. During this time, panelists were allowed to discuss and, if necessary, fine-tune or revise the ALDs. Finally, panelists were thanked for their participation and dismissed.

3.7 Session Results by Panel and Round

Appendices M, N, O, P, and Q contain the feedback reports by round for English I, Algebra II, Geometry, Government, and American History, respectively. Selected data from these graphs and tables are summarized below for ease of cross-round and cross-content-area comparison.

The standard-setting literature typically considers the *median* recommendation to be the best indicator of a panel's judgment, as the median would not be impacted by the judgments of a few outlying panelists. In the case of this standard-setting event, as a review of Appendices M through Q indicates, all median and mean Round 3 cut scores are within a single rounded raw-score point for all of the content areas. Therefore, the choice of a measure of central tendency for these particular panels would not markedly impact the resulting cut scores.

Table 3.2 contains the median panel cut scores for all rounds and content areas. As the data in Table 3.2 indicate, the panels did not make significant changes to their recommended cut scores across the three rounds of judgments. This is not to say that individual panelists made the same recommendations across rounds. In fact, across the 15 sets of judgments between rounds (five content areas with three cut scores each), the average difference in the number of raw score points between cut scores was 0.67 between Rounds 1 and 2, 0.40 between Rounds 2 and 3, and 0.93 between Rounds 1 and 3. (The median raw-score change between any pair of rounds was 0.)

Table 3.2: Median Recommended Cut Scores by Content Area and Round

	Content Area														
	English I			Algebra II			Geometry			Government			American History		
Cut*	B	P	A	B	P	A	B	P	A	B	P	A	B	P	A
Round 1	18	26	32	14	23	33	17	27	33	15	25	33	18	26	32
Round 2	18	26	33	14	24	33	17	24	32	15	26	34	19	25	32
Round 3/Final	16	25	33	16	24	33	17	24	32	15	25	34	19	25	32
No. Points Possible	40			40			40			40			40		

*B = Basic, P = Proficient, A = Advanced

As is typically the case with standard-setting activities conducted over multiple rounds, the standard deviations of panelists' recommendations got smaller across rounds, indicating both an increasing level of panelist understanding of the process and increasing interpanel agreement based on group discussions between rounds of judgments. This is illustrated graphically through an examination of the frequency bar charts in Appendices M through Q, as well as statistically in the tabled results. The bars representing Basic, Proficient, and Advanced cut scores clearly become taller and more compact over each round of judgments. While panelists came closer to their peers in judging the most appropriate cut scores, even in Round 3—not unexpectedly—there was still a fair amount of spread in the recommended scores.

Standard errors of the median judgments (*SEJ*s) were computed for all cut scores across all panels and are presented in Table 3.3. The *SEJ* is a measure of the degree of variability among the participants in each panel. It is calculated in the following manner:

$$SEJ = SE_{Mean} \times 1.25,$$

where SE_{Mean} is the standard error of the mean of the panel's cut scores. SE_{Mean} is calculated by taking the standard deviation of the participant ratings divided by the square root of the number of panelists. Lower values of *SEJ* indicate greater cut score agreement among the participants within a panel. In no case did the Round 3 *SEJ* reach a whole raw-score unit. Most were lower than half of a raw-score point. This indicates that the final median judgments are highly stable.

Table 3.3: Standard Errors of Median Judgments for Each Cut Score Across Rounds and Panels

	Basic			Proficient			Advanced		
Panel	Round 1	Round 2	Round 3	Round 1	Round 2	Round 3	Round 1	Round 2	Round 3
English	2.20	1.34	0.75	0.38	0.23	0.37	0.07	0.03	0.05
Algebra	0.67	0.63	0.35	0.94	0.62	0.34	0.16	0.13	0.11
Geometry	1.46	0.86	0.51	0.40	0.40	0.40	0.11	0.12	0.08
Government	1.85	0.63	0.24	0.88	0.41	0.19	0.10	0.07	0.02
Am. History	0.98	0.61	0.57	0.71	0.87	0.44	0.21	0.19	0.17

Table 3.4 summarizes the projected statewide percentages of students whose EOC scores will fall in each of the four performance categories. These data are based on the Spring 2009 field-test results and were viewed as "lower-bound" estimates of the likely statewide results that were obtained at the end of the 2009–2010 school year.

Table 3.4: Projected Statewide Percentages of Students Scoring in the Various Performance Categories on the EOC Assessments, 2009

Assessment	Below Basic	Basic	Proficient	Advanced
English I	9%	34%	37%	20%
Algebra II	14%	45%	33%	8%
Geometry	18%	30%	38%	14%
Government	12%	44%	34%	10%
Am. History	23%	32%	30%	15%

3.8 Results of Participant Evaluations

Appendix R contains the data collected from panelists for the rating-scale type items on the evaluation forms. For the questions pertaining to the organization and adequacy of information provided in the opening session, the panelists generally provided ratings of 4 or 5 (on a scale of 1 to 5, with 5 being the highest). For the evaluation questions pertaining to the discussions of the achievement-level descriptors and the panelists' understanding of each of the ALDs after the discussions, in all cases, at least 80% of the panelists provided ratings of 4 or 5. The questions pertaining to the panelists' understanding of the judgment process and feedback on the results of each round received similar scores. Overall, these data indicate that the panelists generally understood what was expected of them, were comfortable with the process, and were comfortable with the resulting cut scores.

CHAPTER 4: ITEM ANALYSIS

4.1 Introduction

Item analyses were conducted for Missouri End-of-Course (MO EOC) Assessments in English I, Algebra II, Geometry, Government, and American History. In this chapter, the summary information, which includes mean item score and discrimination indices, is presented at the item level for each content area. The item summary statistics presented in this section (*p*-values, point-biserial correlations, and omit rates) are based on the operational administrations that included responses from 1465 students for Summer 2010, 19957 students for Fall 2010, and 165450 for Spring 2011 across the five content areas. The differential item functioning (DIF) analyses are based on the Spring 2009 standalone field-test and the 2010 embedded field test data.

4.2 Analysis of Forms for Each End-of-Course Assessment

Tables 4.1 through 4.15 summarize item difficulty, discrimination, and omit rates for the items that composed each assessment for the Summer 2010, Fall 2010 and Spring 2011 operational administrations. For each item, the *p*-value is the proportion of students who answered the item correctly. The item discrimination, or corrected point-biserial correlation, is the correlation between students' item scores and their total scores on the remaining test items. Both item difficulty and item discrimination are expressed in the raw score metric.

Table 4.1: Item Statistics for English I, Summer 2010 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.91	0.20	0.00	33	0.43	0.29	0.00
2	0.42	0.36	0.00	34	0.27	0.23	0.00
3	0.65	0.31	0.00	35	0.67	0.40	0.00
4	0.69	0.17	0.00	36	0.69	0.38	0.00
5	0.35	0.34	0.00	37	0.60	0.19	0.00
6	0.71	0.26	0.00	38	0.55	0.32	0.00
7	0.65	0.12	0.01	39	0.50	0.24	0.00
8	0.61	0.23	0.00	40	0.50	0.21	0.00
9	0.44	0.20	0.00	41	0.21	0.22	0.00
10	0.72	0.29	0.00	42	0.41	0.41	0.00
11	0.71	0.51	0.01	43	0.46	0.17	0.00
12	0.57	0.37	0.00	44	0.74	0.21	0.00
13	0.40	0.34	0.00	45	0.54	0.36	0.01
14	0.38	0.16	0.00	46	0.49	0.37	0.01
15	0.52	0.32	0.00	47	0.49	0.17	0.00
16	0.60	0.39	0.00	48	0.41	0.37	0.00
29	0.87	0.32	0.00	49	0.28	0.24	0.00
30	0.58	0.44	0.00	50	0.55	0.26	0.00
31	0.32	0.08	0.00	51	0.52	0.38	0.00
32	0.66	0.49	0.01	52	0.43	0.35	0.00

Table 4.2: Item Statistics for English I, Fall 2010 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.95	0.22	0.00	33	0.51	0.40	0.00
2	0.82	0.37	0.00	34	0.62	0.40	0.00
3	0.89	0.50	0.00	35	0.31	0.07	0.00
4	0.86	0.51	0.01	36	0.49	0.33	0.00
5	0.80	0.41	0.01	37	0.65	0.44	0.00
6	0.65	0.56	0.00	38	0.53	0.45	0.00
7	0.62	0.41	0.00	39	0.50	0.29	0.00
8	0.73	0.35	0.00	40	0.70	0.35	0.00
9	0.62	0.40	0.00	41	0.72	0.36	0.00
10	0.66	0.36	0.00	42	0.74	0.49	0.00
11	0.46	0.14	0.00	43	0.73	0.37	0.00
12	0.68	0.39	0.00	44	0.49	0.28	0.00
13	0.51	0.46	0.00	45	0.41	0.31	0.00
14	0.50	0.39	0.00	46	0.60	0.48	0.00
15	0.69	0.45	0.00	47	0.80	0.50	0.00
16	0.63	0.40	0.00	48	0.62	0.37	0.00
29	0.72	0.41	0.00	49	0.58	0.35	0.00
30	0.78	0.49	0.00	50	0.72	0.69	0.00
31	0.64	0.65	0.00	51	0.53	0.16	0.00
32	0.67	0.46	0.00	52	0.65	0.57	0.00

Table 4.3: Item Statistics for English I, Spring 2011 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.66	0.34	0.00	33	0.39	0.24	0.00
2	0.51	0.39	0.00	34	0.59	0.16	0.00
3	0.59	0.32	0.00	35	0.82	0.33	0.00
4	0.76	0.33	0.00	36	0.62	0.41	0.00
5	0.63	0.22	0.00	37	0.67	0.43	0.00
6	0.44	0.21	0.00	38	0.73	0.53	0.00
7	0.50	0.22	0.00	39	0.52	0.29	0.00
8	0.68	0.45	0.00	40	0.62	0.43	0.00
9	0.88	0.33	0.00	41	0.50	0.31	0.00
10	0.65	0.30	0.00	42	0.54	0.23	0.00
11	0.56	0.25	0.00	43	0.74	0.47	0.00
12	0.81	0.33	0.00	44	0.58	0.40	0.00
13	0.62	0.31	0.00	45	0.72	0.48	0.00
14	0.69	0.41	0.00	46	0.83	0.31	0.00
15	0.53	0.20	0.00	47	0.64	0.28	0.00
16	0.84	0.33	0.00	48	0.79	0.41	0.00
29	0.39	0.19	0.00	49	0.43	0.25	0.00
30	0.68	0.37	0.00	50	0.58	0.34	0.00
31	0.49	0.13	0.00	51	0.48	0.26	0.00
32	0.83	0.23	0.00	52	0.67	0.32	0.00

Table 4.4: Item Statistics for Algebra II, Summer 2010 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.76	0.31	0.00	26	0.27	0.06	0.00
2	0.41	0.06	0.00	27	0.33	0.28	0.00
3	0.58	0.42	0.00	28	0.32	0.23	0.00
4	0.06	0.24	0.00	29	0.40	0.13	0.00
5	0.31	0.33	0.00	30	0.27	0.22	0.00
6	0.50	0.11	0.00	31	0.50	0.04	0.00
7	0.42	0.04	0.00	32	0.55	0.25	0.00
8	0.19	0.24	0.00	33	0.65	0.11	0.00
9	0.40	0.17	0.00	34	0.27	0.16	0.00
10	0.33	0.29	0.00	35	0.40	0.31	0.00
16	0.64	0.25	0.00	41	0.48	0.10	0.00
17	0.16	-0.08	0.00	42	0.42	0.07	0.00
18	0.57	0.43	0.00	43	0.38	0.14	0.00
19	0.53	0.33	0.00	44	0.23	0.06	0.00
20	0.37	0.27	0.00	45	0.61	0.12	0.00
21	0.27	0.17	0.00	46	0.36	0.42	0.00
22	0.73	0.04	0.00	47	0.36	0.40	0.00
23	0.14	0.30	0.00	48	0.35	0.17	0.00
24	0.35	0.27	0.00	49	0.36	0.27	0.00
25	0.21	0.29	0.00	50	0.45	0.14	0.00

Table 4.5: Item Statistics for Algebra II, Fall 2010 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.77	0.33	0.00	26	0.51	0.23	0.00
2	0.47	0.14	0.00	27	0.68	0.05	0.00
3	0.86	0.38	0.00	28	0.49	0.37	0.00
4	0.60	0.21	0.00	29	0.38	0.38	0.00
5	0.67	0.41	0.00	30	0.48	0.35	0.00
6	0.68	0.16	0.00	31	0.41	0.16	0.00
7	0.90	0.35	0.00	32	0.63	0.17	0.00
8	0.35	0.17	0.00	33	0.68	0.48	0.00
9	0.61	0.11	0.00	34	0.57	0.16	0.00
10	0.76	0.05	0.00	35	0.54	0.28	0.00
16	0.56	0.48	0.00	41	0.84	0.41	0.00
17	0.79	0.23	0.00	42	0.70	0.44	0.00
18	0.49	0.45	0.00	43	0.56	0.38	0.00
19	0.66	0.36	0.00	44	0.65	0.46	0.00
20	0.56	0.36	0.00	45	0.44	0.32	0.00
21	0.88	0.27	0.00	46	0.40	0.18	0.00
22	0.45	0.26	0.00	47	0.58	0.34	0.00
23	0.54	0.42	0.00	48	0.77	0.34	0.00
24	0.61	0.43	0.00	49	0.64	0.50	0.00
25	0.69	0.28	0.00	50	0.45	0.44	0.00

Table 4.6: Item Statistics for Algebra II, Spring 2011 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.49	0.31	0.00	26	0.66	0.18	0.00
2	0.85	0.16	0.00	27	0.86	0.24	0.00
3	0.78	0.26	0.00	28	0.38	0.25	0.00
4	0.50	0.33	0.00	29	0.45	0.24	0.00
5	0.40	0.29	0.00	30	0.45	0.28	0.00
6	0.84	0.14	0.00	31	0.43	0.14	0.00
7	0.64	0.44	0.00	32	0.34	0.39	0.00
8	0.47	0.12	0.00	33	0.26	0.28	0.00
9	0.31	0.32	0.00	34	0.58	0.26	0.00
10	0.66	0.26	0.00	35	0.43	0.26	0.00
16	0.45	0.18	0.00	41	0.89	0.29	0.00
17	0.66	0.29	0.00	42	0.66	0.21	0.00
18	0.40	0.37	0.00	43	0.56	0.32	0.00
19	0.63	0.33	0.00	44	0.69	0.36	0.00
20	0.57	0.36	0.00	45	0.85	0.27	0.00
21	0.43	0.34	0.00	46	0.79	0.22	0.00
22	0.67	0.42	0.00	47	0.74	0.22	0.00
23	0.74	0.26	0.00	48	0.56	0.32	0.00
24	0.62	0.34	0.00	49	0.48	0.24	0.00
25	0.57	0.30	0.00	50	0.52	0.28	0.00

Table 4.7: Item Statistics for Geometry, Summer 2010 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.71	0.11	0.00	26	0.41	0.11	0.00
2	0.73	0.28	0.00	27	0.52	0.15	0.00
3	0.59	0.37	0.00	28	0.40	0.25	0.00
4	0.52	0.27	0.00	29	0.53	0.40	0.00
5	0.42	0.24	0.00	30	0.32	0.17	0.00
6	0.80	0.14	0.00	31	0.55	0.19	0.00
7	0.38	0.27	0.00	32	0.24	-0.03	0.00
8	0.44	0.34	0.00	33	0.37	0.27	0.00
9	0.62	0.34	0.00	34	0.40	0.28	0.00
10	0.45	0.05	0.00	35	0.21	0.08	0.00
16	0.41	0.15	0.00	41	0.30	0.12	0.00
17	0.59	0.06	0.00	42	0.33	0.04	0.00
18	0.34	0.19	0.00	43	0.52	0.21	0.00
19	0.71	0.27	0.00	44	0.27	0.33	0.00
20	0.39	0.45	0.00	45	0.39	0.32	0.00
21	0.38	0.22	0.00	46	0.20	0.19	0.00
22	0.64	0.35	0.00	47	0.65	0.23	0.00
23	0.64	0.29	0.00	48	0.28	0.23	0.00
24	0.47	0.15	0.00	49	0.37	0.06	0.00
25	0.48	0.12	0.00	50	0.35	0.07	0.00

Table 4.8: Item Statistics for Geometry, Fall 2010 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.70	0.31	0.00	26	0.81	0.34	0.00
2	0.63	0.51	0.00	27	0.44	0.19	0.00
3	0.83	0.38	0.00	28	0.83	0.45	0.00
4	0.49	0.33	0.00	29	0.75	0.33	0.00
5	0.52	-0.01	0.00	30	0.52	0.35	0.00
6	0.74	0.40	0.00	31	0.76	0.25	0.00
7	0.69	0.38	0.00	32	0.78	0.45	0.00
8	0.77	0.30	0.00	33	0.47	0.36	0.00
9	0.51	0.41	0.00	34	0.45	0.24	0.00
10	0.39	0.42	0.00	35	0.46	0.26	0.00
16	0.84	0.24	0.00	41	0.81	0.53	0.00
17	0.40	0.41	0.00	42	0.61	0.39	0.00
18	0.69	0.30	0.00	43	0.54	0.34	0.00
19	0.54	0.37	0.00	44	0.54	0.44	0.00
20	0.20	0.20	0.01	45	0.31	0.26	0.00
21	0.77	0.29	0.00	46	0.83	0.30	0.00
22	0.75	0.45	0.00	47	0.55	0.45	0.00
23	0.51	0.33	0.00	48	0.63	0.41	0.00
24	0.51	0.50	0.00	49	0.74	0.39	0.00
25	0.23	0.03	0.01	50	0.49	0.19	0.00

Table 4.9: Item Statistics for Geometry, Spring 2011 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.69	0.24	0.00	26	0.38	0.28	0.00
2	0.82	0.23	0.00	27	0.40	0.26	0.00
3	0.87	0.26	0.00	28	0.67	0.47	0.00
4	0.58	0.16	0.00	29	0.55	0.26	0.00
5	0.64	0.30	0.00	30	0.81	0.27	0.00
6	0.65	0.25	0.00	31	0.32	0.19	0.00
7	0.48	0.36	0.00	32	0.57	0.20	0.00
8	0.46	0.13	0.00	33	0.77	0.44	0.00
9	0.49	0.20	0.00	34	0.32	0.17	0.00
10	0.31	0.21	0.00	35	0.84	0.35	0.00
16	0.83	0.30	0.00	41	0.48	0.27	0.00
17	0.44	0.29	0.00	42	0.69	0.25	0.00
18	0.46	0.25	0.00	43	0.38	0.31	0.00
19	0.53	0.31	0.00	44	0.37	0.29	0.00
20	0.82	0.35	0.00	45	0.56	0.36	0.00
21	0.75	0.40	0.00	46	0.43	0.27	0.00
22	0.68	0.39	0.00	47	0.75	0.45	0.00
23	0.63	0.22	0.00	48	0.62	0.43	0.00
24	0.37	0.16	0.00	49	0.60	0.45	0.00
25	0.57	0.17	0.00	50	0.68	0.33	0.00

Table 4.10: Item Statistics for Government, Summer 2010 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.73	0.24	0.00	26	0.60	0.39	0.00
2	0.72	0.37	0.00	27	0.42	0.41	0.00
3	0.79	0.19	0.00	28	0.50	0.37	0.00
4	0.79	0.36	0.00	29	0.49	0.39	0.00
5	0.73	0.47	0.00	30	0.61	0.43	0.00
6	0.55	0.49	0.00	31	0.46	0.56	0.00
7	0.53	0.40	0.00	32	0.52	0.37	0.00
8	0.48	0.37	0.00	33	0.56	0.39	0.00
9	0.64	0.49	0.00	34	0.56	0.52	0.00
10	0.36	0.26	0.00	35	0.57	0.52	0.00
16	0.68	0.18	0.00	41	0.55	0.33	0.00
17	0.38	0.39	0.00	42	0.70	0.51	0.00
18	0.66	0.46	0.00	43	0.63	0.38	0.00
19	0.63	0.46	0.00	44	0.63	0.38	0.00
20	0.60	0.24	0.00	45	0.62	0.50	0.00
21	0.61	0.59	0.00	46	0.62	0.44	0.00
22	0.45	0.41	0.00	47	0.42	0.49	0.00
23	0.60	0.29	0.00	48	0.55	0.44	0.00
24	0.49	0.50	0.00	49	0.67	0.35	0.00
25	0.62	0.46	0.00	50	0.67	0.45	0.00

Table 4.11: Item Statistics for Government, Fall 2010 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.94	0.27	0.00	26	0.42	0.30	0.00
2	0.81	0.33	0.00	27	0.55	0.37	0.00
3	0.90	0.35	0.00	28	0.40	0.29	0.00
4	0.52	0.13	0.00	29	0.48	0.33	0.00
5	0.86	0.30	0.00	30	0.38	0.11	0.00
6	0.71	0.38	0.00	31	0.51	0.27	0.00
7	0.58	0.18	0.00	32	0.34	0.08	0.00
8	0.54	0.27	0.00	33	0.62	0.30	0.00
9	0.69	0.42	0.00	34	0.58	0.30	0.00
10	0.48	0.33	0.00	35	0.52	0.17	0.00
16	0.53	0.34	0.00	41	0.75	0.43	0.00
17	0.67	0.29	0.00	42	0.77	0.28	0.00
18	0.68	0.30	0.00	43	0.66	0.45	0.00
19	0.55	0.30	0.00	44	0.69	0.24	0.00
20	0.36	0.39	0.00	45	0.69	0.40	0.00
21	0.72	0.23	0.00	46	0.81	0.42	0.00
22	0.26	0.22	0.00	47	0.59	0.35	0.00
23	0.53	0.26	0.00	48	0.57	0.46	0.00
24	0.36	0.40	0.00	49	0.77	0.40	0.00
25	0.49	0.23	0.00	50	0.73	0.46	0.00

Table 4.12: Item Statistics for Government, Spring 2011 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.88	0.38	0.00	26	0.26	0.20	0.00
2	0.89	0.30	0.00	27	0.72	0.34	0.00
3	0.73	0.42	0.00	28	0.77	0.28	0.00
4	0.85	0.29	0.00	29	0.56	0.38	0.00
5	0.69	0.29	0.00	30	0.59	0.44	0.00
6	0.80	0.26	0.00	31	0.44	0.34	0.00
7	0.66	0.39	0.00	32	0.53	0.19	0.00
8	0.87	0.24	0.00	33	0.60	0.46	0.00
9	0.76	0.37	0.00	34	0.59	0.49	0.00
10	0.60	0.26	0.00	35	0.46	0.30	0.00
16	0.29	0.26	0.00	41	0.76	0.40	0.00
17	0.63	0.14	0.00	42	0.85	0.41	0.00
18	0.36	0.21	0.00	43	0.73	0.50	0.00
19	0.50	0.16	0.00	44	0.82	0.40	0.00
20	0.33	0.31	0.00	45	0.64	0.51	0.00
21	0.74	0.24	0.00	46	0.84	0.36	0.00
22	0.39	0.30	0.00	47	0.75	0.42	0.00
23	0.36	0.23	0.00	48	0.66	0.34	0.00
24	0.45	0.32	0.00	49	0.68	0.42	0.00
25	0.43	0.41	0.00	50	0.76	0.31	0.00

Table 4.13: Item Statistics for American History, Summer 2010 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.59	0.42	0.00	26	0.46	0.40	0.00
2	0.43	0.33	0.00	27	0.43	0.12	0.00
3	0.78	0.50	0.00	28	0.48	0.51	0.00
4	0.61	0.52	0.00	29	0.48	0.47	0.00
5	0.70	0.36	0.00	30	0.26	0.26	0.00
6	0.70	0.25	0.00	31	0.20	0.37	0.00
7	0.67	0.54	0.00	32	0.39	0.40	0.00
8	0.37	0.42	0.02	33	0.24	0.21	0.00
9	0.30	0.21	0.00	34	0.24	0.17	0.00
10	0.46	0.14	0.00	35	0.41	0.30	0.00
16	0.52	0.17	0.00	41	0.41	0.36	0.00
17	0.70	0.11	0.00	42	0.61	0.38	0.00
18	0.50	0.38	0.00	43	0.28	0.29	0.00
19	0.46	0.42	0.00	44	0.43	0.42	0.00
20	0.17	0.29	0.00	45	0.33	0.18	0.00
21	0.52	0.49	0.00	46	0.57	-0.01	0.00
22	0.35	0.13	0.00	47	0.63	0.43	0.00
23	0.24	0.00	0.00	48	0.41	0.54	0.00
24	0.37	0.36	0.00	49	0.28	0.36	0.00
25	0.46	0.32	0.00	50	0.39	0.59	0.02

Table 4.14: Item Statistics for American History, Fall 2010 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.83	0.37	0.00	26	0.47	0.40	0.00
2	0.82	0.40	0.00	27	0.38	0.29	0.00
3	0.62	0.31	0.00	28	0.31	0.28	0.00
4	0.86	0.23	0.00	29	0.39	0.12	0.00
5	0.86	0.39	0.00	30	0.35	-0.02	0.00
6	0.74	0.45	0.00	31	0.47	0.16	0.00
7	0.83	0.31	0.00	32	0.30	0.16	0.00
8	0.64	0.23	0.00	33	0.33	0.04	0.00
9	0.48	0.22	0.00	34	0.49	0.33	0.00
10	0.90	0.36	0.00	35	0.50	0.13	0.00
16	0.40	0.32	0.00	41	0.68	0.29	0.00
17	0.69	0.21	0.00	42	0.81	0.35	0.00
18	0.62	0.22	0.00	43	0.41	0.27	0.00
19	0.42	0.13	0.00	44	0.64	0.26	0.00
20	0.54	0.27	0.00	45	0.38	0.35	0.00
21	0.65	0.35	0.00	46	0.68	0.44	0.00
22	0.42	0.32	0.00	47	0.54	0.46	0.00
23	0.54	0.28	0.00	48	0.70	0.47	0.00
24	0.52	0.18	0.00	49	0.75	0.32	0.00
25	0.48	0.32	0.00	50	0.62	0.39	0.00

Table 4.15: Item Statistics for American History, Spring 2011 Operational Administration

Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %	Item	*p*-Value/ Mean	Corrected Point-Biserial Correlation	Omit Rate %
1	0.48	0.37	0.00	26	0.40	0.17	0.00
2	0.72	0.12	0.00	27	0.19	0.13	0.00
3	0.80	0.31	0.00	28	0.38	0.15	0.00
4	0.63	0.19	0.00	29	0.56	0.13	0.00
5	0.70	0.37	0.00	30	0.54	0.35	0.00
6	0.79	0.39	0.00	31	0.63	0.14	0.00
7	0.87	0.39	0.00	32	0.29	0.21	0.00
8	0.69	0.16	0.00	33	0.55	0.35	0.00
9	0.86	0.37	0.00	34	0.22	0.04	0.00
10	0.86	0.32	0.00	35	0.51	0.22	0.00
16	0.44	0.24	0.00	41	0.63	0.42	0.00
17	0.68	0.34	0.00	42	0.70	0.42	0.00
18	0.50	0.38	0.00	43	0.43	0.13	0.00
19	0.51	0.21	0.00	44	0.70	0.39	0.00
20	0.42	0.11	0.00	45	0.70	0.42	0.00
21	0.61	0.22	0.00	46	0.68	0.32	0.00
22	0.53	0.25	0.00	47	0.68	0.44	0.00
23	0.54	0.42	0.00	48	0.62	0.39	0.00
24	0.37	0.25	0.00	49	0.57	0.36	0.00
25	0.27	0.12	0.00	50	0.86	0.29	0.00

4.3 Speededness

The consequence of time limits on examinees' scores is called speededness. A test is speeded if examinees taking it score lower than they would have had the test not been timed. Most speededness statistics are based on the number of items that were not attempted by students. For the purpose of this analysis, if a student did not attempt the last item on any of the separately timed subsections of the test, it was assumed that the student might not have reached the item because he or she ran out of time.

The MO EOC Assessments were not designed to be speeded tests. Rather, they were intended to be "power tests"; that is, all students were expected to have ample time to finish all items and prompts.

The "% Omit" column in Tables 4.1 through 4.15 shows the percentage of students who omitted each selected response item for each MO EOC Assessment. It is clear from the tables that the omit rates are negligible or zero for the majority of items.

4.4 Item Bias Statistics

Differential item functioning (DIF) occurs when an item has difficulty measures that vary across contexts for similarly able subgroups of examinees. DIF was examined with the Mantel-Haenszel (MH) procedure (Mantel and Haenszel 1959) for SR items.

The Mantel-Haenszel procedure is a nonparametric approach to DIF. In the MH procedure, total raw scores are held constant while the odds ratio is estimated. In practice, the odds ratio is generally converted to the delta metric, and the Educational Testing Service (ETS) categorization is applied to flag the significance of DIF effects (Dorans and Holland 1993).

With the groups matched on raw score, the comparable examinees can be placed in j 2×2 tables of group by item response, where j equals the number of levels of the matching variable. For these analyses, j equals each observed score category of the k-item tests, with $j = 0, 1, 2, \ldots, k$, then one 2×2 table for a given item with score category j can be represented as

	Correct	Incorrect	Total
Reference	y_j	x_j	m_j
Focal	y'_j	x'_j	m'_j
Total	n_j	n'_j	N_j

The Delta MH test statistic and variance have the following form:

$$DeltaMH = 2.35 \ln \frac{\left[\sum_{j=0}^{K} \frac{\left(y_j x'_j - y'_j x_j \right)}{N_j} \right]}{\sum_{j=0}^{K} \frac{y'_j x_j}{N_j}},$$

where $y_{j,}$ x_j, y'_j, and x'_j are the frequency counts of cells of the 2 × 2 tables and N_j, is the total *n* for the cells.

The critical values of the ETS categorizations are 1.00 and 1.50 on the delta scale for categories A, B, and C. Specifically, if the absolute value of delta is smaller than 1.00, the item is categorized as A. If the absolute value of delta is larger than or equal to 1.50, the item is classified as C. Otherwise, items are categorized as B. In both the A and C categories, statistical significance is set at the 5% level for a single item.

Results of the DIF analyses for the items on the operational administrations (based on field-test data) are summarized in Tables 4.16 through 4.20. Table 4.21 contains DIF statistics for the entire pool of MO EOC Assessment items.

Table 4.16: Frequency Distribution of DIF Categories for the Fall 2009 Operational Assessments

		Selected Response Items*					
Test	**Group*****	**A****	**A–****	**B****	**B–****	**C****	**C–****
Fall 2009							
English I	M/F	38	0	1	1	0	0
	W/B	36	0	0	4	0	0
	W/H	37	0	0	2	0	1
Algebra II	M/F	38	0	1	1	0	0
	W/B	37	0	0	3	0	0
	W/H	39	0	0	1	0	0
Geometry	M/F	38	0	1	1	0	0
	W/B	35	0	1	4	0	0
	W/H	38	0	1	1	0	0
Government	M/F	35	0	1	4	0	0
	W/B	36	0	1	3	0	0
	W/H	37	0	1	2	0	0
American History	M/F	35	0	1	4	0	0
	W/B	34	0	3	3	0	0
	W/H	40	0	0	0	0	0

Note: Classifications with a negative sign ("–") favor the reference group, while classifications with no sign favor the focal group.
*The MH procedure is applied for SR items.
**DIF categories: A, negligible; B, slight to moderate; and C, moderate to severe.
***DIF contrast groups: M/F, male versus female; W/B, white versus African American; and W/H, white versus Hispanic.

Table 4.17: Frequency Distribution of DIF Categories for the Spring 2010 Operational Assessments

Test	Group***	Selected Response Items*					
		A**	A–**	B**	B–**	C**	C–**
Spring 2010							
English I	M/F	39	0	0	1	0	0
	W/B	37	0	1	2	0	0
	W/H	40	0	0	0	0	0
Algebra II	M/F	39	0	0	1	0	0
	W/B	38	0	0	2	0	0
	W/H	36	0	0	3	0	1
Geometry	M/F	37	0	1	2	0	0
	W/B	35	0	0	5	0	0
	W/H	38	0	1	1	0	0
Government	M/F	39	0	0	1	0	0
	W/B	35	0	1	4	0	0
	W/H	40	0	0	0	0	0
American History	M/F	36	0	0	4	0	0
	W/B	34	0	3	3	0	0
	W/H	39	0	1	0	0	0

Note: Classifications with a negative sign ("–") favor the reference group, while classifications with no sign favor the focal group.
*The MH procedure is applied for SR items.
**DIF categories: A, negligible; B, slight to moderate; and C, moderate to severe.
***DIF contrast groups: M/F, male versus female; W/B, white versus African American; and W/H, white versus Hispanic.

Table 4.18: Frequency Distribution of DIF Categories for the Summer 2010 Operational Assessments

Test	Group***	Selected Response Items*					
		A**	A–**	B**	B–**	C**	C–**
Summer 2010							
English I	M/F	34	0	0	1	0	0
	W/B	27	0	3	5	0	0
	W/H	34	0	0	1	0	0
Algebra II	M/F	33	0	0	2	0	0
	W/B	30	0	1	4	0	0
	W/H	33	0	0	2	0	0
Geometry	M/F	32	0	1	2	0	0
	W/B	25	0	4	6	0	0
	W/H	35	0	0	0	0	0
Government	M/F	35	0	0	0	0	0
	W/B	34	0	1	0	0	0
	W/H	34	0	0	0	0	1
American History	M/F	34	0	0	1	0	0
	W/B	30	0	4	1	0	0
	W/H	34	0	0	1	0	0

Note: Classifications with a negative sign ("–") favor the reference group, while classifications with no sign favor the focal group.

*The MH procedure is applied for SR items.

**DIF categories: A, negligible; B, slight to moderate; and C, moderate to severe.

***DIF contrast groups: M/F, male versus female; W/B, white versus African American; and W/H, white versus Hispanic.

Table 4.19: Frequency Distribution of DIF Categories for the Fall 2010 Operational Assessments

Test	Group***	Selected Response Items*					
		A**	A–**	B**	B–**	C**	C–**
Fall 2010							
English I	M/F	33	0	1	1	0	0
	W/B	33	0	2	0	0	0
	W/H	34	0	1	0	0	0
Algebra II	M/F	34	0	1	0	0	0
	W/B	31	0	3	1	0	0
	W/H	35	0	0	0	0	0
Geometry	M/F	28	0	2	4	1	0
	W/B	27	0	5	3	0	0
	W/H	34	0	0	1	0	0
Government	M/F	31	0	3	1	0	0
	W/B	31	0	2	2	0	0
	W/H	32	0	1	2	0	0
American History	M/F	32	0	0	3	0	0
	W/B	30	0	3	2	0	0
	W/H	34	0	0	1	0	0

Note: Classifications with a negative sign ("–") favor the reference group, while classifications with no sign favor the focal group.

*The MH procedure is applied for SR items.

**DIF categories: A, negligible; B, slight to moderate; and C, moderate to severe.

***DIF contrast groups: M/F, male versus female; W/B, white versus African American; and W/H, white versus Hispanic.

Table 4.20: Frequency Distribution of DIF Categories for the Spring 2011 Operational Assessments

Test	Group***	Selected Response Items*					
		A**	A–**	B**	B–**	C**	C–**
Spring 2011							
English I	M/F	34	0	0	1	0	0
	W/B	27	0	3	5	0	0
	W/H	34	0	0	1	0	0
Algebra II	M/F	33	0	0	2	0	0
	W/B	30	0	1	4	0	0
	W/H	33	0	0	2	0	0
Geometry	M/F	32	0	1	2	0	0
	W/B	25	0	4	6	0	0
	W/H	35	0	0	0	0	0
Government	M/F	35	0	0	0	0	0
	W/B	34	0	1	0	0	0
	W/H	34	0	0	0	0	1
American History	M/F	34	0	0	1	0	0
	W/B	30	0	4	1	0	0
	W/H	34	0	0	1	0	0

Note: Classifications with a negative sign ("–") favor the reference group, while classifications with no sign favor the focal group.
*The MH procedure is applied for SR items.
**DIF categories: A, negligible; B, slight to moderate; and C, moderate to severe.
***DIF contrast groups: M/F, male versus female; W/B, white versus African American; and W/H, white versus Hispanic.

Table 4.21: Frequency Distribution of DIF Categories for the Entire Pool of MO EOC Assessment Items (Spring 2009 Field Tests and Spring 2010 Embedded Field Tests)

Test	Group***	Selected Response Items*					
		A**	A–**	B**	B–**	C**	C–**
English I	M/F	496	0	24	24	2	3
	W/B	497	0	24	26	1	1
	W/H	530	0	8	8	1	2
Algebra II	M/F	422	0	11	16	0	4
	W/B	410	0	21	22	0	0
	W/H	434	0	8	10	0	1
Geometry	M/F	434	0	7	15	1	1
	W/B	406	0	21	31	0	0
	W/H	441	0	12	4	0	1
Government	M/F	433	0	12	11	1	0
	W/B	413	0	20	23	0	1
	W/H	435	0	11	9	0	2
American History	M/F	429	0	10	18	0	0
	W/B	396	0	29	30	1	1
	W/H	440	0	8	9	0	0

Note: Classifications with a negative sign ("–") favor the reference group, while classifications with no sign favor the focal group.
*The MH procedure is applied for SR items.
**DIF categories: A, negligible; B, slight to moderate; and C, moderate to severe.
***DIF contrast groups: M/F, male versus female; W/B, white versus African American; and W/H, white versus Hispanic.

4.5 Summary

The item analyses provided in this chapter show that the MO EOC Assessments have sound psychometrics properties. For example, *p*-values show that MO EOC Assessment items measure achievement across a broad range of difficulty. Also, item discrimination values show that most items are appropriately correlated with the total test score and thus contribute to distinguishing between lower-performing and higher-performing students. In addition, very few students omitted items during testing. The low percentage of students omitting SR items provides evidence that the test is a power test of the students' skills and not a speeded test. Finally, item bias statistics based on data from the Spring 2009 standalone field-test administration shows the items to be generally free from statistical bias.

CHAPTER 5: TEST ADMINISTRATION

5.1 Introduction

This chapter contains information about Department of Elementary and Secondary Education (DESE) and Riverside Publishing processes that ensure the standardized administration of the Missouri End-of-Course (MO EOC) Assessments. The Standards (AERA, APA, and NCME 1999) state that, "For tests designed to assess the examinee's knowledge, skills, or abilities, standardization helps to ensure that all examinees have the same opportunity to demonstrate their competencies" (p. 61). In other words, careful attention to the details of information dissemination, Test Examiner training, accommodations and modifications, and test security help ensure that students taking the EOC Assessments in different locations have equal opportunities for success.

The EOC *Test Coordinator's Manual* and *Test Examiner's Manual* contain detailed information about the testing guidelines, materials handling, and standardized administration instructions for the EOC Assessments. While those manuals are not included here, much of the information contained in this chapter can be found in them.

For the MO EOC Assessments, districts can choose either paper-and-pencil or online delivery format. The *Online Test Examiner's Manual* contains information specific to the registration for and administration of the online version of the MO EOC Assessments. Relevant information related to the online delivery, where it differs from the paper-and-pencil format, is included in this chapter.

5.2 Students for Whom the EOC Assessments Are Appropriate

The responsibility and authority for testing students in the MO EOC Assessments at the appropriate time in the course of instruction belong to the local district. The EOC Assessments are based on Course-Level Expectations (CLEs) rather than on Grade-Level Expectations (GLEs). Therefore, when the content of the CLEs is covered in the local school district's curriculum, the test may be administered regardless of student grade level or course name.

5.2.1 Students with Individualized Education Programs

A student with disabilities, as classified under the Individuals with Disabilities Education Act (IDEA), has an Individualized Education Program (IEP) that, in part, governs whether a particular assessment is appropriate for the student. In the case of the EOC Assessments, decisions about whether a student with a disability will participate in the assessments are made by the student's IEP team and are documented in the IEP. All students must take the three Phase I EOC Assessments (English II, Algebra I, and Biology), plus the Government EOC Assessment from Phase II. However, if a student's disability qualifies him or her to take the MAP-Alternate Assessment (MAP-A), that student will not be required to participate in the EOC Assessment.

5.2.2 Students with Individual Accommodation Programs

Students with Individual Accommodation Programs (IAPs) are considered disabled under Section 504 of the 1973 Rehabilitation Act. These students are not served under IDEA

and are not documented with a particular designation for the EOC Assessment. However, professionals who are knowledgeable about a student's disability and educational needs should make accommodation decisions for the student, as they would for a student with an IEP.

5.2.3 English Language Learner Students

Students who have been in the United States for 12 months or less at the time of test administration may be exempted by the local school district from taking EOC English assessments.

5.3 Students for Whom a School or District is Accountable

For accountability purposes, Missouri must include the results for any student who is eligible to take the EOC Assessments and has been enrolled at least one full academic year in a school (for school accountability) or district (for district accountability) without transferring out of the building or district for a significant period of time and re-enrolling. A full academic year is defined as the last Wednesday in September through the EOC Assessment administration. A significant period of time is considered one more than half of the eligible days between the last Wednesday in September and the test administration. DESE obtains enrollment information from the Missouri Student Information System (MOSIS) data that are reported by school districts. This rule applies to the building and district summary levels independently. For example, a student who is coded in a building less than a year but was in the district a full academic year is excluded from the building totals but is included in the district totals.

5.4 Dissemination of Testing Materials and Information

Riverside Publishing works with Questar Assessment, a subcontractor for the EOC Assessment program, to gather all enrollment counts and distribute all paper-and-pencil testing materials. Riverside Publishing distributes all password information for the online system. Before the start of the test window, districts enter their enrollment counts and scheduled testing window into ServicePoint, an online enrollment and materials ordering system. From those enrollment counts, Questar generates each district's order. All paper-and-pencil materials are shipped one week before the district's designated testing window. Districts that administer the assessments online receive an e-mail message with password information one week prior to test administration. The District Test Coordinator (DTC) is responsible for inventorying all paper-and-pencil materials, as well as for distributing the online test information to the test administrators. If additional materials are needed, the Test Coordinator is responsible for placing an Additional Materials Order (AMO) through ServicePoint.

5.5 District and Test Examiner Training

DESE is responsible for training the Test Coordinators on EOC test administration. DESE provided training on all information covered in the *Test Coordinator's Manual* and the *Test Examiner's Manual* via online webinar. Both DESE and Riverside Publishing are available to answer any questions the districts may have about the EOC Assessment administration.

Riverside Publishing provides training to districts that administer the EOC Assessments online. The hour-long training session is conducted via WebEx and gives an overview of both the administrative and student sides of the online system.

5.6 Test Security

The EOC Assessment test books and online assessment are secure. Test Coordinators are instructed to keep the materials in a locked room or cabinet at all times when not in use. No testing materials may be photocopied, duplicated, scanned, or made accessible to personnel who are not responsible for testing. Additionally, written or oral discussion of specific EOC Assessment items breaches the security and integrity of the test. In accordance with the Standards, the *Test Coordinator's Manual* and *Test Examiner's Manual* contain explicit instructions about test security for Test Coordinators and Test Examiners.[5] When the tests are delivered online, Test Examiners do not have access to the student screens for the online assessment, only to the test administrator features. In addition, a secure browser must be installed on each student computer prior to administration of the online assessments. Test items, as well as student responses, are encrypted during transmission to and from student computers.

5.7 Test Administration

5.7.1 Test Organization

Students take the Phase II EOC Assessments in one session. The session contains only selected response (SR) items. Each item consists of a stem followed by four response options. Answers are marked on a separate answer sheet. For the online assessment, the Phase II MO EOC Assessments also comprise one session. For each SR item, the student clicks an answer choice. Students are required to complete the practice tests on the DESE website prior to testing. These practice tests include instructions on how to use the tools in the system and practice questions for the students.

5.7.2 Test and Ancillary Materials

District Test Coordinators or School Test Coordinators are responsible for distributing all EOC Assessment materials to Test Examiners. The materials provided by Riverside Publishing and/or DESE include the following:

- *Test Examiner's Manual* (online and paper-and-pencil)
- *Test Coordinator's Manual*
- Building Identification Sheets
- Group Identification Sheets
- Student barcode labels
- Test books
- Answer sheets
- Math reference sheets (if applicable)
- Return kit materials

[5] **Standard 5.7:** Test users have the responsibility of protecting the security of test materials at all times (p. 64).

Students need the following additional materials for the paper-and-pencil assessment; these materials are not provided by Riverside Publishing or DESE:

- No. 2 pencils
- Scratch paper

For the online assessment, each student needs a computer with a monitor, a mouse, and a keyboard. Adequate space should be left between workstations. Students can use scratch, grid, or draft paper and a writing utensil while taking the online assessment. The Test Examiner needs the following:

- A computer for logging on to the proctor interface
- A writing board and utensil

Additionally, students taking either the paper-and-pencil or online version may use a four-function calculator for the Algebra II and Geometry assessments. (This is not required.)

5.7.3 Preparing the Classroom and the Students

The *Test Examiner's Manual* contains specific instructions for teachers and other test administrators regarding how the classroom should be prepared for testing. These include the following:

- Planning for the distribution and collection of materials
- Planning the seating arrangement to prevent students from seeing other students' responses
- Eliminating distractions such as bells and telephones
- Using a "Do Not Disturb" sign on the door
- Removing from students' view any classroom maps, charts, or other materials that relate to the test content
- Making arrangements for students who may not finish testing in the allotted time

Before students begin the assessment using the online system, a representative of the district or school must do the following:

- Read the entire *Online Test Examiner's Manual*
- Run a system check on each workstation used for testing
- Ensure that the MO EOC browser is downloaded to each workstation for test delivery
- Read the frequently asked questions from the link on the Test Examiner's login page
- Input identification information for students who were not included in the MOSIS precode file
- Contact Riverside Publishing if any changes need to be made to the student roster
- Create a test session immediately before testing

Additionally, while students await proctor approval, the Test Examiner must set and verify class information and set students' testing status codes and/or accommodations information in the online system.

The *Test Examiner's Manual* and *Online Test Examiner's Manual* explain some ways teachers may prepare their students for testing, including the following:

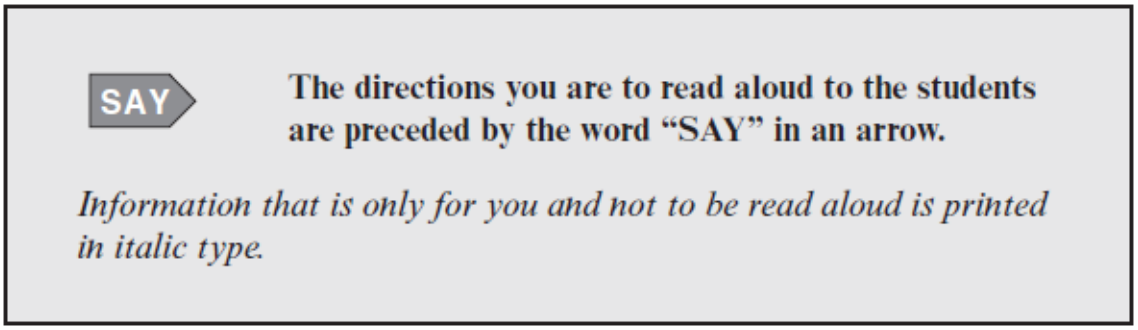
- Helping students approach the testing with a relaxed, positive attitude
- Encouraging and motivating students to do their best work
- Explaining test strategies, such as skipping harder items and coming back to them later
- Reassuring students that they will be given ample time to do their best work

Students are NOT allowed to use electronic devices, such as cellular phones, digital cameras, gaming devices, or scanners during the testing session. However, students may use four-function calculators during the Algebra II and Geometry test sessions.

5.7.4 Directions for Administration

In accordance with Standard 5.1,[6] specific standardized directions for administration are printed in the *Test Examiner's Manual*. Directions that are to be read aloud to the students are printed in **bold** type and have a callout arrow in the margin for clarity. Information for the teacher that should not be read aloud is in *italic* type. Figure 5.1 provides an example of the type styles used in the *Test Examiner's Manual* to differentiate between spoken and unspoken instructions. Figure 5.2 provides an example of a script from the Government EOC Assessment. Figure 5.3 provides an example of a script from the online English I EOC Assessment.

Figure 5.1: Examples of Type Styles Used to Differentiate Between Spoken and Unspoken Instructions in the *Test Examiner's Manual*



[6] **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 (p. 63).

Figure 5.2: Example Script from the *Test Examiner's Manual* for the Government EOC Assessment

Directions for Administering the Government Assessment

Teacher Directions:

Distribute the test books and answer sheets. Make sure each student has the correct answer sheet if student barcode labels were affixed before testing. Have the students write their name on the line provided on the front cover of the test book. Before administering the test, take a moment to have the students look through the test book.

Ensure that all students use a nonmechanical No. 2 pencil.

For students testing in Spring 2011 only, please fill in the FORM letter that corresponds to the student's test book. The FORM letter must be included or scoring the assessment will be negatively impacted.

SAY **For the questions on this test, you will select an answer from a list of given choices. Please record your final answers on the answer sheet. Remember to fill in the circle on the answer sheet that goes with the answer you chose. Your score on these questions will depend on how well you follow directions and show your understanding of Government.**

SAY **Open your test book to page 1 and read the directions. When you have finished reading the directions, turn to page 2.**

Check to see that all students are on the correct page in their test books.

SAY **When you come to the word "STOP," you have finished. You may go back over the test and check your answers. When you have finished checking your answers, close your test book and sit quietly until everyone has finished. Do you have any questions?**

When you are sure that all students understand the directions, continue.

SAY **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. If a student has not finished in the allotted time and is making adequate progress, the student should be allowed to finish. Tests may not be returned to students to complete or to correct incomplete or inaccurate answers. When all students have finished the test,

SAY **Stop. You have finished the test.**

Collect all testing materials and secure them after accounting for all test books and answer sheets.

GOVERNMENT

Figure 5.3: Example Script from the *Online Test Examiner's Manual* for the Online English I EOC Assessment

SAY

For the questions in this session, you will select an answer from a list of given choices. Remember to check that the circle that goes with the answer you chose is filled in after you click it. Your score on these questions will depend on how well you follow directions and show your understanding of what you read. You may choose to look over the questions before reading the passage. You may NOT use a dictionary, thesaurus, or grammar handbook during this session of the test.
See the Help button for instructions on how to use the system tools.

There are several important things to remember:

1. Read each question carefully and think about the answer. Then choose the one answer that you think is best.
2. If you do not know the answer to a question, mark it for review, skip it, and go on. You may return to it later.
3. When you finish the test, you may check over your work.

When you have finished checking your answers, click the End button, Exit the browser, and sit quietly until everyone has finished. Are there any questions?

5.8 Accommodations and Modifications

A student's IEP team has the responsibility and authority to determine individual accommodations to support and ensure his or her participation in the EOC Assessments. Allowable accommodations are intended to assist the student by reducing the effects of his or her disability without reducing performance expectations. Allowable accommodations for the EOC Assessments include the following:

- A student may receive a modified version of the testing materials, such as the Braille or Large Print edition.
- A teacher may present the test content to a student in a nonstandard way, such as by reading it aloud in English or in the student's native language, paraphrasing it, or using sign language. For the Phase II, English I Assessment, this will result in the lowest obtainable scale score (LOSS).
- A student may be allowed additional time to complete one or more sessions of the assessment.
- A student may use an assistive communicative device.
- A student may be tested individually or in a small group.
- A student may be allowed to use a computer, another word-processing device, or a teacher scribe to record his or her responses.
- A student may use other assistive materials such as a bilingual dictionary.

Modifications are alterations in the test that change construct-related requirements. The resulting information may not be equal to the information that might be obtained without

modifications. The following modifications for the Phase II EOC Assessments can be provided:

- Oral reading of the assessment, including paraphrasing questions
- Oral reading in native language
- Use of a bilingual dictionary for the English I Assessment

As noted above, the modifications listed may result in the lowest obtainable scale score (LOSS) on the EOC Assessments. For more information on accommodations and modifications and their effects on the interpretation of the EOC Assessment scores, see the Appendix to the *Test Examiner's Manual*.

In accordance with Standard 5.2,[7] Test Examiners indicate an accommodation, when allowed by a student's IEP and used for the EOC Assessment, by filling in the bubble corresponding to the accommodation on page 1 of the answer sheet.

Table 5.1 contains information about the percentage of students who received each type of allowable accommodation for each EOC Assessment. The most prevalent type of accommodation across all five Phase II EOC Assessments was testing in a small group (provided to between 0.92% and 4.99% of students across assessments).

[7] **Standard 5.2:** Modifications or disruptions of standardized test administration procedures or scoring should be documented (p. 63).

Table 5.1: Frequency and Percentage of Students Receiving Each Type of Allowable Accommodation on the 2010-2011 EOC Operational Assessments

	English I		Algebra II		Geometry		Government		Am. History	
Accommodation	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Braille	3	0.01	0	0.00	2	0.01	6	0.01	1	0.00
Large Print	2	0.00	4	0.02	6	0.02	12	0.02	1	0.00
Oral Reading	4	0.01	61	0.26	195	0.71	2035	3.34	909	2.49
Oral Reading—Blind/Partial Sight	1	0.00	1	0.00	0	0.00	11	0.02	5	0.01
Signing of Assessment	1	0.00	1	0.00	0	0.00	9	0.01	1	0.00
Paraphrasing	0	0.00	1	0.00	0	0.00	5	0.01	0	0.00
Other Administrations	1	0.00	2	0.01	0	0.00	1	0.00	1	0.00
Oral Reading in Native Language	3	0.01	4	0.02	2	0.01	11	0.02	20	0.05
Extended Time	877	2.05	117	0.50	266	0.97	1527	2.51	801	2.20
Administered Using More Than Allotted Periods	306	0.72	29	0.12	72	0.26	422	0.69	194	0.53
Other Timing	24	0.06	2	0.01	4	0.01	48	0.08	24	0.07
Use of Scribe	38	0.09	2	0.01	11	0.04	59	0.10	33	0.09
Use of Calculator, Math Tables, etc.	49	0.11	52	0.22	138	0.50	100	0.16	54	0.15
Using Bilingual Dictionary	0	0.00	2	0.01	0	0.00	16	0.03	7	0.02
Other Response	7	0.02	0	0.00	3	0.01	13	0.02	5	0.01
Testing Individually	122	0.29	15	0.06	35	0.13	248	0.41	130	0.36
Testing in Small Group	1739	4.07	219	0.94	460	1.67	3068	5.04	1463	4.01
Other Setting	93	0.22	15	0.06	24	0.09	130	0.21	104	0.29

5.9 Materials Handling and Return

The *Test Coordinator's Manual* and *Test Examiner's Manual* contain detailed instructions for how schools and districts should collect and package the paper-and-pencil testing materials at the end of the test administration. For Test Examiners, these activities include, but are not limited to, the following:

- Collecting test books and answer sheets from the students
- Counting the test books and answer sheets and comparing the number to the totals from pretesting
- Returning all used and unused test books and answer sheets to the Test Coordinator
- Collecting all scratch paper used during testing
- Properly handling all contaminated test books (i.e., books having contact with bodily fluids such as blood or with any potentially hazardous material)
- Verifying that the barcode labels are affixed properly to the answer sheets
- Verifying that the information contained on the Student Information Sheet (SIS) is accurate and compete

For School Test Coordinators, these activities include, but are not limited to, the following:

- Collecting testing materials from the Test Examiners
- Counting all test books and verifying against the pretesting total
- Completing Group Identification Sheet for each class
- Verifying that the Building Identification Sheets are correct or completing new Building Identification Sheets if incorrect
- Returning all answer sheets and test books (scorable and nonscorable) to the District Test Coordinator
- Destroying all unused answer sheets and other nonsecure testing materials

After receiving the answer sheets and scorable and nonscorable test books from the School Test Coordinators, District Test Coordinators complete the following steps:

- Verify 100% return of test books
- Complete the Test Book Accountability Form and fax it to Riverside Publishing
- Verify that each group of scorable materials is accompanied by a Group Identification Sheet
- Verify that Group Identification Sheets are used consistently for session scorables

For the online system, the student needs to click the End button once he or she has finished testing to submit the test for scoring. No additional information is needed from the Test Examiner after the student has completed the test. All demographic information is edited or added by the test administrator before the student starts the assessment.

5.10 Summary

The distribution, administration, and collection of the EOC Assessments are carefully communicated and executed in the detailed *Test Examiner's Manual* and *Test Coordinator's Manual*. All standards related to test security, administration, and accommodations are adhered to throughout the process. The most important steps and procedures have been covered in this chapter. Readers interested in further detail should consult the *Test Examiner's Manual* and *Test Coordinator's Manual* for the EOC Assessments.

CHAPTER 6: SCANNING, SCORING, AND QUALITY CONTROL PROCEDURES

6.1 Introduction

This chapter describes the processes used to scan and score and to ensure quality control for the Missouri End-of-Course (MO EOC) Assessments. The Phase II EOC Assessment forms contained only selected response (SR) items and were processed and scored by Riverside Publishing. Sections 6.2 through 6.4 of this chapter describe the Riverside Publishing scanning, scoring, and quality control processes for the SR items.

6.2 Quality Control Overview

Riverside Publishing adheres to the guidelines listed in the SCASS/TILSA *Quality Control Checklist for Processing, Scoring, and Reporting* provided by the Council of Chief State School Officers (2003). Quality assurance in processing, scoring, and reporting is the highest consideration in all stages of score report delivery. Additionally, Standard 5.8[8] of the Standards (AERA, APA, and NCME 1999) specifically addresses the issue of quality control in the scoring process. To comply with this standard, Riverside Publishing employed a set of checks at each stage in the process of scoring and reporting the SR items to ensure a zero error rate for the MO EOC Assessments. Riverside Publishing documented the various quality control procedures through a variety of reports and checklists during both the preproduction and post-production phases. Documentation took the form of issues logs and quality audit reports.

6.3 Preparation and Materials Check-In

6.3.1 Preparation for Processing

Before any MO EOC Assessment answer documents were processed for the field test or operational testing, Riverside Publishing programming staff conducted a complete check of scanning programs using the program specifications and a transfer file. A test set of documents was gridded to include all response ranges, ID ranges, blanks, double grids, all correct responses, all incorrect responses, and other scenarios, depending on the specified scoring rules. These mock data were then processed through the scanning program, the editing programs, and the scoring system. The resulting file was thoroughly hand checked to ensure that the machine was scanning correctly, that the pre-edit program was picking up the proper errors, that the post-edit program was accepting corrections properly, and that the scoring system was applying the answer keys correctly. If any errors were found in the programs, the programmer was notified to make the corrections, and quality control checks were run again.

Once the programs were found to be functioning correctly, a batch of live data was processed. This pilot run involved test results from one Missouri district. The resulting data file was put through the same quality control procedures described above, and documents were hand checked against the transfer file created. Riverside Publishing

[8] **Standard 5.8**: Test scoring services should document the procedures that were followed to assure accuracy of scoring. The frequency of scoring errors should be monitored and reported to users of the service on reasonable request. Any systematic source of scoring errors should be corrected (p. 64).

quality control staff checked and verified the live data. All quality control checks were completed successfully before the rest of the live documents were released for processing. This procedure ensured that the scanning programs were accurate and reliable.

When the MO EOC Assessment documents were first checked in at the Riverside Scoring Service® (RSS), they were issued a barcode number and a color-coded sheet that included vital information about the school. The documents were put into barcoded containers that were scanned at each stage of processing to constantly track the location of a client's documents in the Scoring Center.

Next, RSS staff checked that document counts matched the Return Packing Form and that all submitted materials were complete and included fully completed header sheets. If not, the documents were tagged to alert the Scoring Project Manager and Riverside Publishing Customer Service that resolution was necessary.

6.3.2 Materials Check-In

When a shipment of MO EOC Assessment documents was delivered to the Riverside Publishing Scoring Center, the arrival date, time, carrier type, and number of boxes delivered was immediately recorded in the RSS database, thus starting the clock for processing and delivering score reports. As an additional quality step, one of Riverside Publishing's trained receiving clerks hand counted the boxes and entered the number into the RSS tracking system. Any discrepancies were entered into the alert system for resolution.

Box contents (answer sheets) were verified against the order for Scoring Services forms, and any discrepancies were entered into the RSS alert resolution system. Each order was issued a unique barcoded number that enabled the order to be tracked as it was processed through the RSS.

6.4 Materials Scanning

All documents were scanned using Scan Optics 9000M scanners, which use four mounted cameras (two on top and two on the bottom) to capture both the grayscale and the bitonal images of each page. As each document was scanned, a Print After Scan (PAS) number was printed on the edge of the document. The first six digits in the PAS number were identical to the numbers identifying the container in which the documents moved through the Scoring Center. The last digits represented the order of the document in the stack. The PAS number was used by RSS staff to identify the location of an answer document in the processing system. The scanner read preprinted codes at the top of the page to determine which document code should be used for editing and scoring. Image scanners captured the entire test page as if it were a photocopy.

6.4.1 Handling of Unscannable Documents

The scanner is programmed to detect anchor points and zones to capture the image. Occasionally, a page cannot be scanned and is automatically sent by the scanner to the rejection bin. When this occurs, the scanner stops. The scanning operator follows procedures to either scan the document correctly or insert an Unscannable Document Header along with the document or page that is unscannable. Some reasons that a

document might be unscannable include manipulation during the test administration or pages missing or removed from the answer document before it was submitted for scoring. Photocopied documents are also unscannable.

6.4.2 Resolution of n-*Count Discrepancies*

Throughout the scanning of the MO EOC Assessment documents, the scanning station was monitored to ensure that images were gathered for all answer documents submitted with each school's or district's materials. A Scan Integrity Report compared the scanned *n*-count with the expected *n*-count on each Group/Class Header Sheet. Any discrepancies were logged into the system and resolved through a physical check of the documents before the container passed to the next station. If a resolution could not be reached, the order was entered into the alert system.

