Missouri
DEPARTMENT OF ELEMENTARY & SECONDARY
EDUCATION™

End-of-Course Assessments

Technical Report

2012 - 2013

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

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List of Abbreviations

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

ALD ..... Achievement-Level Descriptor
ARC ..... Assessment Resource Center
AYP ..... Adequate Yearly Progress
CLE ..... Course-Level Expectation
CMS..... Content Management System
CR..... Constructed-Response
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
DTC ..... District Test Coordinator
EFT ..... Embedded Field Test
ELL..... English Language Learner
EOC ..... End-of-Course
ESEA ..... Elementary and Secondary Education Act
FRL..... Free and Reduced Lunch
GLE ..... Grade-Level Expectation
GRF ..... General Research File
IAP..... Individualized Accommodation Program
IDEA ..... Individuals with Disabilities Education Act
IEP ..... Individualized Education Program
IRR ..... Inter-Rater Reliability
IRT..... Item Response Theory
ISR..... Individual Student Report
ITC..... Information Technology Coordinator
ITS ..... Internet Testing Systems
LEP ..... Limited English Proficient
LOSS ..... Lowest Obtainable Scale Score
MAP ..... Missouri Assessment Program
MCDS..... Missouri Comprehensive Data System
MH..... Mantel-Haenszel procedure
MOSIS..... Missouri Student Information System
NCLB ..... No Child Left Behind
PE ..... Performance Event
RS ..... Raw Score
SD ..... Standard Deviation
SE ..... Standard Error
SEM..... Standard Error of Measurement
SR ..... Selected-Response
STC..... School Test Coordinator
TAC ..... Technical Advisory Committee
TDS ..... Test Development Specialist
WP ..... Writing Prompt

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Executive Summary

This document provides a technical summary of the 2012–2013 administrations of the Missouri End-of-Course (MO EOC) Assessments in English II, Algebra I, Biology, 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 eight content areas. The 2012–2013 school year marked the fifth operational administration of the English II, Algebra I, and Biology Assessments and the fourth operational administration of the English I, Algebra II, Geometry, Government, and American History Assessments. All the test forms used in 2012–2013 were intact forms previously administered in other testing administrations, and no items were developed or field tested. Therefore, no equating and scaling was needed.

In the past, technical reports consisted of two volumes: one for English II, Algebra I, and Biology and one for English I, Algebra II, Geometry, Government, and American History. Starting with the 2012–2013 edition, the technical report is streamlined to include all assessments in one volume. However, historical information from previous technical reports is still included to provide context in which technical procedures were developed and to assist with the understanding and interpretation of the 2012–2013 results. Previous technical reports can be found on the Missouri Department of Elementary and Secondary Education (DESE) website at http://dese.mo.gov/divimprove/assess/tech/index.html.

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 assessment program to measure student proficiency in the knowledge, skills, and competencies identified in the standards. Therefore, upon adoption of the standards in 1996, Missouri developed the Missouri Assessment Program (MAP) that included grade-level assessments for elementary, middle, and high school students in core academic content areas.

In January 2007, the Missouri State Board of Education approved a plan to replace the MAP for high school students with the MO EOC Assessments beginning with English II, Algebra I, and Biology in 2008–2009. The remaining MO EOC Assessments (English I, Algebra II, Geometry, Government, and American History) were added the following year. The MO EOC Assessments have been administered each summer, fall, and spring since the 2008–2009 school year for English II, Algebra I, and Biology (beginning with the Fall 2008 administration) and since the 2009–2010 school year for English I, Algebra II, Geometry, Government, and American History (beginning with the Fall 2009 administration).

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E.2 Administration

Missouri's goal is for every student to be Proficient, as defined by the Missouri State Board of Education. Therefore, 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 2012, Fall 2012, and Spring 2013 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 required by Missouri's approved Elementary and Secondary Education Act (ESEA) Flexibility Waiver.

Individual student reports are distributed to school districts following each assessment administration window. Building-, district- and state-level reports are available following each spring administration. Scores are used during the accountability year in which the tests are administered. The accountability year begins with the summer administration preceding each academic year. Therefore, the score reports for the 2012–2013 assessment year contained information from the Summer 2012, Fall 2012, and Spring 2013 assessments.

E.3 Student Performance

The MO EOC Assessment score matches a student's performance to a defined achievement level. 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 MO EOC Assessments: Below Basic, Basic, Proficient, and Advanced.

Tables E.1 through E.3 display the percentage of students at each achievement level for the Summer 2012, Fall 2012, and Spring 2013 MO EOC Assessments, respectively. Beginning with the 2012–2013 administration, Missouri began operating under the requirements of its approved ESEA Flexibility Waiver, which includes new high school EOC requirements beginning with the graduating class of 2017. This waiver, approved by the U.S. Department of Education in June 2012, gives Missouri flexibility from No Child Left Behind (NCLB) requirements and allows the state to use its own accountability system. In order to establish three years of trend data prior to the 2012–2013 test administrations, building- and district-level student performance data for English II, Algebra I, and Biology was recalculated for the 2010–2011 and 2011–2012 administration years to include the banked scores of all students who took those assessments prior to entering high school. Scores are no longer banked and are instead considered for accountability purposes at the time the student is assessed and in the building that provided the instruction.[1] It should be noted that the data for *all* tested students are used each year for purposes of item analysis and scaling and equating if they are performed. For this reason, the numbers and/or percentages of tested students reported in the MO EOC technical reports for the 2008–2009 through the 2011–2012 administrations do not match the numbers of students reported by DESE for accountability purposes in those years.

[1] Find more information regarding Missouri's ESEA Waiver at http://dese.mo.gov/qs/esea-waiver.html.

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Table E.1: Percentage of Students at Each Performance Level, Summer 2012

Test Period	Achievement Level	%
English II	Below Basic	13.97
	Basic	46.31
	Proficient	34.54
	Advanced	5.17
Algebra I	Below Basic	18.15
	Basic	42.90
	Proficient	33.88
	Advanced	5.06
Biology	Below Basic	21.78
	Basic	54.56
	Proficient	19.91
	Advanced	3.74
English I	Below Basic	25.08
	Basic	43.01
	Proficient	24.09
	Advanced	7.81
Algebra II	Below Basic	49.28
	Basic	38.94
	Proficient	9.02
	Advanced	2.75
Geometry	Below Basic	44.00
	Basic	32.78
	Proficient	18.70
	Advanced	4.51
Government	Below Basic	16.17
	Basic	35.20
	Proficient	34.43
	Advanced	14.19
Am. History	Below Basic	45.10
	Basic	28.05
	Proficient	21.56
	Advanced	5.28

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Table E.2: Percentage of Students at Each Performance Level, Fall 2012

Test Period	Achievement Level	%
English II	Below Basic	16.94
	Basic	30.91
	Proficient	44.66
	Advanced	7.48
Algebra I	Below Basic	20.90
	Basic	31.46
	Proficient	28.16
	Advanced	19.47
Biology	Below Basic	20.79
	Basic	36.96
	Proficient	31.02
	Advanced	11.22
English I	Below Basic	10.89
	Basic	27.83
	Proficient	44.99
	Advanced	16.28
Algebra II	Below Basic	6.49
	Basic	14.63
	Proficient	44.99
	Advanced	33.88
Geometry	Below Basic	9.35
	Basic	19.69
	Proficient	43.78
	Advanced	27.17
Government	Below Basic	9.24
	Basic	40.04
	Proficient	36.41
	Advanced	14.30
Am. History	Below Basic	27.28
	Basic	24.75
	Proficient	39.49
	Advanced	8.47

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Table E.3: Percentage of Students at Each Performance Level, Spring 2013

Test Period	Achievement Level	%
English II	Below Basic	4.18
	Basic	25.74
	Proficient	51.15
	Advanced	18.92
Algebra I	Below Basic	7.70
	Basic	34.32
	Proficient	41.58
	Advanced	16.39
Biology	Below Basic	3.08
	Basic	20.57
	Proficient	50.49
	Advanced	25.96
English I	Below Basic	11.22
	Basic	28.38
	Proficient	39.27
	Advanced	21.12
Algebra II	Below Basic	12.32
	Basic	33.77
	Proficient	38.50
	Advanced	15.51
Geometry	Below Basic	13.42
	Basic	25.96
	Proficient	38.83
	Advanced	21.78
Government	Below Basic	11.55
	Basic	32.89
	Proficient	37.40
	Advanced	18.15
Am. History	Below Basic	27.17
	Basic	25.85
	Proficient	30.69
	Advanced	16.17

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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 details about the development and operation of the MO EOC Assessments. While Chapter 11 of this report is devoted specifically to the documentation of validity evidence for the MO EOC Assessment scores, all information contained herein ultimately contributes to the argument for the validity of the scores for their intended purposes.

The following summarizes the information contained in this report.

Chapter 1: Introduction

Chapter 1 provides background information about the MO EOC Assessments, as well as MAP in general. It also 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

Questar Assessment, Inc. (Questar) has not conducted item or test development for the MO EOC Assessments. Therefore, Chapter 2 mostly consists of historical data from Riverside Publishing, the previous contractor, and contains descriptions of each step in the development process for the MO EOC Assessments, including test design, test blueprints, test specifications and target point distributions, 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, this 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 consists of summarized historical information from the 2008 achievement-level setting for English II, Algebra I, and Biology and the 2009 achievement-level setting for English I, Algebra II, Geometry, Government, and American History. It details each step in the planning and execution of the 2008 and 2009 achievement-level setting events that resulted in the cut scores for each of the MO EOC achievement levels. While this chapter was included in the *2009–2010 MO EOC Phase I and Phase II Technical Reports*, it is summarized here since the results are relevant to the current test administrations. This chapter covers selection of panelists, development of the ALDs, and an overview of the methodology and considerations for the data available at the time of the achievement-level 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 2012, Fall 2012, and Spring 2013 operational items.