6.4.3 Application of Editing Rules

Riverside Publishing has numerous quality control procedures in place to ensure the accuracy of the scanning of the MO EOC Assessment answer documents. The scoring process applied editing rules to each document as it completed the scanning stage. The editing rules identified conflicts caused either by the student or by the scanner. Examples of these conflicts are double marks, excessive omits, or light marks. Based on these rules, documents were placed in the editing queue for an editor to resolve the conflicts. To ensure that the scanners and the editing rules were working properly, a small percentage of documents from each batch was randomly selected to go to editing, even without any mistakes or errors. If an issue could not be resolved in the editing process, an alert was sent, and a Riverside Publishing alerts specialist contacted the MO EOC Assessments program manager, who worked with the particular school or district to resolve the issue as soon as possible.

Documents that could not be read by the scanner (for instance, because the images were too light, pages were bent, etc.) were manually entered. In these instances, the first editor manually key-entered the student responses. A different editor then manually keyed the student responses a second time. The second editor was not able to see the work of the first editor. Upon completion of the two separate key entries, the system notified the second editor if there were differences in the two entries. If discrepancies were identified, the document was reviewed to determine the correct response.

6.5 Summary

Quality assurance in processing, scoring, and reporting is the highest consideration in all stages of score report delivery. To comply with Standard 5.8 of the Standards, Riverside Publishing employed a set of checks at each stage in the process of scoring and reporting the SR items to ensure a zero error rate for the MO EOC Assessments. Riverside Publishing documented the various quality control procedures through a variety of reports and checklists during both the preproduction and post-production phases. Documentation took the form of issues logs and quality audit reports.

CHAPTER 7: SCALING AND EQUATING

7.1 Introduction

This chapter details the scaling and equating procedures implemented by Riverside Publishing for the 2010 and 2011 Missouri End-of-Course (MO EOC) Assessments. A pre-equating model (Kolen and Brennan, 2004) was used to produce equated forms for each EOC Assessment. The equating methods described in this chapter will serve to maintain consistency of the EOC Assessments score scales over time and ensure that the achievement levels are applied consistently from year to year.

This chapter begins with an overview of the equating design. Then the item response theory (IRT) model used for equating is described, and the model assumptions are examined. This is followed by a description of the steps used to carry out the scaling and equating for the 2009–2010 and 2010–2011 operational assessments.

7.2 Item Response Theory

WINSTEPS software (Linacre, 2006b) was used to accomplish the scaling and equating for the Missouri EOC Assessments. WINSTEPS is designed to produce a single scale by jointly analyzing data from students' responses. Items were calibrated using the Rasch model (Rasch, 1960; Wright and Stone, 1979).

Rasch scaling is "a method for obtaining objective, fundamental, linear measures from stochastic observations of ordered category responses" (Linacre 2006a, p. 10). One feature of the Rasch model that distinguishes it from classical test theory is the placement of estimates of a person's ability and the item difficulty on the same scale. The Rasch model expresses the probability of a correct response to an item as a function of the ability of the person and the difficulty of the item. In the Rasch model, the probability of a correct response to item *i*, given θ, is

$$P_i(\theta) = \frac{e^{(\theta - b_i)}}{1 + e^{(\theta - b_i)}},$$

where θ = latent trait, or ability, level and b_i = the difficulty parameter for item *i*.

7.3 Scaling and Equating

IRT pre-equating involves scaling item parameters and equating test forms based on field-test (FT) data before the forms are administered operationally. Note, however, that for the 2009–2010 year, the forms were pre-equated retroactively (after the Spring 2010 operational administration) to allow for a one-time recentering of the pools using Spring 2010 operational data. The approach used for pre-equating the EOC Assessments is described in the following steps:

1. Calibrate all 2009 standalone field-test forms concurrently without constraint.
2. Establish the base scale through calibration of the Spring 2010 operational forms without constraint.
3. Examine the stability of the common items from the two calibrations (i.e., the operational form items).
4. Recenter the 2009 item bank to the 2010 base scale.
5. Place the 2010 embedded field test (EFT) items onto the 2010 operational scale.
6. Perform Fixed Calibrations on the 2011 Operational Forms.

7.3.1 Step 1: Concurrent Calibration of 2009 Field-Test Forms

Table 7.1 shows the number of field-test forms and their composition for the Spring 2009 standalone field test. For each content area, forms contained only selected response (SR) items and were spiraled within each classroom. Assuming randomly equivalent groups, the complete pool of items for each content area was concurrently calibrated using the WINSTEPS software program, placing all items on a common scale.

Table 7.1: Spring 2009 Standalone Field Test

Assessment	Number of Forms	Number of Items Per Form
English I	14	36
Algebra II	10	36
Geometry	10	36
Government	10	36
American History	10	36

7.3.2 Step 2: Establishing the Base Scale

Three operational forms were constructed for the 2009–2010 test administrations. The forms were built to be consistent with the test blueprint using classical and IRT item statistics from the initial concurrent calibration. Figures 7.1 to 7.5 show the test characteristic curves (TCCs) for the three operational forms (Fall, Spring, and Summer) for each content area. The TCCs generally show the three forms to be similar across the full range of ability. In fact, all differences were within 5% of the range of test scores.

Figure 7.1: TCCs for Three Operational Forms for English I

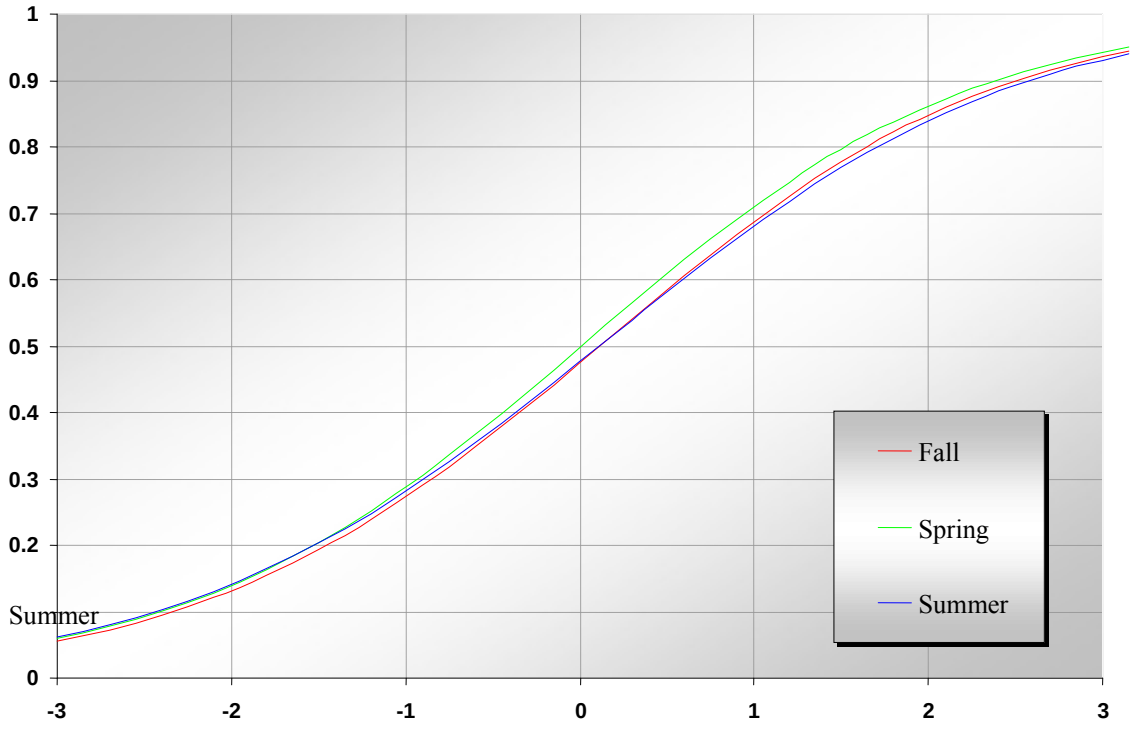


Figure 7.2: TCCs for Three Operational Forms for Algebra II

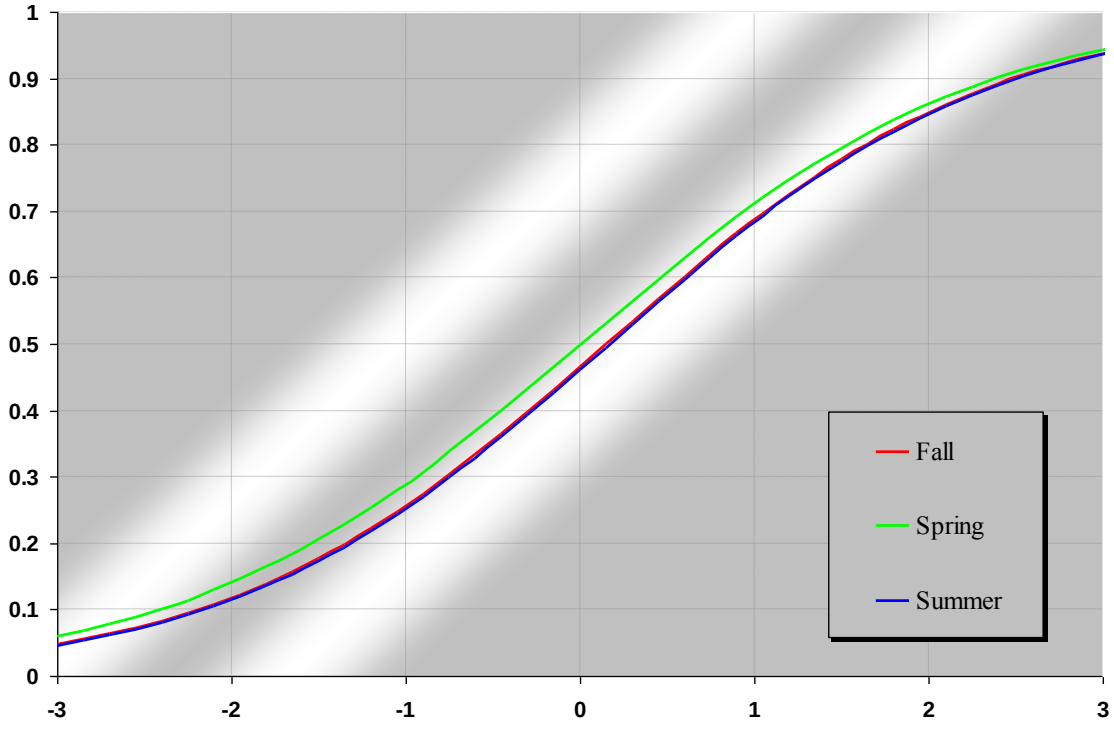


Figure 7.3: TCCs for Three Operational Forms for Geometry

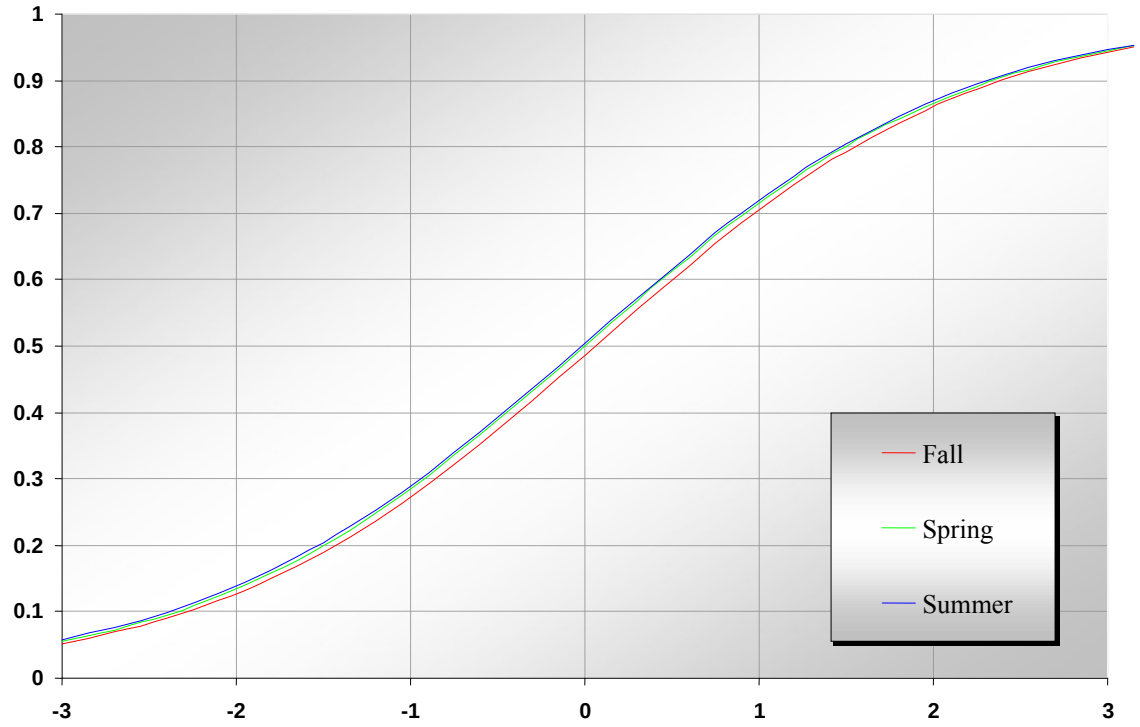


Figure 7.4: TCCs for Three Operational Forms for Government

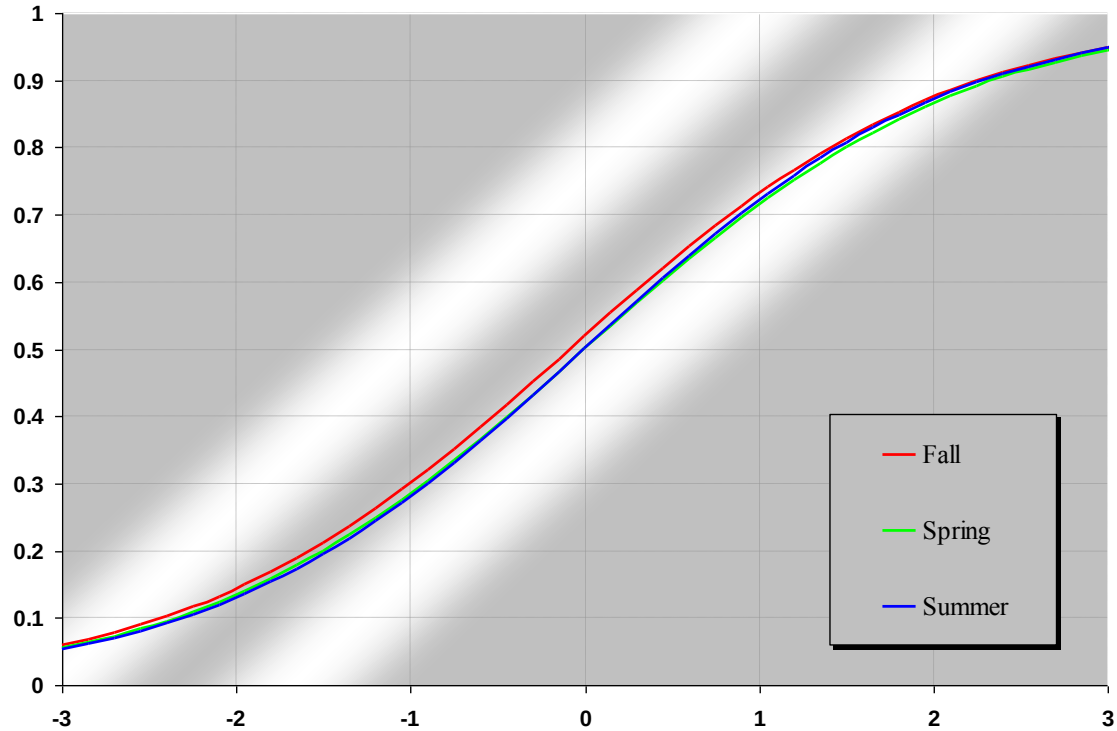
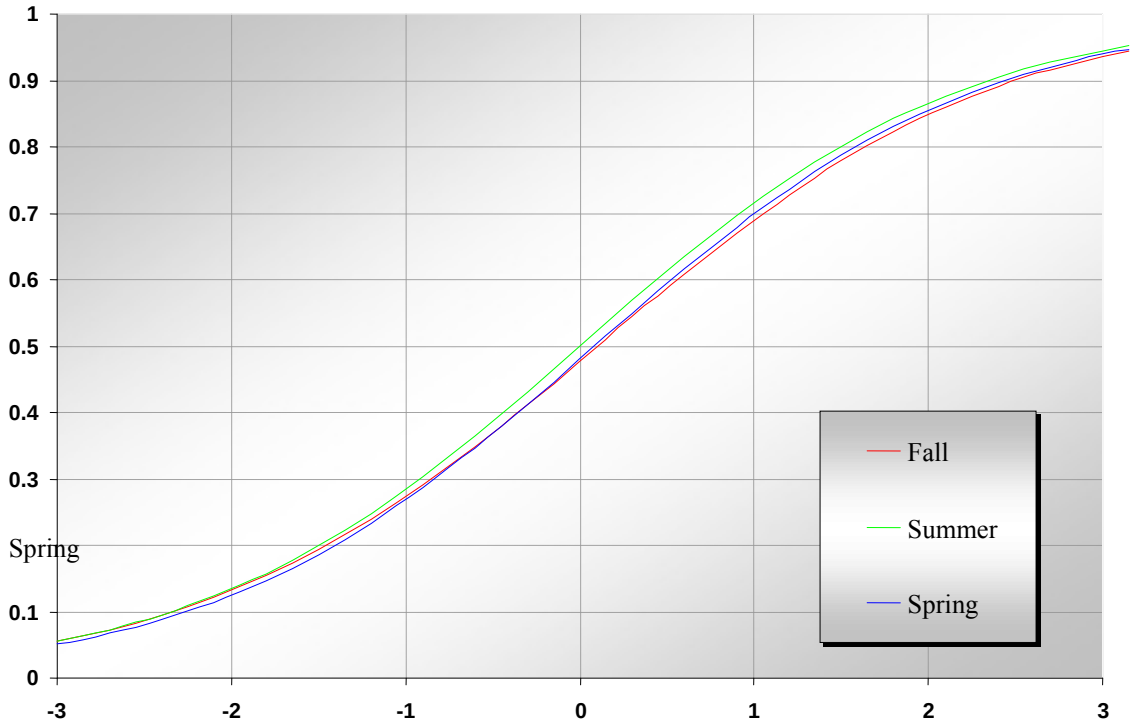


Figure 7.5: TCCs for Three Operational Forms for American History



The three forms were used for the Fall 2009, Spring 2010, and Summer 2010 administrations. The Spring 2010 form also contained new items embedded for field testing. No field-test items were included on the Fall and Summer forms due to the small sample sizes participating in those administrations. However, the Fall and Summer forms each contained one set of 12 additional items for English I and 10 additional items for the remaining subjects, making the test length the same across all three administrations. Table 7.2 shows the composition of the operational tests.

Table 7.2: Operational Test Design for Core Assessments

Content	Number of items	
	OP	EFT
English I	40	12
Algebra II	40	10
Geometry	40	10
Government	40	10
American History	40	10

OP = operational items; EFT = embedded field test items

To establish the base scale for each content area test, calibrations of the Spring 2010 operational forms were executed freely, without constraint. These calibrations had to be performed before a complete set of data was available. Tables 7.3 through 7.7 provide a comparison of the calibration set and complete set of data for the Spring 2010 operational test forms. Inspection of these tables shows that the demographics for the calibration samples were very similar to the census, or complete set of data.

Table 7.3: Comparison of the Calibration and Census Data for the Spring 2010 Operational Test Forms, English I

	English I				
	Calibration Sample		Census Data		Difference (calibration minus census)
	N	%	*N*	%	
All Students	39,825		42,317		
Gender					
Male	20,297	50.99	21,410	50.81	0.18
Female	19,509	49.01	20,730	49.19	–0.18
Race/Ethnicity					
White	33,695	84.67	34,827	82.66	2.01
Black	4,076	10.24	4,936	11.72	–1.47
Hispanic	1,242	3.12	1,515	3.60	–0.48
Asian	567	1.42	632	1.50	–0.08
Native American	216	0.54	221	0.52	0.02

Table 7.4: Comparison of the Calibration and Census Data for the Spring 2010 Operational Test Forms, Algebra II

	Algebra II				
	Calibration Sample		Census Data		Difference (calibration minus census)
	N	%	*N*	%	
All Students	20,490		21,824		
Gender					
Male	9,439	46.08	9,982	45.90	0.18
Female	11,044	53.92	11,766	54.10	–0.18
Race/Ethnicity					
White	16,907	82.57	17,474	80.37	2.20
Black	2,567	12.54	3,067	14.11	–1.57
Hispanic	571	2.79	717	3.30	–0.51
Asian	316	1.54	367	1.69	–0.14
Native American	116	0.57	117	0.54	0.03

Table 7.5: Comparison of the Calibration and Census Data for the Spring 2010 Operational Test Forms, Geometry

	Geometry				
	Calibration Sample		Census Data		Difference (calibration minus census)
	N	%	*N*	%	
All Students	25,112		26,858		
Gender					
Male	11,999	47.80	12,771	47.75	0.05
Female	13,101	52.20	13,974	52.25	–0.05
Race/Ethnicity					
White	20,120	80.17	20,884	78.10	2.07
Black	3,623	14.44	4,224	15.80	–1.36
Hispanic	822	3.28	1,048	3.92	–0.64
Asian	390	1.55	435	1.63	–0.07
Native American	143	0.57	150	0.56	0.01

Table 7.6: Comparison of the Calibration and Census Data for the Spring 2010 Operational Test Forms, Government

	Government				
	Calibration Sample		Census Data		Difference (calibration minus census)
	N	%	*N*	%	
All Students	35,856		36,930		
Gender					
Male	18,053	50.38	18,550	50.46	–0.09
Female	17,783	49.62	18,210	49.54	0.09
Race/Ethnicity					
White	30,026	83.78	30,589	83.21	0.58
Black	3,992	11.14	4,263	11.60	–0.46
Hispanic	1,034	2.89	1,106	3.01	–0.12
Asian	582	1.62	597	1.62	0.00
Native American	203	0.57	207	0.56	0.00

Table 7.7: Comparison of the Calibration and Census Data for the Spring 2010 Operational Test Forms, American History

	American History				
	Calibration Sample		Census Data		Difference (calibration minus census)
	N	%	*N*	%	
All Students	30,578		32,636		
Gender					
Male	15,329	50.18	16,295	50.13	0.05
Female	15,220	49.82	16,209	49.87	–0.05
Race/Ethnicity					
White	25,894	84.77	26,838	82.58	2.19
Black	3,118	10.21	3,820	11.75	–1.55
Hispanic	978	3.20	1,198	3.69	–0.48
Asian	390	1.28	475	1.46	–0.18
Native American	165	0.54	167	0.51	0.03

Table 7.8 provides a comparison of classical item statistics for the item pool, based on 2009 field-test data, and for the Fall 2009, Spring 2010, and Summer 2010 operational forms, based on the Spring 2010 operational test administration for each content area. The comparison includes the percentage of items with *p*-values less than 0.3 and point-biserial correlations less than 0.1. Items with values below these criteria are typically considered low performing and are excluded from operational forms. However, such items may be included if the item pool is limited or if content considerations justify keeping an item. For example, an item may have poor field-test statistics because of examinee motivational issues or because content is not currently being taught. Examination of the summary statistics in Table 7.8 generally supports test development efforts in selecting the highest-quality items for inclusion in each operational form. Summary statistics for the Spring 2010 operational administration are provided in Table 7.9.

Table 7.8: Comparison of 2009 Item Pool with 2009–2010 Operational Test Forms

Subject	Item Set	% *p*-Value < 0.3	% Point-Biserial < 1.0
English I	Phase II FT	3.4%	6.9%
	Fall	0.0%	0.0%
	Spring	0.0%	2.5%
	Summer	0.0%	0.0%
Algebra II	Phase II FT	16.1%	20.0%
	Fall	2.5%	0.0%
	Spring	0.0%	2.5%
	Summer	2.5%	5.0%
Geometry	Phase II FT	10.3%	13.3%
	Fall	0.0%	0.0%
	Spring	0.0%	0.0%
	Summer	0.0%	0.0%
Government	Phase II FT	8.6%	9.7%
	Fall	0.0%	2.5%
	Spring	0.0%	0.0%
	Summer	0.0%	0.0%
American History	Phase II FT	9.4%	20.8%
	Fall	0.0%	0.0%
	Spring	0.0%	0.0%
	Summer	0.0%	0.0%

Table 7.9: Summary Statistics for the Spring 2010 Operational Administration

Content	Total Items	Total Points	Minimum	Maximum	Mean (Raw Score)	*SD* (Raw Score)
English I	40	40	1	40	24.98	7.334
Algebra II	40	40	1	40	22.24	7.239
Geometry	40	40	1	40	23.69	7.391
Government	40	40	1	40	24.36	7.871
American History	40	40	1	40	22.45	7.237

Because the Rasch model is the basis of all scoring and scaling analyses associated with the EOC Assessments, the utility of the results from the Spring 2010 administration depends on the degree to which the assumptions of the model are met, as well as the degree to which the test data fit the model. The assumptions of the Rasch model are that (1) the data are unidimensional and (2) the data have the quality of local independence, meaning that responses to one item do not depend on responses to another item. The sections that follow address these assumptions and include evaluations of the dimensionality and local independence of the data, as well as fit indices.

7.3.2.1 Assessing Unidimensionality of the Data

WINSTEPS provides a residual-based, unrotated principal components analysis (PCA) that can be used to assess the unidimensionality assumption of the Rasch model. The purpose of the analysis is to reveal contrasts between opposing factors by showing the variance explained by factors not accounted for by the Rasch model. That is, the Rasch dimension is removed first, and the residual variance is then analyzed. Consequently, with this analysis, one does not want to identify a second dimension that accounts for a practically significant amount of residual variance.

Ideally, additional factors will be at the "noise" level, implying that there are no other shared dimensions in the data. Because the WINSTEPS standardized residuals are modeled to have unit normal distributions, which are independent, a PCA of these residuals should look similar to a PCA of random normal deviates. Simulation studies (such as Smith and Miao, 1994) indicate that the largest component in a set of random normal deviates would have an eigenvalue of about 1.4, which represents a small percentage of variance explained (i.e., less than 5%).

Table 7.10 shows the results of the PCA for the Spring 2010 operational form for each content area. For each analysis, the secondary dimension has an eigenvalue representing fewer than two items (less than 5% of the total variance) and, therefore, is of little practical importance.

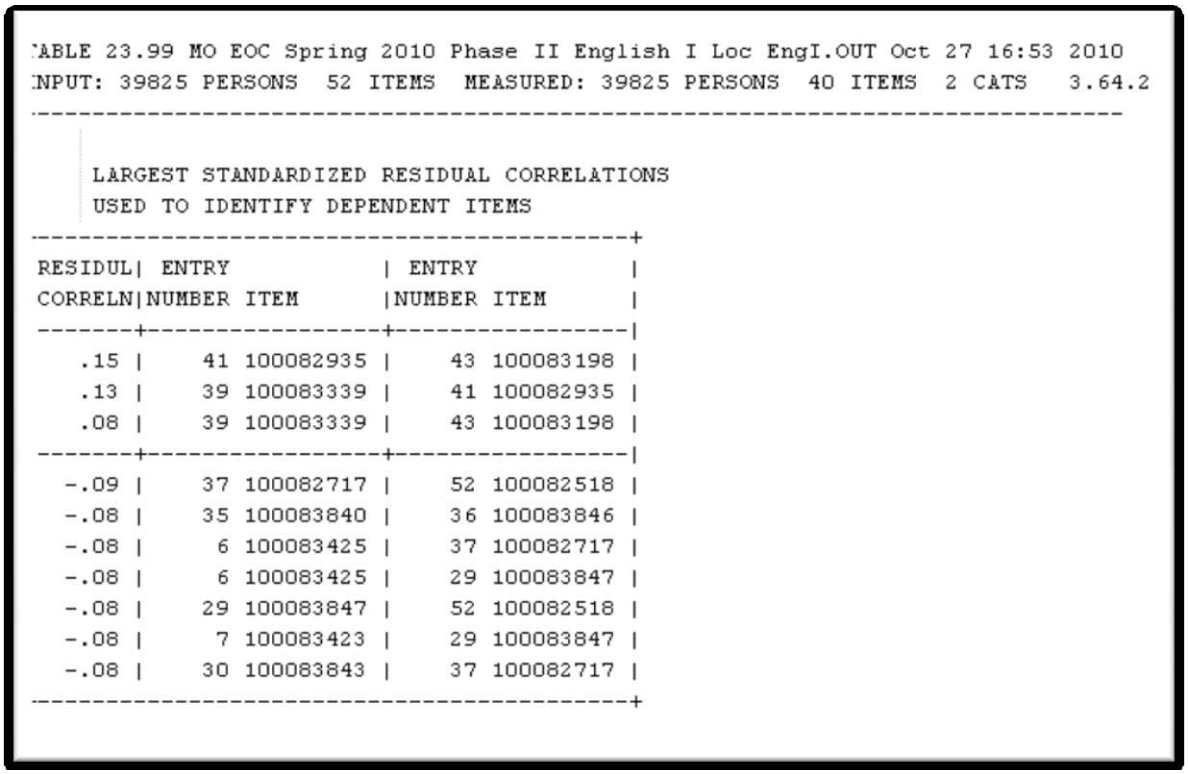
Table 7.10: Results of the PCA for the Spring 2010 Operational Tests

Content	Total Units (Items)	Second Dimension Eigenvalue	Second Dimension % of Total Variance Explained	% of Unexplained Variance	Second Dimension % of Unexplained Variance
English I	40	1.6	4.1	65.4	2.7
Algebra II	40	1.6	3.9	65.1	2.6
Geometry	40	1.6	4.1	58.1	2.4
Government	40	1.7	4.1	64.2	2.7
American History	40	1.7	4.4	71.1	3.1

7.3.2.2 Assessing Local Independence of the Data

Based on the PCA, WINSTEPS also provides standardized residual correlations that can be used to assess the local independence assumption of the Rasch model. The purpose of the analysis is to detect dependency between pairs of items. Figures 7.6 to 7.10 provide screen shots from WINSTEPS Table 23.99 (Linacre, 2006b) for each content area from the Spring 2010 operational test administration. Results of these analyses generally support the assumption of local independence. More specifically, values for standardized residual correlations were generally low (i.e., had absolute values below 0.10), indicating little dependency between pairs of items.

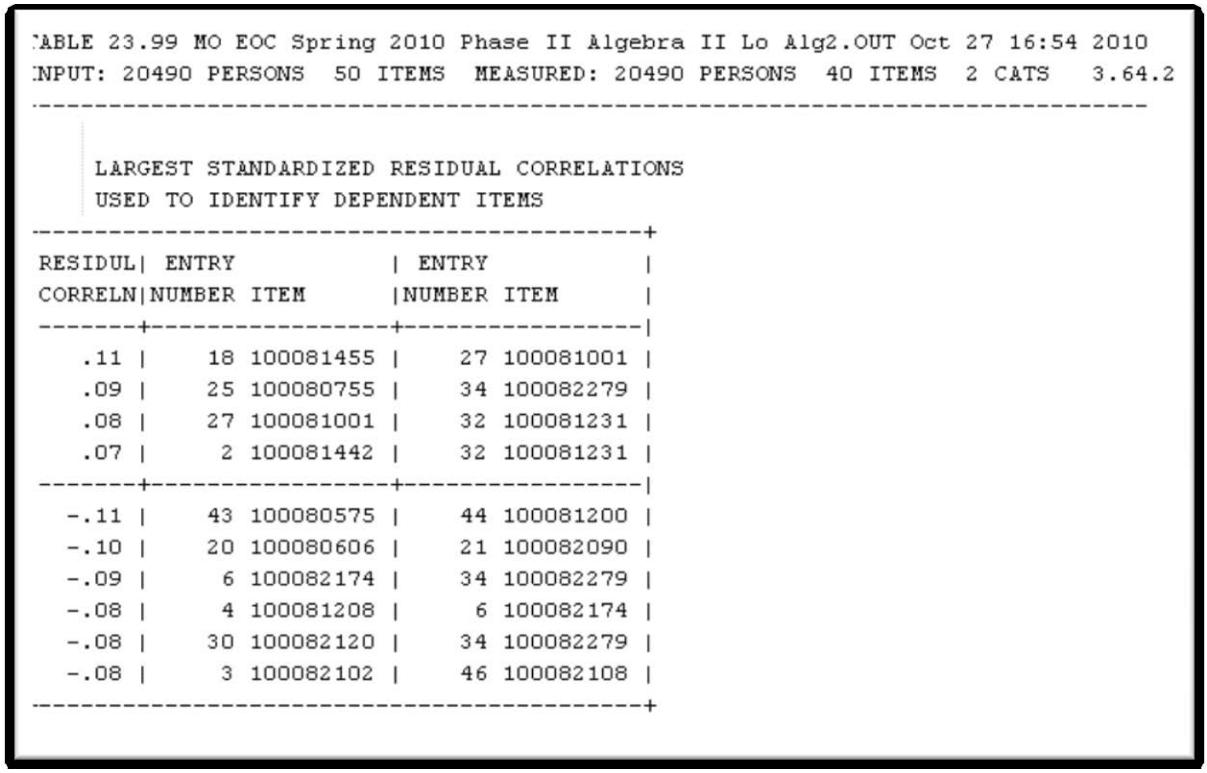
Figure 7.6: Standardized Residual Correlations from the Spring 2010 Administration for English I



```
TABLE 23.99 MO EOC Spring 2010 Phase II English I Loc EngI.OUT Oct 27 16:53 2010
INPUT: 39825 PERSONS  52 ITEMS  MEASURED: 39825 PERSONS  40 ITEMS  2 CATS   3.64.2
-------------------------------------------------------------------------------

     LARGEST STANDARDIZED RESIDUAL CORRELATIONS
     USED TO IDENTIFY DEPENDENT ITEMS
-------------------------------------------+
RESIDUL| ENTRY           | ENTRY           |
CORRELN|NUMBER ITEM      |NUMBER ITEM      |
-------+-----------------+-----------------|
   .15 |    41 100082935 |    43 100083198 |
   .13 |    39 100083339 |    41 100082935 |
   .08 |    39 100083339 |    43 100083198 |
-------+-----------------+-----------------|
  -.09 |    37 100082717 |    52 100082518 |
  -.08 |    35 100083840 |    36 100083846 |
  -.08 |     6 100083425 |    37 100082717 |
  -.08 |     6 100083425 |    29 100083847 |
  -.08 |    29 100083847 |    52 100082518 |
  -.08 |     7 100083423 |    29 100083847 |
  -.08 |    30 100083843 |    37 100082717 |
-------------------------------------------+
```

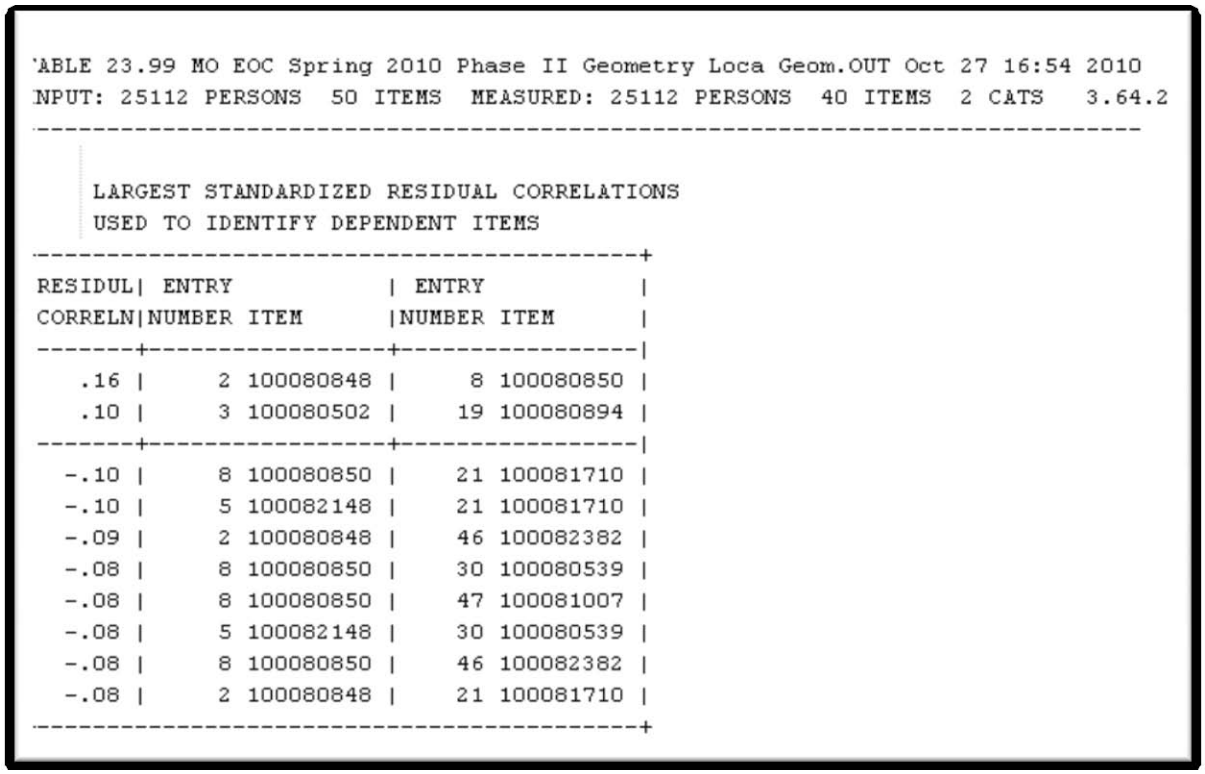
Figure 7.7: Standardized Residual Correlations from the Spring 2010 Administration for Algebra II



```
TABLE 23.99 MO EOC Spring 2010 Phase II Algebra II Lo Alg2.OUT Oct 27 16:54 2010
INPUT: 20490 PERSONS  50 ITEMS  MEASURED: 20490 PERSONS  40 ITEMS  2 CATS   3.64.2
-------------------------------------------------------------------------------

     LARGEST STANDARDIZED RESIDUAL CORRELATIONS
     USED TO IDENTIFY DEPENDENT ITEMS
-------------------------------------------+
RESIDUL| ENTRY           | ENTRY           |
CORRELN|NUMBER ITEM      |NUMBER ITEM      |
-------+-----------------+-----------------|
   .11 |    18 100081455 |    27 100081001 |
   .09 |    25 100080755 |    34 100082279 |
   .08 |    27 100081001 |    32 100081231 |
   .07 |     2 100081442 |    32 100081231 |
-------+-----------------+-----------------|
  -.11 |    43 100080575 |    44 100081200 |
  -.10 |    20 100080606 |    21 100082090 |
  -.09 |     6 100082174 |    34 100082279 |
  -.08 |     4 100081208 |     6 100082174 |
  -.08 |    30 100082120 |    34 100082279 |
  -.08 |     3 100082102 |    46 100082108 |
-------------------------------------------+
```

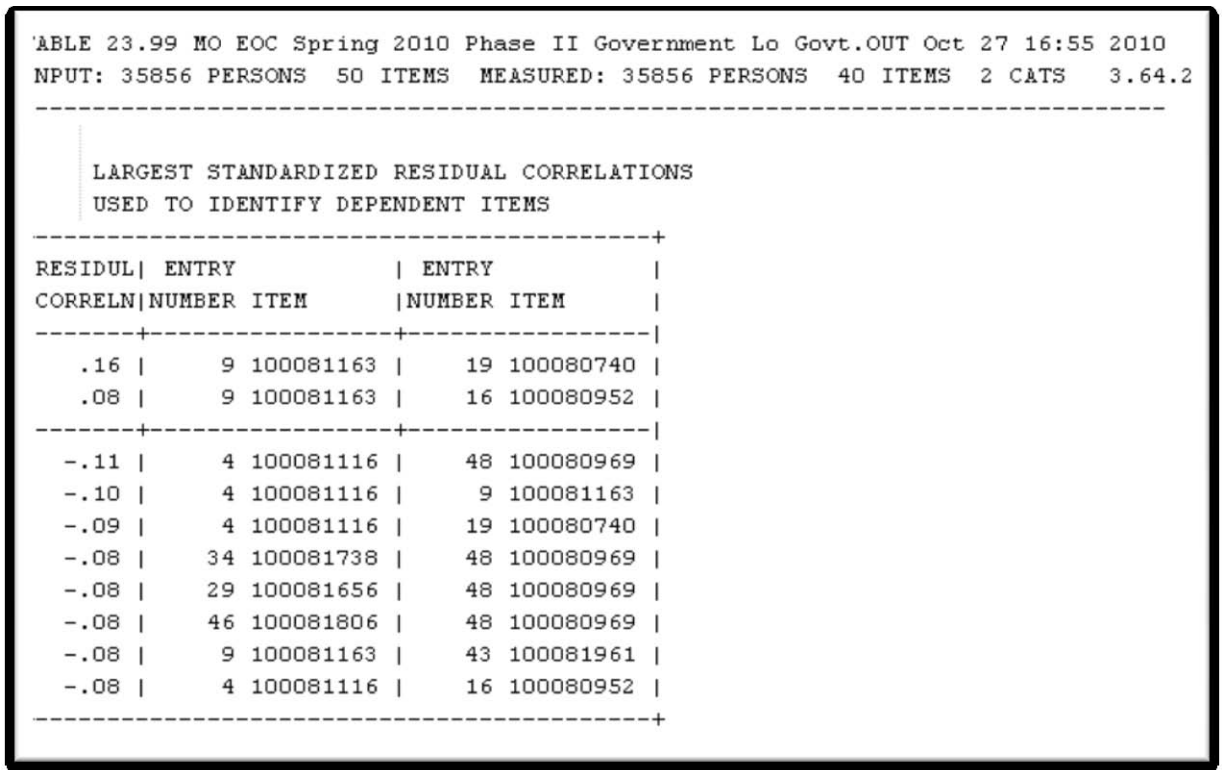
Figure 7.8: Standardized Residual Correlations from the Spring 2010 Administration for Geometry



```
'ABLE 23.99 MO EOC Spring 2010 Phase II Geometry Loca Geom.OUT Oct 27 16:54 2010
NPUT: 25112 PERSONS  50 ITEMS  MEASURED: 25112 PERSONS  40 ITEMS  2 CATS   3.64.2
-------------------------------------------------------------------------------

    LARGEST STANDARDIZED RESIDUAL CORRELATIONS
    USED TO IDENTIFY DEPENDENT ITEMS
-------------------------------------------+
RESIDUL| ENTRY           | ENTRY           |
CORRELN|NUMBER ITEM      |NUMBER ITEM      |
-------+-----------------+-----------------|
   .16 |     2 100080848 |     8 100080850 |
   .10 |     3 100080502 |    19 100080894 |
-------+-----------------+-----------------|
  -.10 |     8 100080850 |    21 100081710 |
  -.10 |     5 100082148 |    21 100081710 |
  -.09 |     2 100080848 |    46 100082382 |
  -.08 |     8 100080850 |    30 100080539 |
  -.08 |     8 100080850 |    47 100081007 |
  -.08 |     5 100082148 |    30 100080539 |
  -.08 |     8 100080850 |    46 100082382 |
  -.08 |     2 100080848 |    21 100081710 |
-------------------------------------------+
```

Figure 7.9: Standardized Residual Correlations from the Spring 2010 Administration for Government



```
'ABLE 23.99 MO EOC Spring 2010 Phase II Government Lo Govt.OUT Oct 27 16:55 2010
NPUT: 35856 PERSONS  50 ITEMS  MEASURED: 35856 PERSONS  40 ITEMS  2 CATS   3.64.2
-------------------------------------------------------------------------------

    LARGEST STANDARDIZED RESIDUAL CORRELATIONS
    USED TO IDENTIFY DEPENDENT ITEMS
-------------------------------------------+
RESIDUL| ENTRY           | ENTRY           |
CORRELN|NUMBER ITEM      |NUMBER ITEM      |
-------+-----------------+-----------------|
   .16 |     9 100081163 |    19 100080740 |
   .08 |     9 100081163 |    16 100080952 |
-------+-----------------+-----------------|
  -.11 |     4 100081116 |    48 100080969 |
  -.10 |     4 100081116 |     9 100081163 |
  -.09 |     4 100081116 |    19 100080740 |
  -.08 |    34 100081738 |    48 100080969 |
  -.08 |    29 100081656 |    48 100080969 |
  -.08 |    46 100081806 |    48 100080969 |
  -.08 |     9 100081163 |    43 100081961 |
  -.08 |     4 100081116 |    16 100080952 |
-------------------------------------------+
```

Figure 7.10: Standardized Residual Correlations from the Spring 2010 Administration for American History

TABLE 23.99 MO EOC Spring 2010 Phase II History Local Hist.OUT Oct 27 16:56 2010
INPUT: 30578 PERSONS 50 ITEMS MEASURED: 30578 PERSONS 40 ITEMS 2 CATS 3.64.2

LARGEST STANDARDIZED RESIDUAL CORRELATIONS
USED TO IDENTIFY DEPENDENT ITEMS

RESIDUL CORRELN	ENTRY NUMBER	ITEM	ENTRY NUMBER	ITEM
.14	19	100081110	45	100081327
-.09	4	100081397	10	100081287
-.09	10	100081287	22	100080574
-.09	10	100081287	48	100080826
-.08	4	100081397	26	100080849
-.08	10	100081287	16	100080873
-.08	16	100080873	46	100081124
-.08	4	100081397	28	100080683
-.08	28	100080683	48	100080826
-.08	18	100081502	48	100080826

7.3.2.3 Assessing Data Fit to the Model

WINSTEPS provides two statistics for indicating how well the data fit the Rasch model. Infit (inlier-sensitive or information-weighted fit) is sensitive to aberrations in item response patterns at the examinee's ability level. High infit statistics indicate unexpected responses to items that are well targeted to the examinee's ability. Low infit statistics, while not a threat to measurement, may indicate over-fit of the data to the model (resulting in Guttman-like patterns) that may result in artificially inflated reliability statistics. Outfit (outlier-sensitive fit) is sensitive to outliers (in other words, to aberrant responses to items with difficulty far from a person's ability). High outfit values may indicate lucky guessing or careless mistakes. Relatively speaking, extremely high infit values are believed to be a greater threat to the measurement process than extreme outfit values.

Infit and outfit can be expressed as a mean square (MS) statistic or on a standardized metric (z). Both should be considered because they provide different perspectives: MS values are more oriented toward practical significance, while standardized values are more oriented toward statistical significance. Fit statistics expressed as mean squares (statistically, a chi-square statistic divided by its degrees of freedom) show the degree of practical distortion in the measurement. The expected value is 1.0, with values less than 1.0 indicating overfitting items (too predictable) and values greater than 1.0 indicating underfitting items (unpredictability, too much noise). Rules of thumb regarding "practically significant" MS fit values vary. Wright and Linacre (1994) suggest that

reasonable MS fit values range from 0.8 to 1.2 for SR items. Others believe that reasonable test results can be achieved with values from 0.5 to 1.5. Riverside Publishing has typically considered values outside the range of 0.7 to 1.3 to be outside the range of acceptable fit.

Fit statistics expressed as *z*-scores (standardized unit normal deviates) offer a means to statistically test model fit. Standardized fit statistics show the degree of statistical improbability in the data (i.e., its significance) if the data actually do fit the model. The expected value of standardized fit statistics is 0.0, with values significantly less than 0.0 indicating too much predictability and values significantly greater than 0.0 indicating lack of predictability. Also, *z*-scores may be affected by sample sizes. For example, in a large sample, the test of interest might show a statistically significant difference. In practice, the difference might not be important.

Tables 7.11 to 7.15 provide summary statistics, including summary fit statistics, for the Spring 2010 operational test calibrations, which were used to establish the base scale for the EOC Assessments. The evaluation of fit values, specifically MS infit, yielded these results: Infit values for English I ranged from 0.87 to 1.20, values for Algebra II ranged from 0.89 to 1.15, values for Geometry ranged from 0.83 to 1.27, values for Government ranged from 0.79 to 1.27, and values for American History ranged from 0.86 to 1.18. The fit values and output files are based on the local runs using WINSTEPS version 3.6.4 (Linacre, 2006b). Tables 7.16 to 7.20 provide Rasch difficulties and item fit statistics.

Table 7.11: Summary Statistics for the Spring 2010 Operational Test Calibrations for English I

Statistic	Rasch Difficulty Estimate	*p*-value	Infit		Outfit		Point-Biserial
			MS	Standardized	*MS*	Statistic	
# of Items	40	40	40	40	40	40	40
Mean	0.00	0.63	1.00	–1.61	0.98	–1.47	0.34
SD	0.72	0.13	0.09	8.78	0.15	8.84	0.09
Minimum	–1.98	0.34	0.87	–9.90	0.64	–9.90	0.14
Percentiles							
10	–0.93	0.44	0.90	–9.90	0.83	–9.90	0.20
25	–0.35	0.55	0.93	–9.90	0.87	–9.90	0.28
50	0.09	0.62	0.97	–6.02	0.96	–6.50	0.36
75	0.45	0.70	1.06	9.90	1.07	9.61	0.40
90	0.97	0.79	1.14	9.90	1.20	9.90	0.45
Maximum	1.44	0.91	1.20	9.90	1.28	9.90	0.49

Table 7.12: Summary Statistics for the Spring 2010 Operational Test Calibrations for Algebra II

Statistic	Rasch Difficulty Estimate	*p*-value	Infit		Outfit		Point-Biserial
			MS	Standardized	*MS*	Standardized	
# of Items	40	40	40	40	40	40	40
Mean	0.00	0.56	1.00	–0.49	1.00	0.06	0.32
SD	0.73	0.14	0.06	7.13	0.09	7.15	0.06
Minimum	–1.53	0.29	0.89	–9.90	0.80	–9.90	0.16
Percentiles							
10	–0.87	0.36	0.92	–9.90	0.89	–9.90	0.23
25	–0.47	0.47	0.96	–6.57	0.94	–6.54	0.28
50	0.13	0.54	1.00	–0.24	1.01	0.79	0.32
75	0.44	0.66	1.03	6.36	1.07	5.88	0.35
90	0.97	0.73	1.08	9.90	1.11	9.90	0.40
Maximum	1.36	0.83	1.15	9.90	1.21	9.90	0.44

Table 7.13: Summary Statistics for the Spring 2010 Operational Test Calibrations for Geometry

Statistic	Rasch Difficulty Estimate	*p*-value	Infit		Outfit		Point-Biserial
			MS	Standardized	*MS*	Statistic	
# of Items	40	40	40	40	40	40	40
Mean	0.00	0.60	1.00	–0.82	1.00	–0.05	0.34
SD	0.89	0.17	0.09	7.54	0.15	7.86	0.09
Minimum	–1.64	0.21	0.83	–9.90	0.73	–9.90	0.08
Percentiles							
10	–1.12	0.39	0.89	–9.90	0.80	–9.90	0.24
25	–0.67	0.46	0.95	–8.59	0.92	–8.44	0.30
50	0.05	0.60	1.00	–0.62	0.99	–1.82	0.34
75	0.69	0.73	1.04	5.55	1.09	9.36	0.40
90	1.07	0.80	1.11	9.90	1.15	9.90	0.44
Maximum	2.12	0.86	1.27	9.90	1.43	9.90	0.51

Table 7.14: Summary Statistics for the Spring 2010 Operational Test Calibrations for Government

Statistic	Rasch Difficulty Estimate	*p*-value	Infit		Outfit		Point-Biserial
			MS	Standardized	*MS*	Statistic	
# of Items	40	40	40	40	40	40	40
Mean	0.00	0.61	1.00	–0.63	1.00	–0.40	0.36
SD	0.62	0.12	0.10	8.65	0.14	8.28	0.09
Minimum	–1.21	0.41	0.79	–9.90	0.69	–9.90	0.13
Percentiles							
10	–0.76	0.44	0.89	–9.90	0.83	–9.90	0.27
25	–0.48	0.51	0.94	–9.90	0.89	–9.35	0.30
50	–0.05	0.63	0.99	–2.50	1.00	0.15	0.35
75	0.52	0.70	1.06	9.90	1.11	9.90	0.41
90	0.88	0.75	1.12	9.90	1.17	9.90	0.47
Maximum	1.05	0.82	1.27	9.90	1.37	9.90	0.57

Table 7.15: Summary Statistics for the Spring 2010 Operational Test Calibrations for American History

Statistic	Rasch Difficulty Estimate	*p*-value	Infit		Outfit		Point-Biserial
			MS	Standardized	*MS*	Statistic	
# of Items	40	40	40	40	40	40	40
Mean	0.00	0.56	1.00	–0.70	1.00	–0.49	0.31
SD	0.62	0.12	0.09	8.69	0.13	8.75	0.10
Minimum	–1.63	0.32	0.86	–9.90	0.79	–9.90	0.11
Percentiles							
10	–0.84	0.39	0.88	–9.90	0.84	–9.90	0.19
25	–0.38	0.50	0.93	–9.90	0.91	–9.90	0.22
50	–0.13	0.59	1.00	–1.09	1.00	–0.71	0.32
75	0.32	0.64	1.07	9.90	1.12	9.90	0.39
90	0.84	0.73	1.12	9.90	1.16	9.90	0.43
Maximum	1.21	0.84	1.18	9.90	1.29	9.90	0.48

Table 7.16: Item Statistics for the Spring 2010 Operational Test Calibrations for English I

Item Number	Item Type	Rasch Difficulty Estimate	*N*	MS Infit	Standardized Infit	MS Outfit	Standardized Outfit
1	SR	–1.3956	39811	0.90	–9.90	0.74	–9.90
2	SR	–0.6399	39809	0.93	–9.90	0.86	–9.90
3	SR	0.3593	39804	1.13	9.90	1.17	9.90
4	SR	–0.8964	39809	0.93	–9.65	0.87	–9.90
5	SR	–1.2006	39811	0.97	–3.32	1.04	2.96
6	SR	0.1967	39808	1.20	9.90	1.28	9.90
7	SR	0.3054	39807	1.18	9.90	1.25	9.90
8	SR	–1.9762	39808	0.88	–9.52	0.64	–9.90
9	SR	–0.3833	39808	1.11	9.90	1.21	9.90
10	SR	–1.3200	39809	0.94	–6.90	0.89	–7.16
11	SR	0.0920	39809	0.99	–1.38	1.01	1.47
12	SR	0.6556	39806	1.02	4.65	1.02	3.36
13	SR	0.1465	39810	1.01	2.83	1.01	1.71
14	SR	–0.5039	39808	0.93	–9.90	0.88	–9.90
15	SR	0.4834	39810	1.14	9.90	1.18	9.90
16	SR	1.0580	39811	0.97	–7.47	0.99	–1.12
29	SR	0.9608	39808	0.89	–9.90	0.87	–9.90
30	SR	1.4378	39809	1.16	9.90	1.26	9.90
31	SR	–0.3286	39809	0.99	–1.90	0.95	–5.83
32	SR	0.1502	39810	0.93	–9.90	0.90	–9.90
33	SR	0.5709	39808	1.08	9.90	1.10	9.90
34	SR	0.5039	39807	1.10	9.90	1.13	9.90
35	SR	0.0798	39809	0.98	–5.13	0.95	–7.89
36	SR	0.1548	39808	1.11	9.90	1.16	9.90
37	SR	–0.3048	39808	0.88	–9.90	0.79	–9.90
38	SR	–0.6072	39808	0.93	–9.90	0.86	–9.90
39	SR	0.0861	39804	0.90	–9.90	0.86	–9.90
40	SR	–0.0458	39803	0.92	–9.90	0.88	–9.90
41	SR	–0.0398	39804	0.87	–9.90	0.82	–9.90
42	SR	–0.1524	39803	1.05	9.18	1.04	5.27
43	SR	–0.3417	39808	0.90	–9.90	0.85	–9.90
44	SR	1.0289	39808	1.03	6.12	1.05	7.72
45	SR	0.5862	39809	0.96	–9.01	0.96	–7.88
46	SR	0.2307	39807	0.95	–9.90	0.93	–9.90
47	SR	–0.1086	39810	0.93	–9.90	0.90	–9.90
48	SR	0.4361	39808	1.04	9.90	1.05	8.50
49	SR	–0.1746	39808	0.96	–8.26	0.92	–9.90
50	SR	1.1192	39805	1.02	5.20	1.06	9.51
51	SR	–0.4773	39808	0.91	–9.90	0.83	–9.90
52	SR	0.2545	39809	1.14	9.90	1.20	9.90

Table 7.17: Item Statistics for the Spring 2010 Operational Test Calibrations for Algebra II

Item Number	Item Type	Rasch Difficulty Estimate	*N*	MS Infit	Standardized Infit	MS Outfit	Standardized Outfit
1	SR	–0.1882	20466	0.98	–4.49	0.96	–3.90
2	SR	–1.0812	20466	1.01	1.43	1.11	6.36
3	SR	–0.1088	20466	0.93	–9.90	0.89	–9.90
4	SR	0.4120	20466	1.09	9.90	1.11	9.90
5	SR	–1.5292	20465	0.98	–1.40	1.12	5.34
6	SR	–0.4679	20463	0.91	–9.90	0.86	–9.90
7	SR	–0.4696	20463	0.97	–5.58	0.93	–6.07
8	SR	0.3892	20464	1.12	9.90	1.17	9.90
9	SR	–0.2054	20466	0.97	–5.45	0.94	–6.61
10	SR	–0.0183	20465	1.03	6.49	1.07	7.47
16	SR	–1.4977	20463	1.00	0.24	1.11	5.01
17	SR	0.9853	20464	1.04	5.26	1.05	5.65
18	SR	–0.7837	20465	0.94	–8.56	0.91	–6.51
19	SR	–0.8425	20466	0.98	–2.32	0.96	–2.98
20	SR	–0.1494	20465	1.04	7.76	1.05	5.62
21	SR	0.2881	20465	1.02	4.06	1.02	1.97
22	SR	–0.4692	20464	1.04	6.71	1.09	7.46
23	SR	0.5696	20466	0.94	–9.90	0.94	–7.76
24	SR	1.0514	20465	1.05	6.56	1.08	8.46
25	SR	–0.0837	20464	1.03	6.32	1.03	3.66
26	SR	0.9663	20463	0.96	–6.14	0.96	–4.20
27	SR	–1.4854	20463	0.91	–7.87	0.80	–9.90
28	SR	0.4058	20464	0.97	–5.36	0.96	–4.81
29	SR	0.6459	20466	1.03	5.96	1.05	5.72
30	SR	–0.6569	20465	0.96	–5.44	0.94	–4.85
31	SR	1.3606	20465	1.09	9.90	1.15	9.90
32	SR	–0.7378	20465	0.89	–9.90	0.84	–9.90
33	SR	0.2795	20466	0.90	–9.90	0.88	–9.90
34	SR	0.0531	20466	1.01	0.97	0.98	–2.35
35	SR	0.2259	20466	1.00	–0.43	1.01	1.32
41	SR	–0.4284	20466	0.92	–9.90	0.90	–9.52
42	SR	0.2527	20460	1.15	9.90	1.21	9.90
43	SR	–0.5280	20464	0.98	–3.00	0.99	–0.98
44	SR	1.1885	20462	1.00	0.32	1.03	3.27
45	SR	0.2424	20466	0.96	–8.61	0.94	–7.79
46	SR	0.2144	20463	1.08	9.90	1.10	9.90
47	SR	0.5188	20466	1.00	–0.05	1.00	0.25
48	SR	0.5422	20466	1.02	2.80	1.02	2.83
49	SR	0.8043	20465	0.94	–9.71	0.93	–9.11
50	SR	0.3354	20466	1.05	9.71	1.07	9.43

Table 7.18: Item Statistics for the Spring 2010 Operational Test Calibrations for Geometry

Item Number	Item Type	Rasch Difficulty Estimate	*N*	MS Infit	Standardized Infit	MS Outfit	Standardized Outfit
1	SR	–0.6577	25070	0.98	–2.18	0.99	–0.52
2	SR	–0.6541	25068	0.85	–9.90	0.77	–9.90
3	SR	–1.1856	25069	0.88	–9.90	0.75	–9.90
4	SR	–0.5380	25069	0.95	–8.38	0.93	–5.61
5	SR	–0.7843	25068	0.85	–9.90	0.76	–9.90
6	SR	–1.4586	25068	0.95	–4.33	0.92	–3.60
7	SR	–0.9609	25070	0.96	–4.75	0.91	–5.58
8	SR	–0.6126	25068	0.83	–9.90	0.73	–9.90
9	SR	–0.8342	25069	0.94	–7.81	0.87	–9.31
10	SR	0.6845	25068	0.99	–1.92	1.00	–0.43
16	SR	0.8564	25070	0.92	–9.90	0.92	–9.90
17	SR	–0.3062	25069	1.01	1.63	0.97	–2.91
18	SR	–0.2183	25069	1.00	0.74	1.02	2.41
19	SR	–0.6096	25069	0.89	–9.90	0.80	–9.90
20	SR	–0.7819	25069	0.92	–9.90	0.84	–9.90
21	SR	0.0319	25067	1.27	9.90	1.43	9.90
22	SR	–1.6370	25069	1.03	2.58	1.15	5.92
23	SR	–1.3667	25069	0.99	–1.06	1.07	3.48
24	SR	–0.4611	25070	1.01	0.84	0.97	–2.13
25	SR	–1.1131	25068	1.03	2.79	1.15	8.36
26	SR	0.1683	25069	0.96	–8.05	0.93	–8.51
27	SR	–0.7225	25070	0.98	–2.79	0.96	–3.08
28	SR	0.2777	25065	0.95	–9.90	0.93	–8.42
29	SR	–0.0839	25068	1.05	8.77	1.10	9.90
30	SR	1.5519	25070	1.17	9.90	1.34	9.90
31	SR	0.0616	25068	1.00	0.24	0.98	–2.02
32	SR	1.1880	25067	1.00	–0.17	1.03	3.15
33	SR	1.1779	25069	0.94	–9.22	0.98	–2.30
34	SR	0.0953	25066	1.00	0.42	0.99	–1.62
35	SR	0.9121	25070	0.93	–9.90	0.90	–9.90
41	SR	0.7258	25070	1.05	9.47	1.08	9.81
42	SR	1.0628	25066	1.04	7.09	1.08	9.21
43	SR	0.3219	25068	1.08	9.90	1.10	9.90
44	SR	0.6177	25069	1.05	9.90	1.08	9.90
45	SR	0.4112	25070	0.96	–6.99	0.96	–5.78
46	SR	0.6539	25068	1.11	9.90	1.14	9.90
47	SR	0.7605	25069	1.12	9.90	1.17	9.90
48	SR	2.1171	25067	1.05	5.04	1.26	9.90
49	SR	0.7622	25068	1.11	9.90	1.15	9.90
50	SR	0.5474	25069	1.03	4.99	1.06	7.65

Table 7.19: Item Statistics for the Spring 2010 Operational Test Calibrations for Government

Item Number	Item Type	Rasch Difficulty Estimate	*N*	MS Infit	Standardized Infit	MS Outfit	Standardized Outfit
1	SR	0.1269	35757	1.11	9.90	1.16	9.90
2	SR	–0.1356	35758	0.96	–8.04	0.95	–5.88
3	SR	–0.2627	35757	1.03	6.53	1.05	5.51
4	SR	0.7774	35758	1.27	9.90	1.37	9.90
5	SR	0.5263	35758	1.08	9.90	1.10	9.90
6	SR	–0.9780	35757	0.92	–9.90	0.81	–9.90
7	SR	–0.6879	35755	0.94	–9.90	0.89	–9.04
8	SR	–0.0242	35757	1.05	9.90	1.04	4.72
9	SR	1.0453	35757	0.79	–9.90	0.75	–9.90
10	SR	–0.3737	35758	0.96	–6.68	0.92	–7.68
16	SR	0.2590	35758	0.88	–9.90	0.83	–9.90
17	SR	–0.7565	35755	0.94	–8.85	0.89	–9.20
18	SR	0.1736	35758	1.05	9.90	1.04	4.96
19	SR	1.0018	35757	0.82	–9.90	0.80	–9.90
20	SR	–1.1050	35757	0.98	–2.84	1.02	1.08
21	SR	–1.2140	35756	0.95	–5.60	0.92	–4.82
22	SR	0.0945	35758	0.91	–9.90	0.87	–9.90
23	SR	–0.7984	35756	1.02	2.60	1.02	1.65
24	SR	–0.2505	35756	0.93	–9.90	0.87	–9.90
25	SR	–0.5955	35758	1.00	0.22	1.00	–0.05
26	SR	0.8950	35758	1.12	9.90	1.17	9.90
27	SR	–0.2134	35756	0.89	–9.90	0.83	–9.90
28	SR	–0.4741	35757	0.98	–3.40	1.05	4.35
29	SR	0.9891	35755	1.12	9.90	1.17	9.90
30	SR	–0.2267	35757	1.07	9.90	1.18	9.90
31	SR	0.1382	35754	0.99	–2.03	0.98	–2.70
32	SR	–0.0846	35754	0.99	–2.15	0.97	–3.06
33	SR	0.5816	35754	1.14	9.90	1.18	9.90
34	SR	0.8751	35757	1.12	9.90	1.17	9.90
35	SR	0.1113	35756	0.94	–9.90	0.93	–9.57
41	SR	0.5215	35757	1.06	9.90	1.06	9.47
42	SR	–0.5641	35755	1.01	2.47	1.01	0.72
43	SR	–0.3817	35755	1.04	7.86	1.13	9.90
44	SR	0.3003	35758	0.91	–9.90	0.87	–9.90
45	SR	0.8722	35757	1.08	9.90	1.12	9.90
46	SR	0.7853	35758	1.12	9.90	1.16	9.90
47	SR	0.3169	35757	0.97	–7.25	0.95	–7.28
48	SR	–0.4919	35755	0.82	–9.90	0.69	–9.90
49	SR	–0.5342	35754	0.95	–8.10	1.00	0.35
50	SR	–0.2389	35758	0.95	–9.81	0.92	–9.28

Table 7.20: Item Statistics for the Spring 2010 Operational Test Calibrations for American History

Item Number	Item Type	Rasch Difficulty Estimate	*N*	MS Infit	Standardized Infit	MS Outfit	Standardized Outfit
1	SR	–0.3904	30559	0.98	–4.91	0.97	–3.87
2	SR	–0.1664	30558	0.98	–3.84	0.97	–4.25
3	SR	–0.1470	30558	0.97	–7.18	0.94	–8.65
4	SR	–0.9185	30557	0.88	–9.90	0.79	–9.90
5	SR	0.8304	30559	1.00	0.98	1.02	2.28
6	SR	–0.5065	30558	0.95	–9.90	0.94	–7.01
7	SR	–0.4506	30559	0.99	–1.60	0.99	–1.09
8	SR	0.1599	30557	1.00	–0.58	1.00	–0.33
9	SR	–0.2907	30556	0.92	–9.90	0.88	–9.90
10	SR	0.9512	30558	1.18	9.90	1.25	9.90
16	SR	0.2358	30559	0.88	–9.90	0.85	–9.90
17	SR	–0.1502	30557	0.92	–9.90	0.88	–9.90
18	SR	–0.1149	30558	1.12	9.90	1.18	9.90
19	SR	0.5970	30557	1.09	9.90	1.13	9.90
20	SR	0.0625	30559	1.12	9.90	1.15	9.90
21	SR	–1.6272	30557	1.05	4.81	1.29	9.90
22	SR	–0.1575	30559	0.86	–9.90	0.81	–9.90
23	SR	0.2767	30557	1.12	9.90	1.16	9.90
24	SR	0.7518	30559	1.13	9.90	1.17	9.90
25	SR	0.2177	30558	1.02	5.32	1.02	3.92
26	SR	0.4653	30557	1.10	9.90	1.12	9.90
27	SR	–0.2126	30556	1.01	2.72	1.01	2.06
28	SR	0.4333	30558	1.11	9.90	1.14	9.90
29	SR	1.0423	30559	1.05	9.67	1.09	9.90
30	SR	0.2388	30558	1.02	5.05	1.02	3.27
31	SR	–0.9839	30559	0.93	–9.64	0.89	–9.31
32	SR	–0.2831	30557	1.08	9.90	1.14	9.90
33	SR	1.1009	30555	1.05	8.79	1.11	9.90
34	SR	0.6910	30559	1.00	0.53	1.01	1.58
35	SR	0.0928	30559	0.96	–9.27	0.94	–9.90
41	SR	–0.3818	30559	0.93	–9.90	0.88	–9.90
42	SR	–0.8593	30558	0.94	–9.05	0.91	–8.16
43	SR	1.2084	30557	1.07	9.90	1.14	9.90
44	SR	–0.3774	30557	0.89	–9.90	0.84	–9.90
45	SR	–0.1355	30557	0.94	–9.90	0.91	–9.90
46	SR	–0.4042	30556	1.07	9.90	1.11	9.90
47	SR	0.2773	30557	0.93	–9.90	0.91	–9.90
48	SR	–0.5150	30557	0.87	–9.90	0.81	–9.90
49	SR	0.2750	30557	0.93	–9.90	0.92	–9.90
50	SR	–0.8356	30558	0.88	–9.90	0.80	–9.90

7.3.2.4 Establish Scaling Transformations

Total scores for the EOC Assessments were reported in scale scores with a range of 100–250. A scale score of 200 represents the cut point between Basic and Proficient, and a scale score of 225 represents the cut point between Proficient and Advanced. The scale score ranges are displayed in Table 7.21.

Table 7.21: Scale Score Ranges for EOC Assessment Achievement Levels

EOC Assessment	Achievement Level	Scale Score Range
English I	Below Basic	100 to 176
	Basic	177 to 199
	Proficient	200 to 224
	Advanced	225 to 250
Algebra II	Below Basic	100 to 181
	Basic	182 to 199
	Proficient	200 to 224
	Advanced	225 to 250
Geometry	Below Basic	100 to 181
	Basic	182 to 199
	Proficient	200 to 224
	Advanced	225 to 250
Government	Below Basic	100 to 178
	Basic	179 to 199
	Proficient	200 to 224
	Advanced	225 to 250
American History	Below Basic	100 to 181
	Basic	182 to 199
	Proficient	200 to 224
	Advanced	225 to 250

To produce these scale score ranges, linear transformations were applied to theta estimates and scale scores. The following formula was used to obtain the slopes and intercepts for the transformation functions:

$$sc(y) = \left[\frac{sc(y_2) - sc(y_1)}{\theta_2 - \theta_1}\right] y + \left\{(sc(y_1) - \left[\frac{sc(y_2) - sc(y_1)}{\theta_2 - \theta_1}\right]\theta_1\right\},$$

where θ_1 and θ_2 are person parameter estimates that correspond to the cut score points, and $sc(y_1)$ and $sc(y_2)$ are scale score points. This formula was adopted from Kolen and Brennan (2004, p, 337). For the Spring 2010 base scale, $sc(y_1)$ was 200 and $sc(y_2)$ was 225. Slopes and intercepts of the transformation functions are summarized in Table 7.22. These same slopes and intercepts will be applied to all future forms for each content area.

Table 7.22: Summary of Slopes and Intercepts of Theta to Scale Score Transformation Functions by Content Area

	Basic			Proficient			Advanced				
	Raw Score	Theta	Scale Score	Raw Score	Theta	Scale Score	Raw Score	Theta	Scale Score	Slope	Intercept
English I	16	–0.44	177	25	0.58	200	33	1.70	225	22.24	187.17
Algebra II	16	–0.45	182	24	0.46	200	33	1.71	225	20.06	190.76
Geometry	17	–0.36	182	24	0.47	200	32	1.60	225	22.12	189.57
Government	15	–0.56	179	25	0.56	200	34	1.86	225	19.11	189.37
Am. History	19	–0.11	182	25	0.56	200	32	1.49	225	26.64	185.19

In addition to the above scaling transformation, the following rules were applied for the Fall 2009 operational tests:

- The raw score cut (e.g., for Proficient) was selected as the lowest raw score associated with a rounded scale score of 200. The same strategy was also followed for a scale score of 225.
- If there was no raw score associated with a rounded scale score of 200, the raw score with the highest scale score below 200 was selected as the cut score and assigned a scale score of 200. For example, if two consecutive raw scores were associated with rounded scale scores of 198 and 201, the scale score of 198 was moved up to 200. The same strategy was also followed for a scale score of 225.
- Scale scores below 100 were rounded up to 100.
- Scale scores above 250 were rounded down to 250.
- For each test, for a perfect raw score, the scale score was set to 250.

7.3.3 Step 3: Examine Stability of the Common Items

While the concurrent calibrations following the 2009 standalone field test were sufficient for developing a common scale for the item pools and for building alternate forms (see Step 2), the Spring 2010 operational administration of the EOC Assessments was chosen as the base form. To equate or recenter the Spring 2009 item pool to the Spring 2010 base scale, the Rasch values for the common items (i.e., the Spring 2010 operational items) were fixed to the 2010 parameter estimates. Next, using the Spring 2009 standalone field-test data, the concurrent calibration with the complete pool of items was repeated, this time with the 2010 operational item parameters fixed to their Spring 2010 values. Before completion of the concurrent calibrations, the stability of the common items was assessed for each content area.

The stability of common items should be examined visually and statistically (Kolen and Brennan 2004). For example, scatterplots can be used to check visually for outlier common items. The scatter points for items that function similarly should line up along a straight line. Outlier items will not fall on the straight line and thus can be seen visually. In addition to a visual examination, an analytical study of the stability of common items may be performed. A 0.30-logistic unit should be applied as a cut criterion for removing "unstable" common items (Miller, Rotou, and Twing 2004).

To study the stability of the common items, the displacement value for each operational item (i.e., the common items) was evaluated after calibrating the items with the operational items fixed, or anchored, to their Spring 2010 difficulty values. Any common item with a displacement greater than 0.30 logits was removed from the common item set and treated as a new item. The fixed calibration was then performed again with the unstable common item free to be estimated. The displacement value for each of the remaining common items was then re-evaluated. As with the previous step, any outlier items identified during this procedure were removed from the rescaling process. Table 7.23 shows the number of items dropped from the set of operationally administered items (i.e., the common set of items) for instability. Figures 7.11 to 7.15 show displacement plots for the final set of common items used to recenter each content area's item bank or pool of items.

Table 7.23: Number of Items Dropped from the Common Set of Operational Items

Subject	Number of Items Dropped
English I	12
Algebra II	14
Geometry	12
Government	3
American History	7

Figure 7.11: Displacement Plot of Stable Linking Items for English I

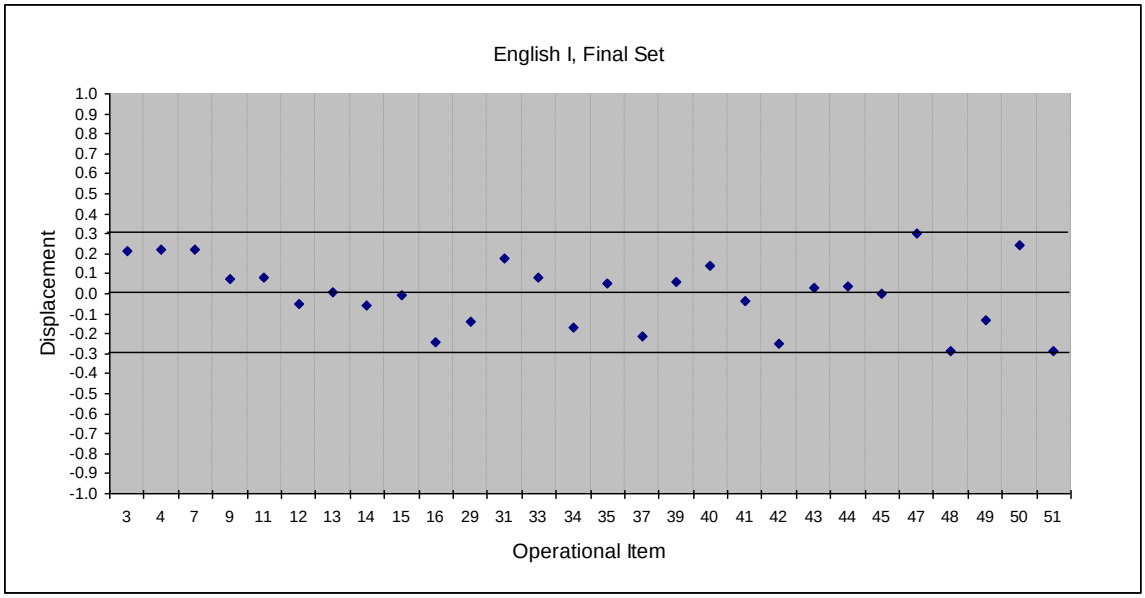


Figure 7.12: Displacement Plot of Stable Linking Items for Algebra II

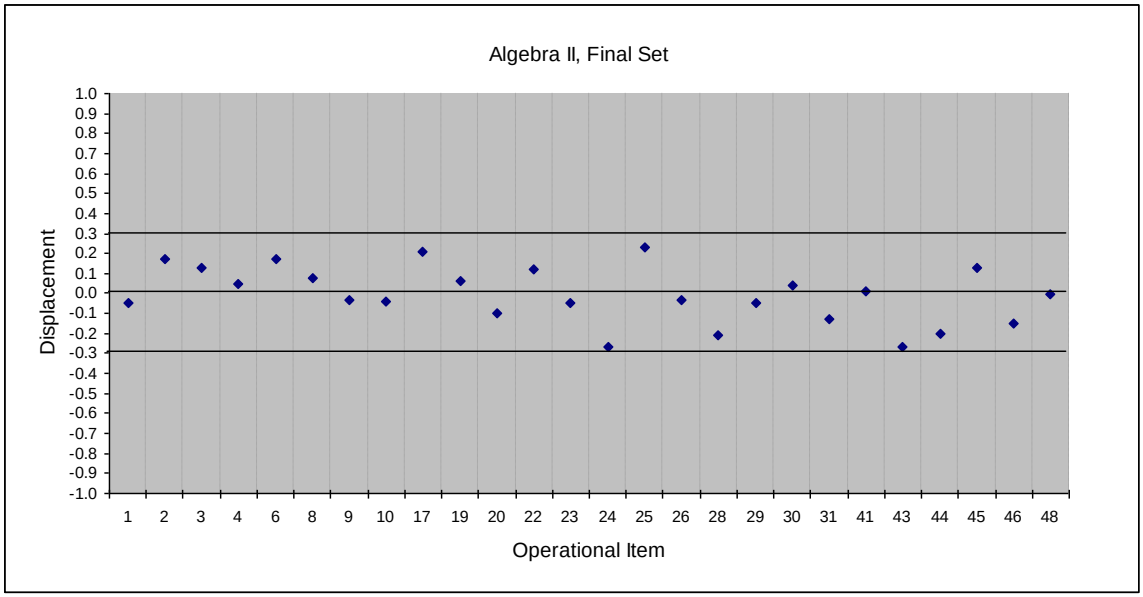


Figure 7.13: Displacement Plot of Stable Linking Items for Geometry

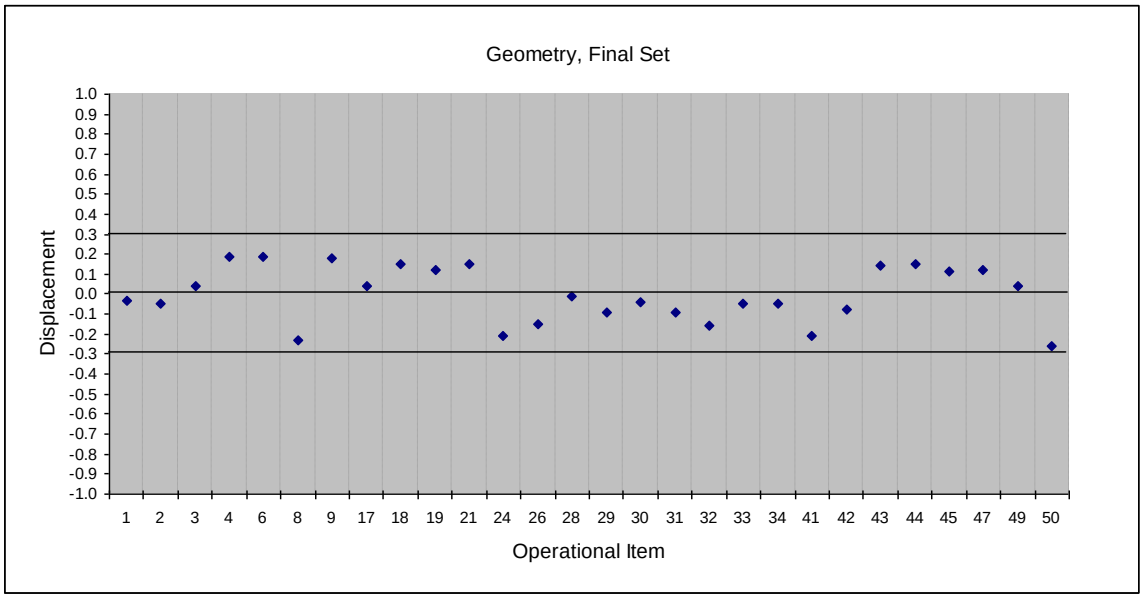


Figure 7.14: Displacement Plot of Stable Linking Items for Government

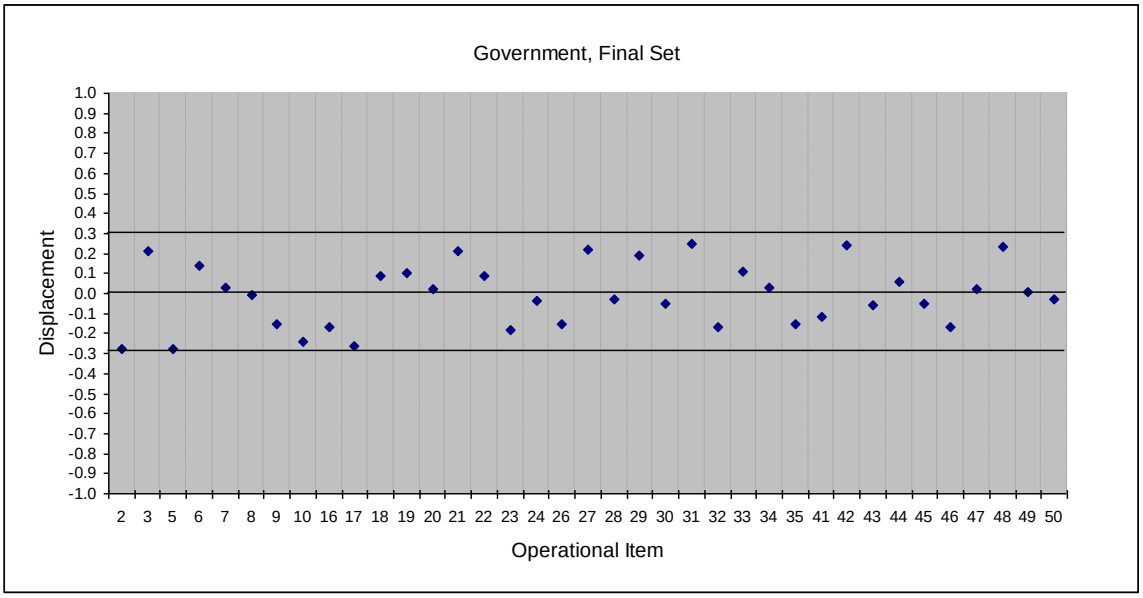


Figure 7.15: Displacement Plot of Stable Linking Items for American History

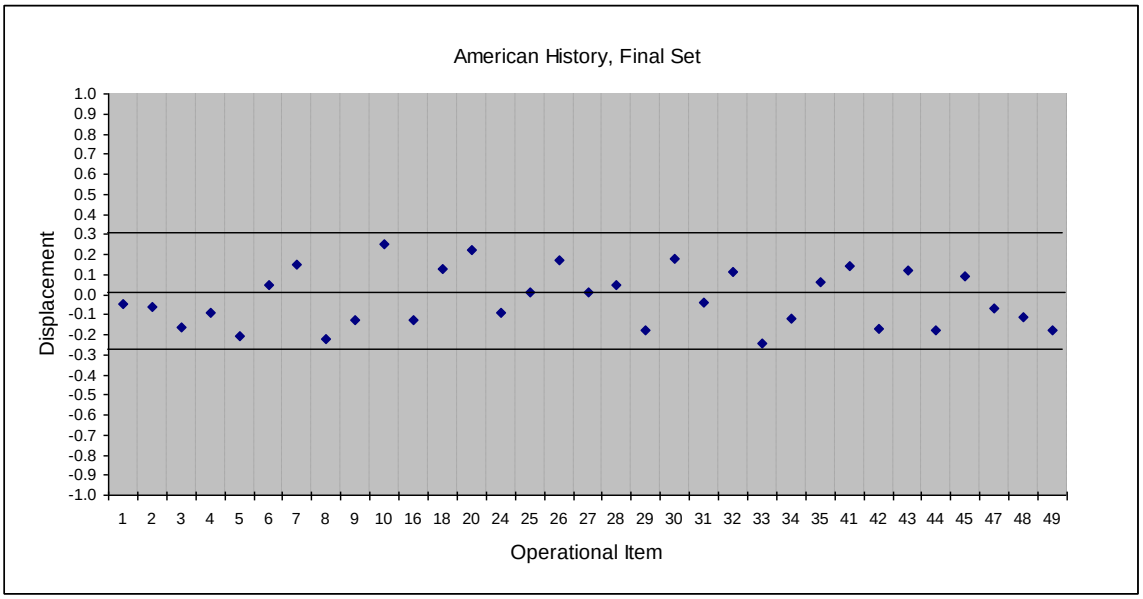


Table 7.24 summarizes displacement statistics for the common items generated with the anchored calibrations. Linacre (2006a) suggests that "random displacements of less than 0.50 logits are unlikely to have much impact in a test instrument" (p. 203). However, as discussed above, the 0.30 criteria for removing unstable items was used. Table 7.24 shows that all displacement statistics for the common items are smaller than 0.30, indicating that the anchored calibrations converged well.

Table 7.24: Displacement Statistics for the Spring 2010 Recentering of the Item Pool

English I		Algebra II		Geometry		Government		American History	
2010 Operational Item	Displacement	2010 Operational Item	Displacement	2010 Operational Item	Displacement	2010 Operational Item	Displacement	2010 Operational Item	Displacement
3	0.21	1	–0.05	1	–0.03	2	–0.28	1	–0.05
4	0.22	2	0.17	2	–0.05	3	0.21	2	–0.06
7	0.22	3	0.13	3	0.04	5	–0.28	3	–0.16
9	0.07	4	0.05	4	0.19	6	0.14	4	–0.09
11	0.08	6	0.17	6	0.19	7	0.03	5	–0.21
12	–0.05	8	0.08	8	–0.23	8	–0.01	6	0.05
13	0.01	9	–0.03	9	0.18	9	–0.15	7	0.15
14	–0.06	10	–0.04	17	0.04	10	–0.24	8	–0.22
15	–0.01	17	0.21	18	0.15	16	–0.17	9	–0.13
16	–0.24	19	0.06	19	0.12	17	–0.26	10	0.25
29	–0.14	20	–0.10	21	0.15	18	0.09	16	–0.13
31	0.18	22	0.12	24	–0.21	19	0.10	18	0.13
33	0.08	23	–0.05	26	–0.15	20	0.02	20	0.22
34	–0.17	24	–0.27	28	–0.01	21	0.21	24	–0.09
35	0.05	25	0.23	29	–0.09	22	0.09	25	0.01
37	–0.21	26	–0.03	30	–0.04	23	–0.18	26	0.17
39	0.06	28	–0.21	31	–0.09	24	–0.04	27	0.01
40	0.14	29	–0.05	32	–0.16	26	–0.15	28	0.05
41	–0.04	30	0.04	33	–0.05	27	0.22	29	–0.18
42	–0.25	31	–0.13	34	–0.05	28	–0.03	30	0.18
43	0.03	41	0.01	41	–0.21	29	0.19	31	–0.04
44	0.04	43	–0.27	42	–0.08	30	–0.05	32	0.11
45	0.00	44	–0.20	43	0.14	31	0.25	33	–0.24
47	0.30	45	0.13	44	0.15	32	–0.17	34	–0.12
48	–0.29	46	–0.15	45	0.11	33	0.11	35	0.06
49	–0.13	48	0.00	47	0.12	34	0.03	41	0.14
50	0.24			49	0.04	35	–0.15	42	–0.17
51	–0.29			50	–0.26	41	–0.12	43	0.12
						42	0.24	44	–0.18
						43	–0.06	45	0.09
						44	0.06	47	–0.07
						45	–0.05	48	–0.11
						46	–0.17	49	–0.18
						47	0.02		
						48	0.23		
						49	0.01		
						50	–0.03		

7.3.4: Step 4: Recenter the 2009 Item Bank

To equate or recenter the 2009 item pool to the 2010 base scale, the Rasch values for the stable common items (i.e., the stable Spring operational items) were fixed to the 2010 parameter estimates. With the Spring 2010 operational item parameters fixed, the rest of the item pool was equated to the Spring 2010 base scale. Note that it was assumed that the latent traits measured by the 2010 operational tests and the 2009 field tests were the same. Given the common items used across the two testing events and given that the blueprint and item specifications were the same, it is reasonable to assume that the underlying latent trait or construct measured by each assessment was the same. The above procedure was a one-time-only activity occurring after the first operational administration. With the pool recentered, the Fall 2009 forms were retroactively equated to the Spring 2009 forms. Although pre-equating occurred after the administration of the Fall 2009 forms, the results were not reported until after the Spring 2010 administration and the item pool recentering. Tables 7.25 to 7.34 provide the raw score to scale score conversions for Fall 2009 and Spring 2010, respectively.

Table 7.25: Raw Score to Scale Score Conversions for Fall 2009, English I

Raw Score	Scale Score	*CSEM*
0	100	41
1	101	23
2	118	16
3	128	14
4	135	12
5	141	11
6	146	10
7	151	10
8	155	9
9	159	9
10	162	9
11	165	8
12	168	8
13	171	8
14	174	8
15	177	8
16	179	8
17	182	8
18	185	8
19	187	8
20	190	7
21	192	7
22	195	8
23	197	8
24	200	8
25	202	8
26	205	8
27	208	8
28	211	8
29	214	8
30	217	8
31	220	9
32	225	9
33	228	10
34	232	10
35	237	11
36	243	12
37	250	14
38	250	16
39	250	23
40	250	41

Table 7.26: Raw Score to Scale Score Conversions for Fall 2009, Algebra II

Raw Score	Scale Score	*CSEM*
0	100	37
1	117	20
2	132	15
3	140	12
4	147	11
5	152	10
6	157	9
7	160	9
8	164	8
9	167	8
10	170	8
11	173	7
12	175	7
13	178	7
14	182	7
15	183	7
16	185	7
17	187	7
18	189	7
19	192	7
20	194	7
21	196	7
22	198	7
23	200	7
24	203	7
25	205	7
26	207	7
27	210	7
28	212	7
29	215	7
30	218	8
31	221	8
32	225	8
33	227	9
34	231	9
35	236	10
36	241	11
37	247	12
38	250	15
39	250	20
40	250	37

Table 7.27: Raw Score to Scale Score Conversions for Fall 2009, Geometry

Raw Score	Scale Score	*CSEM*
0	100	41
1	106	23
2	122	16
3	132	13
4	139	12
5	145	11
6	150	10
7	154	9
8	158	9
9	161	9
10	165	8
11	168	8
12	171	8
13	173	8
14	176	8
15	179	8
16	182	7
17	184	7
18	186	7
19	188	7
20	191	7
21	193	7
22	196	7
23	200	7
24	201	7
25	203	7
26	206	8
27	208	8
28	211	8
29	214	8
30	217	8
31	220	9
32	225	9
33	228	9
34	232	10
35	237	11
36	242	12
37	250	13
38	250	16
39	250	22
40	250	41

Table 7.28: Raw Score to Scale Score Conversions for Fall 2009, Government

Raw Score	Scale Score	*CSEM*
0	100	35
1	114	19
2	128	14
3	137	12
4	143	10
5	148	9
6	152	9
7	156	8
8	159	8
9	162	7
10	165	7
11	168	7
12	170	7
13	173	7
14	175	7
15	177	6
16	179	6
17	181	6
18	184	6
19	186	6
20	188	6
21	190	6
22	192	6
23	194	6
24	196	6
25	200	7
26	201	7
27	203	7
28	205	7
29	208	7
30	210	7
31	213	7
32	216	8
33	220	8
34	225	9
35	228	9
36	233	10
37	239	12
38	247	14
39	250	19
40	250	35

Table 7.29: Raw Score to Scale Score Conversions for Fall 2009, American History

Raw Score	Scale Score	*CSEM*
0	100	49
1	100	27
2	102	20
3	114	16
4	123	14
5	130	13
6	136	12
7	142	12
8	146	11
9	151	11
10	155	10
11	159	10
12	162	10
13	166	10
14	169	9
15	173	9
16	176	9
17	179	9
18	182	9
19	185	9
20	188	9
21	191	9
22	194	9
23	197	9
24	200	9
25	203	9
26	206	9
27	210	9
28	213	10
29	217	10
30	221	10
31	225	11
32	229	11
33	234	11
34	239	12
35	245	13
36	250	14
37	250	16
38	250	20
39	250	27
40	250	49

Table 7.30: Raw Score to Scale Score Conversions for Spring 2010, English I

Raw Score	Scale Score	*CSEM*
0	100	41
1	100	23
2	116	16
3	126	14
4	134	12
5	140	11
6	145	10
7	149	10
8	153	9
9	157	9
10	160	9
11	163	8
12	166	8
13	169	8
14	172	8
15	175	8
16	177	8
17	180	8
18	182	7
19	185	7
20	187	7
21	190	7
22	192	7
23	195	7
24	197	8
25	200	8
26	203	8
27	205	8
28	208	8
29	211	8
30	214	8
31	218	9
32	221	9
33	225	10
34	229	10
35	234	11
36	240	12
37	247	14
38	250	16
39	250	23
40	250	41

Table 7.31: Raw Score to Scale Score Conversions for Spring 2010, Algebra II

Raw Score	Scale Score	*CSEM*
0	100	37
1	112	20
2	127	15
3	136	12
4	143	11
5	148	10
6	152	9
7	156	9
8	160	8
9	163	8
10	166	8
11	169	7
12	172	7
13	175	7
14	177	7
15	179	7
16	182	7
17	184	7
18	186	7
19	189	7
20	191	7
21	193	7
22	195	7
23	198	7
24	200	7
25	202	7
26	205	7
27	207	7
28	210	7
29	212	7
30	215	8
31	218	8
32	221	8
33	225	9
34	229	9
35	233	10
36	239	11
37	245	12
38	250	15
39	250	20
40	250	37

Table 7.32: Raw Score to Scale Score Conversions for Spring 2010, Geometry

Raw Score	Scale Score	*CSEM*
0	100	41
1	101	23
2	117	16
3	127	14
4	135	12
5	141	11
6	146	10
7	150	10
8	154	9
9	158	9
10	161	9
11	164	8
12	168	8
13	171	8
14	173	8
15	176	8
16	179	8
17	182	8
18	184	8
19	187	8
20	189	8
21	192	8
22	195	8
23	197	8
24	200	8
25	203	8
26	206	8
27	208	8
28	211	8
29	215	8
30	218	9
31	221	9
32	225	9
33	229	10
34	234	10
35	239	11
36	245	12
37	250	14
38	250	16
39	250	23
40	250	41

Table 7.33: Raw Score to Scale Score Conversions for Spring 2010, Government

Raw Score	Scale Score	*CSEM*
0	100	35
1	116	19
2	130	14
3	138	12
4	145	10
5	150	9
6	154	9
7	157	8
8	161	8
9	164	7
10	167	7
11	169	7
12	172	7
13	174	7
14	176	7
15	179	7
16	181	6
17	183	6
18	185	6
19	187	6
20	189	6
21	191	6
22	194	6
23	196	6
24	198	6
25	200	7
26	202	7
27	205	7
28	207	7
29	209	7
30	212	7
31	215	7
32	218	8
33	221	8
34	225	9
35	229	9
36	234	10
37	240	12
38	249	14
39	250	19
40	250	35

Table 7.34: Raw Score to Scale Score Conversions for Spring 2010, American History

Raw Score	Scale Score	*CSEM*
0	100	49
1	100	27
2	102	20
3	114	16
4	123	14
5	130	13
6	136	12
7	141	11
8	145	11
9	150	10
10	154	10
11	157	10
12	161	10
13	164	9
14	167	9
15	170	9
16	173	9
17	176	9
18	179	9
19	182	9
20	185	9
21	188	9
22	191	9
23	194	9
24	197	9
25	200	9
26	203	9
27	206	9
28	210	10
29	213	10
30	217	10
31	221	10
32	225	11
33	230	11
34	235	12
35	241	13
36	248	14
37	250	16
38	250	20
39	250	27
40	250	49

7.3.5 Step 5: Place the 2010 Embedded Field Test Items onto the 2010 Scale

The 2010 EFT test items were treated separately in this process to avoid having them influence calibration of the operational items and the establishment of the base scale. To bring the field-test items onto the base scale, a second calibration of the Spring data, fixing the 2010 operational parameter estimates, was conducted.

For the 2010–2011 operational administrations, three new forms were built for each content area from the calibrated and recentered item pools (one each for Fall, Spring, and Summer). These new forms are pre-equated to the base form because, after the recentering of the pool, all previously field-tested items are on the operational scale. For all subsequent years, one new form will be built from the calibrated pool for the Spring administration. A form reuse plan will be implemented for the Fall and Summer administrations. Each Fall and Summer form from the 2009–2010 and 2010–2011 administrations will be used in alternating years and in alternating administrations.

For the new Spring form in 2011, new items were field tested. The field test items will be scaled to the pool, using a calibration in which the operational test item parameters are fixed and the new field test items are free to be estimated. This process will allow all new items for all Spring form administrations to be placed on the same EOC Assessment scale as the other items in the pool.

As outlined above, not only can the pre-equating model be used to annually build alternate test forms, but by using the embedded field testing approach, the Missouri Department of Elementary and Secondary Education (DESE) will also be able to maintain its item pools.

7.3.6 Step 6: Perform Fixed Calibrations on the 2011 Operational Forms

To place the 2010–2011 operational forms onto the 2009 scale, an anchored item calibration was performed by fixing the parameters with the estimates resulting from Step 5 above. Figures 7.16 to 7.20 show the TCCs for the three operational forms (Fall, Spring, and Summer) for each content area. The TCCs generally show the three forms to be similar (differences were within 5% of the range of test scores) across the full range of ability.

Figure 7.16: TCCs for Three Alternate Forms for English I for the 2011 Test Administration

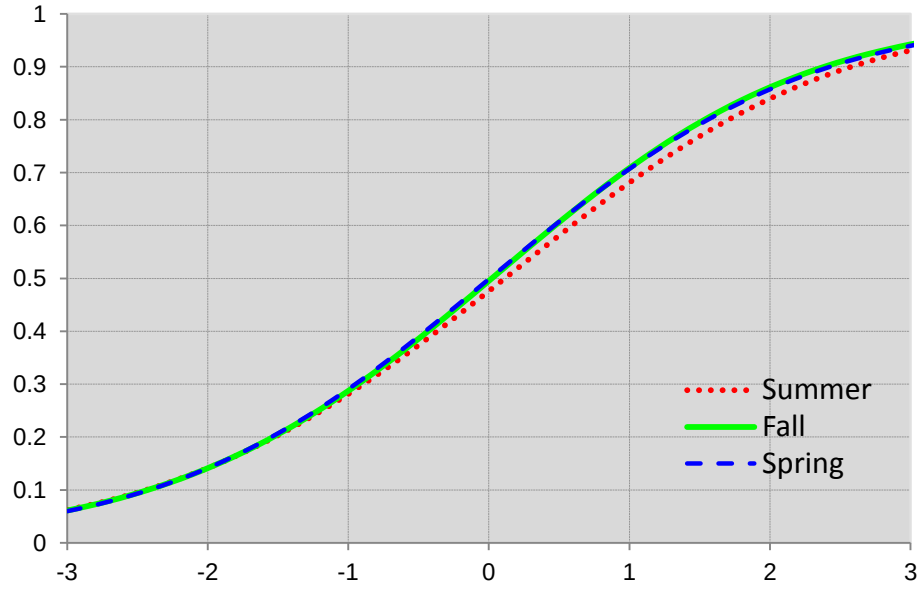


Figure 7.17: TCCs for Three Alternate Forms for Algebra II for the 2011 Test Administration

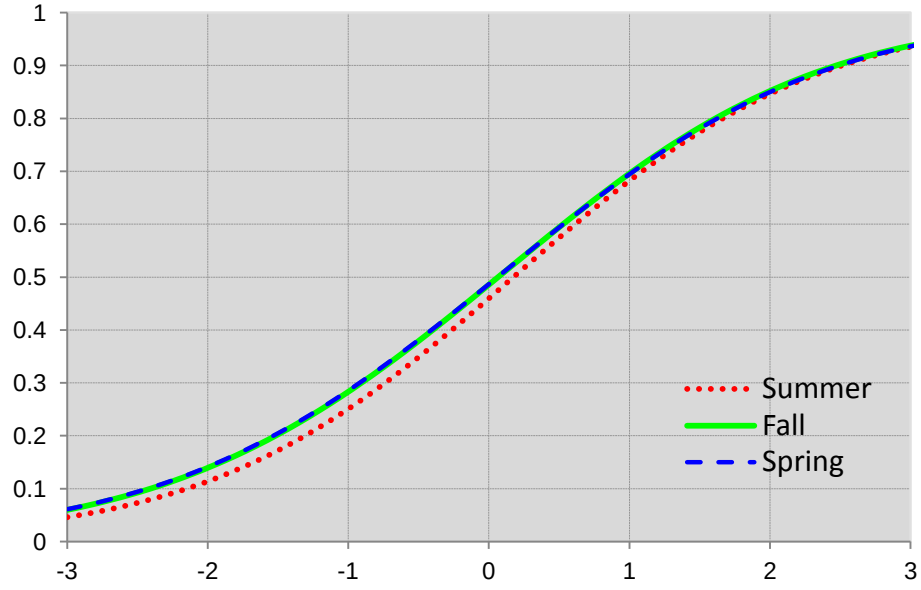


Figure 7.18: TCCs for Three Alternate Forms for Geometry for the 2011 Test Administration

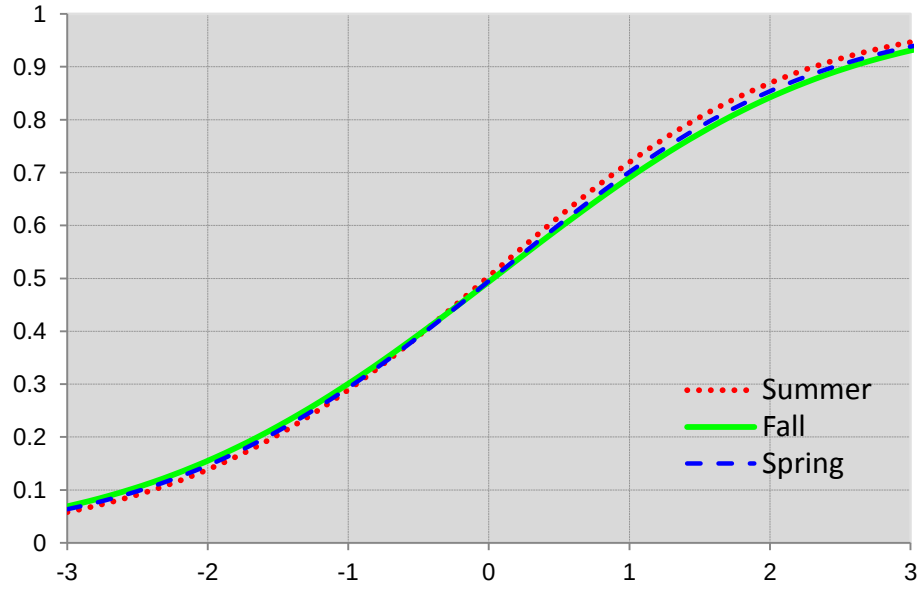


Figure 7.19: TCCs for Three Alternate Forms for Government for the 2011 Test Administration

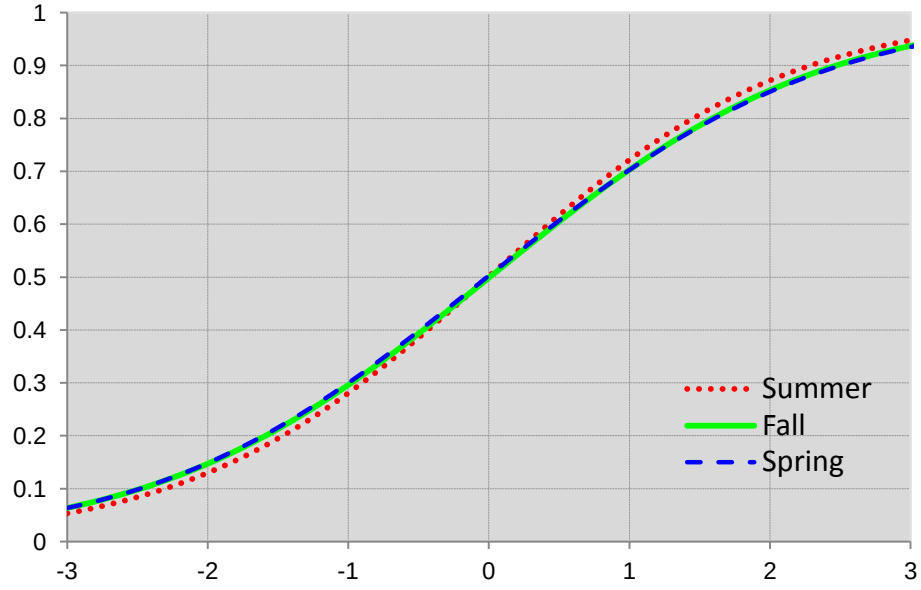


Figure 7.20: TCCs for Three Alternate Forms for American History for the 2011 Test Administration

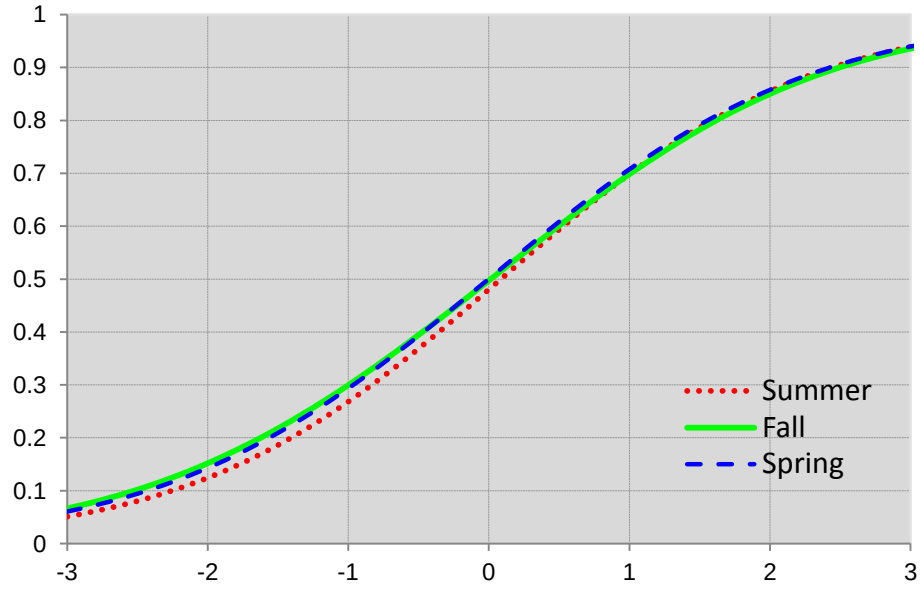


Table 7.35 provides a comparison of classical item statistics for phase II item pool and for the Summer 2010, Fall 2010, and Spring 2011 operational forms based on the 2010–2011 operational test administration for each content area. The comparison includes the percentage of items with *p*-values less than 0.3 and point-biserial correlations less than 0.1. Items with values below these criteria are typically considered low performing and are excluded from operational forms. However, such items may be included if the item pool is limited or if content considerations justify keeping an item. For example, an item may have poor field-test statistics because of examinee motivational issues or because content is not currently being taught. Examination of the summary statistics in Table 7.35 generally supports test development efforts in selecting the highest-quality items for inclusion in each operational form. Summary statistics for the Spring 2011 operational administration are provided in Table 7.36.

Table 7.35: Comparison of Phase II Item Pool with 2010–2011 Operational Test Forms

Subject	Item Set	% *p*-Value < 0.3	% Point-Biserial < 1.0
English I	Phase II Bank	16.8%	17.4%
	Fall	2.5%	5.0%
	Spring	0.0%	5.0%
	Summer	0.0%	12.5%
Algebra II	Phase II Bank	3.3%	6.4%
	Fall	0.0%	0.0%
	Spring	2.5%	7.5%
	Summer	0.0%	2.5%
Geometry	Phase II Bank	12.5%	12.0%
	Fall	0.0%	0.0%
	Spring	7.5%	5.0%
	Summer	0.0%	0.0%
Government	Phase II Bank	7.7%	9.0%
	Fall	0.0%	0.0%
	Spring	2.5%	10.0%
	Summer	2.5%	2.5%
American History	Phase II Bank	8.1%	17.1%
	Fall	2.5%	2.5%
	Spring	2.5%	20.0%
	Summer	2.5%	12.5%

Table 7.36: Summary Statistics for the Spring 2011 Operational Administration

Content	Total Items	Total Points	Minimum	Maximum	Mean (Raw Score)	*SD* (Raw Score)
English I	40	40	2	40	25.19	6.957
Algebra II	40	40	1	40	23.29	6.382
Geometry	40	40	3	40	23.28	6.497
Government	40	40	1	40	25.24	6.936
American History	40	40	1	39	23.13	6.260

Because the Rasch model is the basis of all scoring and scaling analyses associated with the EOC Assessments, the utility of the results from the Spring 2011 administration depends on the degree to which the assumptions of the model are met as well as the degree to which the test data fit the model. As noted in Section 7.3.2, the assumptions of the Rasch model are that (1) the data are unidimensional, and (2) the data have the quality of local independence, meaning that responses to one item do not depend on responses to

another item. The analyses below address these assumptions and include evaluations of the dimensionality and local independence of the data, as well as fit indices.

Table 7.37 shows the results of the PCA for the Spring 2011 operational form for each content area. For each analysis, the secondary dimension has an eigenvalue representing fewer than three items (less than 5% of the total variance) and, therefore, is of little practical import.

Table 7.37: Results of the PCA for the Spring 2011 Operational Tests

Content	Total Units (Items)	Second Dimension Eigenvalue	Second Dimension % of Total Variance Explained	% of Unexplained Variance	Second Dimension % of Unexplained Variance
English I	40	40	1.6	68.6	4.0
Algebra II	40	40	1.5	64.1	3.9
Geometry	40	40	1.8	64.9	4.4
Government	40	40	1.7	55.3	4.2
American History	40	40	1.9	64.6	4.8

Figures 7.21 to 7.25 provide screen shots from WINSTEPS Table 23.99 (Linacre, 2006b) for each content area from the Spring 2011 operational test administration. Results of these analyses generally support the assumption of local independence. More specifically, values for standardized residual correlations were generally low (i.e., had absolute values below .10), indicating little dependency between pairs of items.

Figure 7.21: Standardized Residual Correlations from the Spring 2011 Administration for English I

```
TABLE 23.99 Spring 2011 Missouri EOC Local Calibr EnglishI.OUT Oct 19 14:32 2011
INPUT: 42171 PERSONS  52 ITEMS  MEASURED: 42171 PERSONS  40 ITEMS  80 CATS  3.64.2
-------------------------------------------------------------------------------

     LARGEST STANDARDIZED RESIDUAL CORRELATIONS
     USED TO IDENTIFY DEPENDENT ITEMS
+----------------------------------+
|RESIDUL| ENTRY       | ENTRY       |
|CORRELN|NUMBER ITEM  |NUMBER ITEM  |
|-------+-------------+-------------|
|    .10 |     38 I0038 |     45 I0045 |
|    .08 |     41 I0041 |     45 I0045 |
|-------+-------------+-------------|
|   -.10 |     31 I0031 |     33 I0033 |
|   -.09 |     34 I0034 |     36 I0036 |
|   -.09 |     31 I0031 |     38 I0038 |
|   -.08 |     31 I0031 |     45 I0045 |
|   -.08 |     15 I0015 |     38 I0038 |
|   -.08 |     34 I0034 |     38 I0038 |
|   -.08 |      5 I0005 |     38 I0038 |
|   -.07 |     31 I0031 |     43 I0043 |
+----------------------------------+
```

Figure 7.22: Standardized Residual Correlations from the Spring 2011 Administration for Algebra II

TABLE 23.99 Spring 2011 Missouri EOC Local Calib AlgebraII.OUT Oct 19 14:33 2011
INPUT: 22506 PERSONS 50 ITEMS MEASURED: 22506 PERSONS 40 ITEMS 80 CATS 3.64.2

LARGEST STANDARDIZED RESIDUAL CORRELATIONS
USED TO IDENTIFY DEPENDENT ITEMS

RESIDUL CORRELN	ENTRY NUMBER	ITEM	ENTRY NUMBER	ITEM
.09	29	I0029	49	I0049
.09	32	I0032	50	I0050
.07	25	I0025	29	I0029
-.09	22	I0022	29	I0029
-.08	7	I0007	8	I0008
-.08	32	I0032	42	I0042
-.08	18	I0018	29	I0029
-.08	7	I0007	49	I0049
-.07	22	I0022	28	I0028
-.07	5	I0005	22	I0022

Figure 7.23: Standardized Residual Correlations from the Spring 2011 Administration for Geometry

TABLE 23.99 Spring 2011 Missouri EOC Local Calibr Geometry.OUT Oct 19 14:33 2011
INPUT: 26088 PERSONS 50 ITEMS MEASURED: 26088 PERSONS 40 ITEMS 80 CATS 3.64.2

LARGEST STANDARDIZED RESIDUAL CORRELATIONS
USED TO IDENTIFY DEPENDENT ITEMS

RESIDUL CORRELN	ENTRY NUMBER	ITEM	ENTRY NUMBER	ITEM
.17	18	I0018	29	I0029
.12	21	I0021	47	I0047
-.10	24	I0024	49	I0049
-.09	24	I0024	33	I0033
-.08	24	I0024	28	I0028
-.08	8	I0008	49	I0049
-.08	21	I0021	34	I0034
-.08	4	I0004	49	I0049
-.08	24	I0024	47	I0047
-.08	8	I0008	33	I0033

Figure 7.24: Standardized Residual Correlations from the Spring 2011 Administration for Government

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TABLE 23.99 Spring 2011 Missouri EOC Local Calibration Gov.OUT Oct 19 14:34 2011
INPUT: 39907 PERSONS  50 ITEMS  MEASURED: 39907 PERSONS  40 ITEMS  80 CATS  3.64.2
-------------------------------------------------------------------------------

     LARGEST STANDARDIZED RESIDUAL CORRELATIONS
     USED TO IDENTIFY DEPENDENT ITEMS
+-----------------------------------+
|RESIDUL| ENTRY       | ENTRY       |
|CORRELN|NUMBER ITEM  |NUMBER ITEM  |
|-------+-------------+-------------|
|  -.11 |    17 I0017 |    29 I0029 |
|  -.08 |    17 I0017 |    45 I0045 |
|  -.08 |    17 I0017 |    34 I0034 |
|  -.08 |    19 I0019 |    34 I0034 |
|  -.08 |    32 I0032 |    45 I0045 |
|  -.08 |    16 I0016 |    44 I0044 |
|  -.08 |    18 I0018 |    43 I0043 |
|  -.08 |    16 I0016 |    42 I0042 |
|  -.07 |    18 I0018 |    42 I0042 |
|  -.07 |    19 I0019 |    43 I0043 |
+-----------------------------------+
```

Figure 7.25: Standardized Residual Correlations from the Spring 2011 Administration for American History

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TABLE 23.99 Spring 2011 Missouri EOC Local Calibratio Hist.OUT Oct 19 14:34 2011
INPUT: 34778 PERSONS  50 ITEMS  MEASURED: 34778 PERSONS  40 ITEMS  80 CATS  3.64.2
-------------------------------------------------------------------------------

     LARGEST STANDARDIZED RESIDUAL CORRELATIONS
     USED TO IDENTIFY DEPENDENT ITEMS
+-----------------------------------+
|RESIDUL| ENTRY       | ENTRY       |
|CORRELN|NUMBER ITEM  |NUMBER ITEM  |
|-------+-------------+-------------|
|  -.10 |     7 I0007 |    34 I0034 |
|  -.09 |     9 I0009 |    34 I0034 |
|  -.09 |    18 I0018 |    29 I0029 |
|  -.09 |    43 I0043 |    47 I0047 |
|  -.08 |     7 I0007 |    25 I0025 |
|  -.08 |    31 I0031 |    47 I0047 |
|  -.08 |    20 I0020 |    23 I0023 |
|  -.08 |    34 I0034 |    42 I0042 |
|  -.08 |    23 I0023 |    29 I0029 |
|  -.08 |     7 I0007 |    43 I0043 |
+-----------------------------------+
```

Tables 7.38 to 7.42 provide summary statistics, including summary fit statistics, for the Spring 2011 operational test calibrations. The evaluation of fit values, specifically MS infit, yielded these results: Infit values for English I ranged from 0.82 to 1.18, values for Algebra II ranged from 0.87 to 1.16, values for Geometry ranged from 0.85 to 1.15, values for Government ranged from 0.85 to 1.21, and values for American History ranged from 0.87 to 1.14. The fit values and output files are based on the local runs using WINSTEPS version 3.64.2. Tables 7.43 to 7.47 provide Rasch difficulties and item fit statistics.