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Chapter 5: Test Administration

Chapter 5 contains information about the administration of the MO EOC Assessments, beginning with a description of students for whom the assessments are appropriate. Details of the administration are then 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. The chapter also includes information about the accommodations allowed on the MO EOC Assessments and describes how materials are submitted for processing and scoring.

Chapter 6: Scoring

Chapter 6 covers the scoring processes for both the selected-response (SR) and performance events/writing prompts (PE/WPs) on the MO EOC Assessments. It contains information on how Questar scored the MO EOC SR items, as well as the process that Pearson, the scoring contractor for the PE/WPs, used to score the PE/WPs, including the scoring training and qualification processes, scoring procedures, and monitoring for quality assurance.

Chapter 7: Scaling and Equating

Chapter 7 begins with an introduction to the item response theory (IRT) model used for scaling and equating the MO EOC Assessments. Next, steps are given for the scaling and equating procedures established for the MO EOC Assessments, which include the 2008 and 2009 standalone field-test items, the Spring 2009 operational forms (for establishing the base scale), and the Spring 2009 field-test items. Finally, the raw score to scale score conversion tables are presented for the Summer 2012, Fall 2012, and Spring 2013 operational forms.

Chapter 8: Reporting

Chapter 8 contains information about the reports Questar produced for the MO EOC Assessments, including the Individual Student Report (ISR) 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 and ethnicity, as well as migrant, free and reduced lunch (FRL), limited English proficient (LEP), Title I, Individualized Education Program (IEP), and accommodation statuses.

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 (CSEMs) are presented at each scale score cut point. Finally, this chapter provides inter-rater reliability information for the Fall 2012 and Spring 2013 administrations (the Summer 2012 adminstration did not include PE/WPs).

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Chapter 11: Validity

After an introduction to the validity evidence for the MO EOC Assessments, Chapter 11 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. It provides an 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.

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Chapter 1: Introduction

This technical report provides detailed information and statistical results for the Summer 2012, Fall 2012, and Spring 2013 administrations of the Missouri End-of-Course (MO EOC) Assessments in English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, and American History. These criterion-referenced assessments are designed to assess students‘ knowledge of Missouri‘s Course-Level Expectations (CLEs)[2] in each of these content areas.

The 2012–2013 administration of the MO EOC Assessments marked the fifth operational year for English II, Algebra I, and Biology and the fourth operational year for English I, Algebra II, Geometry, Government, and American History. Previously used operational test forms were re-administered for the 2012–2013 year, and no new item or test development was conducted.

Beginning in Summer 2010, the performance events/writing prompts (PE/WPs) had been temporarily suspended from the English II, Algebra I, and Biology Assessments, but they were added back in beginning with the Fall 2012 administration. As such, the Fall 2012 and Spring 2013 English II, Algebra I, and Biology Assessments contain both PE/WPs and selected-response (SR) items, whereas the Summer 2012 English II, Algebra I, and Biology Assessments contain only SR items. The English I, Algebra II, Geometry, Government, and American History Assessments contain only SR items for each administration.

Past administrations have had two separate technical reports:

- One for the assessments first administered during the 2008–2009 school year, which were designated as Phase I Assessments
- One for the assessments first administered during the 2009–2010 school year, which were designated as Phase II Assessments

Starting in 2012–2013, however, there is only one technical report that contains information for all eight MO EOC Assessments. This chapter starts with the history of the MO EOC Assessments, followed by a description of the current assessments and the purpose of the technical report.

1.1 History of the MO EOC 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.

[2] The Missouri Department of Elementary and Secondary Education (DESE) expects teachers to adhere to Missouri‘s Course-Level Expectations (CLEs), found at http://dese.mo.gov/divimprove/curriculum/GLE/. These expectations give students, teachers, and administrators a clear and standardized framework for learning and teaching the ideas, concepts, skills, and processes for each content area based on grade level.

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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 (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 were 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 2008, the high school GLEs were clustered into CLEs to define content within typical high school courses of study in English, Mathematics, Social Studies, and Science.

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 developing 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 was required until Spring 2002, and a Fine Arts assessment was field tested in 2001. Due to budget constraints, development of the Fine Arts assessment was suspended and the 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 No Child Left Behind (NCLB) requirements.

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Through the Spring 2005 administration, the MAP statewide assessment program included grade-span assessments in the following grade levels and content 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 (PEs). For all content areas, MAP assessments included SR items from the TerraNova® Survey Edition. CR items and PEs were custom-developed with significant input from Missouri educators.

During the initial MAP development and implementation period, DESE developed two to four equivalent forms for each content area and 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 items. Small-scale pilots continued as well.

As each content area and grade level assessment was administered, DESE used the bookmark method 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 NCLB requirements, Missouri‘s assessment program needed to incorporate Mathematics and Communication Arts assessments at all elementary and middle school grade levels (grades 3–8) 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 the MO EOC Assessments. In 2008–2009, the MO EOC Assessments included English II, Algebra I, and Biology. In 2009–2010, the EOC Assessments in English I, Algebra II, Geometry, Government, American History, Integrated Mathematics II, and Integrated Mathematics III were added to the program. However, following the 2009–2010 administration year, the Integrated Mathematics II and Integrated Mathematics III Assessments were discontinued due to extremely low enrollment.

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1.2 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 MO EOC Assessments administered in 2012–2013 included the following:

- English II
- Algebra I
- Biology
- 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 English Language Learners (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 MO EOC Assessments were developed and first administered during the 2008–2009 school year for English II, Algebra I, and Biology. Other MO EOC Assessments were developed and first administered in the 2009–2010 school year for English I, Algebra II, Geometry, Government, and American History. The MO EOC Assessments were created to assess the CLEs and meet 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 MO 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

CLEs outline the ideas, concepts, and skills that form the foundation for an assessed EOC content area, regardless of a student‘s grade level. Each MO EOC Assessment is tailored to each EOC content area and is designed to be administered when a student has completed the content defined for that course. Districts can offer EOC course content in any grade and in a variety of

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configurations. Although many districts offer EOC course content within a course bearing the same name, EOC course content can also be embedded within a course or across several courses. MO EOC Assessments are administered according to a "right test, right time" philosophy when students have completed the content within the CLEs.

An SR item (also known as a multiple-choice item) presents students with a question followed by four response options. PEs are open-ended items that require students to perform more complicated tasks. A PE measures depth of understanding and interpretative and analytical abilities in a format that allows for more than one approach to arrive at a correct response. The advantage of this type of item is that it provides insight into a student‘s ability to apply knowledge and understanding in real-life situations. The WP, a special type of PE that appears in the English II Assessment, is an open-ended item that requires students to demonstrate their writing proficiency. Beginning with the Summer 2010 administration, PEs and the WP were removed from the MO EOC Assessments due to budget constraints but were added back in during the Fall 2012 administration

English II, Algebra I, and Biology contained only SR items during the Summer 2012 administration but contained both SR items and PE/WPs during the Fall 2012 and Spring 2013 administrations. English I, Algebra II, Geometry, Government, and American History contained only SR items for the entire 2012–2013 administration year. These tests are designed to be administered in approximately one testing period and are not strictly timed.

The 2012–2013 MO EOC Assessments were offered primarily in an online administration mode with Paper/Pencil, Braille, or Large Print forms available for students requiring accommodations.

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 for Summer, Fall, and Spring. Table 1.1 displays the 2012–2013 MO EOC testing windows.

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Table 1.1: 2012–2013 MO EOC Testing Windows

Summer 2012	June 11, 2012 – August 31, 2012
Fall 2012	October 8, 2012 – January 25, 2013
Spring 2013	February 25, 2013 – May 31, 2013

Individual Student Reports (ISRs) and student raw scores are available to the district five business days after the close of their district content window. Timely availability of score reports allows teachers the option to consider MO EOC Assessment results in assigning course grades. ISRs are only available in an online format unless an order is placed by the district for paper reports. Multiple testing windows allow school districts the flexibility to schedule MO EOC testing as close as possible to the end of each course to provide students the greatest opportunity to demonstrate proficiency in the course content. In the 2008–2009 and 2009–2010 administration years, districts were required to administer the English II, Algebra I, and Biology Assessments to all students prior to graduation, unless students completed coursework prior to the operational administration of the assessments. In 2010–2011, Government was added to the list of required EOC Assessments. In 2012–2013, districts were required to administer the English II, Algebra I, Biology, English I, Government, and American History Assessments to all students prior to graduation.

Data for this technical report came from the Summer 2012, Fall 2012, and Spring 2013 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 DESE-provided demographic criteria required under Missouri's approved ESEA Flexibility Waiver.

Through the 2011–2012 administration year, Missouri reported English II, Algebra I, and Biology EOC scores in accordance with NCLB, which requires states to assess all students at least once in high school in Mathematics, English/Communication Arts, and Science. All students who took the MO EOC Assessments in English II, Algebra I, and/or Biology prior to entering high school were excluded from Missouri‘s high school accountability data until they enrolled in high school. Their scores were ―banked” until they actually reached high school, at which time they were rolled into the high school accountability data for that year. However, beginning with the 2012–2013 administration with the approved ESEA Flexibility Waiver, scores are no longer banked and are instead considered for accountability purposes at the time the student is assessed and in the building that provided the instruction.

1.5 MO EOC 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. At the outset of the 2008 contract award, Riverside Publishing was the primary contractor working in partnership with Questar Assessment, Inc. (Questar), the Assessment Resource Center (ARC), Internet Testing Systems (ITS), Bookette, and others. Beginning with the Summer 2011 administration, DESE contracted operational activities with Questar. In Fall 2012, DESE contracted with

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Pearson for the scoring of the PE/WPs. Table 1.2 outlines the main activities for each group involved with the 2012–2013 MO EOC administrations.