Table 7.38: Summary Statistics for the Spring 2011 Operational Test Calibrations for English I

Statistic	Rasch Difficulty Estimate	Item Mean	Infit		Outfit		Point-Biserial
			MS	Standardized	*MS*	Statistic	
# of Items	40	40	40	40	40	40	40
Mean	0.00	0.63	1.00	-0.10	0.99	0.09	0.32
SD	0.71	0.13	0.08	8.35	0.13	8.54	0.09
Minimum	-1.61	0.39	0.82	-9.90	0.72	-9.90	0.13
Percentiles							
10	-1.12	0.48	0.90	-9.90	0.83	-9.90	0.21
25	-0.43	0.53	0.93	-9.90	0.91	-9.90	0.25
50	0.08	0.63	1.00	-0.71	1.00	0.35	0.32
75	0.57	0.72	1.05	9.90	1.10	9.90	0.39
90	0.80	0.82	1.10	9.90	1.16	9.90	0.43
Maximum	1.23	0.88	1.18	9.90	1.22	9.90	0.53

Table 7.39: Summary Statistics for the Spring 2011 Operational Test Calibrations for Algebra II

Statistic	Rasch Difficulty Estimate	Item Mean	Infit		Outfit		Point-Biserial
			MS	Standardized	*MS*	Statistic	
# of Items	40	40	40	40	40	40	40
Mean	0.00	0.58	1.00	-0.61	1.01	0.13	0.28
SD	0.88	0.17	0.06	6.55	0.10	6.83	0.07
Minimum	-1.86	0.26	0.87	-9.90	0.82	-9.90	0.12
Percentiles							
10	-1.46	0.40	0.93	-9.90	0.90	-9.51	0.18
25	-0.41	0.45	0.96	-5.63	0.95	-5.77	0.24
50	0.12	0.57	0.99	-1.15	1.00	-0.17	0.28
75	0.66	0.68	1.02	3.57	1.06	6.66	0.32
90	0.93	0.84	1.04	9.23	1.13	9.90	0.36
Maximum	1.65	0.89	1.16	9.90	1.26	9.90	0.44

Table 7.40: Summary Statistics for the Spring 2011 Operational Test Calibrations for Geometry

Statistic	Rasch Difficulty Estimate	Item Mean	Infit		Outfit		Point-Biserial
			MS	Standardized	*MS*	Statistic	
# of Items	40	40	40	40	40	40	40
Mean	0.00	0.58	1.00	0.45	0.99	0.61	0.29
SD	0.86	0.16	0.08	7.72	0.12	7.94	0.09
Minimum	-1.75	0.31	0.85	9.90	0.75	9.90	0.13
Percentiles							
10	-1.30	0.37	0.89	9.90	0.81	9.90	0.17
25	-0.48	0.46	0.95	8.16	0.91	9.90	0.23
50	0.07	0.58	1.01	1.16	1.01	1.69	0.27
75	0.64	0.69	1.04	7.31	1.06	9.21	0.35
90	1.06	0.82	1.10	9.90	1.15	9.90	0.43
Maximum	1.35	0.87	1.15	9.90	1.20	9.90	0.47

Table 7.41: Summary Statistics for the Spring 2011 Operational Test Calibrations for Government

Statistic	Rasch Difficulty Estimate	Item Mean	Infit		Outfit		Point-Biserial
			MS	Standardized	*MS*	Statistic	
# of Items	40	40	40	40	40	40	40
Mean	0.00	0.63	0.99	0.83	0.99	0.71	0.33
SD	1.00	0.18	0.09	8.23	0.18	8.90	0.09
Minimum	-1.70	0.26	0.85	9.90	0.67	9.90	0.14
Percentiles							
10	-1.34	0.36	0.89	9.90	0.80	9.90	0.21
25	-0.65	0.49	0.92	9.90	0.86	9.90	0.26
50	-0.07	0.66	0.99	1.61	0.98	1.35	0.33
75	0.77	0.76	1.04	8.02	1.09	9.90	0.40
90	1.43	0.85	1.12	9.90	1.24	9.90	0.44
Maximum	1.98	0.89	1.21	9.90	1.35	9.90	0.51

Table 7.42: Summary Statistics for the Spring 2011 Operational Test Calibrations for American History

Statistic	Rasch Difficulty Estimate	Item Mean	Infit		Outfit		Point-Biserial
			MS	Standardized	*MS*	Statistic	
# of Items	40	40	40	40	40	40	40
Mean	0.00	0.58	1.00	-0.55	1.00	-0.50	0.28
SD	0.93	0.18	0.09	9.37	0.16	9.72	0.11
Minimum	-1.77	0.19	0.87	-9.90	0.68	-9.90	0.04
Percentiles							
10	-1.22	0.36	0.89	-9.90	0.83	-9.90	0.13
25	-0.54	0.47	0.92	-9.90	0.87	-9.90	0.17
50	-0.01	0.59	0.96	-5.60	0.95	-7.71	0.30
75	0.56	0.70	1.07	9.90	1.14	9.90	0.37
90	1.05	0.81	1.11	9.90	1.19	9.90	0.42
Maximum	2.02	0.87	1.14	9.90	1.42	9.90	0.44

Table 7.43: Item Statistics for the Spring 2011 Operational Test Calibrations for English I

Item Number	Item Type	Rasch Difficulty Estimate	*N*	MS Infit	Standardized Infit	MS Outfit	Standardized Outfit
1	SR	-0.1249	42158	0.99	-1.82	0.96	-5.74
2	SR	0.6194	42158	0.93	-9.90	0.92	-9.90
3	SR	0.2362	42158	1.01	1.35	1.00	-0.14
4	SR	-0.6403	42158	0.98	-3.89	0.96	-4.55
5	SR	0.0601	42158	1.10	9.90	1.12	9.90
6	SR	0.9511	42158	1.10	9.90	1.14	9.90
7	SR	0.6785	42158	1.09	9.90	1.12	9.90
8	SR	-0.2197	42158	0.89	-9.90	0.83	-9.90
9	SR	-1.6108	42158	0.93	-6.42	0.84	-9.27
10	SR	-0.0663	42158	1.02	4.03	1.03	3.86
11	SR	0.4188	42158	1.07	9.90	1.09	9.90
12	SR	-1.0094	42158	0.96	-5.17	0.92	-6.86
13	SR	0.1186	42158	1.01	3.18	1.01	2.13
14	SR	-0.2811	42158	0.92	-9.90	0.88	-9.90
15	SR	0.5586	42158	1.12	9.90	1.16	9.90
16	SR	-1.2325	42158	0.94	-7.00	0.97	-2.16
29	SR	1.2270	42158	1.10	9.90	1.18	9.90
30	SR	-0.2299	42158	0.96	-8.52	0.94	-7.86
31	SR	0.7068	42158	1.18	9.90	1.22	9.90
32	SR	-1.1309	42158	1.02	2.79	1.19	9.90
33	SR	1.1898	42158	1.05	9.90	1.11	9.90
34	SR	0.2756	42158	1.15	9.90	1.19	9.90
35	SR	-1.1228	42158	0.95	-5.68	0.93	-5.21
36	SR	0.1086	42158	0.93	-9.90	0.89	-9.90
37	SR	-0.1289	42158	0.91	-9.90	0.84	-9.90
38	SR	-0.4776	42158	0.82	-9.90	0.72	-9.90
39	SR	0.6099	42158	1.03	7.89	1.04	8.19
40	SR	0.1105	42158	0.91	-9.90	0.87	-9.90
41	SR	0.6674	42158	1.01	2.36	1.01	1.97
42	SR	0.4734	42158	1.09	9.90	1.11	9.90
43	SR	-0.5616	42158	0.87	-9.90	0.78	-9.90
44	SR	0.2957	42158	0.93	-9.90	0.92	-9.90
45	SR	-0.4082	42158	0.87	-9.90	0.77	-9.90
46	SR	-1.1670	42158	0.96	-5.28	1.04	2.84
47	SR	0.0235	42158	1.04	9.65	1.07	9.90
48	SR	-0.8868	42158	0.90	-9.90	0.79	-9.90
49	SR	1.0361	42158	1.04	9.90	1.09	9.90
50	SR	0.2866	42158	0.99	-1.71	1.00	0.83
51	SR	0.7811	42158	1.05	9.90	1.07	9.90
52	SR	-0.1344	42158	1.00	0.30	0.97	-4.19

Table 7.44: Item Statistics for the Spring 2011 Operational Test Calibrations for Algebra II

Item Number	Item Type	Rasch Difficulty Estimate	*N*	MS Infit	Standardized Infit	MS Outfit	Standardized Outfit
1	SR	0.4612	22475	0.99	-2.68	0.99	-1.36
2	SR	-1.5401	22475	1.02	1.76	1.07	3.10
3	SR	-0.9739	22475	0.98	-2.42	0.98	-1.53
4	SR	0.4363	22475	0.97	-6.69	0.96	-6.31
5	SR	0.8980	22475	1.01	1.93	1.02	2.44
6	SR	-1.4525	22475	1.03	2.70	1.26	9.90
7	SR	-0.2356	22475	0.87	-9.90	0.82	-9.90
8	SR	0.5909	22475	1.16	9.90	1.23	9.90
9	SR	1.3455	22475	0.97	-4.07	0.98	-1.77
10	SR	-0.3394	22475	1.01	2.31	1.02	2.57
16	SR	0.6751	22475	1.10	9.90	1.12	9.90
17	SR	-0.3262	22475	0.98	-3.18	1.00	-0.35
18	SR	0.9251	22475	0.93	-9.90	0.93	-9.47
19	SR	-0.1515	22475	0.96	-6.92	0.95	-6.02
20	SR	0.1028	22475	0.95	-9.90	0.92	-9.90
21	SR	0.7667	22475	0.96	-7.09	0.96	-5.69
22	SR	-0.3845	22475	0.89	-9.90	0.83	-9.90
23	SR	-0.7802	22475	0.99	-1.50	1.00	0.01
24	SR	-0.1335	22475	0.96	-8.10	0.93	-8.44
25	SR	0.1273	22475	1.00	-0.79	0.98	-3.32
26	SR	-0.3124	22475	1.07	9.90	1.14	9.90
27	SR	-1.6382	22475	0.96	-2.71	0.95	-2.47
28	SR	0.9957	22475	1.04	6.15	1.06	7.52
29	SR	0.6600	22475	1.04	9.01	1.06	8.41
30	SR	0.6513	22475	1.02	3.32	1.02	2.77
31	SR	0.7882	22475	1.14	9.90	1.18	9.90
32	SR	1.1926	22475	0.92	-9.90	0.90	-9.90
33	SR	1.6474	22475	0.99	-0.69	1.04	3.01
34	SR	0.0599	22475	1.02	4.33	1.02	2.98
35	SR	0.7767	22475	1.03	6.43	1.05	6.79
41	SR	-1.8624	22475	0.93	-4.76	0.82	-7.55
42	SR	-0.3229	22475	1.04	7.48	1.13	9.90
43	SR	0.1419	22475	0.98	-4.42	0.96	-5.29
44	SR	-0.4916	22475	0.93	-9.90	0.91	-8.46
45	SR	-1.5310	22475	0.95	-3.87	0.90	-4.75
46	SR	-1.0419	22475	1.01	0.69	1.06	3.63
47	SR	-0.7503	22475	1.02	2.06	1.09	6.62
48	SR	0.1498	22475	0.98	-5.27	0.98	-3.24
49	SR	0.5265	22475	1.04	9.15	1.05	7.98
50	SR	0.3494	22475	1.01	3.13	1.02	3.53

Table 7.45: Item Statistics for the Spring 2011 Operational Test Calibrations for Geometry

Item Number	Item Type	Rasch Difficulty Estimate	*N*	MS Infit	Standardized Infit	MS Outfit	Standardized Outfit
1	SR	-0.5031	26081	1.04	6.03	1.05	4.89
2	SR	-1.3198	26081	1.01	0.96	0.98	-1.15
3	SR	-1.7520	26081	0.97	-2.53	0.88	-5.83
4	SR	0.0523	26081	1.11	9.90	1.16	9.90
5	SR	-0.2363	26081	0.99	-2.25	0.99	-1.77
6	SR	-0.2642	26081	1.03	5.68	1.04	5.14
7	SR	0.5292	26081	0.95	-9.90	0.94	-9.90
8	SR	0.6256	26081	1.15	9.90	1.20	9.90
9	SR	0.4707	26081	1.08	9.90	1.09	9.90
10	SR	1.3472	26081	1.04	6.84	1.12	9.90
16	SR	-1.4046	26081	0.95	-5.11	0.92	-4.95
17	SR	0.6946	26081	1.01	1.62	1.01	2.35
18	SR	0.6084	26081	1.04	8.73	1.06	9.55
19	SR	0.2768	26081	1.00	-0.90	1.00	-0.21
20	SR	-1.2974	26081	0.92	-8.09	0.82	-9.90
21	SR	-0.8293	26081	0.90	-9.90	0.81	-9.90
22	SR	-0.4360	26081	0.91	-9.90	0.87	-9.90
23	SR	-0.1654	26081	1.06	9.90	1.07	9.10
24	SR	1.0718	26081	1.10	9.90	1.18	9.90
25	SR	0.1311	26081	1.10	9.90	1.14	9.90
26	SR	0.9972	26081	1.01	1.36	1.03	3.50
27	SR	0.8924	26081	1.02	4.34	1.05	7.31
28	SR	-0.3669	26081	0.85	-9.90	0.81	-9.90
29	SR	0.2001	26081	1.03	6.53	1.03	4.47
30	SR	-1.1832	26081	0.98	-2.50	1.00	0.30
31	SR	1.2973	26081	1.06	9.90	1.15	9.90
32	SR	0.0933	26081	1.08	9.90	1.11	9.90
33	SR	-0.9357	26081	0.86	-9.90	0.75	-9.90
34	SR	1.3083	26081	1.10	9.90	1.16	9.90
35	SR	-1.4795	26081	0.91	-8.38	0.78	-9.90
41	SR	0.5204	26081	1.02	5.45	1.04	5.92
42	SR	-0.4787	26081	1.03	4.19	1.05	5.18
43	SR	0.9944	26081	0.99	-2.38	0.99	-0.93
44	SR	1.0534	26081	1.00	-0.54	1.01	1.03
45	SR	0.1630	26081	0.95	-9.90	0.93	-9.90
46	SR	0.7847	26081	1.03	5.51	1.04	6.21
47	SR	-0.8411	26081	0.85	-9.90	0.78	-9.90
48	SR	-0.1457	26081	0.89	-9.90	0.85	-9.90
49	SR	-0.0184	26081	0.88	-9.90	0.85	-9.90
50	SR	-0.4548	26081	0.96	-6.61	0.95	-5.82

Table 7.46: Item Statistics for the Spring 2011 Operational Test Calibrations for Government

Item Number	Item Type	Rasch Difficulty Estimate	*N*	MS Infit	Standardized Infit	MS Outfit	Standardized Outfit
1	SR	-1.5877	39865	0.90	-9.57	0.67	-9.90
2	SR	-1.6986	39864	0.96	-3.75	0.81	-9.61
3	SR	-0.4726	39864	0.92	-9.90	0.88	-9.90
4	SR	-1.3485	39865	0.98	-2.14	0.95	-3.16
5	SR	-0.2414	39864	1.04	7.80	1.05	5.68
6	SR	-0.8910	39865	1.02	3.31	1.14	9.90
7	SR	-0.0844	39865	0.96	-8.04	0.91	-9.90
8	SR	-1.5519	39865	1.01	0.90	0.96	-2.18
9	SR	-0.6400	39864	0.96	-7.11	0.86	-9.90
10	SR	0.2211	39865	1.09	9.90	1.13	9.90
16	SR	1.8290	39864	1.03	4.38	1.23	9.90
17	SR	0.1056	39864	1.21	9.90	1.35	9.90
18	SR	1.4266	39864	1.12	9.90	1.24	9.90
19	SR	0.7259	39865	1.20	9.90	1.29	9.90
20	SR	1.5677	39864	1.03	6.08	1.07	9.05
21	SR	-0.5444	39865	1.07	9.90	1.16	9.90
22	SR	1.2661	39865	1.04	8.66	1.08	9.90
23	SR	1.4318	39863	1.09	9.90	1.23	9.90
24	SR	0.9751	39864	1.03	6.67	1.05	8.31
25	SR	1.0689	39865	0.95	-9.90	0.95	-8.44
26	SR	1.9820	39864	1.12	9.90	1.28	9.90
27	SR	-0.4279	39864	0.98	-2.76	1.00	-0.24
28	SR	-0.6862	39864	1.03	4.67	1.01	0.84
29	SR	0.4435	39865	0.98	-5.63	0.95	-7.36
30	SR	0.2802	39863	0.92	-9.90	0.87	-9.90
31	SR	1.0432	39864	1.00	0.46	1.02	3.45
32	SR	0.5762	39863	1.18	9.90	1.25	9.90
33	SR	0.2307	39864	0.89	-9.90	0.84	-9.90
34	SR	0.2834	39864	0.87	-9.90	0.82	-9.90
35	SR	0.9053	39865	1.05	9.90	1.08	9.90
41	SR	-0.6760	39865	0.92	-9.90	0.87	-9.90
42	SR	-1.3373	39864	0.88	-9.90	0.70	-9.90
43	SR	-0.4492	39864	0.85	-9.90	0.76	-9.90
44	SR	-1.0970	39864	0.89	-9.90	0.81	-9.90
45	SR	0.0057	39864	0.85	-9.90	0.78	-9.90
46	SR	-1.2222	39865	0.93	-8.46	0.80	-9.90
47	SR	-0.5736	39863	0.91	-9.90	0.83	-9.90
48	SR	-0.0482	39865	1.01	2.30	1.00	-0.52
49	SR	-0.1562	39865	0.93	-9.90	0.87	-9.90
50	SR	-0.6333	39864	0.99	-1.07	1.07	5.58

Table 7.47: Item Statistics for the Spring 2011 Operational Test Calibrations for American History

Item Number	Item Type	Rasch Difficulty Estimate	*N*	MS Infit	Standardized Infit	MS Outfit	Standardized Outfit
1	SR	0.5087	34778	0.93	-9.90	0.92	-9.90
2	SR	-0.6728	34778	1.11	9.90	1.19	9.90
3	SR	-1.1735	34778	0.95	-6.59	0.92	-7.11
4	SR	-0.2114	34778	1.07	9.90	1.08	9.90
5	SR	-0.5455	34778	0.93	-9.90	0.87	-9.90
6	SR	-1.0971	34778	0.89	-9.90	0.80	-9.90
7	SR	-1.7726	34778	0.87	-9.90	0.68	-9.90
8	SR	-0.5102	34778	1.09	9.90	1.15	9.90
9	SR	-1.6401	34778	0.90	-9.90	0.72	-9.90
10	SR	-1.6251	34778	0.93	-6.99	0.82	-9.90
16	SR	0.6945	34778	1.04	9.84	1.05	8.97
17	SR	-0.4298	34778	0.95	-9.90	0.92	-9.90
18	SR	0.3892	34778	0.92	-9.90	0.91	-9.90
19	SR	0.3624	34778	1.06	9.90	1.08	9.90
20	SR	0.7801	34778	1.14	9.90	1.19	9.90
21	SR	-0.1154	34778	1.05	9.90	1.06	9.25
22	SR	0.2672	34778	1.03	7.95	1.04	8.91
23	SR	0.2095	34778	0.90	-9.90	0.88	-9.90
24	SR	1.0127	34778	1.01	3.29	1.04	5.76
25	SR	1.5620	34778	1.09	9.90	1.23	9.90
26	SR	0.8596	34778	1.08	9.90	1.13	9.90
27	SR	2.0184	34778	1.06	6.91	1.23	9.90
28	SR	0.9947	34778	1.10	9.90	1.16	9.90
29	SR	0.1302	34778	1.13	9.90	1.16	9.90
30	SR	0.2133	34778	0.95	-9.90	0.93	-9.90
31	SR	-0.1885	34778	1.11	9.90	1.17	9.90
32	SR	1.4235	34778	1.03	4.49	1.10	9.90
33	SR	0.2010	34778	0.95	-9.90	0.96	-8.70
34	SR	1.8157	34778	1.13	9.90	1.42	9.90
35	SR	0.3684	34778	1.06	9.90	1.07	9.90
41	SR	-0.2198	34778	0.90	-9.90	0.85	-9.90
42	SR	-0.5828	34778	0.89	-9.90	0.84	-9.90
43	SR	0.7498	34778	1.12	9.90	1.16	9.90
44	SR	-0.5862	34778	0.91	-9.90	0.84	-9.90
45	SR	-0.5340	34778	0.89	-9.90	0.83	-9.90
46	SR	-0.4491	34778	0.97	-6.58	0.94	-8.30
47	SR	-0.4608	34778	0.88	-9.90	0.83	-9.90
48	SR	-0.1725	34778	0.92	-9.90	0.89	-9.90
49	SR	0.1008	34778	0.94	-9.90	0.93	-9.90
50	SR	-1.6742	34778	0.95	-4.62	0.86	-9.17

Tables 7.48 to 7.62 provide the raw score to scale score conversions for Summer 2010, Fall 2010, and Spring 2011, respectively.

Table 7.48: Raw Score to Scale Score Conversions for Summer 2010, English I

Raw Score	Scale Score	*CSEM*
0	100	41
1	100	23
2	115	17
3	125	14
4	133	12
5	139	11
6	144	10
7	149	10
8	153	9
9	157	9
10	161	9
11	164	9
12	167	8
13	170	8
14	173	8
15	177	8
16	179	8
17	182	8
18	184	8
19	187	8
20	190	8
21	192	8
22	195	8
23	198	8
24	200	8
25	203	8
26	206	8
27	209	8
28	212	8
29	215	8
30	218	9
31	221	9
32	225	9
33	229	10
34	234	10
35	239	11
36	245	12
37	250	14
38	250	16
39	250	23
40	250	41

Table 7.49: Raw Score to Scale Score Conversions for Summer 2010, Algebra II

Raw Score	Scale Score	*CSEM*
0	100	37
1	118	20
2	132	15
3	141	12
4	148	11
5	153	10
6	157	9
7	161	9
8	164	8
9	168	8
10	171	8
11	173	7
12	176	7
13	178	7
14	182	7
15	183	7
16	185	7
17	188	7
18	190	7
19	192	7
20	194	7
21	196	7
22	200	7
23	201	7
24	203	7
25	205	7
26	208	7
27	210	7
28	213	7
29	215	7
30	218	8
31	221	8
32	225	8
33	228	9
34	231	9
35	236	10
36	241	11
37	248	12
38	250	15
39	250	20
40	250	37

Table 7.50: Raw Score to Scale Score Conversions for Summer 2010, Geometry

Raw Score	Scale Score	*CSEM*
0	100	41
1	103	23
2	119	16
3	129	14
4	137	12
5	142	11
6	147	10
7	152	10
8	156	9
9	159	9
10	163	8
11	166	8
12	169	8
13	171	8
14	174	8
15	177	8
16	179	7
17	182	7
18	184	7
19	187	7
20	189	7
21	192	7
22	194	7
23	196	7
24	200	7
25	201	8
26	204	8
27	207	8
28	209	8
29	212	8
30	215	8
31	219	9
32	225	9
33	226	9
34	230	10
35	235	11
36	241	12
37	248	13
38	250	16
39	250	22
40	250	41

Table 7.51: Raw Score to Scale Score Conversions for Summer 2010, Government

Raw Score	Scale Score	*CSEM*
0	100	35
1	117	19
2	131	14
3	139	12
4	145	10
5	150	9
6	154	9
7	158	8
8	161	8
9	164	7
10	167	7
11	170	7
12	172	7
13	175	7
14	177	7
15	179	6
16	181	6
17	183	6
18	185	6
19	187	6
20	189	6
21	191	6
22	193	6
23	195	6
24	197	6
25	200	6
26	202	7
27	204	7
28	206	7
29	209	7
30	211	7
31	214	7
32	217	8
33	220	8
34	225	9
35	228	9
36	233	10
37	239	12
38	248	14
39	250	19
40	250	35

Table 7.52: Raw Score to Scale Score Conversions for Summer 2010, American History

Raw Score	Scale Score	*CSEM*
0	100	49
1	100	27
2	105	19
3	117	16
4	125	14
5	132	13
6	138	12
7	143	11
8	148	11
9	152	10
10	156	10
11	160	10
12	163	10
13	166	9
14	170	9
15	173	9
16	176	9
17	179	9
18	182	9
19	185	9
20	187	9
21	190	9
22	193	9
23	196	9
24	200	9
25	202	9
26	205	9
27	209	9
28	212	10
29	216	10
30	219	10
31	225	10
32	227	11
33	232	11
34	237	12
35	243	13
36	250	14
37	250	16
38	250	20
39	250	27
40	250	49

Table 7.53: Raw Score to Scale Score Conversions for Fall 2010, English I

Raw Score	Scale Score	*CSEM*
0	100	41
1	100	23
2	115	17
3	126	14
4	133	12
5	139	11
6	144	10
7	149	10
8	153	9
9	157	9
10	160	9
11	163	8
12	166	8
13	169	8
14	172	8
15	177	8
16	178	8
17	180	8
18	183	7
19	185	7
20	188	7
21	190	7
22	193	7
23	195	7
24	198	8
25	200	8
26	203	8
27	206	8
28	208	8
29	211	8
30	214	8
31	218	9
32	221	9
33	225	10
34	230	10
35	234	11
36	240	12
37	248	14
38	250	16
39	250	23
40	250	41

Table 7.54: Raw Score to Scale Score Conversions for Fall 2010, Algebra II

Raw Score	Scale Score	*CSEM*
0	100	37
1	112	21
2	127	15
3	136	12
4	142	11
5	148	10
6	153	9
7	157	9
8	160	8
9	164	8
10	167	8
11	170	8
12	173	7
13	175	7
14	178	7
15	182	7
16	183	7
17	185	7
18	187	7
19	190	7
20	192	7
21	194	7
22	197	7
23	200	7
24	201	7
25	204	7
26	206	7
27	209	7
28	211	7
29	214	7
30	217	8
31	220	8
32	225	8
33	227	9
34	231	9
35	235	10
36	240	11
37	247	12
38	250	15
39	250	20
40	250	37

Table 7.55: Raw Score to Scale Score Conversions for Fall 2010, Geometry

Raw Score	Scale Score	*CSEM*
0	100	41
1	100	23
2	115	16
3	125	14
4	133	12
5	139	11
6	144	10
7	149	10
8	153	9
9	157	9
10	161	9
11	164	9
12	167	8
13	170	8
14	173	8
15	176	8
16	179	8
17	182	8
18	185	8
19	187	8
20	190	8
21	193	8
22	195	8
23	200	8
24	201	8
25	204	8
26	206	8
27	209	8
28	212	8
29	215	8
30	219	9
31	225	9
32	226	9
33	230	10
34	234	10
35	240	11
36	246	12
37	250	14
38	250	16
39	250	23
40	250	41

Table 7.56: Raw Score to Scale Score Conversions for Fall 2010, Government

Raw Score	Scale Score	*CSEM*
0	100	35
1	113	20
2	127	14
3	136	12
4	142	10
5	147	10
6	152	9
7	155	8
8	159	8
9	162	8
10	165	7
11	168	7
12	171	7
13	173	7
14	176	7
15	179	7
16	180	7
17	183	7
18	185	7
19	187	7
20	189	7
21	192	7
22	194	7
23	196	7
24	200	7
25	201	7
26	203	7
27	206	7
28	208	7
29	211	7
30	214	7
31	217	8
32	220	8
33	225	8
34	227	9
35	231	9
36	237	10
37	243	12
38	250	14
39	250	20
40	250	35

Table 7.57: Raw Score to Scale Score Conversions for Fall 2010, American History

Raw Score	Scale Score	*CSEM*
0	100	27
1	100	20
2	109	17
3	118	15
4	125	13
5	131	12
6	137	12
7	142	11
8	146	11
9	151	10
10	155	10
11	159	10
12	162	10
13	166	10
14	169	10
15	173	9
16	176	9
17	179	9
18	182	9
19	186	9
20	189	9
21	192	9
22	195	9
23	200	9
24	202	9
25	205	10
26	208	10
27	212	10
28	216	10
29	220	10
30	225	11
31	228	11
32	233	12
33	238	12
34	244	13
35	250	14
36	250	16
37	250	20
38	250	27
39	250	49
40	100	27

Table 7.58: Raw Score to Scale Score Conversions for Spring 2011, English I

Raw Score	Scale Score	*CSEM*
0	100	41
1	100	23
2	116	16
3	126	14
4	133	12
5	139	11
6	144	10
7	149	10
8	153	9
9	156	9
10	160	9
11	163	8
12	166	8
13	169	8
14	172	8
15	174	8
16	177	8
17	180	8
18	182	8
19	185	8
20	187	7
21	190	8
22	192	8
23	195	8
24	198	8
25	200	8
26	203	8
27	206	8
28	209	8
29	212	8
30	215	9
31	218	9
32	225	9
33	226	10
34	230	10
35	235	11
36	241	12
37	249	14
38	250	16
39	250	23
40	250	41

Table 7.59: Raw Score to Scale Score Conversions for Spring 2011, Algebra II

Raw Score	Scale Score	*CSEM*
0	100	37
1	111	21
2	126	15
3	135	12
4	142	11
5	148	10
6	152	9
7	156	9
8	160	8
9	163	8
10	167	8
11	169	8
12	172	7
13	175	7
14	178	7
15	182	7
16	183	7
17	185	7
18	187	7
19	190	7
20	192	7
21	194	7
22	197	7
23	200	7
24	201	7
25	204	7
26	206	7
27	209	7
28	211	7
29	214	7
30	217	8
31	220	8
32	225	8
33	227	9
34	231	9
35	235	10
36	241	11
37	247	12
38	250	15
39	250	20
40	250	37

Table 7.60: Raw Score to Scale Score Conversions for Spring 2011, Geometry

Raw Score	Scale Score	*CSEM*
0	100	41
1	101	23
2	117	16
3	127	14
4	135	12
5	141	11
6	146	10
7	150	10
8	155	9
9	158	9
10	162	9
11	165	8
12	168	8
13	171	8
14	174	8
15	177	8
16	180	8
17	182	8
18	185	8
19	187	8
20	190	8
21	192	8
22	195	8
23	198	8
24	200	8
25	203	8
26	206	8
27	208	8
28	211	8
29	214	8
30	218	8
31	221	9
32	225	9
33	228	10
34	233	10
35	238	11
36	244	12
37	250	14
38	250	16
39	250	23
40	250	41

Table 7.61: Raw Score to Scale Score Conversions for Spring 2011, Government

Raw Score	Scale Score	*CSEM*
0	100	35
1	113	20
2	127	14
3	136	12
4	142	10
5	147	9
6	151	9
7	155	8
8	159	8
9	162	8
10	165	7
11	168	7
12	170	7
13	173	7
14	175	7
15	179	7
16	180	7
17	182	7
18	185	7
19	187	7
20	189	7
21	191	7
22	194	7
23	196	7
24	200	7
25	201	7
26	203	7
27	206	7
28	208	7
29	211	7
30	214	7
31	217	8
32	220	8
33	225	8
34	228	9
35	232	10
36	237	10
37	244	12
38	250	14
39	250	20
40	250	35

Table 7.62: Raw Score to Scale Score Conversions for Spring 2011, American History

Raw Score	Scale Score	*CSEM*
0	100	49
1	100	27
2	100	20
3	112	16
4	120	14
5	128	13
6	134	12
7	139	12
8	144	11
9	148	11
10	152	10
11	156	10
12	160	10
13	163	10
14	166	9
15	170	9
16	173	9
17	176	9
18	179	9
19	182	9
20	185	9
21	188	9
22	191	9
23	194	9
24	200	9
25	201	9
26	204	9
27	207	10
28	211	10
29	214	10
30	218	10
31	225	11
32	227	11
33	231	12
34	237	12
35	243	13
36	250	14
37	250	16
38	250	20
39	250	27
40	250	49

CHAPTER 8: REPORTING

8.1 Introduction

The purpose of reporting assessment data is to communicate test results to students, their parents, their teachers, administrators, and other stakeholders. The Missouri End-of-Course (MO EOC) Assessment reports provide useful information for determining the performance of students in a particular district, school or classroom. These reports help describe students' knowledge of a given set of expectations, allowing educators to determine specific instructional needs, measure student mastery toward post-secondary readiness, provide evidence of accountability for Missouri and national programs, and evaluate educational programs. Additionally, districts may use locally designed assessments aligned to the Show-Me Standards and Course-Level Expectations (CLEs) to provide more detailed information for each student in specific test areas.

Paper reports are generated for all assessment windows following the Spring administration; therefore, for the Summer 2010, Fall 2010 and Spring 2011 assessments, the paper reports were generated and distributed following the Spring 2011 operational administration. However, teachers may access their students' raw scores for selected response items through an online interface shortly after the district's testing materials have been received for processing in each assessment window.

For each testing event, Riverside Publishing converts each student's raw score points earned into an EOC scale score, as described in Chapter 7: Scaling and Equating. A student receives an EOC scale score when he or she has made a valid attempt for the session. EOC scale scores range in value from 100 to 250. The EOC scale score determines the student's achievement level. For all content areas, a scale score of 200 to 224 is considered Proficient, and a scale score of 225 and above is considered Advanced. Each achievement level represents standards of performance for each assessed content area (English I, Algebra II, Geometry, Government, and American History). Achievement-level scores describe what students can do in terms of the content and skills assessed. These scores provide a way to compare test results with standards of academic performance. Panels drawn from Missouri's educational, business, and professional communities recommended the raw score cuts (based on the Spring 2010 test forms) to be used for each achievement level. These cuts were then reviewed and adopted by the Missouri State Board of Education. For more information on how the achievement levels were set, refer to Chapter 3: Achievement-Level Setting.

No test provides a perfect measure of a student's ability. This situation is expected because all tests have a known standard error of measurement (*SEM*). The *SEM* represents the amount of variability that can be expected in a student's test score because of the inherent imprecision of the test. For example, if the student were tested again, he or she would likely obtain a slightly different score. The range for this new score is provided as a standard error (*SE*) and gives an indication of the margin of error for the reported scale score.

8.2 Individual Student Report

The 2010-2011 Individual Student Report provides information about performance on the EOC Assessment, describing the results in terms of four levels of achievement in a content area. It is used for measuring and reflecting an individual student's mastery toward post-secondary readiness for the content area. It is also used in instructional planning as a point of reference during a parent-teacher conference and for permanent record keeping. Teachers are informed that other sources of information should be used along with this report when determining the student's areas of strength or need.

On the report, achievement-level scores describe what students can do in terms of the CLEs for the content and skills assessed by the EOC Assessment. A student at the Proficient or Advanced level has met the standard.

A sample of the 2010-2011 Individual Student Report appears in Figure 8.1. A brief description of selected parts of the report is as follows:

A. The heading of the Individual Student Report includes the content area for the results being presented. A separate report is produced for each content area tested.

B. The Student Information section contains the biographic data for the individual student taking the assessment. Identifying information, including the MOSIS ID, gender, building, and district, is listed, followed by the test period.

C. The individual student's results are presented numerically as a three-digit scale score with the *SE*. An accompanying bar graph to the right of the scale score illustrates the achievement level obtained by the student. Achievement levels (whether Advanced, Proficient, Basic, or Below Basic) are based on the scale score ranges listed beneath the Achievement Level heading in the table.

D. The mean scale scores for the student's building and district are displayed in the two rows below the student's individual results. The mean scale score, with an associated *SE*, and the bar graph provide a way to view the individual's results in contrast to the group's results for the content area during the same test period.

E. The narrative describes the student performance characteristics corresponding to the obtained level of achievement. The text is specific to the content area tested. At the bottom of the narrative is a URL for a website that provides additional information for all of the achievement levels for the content area.

Figure 8.1: Individual Student Report

Missouri End-of-Course Assessment

A *Individual Student Report*

English I

Student: Jane Doe
MOSIS ID: 999999999
Gender: F
Group: English 102
Building: Washington HS
Building Code: 1050
District: Jefferson
District Code: 999999
Test Period: Spring 2010

B

C Student/ Building/ District	Scale Score (SE ±)	Achievement Level			
		Below Basic	Basic	Proficient	Advanced
		(100–179)	(180–199)	(200–224)	(225–250)
Jane Doe	210 (SE ± 7)				
Washington HS	181 (SE ± 5)				D
Jefferson	181 (SE ± 3)				

The average scale score is represented by a bar graph. The standard errors (SE) represented on this report should be taken into account when interpreting test scores.

Jane's achievement level on the English II End-of-Course Assessment: Proficient E

The student's score on the test provides an estimate of what the student knows and is able to do in the subject tested. If the student were to take this test again, the student would be likely to score in the range of 203 to 217.

Students performing at the Proficient level on the Missouri English II End-of-Course Assessment demonstrate an understanding of the skills and processes identified in the Course Level Expectations for English II. They demonstrate these skills in reading processes, in responding to both fiction and nonfiction texts, and in writing effectively. In addition to understanding and applying the skills at the Basic level, students scoring at the Proficient level use a range of strategies to comprehend and interpret a variety of texts, demonstrate an understanding of literary forms, and apply strategies for accessing and summarizing information. They follow a writing process to compose well-developed and organized papers for a variety of audiences and purposes, while correctly applying the rules and conventions of Standard English.

For more information about achievement levels, please visit the following website:
http://www.dese.mo.gov/divimprove/assess/eoc/documents/EOCEnglishIIALD.pdf

Order No. 6231368

8.3 Student Score Label

The 2010-2011 Student Score Label provides a summary of a student's results on the EOC Assessment. A separate label is produced for each content area tested. The individual label provides the student's biographic data, raw score, scale score, and achievement level. The labels have adhesive backing so they can be easily transferred onto the student record folders.

A sample label is shown below in Figure 8.2. A brief description of selected parts of the label is as follows:

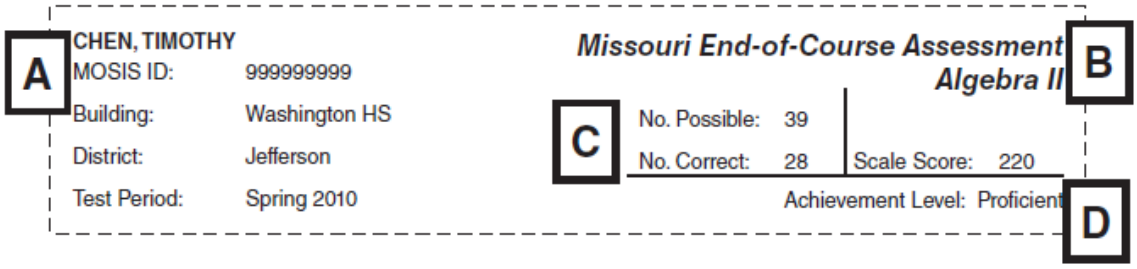
A. The student's name and identifying information are provided on the left side of the label.

B. The upper right side of the label shows the content area tested. If a student has results for more than one content area, the next label is printed below the first one.

C. The middle of the label has the Number Possible and the student's raw score (Number Correct). A corresponding column to the right of these data contains the raw score's associated Scale Score.

D. The student's achievement level is displayed in the lower right corner below the scores.

Figure 8.2: Student Score Label



8.4 Online Crystal Reports

Schools and districts are able to access summary level reports through an online reporting tool for the 2010-2011 school year. This tool allows district and school administrators to create on-the-fly reports containing information relevant to their data needs. There are several reporting options available through the online reporting tool, including administrative reports, adequate yearly progress (AYP) reports, achievement level reports, content standard reports, and item analysis reports.

For each subreport, a user selects various filters such as year, grade/content area, and level of reporting (state, district, or school) to create the desired report. For the Content Standard Reports, the user may also disaggregate results by various subgroups (e.g., race, disability).

8.4.1 Administrative Reports

These reports provide student-level test data. Based on only the MO EOC Assessment results, four reports are generated: MO EOC Scale Score Summary, MO EOC Student Demographic, Student Achievement Level, and Student Report.

MO EOC Scale Score Summary: This report lists each student in the school or district along with his or her MOSIS ID, testing year, content area, grade level, MO EOC scale score, and achievement level.

MO EOC Student Demographic: This report lists all students in the school or district along with their date of birth (DOB), content area, MOSIS ID, district ID, and relevant demographic information, including 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 proficient (LEP), the student's race, if the student qualifies for free and reduced lunch (SES), if the student has an Individualized Education Program (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 United States, the student's disability diagnosis, and if the student is Title 1.

Student Achievement Level: This report lists all students in a school or district along with the year of testing, content area, grade-level, achievement level, and MOSIS ID.

Student Report: For each school or district, this report contains the following information: student name, DOB, district student number, MOSIS ID, content area testing, grade level, achievement level, and scale score for each content area tested.

8.4.2 Achievement Level 4

These reports contain summary information on school or district performance in terms of the four MO EOC achievement levels. There are two types of achievement level reports: Achievement Level 4 Charts and Achievement Level 4 Report.

Achievement Level 4 Chart: This report charts the percentage of students classified as Proficient or Advanced on each MO EOC Assessment. State-level, district-level, and/or school-level performance may be displayed on the chart.

Achievement Level 4 Report: This report summarizes the number and percentage of students in each achievement level. This report is comprised of 10 columns: Total, content area, grade, year, number of accountable (ACC) students, number of reportable (REP) students, number and percentage of students classified in the Basic (B) achievement level, number and percentage of students classified in the Proficient (P) achievement level, number and percentage of students classified in the Advanced (A) achievement level, and mean MO EOC scale score. The first column, Total, shows if aggregate or disaggregated information is being shown. A key to the abbreviations is found in the bottom left corner.

8.4.3 Content Standard

The content standard reports summarize information about the content standards.

Content Standards Report: 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 are aggregated or disaggregated.

Content Standards Detail: This report shows the percentage of points each student achieved on each content standard within a particular content area.

8.4.4 Item Analysis Expanded

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

Content Standard IBD EX: The Content Standard Benchmark Descriptor (IBD) Extended (EX) report contains item-level detail aggregated by content standard. The report is comprised of 11 columns: school code (SC), grade level (GR), standard number and description (desc.), code for the CLE, description of the CLE, 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, the average points (avg pts) earned by students in the district on that item, and percentage of points earned by students in the district on that item.

CHAPTER 9: SUMMARY STATISTICS

9.1 Introduction

This chapter provides descriptive statistics for the number correct raw score and for scale scores for each of the five Phase II Missouri End-of-Course (MO EOC) Assessments from the Summer 2010, Fall 2010 and Spring 2011 administrations. Statistics include *N* counts, means, standard deviations (*SD*), minimum and maximum values, and a variety of data disaggregations.

9.2 Descriptive Statistics for Total Raw Score

Descriptive statistics for total raw score are summarized in Table 9.1 by test administration and content area.

Table 9.1: Descriptive Statistics for Total Raw Score

Test Period	Subject	*N*	Minimum	Maximum	Mean	*SD*
Summer 2010	Algebra II	113	6	35	15.88	5.305
	American History	46	6	33	17.83	7.364
	English I	196	6	37	21.52	6.733
	Geometry	229	4	37	18.33	5.534
	Government	881	2	40	23.38	8.734
Fall 2010	Algebra II	511	6	39	24.32	6.830
	American History	652	7	38	23.06	6.387
	English I	327	1	38	25.78	8.146
	Geometry	878	5	39	24.01	7.190
	Government	17,589	1	40	24.04	6.768
Spring 2011	Algebra II	22,506	1	40	23.29	6.382
	American History	34,778	1	39	23.13	6.260
	English I	42,171	2	40	25.19	6.957
	Geometry	26,088	3	40	23.28	6.497
	Government	39,907	1	40	25.24	6.936

9.3 Descriptive Statistics for Total Raw Score by Cluster

Table 9.2 summarizes the number correct raw score by test administration, content area, and cluster.

Table 9.2: Descriptive Statistics for Total Raw Score by Test Administration, Content Area, and Cluster

Test Period	Subject		*N*	Minimum	Maximum	Mean	*SD*
Summer 2010	English I	Reading	196	6	37	21.52	6.733
	Algebra II	Algebraic Relationships	113	0	8	3.19	1.750
		Data and Probability	113	1	20	9.42	3.469
		Numbers and Operations	113	0	7	3.27	1.325
	Geometry	Algebraic Relationships	229	0	8	4.08	1.471
		Geometric and Spatial Relationships	229	2	21	10.04	3.540
		Measurement	229	0	10	4.20	1.953
	Government	Principles and Processes of Governance Systems	881	0	20	11.40	4.754
		Principles of Constitutional Democracy	881	1	20	11.98	4.392
	Am. History	Missouri, United States, and World History	46	6	33	17.83	7.364
Fall 2010	English I	Reading	327	1	38	25.78	8.146
	Algebra II	Algebraic Relationships	511	0	8	4.79	1.762
		Data and Probability	511	5	24	14.46	4.186
		Numbers and Operations	511	0	8	5.06	1.843
	Geometry	Algebraic Relationships	878	0	9	5.46	2.174
		Geometric and Spatial Relationships	878	2	22	13.14	4.009
		Measurement	878	0	9	5.41	1.892
	Government	Principles and Processes of Governance Systems	17,589	0	20	12.66	3.671
		Principles of Constitutional Democracy	17,589	1	20	11.37	3.636
	Am. History	Missouri, United States, and World History	652	7	38	23.06	6.387

Table 9.2: Descriptive Statistics for Total Raw Score by Test Administration, Content Area, and Cluster (continued)

Test Period	Subject		*N*	Minimum	Maximum	Mean	*SD*
Spring 2011	English I	Reading	42,171	2	40	25.19	6.957
	Algebra II	Algebraic Relationships	22,506	0	8	4.35	1.721
		Data and Probability	22,506	1	24	13.72	4.059
		Numbers and Operations	22,506	0	8	5.22	1.611
	Geometry	Algebraic Relationships	26,088	0	9	5.09	1.919
		Geometric and Spatial Relationships	26,088	1	22	12.90	3.902
		Measurement	26,088	0	9	5.292	1.751
	Government	Principles and Processes of Governance Systems	39,907	0	20	13.22	3.502
		Principles of Constitutional Democracy	39,907	0	20	12.01	3.916
	Am. History	Missouri, United States, and World History	34,778	1	39	23.13	6.260

9.4 Descriptive Statistics for Scale Scores by Test Period and Subject

Descriptive statistics of scale scores and percentage distributions of students' achievement levels are summarized in Tables 9.3 and 9.4. Table 9.3 summarizes student scale scores by each Phase II EOC Assessment for the Summer 2010, Fall 2010 and Spring 2011 administrations. Table 9.4 lists the percentage and frequency of students in each achievement level.

Table 9.3: Scale Score Distributions for Each End-of-Course Assessment

Descriptive Statistics						
Test Period	**Subject**	***N***	**Minimum**	**Maximum**	**Mean**	***SD***
Summer 2010	Algebra II	113	157	236	184.86	12.881
	American History	46	138	232	180.65	23.747
	English I	196	144	250	194.15	19.763
	Geometry	229	137	248	184.97	14.790
	Government	881	131	250	198.60	22.561
Fall 2010	Algebra II	511	153	250	203.54	17.993
	American History	652	137	250	196.38	22.405
	English I	327	100	250	204.44	24.879
	Geometry	878	139	250	202.34	22.264
	Government	17,589	113	250	200.02	17.741
Spring 2011	Algebra II	22,506	111	250	200.81	17.036
	American History	34,778	100	250	195.89	21.327
	English I	42,171	116	250	202.63	20.870
	Geometry	26,088	127	250	199.27	18.857
	Government	39,907	113	250	203.30	18.925

Scale scores range from a minimum of 100 to a maximum of 250 for the five Phase II content areas administered in Summer 2010, Fall 2010 and Spring 2011. For English I, a minimum scale score of 177 is required to earn an achievement level of Basic. For Government, a minimum scale score of 179 is required to earn an achievement level of Basic. For Algebra II, Geometry, and American History, a minimum scale score of 182 is required to earn an achievement level of Basic. For all content areas, a scale score of 200 represents the minimum score to earn an achievement level of Proficient, and a scale score of 225 represents the minimum score to earn an achievement level of Advanced.

Table 9.4: Achievement-Level Distributions for Each End-of-Course Assessment

Summer 2010				Fall 2010				Spring 2011			
Subject	**Achievement**	**Frequency**	**Percentage**	**Subject**	**Achievement**	**Frequency**	**Percentage**	**Subject**	**Achievement**	**Frequency**	**Percentage**
Algebra II	Below Basic	39	34.5	Algebra II	Below Basic	46	9.0	Algebra II	Below Basic	1,905	8.5
	Basic	62	54.9		Basic	155	30.3		Basic	8,606	38.2
	Proficient	10	8.8		Proficient	226	44.2		Proficient	9,391	41.7
	Advanced	2	1.8		Advanced	84	16.4		Advanced	2,604	11.6
	Total	113	100.0		Total	511	100.0		Total	22,506	100.0
American History	Below Basic	26	56.5	American History	Below Basic	170	26.1	American History	Below Basic	8,458	24.3
	Basic	8	17.4		Basic	165	25.3		Basic	8,842	25.4
	Proficient	10	21.7		Proficient	231	35.4		Proficient	13,182	37.9
	Advanced	2	4.3		Advanced	86	13.2		Advanced	4,296	12.4
	Total	46	100.0		Total	652	100.0		Total	34,778	100.0
English I	Below Basic	37	18.9	English I	Below Basic	40	12.2	English I	Below Basic	4,564	10.8
	Basic	81	41.3		Basic	87	26.6		Basic	13,035	30.9
	Proficient	64	32.7		Proficient	116	35.5		Proficient	16,204	38.4
	Advanced	14	7.1		Advanced	84	25.7		Advanced	8,368	19.8
	Total	196	100.0		Total	327	100.0		Total	42,171	100.0
Geometry	Below Basic	96	41.9	Geometry	Below Basic	143	16.3	Geometry	Below Basic	4,248	16.3
	Basic	95	41.5		Basic	227	25.9		Basic	8,783	33.7
	Proficient	34	14.8		Proficient	321	36.6		Proficient	10,291	39.4
	Advanced	4	1.7		Advanced	187	21.3		Advanced	2,766	10.6
	Total	229	100.0		Total	878	100.0		Total	26,088	100.0
Government	Below Basic	177	20.1	Government	Below Basic	1,591	9.0	Government	Below Basic	2,998	7.5
	Basic	304	34.5		Basic	6,540	37.2		Basic	12,622	31.6
	Proficient	246	27.9		Proficient	7,411	42.1		Proficient	17,626	44.2
	Advanced	154	17.5		Advanced	2,047	11.6		Advanced	6,661	16.7
	Total	881	100.0		Total	17,589	100.0		Total	39,907	100.0

9.5 Descriptive Statistics by Demographic Group

Descriptive statistics of scale scores and percentage distributions of students' achievement levels by demographic groups are summarized in Tables 9.5 through 9.20.

The demographic variables included are gender (Tables 9.5 and 9.13), ethnicity (Tables 9.6 and 9.14), migrant status (Tables 9.7 and 9.15), free and reduced lunch (FRL) (Tables 9.8 and 9.16), limited English proficient (LEP) (Tables 9.9 and 9.17), Title I (Tables 9.10 and 9.18), Individualized Education Program (IEP) (Tables 9.11 and 9.19), and accommodations (Tables 9.12 and 9.20).

Table 9.5: Scale Score Distributions by Demographic Group—Gender

Test Period	Subject	Gender	*N*	Minimum	Maximum	Mean	*SD*
Summer 2010	Algebra II	Female	45	164	236	185.87	13.302
		Male	68	157	231	184.19	12.651
	American History	Female	N/A	N/A	N/A	N/A	N/A
		Male	N/A	N/A	N/A	N/A	N/A
	English I	Female	83	149	250	196.00	20.624
		Male	113	144	239	192.80	19.084
	Geometry	Female	115	147	226	183.31	13.475
		Male	114	137	248	186.63	15.894
	Government	Female	421	139	250	198.94	21.850
		Male	445	131	250	199.07	23.056
Fall 2010	Algebra II	Female	262	164	250	201.79	17.809
		Male	249	153	250	205.38	18.037
	American History	Female	312	142	250	192.76	21.805
		Male	339	137	250	199.81	22.422
	English I	Female	129	133	250	207.61	22.547
		Male	195	100	250	203.17	25.257
	Geometry	Female	471	139	250	201.15	22.512
		Male	404	153	250	203.98	21.685
	Government	Female	8,784	136	250	198.58	17.082
		Male	8,751	113	250	201.53	18.267
Spring 2011	Algebra II	Female	12,134	142	250	199.40	16.246
		Male	10,353	111	250	202.49	17.775
	American History	Female	17,515	112	250	193.72	20.711
		Male	17,233	100	250	198.11	21.711
	English I	Female	20,987	133	250	205.13	20.607
		Male	21,137	116	250	200.16	20.828
	Geometry	Female	13,349	127	250	197.54	18.365
		Male	12,716	127	250	201.10	19.191
	Government	Female	19,747	113	250	202.17	18.070
		Male	20,074	113	250	204.48	19.649

Table 9.6: Scale Score Distributions by Demographic Group—Ethnicity

Test Period	Subject	Ethnicity	*N*	Minimum	Maximum	Mean	*SD*
Summer 2010	Algebra II	American Indian/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
		Asian	N/A	N/A	N/A	N/A	N/A
		Pacific Islander	N/A	N/A	N/A	N/A	N/A
		Black (not Hispanic)	66	161	201	182.32	8.693
		Hispanic	N/A	N/A	N/A	N/A	N/A
		White (not Hispanic)	36	157	236	187.25	17.575
		Multi-racial	N/A	N/A	N/A	N/A	N/A
	American History	American Indian/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
		Asian	N/A	N/A	N/A	N/A	N/A
		Pacific Islander	N/A	N/A	N/A	N/A	N/A
		Black (not Hispanic)	N/A	N/A	N/A	N/A	N/A
		Hispanic	N/A	N/A	N/A	N/A	N/A
		White (not Hispanic)	N/A	N/A	N/A	N/A	N/A
		Multi-racial	N/A	N/A	N/A	N/A	N/A
	English I	American Indian/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
		Asian	N/A	N/A	N/A	N/A	N/A
		Pacific Islander	N/A	N/A	N/A	N/A	N/A
		Black (not Hispanic)	104	144	245	191.86	18.619
		Hispanic	N/A	N/A	N/A	N/A	N/A
		White (not Hispanic)	83	149	250	196.78	21.507
		Multi-racial	N/A	N/A	N/A	N/A	N/A
	Geometry	American Indian/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
		Asian	N/A	N/A	N/A	N/A	N/A
		Pacific Islander	N/A	N/A	N/A	N/A	N/A
		Black (not Hispanic)	131	137	219	181.12	11.870
		Hispanic	N/A	N/A	N/A	N/A	N/A
		White (not Hispanic)	76	159	248	189.71	17.675
		Multi-racial	N/A	N/A	N/A	N/A	N/A
	Government	American Indian/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
		Asian	30	161	250	209.30	26.560
		Pacific Islander	N/A	N/A	N/A	N/A	N/A
		Black (not Hispanic)	261	131	250	188.43	18.153
		Hispanic	31	161	250	203.26	24.398
		White (not Hispanic)	493	158	250	205.10	21.796
		Multi-racial	N/A	N/A	N/A	N/A	N/A

Table 9.6: Scale Score Distributions by Demographic Group—Ethnicity (continued)

Test Period	Subject	Ethnicity	*N*	Minimum	Maximum	Mean	*SD*
Fall 2010	Algebra II	American Indian/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
		Asian	N/A	N/A	N/A	N/A	N/A
		Pacific Islander	N/A	N/A	N/A	N/A	N/A
		Black (not Hispanic)	61	164	231	190.98	16.045
		Hispanic	N/A	N/A	N/A	N/A	N/A
		White (not Hispanic)	397	153	250	206.00	17.545
		Multi-racial	N/A	N/A	N/A	N/A	N/A
	American History	American Indian/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
		Asian	N/A	N/A	N/A	N/A	N/A
		Pacific Islander	N/A	N/A	N/A	N/A	N/A
		Black (not Hispanic)	93	142	238	184.45	20.893
		Hispanic	N/A	N/A	N/A	N/A	N/A
		White (not Hispanic)	499	137	250	198.32	21.872
		Multi-racial	N/A	N/A	N/A	N/A	N/A
	English I	American Indian/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
		Asian	N/A	N/A	N/A	N/A	N/A
		Pacific Islander	N/A	N/A	N/A	N/A	N/A
		Black (not Hispanic)	49	144	248	188.27	23.315
		Hispanic	N/A	N/A	N/A	N/A	N/A
		White (not Hispanic)	249	100	250	207.77	23.357
		Multi-racial	N/A	N/A	N/A	N/A	N/A
	Geometry	American Indian/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
		Asian	N/A	N/A	N/A	N/A	N/A
		Pacific Islander	N/A	N/A	N/A	N/A	N/A
		Black (not Hispanic)	132	139	240	187.14	21.109
		Hispanic	62	161	250	198.31	18.219
		White (not Hispanic)	641	153	250	205.70	21.343
		Multi-racial	N/A	N/A	N/A	N/A	N/A
	Government	American Indian/ Alaskan Native	94	168	250	201.21	16.684
		Asian	431	162	250	204.48	19.953
		Pacific Islander	N/A	N/A	N/A	N/A	N/A
		Black (not Hispanic)	3085	113	250	189.24	15.855
		Hispanic	658	142	250	195.44	17.050
		White (not Hispanic)	13,071	142	250	202.70	17.099
		Multi-racial	155	155	250	200.83	17.111

Table 9.6: Scale Score Distributions by Demographic Group—Ethnicity (continued)

Test Period	Subject	Ethnicity	*N*	Minimum	Maximum	Mean	*SD*
Spring 2011	Algebra II	American Indian/ Alaskan Native	105	163	247	198.24	16.127
		Asian	329	163	250	205.05	18.513
		Pacific Islander	N/A	N/A	N/A	N/A	N/A
		Black (not Hispanic)	2207	111	250	189.65	15.347
		Hispanic	873	152	250	196.54	16.100
		White (not Hispanic)	18,806	142	250	202.25	16.710
		Multi-racial	142	167	250	203.70	17.587
	American History	American Indian/ Alaskan Native	188	120	250	191.60	22.131
		Asian	473	134	250	197.91	24.177
		Pacific Islander	41	144	231	192.22	22.459
		Black (not Hispanic)	4,130	120	250	185.60	20.737
		Hispanic	1,331	100	250	189.91	21.761
		White (not Hispanic)	28,061	100	250	197.67	20.841
		Multi-racial	520	139	250	197.47	21.468
	English I	American Indian/ Alaskan Native	230	153	241	198.47	19.023
		Asian	551	144	250	204.81	19.966
		Pacific Islander	46	139	235	195.83	22.023
		Black (not Hispanic)	4,773	126	250	192.22	20.172
		Hispanic	1,558	139	250	197.69	19.693
		White (not Hispanic)	34,323	116	250	204.30	20.568
		Multi-racial	639	144	250	203.33	21.329
	Geometry	American Indian/ Alaskan Native	148	155	238	197.30	16.441
		Asian	392	150	250	205.95	21.523
		Pacific Islander	35	158	228	189.00	16.017
		Black (not Hispanic)	3,045	127	250	186.31	17.589
		Hispanic	1,021	141	250	192.42	18.251
		White (not Hispanic)	21,178	141	250	201.37	18.183
		Multi-racial	243	141	250	200.39	17.805
	Government	American Indian/ Alaskan Native	183	159	250	199.42	17.105
		Asian	587	159	250	208.06	20.504
		Pacific Islander	32	168	250	200.19	18.276
		Black (not Hispanic)	5,456	127	250	191.15	16.208
		Hispanic	1,342	147	250	199.21	17.962
		White (not Hispanic)	31,687	113	250	205.57	18.534
		Multi-racial	430	162	250	202.53	17.440

Table 9.7: Scale Score Distributions by Demographic Group—Migrant Status

Test Period	Subject	Migrant	*N*	Minimum	Maximum	Mean	*SD*
Summer 2010	Algebra II	No	113	157	236	184.86	12.881
		Yes	N/A	N/A	N/A	N/A	N/A
	American History	No	46	138	232	180.65	23.747
		Yes	N/A	N/A	N/A	N/A	N/A
	English I	No	196	144	250	194.15	19.763
		Yes	N/A	N/A	N/A	N/A	N/A
	Geometry	No	229	137	248	184.97	14.790
		Yes	N/A	N/A	N/A	N/A	N/A
	Government	No	879	131	250	198.66	22.552
		Yes	N/A	N/A	N/A	N/A	N/A
Fall 2010	Algebra II	No	511	153	250	203.54	17.993
		Yes	N/A	N/A	N/A	N/A	N/A
	American History	No	652	137	250	196.38	22.405
		Yes	N/A	N/A	N/A	N/A	N/A
	English I	No	327	100	250	204.44	24.879
		Yes	N/A	N/A	N/A	N/A	N/A
	Geometry	No	878	139	250	202.34	22.264
		Yes	N/A	N/A	N/A	N/A	N/A
	Government	No	17,578	113	250	200.03	17.740
		Yes	N/A	N/A	N/A	N/A	N/A
Spring 2011	Algebra II	No	17,578	113	250	200.03	17.740
		Yes	N/A	N/A	N/A	N/A	N/A
	American History	No	22,493	111	250	200.82	17.037
		Yes	N/A	N/A	N/A	N/A	N/A
	English I	No	34,752	100	250	195.90	21.324
		Yes	N/A	N/A	N/A	N/A	N/A
	Geometry	No	42,150	116	250	202.64	20.866
		Yes	N/A	N/A	N/A	N/A	N/A
	Government	No	26,074	127	250	199.28	18.855
		Yes	N/A	N/A	N/A	N/A	N/A

Table 9.8: Scale Score Distributions by Demographic Group—Free and Reduced Lunch

Test Period	Subject	FRL	*N*	Minimum	Maximum	Mean	*SD*
Summer 2010	Algebra II	No	72	157	236	185.43	13.785
		Yes	41	161	215	183.85	11.211
	American History	No	N/A	N/A	N/A	N/A	N/A
		Yes	N/A	N/A	N/A	N/A	N/A
	English I	No	94	149	250	197.29	20.217
		Yes	102	144	239	191.26	18.977
	Geometry	No	121	137	248	186.31	15.222
		Yes	108	147	230	183.45	14.209
	Government	No	568	131	250	203.55	23.738
		Yes	313	158	248	189.61	16.910
Fall 2010	Algebra II	No	395	153	250	206.13	17.478
		Yes	116	164	250	194.73	16.965
	American History	No	401	142	250	201.50	21.892
		Yes	251	137	244	188.21	20.768
	English I	No	205	100	250	209.35	25.615
		Yes	122	144	240	196.20	21.263
	Geometry	No	591	149	250	207.05	20.785
		Yes	287	139	250	192.64	22.104
	Government	No	10,352	136	250	204.80	17.302
		Yes	7,237	113	250	193.20	16.051
Spring 2011	Algebra II	No	15,154	142	250	203.01	17.055
		Yes	7,352	111	250	196.29	16.078
	American History	No	20,568	100	250	200.24	20.557
		Yes	14,210	100	250	189.60	20.848
	English I	No	24,113	116	250	207.66	19.782
		Yes	18,058	116	250	195.92	20.390
	Geometry	No	16,459	141	250	202.37	18.549
		Yes	9,629	127	250	193.96	18.186
	Government	No	24,740	113	250	207.66	18.432
		Yes	15,167	113	250	196.19	17.509

Table 9.9: Scale Score Distributions by Demographic Group—Limited English Proficient

Test Period	Subject	LEP	*N*	Minimum	Maximum	Mean	*SD*
Summer 2010	Algebra II	No	504	153	250	203.53	17.961
		Yes	N/A	N/A	N/A	N/A	N/A
	American History	No	642	137	250	196.60	22.326
		Yes	N/A	N/A	N/A	N/A	N/A
	English I	No	325	100	250	204.56	24.904
		Yes	N/A	N/A	N/A	N/A	N/A
	Geometry	No	858	139	250	202.43	22.353
		Yes	N/A	N/A	N/A	N/A	N/A
	Government	No	17,231	113	250	200.30	17.703
		Yes	358	142	231	186.63	14.058
Fall 2010	Algebra II	No	22,277	111	250	200.91	17.010
		Yes	229	156	250	191.61	17.116
	American History	No	34,315	100	250	196.16	21.197
		Yes	463	100	250	176.06	21.558
	English I	No	41,607	116	250	202.85	20.820
		Yes	564	139	241	186.51	18.039
	Geometry	No	25,742	127	250	199.46	18.788
		Yes	346	141	250	185.29	18.732
	Government	No	39,428	113	250	203.47	18.895
		Yes	479	155	250	189.46	16.010
Spring 2011	Algebra II	No	111	157	236	185.03	12.931
		Yes	N/A	N/A	N/A	N/A	N/A
	American History	No	44	138	232	180.48	24.151
		Yes	N/A	N/A	N/A	N/A	N/A
	English I	No	194	144	250	194.16	19.864
		Yes	N/A	N/A	N/A	N/A	N/A
	Geometry	No	227	137	248	185.05	14.747
		Yes	N/A	N/A	N/A	N/A	N/A
	Government	No	871	131	250	198.79	22.569
		Yes	N/A	N/A	N/A	N/A	N/A

Table 9.10: Scale Score Distributions by Demographic Group—Title I

Test Period	Subject	Title I	*N*	Minimum	Maximum	Mean	*SD*
Summer 2010	Algebra II	No	108	157	236	184.91	13.090
		Yes	N/A	N/A	N/A	N/A	N/A
	American History	No	43	138	232	180.28	23.718
		Yes	N/A	N/A	N/A	N/A	N/A
	English I	No	193	144	250	193.93	19.665
		Yes	N/A	N/A	N/A	N/A	N/A
	Geometry	No	201	137	230	183.78	13.458
		Yes	N/A	N/A	N/A	N/A	N/A
	Government	No	858	131	250	199.10	22.518
		Yes	N/A	N/A	N/A	N/A	N/A
Fall 2010	Algebra II	No	478	153	250	204.83	17.719
		Yes	33	164	201	184.82	9.642
	American History	No	650	137	250	196.42	22.425
		Yes	N/A	N/A	N/A	N/A	N/A
	English I	No	317	115	250	205.00	24.260
		Yes	N/A	N/A	N/A	N/A	N/A
	Geometry	No	821	139	250	203.59	22.099
		Yes	57	153	219	184.28	16.030
	Government	No	15,980	113	250	201.01	17.506
		Yes	1,609	136	250	190.20	17.053
Spring 2011	Algebra II	No	21,170	142	250	201.36	16.928
		Yes	1,336	111	250	192.14	16.392
	American History	No	32,677	100	250	196.51	21.091
		Yes	2,101	100	250	186.21	22.605
	English I	No	39,937	116	250	202.99	20.744
		Yes	2,234	133	250	196.22	22.039
	Geometry	No	24,520	127	250	199.90	18.676
		Yes	1,568	127	250	189.48	18.983
	Government	No	37,399	113	250	204.10	18.753
		Yes	2,508	113	250	191.41	17.427

Table 9.11: Scale Score Distributions by Demographic Group—Students with IEPs

Test Period	Subject	IEP	*N*	Minimum	Maximum	Mean	*SD*
Summer 2010	Algebra II	No	103	161	236	185.57	12.904
		Yes	N/A	N/A	N/A	N/A	N/A
	American History	No	42	138	232	182.14	24.090
		Yes	N/A	N/A	N/A	N/A	N/A
	English I	No	172	149	250	195.90	19.035
		Yes	N/A	N/A	N/A	N/A	N/A
	Geometry	No	215	137	248	185.71	14.762
		Yes	N/A	N/A	N/A	N/A	N/A
	Government	No	799	131	250	199.89	22.777
		Yes	82	161	239	185.96	15.503
Fall 2010	Algebra II	No	498	153	250	203.81	17.910
		Yes	N/A	N/A	N/A	N/A	N/A
	American History	No	597	137	250	197.36	22.280
		Yes	55	142	238	185.80	21.183
	English I	No	297	115	250	205.81	24.234
		Yes	30	100	248	190.87	27.454
	Geometry	No	839	139	250	203.05	22.096
		Yes	39	153	250	187.05	20.546
	Government	No	16,178	136	250	201.09	17.438
		Yes	1,411	113	250	187.77	16.545
Spring 2011	Algebra II	No	21,964	111	250	201.11	16.927
		Yes	542	148	250	188.91	17.204
	American History	No	32,703	100	250	196.86	20.918
		Yes	2,075	100	250	180.65	21.906
	English I	No	38,752	116	250	204.60	19.807
		Yes	3,419	116	250	180.34	19.617
	Geometry	No	25,182	127	250	199.80	18.619
		Yes	906	127	250	184.59	19.508
	Government	No	36,891	113	250	204.54	18.504
		Yes	3,016	113	250	188.21	17.437

Table 9.12 Scale Score Distributions by Demographic Group—Students with Accommodations

Test Period	Subject	Accom.	*N*	Minimum	Maximum	Mean	*SD*
Summer 2010	Algebra II	No	113	157	236	184.86	12.881
		Yes	N/A	N/A	N/A	N/A	N/A
	American History	No	46	138	232	180.65	23.747
		Yes	N/A	N/A	N/A	N/A	N/A
	English I	No	194	144	250	194.09	19.455
		Yes	N/A	N/A	N/A	N/A	N/A
	Geometry	No	227	137	248	185.18	14.681
		Yes	N/A	N/A	N/A	N/A	N/A
	Government	No	864	131	250	198.78	22.600
		Yes	N/A	N/A	N/A	N/A	N/A
Fall 2010	Algebra II	No	506	153	250	203.64	17.895
		Yes	N/A	N/A	N/A	N/A	N/A
	American History	No	632	137	250	196.62	22.382
		Yes	N/A	N/A	N/A	N/A	N/A
	English I	No	307	100	250	204.92	24.966
		Yes	N/A	N/A	N/A	N/A	N/A
	Geometry	No	861	139	250	202.55	22.264
		Yes	N/A	N/A	N/A	N/A	N/A
	Government	No	17,092	113	250	200.44	17.643
		Yes	497	142	231	185.79	15.034
Spring 2011	Algebra II	No	22,362	111	250	200.89	17.017
		Yes	144	148	241	188.44	15.490
	American History	No	34,103	100	250	196.23	21.200
		Yes	675	100	250	178.76	20.713
	English I	No	40,360	116	250	203.76	20.247
		Yes	1,811	126	250	177.33	18.360
	Geometry	No	25,845	127	250	199.41	18.787
		Yes	243	146	250	184.29	20.218
	Government	No	38,875	113	250	203.74	18.785
		Yes	1,032	113	250	186.67	16.519

Table 9.13: Achievement-Level Distributions by Gender

Test Period	Subject	Gender	Achievement Level	Frequency	Percentage
Summer 2010	Algebra II	Female	Below Basic	15	33.3
			Basic	25	55.6
			Proficient	4	8.9
			Advanced	1	2.2
			Total	45	100.0
		Male	Below Basic	24	35.3
			Basic	37	54.4
			Proficient	6	8.8
			Advanced	1	1.5
			Total	68	100.0
	American History	Female	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Male	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	English I	Female	Below Basic	14	16.9
			Basic	33	39.8
			Proficient	29	34.9
			Advanced	7	8.4
			Total	83	100.0
		Male	Below Basic	23	20.4
			Basic	48	42.5
			Proficient	35	31.0
			Advanced	7	6.2
			Total	113	100.0
	Geometry	Female	Below Basic	51	44.3
			Basic	51	44.3
			Proficient	11	9.6
			Advanced	2	1.7
			Total	115	100.0
		Male	Below Basic	45	39.5
			Basic	44	38.6
			Proficient	23	20.2
			Advanced	2	1.8
			Total	114	100.0
	Government	Female	Below Basic	74	17.6
			Basic	150	35.6
			Proficient	128	30.4
			Advanced	69	16.4
			Total	421	100.0
		Male	Below Basic	91	20.4
			Basic	152	34.2
			Proficient	117	26.3
			Advanced	85	19.1
			Total	445	100.0

Table 9.13: Achievement-Level Distributions by Gender (continued)

Test Period	Subject	Gender	Achievement Level	Frequency	Percentage
			Below Basic	26	9.9
			Basic	87	33.2
		Female	Proficient	110	42.0
			Advanced	39	14.9
			Total	262	100.0
	Algebra II		Below Basic	20	8.0
			Basic	68	27.3
		Male	Proficient	116	46.6
			Advanced	45	18.1
			Total	249	100.0
			Below Basic	102	32.7
			Basic	78	25.0
		Female	Proficient	102	32.7
			Advanced	30	9.6
	American History		Total	312	100.0
			Below Basic	67	19.8
			Basic	87	25.7
		Male	Proficient	129	38.1
			Advanced	56	16.5
			Total	339	100.0
			Below Basic	9	7.0
			Basic	35	27.1
		Female	Proficient	52	40.3
			Advanced	33	25.6
			Total	129	100.0
Fall 2010	English I		Below Basic	29	14.9
			Basic	51	26.2
		Male	Proficient	64	32.8
			Advanced	51	26.2
			Total	195	100.0
			Below Basic	85	18.0
			Basic	125	26.5
		Female	Proficient	167	35.5
			Advanced	94	20.0
	Geometry		Total	471	100.0
			Below Basic	56	13.9
			Basic	102	25.2
		Male	Proficient	153	37.9
			Advanced	93	23.0
			Total	404	100.0
			Below Basic	840	9.6
			Basic	3,521	40.1
		Female	Proficient	3,584	40.8
			Advanced	839	9.6
	Government		Total	8,784	100.0
			Below Basic	744	8.5
			Basic	2,986	34.1
		Male	Proficient	3,814	43.6
			Advanced	1,207	13.8
			Total	8,751	100.0

Table 9.13: Achievement-Level Distributions by Gender (continued)

Test Period	Subject	Gender	Achievement Level	Frequency	Percentage
Spring 2011	Algebra II	Female	Below Basic	1,110	9.1
			Basic	4,937	40.7
			Proficient	4,963	40.9
			Advanced	1,124	9.3
			Total	12,134	100.0
		Male	Below Basic	791	7.6
			Basic	3,661	35.4
			Proficient	4,421	42.7
			Advanced	1,480	14.3
			Total	10,353	100.0
	American History	Female	Below Basic	4,785	27.3
			Basic	4,693	26.8
			Proficient	6,322	36.1
			Advanced	1,715	9.8
			Total	17,515	100.0
		Male	Below Basic	3,666	21.3
			Basic	4,138	24.0
			Proficient	6,852	39.8
			Advanced	2,577	15.0
			Total	17,233	100.0
	English I	Female	Below Basic	1,784	8.5
			Basic	6,082	29.0
			Proficient	8,206	39.1
			Advanced	4,915	23.4
			Total	20,987	100.0
		Male	Below Basic	2,771	13.1
			Basic	6,938	32.8
			Proficient	7,979	37.7
			Advanced	3,449	16.3
			Total	21,137	100.0
	Geometry	Female	Below Basic	2,388	17.9
			Basic	4,787	35.9
			Proficient	5,052	37.8
			Advanced	1,122	8.4
			Total	13,349	100.0
		Male	Below Basic	1,853	14.6
			Basic	3,987	31.4
			Proficient	5,234	41.2
			Advanced	1,642	12.9
			Total	12,716	100.0
	Government	Female	Below Basic	1,437	7.3
			Basic	6,695	33.9
			Proficient	8,835	44.7
			Advanced	2,780	14.1
			Total	19,747	100.0
		Male	Below Basic	1,540	7.7
			Basic	5,886	29.3
			Proficient	8,768	43.7
			Advanced	3,880	19.3
			Total	20,074	100.0

Table 9.14: Achievement-Level Distributions by Ethnicity

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Summer 2010	Algebra II	American Indian/Alaskan Native	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Asian	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Pacific Islander	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Black (not Hispanic)	Below Basic	24	36.4
			Basic	41	62.1
			Proficient	1	1.5
			Advanced	0	0.0
			Total	66	100.0
		Hispanic	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		White (not Hispanic)	Below Basic	13	36.1
			Basic	15	41.7
			Proficient	6	16.7
			Advanced	2	5.6
			Total	36	100.0
		Multi-racial	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Summer 2010	American History	American Indian/Alaskan Native	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Asian	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Pacific Islander	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Black (not Hispanic)	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Hispanic	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		White (not Hispanic)	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Multi-racial	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Summer 2010	English I	American Indian/Alaskan Native	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Asian	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Pacific Islander	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Black (not Hispanic)	Below Basic	21	20.2
			Basic	50	48.1
			Proficient	27	26.0
			Advanced	6	5.8
			Total	104	100.0
		Hispanic	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		White (not Hispanic)	Below Basic	16	19.3
			Basic	25	30.1
			Proficient	34	41.0
			Advanced	8	9.6
			Total	83	100.0
		Multi-racial	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Summer 2010	Geometry	American Indian/Alaskan Native	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Asian	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Pacific Islander	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Black (not Hispanic)	Below Basic	65	49.6
			Basic	55	42.0
			Proficient	11	8.4
			Advanced	0	0.0
			Total	131	100.0
		Hispanic	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		White (not Hispanic)	Below Basic	26	34.2
			Basic	28	36.8
			Proficient	18	23.7
			Advanced	4	5.3
			Total	76	100.0
		Multi-racial	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Summer 2010	Government	American Indian/Alaskan Native	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Asian	Below Basic	2	6.7
			Basic	11	36.7
			Proficient	7	23.3
			Advanced	10	33.3
			Total	30	100.0
		Pacific Islander	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Black (not Hispanic)	Below Basic	83	31.8
			Basic	114	43.7
			Proficient	48	18.4
			Advanced	16	6.1
			Total	261	100.0
		Hispanic	Below Basic	6	19.4
			Basic	6	19.4
			Proficient	11	35.5
			Advanced	8	25.8
			Total	31	100.0
		White (not Hispanic)	Below Basic	51	10.3
			Basic	156	31.6
			Proficient	169	34.3
			Advanced	117	23.7
			Total	493	100.0
		Multi-racial	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Fall 2010	Algebra II	American Indian/Alaskan Native	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Asian	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Pacific Islander	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Black (not Hispanic)	Below Basic	17	27.9
			Basic	24	39.3
			Proficient	18	29.5
			Advanced	2	3.3
			Total	61	100.0
		Hispanic	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		White (not Hispanic)	Below Basic	24	6.0
			Basic	108	27.2
			Proficient	189	47.6
			Advanced	76	19.1
			Total	397	100.0
		Multi-racial	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Fall 2010	American History	American Indian/Alaskan Native	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Asian	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Pacific Islander	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Black (not Hispanic)	Below Basic	43	46.2
			Basic	24	25.8
			Proficient	22	23.7
			Advanced	4	4.3
			Total	93	100.0
		Hispanic	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		White (not Hispanic)	Below Basic	113	22.6
			Basic	127	25.5
			Proficient	187	37.5
			Advanced	72	14.4
			Total	499	100.0
		Multi-racial	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Fall 2010	English I	American Indian/Alaskan Native	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Asian	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Pacific Islander	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Black (not Hispanic)	Below Basic	16	32.7
			Basic	15	30.6
			Proficient	15	30.6
			Advanced	3	6.1
			Total	49	100.0
		Hispanic	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		White (not Hispanic)	Below Basic	20	8.0
			Basic	66	26.5
			Proficient	92	36.9
			Advanced	71	28.5
			Total	249	100.0
		Multi-racial	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Fall 2010	Geometry	American Indian/Alaskan Native	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Asian	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Pacific Islander	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Black (not Hispanic)	Below Basic	54	40.9
			Basic	35	26.5
			Proficient	34	25.8
			Advanced	9	6.8
			Total	132	100.0
		Hispanic	Below Basic	10	16.1
			Basic	19	30.6
			Proficient	28	45.2
			Advanced	5	8.1
			Total	62	100.0
		White (not Hispanic)	Below Basic	72	11.2
			Basic	164	25.6
			Proficient	243	37.9
			Advanced	162	25.3
			Total	641	100.0
		Multi-racial	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Fall 2010	Government	American Indian/Alaskan Native	Below Basic	4	4.3
			Basic	36	38.3
			Proficient	45	47.9
			Advanced	9	9.6
			Total	94	100.0
		Asian	Below Basic	26	6.0
			Basic	144	33.4
			Proficient	174	40.4
			Advanced	87	20.2
			Total	431	100.0
		Pacific Islander	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Black (not Hispanic)	Below Basic	682	22.1
			Basic	1553	50.3
			Proficient	749	24.3
			Advanced	101	3.3
			Total	3,085	100.0
		Hispanic	Below Basic	88	13.4
			Basic	289	43.9
			Proficient	230	35.0
			Advanced	51	7.8
			Total	658	100.0
		White (not Hispanic)	Below Basic	758	5.8
			Basic	4,416	33.8
			Proficient	6,118	46.8
			Advanced	1,779	13.6
			Total	13,071	100.0
		Multi-racial	Below Basic	13	8.4
			Basic	54	34.8
			Proficient	70	45.2
			Advanced	18	11.6
			Total	155	100.0

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Spring 2011	Algebra II	American Indian/Alaskan Native	Below Basic	8	7.6
			Basic	55	52.4
			Proficient	34	32.4
			Advanced	8	7.6
			Total	105	100.0
		Asian	Below Basic	19	5.8
			Basic	114	34.7
			Proficient	129	39.2
			Advanced	67	20.4
			Total	329	100.0
		Pacific Islander	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Black (not Hispanic)	Below Basic	542	24.6
			Basic	1,090	49.4
			Proficient	510	23.1
			Advanced	65	2.9
			Total	2,207	100.0
		Hispanic	Below Basic	114	13.1
			Basic	363	41.6
			Proficient	340	38.9
			Advanced	56	6.4
			Total	873	100.0
		White (not Hispanic)	Below Basic	1,203	6.4
			Basic	6,916	36.8
			Proficient	8,306	44.2
			Advanced	2,381	12.7
			Total	18,806	100.0
		Multi-racial	Below Basic	10	7.0
			Basic	49	34.5
			Proficient	58	40.8
			Advanced	25	17.6
			Total	142	100.0

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Spring 2011	American History	American Indian/Alaskan Native	Below Basic	57	30.3
			Basic	44	23.4
			Proficient	70	37.2
			Advanced	17	9.0
			Total	188	100.0
		Asian	Below Basic	106	22.4
			Basic	103	21.8
			Proficient	187	39.5
			Advanced	77	16.3
			Total	473	100.0
		Pacific Islander	Below Basic	13	31.7
			Basic	11	26.8
			Proficient	13	31.7
			Advanced	4	9.8
			Total	41	100.0
		Black (not Hispanic)	Below Basic	1,757	42.5
			Basic	1,116	27.0
			Proficient	1,041	25.2
			Advanced	216	5.2
			Total	4,130	100.0
		Hispanic	Below Basic	452	34.0
			Basic	357	26.8
			Proficient	406	30.5
			Advanced	116	8.7
			Total	1,331	100.0
		White (not Hispanic)	Below Basic	5,947	21.2
			Basic	7,092	25.3
			Proficient	11,228	40.0
			Advanced	3,794	13.5
			Total	28,061	100.0
		Multi-racial	Below Basic	118	22.7
			Basic	105	20.2
			Proficient	229	44.0
			Advanced	68	13.1
			Total	520	100.0

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Spring 2011	English I	American Indian/Alaskan Native	Below Basic	30	13.0
			Basic	84	36.5
			Proficient	89	38.7
			Advanced	27	11.7
			Total	230	100.0
		Asian	Below Basic	44	8.0
			Basic	162	29.4
			Proficient	227	41.2
			Advanced	118	21.4
			Total	551	100.0
		Pacific Islander	Below Basic	7	15.2
			Basic	22	47.8
			Proficient	9	19.6
			Advanced	8	17.4
			Total	46	100.0
		Black (not Hispanic)	Below Basic	1,053	22.1
			Basic	1,921	40.2
			Proficient	1,419	29.7
			Advanced	380	8.0
			Total	4,773	100.0
		Hispanic	Below Basic	210	13.5
			Basic	597	38.3
			Proficient	558	35.8
			Advanced	193	12.4
			Total	1,558	100.0
		White (not Hispanic)	Below Basic	3,144	9.2
			Basic	10,034	29.2
			Proficient	13,642	39.7
			Advanced	7,503	21.9
			Total	34,323	100.0
		Multi-racial	Below Basic	67	10.5
			Basic	196	30.7
			Proficient	241	37.7
			Advanced	135	21.1
			Total	639	100.0

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Spring 2011	Geometry	American Indian/Alaskan Native	Below Basic	21	14.2
			Basic	62	41.9
			Proficient	55	37.2
			Advanced	10	6.8
			Total	148	100.0
		Asian	Below Basic	51	13.0
			Basic	103	26.3
			Proficient	160	40.8
			Advanced	78	19.9
			Total	392	100.0
		Pacific Islander	Below Basic	10	28.6
			Basic	16	45.7
			Proficient	8	22.9
			Advanced	1	2.9
			Total	35	100.0
		Black (not Hispanic)	Below Basic	1,164	38.2
			Basic	1,190	39.1
			Proficient	615	20.2
			Advanced	76	2.5
			Total	3,045	100.0
		Hispanic	Below Basic	265	26.0
			Basic	393	38.5
			Proficient	318	31.1
			Advanced	45	4.4
			Total	1,021	100.0
		White (not Hispanic)	Below Basic	2,699	12.7
			Basic	6,922	32.7
			Proficient	9,027	42.6
			Advanced	2,530	11.9
			Total	21,178	100.0
		Multi-racial	Below Basic	29	11.9
			Basic	88	36.2
			Proficient	102	42.0
			Advanced	24	9.9
			Total	243	100.0

Table 9.14: Achievement-Level Distributions by Ethnicity (continued)

Test Period	Subject	Ethnicity	Achievement Level	Frequency	Percentage
Spring 2011	Government	American Indian/Alaskan Native	Below Basic	15	8.2
			Basic	75	41.0
			Proficient	75	41.0
			Advanced	18	9.8
			Total	183	100.0
		Asian	Below Basic	35	6.0
			Basic	143	24.4
			Proficient	256	43.6
			Advanced	153	26.1
			Total	587	100.0
		Pacific Islander	Below Basic	5	15.6
			Basic	7	21.9
			Proficient	19	59.4
			Advanced	1	3.1
			Total	32	100.0
		Black (not Hispanic)	Below Basic	1,021	18.7
			Basic	2,636	48.3
			Proficient	1,587	29.1
			Advanced	212	3.9
			Total	5,456	100.0
		Hispanic	Below Basic	135	10.1
			Basic	515	38.4
			Proficient	547	40.8
			Advanced	145	10.8
			Total	1,342	100.0
		White (not Hispanic)	Below Basic	1,720	5.4
			Basic	9,024	28.5
			Proficient	14,888	47.0
			Advanced	6,055	19.1
			Total	31,687	100.0
		Multi-racial	Below Basic	28	6.5
			Basic	146	34.0
			Proficient	197	45.8
			Advanced	59	13.7
			Total	430	100.0

Table 9.15: Achievement-Level Distributions—Migrant

Test Period	Subject	Migrant	Achievement Level	Frequency	Percentage
Summer 2010	Algebra II	No	Below Basic	39	34.5
			Basic	62	54.9
			Proficient	10	8.8
			Advanced	2	1.8
			Total	113	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	American History	No	Below Basic	26	56.5
			Basic	8	17.4
			Proficient	10	21.7
			Advanced	2	4.3
			Total	46	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	English I	No	Below Basic	37	18.9
			Basic	81	41.3
			Proficient	64	32.7
			Advanced		
			Total	196	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Geometry	No	Below Basic	96	41.9
			Basic	95	41.5
			Proficient	34	14.8
			Advanced	4	1.7
			Total	229	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Government	No	Below Basic	175	19.9
			Basic	304	34.6
			Proficient	246	28.0
			Advanced	154	17.5
			Total	879	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.15: Achievement-Level Distributions—Migrant (continued)

Test Period	Subject	Migrant	Achievement Level	Frequency	Percentage
Fall 2010	Algebra II	No	Below Basic	46	9.0
			Basic	155	30.3
			Proficient	226	44.2
			Advanced	84	16.4
			Total	511	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	American History	No	Below Basic	170	26.1
			Basic	165	25.3
			Proficient	231	35.4
			Advanced	86	13.2
			Total	652	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	English I	No	Below Basic	40	12.2
			Basic	87	26.6
			Proficient	116	35.5
			Advanced	84	25.7
			Total	327	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Geometry	No	Below Basic	143	16.3
			Basic	227	25.9
			Proficient	321	36.6
			Advanced	187	21.3
			Total	878	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Government	No	Below Basic	1,588	9.0
			Basic	6,534	37.2
			Proficient	7,410	42.2
			Advanced	2,046	11.6
			Total	17,578	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.15: Achievement-Level Distributions—Migrant (continued)

Test Period	Subject	Migrant	Achievement Level	Frequency	Percentage
Spring 2011	Algebra II	No	Below Basic	1,903	8.5
			Basic	8,597	38.2
			Proficient	9,389	41.7
			Advanced	2,604	11.6
			Total	22,493	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	American History	No	Below Basic	8,446	24.3
			Basic	8,836	25.4
			Proficient	13,176	37.9
			Advanced	4,294	12.4
			Total	34,752	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	English I	No	Below Basic	4,558	10.8
			Basic	13,027	30.9
			Proficient	16,198	38.4
			Advanced	8,367	19.9
			Total	42,150	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Geometry	No	Below Basic	4,244	16.3
			Basic	8,775	33.7
			Proficient	10,289	39.5
			Advanced	2,766	10.6
			Total	26,074	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Government	No	Below Basic	2,995	7.5
			Basic	12,617	31.6
			Proficient	17,619	44.2
			Advanced	6,661	16.7
			Total	39,892	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.16: Achievement-Level Distributions—FRL

Test Period	Subject	FRL	Achievement Level	Frequency	Percentage
Summer 2010	Algebra II	No	Below Basic	21	29.2
			Basic	42	58.3
			Proficient	7	9.7
			Advanced	2	2.8
			Total	72	100.0
		Yes	Below Basic	18	43.9
			Basic	20	48.8
			Proficient	3	7.3
			Advanced	0	0
			Total	41	100.0
	American History	No	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	English I	No	Below Basic	13	13.8
			Basic	40	42.6
			Proficient	32	34.0
			Advanced	9	9.6
			Total	94	100.0
		Yes	Below Basic	24	23.5
			Basic	41	40.2
			Proficient	32	31.4
			Advanced	5	4.9
			Total	102	100.0
	Geometry	No	Below Basic	43	35.5
			Basic	56	46.3
			Proficient	19	15.7
			Advanced	3	2.5
			Total	121	100.0
		Yes	Below Basic	53	49.1
			Basic	39	36.1
			Proficient	15	13.9
			Advanced	1	.9
			Total	108	100.0
	Government	No	Below Basic	83	14.6
			Basic	167	29.4
			Proficient	182	32.0
			Advanced	136	23.9
			Total	568	100.0
		Yes	Below Basic	94	30.0
			Basic	137	43.8
			Proficient	64	20.4
			Advanced	18	5.8
			Total	313	100.0

Table 9.16: Achievement-Level Distributions—FRL (continued)

Test Period	Subject	FRL	Achievement Level	Frequency	Percentage
Fall 2010	Algebra II	No	Below Basic	21	5.3
			Basic	115	29.1
			Proficient	180	45.6
			Advanced	79	20.0
			Total	395	100.0
		Yes	Below Basic	25	21.6
			Basic	40	34.5
			Proficient	46	39.7
			Advanced	5	4.3
			Total	116	100.0
	American History	No	Below Basic	74	18.5
			Basic	96	23.9
			Proficient	161	40.1
			Advanced	70	17.5
			Total	401	100.0
		Yes	Below Basic	96	38.2
			Basic	69	27.5
			Proficient	70	27.9
			Advanced	16	6.4
			Total	251	100.0
	English I	No	Below Basic	19	9.3
			Basic	45	22.0
			Proficient	69	33.7
			Advanced	72	35.1
			Total	205	100.0
		Yes	Below Basic	21	17.2
			Basic	42	34.4
			Proficient	47	38.5
			Advanced	12	9.8
			Total	122	100.0
	Geometry	No	Below Basic	62	10.5
			Basic	129	21.8
			Proficient	242	40.9
			Advanced	158	26.7
			Total	591	100.0
		Yes	Below Basic	81	28.2
			Basic	98	34.1
			Proficient	79	27.5
			Advanced	29	10.1
			Total	287	100.0
	Government	No	Below Basic	497	4.8
			Basic	3,081	29.8
			Proficient	5,076	49.0
			Advanced	1,698	16.4
			Total	10,352	100.0
		Yes	Below Basic	1,094	15.1
			Basic	3,459	47.8
			Proficient	2,335	32.3
			Advanced	349	4.8
			Total	7,237	100.0

Table 9.16: Achievement-Level Distributions—FRL (continued)

Test Period	Subject	FRL	Achievement Level	Frequency	Percentage
Spring 2011	Algebra II	No	Below Basic	916	6.0
			Basic	5,393	35.6
			Proficient	6,709	44.3
			Advanced	2,136	14.1
			Total	15,154	100.0
		Yes	Below Basic	989	13.5
			Basic	3,213	43.7
			Proficient	2,682	36.5
			Advanced	468	6.4
			Total	7,352	100.0
	American History	No	Below Basic	3,572	17.4
			Basic	4,965	24.1
			Proficient	8,714	42.4
			Advanced	3,317	16.1
			Total	20,568	100.0
		Yes	Below Basic	4,886	34.4
			Basic	3,877	27.3
			Proficient	4,468	31.4
			Advanced	979	6.9
			Total	14,210	100.0
	English I	No	Below Basic	1,518	6.3
			Basic	6,080	25.2
			Proficient	10,214	42.4
			Advanced	6,301	26.1
			Total	24,113	100.0
		Yes	Below Basic	3,046	16.9
			Basic	6,955	38.5
			Proficient	5,990	33.2
			Advanced	2,067	11.4
			Total	18,058	100.0
	Geometry	No	Below Basic	1,970	12.0
			Basic	5,117	31.1
			Proficient	7,179	43.6
			Advanced	2,193	13.3
			Total	16,459	100.0
		Yes	Below Basic	2,278	23.7
			Basic	3,666	38.1
			Proficient	3,112	32.3
			Advanced	573	6.0
			Total	9,629	100.0
	Government	No	Below Basic	1,061	4.3
			Basic	6,204	25.1
			Proficient	12,048	48.7
			Advanced	5,427	21.9
			Total	24,740	100.0
		Yes	Below Basic	1,937	12.8
			Basic	6,418	42.3
			Proficient	5,578	36.8
			Advanced	1,234	8.1
			Total	15,167	100.0

Table 9.17: Achievement-Level Distributions—LEP

Test Period	Subject	LEP	Achievement Level	Frequency	Percentage
Summer 2010	Algebra II	No	Below Basic	37	33.3
			Basic	62	55.9
			Proficient	10	9.0
			Advanced	2	1.8
			Total	111	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	American History	No	Below Basic	25	56.8
			Basic	7	15.9
			Proficient	10	22.7
			Advanced	2	4.5
			Total	44	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	English I	No	Below Basic	37	19.1
			Basic	79	40.7
			Proficient	64	33.0
			Advanced	14	7.2
			Total	194	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Geometry	No	Below Basic	95	41.9
			Basic	94	41.4
			Proficient	34	15.0
			Advanced	4	1.8
			Total	227	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Government	No	Below Basic	171	19.6
			Basic	302	34.7
			Proficient	244	28.0
			Advanced	154	17.7
			Total	871	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.17: Achievement-Level Distributions—LEP (continued)

Test Period	Subject	LEP	Achievement Level	Frequency	Percentage
Fall 2010	Algebra II	No	Below Basic	45	8.9
			Basic	154	30.6
			Proficient	222	44.0
			Advanced	83	16.5
			Total	504	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	American History	No	Below Basic	164	25.5
			Basic	163	25.4
			Proficient	230	35.8
			Advanced	85	13.2
			Total	642	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	English I	No	Below Basic	40	12.3
			Basic	85	26.2
			Proficient	116	35.7
			Advanced	84	25.8
			Total	325	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Geometry	No	Below Basic	139	16.2
			Basic	221	25.8
			Proficient	313	36.5
			Advanced	185	21.6
			Total	858	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Government	No	Below Basic	1,501	8.7
			Basic	6,344	36.8
			Proficient	7,345	42.6
			Advanced	2,041	11.8
			Total	17,231	100.0
		Yes	Below Basic	90	25.1
			Basic	196	54.7
			Proficient	66	18.4
			Advanced	6	1.7
			Total	358	100.0

Table 9.17: Achievement-Level Distributions—LEP (continued)

Test Period	Subject	LEP	Achievement Level	Frequency	Percentage
Spring 2011	Algebra II	No	Below Basic	1,851	8.3
			Basic	8,499	38.2
			Proficient	9,336	41.9
			Advanced	2,591	11.6
			Total	22,277	100.0
		Yes	Below Basic	54	23.6
			Basic	107	46.7
			Proficient	55	24.0
			Advanced	13	5.7
			Total	229	100.0
	American History	No	Below Basic	8,167	23.8
			Basic	8,758	25.5
			Proficient	13,107	38.2
			Advanced	4,283	12.5
			Total	34,315	100.0
		Yes	Below Basic	291	62.9
			Basic	84	18.1
			Proficient	75	16.2
			Advanced	13	2.8
			Total	463	100.0
	English I	No	Below Basic	4,414	10.6
			Basic	12,752	30.6
			Proficient	16,096	38.7
			Advanced	8,345	20.1
			Total	41,607	100.0
		Yes	Below Basic	150	26.6
			Basic	283	50.2
			Proficient	108	19.1
			Advanced	23	4.1
			Total	564	100.0
	Geometry	No	Below Basic	4,092	15.9
			Basic	8,667	33.7
			Proficient	10,230	39.7
			Advanced	2,753	10.7
			Total	25,742	100.0
		Yes	Below Basic	156	45.1
			Basic	116	33.5
			Proficient	61	17.6
			Advanced	13	3.8
			Total	346	100.0
	Government	No	Below Basic	2,881	7.3
			Basic	12,398	31.4
			Proficient	17,506	44.4
			Advanced	6,643	16.8
			Total	39,428	100.0
		Yes	Below Basic	117	24.4
			Basic	224	46.8
			Proficient	120	25.1
			Advanced	18	3.8
			Total	479	100.0

Table 9.18: Achievement-Level Distributions—Title I

Test Period	Subject	Title I	Achievement Level	Frequency	Percentage
Summer 2010	Algebra II	No	Below Basic	38	35.2
			Basic	58	53.7
			Proficient	10	9.3
			Advanced	2	1.9
			Total	108	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	American History	No	Below Basic	24	55.8
			Basic	8	18.6
			Proficient	9	20.9
			Advanced	2	4.7
			Total	43	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	English I	No	Below Basic	37	19.2
			Basic	80	41.5
			Proficient	63	32.6
			Advanced	13	6.7
			Total	193	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Geometry	No	Below Basic	88	43.8
			Basic	85	42.3
			Proficient	27	13.4
			Advanced	1	.5
			Total	201	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Government	No	Below Basic	163	19.0
			Basic	297	34.6
			Proficient	245	28.6
			Advanced	153	17.8
			Total	858	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.18: Achievement-Level Distributions—Title I (continued)

Test Period	Subject	Title I	Achievement Level	Frequency	Percentage
Fall 2010	Algebra II	No	Below Basic	37	7.7
			Basic	135	28.2
			Proficient	222	46.4
			Advanced	84	17.6
			Total	478	100.0
		Yes	Below Basic	9	27.3
			Basic	20	60.6
			Proficient	4	12.1
			Advanced	33	100.0
			Total	9	27.3
	American History	No	Below Basic	169	26.0
			Basic	164	25.2
			Proficient	231	35.5
			Advanced	86	13.2
			Total	650	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	English I	No	Below Basic	37	11.7
			Basic	84	26.5
			Proficient	113	35.6
			Advanced	83	26.2
			Total	317	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Geometry	No	Below Basic	118	14.4
			Basic	209	25.5
			Proficient	307	37.4
			Advanced	187	22.8
			Total	821	100.0
		Yes	Below Basic	25	43.9
			Basic	18	31.6
			Proficient	14	24.6
			Advanced	0	0.0
			Total	57	100.0
	Government	No	Below Basic	5,794	36.3
			Basic	6,985	43.7
			Proficient	1,975	12.4
			Advanced	15,980	100.0
			Total	365	22.7
		Yes	Below Basic	746	46.4
			Basic	426	26.5
			Proficient	72	4.5
			Advanced	1,609	100.0
			Total	118	14.4

Table 9.18: Achievement-Level Distributions—Title I (continued)

Test Period	Subject	Title I	Achievement Level	Frequency	Percentage
Spring 2011	Algebra II	No	Below Basic	1,615	7.6
			Basic	8,001	37.8
			Proficient	9,010	42.6
			Advanced	2,544	12.0
			Total	21,170	100.0
		Yes	Below Basic	290	21.7
			Basic	605	45.3
			Proficient	381	28.5
			Advanced	60	4.5
			Total	1,336	100.0
	American History	No	Below Basic	7,560	23.1
			Basic	8,339	25.5
			Proficient	12,632	38.7
			Advanced	4,146	12.7
			Total	32,677	100.0
		Yes	Below Basic	898	42.7
			Basic	503	23.9
			Proficient	550	26.2
			Advanced	150	7.1
			Total	2,101	100.0
	English I	No	Below Basic	4,124	10.3
			Basic	12,266	30.7
			Proficient	15,488	38.8
			Advanced	8,059	20.2
			Total	39,937	100.0
		Yes	Below Basic	440	19.7
			Basic	769	34.4
			Proficient	716	32.1
			Advanced	309	13.8
			Total	2,234	100.0
	Geometry	No	Below Basic	3,717	15.2
			Basic	8,230	33.6
			Proficient	9,869	40.2
			Advanced	2,704	11.0
			Total	24,520	100.0
		Yes	Below Basic	531	33.9
			Basic	553	35.3
			Proficient	422	26.9
			Advanced	62	4.0
			Total	1,568	100.0
	Government	No	Below Basic	2,493	6.7
			Basic	11,450	30.6
			Proficient	16,925	45.3
			Advanced	6,531	17.5
			Total	37,399	100.0
		Yes	Below Basic	505	20.1
			Basic	1,172	46.7
			Proficient	701	28.0
			Advanced	130	5.2
			Total	2,508	100.0

Table 9.19: Achievement-Level Distributions—IEP

Test Period	Subject	IEP	Achievement Level	Frequency	Percentage
Summer 2010	Algebra II	No	Below Basic	34	33.0
			Basic	57	55.3
			Proficient	10	9.7
			Advanced	2	1.9
			Total	103	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	American History	No	Below Basic	22	52.4
			Basic	8	19.0
			Proficient	10	23.8
			Advanced	2	4.8
			Total	42	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	English I	No	Below Basic	27	15.7
			Basic	71	41.3
			Proficient	61	35.5
			Advanced	13	7.6
			Total	172	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Geometry	No	Below Basic	86	40.0
			Basic	91	42.3
			Proficient	34	15.8
			Advanced	4	1.9
			Total	215	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Government	No	Below Basic	149	18.6
			Basic	262	32.8
			Proficient	238	29.8
			Advanced	150	18.8
			Total	799	100.0
		Yes	Below Basic	28	34.1
			Basic	42	51.2
			Proficient	8	9.8
			Advanced	4	4.9
			Total	82	100.0

Table 9.19: Achievement-Level Distributions—IEP (continued)

Test Period	Subject	IEP	Achievement Level	Frequency	Percentage
Fall 2010	Algebra II	No	Below Basic	44	8.8
			Basic	148	29.7
			Proficient	223	44.8
			Advanced	83	16.7
			Total	498	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	American History	No	Below Basic	147	24.6
			Basic	152	25.5
			Proficient	214	35.8
			Advanced	84	14.1
			Total	597	100.0
		Yes	Below Basic	23	41.8
			Basic	13	23.6
			Proficient	17	30.9
			Advanced	2	3.6
			Total	55	100.0
	English I	No	Below Basic	35	11.8
			Basic	74	24.9
			Proficient	108	36.4
			Advanced	80	26.9
			Total	297	100.0
		Yes	Below Basic	5	16.7
			Basic	13	43.3
			Proficient	8	26.7
			Advanced	4	13.3
			Total	30	100.0
	Geometry	No	Below Basic	130	15.5
			Basic	207	24.7
			Proficient	319	38.0
			Advanced	183	21.8
			Total	839	100.0
		Yes	Below Basic	13	33.3
			Basic	20	51.3
			Proficient	2	5.1
			Advanced	4	10.3
			Total	39	100.0
	Government	No	Below Basic	1,213	7.5
			Basic	5,881	36.4
			Proficient	7,079	43.8
			Advanced	2,005	12.4
			Total	16,178	100.0
		Yes	Below Basic	378	26.8
			Basic	659	46.7
			Proficient	332	23.5
			Advanced	42	3.0
			Total	1,411	100.0

Table 9.19: Achievement-Level Distributions—IEP (continued)

Test Period	Subject	IEP	Achievement Level	Frequency	Percentage
Spring 2011	Algebra II	No	Below Basic	1,738	7.9
			Basic	8,372	38.1
			Proficient	9,273	42.2
			Advanced	2,581	11.8
			Total	21,964	100.0
		Yes	Below Basic	167	30.8
			Basic	234	43.2
			Proficient	118	21.8
			Advanced	23	4.2
			Total	542	100.0
	American History	No	Below Basic	7,360	22.5
			Basic	8,356	25.6
			Proficient	12,787	39.1
			Advanced	4,200	12.8
			Total	32,703	100.0
		Yes	Below Basic	1,098	52.9
			Basic	486	23.4
			Proficient	395	19.0
			Advanced	96	4.6
			Total	2,075	100.0
	English I	No	Below Basic	3,016	7.8
			Basic	11,763	30.4
			Proficient	15,707	40.5
			Advanced	8,266	21.3
			Total	38,752	100.0
		Yes	Below Basic	1,548	45.3
			Basic	1,272	37.2
			Proficient	497	14.5
			Advanced	102	3.0
			Total	3,419	100.0
	Geometry	No	Below Basic	3,828	15.2
			Basic	8,493	33.7
			Proficient	10,133	40.2
			Advanced	2,728	10.8
			Total	25,182	100.0
		Yes	Below Basic	420	46.4
			Basic	290	32.0
			Proficient	158	17.4
			Advanced	38	4.2
			Total	906	100.0
	Government	No	Below Basic	2,174	5.9
			Basic	11,257	30.5
			Proficient	16,939	45.9
			Advanced	6,521	17.7
			Total	36,891	100.0
		Yes	Below Basic	824	27.3
			Basic	1,365	45.3
			Proficient	687	22.8
			Advanced	140	4.6
			Total	3,016	100.0

Table 9.20: Achievement-Level Distributions—Accommodations

Test Period	Subject	Accommodations	Achievement Level	Frequency	Percentage
Summer 2010	Algebra II	No	Below Basic	39	34.5
			Basic	62	54.9
			Proficient	10	8.8
			Advanced	2	1.8
			Total	113	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	American History	No	Below Basic	26	56.5
			Basic	8	17.4
			Proficient	10	21.7
			Advanced	2	4.3
			Total	46	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	English I	No	Below Basic	36	18.6
			Basic	81	41.8
			Proficient	64	33.0
			Advanced	13	6.7
			Total	194	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Geometry	No	Below Basic	94	41.4
			Basic	95	41.9
			Proficient	34	15.0
			Advanced	4	1.8
			Total	227	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Government	No	Below Basic	173	20.0
			Basic	294	34.0
			Proficient	245	28.4
			Advanced	152	17.6
			Total	864	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A

Table 9.20: Achievement-Level Distributions—Accommodations (continued)

Test Period	Subject	Accommodations	Achievement Level	Frequency	Percentage
Fall 2010	Algebra II	No	Below Basic	45	8.9
			Basic	152	30.0
			Proficient	226	44.7
			Advanced	83	16.4
			Total	506	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	American History	No	Below Basic	162	25.6
			Basic	160	25.3
			Proficient	225	35.6
			Advanced	85	13.4
			Total	632	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	English I	No	Below Basic	37	12.1
			Basic	80	26.1
			Proficient	110	35.8
			Advanced	80	26.1
			Total	307	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Geometry	No	Below Basic	139	16.1
			Basic	219	25.4
			Proficient	318	36.9
			Advanced	185	21.5
			Total	861	100.0
		Yes	Below Basic	N/A	N/A
			Basic	N/A	N/A
			Proficient	N/A	N/A
			Advanced	N/A	N/A
			Total	N/A	N/A
	Government	No	Below Basic	1,449	8.5
			Basic	6,294	36.8
			Proficient	7,310	42.8
			Advanced	2,039	11.9
			Total	17,092	100.0
		Yes	Below Basic	142	28.6
			Basic	246	49.5
			Proficient	101	20.3
			Advanced	8	1.6
			Total	497	100.0

Table 9.20: Achievement-Level Distributions—Accommodations (continued)

Test Period	Subject	Accommodations	Achievement Level	Frequency	Percentage
Spring 2011	Algebra II	No	Below Basic	1,867	8.3
			Basic	8,531	38.1
			Proficient	9,366	41.9
			Advanced	2,598	11.6
			Total	22,362	100.0
		Yes	Below Basic	38	26.4
			Basic	75	52.1
			Proficient	25	17.4
			Advanced	6	4.2
			Total	144	100.0
	American History	No	Below Basic	8,082	23.7
			Basic	8,681	25.5
			Proficient	13,063	38.3
			Advanced	4,277	12.5
			Total	34,103	100.0
		Yes	Below Basic	376	55.7
			Basic	161	23.9
			Proficient	119	17.6
			Advanced	19	2.8
			Total	675	100.0
	English I	No	Below Basic	3,648	9.0
			Basic	12,366	30.6
			Proficient	16,012	39.7
			Advanced	8,334	20.6
			Total	40,360	100.0
		Yes	Below Basic	916	50.6
			Basic	669	36.9
			Proficient	192	10.6
			Advanced	34	1.9
			Total	1811	100.0
	Geometry	No	Below Basic	4,136	16.0
			Basic	8,708	33.7
			Proficient	10,245	39.6
			Advanced	2,756	10.7
			Total	25,845	100.0
		Yes	Below Basic	112	46.1
			Basic	75	30.9
			Proficient	46	18.9
			Advanced	10	4.1
			Total	243	100.0
	Government	No	Below Basic	2,704	7.0
			Basic	12,125	31.2
			Proficient	17,419	44.8
			Advanced	6,627	17.0
			Total	38,875	100.0
		Yes	Below Basic	294	28.5
			Basic	497	48.2
			Proficient	207	20.1
			Advanced	34	3.3
			Total	1,032	100.0

CHAPTER 10: RELIABILITY

10.1 Introduction

The Missouri Department of Elementary and Secondary Education (DESE) is required by federal law to ensure that the instruments used to measure student achievement for school accountability provide reliable results. This chapter provides evidence that scores from the Missouri End-of-Course (EOC) Assessments measure student achievement in a reliable manner and that the size of the measurement error associated with reported test scores is reasonable, especially at the Proficient cut score.

10.2 Reliability and Measurement Error

10.2.1 Defining Reliability

Reliability refers to the consistency of student test scores. *Measurement error* refers to the random variability in the test scores. Both are indicators of the degree of precision in a test score. In general, measurement error and reliability are inversely related. When measurement error is large, reliability is small. Increasing reliability by minimizing measurement error is an important goal in the construction of any test.

Estimating the size of the measurement error associated with a true score is the key to estimating reliability. Errors in measurement can result from any of a multitude of factors, including environmental factors (e.g., testing conditions) and examinee factors (e.g., fatigue, stress). Feldt and Brennan (1989) note that "Quantification of the consistency and inconsistency in examinee performance constitutes the essence of reliability analysis" (p. 105). Classical test theory (CTT) provides a means for this quantification of examinee inconsistency (i.e., measurement error). This approach builds on the notion of an ideal error-free, or true, measurement score. Any observed measurement, such as test score X, is defined as a composite of true score, T, and its associated error:

$$X = T + \text{error}.$$

The definitions or assumptions in CTT lead to several important properties. For example, it can be demonstrated that observed score variance equals the sum of true score variance plus error variance:

$$\sigma_x^2 = \sigma_t^2 + \sigma_e^2.$$

The relationship among variance terms (i.e., $\sigma_x^2, \sigma_t^2, \sigma_e^2$) is critical to a more thorough understanding of important CTT concepts, including reliability and the standard error of measurement (*SEM*). For example, CTT equivalence reliability is defined as the correlation between observed scores on parallel forms, which is equal to

$$\rho_{x_1 x_2} = \sigma_t^2 \Big/ \sigma_x^2.$$

Reliability in CTT is thus conceptualized as true score variance divided by observed score variance. With just a few algebraic steps, the CTT definition of the *SEM* can be derived:

$$\sigma_e = \sigma_x \sqrt{1 - \rho_{x_1 x_2}}.$$

Although the conceptualizations of reliability and *SEM* are relatively straightforward, issues underlying the estimation of reliability are not.

10.2.2 Estimating Reliability

Reliability can be estimated via the correlation of scores on parallel forms (equivalence reliability) or from test-retest data (stability reliability), or it can be estimated from a single test administration (internal consistency reliability) using any one of a variety of techniques (e.g., Brown 1910; Cronbach 1951; Kuder and Richardson 1937). A very popular index for describing internal consistency reliability based on a single test administration is Cronbach's coefficient alpha, which provides an estimate of reliability that is mathematically equivalent to the average of all possible split-half reliability estimates.

10.2.3 Sources of Measurement Error

As noted above, errors in measurement can result from environmental factors and examinee factors. To reduce other sources of measurement error, the scoring of student responses to selected response (SR) items was done electronically. Scoring error may result from improper coding or extraneous marks on scannable response sheets. The size of this sort of error is usually small and is controlled through standardized test administration procedures (including detailed instructions on how to fill out response sheets and how to erase extraneous markings) and quality control measures implemented during the scanning process.

10.3 Evidence of Raw-Score Internal Consistency

Consistency of individual student performance was estimated using Cronbach's coefficient alpha. As previously noted, coefficient alpha provides an estimate of reliability that is mathematically equivalent to the average of all possible split-half reliability estimates. Alpha is an appropriate index of internal consistency for use on untimed tests such as the MO EOC Assessments. Cronbach's alpha can be interpreted as a lower bound to reliability and can be estimated using the following formula:

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

where n is the number of items, $\sigma_{Y_i}^2$ is the variance of item i, and σ_X^2 is the variance of the total score. Following this, *SEM* can be interpreted as "the square root of the average of the person-specific error variances of all examinees who participated in the reliability

estimation experiment" (Traub 1994, p. 114). *SEM*s were calculated using the following formula:

$$SEM = S_X \sqrt{1-\alpha},$$

where S_X is the standard deviation (*SD*) of observed total scores. Separate analyses were performed for each EOC content area. Tables 10.1 to 10.25 show the reliability coefficients (Cronbach's alpha) and *SEM*s based on the raw-score metric for the total population and for select student subgroups.

Table 10.1: Alpha Coefficients and Standard Errors of Measurement, Algebra II, Fall 2009

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	24.14	7.35	516	0.85	2.87
Gender					
Female	23.47	7.50	273	0.85	2.88
Male	24.88	7.11	243	0.84	2.86
Ethnicity					
White	24.82	7.34	410	0.85	2.84
Black	21.64	5.67	59	0.71	3.04
Hispanic	18.67	8.21	30	0.88	2.85
Asian	N/A	N/A	N/A	N/A	N/A
Native American	N/A	N/A	N/A	N/A	N/A
LEP					
Yes	N/A	N/A	N/A	N/A	N/A
No	24.20	7.32	508	0.85	2.87
IEP					
Yes	N/A	N/A	N/A	N/A	N/A
No	24.29	7.29	505	0.85	2.87
Migrant					
Yes	N/A	N/A	N/A	N/A	N/A
No	24.16	7.33	515	0.85	2.87
FRL					
Yes	21.06	7.06	123	0.83	2.92
No	25.10	7.18	393	0.84	2.85
Title I					
Yes	N/A	N/A	N/A	N/A	N/A
No	24.14	7.35	516	0.85	2.87
Accommodations					
Yes	N/A	N/A	N/A	N/A	N/A
No	24.15	7.35	515	0.85	2.87

Table 10.2: Alpha Coefficients and Standard Errors of Measurement, Algebra II, Spring 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	22.26	7.23	21,751	0.84	2.90
Gender					
Female	21.67	7.02	11,766	0.83	2.93
Male	22.95	7.42	9,982	0.85	2.87
Ethnicity					
White	23.20	7.00	17,474	0.83	2.89
Black	17.15	6.18	3,067	0.77	2.97
Hispanic	20.14	7.17	717	0.83	2.93
Asian	24.55	7.46	367	0.85	2.85
Native American	21.51	6.79	117	0.82	2.91
LEP					
Yes	18.12	6.80	246	0.81	2.98
No	22.30	7.23	21,505	0.84	2.90
IEP					
Yes	16.91	7.03	580	0.83	2.93
No	22.40	7.18	21,171	0.84	2.90
Migrant					
Yes	N/A	N/A	N/A	N/A	N/A
No	22.26	7.24	21,740	0.84	2.90
FRL					
Yes	20.11	6.86	7,335	0.82	2.94
No	23.35	7.17	14,416	0.84	2.88
Title I					
Yes	16.07	6.26	941	0.78	2.97
No	22.54	7.15	20,810	0.84	2.90
Accommodations					
Yes	16.93	6.62	151	0.80	2.96
No	22.29	7.23	21,600	0.84	2.90

Table 10.3: Alpha Coefficients and Standard Errors of Measurement, Algebra II, Summer 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	15.88	5.31	113	0.71	2.86
Gender					
Female	16.24	5.47	45	0.73	2.82
Male	15.63	5.22	68	0.70	2.88
Ethnicity					
Native American/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
Asian	N/A	N/A	N/A	N/A	N/A
Pacific Islander	N/A	N/A	N/A	N/A	N/A
Black (not Hispanic)	14.80	3.61	66	0.37	2.88
Hispanic	N/A	N/A	N/A	N/A	N/A
White (not Hispanic)	16.86	7.12	36	0.84	2.81
Multi-racial	N/A	N/A	N/A	N/A	N/A
LEP					
No	15.95	5.33	111	0.71	2.86
Yes	N/A	N/A	N/A	N/A	N/A
IEP					
No	16.17	5.34	103	0.71	2.86
Yes	N/A	N/A	N/A	N/A	N/A
Migrant					
No	15.88	5.31	113	0.71	2.86
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	16.10	5.62	72	0.74	2.85
Yes	15.49	4.75	41	0.63	2.87
Title I					
No	15.90	5.39	108	0.72	2.86
Yes	N/A	N/A	N/A	N/A	N/A
Accommodations					
No	15.88	5.31	113	0.71	2.86
Yes	N/A	N/A	N/A	N/A	N/A

Table 10.4: Alpha Coefficients and Standard Errors of Measurement, Algebra II, Fall 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	24.32	6.83	511	0.83	2.79
Gender					
Female	23.66	6.87	262	0.83	2.81
Male	25.00	6.74	249	0.83	2.75
Ethnicity					
Native American/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
Asian	N/A	N/A	N/A	N/A	N/A
Pacific Islander	N/A	N/A	N/A	N/A	N/A
Black (not Hispanic)	19.41	6.48	61	0.80	2.90
Hispanic	N/A	N/A	N/A	N/A	N/A
White (not Hispanic)	25.27	6.56	397	0.82	2.76
Multi-racial	N/A	N/A	N/A	N/A	N/A
LEP					
No	24.31	6.82	504	0.83	2.79
Yes	N/A	N/A	N/A	N/A	N/A
IEP					
No	24.42	6.80	498	0.83	2.79
Yes	N/A	N/A	N/A	N/A	N/A
Migrant					
No	24.32	6.83	511	0.83	2.79
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	25.31	6.55	395	0.82	2.76
Yes	20.93	6.70	116	0.82	2.87
Title I					
No	24.83	6.69	478	0.83	2.78
Yes	16.88	3.97	33	0.49	2.84
Accommodations					
No	24.36	6.80	506	0.83	2.79
Yes	N/A	N/A	N/A	N/A	N/A

Table 10.5: Alpha Coefficients and Standard Errors of Measurement, Algebra II, Spring 2011

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	23.29	6.38	22,506	0.81	2.80
Gender					
Female	22.78	6.19	12,134	0.79	2.82
Male	23.90	6.55	10,353	0.82	2.77
Ethnicity					
Native American/ Alaskan Native	22.27	6.15	105	0.79	2.83
Asian	24.78	6.71	329	0.83	2.77
Pacific Islander	N/A	N/A	N/A	N/A	N/A
Black (not Hispanic)	18.95	5.99	2,207	0.77	2.89
Hispanic	21.64	6.19	873	0.79	2.86
White (not Hispanic)	23.85	6.22	18,806	0.80	2.79
Multi-racial	24.36	6.51	142	0.82	2.78
LEP					
No	23.33	6.37	22,277	0.81	2.80
Yes	19.64	6.55	229	0.81	2.89
IEP					
No	23.40	6.33	21,964	0.81	2.80
Yes	18.64	6.64	542	0.81	2.88
Migrant					
No	23.29	6.38	22,493	0.81	2.80
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	24.12	6.30	15,154	0.81	2.77
Yes	21.57	6.21	7352	0.79	2.85
Title I					
No	23.50	6.33	21,170	0.81	2.79
Yes	19.94	6.34	1336	0.80	2.86
Accommodations					
No	23.32	6.37	22,362	0.81	2.80
Yes	18.37	6.01	144	0.77	2.88

Table 10.6: Alpha Coefficients and Standard Errors of Measurement, American History, Fall 2009

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	23.26	7.18	685	0.85	2.81
Gender					
Female	21.60	6.84	334	0.83	2.83
Male	24.83	7.15	351	0.85	2.78
Ethnicity					
White	23.54	7.14	567	0.85	2.81
Black	22.21	6.85	84	0.84	2.78
Hispanic	N/A	N/A	N/A	N/A	N/A
Asian	N/A	N/A	N/A	N/A	N/A
Native American	N/A	N/A	N/A	N/A	N/A
LEP					
Yes	N/A	N/A	N/A	N/A	N/A
No	23.39	7.10	672	0.84	2.80
IEP					
Yes	17.77	7.31	48	0.84	2.92
No	23.67	7.00	637	0.84	2.80
Migrant					
Yes	N/A	N/A	N/A	N/A	N/A
No	23.26	7.18	685	0.85	2.81
FRL					
Yes	20.57	7.14	230	0.84	2.87
No	24.62	6.81	455	0.83	2.78
Title I					
Yes	N/A	N/A	N/A	N/A	N/A
No	23.31	7.17	680	0.85	2.81
Accommodations					
Yes	N/A	N/A	N/A	N/A	N/A
No	23.47	7.11	663	0.84	2.81

Table 10.7: Alpha Coefficients and Standard Errors of Measurement, American History, Spring 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	22.46	7.23	32,524	0.83	2.96
Gender					
Female	21.58	6.96	16,209	0.82	2.99
Male	23.35	7.39	16,295	0.84	2.93
Ethnicity					
White	23.01	7.13	26,838	0.83	2.95
Black	19.39	7.00	3,820	0.81	3.03
Hispanic	20.21	7.35	1,198	0.83	3.01
Asian	22.84	7.66	475	0.85	2.93
Native American	21.80	6.58	167	0.79	3.01
LEP					
Yes	16.90	6.26	503	0.76	3.04
No	22.55	7.22	32,021	0.83	2.96
IEP					
Yes	17.46	7.03	2,207	0.81	3.02
No	22.83	7.11	30,317	0.83	2.96
Migrant					
Yes	N/A	N/A	N/A	N/A	N/A
No	22.47	7.23	32,495	0.83	2.96
FRL					
Yes	20.27	6.98	13,122	0.81	3.02
No	23.95	7.02	19,402	0.83	2.92
Title I					
Yes	17.14	6.45	1,459	0.78	3.01
No	22.71	7.17	31,065	0.83	2.96
Accommodations					
Yes	16.19	6.68	861	0.80	3.02
No	22.63	7.17	31,663	0.83	2.96

Table 10.8: Alpha Coefficients and Standard Errors of Measurement, American History, Summer 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	17.83	7.36	46	0.85	2.83
Gender					
Female	N/A	N/A	N/A	N/A	N/A
Male	N/A	N/A	N/A	N/A	N/A
Ethnicity					
Native American/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
Asian	N/A	N/A	N/A	N/A	N/A
Pacific Islander	N/A	N/A	N/A	N/A	N/A
Black (not Hispanic)	N/A	N/A	N/A	N/A	N/A
Hispanic	N/A	N/A	N/A	N/A	N/A
White (not Hispanic)	N/A	N/A	N/A	N/A	N/A
Multi-racial	N/A	N/A	N/A	N/A	N/A
LEP					
No	17.77	7.48	44	0.86	2.83
Yes	N/A	N/A	N/A	N/A	N/A
IEP					
No	18.31	7.46	42	0.86	2.83
Yes	N/A	N/A	N/A	N/A	N/A
Migrant					
No	17.83	7.36	46	0.85	2.83
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	N/A	N/A	N/A	N/A	N/A
Yes	N/A	N/A	N/A	N/A	N/A
Title I					
No	17.72	7.34	43	0.85	2.82
Yes	N/A	N/A	N/A	N/A	N/A
Accommodations					
No	17.83	7.36	46	0.85	2.83
Yes	N/A	N/A	N/A	N/A	N/A

Table 10.9: Alpha Coefficients and Standard Errors of Measurement, American History, Fall 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	23.06	6.39	652	0.81	2.79
Gender					
Female	22.04	6.29	312	0.80	2.82
Male	24.04	6.33	339	0.81	2.76
Ethnicity					
Native American/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
Asian	N/A	N/A	N/A	N/A	N/A
Pacific Islander	N/A	N/A	N/A	N/A	N/A
Black (not Hispanic)	19.65	6.11	93	0.78	2.88
Hispanic	N/A	N/A	N/A	N/A	N/A
White (not Hispanic)	23.62	6.21	499	0.80	2.78
Multi-racial	N/A	N/A	N/A	N/A	N/A
LEP					
No	23.13	6.36	642	0.81	2.79
Yes	N/A	N/A	N/A	N/A	N/A
IEP					
No	23.34	6.34	597	0.81	2.78
Yes	20.02	6.17	55	0.78	2.89
Migrant					
No	23.06	6.39	652	0.81	2.79
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	24.53	6.17	401	0.80	2.74
Yes	20.72	6.03	251	0.77	2.87
Title I					
No	23.07	6.39	650	0.81	2.79
Yes	N/A	N/A	N/A	N/A	N/A
Accommodations					
No	23.13	6.38	632	0.81	2.79
Yes	N/A	N/A	N/A	N/A	N/A

Table 10.10: Alpha Coefficients and Standard Errors of Measurement, American History, Spring 2011

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	23.13	6.26	34,778	0.80	2.79
Gender					
Female	22.50	6.14	17,515	0.79	2.80
Male	23.78	6.32	17,233	0.81	2.76
Ethnicity					
Native American/ Alaskan Native	21.93	6.50	188	0.81	2.81
Asian	23.68	7.03	473	0.85	2.73
Pacific Islander	22.07	6.77	41	0.83	2.82
Black (not Hispanic)	20.06	6.24	4,130	0.79	2.87
Hispanic	21.35	6.43	1,331	0.81	2.83
White (not Hispanic)	23.66	6.09	28,061	0.79	2.76
Multi-racial	23.60	6.31	520	0.81	2.75
LEP					
No	23.21	6.22	34,315	0.80	2.78
Yes	17.19	6.37	463	0.80	2.88
IEP					
No	23.42	6.13	32,703	0.80	2.78
Yes	18.57	6.51	2,075	0.80	2.89
Migrant					
No	23.13	6.26	34,752	0.80	2.79
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	24.41	5.95	20,568	0.79	2.74
Yes	21.27	6.23	14,210	0.79	2.84
Title I					
No	23.32	6.18	32,677	0.80	2.78
Yes	20.22	6.72	2,101	0.82	2.86
Accommodations					
No	23.23	6.22	34,103	0.80	2.78
Yes	18.03	6.15	675	0.78	2.90

Table 10.11: Alpha Coefficients and Standard Errors of Measurement, English I, Fall 2009

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	23.61	7.55	310	0.86	2.80
Gender					
Female	25.09	7.70	141	0.87	2.75
Male	22.38	7.23	169	0.85	2.83
Ethnicity					
White	24.16	7.57	256	0.86	2.78
Black	N/A	N/A	N/A	N/A	N/A
Hispanic	N/A	N/A	N/A	N/A	N/A
Asian	N/A	N/A	N/A	N/A	N/A
Native American	N/A	N/A	N/A	N/A	N/A
LEP					
Yes	N/A	N/A	N/A	N/A	N/A
No	23.82	7.54	300	0.86	2.79
IEP					
Yes	18.00	7.05	39	0.83	2.94
No	24.42	7.29	271	0.85	2.78
Migrant					
Yes	N/A	N/A	N/A	N/A	N/A
No	23.61	7.57	309	0.86	2.80
FRL					
Yes	21.70	6.93	126	0.83	2.85
No	24.92	7.70	184	0.87	2.76
Title I					
Yes	N/A	N/A	N/A	N/A	N/A
No	23.68	7.53	308	0.86	2.80
Accommodations					
Yes	N/A	N/A	N/A	N/A	N/A
No	24.16	7.41	290	0.86	2.79