Table 1.2: Main Activities for Groups Involved in MO EOC Organizational Support

Group	Responsibilities
Questar Assessment, Inc. (Questar)	• Provide program management, including primary contact with DESE; coordinate all meetings; handle all administrative costs/activities; generate all program management reports and status reports • Create and update the Test Administration Manual, Software Installation Guides, and other ancillary materials • Conduct psychometric analyses, reporting, linking/equating studies, and associated tasks • Provide all needed prepress work for program materials through camera-ready art • Produce all materials, including online, Paper/Pencil, Braille, and Large Print versions of the test, as well as online testing tools and content area-specific tutorials • Account for secure test books received after testing • Provide a direct customer service line, including technical support and general support to the program and customer interactions • Store materials after testing • Participate in and present at Technical Advisory Committee (TAC) meetings • Score all SR items • Coordinate the transfer of PE/WP scoring data to and from Pearson • Produce and distribute all score reports and the Guide for Interpreting Results • Complete the technical report for DESE • Provide online enrollment and pre-ID system for use by Missouri districts • Provide online testing interface and online test administration site • Package and distribute materials • Barcode test books with security IDs
Pearson	• Score the PE/WPs • Report data to Questar
Districts	• Distribute materials to the school buildings, track all secure materials, and promptly return all materials, including transcribed test forms, for scoring • Assist in the timely resolution of scoring alerts • Act as a liaison between Questar and buildings
School Buildings	• Administer tests, track all secure materials, and promptly return materials to districts for scoring
American Printing House for the Blind (APH)	• Print both Braille and Large Print versions

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1.6 Purpose of the Technical Report

The purpose of this technical report is to provide information about the technical characteristics of the 2012–2013 operational administration of the MO 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 operation of the MO EOC Assessments, as well as the history of their development. The empirical reliability of the assessments and validity of intended uses of the scores are reported explicitly in this document. Chapter 10 contains a relatively straightforward discussion of reliability, and Chapter 11 summarizes the validity argument. 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 a specific chapter is devoted to validity, other parts of this document provide evidence necessary to assess the validity of the MO 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 to improve student learning. The MO EOC Assessments are an integrated program of testing and accountability, as well as curricular and instructional support. The assessments can be evaluated properly only within their full context.

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Chapter 2: Test Development

2.1 Introduction

The English II, Algebra I, and Biology Assessments were first administered operationally during the 2008–2009 school year. The English I, Algebra II, Geometry, Government, American History, Integrated Mathematics II, and Integrated Mathematics III Assessments were first administered operationally during the 2009–2010 school year. (Integrated Mathematics II and Integrated Mathematics III were discontinued after the first administration year due to extremely low enrollment.) Although there was no item or test development for 2012–2013, information on the test design and development processes established for the testing program is essential for understanding the assessments and interpreting the results. Therefore, documentation of test development from previous technical reports has been carried over and constitutes the majority of the content of this chapter.

This chapter provides an overview of the development of the MO EOC Assessments, including the test specifications, item development, item review, and test form development. According to the Standards for Educational and Psychological Testing (AERA, APA, & 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 descriptions of the test development procedures included in this chapter provide validity evidence of the MO EOC Assessments.

2.2 Design of the MO EOC Assessments

Figure 2.1 details the design of the Spring 2008 standalone field test, the Fall 2008 operational administration, and the Spring 2009 operational administration with the embedded field test (EFT) for English II. Additionally, Figure 2.1 displays the design of the Spring 2009 standalone WP field test.

Figure 2.2 details the design of the Spring 2008 standalone field test, the Fall 2008 operational administration, and the Spring 2009 operational administration with the EFT for Algebra I and Biology.

Figure 2.3 details the design of the linking forms for the 2009–2010 administration year. The Fall 2009 operational administration was linked to both the Spring 2009 and Spring 2010 operational administrations. Additionally, the Spring 2010 administration was linked to the Summer 2010 administration. Besides being linked to the Spring 2010 administration, the Summer 2010 administration was also linked to the Spring 2009 administration.

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Figure 2.1: 2008–2009 Field-Test and Operational Assessment Design, English II

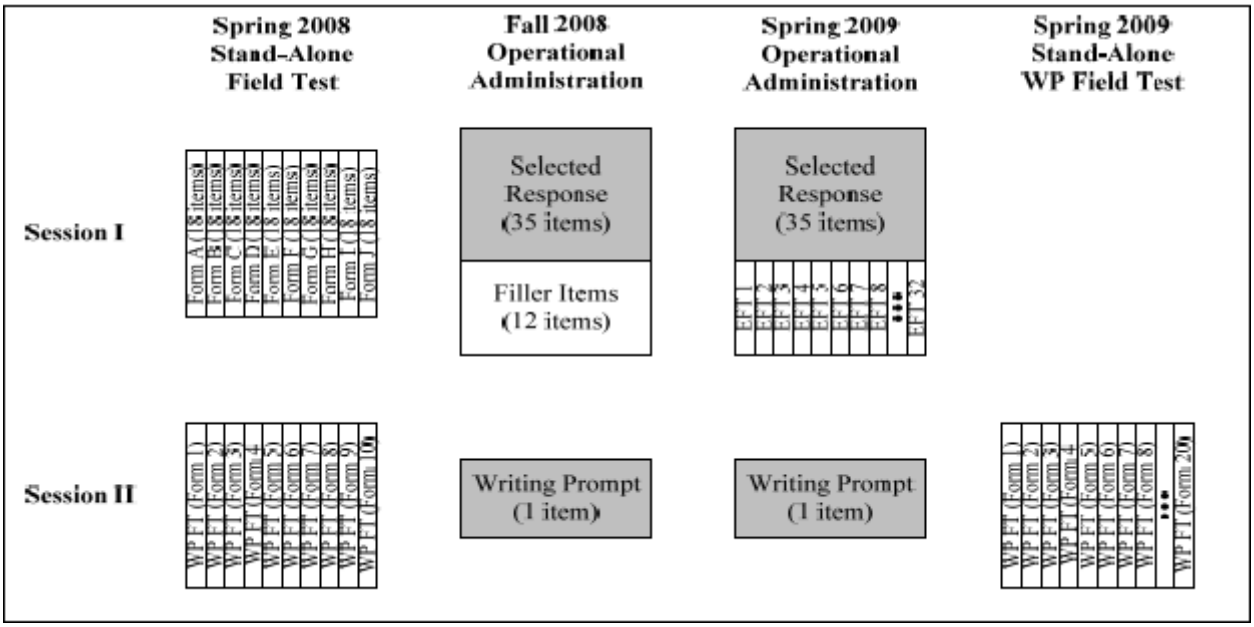

Figure 2.2: 2008–2009 Field-Test and Operational Assessment Design, Algebra I and Biology

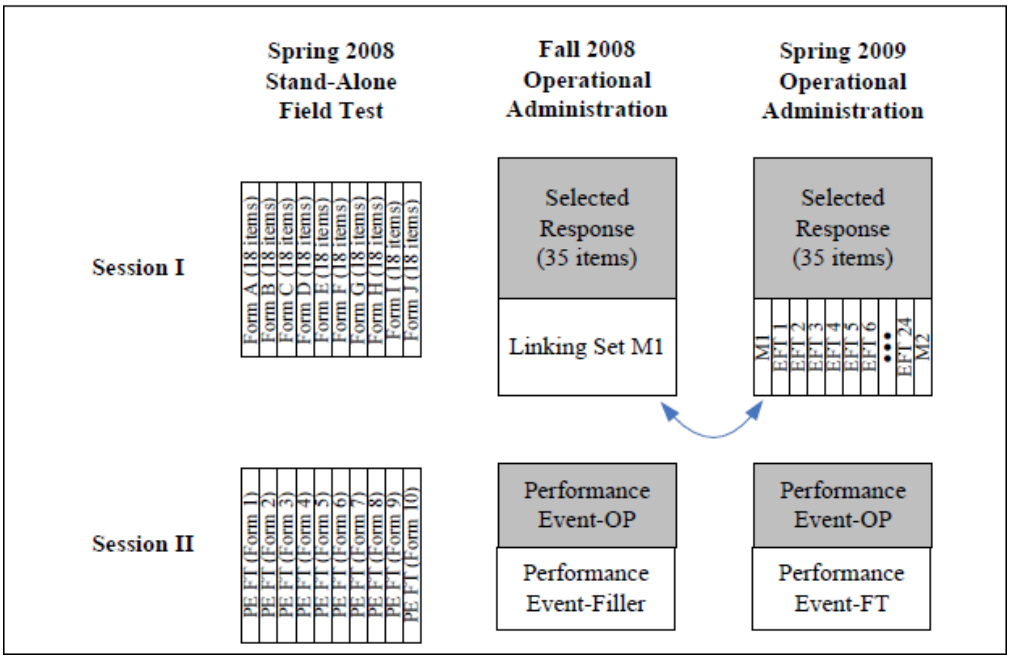

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Figure 2.3: Linking Design for Post Equating the MO EOC Assessments

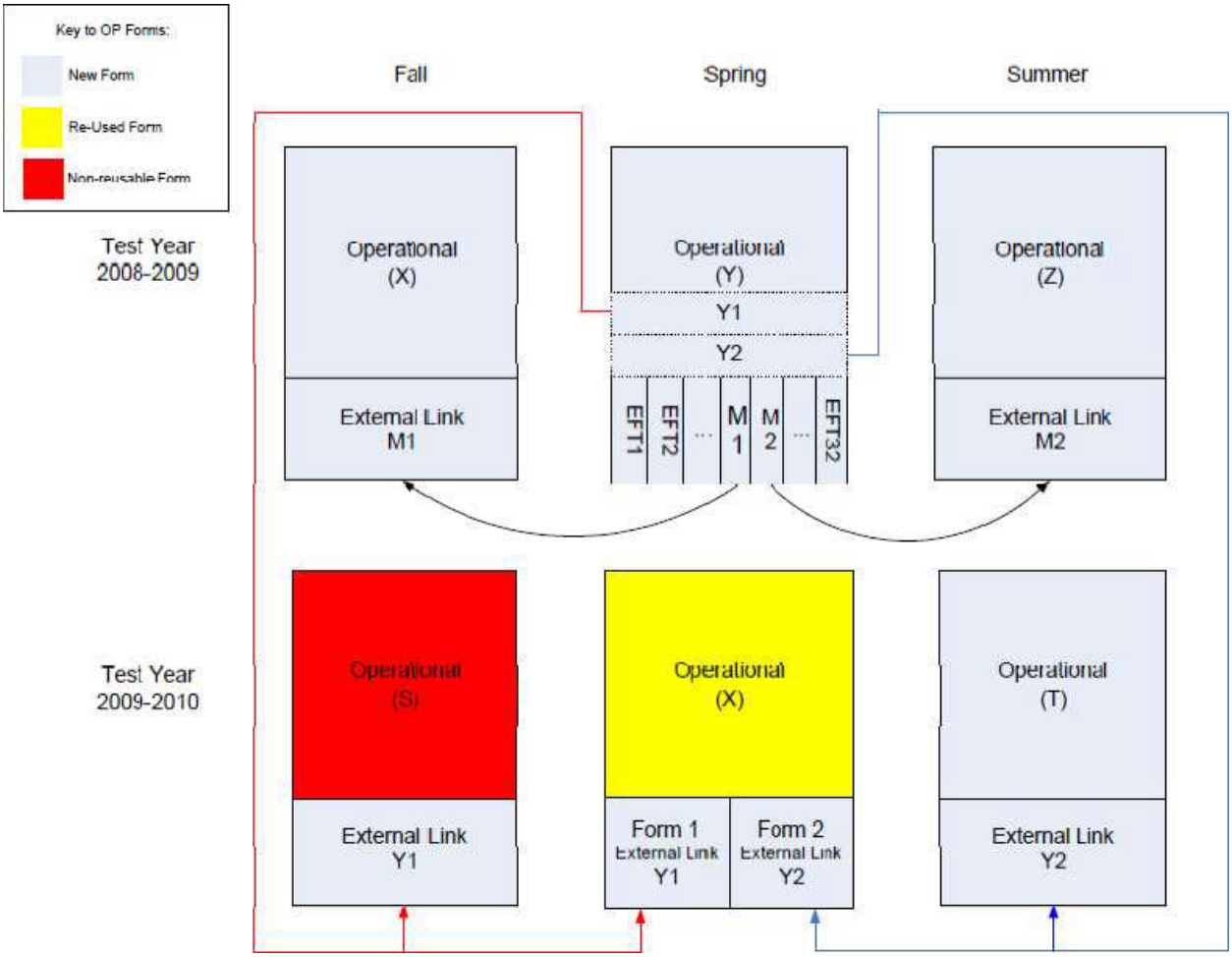

Table 2.1 lists the linking design for multiple operational administration years of the English II, Algebra I, and Biology Assessments.

Table 2.1: Linking Design for the English II, Algebra I, and Biology Assessments

Test Period	Assessment Form*	Linking Set(s)
Fall 2008	A	M1
Spring 2009	B	M1, M2, Y1, Y2
Summer 2009	C	M2
Fall 2009	D	Y1
Spring 2010	A	Y1, Y2
Summer 2010	E	Y2
Fall 2010	B	M1, M2
Spring 2011	F	M1, M2

*The correspondence between the forms presented in Figure 2.3 and Table 2.1 is X=A, Y=B, Z=C, S=D, and T=E.

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Figure 2.4 details the design of the Spring 2009 standalone field test, the Fall 2009 operational administration, and the Spring 2010 operational administration with the EFT for English I. Figure 2.5 details the design of the Spring 2009 standalone field test, the Fall 2009 operational administration, and the Spring 2010 operational administration with EFTs for Algebra II, Geometry, Government, and American History. Figure 2.6 details the design of the Spring 2009, Fall 2009, and Spring 2010 Integrated Mathematics II and III Assessments. It should be noted that 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. Therefore, information about the Integrated Mathematics II and Integrated Mathematics III Assessments is limited in this technical report.

Figure 2.4: Field Test and Operational Assessment Design, English I

Figure 2.5: Field Test and Operational Assessment Design, Algebra II, Geometry, Government, and American History

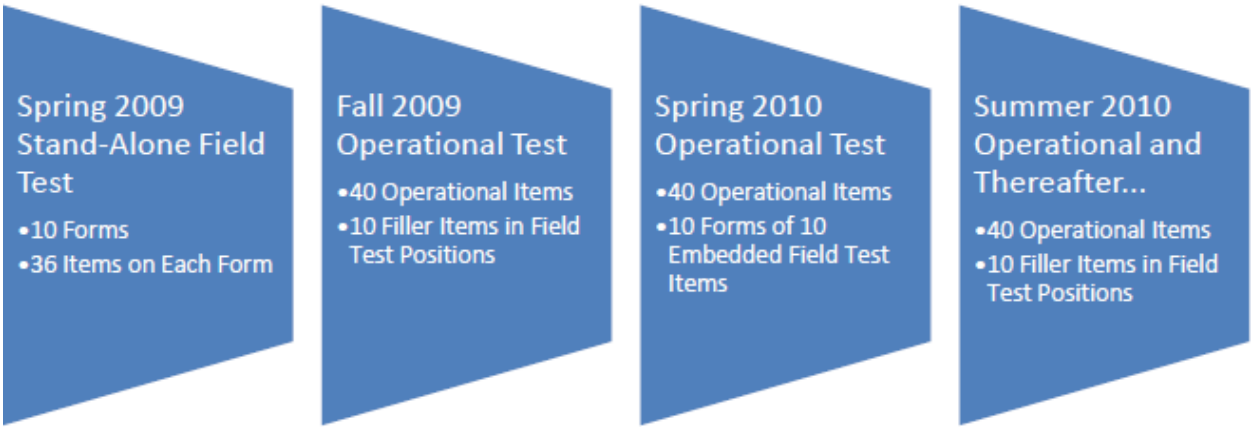

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Figure 2.6: Field Test and Operational Assessment Design, Integrated Mathematics II and III

2.2.1 Spring 2008 Standalone Field Test

The Spring 2008 standalone field test of the English II, Algebra I, and Biology Assessments provided item data to inform the 2008–2009 operational forms selection process. The Spring 2008 field test consisted of two sessions. For each assessment, Session I included 10 unique forms of SR items, with each form containing 19 items. Session II included 10 unique forms of PE/WPs. For English II, the PE forms in Session II each consisted of one 4-point WP. For Algebra I, each Session II form consisted of one 4-point PE. For Biology, each Session II form consisted of 10–12 CR items for a total of 20 points on each form. Forms within each session were spiraled at the student level across the state.

2.2.2 Fall 2008 Operational Administration

The Fall 2008 administration consisted of three operational assessments (English II, Algebra I, and Biology). English II consisted of one 35-item SR form and one WP. Algebra I and Biology each consisted of one 35-item SR form and one PE form. The Algebra I PE consisted of one 4-point item. The Biology PE consisted of 10 CR items, ranging from 1 to 4 points each for a total of 20 points.

In addition to the 35 scored items, each Fall 2008 Algebra I and Biology Session I test book contained a set of 12 linking items (designated as M1 in Figures 2.2 and 2.3). These linking items were used for the post-equating check of the pre-equating results following the Spring 2009 operational administration (indicated by an arrow in Figure 2.2). For the English II Assessment, the 12 additional SR items in Session I were filler (non-scored) items.

2.2.3 Spring 2009 Operational Administration

The Spring 2009 administration consisted of three operational assessments (English II, Algebra I, and Biology). For all three content areas, Session I consisted of 35 operational SR items. English II had 32 unique sets of 12 EFT items (labeled as EFT 1 through EFT 32 in Figure 2.1). Algebra I and Biology had 24 unique sets of 12 EFT items (labeled as EFT 1 through EFT 24 in Figure 2.2). Additionally, the sets of items used to link the Spring 2009 form to the Fall 2008 (M1) and

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Summer 2009 (M2) assessments for the post-equating check occupied two of the EFT slots on the Algebra I and Biology Assessments.

Session II of the Spring 2009 English II Assessment contained one 4-point WP. Session II of the Algebra I Assessment contained one 4-point PE. Finally, Session II of the Biology Assessment contained 11 CR items, ranging from 1 to 4 points each, for a total of 20 points. Session II of the Algebra I and Biology Assessments also contained an EFT PE.

2.2.4 Spring 2009 Standalone English II WP Field Test

In Spring 2009, 20 English II WPs were administered statewide in a separate standalone field test. Each WP was administered on its own form.

2.2.5 Spring 2009 Standalone Field Test

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

2.2.6 Fall 2009 Operational Administration

The Fall 2009 administration consisted of 10 operational assessments (English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, American History, Integrated Mathematics II, and Integrated Mathematics III). Session I for English II, Algebra I, and Biology consisted of 35 operational SR items. Each form also contained 12 linking items used to equate the Fall 2009 forms to the Spring 2009 forms as shown in Figure 2.3. Session II of the Fall 2009 English II Assessment contained one 4-point WP. Session II of the Algebra I Assessment contained one 4-point PE. Session II of the Biology Assessment contained 12 CR items, ranging from 1 to 4 points each, for a total of 20 points.

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

2.2.7 Spring 2010 Operational Administration

The Spring 2010 administration consisted of 10 operational assessments (English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, American History, Integrated Mathematics II, and Integrated Mathematics III). For English II, Algebra I, and Biology, the Fall 2008 operational form was re-used for the Spring 2010 operational SR assessment. The English II, Algebra I, and Biology Assessments each had two forms, which contained the same set of operational items but two unique sets of linking items. As shown in Figure 2.3, each course had

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two unique sets of linking items. Set Y1 linked the Spring 2010 Form A to the Fall 2009 and the Spring 2008 forms. Set Y2 linked the Spring 2010 Form B to the Spring 2008 and the Summer 2009 forms. Session II of the Spring 2010 English II Assessment contained one 4-point WP. Session II of the Algebra I Assessment contained one 4-point PE. Session II of the Biology Assessment contained 12 CR items, ranging from 1 to 4 points each, for a total of 20 points. Session II of the Algebra I and Biology Assessments also contained an EFT PE.