Table 10.12: Alpha Coefficients and Standard Errors of Measurement, English I, Spring 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	24.99	7.33	42,153	0.85	2.81
Gender					
Female	25.67	7.15	20,730	0.85	2.78
Male	24.35	7.44	21,410	0.85	2.83
Ethnicity					
White	25.65	7.14	34,827	0.85	2.79
Black	21.07	7.14	4,936	0.83	2.93
Hispanic	22.72	7.50	1,515	0.85	2.90
Asian	25.50	7.68	632	0.87	2.76
Native American	24.66	7.44	221	0.86	2.79
LEP					
Yes	18.52	6.64	546	0.80	2.97
No	25.08	7.30	41,607	0.85	2.81
IEP					
Yes	17.11	6.71	3,755	0.80	2.97
No	25.77	6.92	38,398	0.84	2.79
Migrant					
Yes	19.97	6.22	39	0.76	3.05
No	25.00	7.33	42,114	0.85	2.81
FRL					
Yes	22.60	7.27	17,460	0.84	2.90
No	26.69	6.88	24,693	0.84	2.74
Title I					
Yes	20.88	7.20	1,572	0.83	2.93
No	25.15	7.29	40,581	0.85	2.80
Accommodations					
Yes	16.31	6.44	1,960	0.79	2.97
No	25.42	7.10	40,193	0.84	2.80

Table 10.13: Alpha Coefficients and Standard Errors of Measurement, English I, Summer 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	21.52	6.73	196	0.82	2.84
Gender					
Female	22.10	6.92	83	0.83	2.82
Male	21.10	6.59	113	0.81	2.87
Ethnicity					
Native American/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
Asian	N/A	N/A	N/A	N/A	N/A
Pacific Islander	N/A	N/A	N/A	N/A	N/A
Black (not Hispanic)	20.68	6.31	104	0.79	2.87
Hispanic	N/A	N/A	N/A	N/A	N/A
White (not Hispanic)	22.47	7.34	83	0.85	2.81
Multi-racial	N/A	N/A	N/A	N/A	N/A
LEP					
No	21.52	6.77	194	0.82	2.85
Yes	N/A	N/A	N/A	N/A	N/A
IEP					
No	22.14	6.49	172	0.81	2.85
Yes	N/A	N/A	N/A	N/A	N/A
Migrant					
No	21.52	6.73	196	0.82	2.84
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	22.57	6.78	94	0.83	2.82
Yes	20.55	6.57	102	0.81	2.87
Title I					
No	21.45	6.70	193	0.82	2.85
Yes	N/A	N/A	N/A	N/A	N/A
Accommodations					
No	21.51	6.65	194	0.82	2.85
Yes	N/A	N/A	N/A	N/A	N/A

Table 10.14: Alpha Coefficients and Standard Errors of Measurement, English I, Fall 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	25.78	8.15	327	0.89	2.65
Gender					
Female	26.83	7.41	129	0.87	2.63
Male	25.33	8.33	195	0.90	2.65
Ethnicity					
Native American/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
Asian	N/A	N/A	N/A	N/A	N/A
Pacific Islander	N/A	N/A	N/A	N/A	N/A
Black (not Hispanic)	20.12	8.21	49	0.88	2.82
Hispanic	N/A	N/A	N/A	N/A	N/A
White (not Hispanic)	26.91	7.52	249	0.88	2.61
Multi-racial	N/A	N/A	N/A	N/A	N/A
LEP					
No	25.82	8.15	325	0.90	2.64
Yes	N/A	N/A	N/A	N/A	N/A
IEP					
No	26.23	8.00	297	0.89	2.63
Yes	21.30	8.36	30	0.89	2.78
Migrant					
No	25.78	8.15	327	0.89	2.65
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	27.36	8.09	205	0.90	2.55
Yes	23.12	7.55	122	0.86	2.81
Title I					
No	25.94	8.05	317	0.89	2.64
Yes	N/A	N/A	N/A	N/A	N/A
Accommodations					
No	25.95	8.15	307	0.90	2.63
Yes	N/A	N/A	N/A	N/A	N/A

Table 10.15: Alpha Coefficients and Standard Errors of Measurement, English I, Spring 2011

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	25.19	6.96	42,171	0.84	2.77
Gender					
Female	26.01	6.77	20,987	0.84	2.73
Male	24.39	7.04	21,137	0.84	2.80
Ethnicity					
Native American/ Alaskan Native	23.87	6.59	230	0.82	2.82
Asian	25.95	6.61	551	0.83	2.74
Pacific Islander	22.89	7.45	46	0.85	2.84
Black (not Hispanic)	21.68	7.04	4,773	0.83	2.87
Hispanic	23.57	6.75	1,558	0.82	2.84
White (not Hispanic)	25.76	6.80	34,323	0.84	2.75
Multi-racial	25.40	7.07	639	0.85	2.75
LEP					
No	25.27	6.94	41,607	0.84	2.77
Yes	19.68	6.41	564	0.79	2.92
IEP					
No	25.88	6.54	38,752	0.82	2.75
Yes	17.44	6.89	3,419	0.82	2.90
Migrant					
No	25.20	6.96	42,150	0.84	2.76
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	26.88	6.42	24,113	0.82	2.70
Yes	22.94	7.02	18,058	0.84	2.84
Title I					
No	25.32	6.91	39,937	0.84	2.76
Yes	22.99	7.50	2,234	0.86	2.81
Accommodations					
No	25.59	6.71	40,360	0.83	2.76
Yes	16.36	6.45	1,811	0.80	2.90

Table 10.16: Alpha Coefficients and Standard Errors of Measurement, Geometry, Fall 2009

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	27.06	7.54	587	0.88	2.66
Gender					
Female	26.14	7.56	305	0.87	2.71
Male	28.05	7.41	282	0.88	2.61
Ethnicity					
White	27.42	7.50	492	0.88	2.64
Black	24.47	6.56	51	0.81	2.86
Hispanic	N/A	N/A	N/A	N/A	N/A
Asian	N/A	N/A	N/A	N/A	N/A
Native American	N/A	N/A	N/A	N/A	N/A
LEP					
Yes	N/A	N/A	N/A	N/A	N/A
No	27.05	7.55	585	0.88	2.66
IEP					
Yes	N/A	N/A	N/A	N/A	N/A
No	27.21	7.44	569	0.87	2.66
Migrant					
Yes	N/A	N/A	N/A	N/A	N/A
No	27.06	7.54	587	0.88	2.66
FRL					
Yes	23.67	7.66	141	0.86	2.82
No	28.13	7.19	446	0.87	2.61
Title I					
Yes	N/A	N/A	N/A	N/A	N/A
No	27.04	7.54	586	0.88	2.67
Accommodations					
Yes	N/A	N/A	N/A	N/A	N/A
No	27.15	7.48	579	0.87	2.66

Table 10.17: Alpha Coefficients and Standard Errors of Measurement, Geometry, Spring 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	23.70	7.39	26,749	0.86	2.77
Gender					
Female	23.14	7.28	13,974	0.85	2.80
Male	24.32	7.46	12,771	0.87	2.73
Ethnicity					
White	24.85	7.00	20,884	0.85	2.74
Black	18.33	6.67	4,224	0.81	2.87
Hispanic	21.44	7.20	1,048	0.84	2.84
Asian	26.13	7.99	435	0.89	2.67
Native American	23.15	7.64	150	0.87	2.78
LEP					
Yes	18.37	6.84	396	0.82	2.91
No	23.78	7.37	26,353	0.86	2.76
IEP					
Yes	17.71	7.04	1,209	0.84	2.85
No	23.98	7.29	25,540	0.86	2.76
Migrant					
Yes	N/A	N/A	N/A	N/A	N/A
No	23.70	7.39	26,735	0.86	2.77
FRL					
Yes	21.54	7.27	10,168	0.85	2.83
No	25.02	7.15	16,581	0.85	2.73
Title I					
Yes	17.67	7.08	1,142	0.84	2.86
No	23.97	7.29	25,607	0.86	2.76
Accommodations					
Yes	17.76	6.77	360	0.82	2.86
No	23.78	7.37	26,389	0.86	2.76

Table 10.18: Alpha Coefficients and Standard Errors of Measurement, Geometry, Summer 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	18.33	5.53	229	0.72	2.92
Gender					
Female	17.69	5.12	115	0.67	2.94
Male	18.97	5.87	114	0.76	2.90
Ethnicity					
Native American/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
Asian	N/A	N/A	N/A	N/A	N/A
Pacific Islander	N/A	N/A	N/A	N/A	N/A
Black (not Hispanic)	16.89	4.49	131	0.57	2.93
Hispanic	N/A	N/A	N/A	N/A	N/A
White (not Hispanic)	20.09	6.53	76	0.80	2.90
Multi-racial	N/A	N/A	N/A	N/A	N/A
LEP					
No	18.36	5.52	227	0.72	2.92
Yes	N/A	N/A	N/A	N/A	N/A
IEP					
No	18.61	5.52	215	0.72	2.92
Yes	N/A	N/A	N/A	N/A	N/A
Migrant					
No	18.33	5.53	229	0.72	2.92
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	18.82	5.60	121	0.73	2.91
Yes	17.78	5.44	108	0.71	2.93
Title I					
No	17.91	5.14	201	0.68	2.93
Yes	N/A	N/A	N/A	N/A	N/A
Accommodations					
No	18.41	5.50	227	0.72	2.92
Yes	N/A	N/A	N/A	N/A	N/A

Table 10.19: Alpha Coefficients and Standard Errors of Measurement, Geometry, Fall 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	24.01	7.19	878	0.86	2.71
Gender					
Female	23.61	7.26	471	0.86	2.73
Male	24.56	7.01	404	0.85	2.69
Ethnicity					
Native American/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
Asian	N/A	N/A	N/A	N/A	N/A
Pacific Islander	N/A	N/A	N/A	N/A	N/A
Black (not Hispanic)	19.05	7.11	132	0.84	2.84
Hispanic	22.79	6.04	62	0.78	2.83
White (not Hispanic)	25.10	6.82	641	0.85	2.67
Multi-racial	N/A	N/A	N/A	N/A	N/A
LEP					
No	24.04	7.21	858	0.86	2.71
Yes	N/A	N/A	N/A	N/A	N/A
IEP					
No	24.26	7.13	839	0.86	2.70
Yes	18.79	6.63	39	0.82	2.83
Migrant					
No	24.01	7.19	878	0.86	2.71
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	25.57	6.63	591	0.84	2.66
Yes	20.80	7.26	287	0.85	2.81
Title I					
No	24.43	7.11	821	0.86	2.69
Yes	18.00	5.56	57	0.72	2.96
Accommodations					
No	24.08	7.18	861	0.86	2.71
Yes	N/A	N/A	N/A	N/A	N/A

Table 10.20: Alpha Coefficients and Standard Errors of Measurement, Geometry, Spring 2011

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	23.28	6.50	26,088	0.82	2.79
Gender					
Female	22.70	6.39	13,349	0.81	2.82
Male	23.90	6.55	12,716	0.82	2.77
Ethnicity					
Native American/ Alaskan Native	22.67	5.88	148	0.77	2.84
Asian	25.41	7.05	392	0.85	2.69
Pacific Islander	19.69	5.81	35	0.75	2.90
Black (not Hispanic)	18.72	6.25	3,045	0.79	2.89
Hispanic	20.88	6.41	1,021	0.80	2.86
White (not Hispanic)	24.02	6.23	21,178	0.80	2.78
Multi-racial	23.68	6.06	243	0.78	2.83
LEP					
No	23.35	6.47	25,742	0.81	2.79
Yes	18.27	6.50	346	0.80	2.88
IEP					
No	23.47	6.41	25,182	0.81	2.79
Yes	18.04	6.80	906	0.82	2.86
Migrant					
No	23.28	6.50	26,074	0.82	2.79
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	24.36	6.31	16,459	0.81	2.76
Yes	21.44	6.40	9,629	0.80	2.85
Title I					
No	23.50	6.42	24,520	0.81	2.79
Yes	19.85	6.70	1,568	0.82	2.87
Accommodations					
No	23.33	6.47	25,845	0.81	2.79
Yes	17.96	7.05	243	0.84	2.83

Table 10.21: Alpha Coefficients and Standard Errors of Measurement, Government, Fall 2009

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	24.36	7.74	20,891	0.86	2.86
Gender					
Female	23.66	7.50	10,356	0.85	2.90
Male	25.05	7.90	10,507	0.87	2.83
Ethnicity					
White	25.98	7.35	14,635	0.85	2.81
Black	19.66	6.72	4,842	0.80	3.00
Hispanic	21.66	7.33	721	0.84	2.95
Asian	27.41	8.45	505	0.90	2.64
Native American	22.52	6.80	130	0.81	2.95
LEP					
Yes	18.63	6.91	421	0.82	2.96
No	24.47	7.71	20,470	0.86	2.86
IEP					
Yes	18.48	7.08	1,872	0.82	2.98
No	24.93	7.56	19,019	0.86	2.85
Migrant					
Yes	N/A	N/A	N/A	N/A	N/A
No	24.36	7.74	20,881	0.86	2.86
FRL					
Yes	21.02	7.03	8,559	0.82	2.98
No	26.67	7.36	12,332	0.86	2.77
Title I					
Yes	19.03	7.01	821	0.82	2.99
No	24.57	7.69	20,070	0.86	2.86
Accommodations					
Yes	17.88	6.81	726	0.81	2.99
No	24.59	7.67	20,165	0.86	2.86

Table 10.22: Alpha Coefficients and Standard Errors of Measurement, Government, Spring 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	24.37	7.87	36,782	0.87	2.84
Gender					
Female	23.80	7.76	18,210	0.86	2.87
Male	24.94	7.93	18,550	0.87	2.81
Ethnicity					
White	25.15	7.68	30,589	0.87	2.81
Black	19.48	7.21	4,263	0.83	3.00
Hispanic	21.60	7.69	1,106	0.85	2.94
Asian	24.88	8.43	597	0.89	2.81
Native American	24.13	7.81	207	0.87	2.84
LEP					
Yes	17.45	6.46	467	0.78	3.03
No	24.46	7.85	36,315	0.87	2.84
IEP					
Yes	18.07	7.40	2,768	0.84	2.98
No	24.88	7.68	34,014	0.86	2.83
Migrant					
Yes	N/A	N/A	N/A	N/A	N/A
No	24.38	7.87	36,759	0.87	2.84
FRL					
Yes	21.34	7.49	13,064	0.84	2.96
No	26.04	7.57	23,718	0.87	2.77
Title I					
Yes	18.40	7.25	1,138	0.83	2.99
No	24.56	7.81	35,644	0.87	2.83
Accommodations					
Yes	17.41	7.10	1,043	0.82	2.98
No	24.57	7.80	35,739	0.87	2.84

Table 10.23: Alpha Coefficients and Standard Errors of Measurement, Government, Summer 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	23.38	8.73	881	0.90	2.75
Gender					
Female	23.59	8.50	421	0.89	2.77
Male	23.51	8.85	445	0.90	2.74
Ethnicity					
Native American/ Alaskan Native	N/A	N/A	N/A	N/A	N/A
Asian	27.00	9.09	30	0.92	2.57
Pacific Islander	N/A	N/A	N/A	N/A	N/A
Black (not Hispanic)	19.31	7.49	261	0.85	2.88
Hispanic	25.19	9.36	31	0.92	2.63
White (not Hispanic)	26.03	8.14	493	0.89	2.68
Multi-racial	N/A	N/A	N/A	N/A	N/A
LEP					
No	23.46	8.73	871	0.90	2.75
Yes	N/A	N/A	N/A	N/A	N/A
IEP					
No	23.91	8.76	799	0.90	2.73
Yes	18.26	6.60	82	0.80	2.92
Migrant					
No	23.41	8.73	879	0.90	2.75
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	25.28	8.90	568	0.91	2.67
Yes	19.93	7.25	313	0.84	2.89
Title I					
No	23.59	8.69	858	0.90	2.75
Yes	N/A	N/A	N/A	N/A	N/A
Accommodations					
No	23.46	8.74	864	0.90	2.75
Yes	N/A	N/A	N/A	N/A	N/A

Table 10.24: Alpha Coefficients and Standard Errors of Measurement, Government, Fall 2010

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	24.04	6.77	17,589	0.83	2.76
Gender					
Female	23.51	6.62	8,784	0.82	2.79
Male	24.59	6.87	8,751	0.84	2.73
Ethnicity					
Native American/ Alaskan Native	24.51	6.24	94	0.81	2.73
Asian	25.55	7.30	431	0.86	2.69
Pacific Islander	N/A	N/A	N/A	N/A	N/A
Black (not Hispanic)	19.79	6.38	3,085	0.80	2.87
Hispanic	22.25	6.66	658	0.82	2.82
White (not Hispanic)	25.09	6.43	13,071	0.82	2.73
Multi-racial	24.44	6.55	155	0.82	2.75
LEP					
No	24.15	6.74	17,231	0.83	2.76
Yes	18.75	5.77	358	0.75	2.91
IEP					
No	24.46	6.62	16,178	0.83	2.74
Yes	19.19	6.62	1,411	0.81	2.89
Migrant					
No	24.04	6.77	17,578	0.83	2.76
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	25.88	6.39	10,352	0.82	2.70
Yes	21.40	6.41	7,237	0.80	2.85
Title I					
No	24.43	6.64	15,980	0.83	2.75
Yes	20.15	6.79	1,609	0.82	2.86
Accommodations					
No	24.20	6.72	17,092	0.83	2.75
Yes	18.40	6.14	497	0.78	2.90

Table 10.25 Alpha Coefficients and Standard Errors of Measurement, Government, Spring 2011

Group	Mean Raw Score	*SD* Raw Score	*N* Count	Reliability	*SEM*
All Students	25.24	6.94	39,907	0.85	2.65
Gender					
Female	24.87	6.71	19,747	0.84	2.67
Male	25.62	7.13	20,074	0.86	2.64
Ethnicity					
Native American/ Alaskan Native	23.87	6.44	183	0.82	2.72
Asian	26.81	7.15	587	0.87	2.57
Pacific Islander	24.19	6.94	32	0.85	2.71
Black (not Hispanic)	20.63	6.45	5,456	0.81	2.82
Hispanic	23.74	6.77	1,342	0.84	2.72
White (not Hispanic)	26.10	6.69	31,687	0.85	2.62
Multi-racial	25.06	6.56	430	0.83	2.69
LEP					
No	25.30	6.92	39,428	0.85	2.65
Yes	19.94	6.45	479	0.81	2.83
IEP					
No	25.72	6.72	36,891	0.85	2.64
Yes	19.38	6.86	3,016	0.83	2.84
Migrant					
No	25.24	6.94	39,892	0.85	2.65
Yes	N/A	N/A	N/A	N/A	N/A
FRL					
No	26.86	6.53	24,740	0.84	2.58
Yes	22.59	6.76	15,167	0.83	2.76
Title I					
No	25.54	6.84	37,399	0.85	2.64
Yes	20.68	6.81	2,508	0.83	2.81
Accommodations					
No	25.41	6.86	38,875	0.85	2.65
Yes	18.80	6.56	1,032	0.81	2.85

10.4 Conditional Standard Error Estimates for Scale Scores

The overall *SEM* in Tables 10.1 to 10.25 represents the *SD* of projected replications of the testing procedure averaged over all students. In contrast, conditional standard errors of measurement (*CSEM*s) are conditioned on the ability of the student. Rasch-based *CSEM*s ($CSEM(\theta)$) for each scale score are defined as the reciprocal of the square root of the test information function ($I(\theta)$) at the point on the ability continuum that corresponds to each scale score (Hambleton and Swaminathan 1985):

$$CSEM(\theta) = \frac{1}{\sqrt{I(\theta)}}.$$

*CSEM*s are especially useful for characterizing measurement precision in the neighborhood of score levels used for decision making, such as cut scores at various achievement levels. The *CSEM*s for the Proficient cut scores for the MO EOC Assessments are presented in Table 10.26. *CSEM*s for other scale scores are reported in Chapter 7 of this technical report. Note that *CSEM*s are smaller in the middle of the score distribution than at the extremes. This pattern is expected for item response theory (IRT)-based *CSEM*s. The value for all *CSEM*s was between 7 and 9 scale-score points..

Table 10.26: *CSEM*s at the Proficient Cut Score

Test Event	Subject	SS Cut*	*CSEM*
Fall 2009	English I	200	8
	Algebra II	200	7
	Geometry	200	7
	Government	200	7
	U. S. History	200	9
Spring 2010	English I	200	8
	Algebra II	200	7
	Geometry	200	8
	Government	200	7
	U. S. History	200	9
Summer 2010	English I	200	8
	Algebra II	200	7
	Geometry	200	7
	Government	200	6
	U. S. History	200	9
Fall 2010	English I	200	8
	Algebra II	200	7
	Geometry	200	8
	Government	200	7
	U. S. History	200	9
Spring 2011	English I	200	8
	Algebra II	200	7
	Geometry	200	8
	Government	200	7
	U. S. History	200	9

* See Tables 7.48 through 7.62 in Chapter 7 for the *CSEM* at each scale score.

10.5 Reliability of Classifications

The reliability of student achievement-level classifications (i.e., Below Basic, Basic, Proficient, and Advanced) was evaluated using a computer program developed by Huynh

(1979). This FORTRAN program is based on the beta-binomial model that also provides standard errors (*SE*s) for the consistency estimates. Classification consistency refers to the degree to which each student's achievement level can be replicated and is similar to the traditional test-retest or equivalent forms reliability. Using the maximum possible score, mean, *SD*, and KR-21 reliability estimate, the program computes parameters (α, β) for the beta-binomial distribution. Kappa indices, which estimate the level of improvement in decision consistency beyond chance when test data are used, are then computed (Huynh 1979).

Tables 10.27 and 10.28 show the results of the classification and decision consistency analyses for the operational test administrations for the five MO EOC Assessments. As noted above, the raw agreement index is a classification consistency index that estimates the percentage of examinees who would (hypothetically) be assigned to the same achievement level if the same test was administered a second time or an equivalent test was administered under the same conditions. The agreement consistency indices (p) for the EOC Assessments were generally in the low to mid 60s. These values reflect classification agreement consistency for the four performance categories: Below Basic, Basic, Proficient, and Advanced. Had a student been regarded as "pass" if his or her achievement level was Proficient or Advanced and as "fail" if his or her achievement level was Below Basic or Basic, the agreement consistency indices would have been 15 to 20 percent higher, as indicated in Tables 10.29 and 10.30.

Table 10.27: Classification Consistency Coefficients

Year	*N* (Items)	Raw Cut Scores			Mean	*SD*	*Kappa*	*SE* (κ)
		Basic	Proficient	Advanced				
Fall 2009								
English I	40	16	25	33	23.46	7.56	0.49	0.0139
Algebra II	40	16	24	33	24.12	7.34	0.48	0.0110
Geometry	40	17	24	32	27.00	7.56	0.51	0.0102
Government	40	15	25	34	24.30	7.75	0.52	0.0016
Am. History	40	19	25	32	23.20	7.19	0.45	0.0104
Spring 2010								
English I	40	16	25	33	24.98	7.33	0.48	0.0012
Algebra II	40	16	24	33	22.24	7.24	0.47	0.0017
Geometry	40	17	24	32	23.69	7.39	0.47	0.0016
Government	40	15	25	34	24.36	7.87	0.52	0.0012
Am. History	40	19	25	32	22.45	7.24	0.45	0.0015
Summer 2010								
English I	40	15	24	32	21.52	6.73	0.44	0.0185
Algebra II	40	14	22	32	15.88	5.31	0.37	0.0346
Geometry	40	17	24	32	18.33	5.53	0.37	0.0213
Government	40	15	25	34	23.38	8.73	0.56	0.0074
Am. History	40	18	24	31	17.83	7.36	0.48	0.0325
Fall 2010								
English I	40	15	25	33	25.78	8.15	0.54	0.0128
Algebra II	40	15	23	32	24.32	6.83	0.45	0.0116
Geometry	40	17	23	31	24.01	7.19	0.45	0.0095
Government	40	15	24	33	24.04	6.77	0.45	0.0018
Am. History	40	19	24	31	23.06	6.39	0.38	0.0118
Spring 2011								
English I	40	16	25	32	25.19	6.96	0.46	0.0013
Algebra II	40	15	23	32	23.29	6.38	0.42	0.0017
Geometry	40	17	24	32	23.28	6.50	0.41	0.0017
Government	40	15	24	33	25.24	6.90	0.47	0.0013
Am. History	40	19	24	31	23.13	6.26	0.38	0.0016

Table 10.28: Raw Agreement Consistency Coefficients

Year	*N* (Items)	Raw Cut Scores			Mean	*SD*	*p*	*SE* (*p*)
		Basic	Proficient	Advanced				
Fall 2009								
English I	40	16	25	33	23.46	7.56	0.64	0.0055
Algebra II	40	16	24	33	24.12	7.34	0.64	0.0039
Geometry	40	17	24	32	27.00	7.56	0.66	0.0064
Government	40	15	25	34	24.30	7.75	0.67	0.0005
Am. History	40	19	25	32	23.20	7.19	0.60	0.0063
Spring 2010								
English I	40	16	25	33	24.98	7.33	0.64	0.0005
Algebra II	40	16	24	33	22.24	7.24	0.63	0.0006
Geometry	40	17	24	32	23.69	7.39	0.62	0.0008
Government	40	15	25	34	24.36	7.87	0.67	0.0004
Am. History	40	19	25	32	22.45	7.24	0.60	0.0010
Summer 2010								
English I	40	15	24	32	21.52	6.73	0.62	0.0051
Algebra II	40	14	22	32	15.88	5.31	0.62	0.0124
Geometry	40	17	24	32	18.33	5.53	0.60	0.0109
Government	40	15	25	34	23.38	8.73	0.69	0.0033
Am. History	40	18	24	31	17.83	7.36	0.66	0.0325
Fall 2010								
English I	40	15	25	33	25.78	8.15	0.67	0.0065
Algebra II	40	15	23	32	24.32	6.83	0.63	0.0033
Geometry	40	17	23	31	24.01	7.19	0.61	0.0049
Government	40	15	24	33	24.04	6.77	0.64	0.0004
Am. History	40	19	24	31	23.06	6.39	0.56	0.0065
Spring 2011								
English I	40	16	25	32	25.19	6.96	0.62	0.0006
Algebra II	40	15	23	32	23.29	6.38	0.62	0.0004
Geometry	40	17	24	32	23.28	6.50	0.59	0.0006
Government	40	15	24	33	25.24	6.90	0.65	0.0013
Am. History	40	19	24	31	23.13	6.26	0.55	0.0009

Table 10.29: Classification Consistency Coefficients (Two Classification Categories)

Year	*N* (Items)	Raw Cut Scores	Mean	*SD*	*Kappa*	*SE* (κ)
		Proficient/ Advanced				
Fall 2009						
English I	40	25	23.46	7.56	0.66	0.0145
Algebra II	40	24	24.12	7.34	0.65	0.0117
Geometry	40	24	27.00	7.56	0.68	0.0109
Government	40	25	24.30	7.75	0.68	0.0017
Am. History	40	25	23.20	7.19	0.64	0.0105
Spring 2010						
English I	40	25	24.98	7.33	0.66	0.0013
Algebra II	40	24	22.24	7.24	0.64	0.0019
Geometry	40	24	23.69	7.39	0.65	0.0016
Government	40	25	24.36	7.87	0.68	0.0013
Am. History	40	25	22.45	7.24	0.63	0.0016
Summer 2010						
English I	40	24	21.52	6.73	0.60	0.0223
Algebra II	40	22	15.88	5.31	0.42	0.0477
Geometry	40	24	18.33	5.53	0.45	0.0314
Government	40	25	23.38	8.73	0.72	0.0072
Am. History	40	24	17.83	7.36	0.62	0.0477
Fall 2010						
English I	40	25	25.78	8.15	0.71	0.0127
Algebra II	40	23	24.32	6.83	0.62	0.0132
Geometry	40	23	24.01	7.19	0.64	0.0094
Government	40	24	24.04	6.77	0.61	0.0022
Am. History	40	24	23.06	6.39	0.58	0.0126
Spring 2011						
English I	40	25	25.19	6.96	0.63	0.0014
Algebra II	40	23	23.29	6.38	0.58	0.0022
Geometry	40	24	23.28	6.50	0.59	0.0020
Government	40	24	25.24	6.90	0.63	0.0015
Am. History	40	24	23.13	6.26	0.57	0.0018

Table 10.30: Raw Agreement Consistency Coefficients (Two Classification Categories)

Year	*N* (Items)	Raw Cut Scores: Proficient/ Advanced	Mean	*SD*	*p*	*SE* (*p*)
Summer 2009						
English I	40	25	23.46	7.56	0.83	0.0072
Algebra II	40	24	24.12	7.34	0.83	0.0058
Geometry	40	24	27.00	7.56	0.86	0.0044
Government	40	25	24.30	7.75	0.84	0.0009
Am. History	40	25	23.20	7.19	0.82	0.0052
Spring 2010						
English I	40	25	24.98	7.33	0.83	0.0006
Algebra II	40	24	22.24	7.24	0.82	0.0009
Geometry	40	24	23.69	7.39	0.83	0.0008
Government	40	25	24.36	7.87	0.84	0.0006
Am. History	40	25	22.45	7.24	0.82	0.0007
Summer 2010						
English I	40	24	21.52	6.73	0.81	0.0104
Algebra II	40	22	15.88	5.31	0.85	0.0153
Geometry	40	24	18.33	5.53	0.84	0.0105
Government	40	25	23.38	8.73	0.86	0.0036
Am. History	40	24	17.83	7.36	0.86	0.0164
Fall 2010						
English I	40	25	25.78	8.15	0.86	0.0061
Algebra II	40	23	24.32	6.83	0.82	0.0061
Geometry	40	23	24.01	7.19	0.83	0.0045
Government	40	24	24.04	6.77	0.81	0.0011
Am. History	40	24	23.06	6.39	0.79	0.0063
Spring 2011						
English I	40	25	25.19	6.96	0.82	0.0007
Algebra II	40	23	23.29	6.38	0.79	0.0011
Geometry	40	24	23.28	6.50	0.79	0.0010
Government	40	24	25.24	6.90	0.82	0.0007
Am. History	40	24	23.13	6.26	0.78	0.0009

CHAPTER 11: VALIDITY

11.1 Introduction

According to the Standards (AERA, APA, and 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 program. 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" (p. 17). While this chapter summarizes evidence that supports claims about the validity of Missouri End-of-Course (MO EOC) Assessment scores, many other parts of this technical report also provide appropriate evidence for validity. Some of this evidence is cross-referenced below for added convenience. The procedural and empirical evidence available, along with the rationale presented below, provides support for the standards-based interpretations of the MO EOC Assessments.

This chapter begins with a brief review of important federal statutes related to the the Phase II MO EOC Assessments and explains the purposes and intended uses of test scores, suggesting the value implications of these assessments for schools, teachers, students, and parents. Validity evidence related to test content is presented in terms of the adequacy and appropriateness of the EOC Assessments for measuring progress on the Missouri content standards. Then, validity evidence based on the internal structure of the MO EOC Assessments is provided through a correlational analysis of MO EOC Assessment content clusters. References to specific standards are provided where appropriate.

11.2 Purpose and Intended Uses of Test Scores

The *Standards* state that "Validation logically begins with an explicit statement of the proposed interpretation of the test scores, along with a rationale for the relevance of the interpretation to the proposed use" (AERA, APA, and NCME 1999).[9] The MO EOC Assessments were developed for the following purposes and uses:

- Measuring and reflecting students' mastery toward post-secondary readiness
- Identifying students' strengths and weaknesses
- Communicating expectations for all students
- Serving as the basis for state and national accountability plans
- Evaluating programs

The valid interpretation and appropriate use of MO EOC Assessment scores are supported in a variety of ways, including the training and consultation provided by personnel of the Missouri Department of Elementary and Secondary Education (DESE) and publications such as the *Test Examiner's Manual*, *Guide to Interpreting Results*, and this technical report. The training and documentation provided to test users help them better administer, understand, and use test score results.

[9] **Standard 1.2:** The test developer should set forth clearly how test scores are intended to be interpreted and used. The population(s) for which a test is appropriate should be clearly delimited, and the construct that the test is intended to assess should be clearly described (p. 17).

11.3 MO EOC Assessment Scores

The MO EOC Assessment scores are scaled in several ways: raw-score points, item response theory (IRT)-derived scale scores, and achievement level (based on scale-score cuts). Missouri actively promotes the use of achievement-level results, reporting them annually on each assessment at the student, school, district, and state levels. Individual student and average scale scores are also used, but they play a secondary role and are generally interpreted with reference to their distance from achievement-level cut points. Test results are reported for students as a whole as well as by student group, including gender, ethnicity, migrant status, free and reduced lunch (FRL) status, English language proficiency, Title I, Individualized Education Program (IEP) status, and accommodations used during testing. Scores are reported to schools and districts in annually published reports (for more information, see Chapter 8: Reporting).

The MO EOC Assessment score indicates that an individual student performs at the Below Basic, Basic, Proficient, or Advanced level in a given content area. Achievement-level descriptors provide details about the content expectations that students at each level meet or exceed. No stakes for teachers are attached to student-level scores by the state. Teachers are counseled to interpret individual student scores only in the context of other assessment results and their own experience.

11.4 Content-Related Evidence of Validity

Baker and Linn (2002) suggest that "Two questions are central in the evaluation of content aspects of validity. Is the definition of the content domain to be assessed adequate and appropriate? Does the test provide an adequate representation of the content domain the test is intended to measure?" (p. 6). The following sections help answer these two very important questions and also address Standard 1.6[10] of the Standards (AERA, APA, and NCME 1999), which specifically relates to the definition and development of test content.

11.4.1 Appropriateness of Content Definition

In 1993, the Missouri legislature passed the Outstanding Schools Act (Senate Bill 380), requiring the Missouri State Board of Education to adopt challenging academic performance standards that define the skills and competencies necessary for students to successfully advance through the public school system, prepare for post-secondary education and the workplace, and participate as citizens in a democratic society. The State Board of Education formally adopted the academic standards known as the Show-Me Standards in January 1996.

In addition to mandating the development of rigorous academic standards, the Outstanding Schools Act of 1993 required the development and implementation of a comprehensive, primarily performance-based assessment program to measure student

[10] **Standard 1.6:** When the validation rests in part on the appropriateness of test content, the procedures followed in specifying and generating test content should be described and justified in reference to the construct the test is intended to measure or the domain it is intended to represent. If the definition of the content sampled incorporates criteria such as importance, frequency, or criticality, these criteria should also be clearly explained and justified (p. 18).

proficiency in the knowledge, skills, and competencies identified in the standards. Upon adoption of the standards in 1996, Missouri began developing the Missouri Assessment Program (MAP).

In January 2007, the Missouri State Board of Education approved a plan to replace the MAP for high school students, beginning in August of the 2008–2009 school year, with EOC Assessments in English II, Algebra I, and Biology. The remaining EOC Assessments (English I, Algebra II, Geometry, Government, and American History) were added the following year. The intent was to provide MO EOC Assessments that are an integral part of the statewide assessment system and, as such, are a logical extension of MAP tests at the elementary and middle school grade levels.

11.4.2 Adequacy of Content Representation

Adequacy of the content representation of the MO EOC Assessments is critically important because the tests must provide an indication of student progress toward achieving the knowledge and skills identified in the Missouri Course-Level Expectations (CLEs).

Adequate representation of the content domains defined in the CLEs is assured through the use of a test blueprint and a carefully documented test construction process. CLEs and the Show-Me Standards for the Phase II Assessments are taken into consideration in the writing of selected response (SR) items. Each assessment must align with and proportionally represent the subdomains of the test blueprint. Evidence to support the content validity of the MO EOC Assessments was provided in Chapter 2: Test Development through the documentation of the test specifications and blueprints, item-writing processes, and item-review processes.

Additional evidence to support the content validity of the MO EOC Assessments was provided in Tables 2.1 through 2.7 in Chapter 2: Test Development and also in Chapter 4: Item Analysis. Chapter 2 outlined the target strand and CLE point distributions on the English I, Algebra II, Geometry, Government, and American History operational forms. All forms administered in 2010–2011 met the point ranges specified in the blueprints. In addition, Riverside Publishing strove to equitably represent the strands on each assessment by balancing CLE and sub-CLE coverage according to the targets outlined in the test specifications.

11.5 Validity Evidence Based on the Internal Structure of the MO EOC Assessments

Standard 1.11[11] pertains to the relationships between the parts of the test. Because the MO EOC Assessments measure student performance in several content areas, it is important to study the pattern of relationships among the content domains and clusters. One way to study patterns of relationships to provide evidence supporting the inferences made from test scores is the multitrait, multimethod matrix. Tables 11.1 through 11.3 summarize Pearson correlation coefficients among test domains and clusters for Algebra II, Geometry, and Government. Because both English I and American History have only

[11] **Standard 1.11:** If the rationale for a test use or interpretation depends on premises about the relationships among parts of the test, evidence concerning the internal structure of the test should be provided (p. 20).

one content cluster, correlation coefficients were not calculated for these EOC Assessments. The correlations between clusters within each assessment are in the moderate to moderately high range, suggesting strong relationships between the clusters. Note that the high correlations between cluster scores and total assessment scores are inflated due to the overlap of items.

Table 11.1: Pearson Correlation Coefficients Between Domains and Clusters for Algebra II

		Algebraic Relationships	Data and Probability	Numbers and Operations
Fall 2009	Algebra II	0.95	0.79	0.82
	Algebraic Relationships		0.61	0.69
	Data and Probability			0.58
	Numbers and Operations			
Spring 2010	Algebra II	0.93	0.80	0.79
	Algebraic Relationships		0.60	0.61
	Data and Probability			0.55
	Numbers and Operations			
Summer 2010	Algebra II	0.75	0.92	0.61
	Algebraic Relationships		0.52	0.32
	Data and Probability			0.38
	Numbers and Operations			
Fall 2010	Algebra II	0.77	0.95	0.81
	Algebraic Relationships		0.62	0.51
	Data and Probability			0.66
	Numbers and Operations			
Spring 2011	Algebra II	0.78	0.94	0.75
	Algebraic Relationships		0.60	0.49
	Data and Probability			0.58
	Numbers and Operations			

Table 11.2: Pearson Correlation Coefficients Between Domains and Clusters for Geometry

		Algebraic Relationships	Geometric and Spatial Relationships	Measurement
Fall 2009	Geometry	0.81	0.96	0.82
	Algebraic Relationships		0.67	0.56
	Geometric and Spatial Relationships			0.70
	Measurement			
Spring 2010	Geometry	0.77	0.95	0.83
	Algebraic Relationships		0.62	0.56
	Geometric and Spatial Relationships			0.68
	Measurement			
Summer 2010	Geometry	0.58	0.93	0.71
	Algebraic Relationships		0.41	0.14
	Geometric and Spatial Relationships			0.51
	Measurement			
Fall 2010	Geometry	0.85	0.95	0.83
	Algebraic Relationships		0.69	0.60
	Geometric and Spatial Relationships			0.68
	Measurement			
Spring 2011	Geometry	0.79	0.94	0.76
	Algebraic Relationships		0.61	0.49
	Geometric and Spatial Relationships			0.58
	Measurement			

Table 11.3: Pearson Correlation Coefficients Between Domains and Clusters for Government

		Knowledge of principles and processes of governance systems	Knowledge of the principles expressed in documents shaping constitutional democracy in the United States
Fall 2009	Government	0.94	0.94
	Knowledge of principles and processes of governance systems		0.78
	Knowledge of the principles expressed in documents shaping constitutional democracy in the United States		
Spring 2010	Government	0.95	0.94
	Knowledge of principles and processes of governance systems		0.79
	Knowledge of the principles expressed in documents shaping constitutional democracy in the United States		
Summer 2010	Government	0.96	0.95
	Knowledge of principles and processes of governance systems		0.82
	Knowledge of the principles expressed in documents shaping constitutional democracy in the United States		
Fall 2010	Government	0.93	0.93
	Knowledge of principles and processes of governance systems		0.72
	Knowledge of the principles expressed in documents shaping constitutional democracy in the United States		
Spring 2011	Government	0.93	0.94
	Knowledge of principles and processes of governance systems		0.75
	Knowledge of the principles expressed in documents shaping constitutional democracy in the United States		

11.6 Discriminant Validity Evidence for the MO EOC Assessments

The Standards for Educational and Psychological Testing (1999) states the following regarding convergent and divergent validity: "Relationships between test scores and other measures intended to assess similar constructs provide convergent evidence, whereas relationships between test scores and measures purportedly of different constructs provide discriminant evidence." (pg. 14). The Missouri End-of Course assessments were designed to measure different constructs as shown by both the standards they assess and the content coverage detailed in the test blueprints.

The data presented below show evidence of divergent validity for Phase II content areas using scale scores. The data sets used for the analysis were drawn from the Spring 2011 operational test administration. The students in the data sets were merged using Missouri's unique student identification number. Any student who took at least two of the five operational tests was included in the correlations. Table 11.4 shows the Pearson correlation coefficients between scale scores and the N count for each correlation.

Table 11.4 Pearson Correlation Coefficients Between Phase II Assessments

	English I	Algebra II	Geometry	Government	History
English I	—	0.491 (N=1303)	0.481 (N=5434)	0.704 (N=6095)	0.656 (N=13526)
Algebra II		—	0.736 (N=1294)	0.525 (N=4620)	0.499 (N=6274)
Geometry			—	0.572 (N=4321)	0.539 (N=6171)
Government				—	0.763 (N=787)
History					—

The results shown in Table 11.4 contain evidence of divergent validity. Evidence of divergent validity is supported by the lower correlations between content areas that measure dissimilar constructs as compared to content areas that assess similar constructs. For example, the correlations between the similar constructs of Algebra II and Geometry (0.736), and Government and History (0.763) are higher than the correlations between the dissimilar constructs of English I and Algebra II (0.491).

For English I and Government, challenging language and grammar on both tests could account for the higher correlation value. These correlation values are still lower than the tests measuring a similar construct and are in the range of the correlations among high school MAP subject area tests (the precursor to MAP End-of-Course assessments) as reported in the *Missouri Assessment Program Technical Report, 2008* (Missouri Department of Elementary and Secondary Education, 2008).

Table 11.5 provides more evidence of discriminant validity with correlations between Phase I and Phase II subjects. Evidence of discriminant validity is seen when comparing correlations between the similar contents of Algebra I and Geometry (0.709) , Algebra I and Algebra II (0.770), English I and English II (0.681) and the dissimilar contents of

Algebra I and English I (0.532), Algebra II and English II (0.535) and Geometry and English II (0.536).

Table 11.5 Pearson Correlation Coefficients Between Phase I and Phase II Assessments

	English I	Algebra II	Geometry	Government	History
English II	0.681 (N=420)	0.535 (N=8154)	0.536 (N=13562)	0.725 (N=8212)	0.656 (N=7270)
Algebra I	0.532 (N=20349)	0.770 (N=152)	0.709 (N=379)	0.618 (N=8558)	0.512 (N=9406)
Biology	0.676 (N=7137)	0.605 (N=8105)	0.588 (N=11086)	0.743 (N=7890)	0.675 (N=8640)

11.7 Additional Validity Evidence for the MO EOC Assessments

Validity evidence related to other standards is described below.

Standard 1.5[12] relates to the characteristics of the sample of examinees from which validity evidence is inferred. The sample of examinees from which the validity evidence for the MO EOC Assessments was obtained is described in detail in Chapter 9: Summary Statistics, which includes tables with descriptive statistics for raw-score, scale-score, and achievement-level distributions. Statistics include *n*-counts, means, standard deviations (*SD*s), minimum and maximum values, and a variety of data disaggregations.

Standard 1.7[13] relates to human judgment at various points in the test development, scoring, and reporting process. For the MO EOC Assessments, human judgment was especially prevalent during the standard-setting process. Chapter 3: Achievement-Level Setting contains detailed information about the standard-setting procedures used for the MO EOC Assessments, including the selection process for and characteristics of the standard-setting participants.

Standard 1.13[14] relates to the conditions under which the data used to support validity claims were collected. Chapter 5: Test Administration contains information about how data were gathered in both the online and paper-and-pencil administrations, including the

[12] **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 (p. 18).

[13] **Standard 1.7:** When a validation rests in part on the opinions or decisions of expert judges, observers, or raters, procedures for selecting such experts and for eliciting judgments or ratings should be fully described. The qualifications, and experience, of the judges should be presented. The description of procedures should include any training and instructions provided, should indicate whether participants reached their decisions independently, and should report the level of agreement reached. If participants interacted with one another or exchanged information, the procedures through which they may have influenced one another should be set forth (p. 19).

[14] **Standard 1.13:** When validity evidence includes statistical analyses of test results, either alone or together with data on other variables, the conditions under which the data were collected should be described in enough detail that users can judge the relevance of the statistical findings to local conditions. Attention should be drawn to any features of a validation data collection that are likely to differ from typical operational testing conditions and that could plausibly influence test performance (p. 20).

testing environment, materials distribution and security, Test Examiner training, student preparation, and allowable accommodations.

11.8 Summary

Validity is not an all-or-nothing property of a test; rather, validity evidence must be documented for a specific purpose and in the context of how the test scores will be interpreted and used. Much of the information contained in this technical report is, in and of itself, documentation of the validity of the MO EOC Assessments for their stated purpose. This chapter provides a summary of the evidence presented elsewhere in the manual and provides some additional types of validity evidence relevant to the content and internal structure of the assessments.

The overall technical quality of the EOC Assessments was sound. The Spring 2009 standalone field tests produced pools of technically sound items, with more than a 90% retention rate after psychometric and content criteria were applied. From those pools, Riverside Publishing was able to assemble forms that were psychometrically very similar and that similarity helped support the pre-equating model that is in place. Application of IRT pre-equating resulted in perfect or nearly congruent raw-to-scale score conversions between the Spring (base) and Fall forms at the proficiency level cuts.

Post-administration test analyses supported the technical quality of the MO EOC Assessments. Evaluations of IRT model assumptions supported the use of the Rasch model for all tests. Test reliabilities ranged from 0.71 to 0.90 across the content areas for the Summer 2010, Fall 2010, and Spring 2011 forms. Conditional standard errors of measurement (*CSEM*s) were between 6 and 9 scale score points at the cut scores. The item analyses also showed that the MO EOC Assessments have sound psychometrics properties. The *p*-value ranges were sufficiently broad to indicate that the items do measure achievement across a broad range of difficulty. Nearly all items had discrimination values > 0.15, and 36 items had a value < 0.10. Speededness was not a factor in students' test performance. Item bias analyses conducted on the pools further indicated that items were functioning equivalently for gender and ethnic groups.

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APPENDIX A:

LIST OF MISSOURI EDUCATION-RELATED PROFESSIONAL ORGANIZATIONS

Missouri Migrant Education/English Language Learning

Missouri National Education Association

Missouri PTA

Missouri Reading Initiative

Missouri School Boards' Association

Missouri School Public Relations Association

Missouri Special Needs Association

Missouri Staff Development Council

Missouri State Council–International Reading Association

Missouri State Teachers Association

Missouri Student Success Network

Missouri Unit Association of Teacher Educators

Missouri United School Insurance Council

Show-Me Curriculum Administrators Association

Show-Me Scholars

Southwest Center for Educational Excellence

SuccessLink

Technology Education Association of Missouri

APPENDIX B:

NOMINATION LETTERS

D. Kent King
Commissioner of Education

P.O. Box 480
Jefferson City, MO 65102-0480
http://dese.mo.gov

Missouri Department of Elementary and Secondary Education

— Making a positive difference through education and service —

July 31, 2009

Dear School Administrator,

In 2009-2010, Missouri students will have the opportunity to take the second phase of End-of-Course (EOC) assessments, including tests in Algebra II, Geometry, Integrated Mathematics II and III, English I, American History, and Government. Just as we determined achievement levels for the first phase EOC assessments (Algebra I, English II, and Biology) about a year ago, we will need to define student performance on these EOC assessments as Below Basic, Basic, Proficient or Advanced.

To accomplish this important task, we will conduct an Achievement Level Setting Conference with the assistance of our contractors for EOC assessment development, Riverside Publishing and Questar Assessment. This conference will provide an opportunity for panels of educators and other individuals to discuss course-level expectations for each applicable course and to review assessment items to determine the appropriate "cut scores" for each achievement level. The composition of the achievement level setting panels and the expertise of panelists are critically important to this process. The panel for each EOC assessment will consist of 15-18 members. Within each panel, a minimum of 50 percent of the panelists will be classroom teachers. At least half of the remaining panelists will be non-teacher educators (administrators, curriculum specialists, etc.) with knowledge of the appropriate content area. Each panel will also include non-school employees (parents, business professionals, etc.) with expertise in the appropriate content area. Because you have the opportunity to work with excellent educators, as well as members of your community, we are asking for your input in assembling achievement level setting panels that are knowledgeable and reflective of Missouri's diverse population.

Forms for you to nominate classroom teachers, non-teacher educators and business professionals to serve on EOC achievement level setting panels, along with guidelines for panelist nomination, are posted on the DESE website at http://www.dese.mo.gov/divimprove/assess/. These nominations will be placed into a large pool from which we will select final panelists. Selected panelists will be representative of the state's demographic characteristics and geographic make-up. **The EOC Achievement Level Setting Conference will be held on November 2-5, 2009**. Panels for English I, American History, and Integrated Mathematics II and III (combined panel) will meet on **November 2nd and 3rd;** panels for Government, Geometry, and Algebra II will meet on **November 4th and 5th.** Specific location for the conference has not yet been determined, but it will be held in mid-Missouri.

D. Kent King
Commissioner of Education

P.O. Box 480
Jefferson City, MO 65102-0480
http://dese.mo.gov

Missouri Department of Elementary and Secondary Education

— Making a positive difference through education and service —

If you are interested in nominating an individual(s) to serve as a panelist, please complete the appropriate form(s) according to the specified guidelines and return it to the Curriculum and Assessment Section by e-mail, mail or fax. **Nomination forms must be postmarked, faxed, or e-mailed on or before September 1, 2009, to be considered for panel selection. Return address and fax number are printed on the forms.**

Prior to submitting nominations, please contact any individual you wish to nominate to ensure his/her interest and availability if selected to participate as a panelist. It is very important that panelists are available for both days of the conference for their content area. All participants will be reimbursed for travel expenses and meals not provided during the conference. Additionally, those panelists that are not otherwise being compensated (by their employer, school district, etc.) will receive a stipend of $100 for each full day of work. For teachers that are on contract (and, therefore not requesting a stipend) school districts will be reimbursed for the cost of substitutes. We will notify all potential panelists of the status of their nomination in early October. Those nominees selected to participate in the Achievement Level Setting Conference will receive further information about the conference at that time. Thank you for your assistance in this important endeavor. Please feel free to contact the Curriculum and Assessment Section at 573-751-2625 if you have any questions.

Sincerely,

Stan Johnson

Stan Johnson, Assistant Commissioner
Division of School Improvement

D. Kent King
Commissioner of Education

P.O. Box 480
Jefferson City, MO 65102-0480
http://dese.mo.gov

Missouri Department of Elementary and Secondary Education

— Making a positive difference through education and service —

July 31, 2009

TO: RPDC Directors
FROM: Michael Muenks, Coordinator, Curriculum and Assessment
RE: End-of-Course Assessment Achievement Level Setting

In 2009-10, Missouri students will have the opportunity to take End-of-Course (EOC) assessments in Geometry, Algebra II, Integrated Mathematics II and III, English II, American History, and Government (Phase II EOC tests). From November 2-5, DESE's Assessment Section will conduct an achievement level setting conference with the assistance of Riverside Publishing and Questar Assessment to determine the scores that will be used to define student performance as Below Basic, Basic, Proficient or Advanced. Panels for English I, American History, and Integrated Mathematics II and III (combined panel) will meet on November 2nd and 3rd; panels for Geometry, Algebra II, and Government will meet on November 4th and 5th. Specific location for the conference has not yet been determined, but it will be held in mid-Missouri.

This conference will provide an opportunity for panels of educators and other individuals to discuss course-level expectations for each applicable course and to review assessment items to determine the appropriate "cut scores" for each achievement level. The composition of the achievement level setting panels and the expertise of panelists are critically important to this process. We anticipate including at least two post-secondary education representatives on each panel.

I am requesting your assistance in identifying teacher educators or other post-secondary educators that have expertise in the appropriate course content to serve as panelists. Nomination guidelines and forms are posted on the DESE website at http://www.dese.mo.gov/divimprove/assess/. If you would like to nominate an individual to serve as a panelist, please return the completed nomination form to the Curriculum and Assessment Section by e-mail, mail or fax no later than September 1, 2009 (mailing address and fax number are printed on the form).

Prior to submitting nominations, please contact any individual you wish to nominate to ensure his/her interest and availability if selected to participate as a panelist. It is very important that panelists are available for both days on which their panel will meet. All participants will be reimbursed for travel expenses and meals not provided during the conference. Additionally, those panelists that are not otherwise being compensated by their employer will receive a stipend of $100 for each full day of work. We will notify

all panelists of the status of their nomination in early October. Those nominees selected to participate in the Achievement Level Setting Conference will receive further information about the conference at that time.

Feel free to contact the Curriculum and Assessment Section at 573-751-2625 or e-mail map@dese.mo.gov if you have any questions.

D. Kent King
Commissioner of Education

P.O. Box 480
Jefferson City, MO 65102-0480
http://dese.mo.gov

Missouri Department of Elementary and Secondary Education

— Making a positive difference through education and service —

July 31, 2009

Dear Colleague in Education,

In 2009-2010, Missouri students will have the opportunity to take the second phase of End-of-Course (EOC) assessments, including tests in Algebra II, Geometry, Integrated Mathematics II and III, English I, American History, and Government. Just as we determined achievement levels for the first phase EOC assessments (Algebra I, English II, and Biology) about a year ago, we will need to define student performance on these EOC assessments as Below Basic, Basic, Proficient or Advanced.

To accomplish this important task, we will conduct an Achievement Level Setting Conference with the assistance of our contractors for EOC assessment development, Riverside Publishing and Questar Assessment. This conference will provide an opportunity for panels of educators and other individuals to discuss course-level expectations for each applicable course and to review assessment items to determine the appropriate "cut scores" for each achievement level. The composition of the achievement level setting panels and the expertise of panelists are critically important to this process. The panel for each EOC assessment will consist of 15-18 members. Within each panel, a minimum of 50 percent of the panelists will be classroom teachers. At least half of the remaining panelists will be non-teacher educators (administrators, curriculum specialists, etc.) with knowledge of the appropriate content area. Each panel will also include non-school employees (parents, business professionals, etc.) with expertise in the appropriate content area. Because you have the opportunity to work with excellent educators, as well as members of communities throughout the state, we are asking for your input in assembling achievement level setting panels that are knowledgeable and reflective of Missouri's diverse population.

Forms for you to nominate individuals to serve on EOC achievement level setting panels, along with guidelines for panelist nomination, are posted on the DESE website at http://www.dese.mo.gov/divimprove/assess/. These nominations will be placed into a large pool from which we will select final panelists. Selected panelists will be representative of the state's demographic characteristics and geographic make-up. **The EOC Achievement Level Setting Conference will be held on November 2-5, 2009**. Panels for English I, American History, and Integrated Mathematics II and III (combined panel) will meet on **November 2nd and 3rd;** panels for Government, Geometry, and Algebra II will meet on **November 4th and 5th.** Specific location for the conference has not yet been determined, but it will be held in mid-Missouri.

If you are interested in nominating an individual(s) to serve as a panelist, please complete the appropriate form(s) according to the specified guidelines and return it to the Curriculum and Assessment Section by e-mail, mail, or fax. **Nomination forms must be postmarked, faxed, or e-mailed on or before September 1, 2009, to be considered for panel selection. Return address and fax number are printed on the forms.**

Prior to submitting nominations, please contact any individual you wish to nominate to ensure his/her interest and availability if selected to participate as a panelist. It is very important that panelists are available for both days of the conference for their content area. All participants will be reimbursed for travel expenses and meals not provided during the conference. Additionally, those panelists that are not otherwise being compensated (by their employer, school district, etc.) will receive a stipend of $100 for each full day of work. For teachers that are on contract (and, therefore not requesting a stipend) school districts will be reimbursed for the cost of substitutes. We will notify all potential panelists of the status of their nomination in early October. Those nominees selected to participate in the Achievement Level Setting Conference will receive further information about the conference at that time. Thank you for your assistance in this important endeavor. Please feel free to contact the Curriculum and Assessment Section at 573-751-2625 if you have any questions.

Sincerely,

Stan Johnson, Assistant Commissioner
Division of School Improvement

APPENDIX C:

NOMINATION FORMS

MISSOURI DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION
DIVISION OF SCHOOL IMPROVEMENT – ASSESSMENT SECTION

PHASE II END-OF-COURSE ASSESSMENT ACHIEVEMENT LEVEL SETTING CLASSROOM TEACHER NOMINATION

Directions

Complete this form for each individual you wish to nominate to serve as a panelist for Phase II End-of-Course Assessment Achievement Level Setting. Please verify spelling of first and last name of the individual you are nominating, and ensure that all information is complete and accurate.

E-MAIL, FAX OR MAIL: the completed form no later than **October 5, 2009**

E-MAIL: sara.hagenhoff@dese.mo.gov
FAX: **(573) 526-7861**
MAIL: **MO Department of Elementary and Secondary Education, ATTN: Sara Hagenhoff**
P.O Box 480
Jefferson City, MO 65102

QUESTIONS: Call: (573) 751-2625 or Email: sara.hagenhoff@dese.mo.gov

Content Area

END-OF-COURSE ASSESSMENT FOR WHICH NOMINEE SHOULD SERVE AS A PANELIST (please check one):

❒ Algebra II ❒ Geometry ❒ Integrated Mathematics II/III ❒ English I ❒ American History ❒ Government

Years of experience in teaching the course indicated above: _____

Participant Information

CURRENT NAME (LAST, FIRST, MIDDLE INITIAL) Please Print:	
STREET ADDRESS:	
CITY, STATE, ZIP CODE:	
HOME E-MAIL ADDRESS	HOME PHONE NUMBER:
RACE/ETHNICITY (optional): ❒ Asian/Pac Isl. ❒ Black ❒ Hispanic ❒ Native Am. Indian ❒ White	
CURRENT COURSE ASSIGNMENT:	NUMBER OF YEARS IN CURRENT POSITION:
AREAS OF EXPERTISE (Mark all that apply): ❒ Regular Education ❒ Special Education ❒ English Language Learners (ELL)	GENDER: ❒ Male ❒ Female

District Information

SCHOOL DISTRICT NAME:	COUNTY-DISTRICT CODE:
SCHOOL BUILDING NAME:	SCHOOL CODE:
SCHOOL EMAIL ADDRESS:	SCHOOL PHONE NUMBER

Experience/Expertise

Summarize the nominee's involvement in education initiatives that are pertinent to Phase II End-of-Course assessment achievement level setting (e.g., Show-Me Standards development/review, Course-Level/Grade-Level Expectations development/review, EOC development activities, Regional Professional Development Center professional development activities).

Professional Organizations/Affiliations

Individual Providing Nomination

NAME/TITLE	PHONE NUMBER
	E-MAIL ADDRESS

MISSOURI DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION
DIVISION OF SCHOOL IMPROVEMENT – ASSESSMENT SECTION

PHASE II END-OF-COURSE ASSESSMENT ACHIEVEMENT LEVEL SETTING NON-TEACHER EDUCATOR NOMINATION (INCLUDING POST-SECONDARY EDUCATOR)

Directions

Complete this form for each individual you wish to nominate to serve as a panelist for Phase II End-of-Course Assessment Achievement Level Setting. Please verify spelling of first and last name of the individual you are nominating, and ensure that all information is complete and accurate.

E-MAIL, FAX OR MAIL the completed form no later than **October 5, 2009,** to Sara Hagenhoff

E-MAIL: sara.hagenhoff@dese.mo.gov
FAX: (573) 526-7861
MAIL: MO Department of Elementary and Secondary Education, ATTN: Sara Hagenhoff
P.O. Box 480
Jefferson City, MO 65102

QUESTIONS: Call: (573) 751-2625 or Email: sara.hagenhoff@dese.mo.gov

Content Area

END-OF-COURSE ASSESSMENT FOR WHICH NOMINEE SHOULD SERVE AS A PANELIST (please check one):

❒ Algebra II ❒ Geometry ❒ Integrated Mathematics II/III ❒ English I ❒ American History ❒ Government

Participant Information

CURRENT NAME (LAST, FIRST, MIDDLE INITIAL) Please Print:

HOME ADDRESS:

CITY, STATE, ZIP CODE:

HOME E-MAIL ADDRESS	HOME PHONE NUMBER:
RACE/ETHNICITY (optional): ❒ Asian/Pac Isl. ❒ Black ❒Hispanic ❒ Native Am. Indian ❒ White	GENDER: ❒ Male ❒ Female

District Information (If nominee is a post-secondary educator, please provide name of institution.)

SCHOOL DISTRICT NAME:	COUNTY-DISTRICT CODE:
SCHOOL BUILDING NAME:	SCHOOL CODE:
SCHOOL EMAIL ADDRESS:	SCHOOL PHONE NUMBER

Experience/Expertise

Summarize the nominee's involvement in education initiatives that are pertinent to End-of-Course assessment achievement level setting (e.g., Show-Me Standards development/review, Grade-Level/Course-Level Expectations development/review, EOC development activities)

CURRENT POSITION/TITLE:	PREVIOUS TEACHING EXPERIENCE Grade Level(s): _____ Years: _____ Subject Area(s): _____
# OF YEARS IN CURRENT POSITION: _____	

AREAS OF EXPERTISE (Mark all that apply):

❒ Regular Education ❒ Special Education ❒ English Language Learners (ELL)

Professional Organizations/Affiliations

Individual Providing Nomination

NAME/TITLE	PHONE NUMBER
	E-MAIL ADDRESS

MISSOURI DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION
DIVISION OF SCHOOL IMPROVEMENT – ASSESSMENT SECTION

PHASE II END-OF-COURSE ASSESSMENT ACHIEVEMENT LEVEL SETTING BUSINESS PROFESSIONAL NOMINATION FORM

Directions

Complete this form for each individual you wish to nominate to serve as a panelist for Phase II End-of-Course Assessment Achievement Level Setting. Please verify spelling of first and last name of the individual you are nominating, and ensure that all information is complete and accurate.