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

2.2.8 Summer 2010 Operational Administration

The Summer 2010 administration consisted of eight operational assessments (English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, and American History). The English II, Algebra I, and Biology Assessments were newly developed test forms. For all three assessments, Session I consisted of 35 operational SR items. Each form also contained 12 linking items that were also administered on the Summer 2009 test form and the Spring 2010 test form as shown in Figure 2.3. Session II of the Fall 2009 English II Assessment contained one 4-point WP. Session II of the Algebra I assessment contained one 4-point PE. Finally, Session II of the Biology Assessment contained 12 CR items, ranging from 1 to 4 points each, for a total of 20 points. Session II of the Algebra I and Biology Assessments also contained an EFT PE. After the forms were created and printed, a decision was made to discontinue the use of PE/WPs on the MO EOC Assessments. Therefore, the student responses from this administration were not scored.

The English I, Algebra II, Geometry, Government, and American History Assessments had filler items in the EFT slots.

2.2.9 Fall 2010 Operational Administration

The Fall 2010 administration consisted of eight operational assessments (English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, and American History). For English II, Algebra I, and Biology, the operational form was reused for the Spring 2009 operational SR assessment. The English II, Algebra I, and Biology Assessments each had two forms, which contained 12 linking items. As shown in Figure 2.3, each course had two unique sets of linking items. Set M1 linked the Fall 2010 form to the Fall 2008 and the Spring 2009 forms. Set M2 linked the Fall 2010 form to the Summer 2008 and the Spring 2009 forms.

English I consisted of one 52-item SR form. Algebra II, Geometry, Government, and American History each consisted of one 50-item SR form. Each Algebra II, Geometry, Government, and American History Assessment consisted of 40 operational items and 10 filler items in the EFT slots. The English I Assessment contained 12 filler items in the EFT slots in addition to 40 scored items.

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2.2.10 Spring 2011 Operational Administration

The Spring 2011 administration consisted of eight operational assessments (English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, and American History). The English II, Algebra I, and Biology Assessments were newly created. For all three assessments, Session I consisted of 35 operational SR items. Each form also contained 12 linking items (sets M1 and M2) as shown in Figure 2.3. In addition to the linking items, additional items were field tested in the EFT positions. Each of the three content areas field tested an additional 12 forms‘ worth of new items.

English I consisted of one 52-item SR form. Algebra II, Geometry, Government, and American History each consisted of one 50-item SR form. Each Algebra II, Geometry, Government, and American History Assessment consisted of 40 operational items and 10 filler items in the EFT slots. The English I Assessment contained 12 filler items in the EFT slots in addition to 40 scored items.

2.2.11 Released Forms

In addition to the operational forms, DESE and contractor Riverside Publishing constructed ―released" forms for each operational assessment. The English II, Algebra I, and Biology forms were posted on the DESE website in August 2008, and the English I, Algebra II, Geometry, Government, and American History 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 MO EOC Assessments. Although these forms were constructed to parallel the operational forms, the items in these released forms were never used on an operational MO EOC Assessment.

2.2.12 Summer 2011 through Spring 2013 Operational Administrations

Beginning with Summer 2011, Questar was awarded the contract for administering the MO EOC Assessments. The assessments were administered according to an established form rotation schedule, and two forms of each of the operational assessments were used to create Braille and Large Print versions of the assessments. Depending on the form rotation schedule, the Braille and Large Print versions of the test may not have been the same form administered to the general student population.

2.3 Test Blueprints

Test blueprints specify the relative percentage 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 2007. Blueprint development was guided by the Missouri Show-Me Standards.

Tables 2.2 through 2.9 outline the test construction blueprints for English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, and American History, respectively.

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Table 2.2: Test Construction Blueprint for English II with WP

Big Idea	Target # of Points	Point Range*	Target % Total	Minimum Emphasis	Maximum Emphasis
Develop and apply skills and strategies to the reading process	12	10–14	31%	**26%**	**36%**
Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama	9	8–11	23%	**23%**	**28%**
Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction	9	8–11	23%	**23%**	**28%**
Writing • Apply a writing process in composing text • Compose well-developed text • Write effectively in various forms and types of writing	9	8–9	23%	**23%**	**23%**
Total	39		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 operational test will be composed of two sessions. Session I will have 35 1-point SR items, and Session II will have one 4-point WP.
2. 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.
3. Content strand 1 has a larger percentage of total points because it can be assessed using both fiction and nonfiction passages.
4. The writing form/type will vary depending on the WP selected for a particular administration. WPs will be aligned to a primary CLE; however, multiple writing CLEs may be assessed to reflect the holistic rubric.

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Table 2.3: Test Construction Blueprint for Algebra I with PE

Content Strand	Target # of Points	Point Range	Target % Total	Minimum Emphasis	Maximum Emphasis
Number and Operations	8	7–9	21%	**19%**	**23%**
Algebraic Relationships	23	21–25	58%	**53%**	**63%**
Data and Probability	8	7–9	21%	**19%**	**23%**
Total	39		100%		

Note: Total score points for the operational tests may vary depending on which PE is selected for a particular administration. Regardless of the total score points on a particular operational test, the percentage of total score points from each content strand (emphasis) will fall within the blueprint range described above. Point ranges are determined using a 10 percent tolerance.

This blueprint was built under the following assumptions:

1. The operational test will be composed of two sessions. Session I will have 35 1-point SR items, and Session II will have one 4-point PE.
2. Each PE will be aligned to one CLE from the Algebraic Relationships strand.

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Table 2.4: Test Construction Blueprint for Biology with PEs

Content Strand	Target # of Points	Point Range	Target % Total	Minimum Emphasis	Maximum Emphasis
Characteristic and Interactions of Living Organisms	22	20–24	40%	**36%**	**44%**
Changes in Ecosystems and Interactions of Organisms with Their Environments	13	12–14	24%	**22%**	**27%**
Scientific Inquiry	20	20	36%	**36%**	**36%**
Total	55		100%		

Note: Total score points for the operational tests may vary depending on which PE prompts are selected for a particular administration. Regardless of the total score points on a particular operational test, the percentage of total score points from each content strand (emphasis) will fall within the blueprint range described above. Point ranges are determined using a 10 percent tolerance.

This blueprint was built under the following assumptions:

1. The operational test will be composed of two sessions. Session I will have 35 1-point SR items, and Session II will have one 20-point PE that is comprised of a main context and several prompts.
2. Prompts within PEs will be aligned to CLEs from the Scientific Inquiry strand only.

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Table 2.5: Test Construction Blueprint for English I

Big Idea	Target # of Points	Point Range*	Target % Total	Minimum Emphasis	Maximum Emphasis
Develop and apply skills and strategies to the reading process	15	13–17	38%	**33%**	**43%**
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%**
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.

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Table 2.6: 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	8	7–9	20%		

Table 2.7: 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 Spatial	24	22–24	60%	**55%**	**60%**
Measurement	8	7–9	20%	**18%**	**23%**
Total	40	40	100%		

Table 2.8: Test Construction Blueprint for Government

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

Note: Point ranges are determined using a 10 percent tolerance.

Table 2.9: Test Construction Blueprint for American History

Content Strand	Target # of Points	Point Range	Target % Total	Minimum Emphasis	Maximum Emphasis
Government	8	7–9	20%	**18%**	**23%**
History	16	14–18	40%	**35%**	**45%**
Economics	8	7–9	20%	**18%**	**23%**
Geography	8	7–9	20%	**18%**	**23%**
Total	40	40	100%		

Note: Point ranges are determined using a 10 percent tolerance.

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.

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2.4 Test Specifications

Standard 1.6[3] specifically addresses the appropriateness of test content and its relationship to a solid validity argument. Additionally, Standard 3.3[4] 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 CLE. This section details the development and use of the test specification documents for the MO EOC Assessments.

Riverside Publishing content experts developed draft test specifications for English II, Algebra I, and Biology in 2007 and for English I, Algebra II, Geometry, Government, and American History in 2008. These draft test specifications were subsequently reviewed and approved by DESE. The specifications were finalized in Fall 2007 and Fall 2008, respectively, before the development of items for the field-test forms.

The test specification document served as the foundation for all item development. The material in the test specifications was designed for use by Riverside Publishing content experts and DESE to construct tests with the following characteristics:

- Aligned to Missouri CLEs
- Aligned to Norman Webb's depth of knowledge (DOK) cognitive levels
- Include both SR items and PE/WPs
- Include both standalone and passage-based items

Detailed descriptions of the test content measured in each MO EOC Assessment are presented in the following sections.

2.4.1 English II

The English II Assessment measures student achievement in reading and writing. Session I of the test contains 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. The English II Assessment has 35 SR items, as well as standalone SR items that assess grammar and language usage. Session II of the English II Assessment comprises a WP, which could cover one or more of the following genres: narrative, expository, persuasive, or informative. The WP is scored based on a holistic 4-point rubric.

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[3] **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).

[4] **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).

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Table 2.10 contains targets for the CLE point distribution on the English II operational forms for Session I only. 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.

Tables 2.11, 2.12, and 2.13 contain actual point distributions for the Summer 2012, Fall 2012, and Spring 2013 operational forms, respectively. Note that the Summer 2012 administration did not include PE/WPs.

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Table 2.10: Target Point Distributions for the English II Operational Forms

Reading Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range of Points per CLE on the Operational Test**
Develop and apply skills and strategies to the reading process	Vocabulary	Develop vocabulary through text, using a. roots and affixes b. context clues c. glossary, dictionary, and thesaurus	2	3–4
	Post Reading	Apply post-reading skills to comprehend, interpret, analyze, and evaluate text: *a. question to clarify *b. reflect c. draw conclusions d. paraphrase e. summarize	3	5–6
	Making Connections	Compare, contrast, analyze and evaluate connections: a. text to text (information and relationships in various fiction and nonfiction works) *b. text to self (text ideas and own experiences) *c. text to world (text ideas and the world by analyzing and evaluating the relationship between literature and its historical period and culture)	3	1–2
Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry and drama from a variety of cultures and times	Text Features	Analyze and evaluate the text features in grade-level text	3	2–3
	Literary Techniques	Identify and explain literary techniques, emphasizing a. understatement b. parallelism c. allusion d. analogy e. analyze and evaluate literary techniques previously introduced	3	2–3
	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. identify and analyze tone	3	4–5

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Table 2.10 (continued): Target Point Distributions for the English II Operational Forms

Reading Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range of Points per CLE on the Operational Test**
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	Text Features	Explain, analyze, and evaluate the author‘s use of text features to clarify meaning	3	1–2
	Literary Techniques	Identify, explain, and analyze literary techniques in nonfiction, emphasizing a. understatement b. parallelism c. allusion d. analogy e. figurative language and sound devices previously introduced	3	2–3
	Text Structures	Use details from informational and persuasive text(s) to a. analyze and evaluate the organizational patterns b. identify and analyze faulty reasoning and unfounded inferences c. evaluate proposed solutions d. evaluate for accuracy and adequacy of evidence e. evaluate effect of tone on the overall meaning of work f. analyze and evaluate point of view g. analyze and evaluate author‘s viewpoint/perspective h. demonstrate comprehension skills previously introduced	3	3–4
Writing Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range of Points per CLE on the Operational Test**
Compose well-developed text	Conventions	In written text, apply a. conventions of capitalization b. conventions of punctuation c. standard usage	1	5

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Table 2.11: Actual Point Distributions for the Summer 2012 English II Operational Forms

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
Reading Process	12	11
Reading (fiction)	9	8
Reading (nonfiction)	9	11
Writing	5	5
Total #Items/Points	**35**	**35**

Table 2.12: Actual Point Distributions for the Fall 2012 English II Operational Forms

Reporting Categories	Blueprint Target				Actual			
	# Items		# Points		# Items		# Points	
	SR	WP	SR	WP	SR	WP	SR	WP
Reading Process	12		12		14		14	
Reading (fiction)	9		9		9		9	
Reading (nonfiction)	9		9		7		7	
Writing	5	1	5	4	5	1	5	4
Total #Items/Points	**35**	**1**	**35**	**4**	**35**	**1**	**35**	**4**

Table 2.13: Actual Point Distributions for the Spring 2013 English II Operational Forms

Reporting Categories	Blueprint Target				Actual			
	# Items		# Points		# Items		# Points	
	SR	WP	SR	WP	SR	WP	SR	WP
Reading Process	12		12		11		11	
Reading (fiction)	9		9		8		8	
Reading (nonfiction)	9		9		11		11	
Writing	5	1	5	4	5	1	5	4
Total #Items/Points	**35**	**1**	**35**	**4**	**35**	**1**	**35**	**4**

2.4.2 Algebra I

The Algebra I Assessment measures a student‘s ability to solve problems by applying mathematical concepts. Three strands are assessed on the Algebra I Assessment:

- Numbers and Operations
- Algebraic Relationships
- Data and Probability

The 35 SR items in Session I are aligned to the strands listed above. Session II contains a PE aligned to the Algebraic Relationships strand. The PE is a mathematical scenario in which the student is required to respond to several CR items. The student may be asked to construct a graph

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and/or provide equations. On some items, the student is required to show his or her work for full credit. The PE is worth a total of 4 points and is scored on an item-specific rubric.

Table 2.14 contains targets for the CLE point distribution on the Algebra I operational forms. Some Big Ideas are not represented in this table because they are not assessed at this course level. Tables 2.15, 2.16, and 2.17 contain actual point distributions for the Summer 2012, Fall 2012, and Spring 2013 Algebra I operational forms, respectively. Note that the Summer 2012 administration did not include PEs.

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Table 2.14: Target Point Distributions for the Algebra I Operational Forms

Numbers and Operations Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range of Points per CLE on the Operational Test**
Understand numbers, ways of representing numbers, relationships among numbers, and number systems	Read, write, and compare numbers	Compare and order rational and irrational numbers, including finding their approximate locations on a number line	1	3–5
	Represent and use real numbers	Use real numbers and various models, drawing, etc. to solve problems	3	3–5
Algebraic Relationships Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range of Points per CLE on the Operational Test**
Understand patterns, relations, and functions	Create and analyze patterns	Generalize patterns using explicitly or recursively defined functions	2	1–2
	Classify objects and representations	Compare and contrast various forms of representations of patterns	3	1–2
	Identify and compare functions	Understand and compare the properties of linear and nonlinear functions	2	2–3
	Describe the effects of parameter changes	Describe the effects of parameter changes on linear, exponential growth/decay, and quadratic functions including intercepts	2	2–3
Represent and analyze mathematical situations and structures using algebraic symbols	Represent mathematical situations	Use symbolic algebra to represent and solve problems that involve linear and quadratic relationships, including equations and inequalities	3	2–3
	Describe and use mathematical manipulation	Describe and use algebraic manipulations, including factoring and rules of integer exponents, and apply properties of exponents, including order of operations, to simplify expressions	2	2–3
	Use equivalent forms	Use and solve equivalent forms of equations (linear, absolute value, and quadratic)	2	1–2
	Use systems	Use and solve systems of linear equations or inequalities with 2 variables	2	1–2

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Table 2.14 (continued): Target Point Distribution for the Algebra I Operational Forms

Algebraic Relationships Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range of Points per CLE on the Operational Test**
Use mathematical models to represent and understand quantitative relationships	Use mathematical models	Identify quantitative relationships and determine the type(s) of functions that might model the situation to solve the problem	2	3–4
Analyze change in various contexts	Analyze change	Analyze linear and quadratic functions by investigating rates of change, intercepts, and zeros	3	3–4
Data and Probability Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range of Points per CLE on the Operational Test**
Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them	Formulate questions	Formulate questions and collect data about a characteristic, which include sample spaces and distributions	3	1–2
	Represent and interpret data	Select and use appropriate graphical representation of data and, given one-variable quantitative data, display the distribution and describe its shape	3	2–3
Select and use appropriate statistical methods to analyze data	Describe and analyze data	Apply statistical measures of center to solve problems	2	2–3
	Represent data algebraically	Given a scatterplot, determine an equation for a line of best fit	2	1–2
Develop and evaluate inferences and predictions that are based on data	Develop and evaluate inferences	Make conjectures about possible relationships between 2 characteristics of a sample on the basis of scatterplots of the data	3	2–3

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Table 2.15: Actual Point Distributions for the Summer 2012 Algebra I Operational Forms

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
Number and Operation	8	8
Algebraic Relationships	19	19
Data and Probability	8	8
Total #Items/Points	**35**	**35**

Table 2.16: Actual Point Distributions for the Fall 2012 Algebra I Operational Forms

	Blueprint Target				Actual			
	# Items		# Points		# Items		# Points	
Reporting Categories	**SR**	**PE**	**SR**	**PE**	**SR**	**PE**	**SR**	**PE**
Number and Operation	8		8		8		8	
Algebraic Relationships	19	1	19	4	19	1	19	4
Data and Probability	8		8		8		8	
Total #Items/Points	35	1	35	4	35	1	35	4

Table 2.17: Actual Point Distributions for the Spring 2013 Algebra I Operational Forms

	Blueprint Target				Actual			
	# Items		# Points		# Items		# Points	
Reporting Categories	**SR**	**PE**	**SR**	**PE**	**SR**	**PE**	**SR**	**PE**
Number and Operation	8		8		8		8	
Algebraic Relationships	19	1	19	4	19	1	19	4
Data and Probability	8		8		8		8	
Total #Items/Points	35	1	35	4	35	1	35	4

2.4.3 Biology

The Biology Assessment measures student achievement in the following content and process strands:

- Characteristics and Interactions of Living Organisms
- Changes in Ecosystems and Interactions of Organisms with Their Environments
- Scientific Inquiry (beginning in Fall 2012 for the 2012–2013 school year when the PE was reintroduced)

The 35 SR items in Session I are aligned to the two strands listed above. Session II contains a PE aligned to the Scientific Inquiry strand, in which the student is required to respond to several CR items. The student may be asked to construct a data table, measure, and/or graph scientific results. Individual items within the PE may be worth 1, 2, 3, or 4 points and are scored on item-specific rubrics. The total point value of each operational PE is 20 points.

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Table 2.18 is used as a target for the CLE point distribution for the Biology operational forms. Some Big Ideas are not represented in this table because they are not assessed at this course level. Tables 2.19, 2.20, and 2.21 contain actual point distributions for the Summer 2012, Fall 2012, and Spring 2013 operational forms, respectively. Note that the Summer 2012 administration did not include PEs.