E-MAIL, FAX OR MAIL the completed form no later than **September 1, 2009,** to Sara Hagenhoff:

E-MAIL: sara.hagenhoff@dese.mo.gov
FAX: (573) 526-7861
MAIL: MO Department of Elementary and Secondary Education, ATTN: Sara Hagenhoff
P.O. Box 480
Jefferson City, MO 65102

QUESTIONS: Call: (573) 751-2625 or Email: sara.hagenhoff@dese.mo.gov

Content Area

END-OF-COURSE ASSESSMENT FOR WHICH NOMINEE SHOULD SERVE AS A PANELIST (please check one):

❒ Algebra II ❒ Geometry ❒ Integrated Mathematics II/III ❒ English I ❒ American History ❒ Government

Participant Information

CURRENT NAME (LAST, FIRST, MIDDLE INITIAL) Please Print:	
EMPLOYER:	
TITLE:	
HOME ADDRESS:	
CITY, STATE, ZIP CODE:	
HOME E-MAIL ADDRESS	HOME PHONE NUMBER:
RACE/ETHNICITY (optional): ❒ Asian/Pac Isl. ❒ Black ❒ Hispanic ❒ Native Am. Indian ❒ White	GENDER: ❒ Male ❒ Female

Experience/Expertise

Explain why you believe this individual would be an asset to the Phase II End-of-Course Assessment Achievement Level Setting Panel:

Professional Organizations/Affiliations

Individual Providing Nomination

NAME/TITLE	PHONE NUMBER
SCHOOL DISTRICT/EMPLOYER	E-MAIL ADDRESS

APPENDIX D:

PANELIST QUALIFICATION GUIDELINES

GUIDELINES FOR PANELIST NOMINATION
PHASE II END-OF-COURSE ASSESSMENT ACHIEVEMENT LEVEL SETTING

Qualifications of Classroom Teachers:

- Must have taught the course for which they are being nominated to serve as a panelist for a minimum of five years.
- Should be familiar with the Show-Me Standards and the applicable Course-Level Expectations.
- Should be recognized as "outstanding" in professional performance.

Qualifications of Non-Teacher Educators and Post-Secondary Educators:

- May be a non-teacher educational staff member in a building or district central office, or an instructor or administrator at a post-secondary institution.
- Must have familiarity with the course content for which they are being nominated to serve as a panelist.
- Should be familiar with the Show-Me Standards and applicable Course-Level Expectations.
- Must be recognized as "outstanding" in professional performance by the individual making the nomination.

Qualifications of Business Professionals:

- Must have familiarity with the content of the course for which they are being nominated to serve as a panelist (Algebra II, Geometry, Integrated Mathematics II and III, English I, American History, or Government).
- Should either:
    - use high school course content for the applicable content area in their daily professional work
    - OR be familiar with the knowledge and skills that high school students completing the applicable courses must possess to have a firm foundation for further coursework or for the workplace.
- Should not be a current or former employee of the public school system.

General Information to Share with Nominees:

- It is imperative that panelists participate fully in all conference activities. **Before making a nomination, please verify that any individual you nominate is all available for ALL applicable conference dates (November 2-3** for English I, American History, and Integrated Mathematics II and III; **November 4-5** for Algebra II, Geometry, and Government)**.**
- A total of 15-18 panelists per End-of-Course assessment will be selected from the pool of nominations. A minimum of half of the members of each panel will be classroom teachers. At least half of the remaining panelists will be non-teacher educators. Each panel will also include members of the business/professional community.
- All nominees will receive notice of the status of their nomination in early October.
- Selected panelists will receive a stipend of $100 per day for their work if they are not otherwise being compensated by their employer. (Classroom teachers may request a stipend if not on contract with their school district on meeting days.) Participants will be reimbursed for mileage at the State's approved rate, lodging, and meals not provided during the conference.

Making a Nomination:

- Download and complete the correct nomination form for each individual(s) you wish to nominate:
  -- Classroom Teacher Nomination
  -- Non-Teacher Educator Nomination
  -- Business/Professional Nomination
- Make sure the form is completed fully and accurately. Incomplete forms will not be placed in the pool for consideration. Please verify all information on each form prior to submitting nominations.
- Mail, e-mail or fax the nomination form(s) to DESE on or before September 18, 2009. Forms postmarked, e-mailed or faxed after September 18, 2009, will NOT be accepted.

PLEASE CONTACT THE CURRICULUM AND ASSESSMENT SECTION AT 573-751-2625 OR E-MAIL sara.hagenhoff@dese.mo.gov IF YOU HAVE FURTHER QUESTIONS ABOUT COMPLETING NOMINATION FORMS.

APPENDIX E:

PANEL DEMOGRAPHIC CHARACTERISTICS

Appendix Table E.1: Panel Characteristics for English I

District	Position	Gender	Ethnicity	Community Type	RPDC Region	% FRL*	% Minority*
Francis Howell	Classroom Teacher	Female	White	Suburban	St. Louis	13%	11%
Boonville R-I	Classroom Teacher	Female	White	Rural	Heart of Missouri	46%	16%
Blue Springs	Nonteacher educator	Female	White	Suburban	Kansas City	21%	19%
Affton	Classroom Teacher	Female	White	Suburban	St. Louis	32%	15%
Lee's Summit R-7	Classroom Teacher	Female	White	Suburban	Kansas City	13%	19%
N/A (MC3)	Nonteacher educator	Female	White	N/A	N/A		
Milan C-2	Classroom Teacher	Female	White	Rural	Northeast	67%	39%
St. Louis Public	Classroom Teacher	Female	White	Urban	St. Louis	72%	86%
Lebanon R-III	Classroom Teacher	Female	White	Rural	Southwest	52%	5%
Butler	Nonteacher educator	Female	White	Rural	West Central	50%	6%
Raytown C-2	Nonteacher educator	Female	White	Suburban	Kansas City	49%	55%
N/A (William Woods University)	Higher Ed.	Female	Native American	Rural	Heart of Missouri		
Richland R-I	Classroom Teacher	Male	White	Rural	South Central	71%	7%
Willard R-2	Classroom Teacher	Female	White	Rural	Southwest	38%	5%
Park Hill	Nonteacher educator	Male	White	Suburban	Kansas City	22%	12%
Prairie Home R-V	Nonteacher educator	Female	White	Rural	Heart of Missouri	26%	3%

* Percent free and reduced lunch (FRL) and percent minority refer to the population of the district represented by the panelist.

N/A = Not available

Appendix Table E.2: Panel Characteristics for Algebra II

District	Position	Gender	Ethnicity	Community Type	RPDC Region	% FRL*	% Minority*
Forsyth R-3	Classroom Teacher	F	White	Rural	Southwest	65%	4%
Pattonville	Classroom Teacher	M	White	Suburban	St. Louis	36%	38%
Francis Howell	Classroom Teacher	F	White	Suburban	St. Louis	13%	11%
Boonville R-I	Nonteacher Educator	M	White	Rural	Heart of Missouri	46%	16%
Jennings	Classroom Teacher	M	African American	Urban	St. Louis	84%	99%
Norwood R-I	Classroom Teacher	F	White	Rural	Southwest	62%	0%
Fredericktown	Classroom Teacher	F	White	Rural	Southeast	53%	3%
N/A (St. Charles Community College)	Higher Education	F	White	Suburban	St. Louis		
North Pemiscot R-I	Classroom Teacher	F	White	Rural	Southeast	71%	19%
Webster Groves	Classroom Teacher	F	White	Suburban	St. Louis	19%	27%
Washington	Classroom Teacher	F	White	Rural	Southeast	23%	4%
Sikeston	Classroom Teacher	F	White	Rural	Southeast	60%	39%
N/A (Northwest Missouri State University)	Higher Education	F	White	Rural	Northwest		
St. James R-I	Classroom Teacher	F	White	Rural	South Central	55%	6%
Park Hill	Classroom Teacher	F	White	Suburban	Kansas City	22%	22%
Rolla 31	Classroom Teacher	F	White	Rural	South Central	42%	11%

* Percent free and reduced lunch (FRL) and percent minority refer to the population of the district represented by the panelist.

N/A = Not available

Appendix Table E.3: Panel Characteristics for Geometry

District	Position	Gender	Ethnicity	Community Type	RPDC Region	% FRL*	% Minority*
St. James R-I	Regular Ed.	M	White	Rural	South Central	55%	6%
Kearney R-I	Regular Ed.	M	White	Rural	Missouri Western	11%	4%
Sikeston	Regular Ed.	F	White	Rural	Southeast	60%	39%
N/A (Mineral Area College	Regular Ed.	F	White	Rural	South Central		
North St. Francois R-I	Regular Ed.	F	White	Rural	Southeast	51%	3%
Southern Reynolds County R-2	Regular Ed.	F	White	Rural	South Central	67%	3%
Richland	Regular Ed.	F	White	Rural	Southeast	53%	4%
Prairie Home R-V	Regular Ed.	F	White	Rural	Heart of Missouri	26%	3%
Ray-Pec	Regular Ed.	F	White	Rural	West Central	21%	14%
Center 58	Regular Ed.	F	White	Urban	Kansas City	67%	76%
Francis Howell	Regular Ed.	F	White	Suburban	St. Louis	13%	11%
Marshfield R-I	Regular Ed.	M	White	Rural	Southwest	42%	4%
Lees Summit	Regular Ed.	F	White	Suburban	Kansas City	13%	19%
Ferguson-Florissant	Regular Ed.	M	White	Suburban	St. Louis	64%	79%
Fairplay	Regular Ed.	M	White	Rural	Southwest	63%	1%
Fort Osage	Regular Ed.	M	White	Suburban	Kansas City	43%	16%

* Percent free and reduced lunch (FRL) and percent minority refer to the population of the district represented by the panelist.

N/A = Not available

Appendix Table E.4: Panel Characteristics for Government

District	Position	Gender	Ethnicity	Community Type	RPDC Region	% FRL*	% Minority*
N/A (Missouri Bar)	Noneducator	Female	White	Suburban	Heart of Missouri		
North Kansas City	Nonteacher Educator	Female	White	Suburban	Kansas City	39%	28%
Hazelwood	Nonteacher Educator	Female	White	Urban	St. Louis	53%	70%
Waynesville	Classroom Teacher	Male	White	Urban	South Central	39%	39%
Independence	Classroom Teacher	Male	White	Suburban	Kansas City	55%	25%
Jefferson College	Higher Education	Male	White	Suburban	St. Louis		
Sikeston R-6	Classroom Teacher	Female	White	Rural	Southeast	60%	39%
Affton	Classroom Teacher	Male	Asian/ Pacific Islander	Urban	St. Louis	32%	15%
Salem R-80	Classroom Teacher	Male	White	Rural	South Central	56%	5%
Francis Howell	Classroom Teacher	Female	White	Suburban	St. Louis	13%	11%
Neosho R-5	Classroom teacher	Male	White	Rural	Southwest	56%	17%
Rockwood	Nonteacher Educator	Female	White	Suburban	St. Louis	13%	17%

* Percent free and reduced lunch (FRL) and percent minority refer to the population of the district represented by the panelist.

N/A = Not available

Appendix Table E.5: Panel Characteristics for American History

District	Position	Gender	Ethnicity	Community Type	RPDC Region	% FRL*	% Minority*
Neosho R-5	Classroom teacher	F	White	Rural	Southwest	56%	17%
Prairie Home R-V	Classroom teacher	M	White	Rural	Heart of Missouri	26%	3%
Holden	Classroom teacher	M	White	Rural	West Central	38%	3%
Rolla 31	Classroom teacher	M	White	Rural	South Central	42%	11%
Ferguson-Florissant	Nonteacher educator	M	White	Suburban	St. Louis	64%	79%
St. James	Classroom teacher	M	White	Rural	South Central	55%	6%
Sikeston R-6	Classroom teacher	M	White	Rural	Southeast	60%	39%
Hazelwood	Classroom teacher	M	White	Urban	St. Louis	53%	70%
Dixon	Classroom teacher	M	White	Rural	South Central	45%	5%
Warrensburg R-VI	Classroom teacher	M	White	Rural	West Central	33%	15%
Francis Howell	Classroom teacher	F	White	Suburban	St. Louis	13%	11%
Park Hill	Nonteacher educator	M	White	Suburban	Kansas City	22%	12%
University City	Classroom teacher	F	African American	Urban	St. Louis	59%	88%
Neosho R-5	Classroom teacher	F	White	Rural	Southwest	56%	17%
Prairie Home R-V	Classroom teacher	M	White	Rural	Heart of Missouri	26%	3%

* Percent free and reduced lunch (FRL) and percent minority refer to the population of the district represented by the panelist.

N/A = Not available

APPENDIX F:

PARTICIPANT AGENDAS

MISSOURI EOC STANDARD SETTING

November 2–3, 2009 English I & American History

Participant Agenda

Day 1—Morning

7:45 AM: Participants Arrive for Registration and Breakfast

- Welcome, Introductions, Logistics .....(DESE staff)

(Large-Group session—all panels together)

- Overview of MO EOC Assessment System .....(DESE)
- Overview of the two days of sessions .....(Mike Beck [Questar])
- Intro. to Achievement-Level Descriptors (ALDs) .....(Sheila Potter [Questar])

(Panelists now break into 3 individual groups, separately facilitated; all subsequent panel work will take place in the separate sessions.)

- Setting Performance Standards—General Process
- "Experience" the Assessments

12:00 PM: Lunch

Day 1—Afternoon

- Definitions and Description of Performance Standards
- Orientation to the Specific Standard-Setting Methodology
- Preparation for Round 1 of Judgments
- First Round of Judges' Work (until completed)

5:30 PM: Participants Excused

Day 2—Morning

7:45 AM: Participants Arrive for Registration and Breakfast

- Review of Day 1 Activities and Discussions
- Feedback & Discussion of Round 1 Judgments
- Preparation for Round 2 Judgments (until completed)
- Round 2 of Judges' Work

12:00 PM: Lunch

Day 2—Afternoon

- Review of Round 2 Judgments
- Preparation for Final Judgments
- Final Round of Judgments & Evaluation (until completed)
- Final review of ALDs & Session Wrapup

4:45 PM: Participants Excused

MISSOURI EOC STANDARD SETTING

November 4–5, 2009: Algebra II, Geometry, & Government

Participant Agenda

Day 1—Morning

7:45 AM: Participants Arrive for Registration and Breakfast

- Welcome, Introductions, Logistics .....(DESE staff)

(Large-Group session—all panels together)

- Overview of MO EOC Assessment System .....(DESE)
- Overview of the two days of sessions .....(Mike Beck [Questar])
- Intro. to Achievement-Level Descriptors (ALDs) .....(Sheila Potter [Questar])

(Panelists now break into 3 individual groups, separately facilitated; all subsequent panel work will take place in the separate sessions.)

- Setting Performance Standards—General Process
- "Experience" the Assessments

12:00 PM: Lunch

Day 1—Afternoon

- Definitions and Description of Performance Standards
- Orientation to the Specific Standard-Setting Methodology
- Preparation for Round 1 of Judgments
- First Round of Judges' Work (until completed)

5:30 PM: Participants Excused

Day 2—Morning

7:45 AM: Participants Arrive for Registration and Breakfast

- Review of Day 1 Activities and Discussions
- Feedback & Discussion of Round 1 Judgments
- Preparation for Round 2 Judgments (until completed)
- Round 2 of Judges' Work

12:00 PM: Lunch

Day 2—Afternoon

- Review of Round 2 Judgments
- Preparation for Final Judgments
- Final Round of Judgments & Evaluation (until completed)
- Final review of ALDs & Session Wrapup

4:45 PM: Participants Excused

APPENDIX G

OPENING SESSION POWERPOINT PRESENTATION

Setting the Standard

Achievement Level-Setting Conference
Missouri End-of-Course Assessments

English I, American History – November 2-3, 2009
Algebra II, Geometry, Government – November 4-5, 2009

Statewide Assessment in Missouri - A Brief History

- Missouri S.B. 380 – The Outstanding Schools Act
  - Passed in 1993
  - Required development of academic performance standards
  - Mandated statewide assessments to measure student progress toward standards
  - The Missouri Assessment Program (MAP)
  - Designed to evaluate student performance relative to Show-Me Standards
  - First administration in 1996 (began with grade span Mathematics test)
  - Developed over the next decade to include assessments in multiple grades and content areas

No Child Left Behind (NCLB)

- Federal legislation passed in 2001
  - By 2005-2006, states required to assess students in Mathematics and Communication Arts in all grades 3-8 and once in high school
  - Science added in 2007 – States required to assess once in each grade range (elementary, middle, and high school)
  - Goal is to have all students reach "Proficiency" by 2014
  - States create unique definitions of "Proficiency"

Impact of NCLB on MAP

- Added grade-level assessments for grades 3-8 and 10 in Mathematics and grades 3-8 and 11 in Communication Arts in Spring 2006
- Added Science assessments for grades 5, 8, and 11 in Spring 2007
- Established achievement levels of Below Basic, Basic, Proficient, and Advanced for all MAP-assessed grade levels and content areas

Missouri End-of-Course (EOC) Assessments

- New approach to high school assessment in Missouri
- Recommended by Missouri State Board of Education and task force on high school assessment
- Designed to be administered when students complete specific course content rather than at the end of a grade level

Purposes of Missouri EOC Assessments

- According to the Missouri State Board of Education, Missouri EOC Assessments are intended to:
  - measure and reflect student mastery toward post secondary readiness
  - identify students' strengths and weaknesses
  - communicate expectations for all students to patrons and community
  - serve as the basis of state and national accountability plans
  - evaluate programs

Missouri EOC Assessment Development

- Phase I – Algebra I, English II, Biology
  - Implemented in 2008-2009
  - Replaced high school MAP assessments in Mathematics, Communication Arts, and Science
- Phase II – Algebra II, Geometry, English I, American History, Government
  - Implemented in 2009-2010

About Missouri EOC Assessments...

- Phase I EOC Assessments include both multiple choice items and performance items and are designed to be administered in two 55-minute class periods
- Phase II EOC Assessments include multiple choice items only and can be administered in one 55-minute class period.
- Flexible administration – Districts can administer during fall, spring, or summer window.
- Can contribute to course grades (local decision)
- Provide data for state and federal accountability

Achievement Level-Setting for Phase II Missouri EOC Assessments

- What is the task?
  - To determine what score on a Missouri EOC Assessment separates "Below Basic" from "Basic" performance, "Basic" from "Proficient" performance, and "Proficient" from "Advanced" performance
  - To define what characteristics of student performance should be demonstrated at each performance level

Achievement Level-Setting for Phase II Missouri EOC Assessments

- Why is it important?
  - Defining achievement levels helps us answer the question, "How good is good enough?"
  - Achievement levels provide a common measure and a common vocabulary for educators, parents, and other stakeholders to talk about student performance.
  - Achievement levels provide us with a way of looking at student performance and progress over time.

Achievement Level-Setting for Phase II Missouri EOC Assessments

- Who is involved?
  - Approximately 15 panelists per Missouri EOC Assessment
  - Panels include classroom teachers (at least 50 percent), non-teacher educators, representatives of postsecondary education, and other professionals
  - Panelists nominated by building and district administrators, professional educator organizations, and postsecondary education community
  - Panels selected to be geographically and demographically representative of Missouri's population

Achievement Level-Setting for Phase II Missouri EOC Assessments

- **Roles and responsibilities**
  - **Riverside Publishing Company** (Missouri's contractor for EOC Assessments) – Overseeing achievement level-setting process and providing onsite data
  - **Questar Assessment** (Riverside Publishing Company's subcontractor for achievement level setting) – Training and facilitating in large and small group sessions
  - **DESE Curriculum and Assessment staff** – Available to answer questions about test development and content, and conference logistics
  - **Regional Instructional Facilitators** – Present in each room during small group sessions to serve as content resources
  - **Panelists** - Evaluate test content and data to recommend cut scores and to revise achievement level descriptors

Achievement Level-Setting for Phase II Missouri EOC Assessments

- The Achievement Level-Setting Process
  - Modified Angoff method as recommended by Missouri's TAC
  - Training in large and small groups
  - Review of test items and content
  - Rounds of judgments of cutscores for each achievement level
  - Consideration of 2008-2009 field test data
  - Review and revision of achievement level descriptors

Achievement Level-Setting for Phase II Missouri EOC Assessments

- Results:
  - Recommended cut scores for each Phase II Missouri EOC Assessment
  - Recommended achievement level descriptors for each Phase II Missouri EOC Assessment

Final Determination of Achievement Levels for Phase II Missouri EOC Assessments

Recommended cutscores and achievement level descriptors will be presented to the Missouri State Board of Education in January, 2010.

Standard Setting Overview

Missouri
End-of-Course (EOC) Assessments

November, 2009

Session Overview - Day 1

I. What is "standard setting" - in general and for the EOC Assessments?

II. Describe the performance categories; refine achievement-level descriptors.

III. Review and discuss the actual EOC test.

IV. The "Angoff procedure" – how it works; "Practice" and "Warm-up"

V. Round 1 of Recommendations

Setting Performance Standards

- *Who's Involved*? State and contractor roles
- *Why Questar*? Who's facilitating? Our role: *Not* content experts, but facilitators

Setting Performance Standards

- *Who's Involved*? State and contractor roles
- *Why Questar*? Who's facilitating? Our role
- *Why <u>you</u>?* **Individually and collectively:**

You are the *experts*.
You *represent* various audiences.

Setting Performance Standards

- *Who's Involved*? State and contractor roles
- *Why Questar*? Who's facilitating? Our role
- *Why <u>you</u>?* **Individually and collectively:**

You are the *experts*.
You *represent* various audiences.
You are *judges*, not psychometricians.

Setting Performance Standards

- *Who's Involved*? State and contractor roles
- *Why Questar*? Who's facilitating? Our role
- *Why <u>you</u>?* **Individually and collectively:**

You are the *experts*.
You *represent* various audiences.
You are *judges*, not psychometricians.
You are *advisors*, not policy makers.

Groundrules

NO DISCUSSIONS about the ***EOC program or its underlying content standards***

OR

Groundrules

NO DISCUSSIONS about the *EOC program*
OR

- **why to set standards**
- **the philosophy of educational assessment**
- **why these particular tasks/assessments**
- **why a particular procedure is being used**

Groundrules

NO DISCUSSIONS about the *EOC program*
OR

- why to set standards
- the philosophy of educational assessment
- why these particular tasks/assessments
- why a particular procedure is being used

Confidentiality **-**
all materials & discussions.

Groundrules

NO DISCUSSIONS about the *EOC program*
OR

- why to set standards
- the philosophy of educational assessment
- why these particular tasks/assessments
- the fairness of assessing special students
- why a particular procedure is being used

Confidentiality **of all materials & discussions**

All discussions should be *as a group.*

Overarching Principle to Guide our Work

First expounded by, unarguably, the world's leading philosopher and intellectual . . . .

Dave Barry

Overarching Principle to Guide our Work

"If you had to identify, in one word, the reason why the human race has not achieved, and never will achieve, its full potential, that word would be . . . *meetings*."

What *IS* Standard Setting?

- another frame of reference to interpret test scores ("How good is *good*"?)
- a routine, daily activity

What *IS* Standard Setting?

- another frame of reference to interpret test scores ("How good is *good*"?)
- a routine, daily activity
- true "criterion-referencing"

What *IS* Standard Setting?

- another frame of reference to interpret test scores ("How good is *good*"?)
- a routine, daily activity
- true "criterion-referencing"
- a *semi*-quantitative, *semi*-standardized, socio-political judgment process

What *IS* Standard Setting?

- just a frame of reference for test scores
- a routine, daily activity
- true "criterion-referencing"
- essentially, a judgment process
- NOT "science" !

4 Keys to Being a Great Judge

1. Judgments *vs.* Data

4 Keys to Being a Great Judge

1. Judgments *vs.* Data
2. "Should" *vs.* "Will"

4 Keys to Being a Great Judge

1. Judgments *vs.* Data
2. "Should" *vs.* "Will"
3. **Consider *ALL Missouri* students who will take this EOC assessment.**

4 Keys to Being a Great Judge

1. Judgments *vs.* Data
2. "Should" *vs.* "Will"
3. Consider *ALL Missouri* students who took this EOC assessment
4. **Think of *threshold* students, not *all* who are Proficient.**

Advice on Setting Standards

- **Set demanding, but *attainable* standards.**

Advice on Setting Standards

- Set demanding, but *attainable* standards.
- **What "*should be*" probably shouldn't disregard what "*is.*"**

Advice on Setting Standards

- Set demanding, but *attainable* standards.
- What "*should be*" probably shouldn't disregard what "*is.*"
- **Focus on *concrete* behaviors, skills, responses.**

Advice on Setting Standards

- Set demanding, but *attainable* standards.
- What "*should be*" probably shouldn't disregard what "*is.*"
- Focus on *concrete* behaviors, skills, responses.
- **Item difficulty resides in the answer choices, not the item "stem."**

Who was the 7th President of the United States?

Who was the 7th President of the United States?

A. Augie Busch
B. Stan Musial
C. Andrew Jackson
D. Mark Twain
E. George Washington Carver

Who was the 7th President of the United States?

A. Abraham Lincoln
B. Harry Truman
C. Andrew Jackson
D. Nellie Tayloe Ross
E. George Bush

Who was the 7th President of the United States?

A. Martin VanBuren
B. John Quincy Adams
C. Andrew Jackson
D. James Monroe
E. John F. Kennedy

Advice on Setting Standards

- Set demanding, but *attainable* standards.
- What "*should be*" shouldn't disregard what "is."
- Focus on the *concrete*.
- Remember to review the options for all items.

Use your best judgment !!

Critical Elements of An Assessment System

Content Standards =
Course-Level Expectations (CLEs)

Critical Elements of An Assessment System

Content Standards (CLEs)

Assessment Content

Critical Elements of An Assessment System

Content Standards (CLEs)

Assessment Content

Achievement Categories (Standards)

Critical Elements of An Assessment System

Content Standards (CLEs)

Assessment Content

Achievement Categories (Standards)

Achievement Level Descriptors (ALDs)

Achievement Level Descriptors ALDs

Below Basic | Basic | Proficient | Advanced

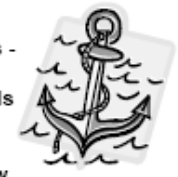
Achievement Level Descriptors ALDs

Written *draft* statements describing in content-specific terms the level of knowledge and skills required at each performance/ achievement category – *Below Basic, Basic Proficient, Advanced*

Achievement Level Descriptors ALDs

Anchors for your decisions consisting of:

- Labels, i.e., BB, B, P, A
- Introductory paragraphs - general descriptions of Achievement Levels
- Lists of specific behaviors - what students should know and be able to do



Achievement Level Descriptors ALDs

Why are they important?
Standard-setting ANCHORS for classifying student performance and determining cut scores.
Reporting tools to help students, teachers, parents *interpret* what learners know and can do, and what they do not know and cannot do.

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Achievement Level Descriptors ALDs

- Are derived from the Course Level Expectations CLEs.
- Are based on *assessable* CLEs.
- Describe in general terms behaviors assessed specifically on the EOC assessments.

Not everything that can be counted counts, and not everything that counts can be counted. Albert Einstein

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Achievement Level Descriptors ALDs – Your Task

Determine what these ***general*** ALDs mean ***concretely*** for students taking each EOC assessment.

How??

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Achievement Level Descriptors ALDs – Your Task

- Beginning with the *Proficient* category, describe the assessed students *concretely*.
- What do they know? What can they do?
- What skills do they possess in order to demonstrate this behavior?
- What does the skill look like?
- What are examples?
- What behaviors/actions "fit" a certain category?

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ALDs – Your Task

Advanced
- Demonstrate thorough understanding
- Demonstrate higher-level skills
- Use wide range of strategies to understand
- Consistently apply

Proficient
- Demonstrate understanding of skills and processes
- Use a range of strategies to understand and apply

Basic
- Demonstrate incomplete or partial understanding
- Demonstrate skills inconsistently
- Use some strategies

Below Basic
- Demonstrate little understanding
- Demonstrate skills inconsistently or incorrectly
- Use few strategies

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Achievement Level Descriptors ALDs – Your Task

- **Action verbs** - e.g., determine, evaluate, analyze, identify, compare, describe, explain
- **Qualifiers** - adjectives and adverbs that describe:
  - Differences in amount (most, various, few, both, limited)
  - Degree of
    - understanding (complex, clear, relevant, little, incomplete)
    - frequency (consistently, inconsistently, rarely)
    - effectiveness (highly, moderately, somewhat, thorough)

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APPENDIX H:

DRAFT ALDS WITH PANEL EDITS MARKED

Missouri End-of-Course Assessment Achievement-Level Descriptors—DRAFT
English I
Achievement Levels

Advanced: Students performing at the Advanced level on the Missouri English I End-of-Course Assessment consistently demonstrate a thorough understanding of the skills and processes identified in the Course Level Reading Expectations for English I. They demonstrate higher-level skills in reading processes and in responding to both fiction and nonfiction texts. In addition to understanding and applying the skills at the Proficient level, students scoring at the Advanced level use a range of strategies to comprehend and interpret a variety of texts, demonstrate a thorough understanding of literary forms, and consistently apply different strategies for accessing and summarizing information.

Proficient: Students performing at the Proficient level on the Missouri English I End-of-Course Assessment demonstrate an understanding of the skills and processes identified in the Course Level Reading Expectations for English I. They demonstrate these skills in reading processes and in responding to both fiction and nonfiction texts. In addition to understanding and applying the skills at the Basic level, students scoring at the Proficient level use a range of strategies to comprehend and interpret a variety of texts, demonstrate an understanding of literary forms, and apply strategies for accessing and summarizing information.

Basic: Students performing at the Basic level on the Missouri English I End-of-Course Assessment demonstrate an incomplete understanding of the skills and processes identified in the Course Level Reading Expectations for English I. They demonstrate these skills inconsistently in reading processes and in responding to both fiction and nonfiction texts. In addition to understanding and applying the skills at the Below Basic level, students scoring at the Basic level use some strategies to comprehend and interpret a variety of texts, demonstrate a partial understanding of literary forms, and inconsistently apply few strategies for accessing and summarizing information.

Below Basic: Students performing at the Below Basic level on the Missouri English I End-of-Course Assessment demonstrate little understanding of the skills and processes identified in the Course Level Reading Expectations for English I. They demonstrate these skills inconsistently and/or incorrectly in reading processes and in responding to both fiction and nonfiction texts. Students scoring at the Below Basic level use few strategies to comprehend and interpret texts, demonstrate little understanding of literary forms, and apply few strategies for accessing information.

Achievement Descriptors

Advanced

Reading—In both fiction and nonfiction, a student can

- ✓ Determine vocabulary meaning
- ✓ Analyze the main idea and evaluate supporting details
- ✓ Make connections—compare, contrast, evaluate
- ✓ Evaluate text features
- ✓ Analyze and evaluate figurative language and literary techniques
- ✓ Draw insightful conclusions ~~to evaluate text~~
- ✓ Summarize and paraphrase complex ideas and information
- ✓ Evaluate literary elements
- ✓ Evaluate proposed solutions
- ✓ Evaluate accuracy and adequacy of evidence
- ✓ Analyze organizational patterns
- ✓ Evaluate the author's point of view, viewpoint/perspective, and purpose
- ✓ Evaluate the author's style and word choice

Proficient

Reading—In both fiction and nonfiction, a student can

- ✓ Determine vocabulary meaning
- ✓ Identify the main idea and supporting details
- ✓ Make connections—compare, contrast, analyze
- ✓ Analyze text features
- ✓ Analyze figurative language and literary techniques
- ✓ Draw accurate conclusions
- ✓ Summarize and paraphrase ideas and information
- ✓ Analyze literary elements
- ✓ Analyze proposed solutions
- ✓ Analyze accuracy and adequacy of evidence
- ✓ ~~Analyze~~ Explain organizational patterns

- ✓ Analyze the author's point of view, viewpoint/perspective, and purpose
- ✓ Analyze the author's style and word choice

Basic
Reading—In fiction and nonfiction, a student can
- ✓ Determine vocabulary meaning
- ✓ Identify the main idea and major details
- ✓ Make simple connections—compare, contrast
- ✓ Identify text features
- ✓ Identify figurative language and literary techniques
- ✓ Draw conclusions
- ✓ Summarize and paraphrase basic ideas and information
- ✓ Identify basic literary elements
- ✓ Identify proposed solutions
- ✓ Determine reliability of evidence
- ✓ Identify organizational patterns
- ✓ Identify author's point of view and purpose
- ✓ Identify the author's style and word choice

Below Basic
***Readin*g**—In fiction and nonfiction, a student can
- ✓ Determine vocabulary meaning
- ✓ Identify the main idea and some details
- ✓ Make simple connections
- ✓ Identify simple text features
- ✓ Identify figurative language
- ✓ Identify characters, plot, and setting
- ✓ Identify point of view
- ✓ Determine literal meaning

Missouri End-of-Course Assessment Achievement-Level Descriptors
Algebra II
Achievement Levels

Advanced: Students performing at the Advanced level on the Missouri Algebra II End-of-Course Assessment demonstrate a thorough understanding of the course-level expectations for Algebra II. They demonstrate these skills in numbers and operations, algebraic relationships, and data and probability. In addition to understanding and applying the skills at the Proficient level, students scoring at the Advanced level use a wide range of strategies to solve problems and demonstrate a thorough understanding of important mathematical content and concepts.

Proficient: Students performing at the Proficient level on the Missouri Algebra II End-of-Course Assessment demonstrate an understanding of most of the course-level expectations for Algebra II. They demonstrate these skills in numbers and operations, algebraic relationships, and data and probability. In addition to understanding and applying the skills at the Basic level, students scoring at the Proficient level use a range of strategies to solve problems and demonstrate an understanding of important mathematical content and concepts.

Basic: Students performing at the Basic level on the Missouri Algebra II End-of-Course Assessment demonstrate some understanding of the course-level expectations for Algebra II. They demonstrate these skills in numbers and operations, algebraic relationships, and data and probability. In addition to understanding and applying the skills at the Below Basic level, students scoring at the Basic level use some strategies to solve problems and demonstrate some understanding of important mathematical content and concepts.

Below Basic: Students performing at the Below Basic level on the Missouri Algebra II End-of-Course Assessment demonstrate a limited understanding of the course-level expectations for Algebra II. They demonstrate these skills in numbers and operations, algebraic relationships, and data and probability. In addition to demonstrating these skills, students scoring at the Below Basic level use very few strategies to solve problems and demonstrate a limited understanding of important mathematical content and concepts.

Achievement Descriptors

Advanced

Algebraic Relationships—Using algebraic relationships, a student can

- ✓ Describe the effect of parameter changes on logarithmic and rational functions
- ✓ Compare and contrast properties of rational functions
- ✓ Use symbolic algebra to represent and solve problems that involve logarithmic relationships
- ✓ Describe and use algebraic manipulations, inverse, or composition of functions
- ~~✓ Compare and contrast properties of rational functions~~
- ✓ Use and solve equivalent forms of logarithmic, radical, and rational equations
- ✓ Use and solve systems of quadratic equations or inequalities with 2 variables
- ✓ Identify quantitative relationships and determine type(s) of functions that might model the situation to solve a problem, including logarithmic and rational functions
- ✓ Analyze logarithmic functions by investigating intercepts, domain and range, and asymptotes

Data and Probability—Using data and probability, a student can

- ~~✓ Given one-variable quantitative data, describe its shape and calculate summary statistics~~
- ✓ Describe the concept of probability distribution
- ✓ Compute the probability of compound events

Proficient

Algebraic Relationships—Using algebraic relationships, a student can

- ✓ Compare and contrast various forms of representations of patterns
- ✓ Describe the effect of parameter changes on quadratic, cubic, absolute value, and square root functions
- ✓ Compare and contrast the properties of exponential and logarithmic functions
- ✓ Use symbolic algebra to represent and solve problems that involve exponential or quadratic relationships

- ✓ Describe and use algebraic manipulations, including factoring or imaginary numbers, to simplify expressions
- ✓ Use and solve equivalent forms of quadratic and exponential equations
- ✓ Use and solve systems of linear inequalities with two variables
- ✓ Identify quantitative relationships and determine type(s) of functions that might model the situation to solve a problem, including quadratic and exponential growth/decay
- ✓ Analyze exponential functions by investigating rates of change, intercepts, domain and range, and asymptotes
- ~~✓ Identify quantitative relationships that can be modeled by exponential or quadratic functions to solve a problem~~

Data and Probability—Using data and probability, a student can

- ✓ Given a scatterplot, determine a type of function that models the data
- ✓ Given one-variable quantitative data, calculate summary statistics
- ✓ Use and describe the concepts of conditional probability
- ~~✓ Given one-variable quantitative data, display the distribution and describe its shape~~
- ~~✓ Describe the concept of probability distribution~~
- ~~✓ Compute the probability of compound events~~

Basic

Numbers and Operations—Using numbers and operations, a student can

- ✓ Compare and order irrational numbers, including finding their approximate location on a number line
- ✓ Use real numbers and various models, drawings, etc. to solve problems

Algebraic Relationships—Using algebraic relationships, a student can

- ✓ Generalize patterns using explicitly or recursively defined linear or exponential functions
- ✓ Describe the effect of parameter changes on exponential functions
- ✓ Compare and contrast the properties of linear and exponential functions

- ✓ ~~Describe the effect of parameter changes on exponential functions~~
- ✓ ~~Describe and use algebraic manipulations, including rules of exponents, to simplify expressions~~
- ✓ Use symbolic algebra to represent and solve problems that involve linear relationships
- ✓ Describe and use algebraic manipulations, including rules of exponents, to simplify expressions
- ✓ Use and solve equivalent forms of absolute value and linear equations
- ✓ Use and solve systems of linear equations with two variables
- ✓ Identify quantitative relationships that can be modeled by linear functions to solve a problem

Data and Probability—Using data and probability, a student can

- ✓ Given a scatterplot, determine an equation for a line of best fit
- ✓ Given one-variable quantitative data, display the distribution and describe its shape
- ✓ Apply statistical measures of center to solve problems
- ✓ ~~Given a scatterplot, determine an equation for a line of best fit~~
- ✓ ~~Use and describe the concepts of conditional probability~~

Below Basic

Numbers and Operations—Using numbers and operations, a student can

- ✓ Compare and order rational numbers, including finding approximate locations on a number line

Algebraic Relationships—Using algebraic relationships, a student can

- ✓ Generalize patterns using explicitly or recursively defined single operation functions
- ✓ Describe the effects of parameter changes on linear functions
- ✓ Compare the properties of linear functions
- ✓ Describe and use algebraic manipulations, including order of operations, to simplify expressions

- ✓ Use and solve equivalent forms of linear equations

Data and Probability—Using data and probability, a student can

- ✓ Use appropriate graphical representations of data
- ✓ Describe the concept of sample space
- ✓ Determine the probability of two independent events

Missouri End-of-Course Assessment Achievement-Level Descriptors
Geometry
Achievement Levels

Advanced: Students performing at the Advanced level on the Missouri Geometry End-of-Course Assessment demonstrate a thorough understanding of the course-level expectations for Geometry. They demonstrate these skills in algebraic relationships, geometric and spatial relationships, and measurement. In addition to understanding and applying the skills at the Proficient level, students scoring at the Advanced level use a wide range of strategies to solve problems and demonstrate a thorough understanding of important mathematical content and concepts.

Proficient: Students performing at the Proficient level on the Missouri Geometry End-of-Course Assessment demonstrate an understanding of most of the course-level expectations for Geometry. They demonstrate these skills in algebraic relationships, geometric and spatial relationships, and measurement. In addition to understanding and applying the skills at the Basic level, students scoring at the Proficient level use a range of strategies to solve problems and demonstrate an understanding of important mathematical content and concepts.

Basic: Students performing at the Basic level on the Missouri Geometry End-of-Course Assessment demonstrate some understanding of the course-level expectations for Geometry. They demonstrate these skills in algebraic relationships, geometric and spatial relationships, and measurement. In addition to understanding and applying the skills at the Below Basic level, students scoring at the Basic level use some strategies to solve problems and demonstrate some understanding of important mathematical content and concepts.

Below Basic: Students performing at the Below Basic level on the Missouri Geometry End-of-Course Assessment demonstrate a limited understanding of the course-level expectations for Geometry. They demonstrate these skills in algebraic relationships, geometric and spatial relationships, and measurement. In addition to demonstrating these skills, students scoring at the Below Basic level use very few strategies to solve problems and demonstrate a limited understanding of important mathematical content and concepts.

Achievement Descriptors

Advanced

Algebraic Relationships—Using algebraic relationships, a student can

- ✓ Compare and contrast various forms of representations of patterns (exponential)

Geometric and Spatial Relationships—Using geometric and spatial relationships, a student can

- ✓ Use inductive and deductive reasoning to prove theorems and critique arguments made by others
- ✓ Make conjectures involving 2-dimensional objects represented with Cartesian coordinates
- ✓ Apply constructions and the coordinate plane to represent translations, reflections, rotations, and dilations of objects
- ~~✓ Identify types of symmetries of 3-dimensional figures~~
- ✓ Draw vertex-edge graphs or networks to find optimal solutions
- ✓ Draw representations of 3-dimensional geometric objects from different perspectives

Measurement—Using measurement relationships, a student can

- ✓ Solve problems of angle measure involving polygons

Proficient

Algebraic Relationships—Using algebraic relationships, a student can

- ✓ Identify quantitative relationships and determine the type(s) of function that might model the situation to solve the problem (exponential)
- ✓ Analyze linear functions by investigating rates of change and intercepts
- ✓ Apply appropriate properties of exponents to solve equations
- ✓ Compare and contrast various forms of representations of patterns (quadratic)

Geometric and Spatial Relationships—Using geometric and spatial relationships, a student can

- ✓ Use inductive and deductive reasoning to establish the validity of geometric conjectures
- ✓ Solve problems involving 2-dimensional objects represented with Cartesian

coordinates

- ✓ Use constructions and the coordinate plane to represent translations, reflections, rotations, and dilations of objects
- ✓ Identify types of symmetries of 3-dimensional figures
- ✓ Use vertex-edge graphs or networks to find optimal solutions

Measurement—Using measurement relationships, a student can

- ✓ Solve problems of angle measure involving parallel lines cut by a transversal
- ✓ Determine the surface area of geometric figures, including cylinders, cones, and spheres

Basic

Algebraic Relationships—Using algebraic relationships, a student can

- ✓ Generalize patterns using explicitly or recursively defined functions
- ✓ Apply appropriate properties of exponents to simplify expressions
- ✓ Identify quantitative relationships and determine the type(s) of function that might model the situation to solve the problem (absolute value and quadratic)
- ✓ Compare and contrast various forms of representations of patterns (linear)

Geometric and Spatial Relationships—Using geometric and spatial relationships, a student can

- ✓ Identify types of symmetries of 2-dimensional figures (rotational)

Measurement—Using measurement relationships, a student can

- ✓ Solve problems of angle measure involving triangles
- ✓ Determine the volume of geometric figures, including cylinders, cones, and spheres

Below Basic

Algebraic Relationships—Using algebraic relationships, a student can

- ✓ Identify quantitative relationships and determine the type(s) of function that might model the situation to solve the problem (linear)

***Geometric and Spatial Relationships*—**Using geometric and spatial relationships, a student can

- ✓ Identify types of symmetries of 2-dimensional figures (line)

***Measurement*—**Using measurement relationships, a student can

- ✓ Determine the volume of geometric figures (prism and pyramids)

Missouri End-of-Course Assessment Achievement-Level Descriptors
Government
Achievement Levels

Advanced: Students performing at the Advanced level on the Missouri End-of-Course Assessment demonstrate a thorough understanding of the Course-Level Expectations for Government. They demonstrate these skills in addition to understanding and applying the skills at the Proficient level. Students scoring at the Advanced level use a wide range of strategies to understand and apply the concepts of government.

Proficient: Students performing at the Proficient level on the Missouri End-of-Course Assessment demonstrate an understanding of the Course-Level Expectations for Government. They demonstrate these skills in addition to understanding and applying the skills at the Basic level. Students scoring at the Proficient level use a range of strategies to understand and apply the concepts of government.

Basic: Students performing at the Basic level on the Missouri End-of-Course Assessment demonstrate a partial understanding of the Course-Level Expectations for Government. They demonstrate these skills in addition to understanding and applying the skills at the Below Basic level. Students scoring at the Basic level use some strategies to understand and apply the concepts of government.

Below Basic: Students performing at the Below Basic level on the Missouri End-of-Course Assessment demonstrate a limited understanding of the Course-Level Expectations for Government. In addition to demonstrating these skills, students scoring at the Below Basic level use few strategies and demonstrate a limited understanding of important government content and concepts.

Achievement Descriptors

Advanced

Knowledge of the principles expressed in documents shaping constitutional democracy in the United States—A student can

- ✓ Apply the principles of constitutional democracy to complex historical and contemporary issues
- ✓ Thoroughly assess the changing roles of government
- ✓ Describe the historical foundations of the United States governmental system by citing the influence of different documents and writings
- ✓ Determine the civic responsibilities of individual citizens
- ✓ Identify and give clear examples of democracies and republics
- ✓ Explain the relevance of constitutional principles and make complex connections to different ~~foundational~~ historical documents and court cases

Knowledge of principles and processes of governance systems—A student can

- ✓ Describe in detail the structure of federal and state levels of government and the purposes of ~~both federal and state~~ laws
- ✓ Thoroughly explain the importance of government principles
- ✓ Evaluate the roles and influence of political parties and interest groups
- ✓ Thoroughly explain ~~Explain~~ ~~various~~ processes pertaining to ~~different~~ governmental systems

Proficient

Knowledge of the principles expressed in documents shaping constitutional democracy in the United States—A student can

- ✓ Apply the principles of constitutional democracy to historical and contemporary issues
- ✓ Assess the changing roles of government
- ✓ Describe the historical foundations of the United States governmental system
- ✓ Determine the civic responsibilities of individual citizens
- ✓ Identify and give examples of democracies and republics
- ✓ Explain the relevance and connection of constitutional principles in different historical documents and court cases

Knowledge of principles and processes of governance systems—A student can

- ✓ Describe the structure of federal and state levels of government and the purposes of laws
- ✓ Explain the importance of government principles
- ✓ Evaluate the roles and influence of political parties and interest groups
- ✓ Explain the processes pertaining to governmental systems

Basic

Knowledge of the principles expressed in documents shaping constitutional democracy in the United States—A student can

- ✓ Describe the principles of constitutional democracy
- ✓ Explain the changing roles of government
- ✓ ~~Explain~~ Identify the historical foundations of the United States governmental system
- ✓ Describe the civic responsibilities of individual citizens
- ✓ Identify democracies and republics
- ✓ Describe the relevance of different historical documents

Knowledge of principles and processes of governance systems—A student can

- ✓ Identify the structure of government and the purposes of laws
- ✓ Define different government principles
- ✓ Identify the roles and influence of political parties and interest groups
- ✓ Recognize the processes pertaining to governance systems

Below Basic

Knowledge of the principles expressed in documents shaping constitutional democracy in the United States—A student can

- ✓ Identify the principles of constitutional democracy
- ✓ Recognize the changing roles of government
- ✓ Recognize the historical foundations of the United States governmental system
- ✓ Identify the civic responsibilities of individual citizens
- ✓ Inconsistently identifies democracies and republics
- ✓ Identify different relevant historical documents

Knowledge of principles and processes of governance systems—A student can

- ✓ Inconsistently identifies the structure of government and the purposes of laws
- ✓ Inconsistently defines different government principles
- ✓ Identify the roles and influence of political parties and interest groups
- ✓ Recognize the processes pertaining to governance systems

Missouri End-of-Course Assessment Achievement-Level Descriptors
American History
Achievement Levels

Advanced: Students performing at the Advanced level on the Missouri End-of-Course Assessment demonstrate a thorough understanding of the Course-Level Expectations for American History. They demonstrate these skills in addition to understanding and applying the skills at the Proficient level. Students scoring at the Advanced level effectively and consistently demonstrate an understanding and apply concepts in American History.

Proficient: Students performing at the Proficient level on the Missouri End-of-Course Assessment demonstrate an understanding of the Course-Level Expectations for American History. They demonstrate these skills in addition to understanding and applying the skills at the Basic level. Students scoring at the Proficient level demonstrate understanding and apply concepts in American History.

Basic: Students performing at the Basic level on the Missouri End-of-Course Assessment demonstrate a partial understanding of the Course-Level Expectations for American History. They demonstrate these skills in addition to understanding and applying the skills at the Below Basic level. Students scoring at the Basic level use some strategies to demonstrate partial understanding and apply concepts in American History.

Below Basic: Students performing at the Below Basic level on the Missouri End-of-Course Assessment demonstrate a limited understanding of the Course-Level Expectations for American History. In addition to demonstrating these skills, students scoring at the Below Basic level use few strategies and demonstrate a limited understanding of important content and concepts in American History.

Achievement Descriptors

Advanced

Knowledge of continuity and change in the history of Missouri and the United States—A student can

- ✓ Describe various motivations and challenges for people migrating from many regions of the world and the interactions of cultures and religious traditions that have contributed to America's history from Reconstruction to the present
- ✓ Analyze the evolution of American democracy by recognizing events and movements that expanded the role of the government, civic participation, and civil rights from Reconstruction to the present
- ✓ Apply various major economic concepts in the context of the historical period studied
- ✓ Thoroughly explain the importance of various government principles within the context of United States history from Reconstruction to the present
- ✓ Analyze the various roles and influence of political parties and interest groups from Reconstruction to the present
- ✓ Describe the historical development of various aspects of the American economy
- ✓ Thoroughly analyze the interplay of people, business, labor unions, and government with respect to regulation and to fiscal and monetary policy in the United States economy
- ✓ ~~Effectively survey~~ Explain the functions and effects of major economic institutions of the United States economy
- ✓ Identify the ~~various~~ roles of the government in the United States economy
- ✓ Distinguish ~~major~~ patterns and issues with regard to population distribution, demographics, settlements, migrations, and cultures in the United States

- ✓ Identify and ~~thoroughly~~ explain criteria that give regions their identities in different periods of United States history; connect ideas about how and why regions change
- ✓ Describe and evaluate the evolution of United States domestic and foreign policies from Reconstruction to the present by citing specific policy-shaping events

Knowledge of continuity and change in the history of the world—A student can

- ✓ ~~Effectively analyze~~ Analyze various aspects of twentieth century wars pertinent to United States history

Proficient

Knowledge of continuity and change in the history of Missouri and the United States—A student can

- ✓ Describe the migrations of people from many regions of the world and the interactions of cultures and religious traditions that have contributed to America's history from Reconstruction to the present
- ✓ Analyze the evolution of American democracy—its ideas, institutions, and political processes from Reconstruction to the present
- ✓ ~~Apply~~ Explain major economic concepts in the context of the historical period studied
- ✓ Explain the importance of government principles within the context of United States history from Reconstruction to the present
- ✓ Analyze the significance of the roles and influence of political parties and interest groups from Reconstruction to the present
- ✓ Describe significant aspects of the historical development of the American economy
- ✓ Analyze the roles people, business, labor unions, and government play in the United States economy
- ✓ ~~Draw conclusions about~~ Survey the functions and effects of major economic institutions of the United States economy.
- ✓ Identify ~~the~~ significant roles of government in the United States economy
- ✓ Distinguish major patterns and issues with regard to population distribution, demographics, settlements, migrations, and cultures in the United States
- ✓ List ~~and explain~~ criteria that give regions their identities in different periods of United States history; explain how and why regions change

- ✓ ~~Analyze the evolution~~ Describe the changes of United States domestic and foreign policies from Reconstruction to the present

Knowledge of continuity and change in the history of the world—A student can
- ✓ ~~Analyze~~ Demonstrate an understanding of the causes and impacts of the wars in the twentieth century that are pertinent to United States history

Basic

Knowledge of continuity and change in the history of Missouri and the United States—A student can
- ✓ Identify the migrations of people from many regions of the world that have contributed to America's history from Reconstruction to the present
- ✓ Explain the evolution of American democracy—its ideas, institutions, and political processes from Reconstruction to the present
- ✓ Describe major economic concepts in the context of the historical period studied
- ✓ Describe the importance of government principles within the context of United States history from Reconstruction to the present
- ✓ Explain the roles and influence of political parties and interest groups from Reconstruction to the present
- ✓ Explain the roles people, business, labor unions, and government play in the United States economy
- ✓ Identify the functions and effects of major economic institutions of the United States economy
- ✓ Describe major patterns and issues with regard to population distribution, demographics, settlements, migrations, and cultures in the United States
- ✓ Identify criteria that give regions their identities in different periods of United States history; describe how and why regions change
- ✓ Describe ~~the evolution of~~ United States domestic and foreign policies from Reconstruction to the present

Knowledge of continuity and change in the history of the world—A student can
- ✓ Describe the wars of the twentieth century pertinent to United States history

Below Basic

Knowledge of continuity and change in the history of Missouri and the United States—A student can

- ✓ Describe the evolution of American democracy—its ideas, institutions, and political processes from Reconstruction to the present
- ✓ Identify major economic concepts
- ✓ Identify government principles
- ✓ Describe the roles and influence of political parties and interest groups from Reconstruction to the present
- ✓ Describe the roles people, business, labor unions, and government play in the United States economy
- ✓ Identify major patterns and issues with regard to population distribution, demographics, settlements, migrations, and cultures in the United States
- ✓ Identify United States domestic and foreign policies from Reconstruction to the present

Knowledge of continuity and change in the history of the world—A student can

- ✓ Identify the wars of the twentieth century pertinent to United States history

APPENDIX I:

QUALIFYING TEST

EOC Assessment: _____ **Judge # _____**

Pre-Standard Setting Self-Evaluation Assessment for Judges of the Missouri EOC Assessments

1. Why are Achievement Level Descriptors such an integral part of the standard-setting process?
   A. They provide an anchor, giving concrete meaning to the terms Basic, Proficient, and Advanced.
   B. They describe critical knowledge and skills that all students at a given performance level should possess.
   C. They define all of the items that are contained on the EOC.
   D. They summarize elements of the Course-Level Expectations for the course.

2. Which of these statements about standard setting is TRUE?
   A. Panelists should use their best judgment to make their recommendations but should rely more on various empirical data to be provided during the sessions.
   B. While the EOC assessments are given statewide, judges should make recommendations based on the unique characteristics of *their* districts since other panelists will focus on other district types.
   C. A judge who concludes that the "proper" cut score for Proficient is 24 should make a final recommendation of 22 or 23 to account for errors that are present in any assessment.
   D. Judges must consider both the "stem" *and* answer options in selected-response items in deciding what percent of students should answer correctly.

3. Joe the Judge decided that about 50% of the typical Proficient students in Missouri taking the EOC assessment should answer Item 32 correctly. He coded 50% under Proficient on his Rating Form. What error did he make?
   A. He should have coded 45% since some percent of special-needs students will take the assessment.
   B. He should have considered *barely* Proficient, not *typical* Proficient, students.
   C. He should reconsider his judgment, as 50% correct couldn't possibly be considered Proficient.
   D. He made no error here. This was the correct procedure.

4. Judge Jan thought that a particular item on her EOC assessment was clear, and that it measured content that was very important. She also thought that students should answer this correctly if they were Proficient performers. Which of these percentages should she most likely enter for Proficient on her Rating Form?

A. 90%—because almost all students whose course achievement is Proficient should answer correctly

B. 65%—because this is the approximate percentage that corresponds to "pass" in the school's grading system

C. 50%—because many students taking this test will be learning-disabled or disadvantaged or won't take the assessment seriously

D. 35%—because large proportions of students taking this test aren't receiving instruction following the state's content standards

5. Which of these sets of "Angoff" judgments for a selected-response (SR) item appears to be *improper* and why?

	Cut Score		
	Below Basic/ Basic	Basic/ Proficient	Proficient/ Advanced
A.	25%	35%	40%
B.	80%	90%	100%
C.	50%	50%	55%
D.	40%	75%	95%

A. A, because these are unrealistically low expectations for an SR item.

B. B, because it is unreasonable to expect students to score this well on an SR item.

C. C, because the judge doesn't expect higher-achieving students to perform any better on the item than lower-achieving students.

D. D, because the increase in percentages across the three groups is unrealistically large.

APPENDIX J:

MID-PROCESS EVALUATION

MISSOURI EOC STANDARD SETTING

November 2–5, 2009

Mid-Process Evaluation

I understand the background information related to the standard-setting procedures and I am ready to begin.

_____YES

_____NO

If no, use the space below to identify the issues or procedures you would like the facilitator to review before the formal standard setting begins.