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Table 2.18: Target Point Distributions for the Biology I Operational Forms

Characteristics and Interactions of Living Organisms Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range of Points per CLE on the Operational Test**
There is a fundamental unity underlying the diversity of all living organisms	Organisms progress through life cycles unique to different types of organisms	Recognize cells both increase in number and differentiate, becoming specialized in structure and function, during and after embryonic development	1	1–2
	Cells are the fundamental units of structure and function of all living things	Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism	2	1–2
Living organisms carry out life processes in order to survive	The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means	Explain physical and chemical interactions that occur between organelles (e.g., nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes	2	1–2
	Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth	Explain the interrelationship between the processes of photosynthesis and cellular respiration (e.g., recycling of oxygen and carbon dioxide), comparing and contrasting photosynthesis and cellular respiration reactions (Do NOT assess intermediate reactions.)	2	1–2
		Determine what factors affect the processes of photosynthesis and cellular respiration (i.e., light intensity, availability of reactants, temperature)	2	1–2

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Table 2.18 (continued): Target Point Distributions for the Biology I Operational Forms

Characteristics and Interactions of Living Organisms Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range of Points per CLE on the Operational Test**
Living organisms carry out life processes in order to survive	Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)	Explain the significance of the selectively permeable membrane to the transport of molecules	2	1–2
		Predict the movement of molecules across a selectively permeable membrane (i.e., diffusion, osmosis, active transport) needed for a cell to maintain homeostasis given concentration gradients and different sizes of molecules	2	1–2
		Explain how water is important to cells (e.g., is a buffer for body temperature, provides a soluble environment for chemical reactions, serves as a reactant in chemical reactions, provides hydration that maintains cell turgidity, maintains protein shape)	2	1–2
There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes	All living organisms have genetic material (DNA) that carries hereditary information	Describe the chemical and structural properties of DNA (e.g., DNA is a large polymer formed from linked subunits of four kinds of nitrogen bases; genetic information is encoded in genes based on the sequence of subunits; each DNA molecule in a cell forms a single chromosome) (Assess the concepts; do NOT memorize the nitrogen base pairs.)	1	1–2
		Recognize the DNA codes for proteins, which are expressed as the heritable characteristics of an organism.	1	1–2
		Identify possible external causes (e.g., heat, radiation, certain chemicals) and effects of DNA mutations (e.g., altered proteins which may affect chemical reactions and structural development)	2	1–2

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Table 2.18 (continued): Target Point Distributions for the Biology I Operational Forms

Characteristics and Interactions of Living Organisms Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range of Points per CLE on the Operational Test**
There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes	Chromosomes are components of cells that occur in pairs and carry hereditary information from one cell to daughter cells and from parent to offspring during reproduction	Recognize the chromosomes of daughter cells, formed through the processes of asexual reproduction and mitosis, the formation of somatic (body) cells in multicellular organisms, are identical to the chromosomes of the parent cell	1	1–2
		Recognize that during meiosis, the formation of sex cells, chromosomes are reduced to half the number present in the parent cell	1	1–2
		Explain how fertilization restores the diploid number of chromosomes	2	1–2
	There is heritable variation within every species of organism	Describe the advantages and disadvantages of asexual and sexual reproduction with regard to variation within a population	2	1–2
	The pattern of inheritance for many traits can be predicted by using the principles of Mendelian genetics	Predict the probability of the occurrence of specific traits, including sex-linked traits, in an offspring by using a monohybrid cross	2	1–2

Changes in Ecosystems and Interactions of Organisms with their Environments Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range of Points per CLE on the Operational Test**
Organisms are interdependent with one another and with their environment	All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem	Explain the nature of interactions between organisms in predator/prey relationships and different symbiotic relationships (i.e., mutualism, commensalism, parasitism)	1	1–3
		Explain how cooperative (e.g., symbiotic) and competitive (e.g., predator/prey) relationships help maintain balance within an ecosystem	2	1–2

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Table 2.18 (continued): Target Point Distributions for the Biology I Operational Forms

Changes in Ecosystems and Interactions of Organisms with their Environments Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range of Points per CLE on the Operational Test**
Organisms are interdependent with one another and with their environment	Living organisms have the capacity to produce populations of infinite size, but environments and resources are finite	Identify and explain the limiting factors (biotic and abiotic) that may affect the carrying capacity of a population within an ecosystem	2	1–3
	The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes	Predict the impact (beneficial or harmful) a natural environmental event (e.g., forest fire, flood, volcanic eruption, avalanche) or human caused change (e.g., acid rain, global warming, pollution, deforestation, introduction of an exotic species) may have on the diversity of different species in an ecosystem	2	1–2
Matter and energy flow through the ecosystem	As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use	Predict how the use and flow of energy will be altered due to changes in a food web	2	1–2
Genetic variation sorted by the natural selection process explains evidence of biological evolution	Reproduction is essential to the continuation of every species	Explain the importance of reproduction to the survival of a species (i.e., the failure of a species to reproduce will lead to extinction of that species)	1	1–2
	Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem	Identify examples of adaptations that may have resulted from variations favored by natural selection (e.g., long-necked giraffes, long-eared jack rabbits) and describe how that variation may have provided populations an advantage for survival	2	1–2
		Explain how environmental factors (e.g., habitat loss, climate change, pollution, introduction of non-native species) can be agents of natural selection	2	1–2

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Table 2.19: Actual Point Distributions for the Summer 2012 Biology Operational Forms

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
Characteristics and Interactions of Living Organisms Total	22	22
Changes in Ecosystems and Interactions of Organisms with Their Environments Total	13	13
Scientific Inquiry		
Total #Items/Points	**35**	**35**

Table 2.20: Actual Point Distributions for the Fall 2012 Biology Operational Forms

Reporting Categories	Blueprint Target				Actual			
	# Items		# Points		# Items		# Points	
	SR	WP	SR	WP	SR	WP	SR	WP
Characteristics and Interactions of Living Organisms Total	22		22		22		22	
Changes in Ecosystems and Interactions of Organisms with Their Environments Total	13		13		13		13	
Scientific Inquiry		10		20		10		20
Total #Items/Points	**35**	**10**	**35**	**20**	**35**	**10**	**35**	**20**

Table 2.21: Actual Point Distributions for the Spring 2013 Biology Operational Forms

Reporting Categories	Blueprint Target				Actual			
	# Items		# Points		# Items		# Points	
	SR	WP	SR	WP	SR	WP	SR	WP
Characteristics and Interactions of Living Organisms Total	22		22		22		22	
Changes in Ecosystems and Interactions of Organisms with Their Environments Total	13		13		13		13	
Scientific Inquiry		10		20		10		20
Total #Items/Points	**35**	**10**	**35**	**20**	**35**	**10**	**35**	**20**

2.4.4 English I

The English I Assessment measures student 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

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texts, and webpages. The items associated with each passage are in SR format. The English I Assessment contains 40 SR items.

Table 2.22 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.

Tables 2.23 and 2.24 contain actual point distributions for the Summer 2012/Spring 2013 and Fall 2012 operational forms, respectively. (The same form was used during the Summer 2012 and Spring 2013 administrations, so, therefore, the actual point distribution is the same.)

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Table 2.22: Target Point Distributions for the English I Operational Forms

Big Idea	Concept	CLE	DOK Limit	Range/CLE
Develop and apply skills and strategies to the reading process	Vocabulary	Develop vocabulary through text, using a. roots and affixes b. context clues c. glossary, dictionary, and thesaurus	2	4–6
	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
	Making Connections	Compare, contrast, analyze, and evaluate connections a. text to text (information and relationships in various fiction and nonfiction works)	3	2–3
Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama from a variety of cultures and times	Text Features	Analyze and evaluate the text features in grade-level text	3	2–3
	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
	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

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Table 2.22 (continued): Target Point Distributions for the English I Operational Forms

Big Idea	Concept	CLE	DOK Limit	Range/CLE
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	Text Features	Explain, analyze and evaluate the author‘s use of text features to clarify meaning	3	2–3
	Literary Elements	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
	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

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Table 2.23: Actual Point Distributions for the Summer 2012/Spring 2013 English I Operational Form

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
Develop and apply skills and strategies to the reading process	13–17	14
Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama	10–14	11
Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction	11–15	15
Total #Items/Points	**40**	**40**

Table 2.24: Actual Point Distributions for the Fall 2012 English I Operational Form

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
Develop and apply skills and strategies to the reading process	13–17	12
Develop and apply skills and strategies to comprehend, analyze, and evaluate fiction, poetry, and drama	10–14	17
Develop and apply skills and strategies to comprehend, analyze, and evaluate nonfiction	11–15	11
Total #Items/Points	**40**	**40**

2.4.5 Algebra II

The Algebra II Assessment measures a student‘s 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 items are aligned to the strands listed above. Table 2.25 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 2.26 and 2.27 contain actual point distributions for the Summer 2012/Spring 2013 and Fall 2012 operational forms, respectively. (The same form was used during the Summer 2012 and Spring 2013 administrations, so, therefore, the actual point distribution is the same.)

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Table 2.25: Target Point Distributions for the Algebra II Operational Forms

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

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Table 2.25 (continued): Target Point Distributions for the Algebra II Operational Forms

Data and Probability Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range/CLE**
Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them	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
Select and use appropriate statistical methods to analyze data	Describe and analyze data	Apply statistical measures of center to solve problems	3	2–3
	Represent data algebraically	Given a scatterplot, determine the type of function which models the data	2	1–2
Understand and apply basic concepts of probability	Apply basic concepts of probability	Describe the concepts of sample space and probability distribution	2	1–2
	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

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Table 2.26: Actual Point Distributions for the Summer 2012/Spring 2013 Algebra II Operational Form

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
Numbers and Operations	7–9	8
Algebraic Relationships	20–24	22
Data and Probability	9–11	10
Total #Items/Points	**40**	**40**

Table 2.27: Actual Point Distributions for the Fall 2012 Algebra II Operational Form

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
Numbers and Operations	7–9	9
Algebraic Relationships	20–24	22
Data and Probability	9–11	9
Total #Items/Points	**40**	**40**

2.4.6 Geometry

The Geometry Assessment measures a student‘s 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 items are aligned to the strands listed above. Table 2.28 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 2.29 and 2.30 contain actual point distributions for the Summer 2012/Spring 2013 and Fall 2012 operational forms, respectively. (The same form was used during the Summer 2012 and Spring 2013 administrations, so, therefore, the actual point distribution is the same.)