APPENDIX K:

EXAMPLE RATING SHEET

Missouri End of Course Standard Setting 2009
Rating Form

ID # _____ English I

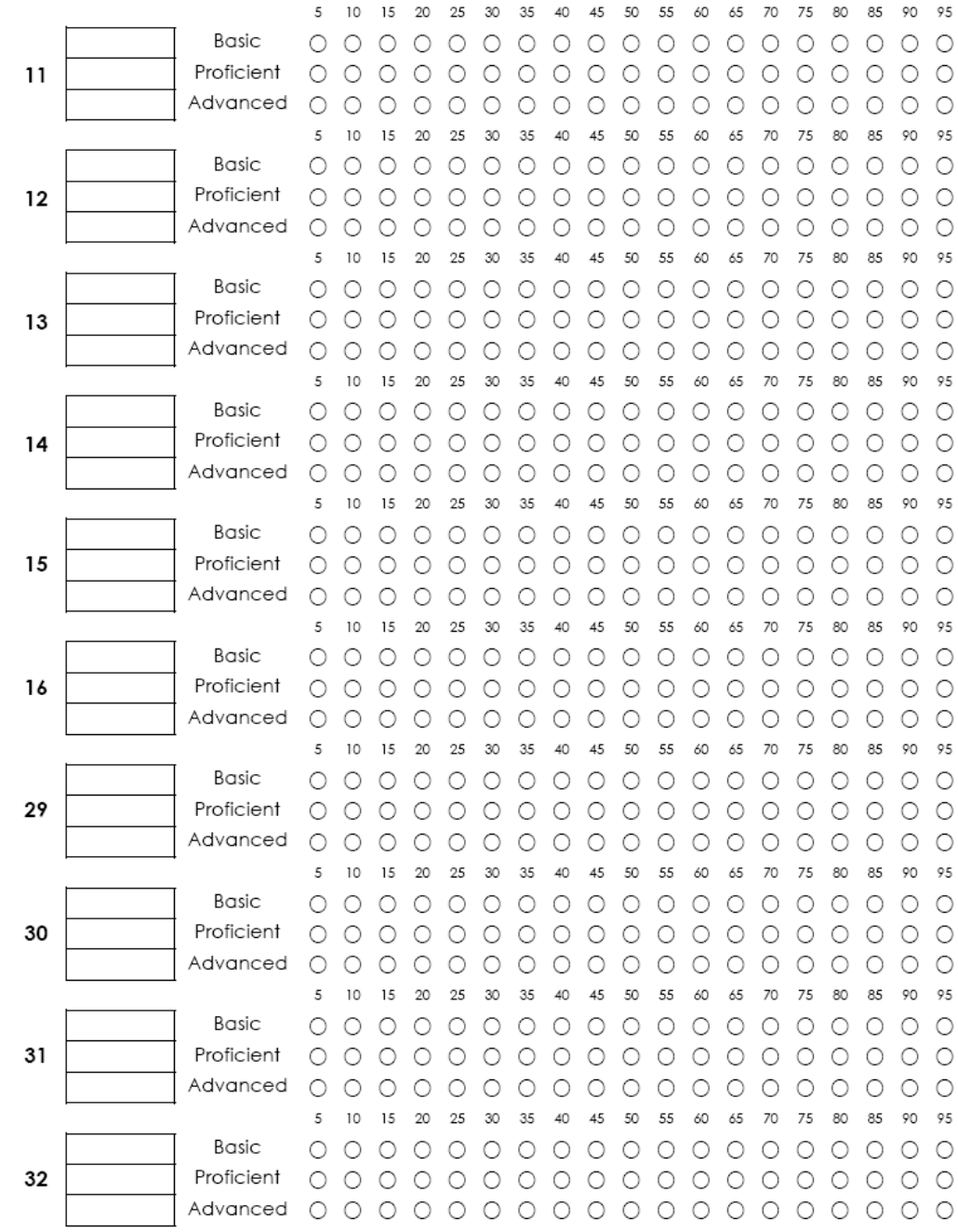
Round ① ②

Item		Perf Level	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
1		Basic	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Proficient	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Advanced	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
2		Basic	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Proficient	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Advanced	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
3		Basic	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Proficient	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Advanced	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
4		Basic	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Proficient	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Advanced	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
5		Basic	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Proficient	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Advanced	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
6		Basic	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Proficient	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Advanced	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
7		Basic	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Proficient	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Advanced	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
8		Basic	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Proficient	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Advanced	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
9		Basic	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Proficient	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Advanced	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
10		Basic	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Proficient	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Advanced	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Page 1

Missouri End of Course Standard Setting 2009

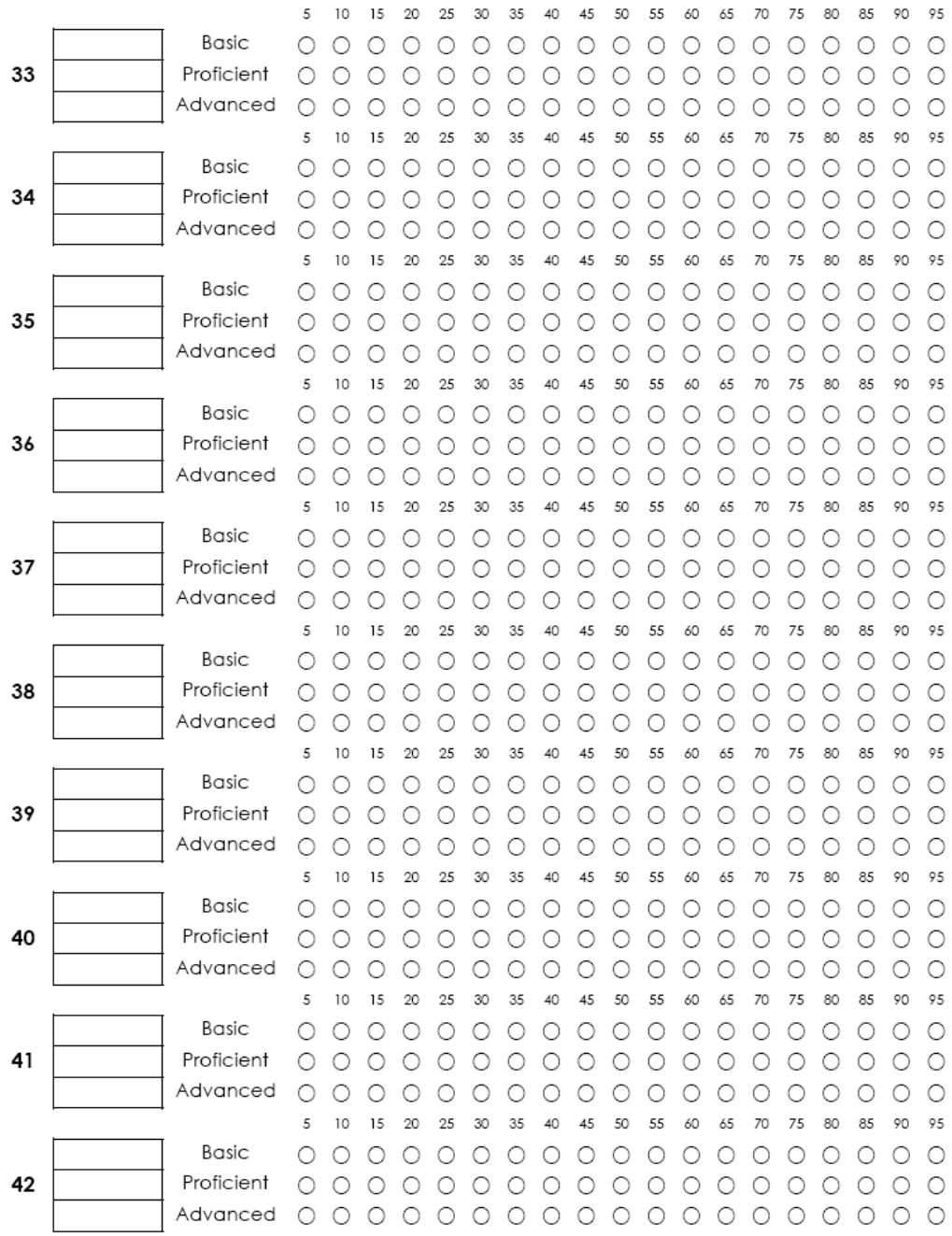
Rating Form



Page 2

Missouri End of Course Standard Setting 2009

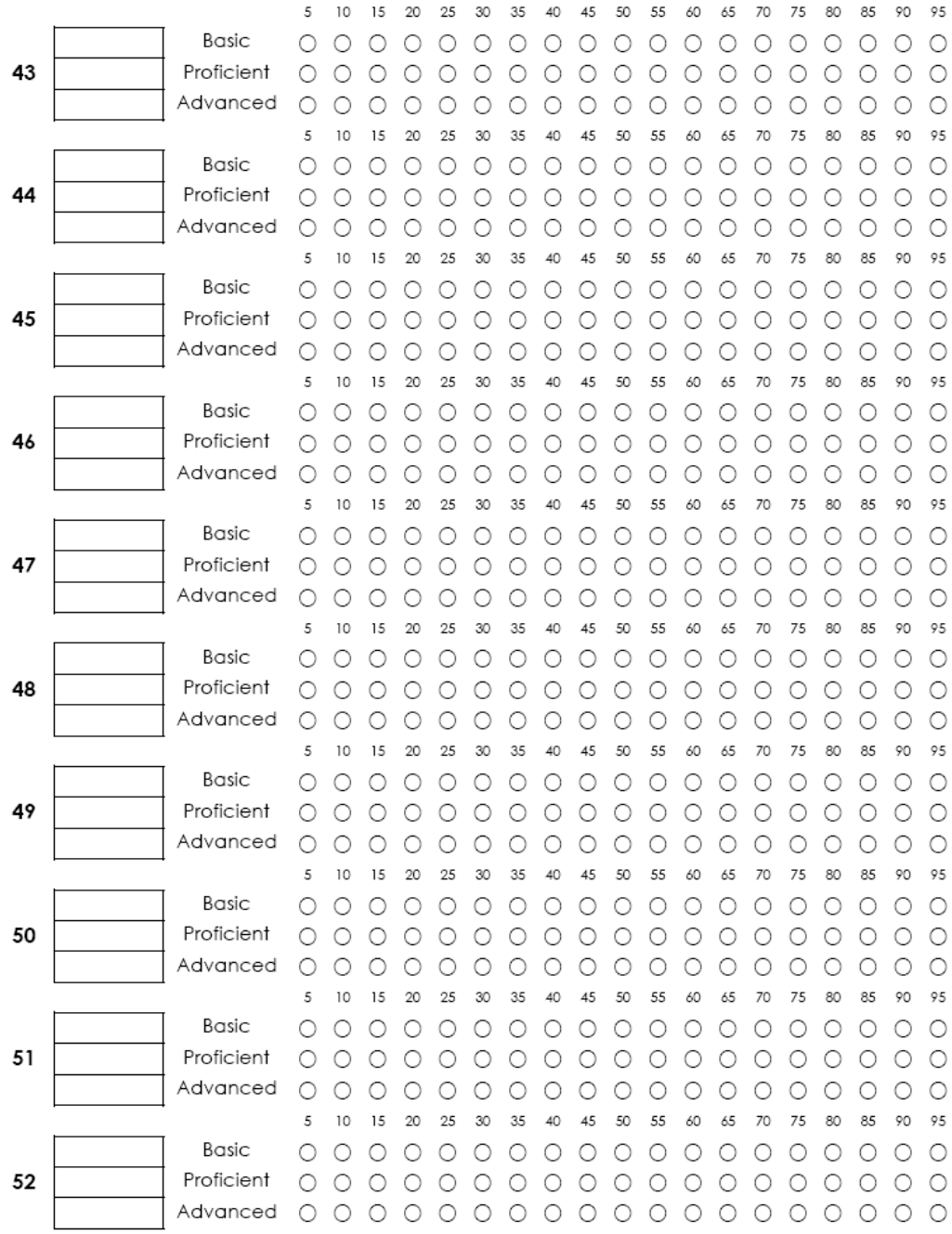
Rating Form



Page 3

Missouri End of Course Standard Setting 2009

Rating Form



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APPENDIX L:

PARTICIPANT EVALUATION FORM

MISSOURI EOC STANDARD SETTING

November 2–5, 2009

Participant Evaluation Form

This form contains six sections, five of which ask for feedback on specific aspects of this standard-setting session. The last section asks for general reactions to the standard-setting session. Please fill out each of these sections as completely as possible in order to provide information that will help in the improvement of similar sessions in the future. Your identification number is used for analysis purposes only. Your responses to these questions will be held in strict confidence and will be analyzed in conjunction with those of the other judges who participated in this meeting.

Panelist I.D. (optional) _____

Section I: Opening Training Sessions

The following statements seek your judgments about the Opening Sessions for the Missouri End-of-Course standard-setting meeting. Please circle one value on the scale under each statement that best characterizes your judgment.

1. The Opening Session provided adequate background information about the Missouri End-of-Course Assessments.

5	4	3	2	1
Completely		Somewhat		Not at all

2. The topics covered in the Opening Session were appropriate to providing a context for my role in this meeting.

5	4	3	2	1
Completely		Somewhat		Not at all

3. The content of the Opening Sessions was:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

4. The organization of the Opening Sessions was:

5	4	3	2	1
Very good		Acceptable		Very poor

The following statements seek your judgments about the Opening Session for the Missouri End-of-Course standard-setting session. Please write your responses to each prompt on the lines provided.

5. Did you have questions or concerns that were not answered or addressed in the Opening Session? Please indicate these below. (Use the reverse side for additional space.)

_____

_____

_____

6. What was most helpful about the Opening Session?

_____

_____

_____

7. Please use the space below to provide additional comments concerning the adequacy, appropriateness, usefulness, or organization of the Opening Session.

_____

_____

_____

Section II: Discussing Proficient Performance

The following statements seek your judgments about the discussions of Proficient performance as they relate to Missouri's End-of-Course Assessments. Please circle the value on the scale under each statement that best characterizes your judgment.

8. The activities used to help operationalize Proficient performance were:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

9. By the end of the activity, my conception of Proficient performance was:

5	4	3	2	1
Very well formed		Moderately well formed		Not well formed

10. Please use the space below to provide additional comments concerning the activities around operationalizing Proficient performance for Missouri's End-of-Course Assessments.

_____

_____

_____

Section III: Discussing Basic Performance

The following statements seek your judgments about the discussions of Basic performance as they relate to Missouri's End-of-Course Assessments. Please circle the value on the scale under each statement that best represents your judgment.

11. The activities used to help operationalize Basic performance were:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

12. By the end of this activity my conception of Basic performance was:

5	4	3	2	1
Very well formed		Moderately well formed		Not well formed

13. Please use the space below to provide additional comments concerning the activities around operationalizing Basic performance for Missouri's End-of-Course Assessments.

_____

_____

_____

Section IV: Discussing Advanced Performance

The following statements seek your judgments about the discussions of Advanced performance as they relate to Missouri's End-of-Course Assessments. Please circle the value on the scale under each statement that best represents your judgment.

14. The activities used to help operationalize Advanced performance were:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

15. By the end of this activity my conception of Advanced performance was:

5	4	3	2	1
Very well formed		Moderately well formed		Not well formed

16. Please use the space below to provide additional comments concerning the activities around operationalizing Advanced performance for Missouri's End-of-Course Assessments.

_____

_____

_____

Section V: Item Rating Activities

The following statements seek your judgments about the item rating activities as they relate to the Missouri End-of-Course standard-setting meeting. Please circle the value on the scale under each statement that best represents your judgment.

17. Using the sample items to prepare for the actual item rating was:

5	4	3	2	1
Very helpful		Somewhat helpful		Not helpful

18. The explanation of the item data during the sample item portion of the training was:

5	4	3	2	1
Very helpful		Somewhat helpful		Not helpful

19. The Item Rating Form was:

5	4	3	2	1
Very easy to use		Somewhat easy to use		Not at all easy to use

20. The information provided prior to each round of rating was:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

21. My level of understanding of the tasks I was to accomplish for each round was:

5	4	3	2	1
Very good		Acceptable		Very poor

22. The amount of time I had to complete the tasks during each round was:

5	4	3	2	1
Far too long		About right		Far too short

23. Please use the space below to provide additional comments concerning the instructions and explanations you received, the adequacy of the time available, your levels of understanding of the process, or any other aspects of the item rating activities. (Use reverse side for additional space.)

_____

_____

_____

Section VI: The Overall Missouri End-of-Course Standard-Setting Session

The following statements seek your judgments about the overall processes and procedures used during the Missouri End-of-Course standard-setting session in which you participated as a panelist. Please circle the value on the scale under each statement that best represents your judgment.

24. I feel that this standard-setting session provided me an opportunity to use my best judgment in selecting and revising estimates for a recommended standard of *Proficient* performance.

5	4	3	2	1
To a great extent		To some extent		Not at all

25. I feel that this standard-setting meeting provided me an opportunity to use my best judgment in selecting and revising estimates for a recommended standard of Basic performance.

5	4	3	2	1
To a great extent		To some extent		Not at all

26. I feel that this standard-setting meeting provided me an opportunity to use my best judgment in selecting and revising estimates for a recommended standard of Advanced performance.

5	4	3	2	1
To a great extent		To some extent		Not at all

27. Please provide any comments you wish to share regarding the quality of assistance provided by the standard-setting staff.

_____

_____

_____

28. Please provide any additional comments you wish to share regarding the overall meeting.

_____

_____

_____

APPENDIX M:

RESULTS FOR ENGLISH I

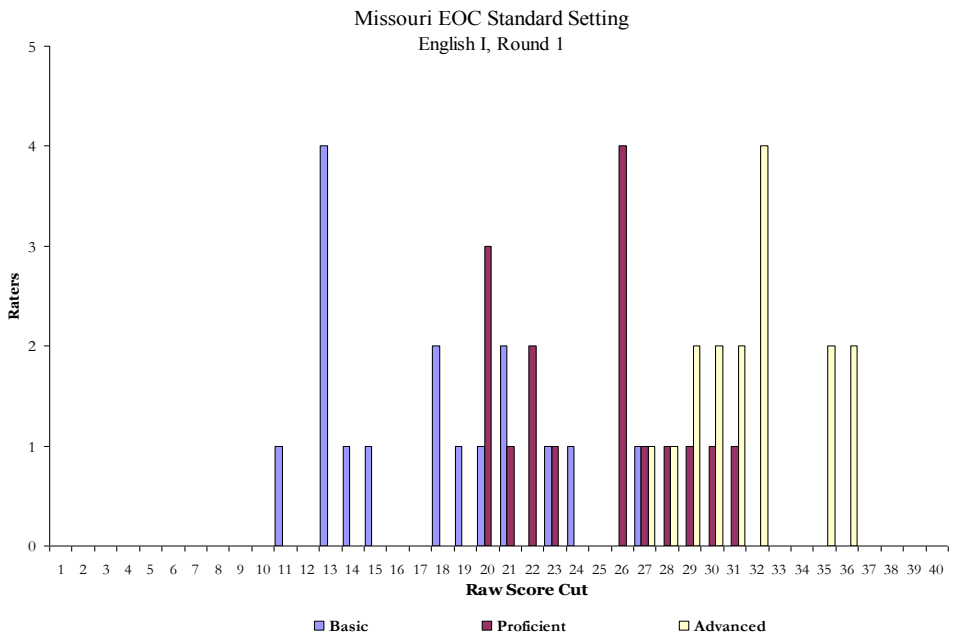
Standard Setting for the Missouri EOC Assessment

English I

Round 1 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
12123	27	31	36
12133	24	30	35
12111	18	26	32
12213	13	21	29
12131	18	29	35
12112	11	20	29
12122	13	22	31
12211	19	26	32
12113	21	26	30
12222	15	22	31
12132	23	28	32
12232	21	27	36
12222	20	26	32
12231	13	20	27
12212	13	20	28
12121	14	23	30

Median Rating:	18	26	32
Average Rating:	17.7	24.8	31.6
Standard Deviation:	4.6	3.6	2.7
Lowest Rating:	11	20	27
Highest Rating:	27	31	36
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	16	16	16



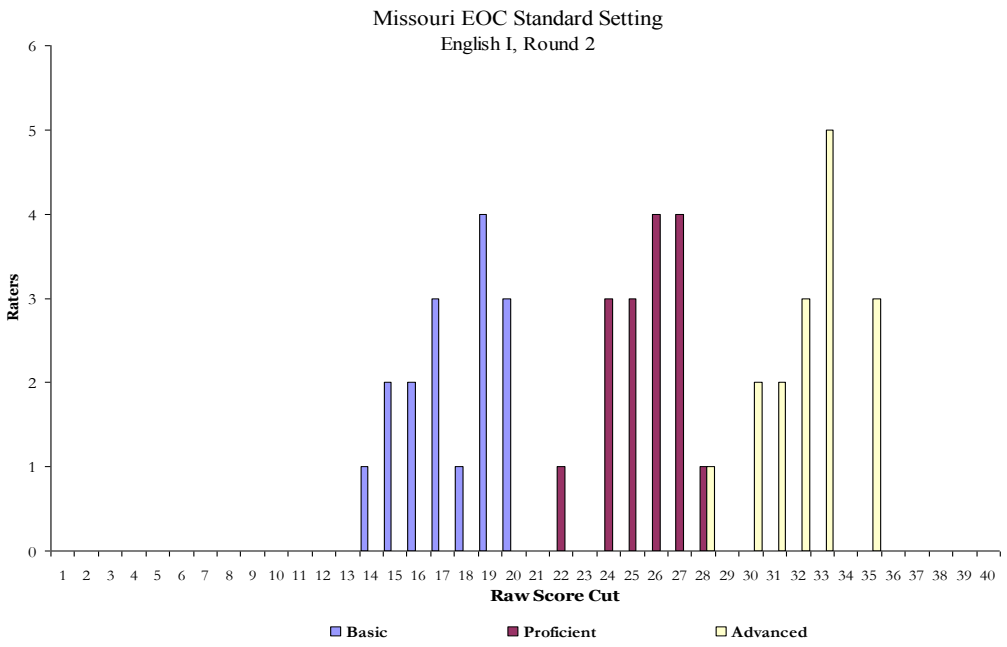
Standard Setting for the Missouri EOC Assessment

English I

Round 2 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
12113	19	26	32
12111	17	27	33
12212	17	24	31
12231	19	27	35
12133	15	24	32
12222	20	27	33
12131	16	28	35
12232	16	25	35
12123	20	24	28
12213	18	26	33
12121	15	25	30
12122	17	25	32
12112	19	27	33
12221	14	22	31
12132	20	26	30
12211	19	26	33

Median Rating:	18	26	33
Average Rating:	17.6	25.6	32.3
Standard Deviation:	1.9	1.5	1.9
Lowest Rating:	14	22	28
Highest Rating:	20	28	35
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	16	16	16



IMPACT RESULTS

	Minimal	Basic	Proficient	Advanced
Total Population	**15.0**	**33.0**	**32.0**	**20.0**

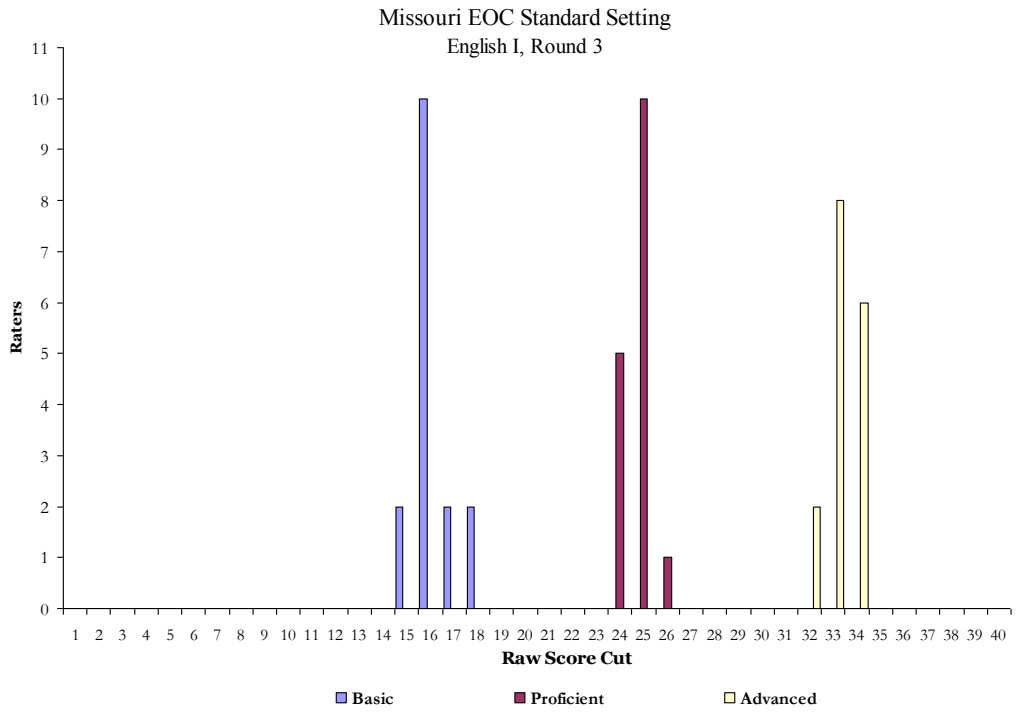
Standard Setting for the Missouri EOC Assessment

English I

Round 3 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
12111	16	24	33
12112	15	24	32
12113	16	25	34
12121	16	25	33
12122	16	25	33
12123	18	25	34
12131	16	25	33
12132	16	24	32
12133	16	24	33
12211	16	24	33
12212	17	25	33
12213	16	25	33
12221	15	25	34
12222	18	26	34
12231	16	25	34
12232	17	25	34

Median Rating:	16	25	33
Average Rating:	16.3	24.8	33.3
Standard Deviation:	0.8	0.6	0.7
Lowest Rating:	15	24	32
Highest Rating:	18	26	34
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	16	16	16



English I

IMPACT RESULTS

	Minimal	Basic	Proficient	Advanced
Total Population	**9.0**	**34.0**	**37.0**	**20.0**

APPENDIX N:

RESULTS FOR ALGEBRA II

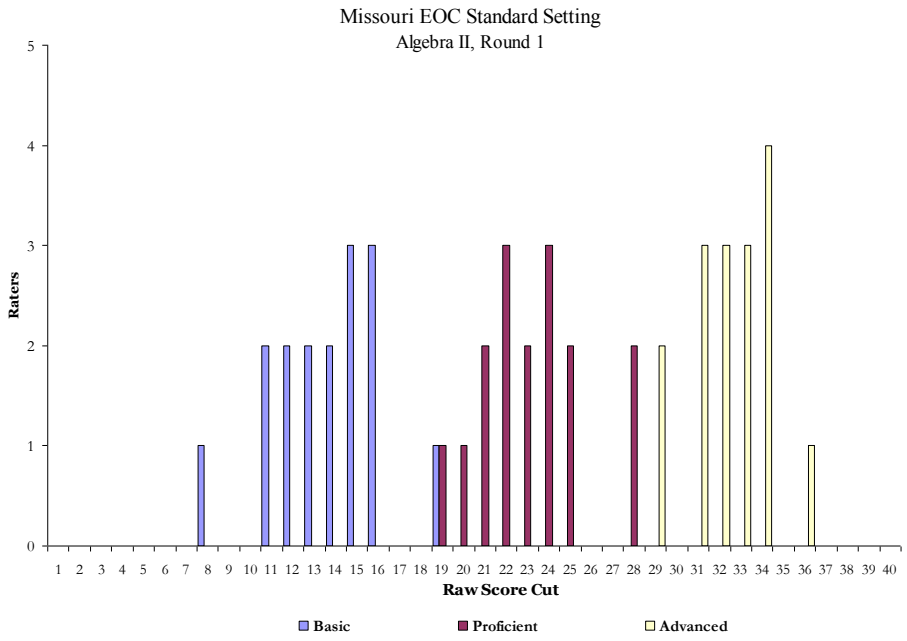
Standard Setting for the Missouri EOC Assessment

Algebra II

Round 1 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
21111	12	19	34
21112	19	28	34
21113	14	22	32
21121	16	25	32
21122	8	22	29
21123	11	23	33
21131	12	21	31
21132	15	24	32
21133	14	20	29
21211	13	28	36
21212	15	23	31
21213	13	24	34
21221	15	24	33
21222	11	21	33
21223	16	25	34
21231	16	22	31

Median Rating:	14	23	33
Average Rating:	13.8	23.2	32.4
Standard Deviation:	2.5	2.5	1.8
Lowest Rating:	8	19	29
Highest Rating:	19	28	36
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	16	16	16



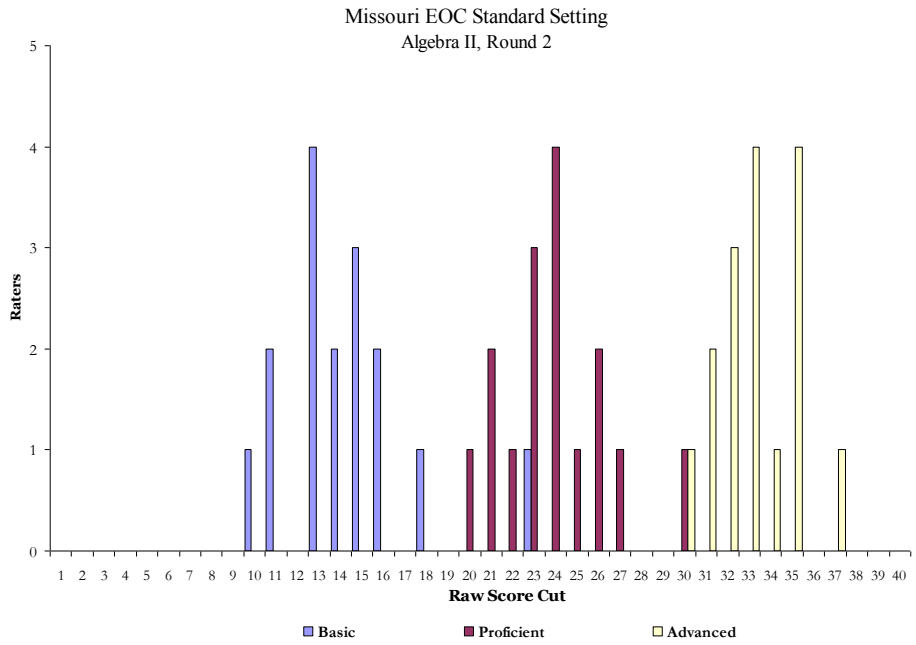
Standard Setting for the Missouri EOC Assessment

Algebra II

Round 2 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
21111	13	20	33
21112	18	26	32
21113	23	30	37
21121	15	24	31
21122	10	24	33
21123	11	23	34
21131	13	22	32
21132	15	24	32
21133	14	21	30
21211	13	27	35
21212	15	23	31
21213	13	24	35
21221	16	26	35
21222	11	21	33
21223	14	25	35
21231	16	23	33

Median Rating:	14	24	33
Average Rating:	14.4	23.9	33.2
Standard Deviation:	3.0	2.4	1.8
Lowest Rating:	10	20	30
Highest Rating:	23	30	37
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	16	16	16



Algebra II

ROUND 2 IMPACT RESULTS

	Below Basic	Basic	Proficient	Advanced
Total Population	**7.0**	**52.0**	**33.0**	**8.0**

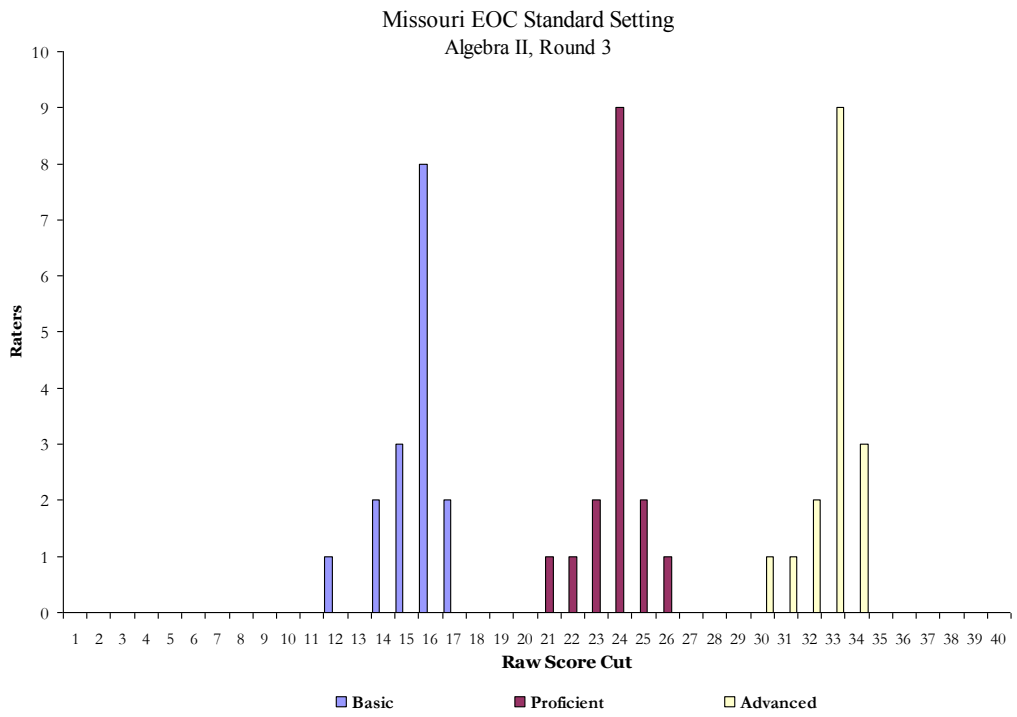
Standard Setting for the Missouri EOC Assessment

Algebra II

Round 3 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
21111	16	21	31
21112	17	26	33
21113	14	24	33
21121	17	24	33
21122	12	24	33
21123	14	23	33
21131	15	24	33
21132	16	24	32
21133	16	23	33
21211	16	24	32
21212	16	24	33
21213	15	24	34
21221	16	25	34
21222	16	24	33
21223	15	25	34
21231	16	22	30

Median Rating:	16	24	33
Average Rating:	15.4	23.8	32.8
Standard Deviation:	1.2	1.1	1.0
Lowest Rating:	12	21	30
Highest Rating:	17	26	34
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	16	16	16



Algebra II

FINAL IMPACT RESULTS

	Below Basic	Basic	Proficient	Advanced
Total Population	**14.0**	**45.0**	**33.0**	**8.0**

APPENDIX O:

RESULTS FOR GEOMETRY

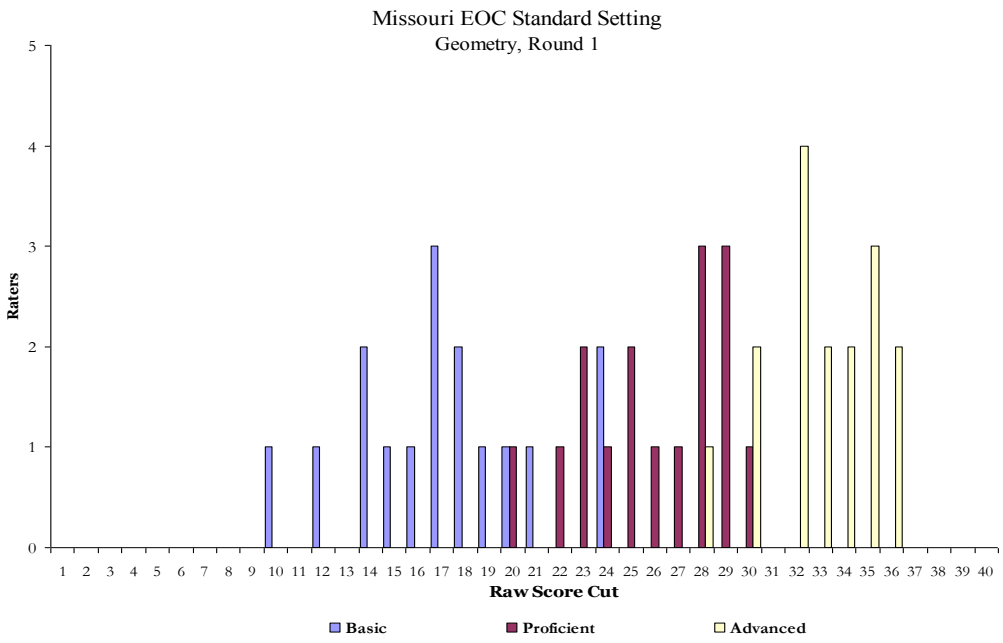
Standard Setting for the Missouri EOC Assessment

Geometry

Round 1 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
22111	17	26	33
22113	14	22	30
22121	12	29	36
22123	10	20	30
22131	24	28	32
22132	17	23	28
22133	16	25	32
22211	19	28	34
22212	24	30	36
22213	14	24	32
22221	18	28	35
22222	18	29	35
22223	20	27	33
22231	15	23	34
22232	21	29	35
22233	17	25	32

Median Rating:	17	27	33
Average Rating:	17.3	26.0	32.9
Standard Deviation:	3.8	2.9	2.2
Lowest Rating:	10	20	28
Highest Rating:	24	30	36
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	16	16	16



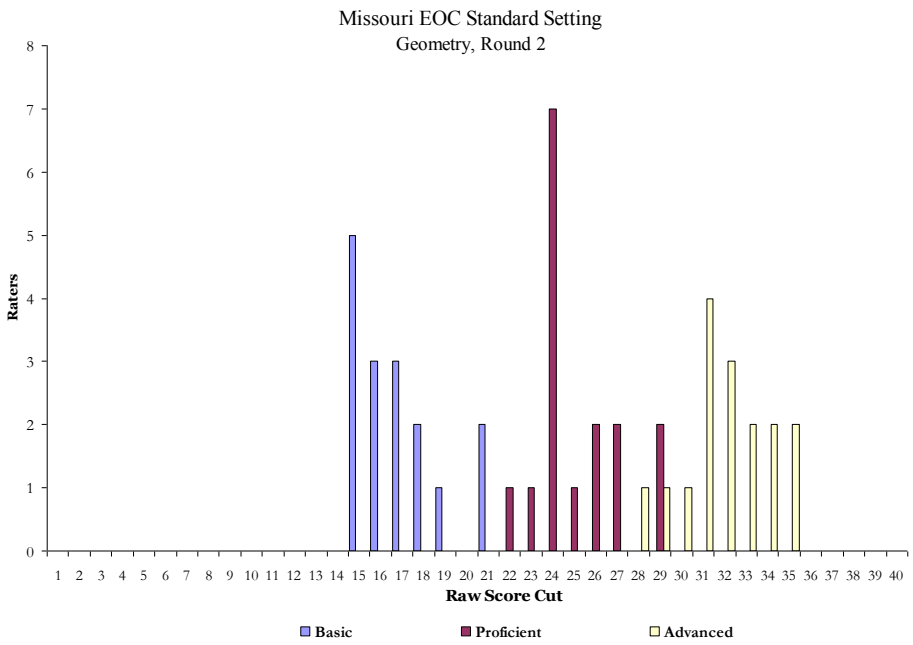
Standard Setting for the Missouri EOC Assessment

Geometry

Round 2 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
22111	16	24	31
22113	15	22	28
22121	16	29	35
22123	15	24	34
22131	21	26	31
22131	19	24	30
22133	15	24	31
22211	17	23	29
22212	18	25	33
22213	16	24	31
22221	17	27	34
22222	15	26	33
22223	18	29	35
22231	15	24	32
22232	21	27	32
22233	17	24	32

Median Rating:	17	24	32
Average Rating:	16.9	25.1	31.9
Standard Deviation:	2.0	2.0	2.0
Lowest Rating:	15	22	28
Highest Rating:	21	29	35
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	16	16	16



Geometry

ROUND 2 IMPACT RESULTS

	Below Basic	Basic	Proficient	Advanced
Total Population	**18.0**	**30.0**	**38.0**	**14.0**

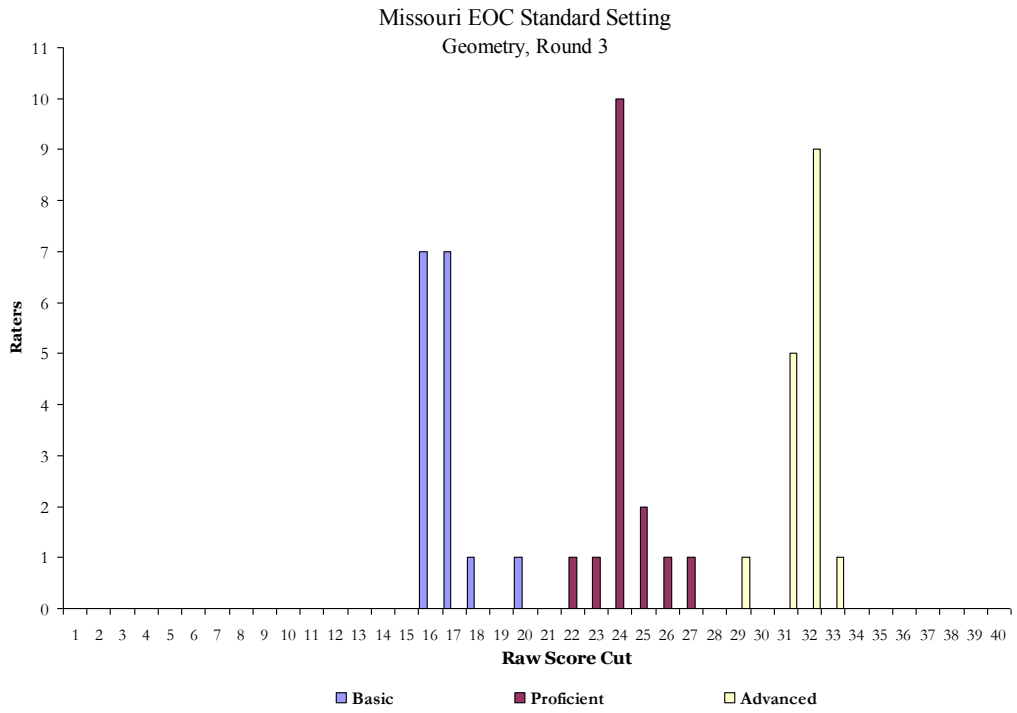
Standard Setting for the Missouri EOC Assessment

Geometry

Round 3 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
22111	16	24	31
22113	16	24	32
22121	17	25	32
22123	16	24	32
22131	20	26	31
22132	17	22	29
22133	16	24	32
22211	17	24	32
22212	17	24	32
22213	17	25	31
22221	17	24	32
22222	17	24	32
22223	18	27	33
22231	16	24	31
22232	16	23	31
22233	16	24	32

Median Rating:	17	24	32
Average Rating:	16.8	24.3	31.6
Standard Deviation:	1.0	1.1	0.9
Lowest Rating:	16	22	29
Highest Rating:	20	27	33
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	16	16	16



Geometry

FINAL IMPACT RESULTS

	Below Basic	Basic	Proficient	Advanced
Total Population	**18.0**	**30.0**	**38.0**	**14.0**

APPENDIX P:

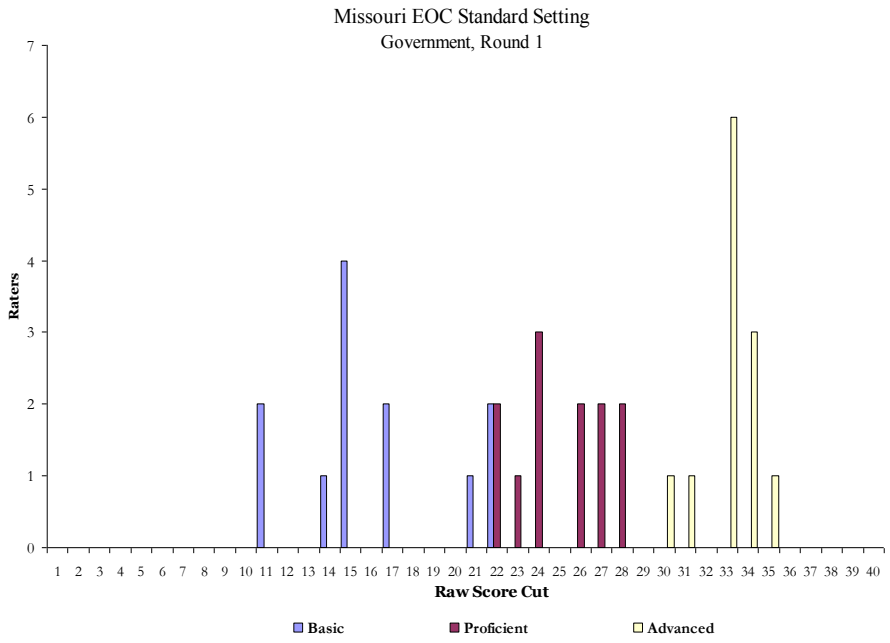
RESULTS FOR GOVERNMENT

Standard Setting for the Missouri EOC Assessment

Government

Round 1 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
22111	17	27	34
23112	22	27	33
23113	14	26	33
23121	15	23	33
23123	15	24	34
23131	22	28	33
23132	17	24	31
23133	15	26	33
23211	11	22	30
23212	11	22	33
23213	15	24	35
23221	21	28	34
Median Rating:	15	25	33
Average Rating:	16.3	25.1	33.0
Standard Deviation:	3.6	2.1	1.3
Lowest Rating:	11	22	30
Highest Rating:	22	28	35
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	12	12	12



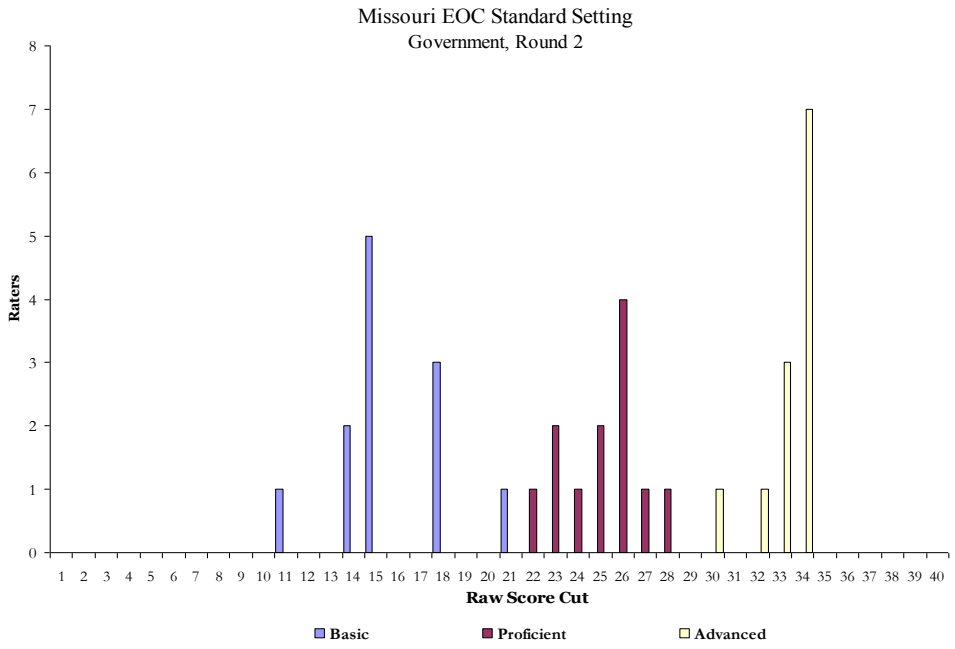
Standard Setting for the Missouri EOC Assessment

Government

Round 2 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
23111	15	26	34
23112	18	26	33
23113	14	26	33
23121	15	23	34
23123	15	24	34
23131	21	27	32
23132	18	26	34
23133	14	25	33
23211	11	22	30
23212	15	25	34
23213	15	23	34
23221	18	28	34

Median Rating:	15	26	34
Average Rating:	15.8	25.1	33.3
Standard Deviation:	2.5	1.7	1.2
Lowest Rating:	11	22	30
Highest Rating:	21	28	34
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	12	12	12



Government

ROUND 2 IMPACT RESULTS

	Below Basic	Basic	Proficient	Advanced
Round 2	**12%**	**49%**	**29%**	**10%**

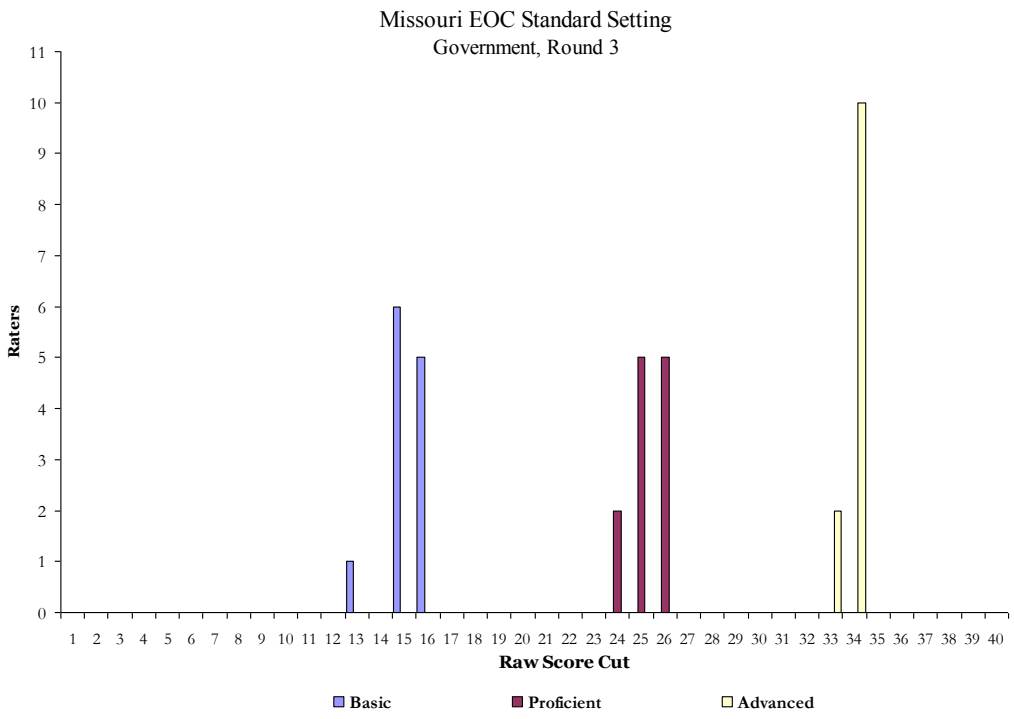
Standard Setting for the Missouri EOC Assessment

Government

Round 3 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
23111	15	25	34
23112	16	26	34
23113	16	26	34
23121	15	25	34
23123	15	25	34
23131	15	25	33
23132	15	26	34
23133	13	24	33
23211	16	24	34
23212	16	26	34
23213	16	25	34
23221	15	26	34

Median Rating:	15	25	34
Average Rating:	15.3	25.3	33.8
Standard Deviation:	0.8	0.7	0.4
Lowest Rating:	13	24	33
Highest Rating:	16	26	34
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	12	12	12



Government

	Below Basic	Basic	Proficient	Advanced
Total Population	**12.0**	**44.0**	**34.0**	**10.0**

APPENDIX Q:

RESULTS FOR AMERICAN HISTORY

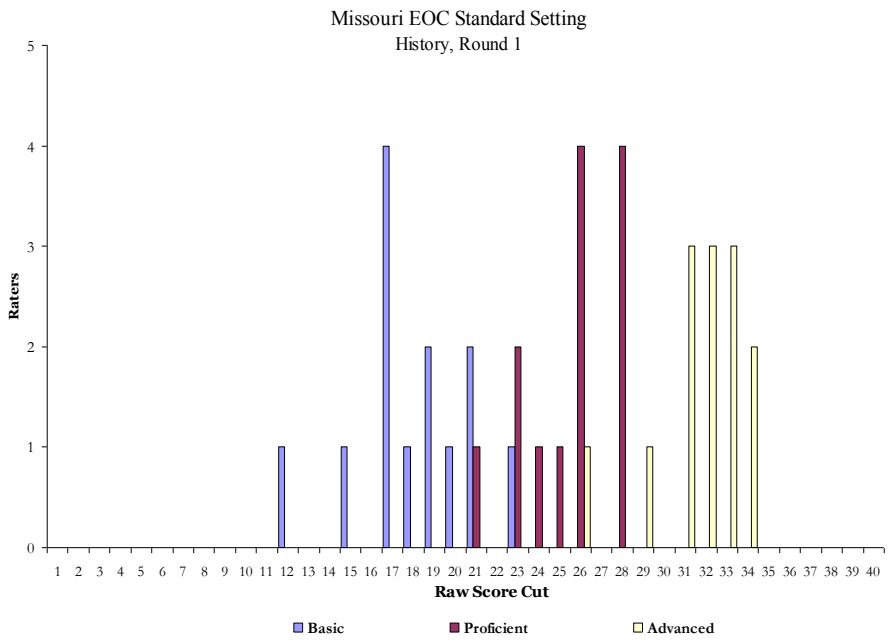
Standard Setting for the Missouri EOC Assessment

American History

Round 1 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
11122	12	23	31
11123	17	23	29
11223	19	28	34
11111	17	25	32
11131	21	28	34
11222	15	21	26
11112	18	26	31
11212	17	26	33
11132	23	28	33
11213	17	26	33
11221	21	28	32
11211	20	26	32
11121	19	24	31

Median Rating:	18	26	32
Average Rating:	18.2	25.5	31.6
Standard Deviation:	2.7	2.2	2.1
Lowest Rating:	12	21	26
Highest Rating:	23	28	34
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	13	13	13



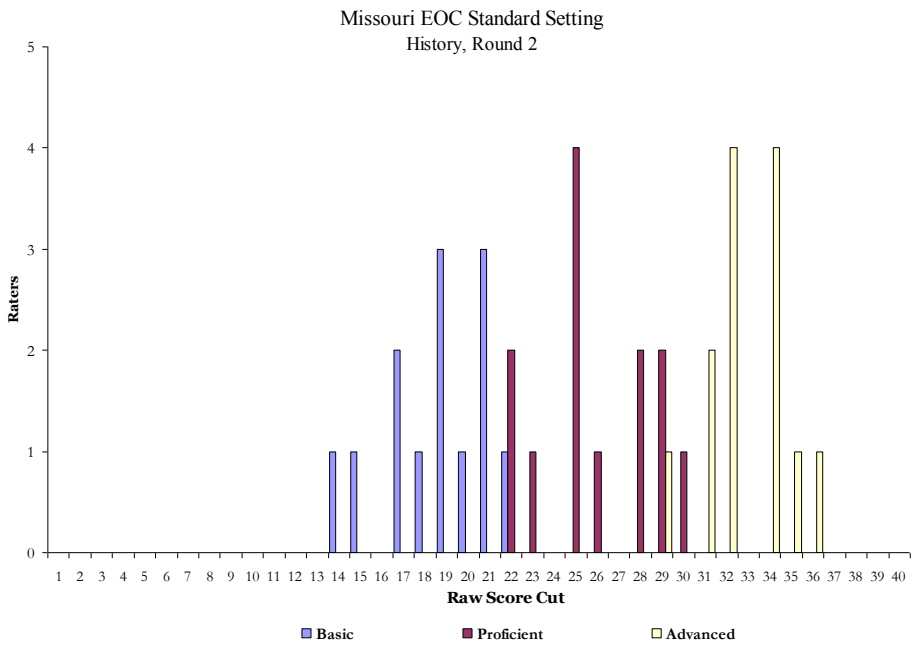
Standard Setting for the Missouri EOC Assessment

American History

Round 2 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
11212	17	25	32
11111	18	25	32
11123	19	25	31
11131	15	22	31
11132	19	28	34
11221	21	28	34
11112	22	29	34
11222	17	22	29
11122	14	23	32
11121	20	25	34
11223	21	29	35
11213	21	30	36
11211	19	26	32

Median Rating:	19	25	32
Average Rating:	18.7	25.9	32.8
Standard Deviation:	2.3	2.6	1.8
Lowest Rating:	14	22	29
Highest Rating:	22	30	36
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	13	13	13



Standard Setting for the Missouri EOC Assessment

American History

IMPACT RESULTS

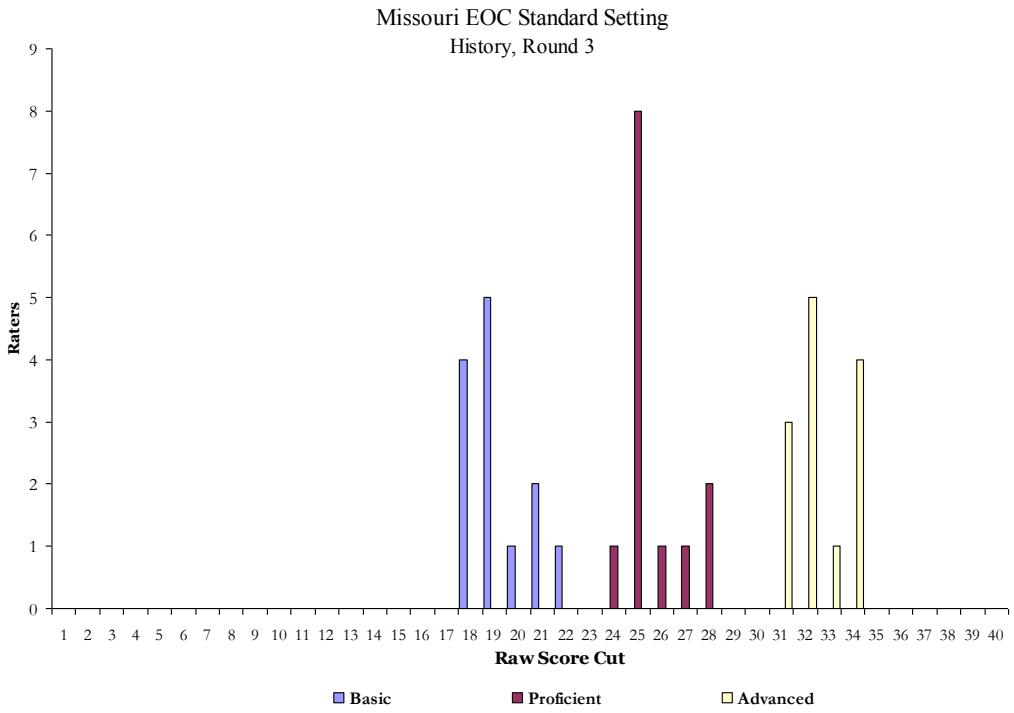
	Below Basic	Basic	Proficient	Advanced
Round 2	**23.0**	**32.0**	**30.0**	**15.0**

Standard Setting for the Missouri EOC Assessment

American History

Round 3 Ratings Summary

	Individual Rater Cut Scores		
Rater	Basic	Proficient	Advanced
11111	19	25	34
11112	20	27	34
11121	18	25	32
11122	18	24	31
11123	19	25	31
11131	21	28	34
11132	19	25	32
11211	19	25	32
11212	18	25	33
11213	18	25	31
11221	22	28	34
11222	21	26	32
11223	19	25	32
Median Rating:	19	25	32
Average Rating:	19.3	25.6	32.5
Standard Deviation:	1.3	1.2	1.2
Lowest Rating:	18	24	31
Highest Rating:	22	28	34
Number of Items:	40	40	40
Points Possible:	40	40	40
Number of Raters:	13	13	13



IMPACT RESULTS

	Minimal	Basic	Proficient	Advanced
Total Population	**23.0**	**32.0**	**30.0**	**15.0**

APPENDIX R:

PARTICIPANT EVALUATION FORM DATA

Item 1

The Opening Session provided adequate background information about the Missouri End-of-Course Assessments.

5	4	3	2	1
Completely		Somewhat		Not at all

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	13	81	11	69	10	63	10	83	11	85	55	75
4	3	19	5	31	6	38	2	17	2	15	18	25
3	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	16	100	16	100	12	100	13	100	73	100

Item 2

The topics covered in the Opening Session were appropriate to providing a context for my role in this meeting.

5	4	3	2	1
Completely		Somewhat		Not at all

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	14	88	13	81	10	63	11	92	12	92	60	82
4	2	13	3	19	6	38	1	8	1	8	13	18
3	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	16	100	16	100	12	100	13	100	73	100

Item 3

The content of the Opening Sessions was:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	8	50	13	81	6	38	10	84	8	62	45	67
4	8	50	3	19	7	44	2	17	5	39	25	34
3	0	0	0	0	3	19	0	0	0	0	3	4
2	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	16	100	16	100	12	100	13	100	73	100

Item 4

The organization of the Opening Sessions was:

5	4	3	2	1
Very good		Acceptable		Very poor

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	13	81	13	81	8	50	10	84	9	70	53	73
4	2	13	2	13	5	31	2	17	4	31	15	21
3	1	6	1	6	3	19	0	0	0	0	5	7
2	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	16	100	16	100	12	100	13	100	73	100

Item 8

The activities used to help operationalize Proficient performance were:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

	English I		Algebra II		Geometry		Government		History		Total	
Rating	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
5	5	31	13	81	9	56	7	58	12	92	46	63
4	9	56	3	19	5	31	5	42	1	8	23	32
3	2	13	0	0	1	6	0	0	0	0	3	4
2	0	0	0	0	1	6	0	0	0	0	1	1
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	16	100	16	100	12	100	13	100	73	100

Item 9

By the end of the activity, my conception of Proficient performance was:

5	4	3	2	1
Very well formed		Moderately well formed		Not well formed

	English I		Algebra II		Geometry		Government		History		Total	
Rating	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
5	7	44	7	44	10	63	8	67	11	85	43	59
4	7	44	7	44	5	31	4	33	2	15	25	34
3	2	13	2	13	0	0	0	0	0	0	4	6
2	0	0	0	0	1	6	0	0	0	0	1	1
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	16	100	16	100	12	100	13	100	73	100

Item 11

The activities used to help operationalize Basic performance were:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

	English I		Algebra II		Geometry		Government		History		Total	
Rating	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
5	4	25	12	75	10	63	5	42	11	85	42	58
4	9	56	4	25	5	31	7	59	2	15	27	37
3	3	19	0	0	0	0	0	0	0	0	3	4
2	0	0	0	0	1	6	0	0	0	0	1	1
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	16	100	16	100	12	100	13	100	73	100

Item 12

By the end of this activity my conception of Basic performance was:

5	4	3	2	1
Very well formed		Moderately well formed		Not well formed

	English I		Algebra II		Geometry		Government		History		Total	
Rating	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
5	7	44	5	31	10	63	5	42	10	77	37	51
4	7	44	10	63	5	31	6	50	3	23	31	43
3	2	13	1	6	0	0	1	8	0	0	4	6
2	0	0	0	0	1	6	0	0	0	0	1	1
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	16	100	16	100	12	100	13	100	73	100

Item 14

The activities used to help operationalize Advanced performance were:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	5	36	12	75	9	56	7	58	12	92	45	63
4	8	57	4	25	6	38	3	25	1	8	22	31
3	1	7	0	0	0	0	2	17	0	0	3	4
2	0	0	0	0	1	6	0	0	0	0	1	1
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	14*	100	16	100	16	100	12	100	13	100	71	100

*Two English I panelists did not respond to this question.

Item 15

By the end of this activity my conception of Advanced performance was:

5	4	3	2	1
Very well formed		Moderately well formed		Not well formed

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	7	50	9	56	10	63	7	58	10	77	43	61
4	6	43	6	38	5	31	4	33	3	23	24	34
3	1	7	1	6	0	0	1	8	0	0	3	4
2	0	0	0	0	1	6	0	0	0	0	1	1
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	14*	100	16	100	16	100	12	100	13	100	71	100

*Two English I panelists did not respond to this question.

Item 17

Using the sample items to prepare for the actual item rating was:

5	4	3	2	1
Very helpful		Somewhat helpful		Not helpful

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	8	53	12	80	8	50	8	68	9	69	45	63
4	4	27	1	7	2	13	4	33	2	15	13	18
3	3	20	2	13	5	31	0	0	2	15	12	17
2	0	0	0	0	1	6	0	0	0	0	1	1
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	15*	100	15*	100	16	100	12	100	13	100	71	100

*One English I panelist and one Algebra II panelist did not respond to this question.

Item 18

The explanation of the item data during the sample item portion of the training was:

5	4	3	2	1
Very helpful		Somewhat helpful		Not helpful

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	9	57	12	80	7	44	9	75	10	77	47	65
4	7	44	2	13	6	38	3	25	2	15	20	28
3	0	0	1	7	3	19	0	0	1	8	5	7
2	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	15*	100	16	100	12	100	13	100	72	100

*One Algebra II panelist did not respond to this question.

Item 19

The Item Rating Form was:

5	4	3	2	1
Very easy to use		Somewhat easy to use		Not at all easy to use

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	14	93	11	73	12	75	8	67	9	69	54	76
4	1	7	4	27	4	25	3	25	4	31	16	23
3	0	0	0	0	0	0	1	8	0	0	1	1
2	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	15*	100	15*	100	16	100	12	100	13	100	71	100

*One English I panelist and one Algebra II panelist did not respond to this question.

Item 20

The information provided prior to each round of rating was:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	10	63	13	87	12	75	8	67	9	69	52	72
4	6	38	2	13	2	13	2	17	4	31	16	22
3	0	0	0	0	2	13	2	17	0	0	4	6
2	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	15*	100	16	100	12	100	13	100	72	100

*One Algebra II panelist did not respond to this question.

Item 21

My level of understanding of the tasks I was to accomplish for each round was:

5	4	3	2	1
Very good		Acceptable		Very poor

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	12	75	10	67	13	81	9	75	10	77	54	75
4	3	18	5	33	3	19	1	8	3	23	15	21
3	1	6	0	0	0	0	2	17	0	0	3	4
2	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	15*	100	16	100	12	100	13	100	72	100

*One Algebra II panelist did not respond to this question.

Item 22

The amount of time I had to complete the tasks during each round was:

5	4	3	2	1
Far too long		About right		Far too short

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	2	13	0	0	0	0	5	42	1	8	8	11
4	1	6	0	0	4	25	0	0	0	92	5	7
3	13	81	15	100	12	75	7	58	12	0	59	82
2	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	15*	100	16	100	12	100	13	100	72	100

*One Algebra II panelist did not respond to this question.

Item 24

I feel that this standard-setting session provided me an opportunity to use my best judgment in selecting and revising estimates for a recommended standard of Proficient performance.

5	4	3	2	1
To a great extent		To some extent		Not at all

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	13	81	11	73	11	69	8	67	12	92	55	76
4	3	19	4	27	4	25	4	33	1	8	16	22
3	0	0	0	0	1	6	0	0	0	0	1	1
2	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	15*	100	16	100	12	100	13	100	72	100

*One Algebra II panelist did not respond to this question.

Item 25

I feel that this standard-setting meeting provided me an opportunity to use my best judgment in selecting and revising estimates for a recommended standard of Basic performance.

5	4	3	2	1
To a great extent		To some extent		Not at all

	English I		Algebra II		Geometry		Government		History		Total	
Rating	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
5	12	75	11	73	12	75	7	58	12	92	54	75
4	4	25	3	20	3	19	4	33	1	8	15	21
3	0	0	1	7	1	6	1	8	0	0	3	4
2	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	15*	100	16	100	12	100	13	100	72	100

*One Algebra II panelist did not respond to this question.

Item 26

I feel that this standard-setting meeting provided me an opportunity to use my best judgment in selecting and revising estimates for a recommended standard of Advanced performance.

5	4	3	2	1
To a great extent		To some extent		Not at all

	English I		Algebra II		Geometry		Government		History		Total	
Rating	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
5	12	75	12	80	11	69	9	75	11	85	55	76
4	4	25	3	20	4	25	3	25	2	15	16	22
3	0	0	0	0	1	6	0	0	0	0	1	1
2	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	100	15*	100	16	100	12	100	13	100	72	100

*One Algebra II panelist did not respond to this question.