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Table 2.28: Target Point Distributions for the Geometry Operational Forms

Algebraic Relationships Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range/CLE**
Understand patterns, relations, and functions	Create and analyze patterns	Generalize patterns using explicitly or recursively defined functions	2	1–2
	Classify objects and representations	Compare and contrast various forms of representations of patterns	3	1–2
	Identify and compare functions	Understand and compare the properties of linear and nonlinear functions	2	1–2
Represent and analyze mathematical situations and structures using algebraic symbols	Describe and use mathematical manipulation	Apply appropriate properties of exponents to simplify expressions and solve equations	2	1–2
Use mathematical models to represent and understand quantitative relationships	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
Analyze change in various contexts	Analyze change	Analyze linear and quadratic functions by investigating rates of change, intercepts, and zeros	3	2–3
Geometric and Spatial Relationships Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range/CLE**
Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships	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
Specify locations and describe spatial relationships using coordinate geometry and other representational systems	Use coordinate systems	Make conjectures and solve problems involving two-dimensional objects represented with Cartesian coordinates	3	6–7
Apply transformations and use symmetry to analyze mathematical situations	Use transformations on objects	Use and apply constructions and the coordinate plane to represent translations, reflections, rotations, and dilations of objects	2	3–4
	Use symmetry	Identify types of symmetries of two- and three-dimensional figures	2	3–4

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Table 2.28 (continued):Target Point Distributions for the Geometry Operational Forms

Geometric and Spatial Relationships Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range/CLE**
Use visualization, spatial reasoning, and geometric modeling to solve problems	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
	Draw and use visual models	Draw or use visual models to represent and solve problems	3	
Measurement Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range/CLE**
Apply appropriate techniques, tools, and formulas to determine measurements	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
	Apply geometric measurements	Determine the surface area and volume of geometric figures, including cones, spheres, and cylinders	2	3–4
	Use relationships within a measurement system	Use unit analysis to solve problems	2	

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Table 2.29: Actual Point Distributions for the Summer 2012/Spring 2013 Geometry Operational Form

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
Algebraic Relationships	7–9	8
Geometric and Spatial Relationships	22–26	24
Measurement	7–9	8
Total #Items/Points	**40**	**40**

Table 2.30: Actual Point Distributions for the Fall 2012 Geometry Operational Form

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
Algebraic Relationships	7–9	8
Geometric and Spatial Relationships	22–26	24
Measurement	7–9	8
Total #Items/Points	**40**	**40**

2.4.7 Government

The Government Assessment measures a student‘s ability 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 the following strands:

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

Table 2.31 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 2.32 and 2.33 contain actual point distributions for the Summer 2012/Spring2013 and Fall 2012 operational forms, respectively. (The same form was used during the Summer 2012 and Spring 2013 administrations, so, therefore, the actual point distribution is the same.)

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Table 2.31: Target Point Distributions for the Government Operational Forms

Principles of Consitutional Democracy Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range/CLE**
Knowledge of the principles expressed in documents shaping constitutional democracy in the United States	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
	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

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Table 2.31 (continued): Target Point Distributions for the Government Operational Forms

Principles and Processes of Governance Systems Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range/CLE**
Knowledge of principles and processes of governance systems	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
	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

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Table 2.32: Actual Point Distributions for the Summer 2012/Spring 2013 Government Operational Form

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
Principles of Constitutional Democracy	18–22	20
Principles and Processes of Governance Systems	18–22	20
Total #Items/Points	**40**	**40**

Table 2.33: Actual Point Distributions for the Fall 2012 Government Operational Form

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
Principles of Constitutional Democracy	18–22	20
Principles and Processes of Governance Systems	18–22	20
Total #Items/Points	**40**	**40**

2.4.8 American History

The American History Assessment measures a student‘s ability to understand U.S. history and participate in U.S. civic life as citizens and consumers. The American History forms consist of 40 SR items that are aligned to the Missouri, United States, and World History strand. Individual CLEs within that strand report out to the following categories:

- History
- Government
- Economics
- Geography

Table 2.34 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 2.35 and 2.36 contain actual point distributions for the Summer 2012/Spring 2013 and Fall 2012 operational forms, respectively. (The same form was used during the Summer 2012 and Spring 2013 administrations, so, therefore, the actual point distribution is the same.)

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Table 2.34: Target Distributions for the American History Operational Forms

Missouri, United States, and World History Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range/CLE**
Knowledge of continuity and change in the history of Missouri and the United States	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
	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
	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
	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
	Processes of governmental systems	Analyze the roles and influence of political parties and interest groups since Reconstruction to the present	3	4

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Table 2.34 (continued): Target Point Distributions for the American History Operational Forms

Missouri, United States, and World History Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range/CLE**
Knowledge of continuity and change in the history of Missouri and the United States	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
	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
	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
	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
	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
	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

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Table 2.34 (continued): Target Point Distributions for the American History Operational Forms

Missouri, United States, and World History Strand				
Big Idea	**Concept**	**CLE**	**DOK Limit**	**Range/CLE**
Knowledge of continuity and change in the history of Missouri and the United States	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
	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

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Table 2.35: Actual Point Distributions for the Summer 2012/Spring 2013 American History Operational Form

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
History	14–18	12
Government	7–9	12
Economics	7–9	8
Geography	7–9	8
Total #Items/Points	**40**	**40**

Table 2.36: Actual Point Distributions for the Fall 2012 American History Operational Form

Reporting Categories	Blueprint #Items/Points (SR)	Actual #Items/Points (SR)
History	14–18	12
Government	7–9	12
Economics	7–9	8
Geography	7–9	8
Total #Items/Points	**40**	**40**

2.5 Development of Test Items

Content-related evidence of validity supporting test interpretation is presented in terms of how the MO EOC Assessments were assembled. Detailed information regarding both item-development procedures and content coverage is included in this section.

The forms for the Fall 2008 through the Spring 2013 administrations were constructed using items field tested in Spring 2008, Spring 2009, or Spring 2010. During the process of building the forms for the 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 plans included the number of items necessary for each assessed CLE, as well as an outline of the review process for developed items and passages. This process included internal Riverside Publishing reviews, DESE item review, and a content and bias review by Missouri educators.

2.5.1 Item Writing

Missouri educators, DESE staff members, Regional Instructional Facilitators (curriculum and assessment specialists housed in each of Missouri's nine Regional Professional Development Centers), and Riverside Publishing TDSs created all the test items, including the PEs. English II

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passages and WPs and 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 September 2007 and June 2008, Riverside Publishing conducted item-writing workshops to develop SR items for English II, Algebra I, and Biology as well as PEs for Algebra I and Biology. 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) in Columbia, Mo. Participants in the workshops included Missouri educators, DESE staff, Regional Instructional Facilitators, and Riverside Publishing TDSs. The workshops were held over 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. The content developed at the workshops was based on the Missouri Show-Me Standards and CLEs.

The English II participants wrote SR items associated with the passages that had been developed prior to the item-writing workshops. The Algebra I and Biology participants wrote SR items and PEs along with rubrics. Biology PEs consist of a science investigation scenario and several associated CR items and were written based on an existing Science PE development template that specified the types of tasks and numbers of items that compose a PE.

In March 2008, Riverside Publishing conducted item-writing workshops to develop SR items for English I. English I participants wrote SR items associated with the passages that had been developed prior to the item-writing workshops.

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 on the basis of 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 art, graphs, 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 depth of knowledge (DOK) levels.

Riverside Publishing TDSs trained item writers to enter content into the company‘s electronic Content Management System (CMS). During training, each item writer wrote several items and received feedback on them. Participants also received feedback through the CMS as 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

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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, and correspondence with item specifications.

2.5.2 Universal Design

Riverside Publishing TDSs were 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) universally designed assessments have seven elements:

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 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 content areas. To ensure the

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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, art, tables, maps, and diagrams were constructed with maximum legibility.

2.5.3 Content and Bias Review Process

Standard 3.6[5] 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 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 November 2007 and July 2008 in Columbia, Mo. The content review committees included DESE staff, Missouri educators from around the state, Regional Instructional Facilitators, and Riverside Publishing staff.

The content and bias review committees reviewed SR items and PE/WPs using the following criteria:

- 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 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:

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[5] **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).

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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? (Mathematics and Science only)
- ☐ Is the item free from absolutes (~~–n~~one of the above," ~~–a~~ll of the above") as options and free from the use of negatives (~~–n~~ot," "none," ~~–e~~xcept") 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)?

For PE/WPs:

- ☐ Does the item assess the assigned CLE?
- ☐ Does the item clearly specify how the student should respond?
- ☐ Does the item allow for a variety of acceptable responses for the student to get full credit?
- ☐ 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 rich enough to elicit an appropriate range of responses covering all possible score points?
- ☐ Is the item fair to all students and free of bias and sensitivity issues?
- ☐ Does the rubric clearly define an acceptable answer or answers at each score point level?

Missouri educators participated in the review process for each content area. The committee members read and reviewed each item. Discussions were held about whether 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. Between approximately 95% and 98% of the items were accepted (as–is or with edits) by the content and bias committees. Tables 2.37 and 2.38 show the number of items reviewed in 2007 and 2008, respectively. The accepted items in Table 2.37 were placed in a pool of items from which the 2008 standalone field-test forms were built. The accepted items in Table 2.38 were placed on EFT forms in the 2009 operational administrations.

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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 2.37: 2007 Content/Bias Item Review Acceptance Rates

Test Period	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)
English II	404	398	99%
Algebra I	239	233	97%
Biology	402	365	91%

Table 2.38: 2008 Content/Bias Item Review Acceptance Rates

Test Period	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)
English II	298	298	100%
Algebra I	288	288	100%
Biology	164	161	98%
English I	669	669	100%
Algebra II	490	488	99.5%
Geometry	488	471	97%
Government	492	474	96%
Am. History	494	470	95%

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 administered in Spring 2008 and 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 2008 field test consisted of 10 SR forms per course, 10 English II WPs, 10 Algebra I PE forms, and 10 Biology PE forms. All field-test forms were reviewed and approved by DESE.

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

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items on each form. All field-test forms were reviewed and approved by DESE. Both standalone field tests were census tests of all students enrolled in courses corresponding to the MO EOC Assessments. The forms for each course were spiraled at the student level across the state.

2.6.2 Statistical Item Review

After completion of the 2008 field-test item scoring and again 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 and for DIF analysis for the PE/WPs.

During the data review, Riverside Publishing Research and Test Development staff and DESE staff reviewed student performance on the Spring 2008 field-test items for English II, Algebra I, and Biology and on the Spring 2009 field-test items for English I, Algebra II, Geometry, Government, and American History. 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 (for SR items only)
- Mean and SD of item score (for PE/WPs only)
- Point-biserial correlation of correct response and point-biserial for each distractor
- (for SR items only)
- Total number of students who attempted to answer each question
- DIF using the Mantel-Haenszel (MH) (1959) procedure and the Educational Testing Service (ETS) classification (for SR items only)

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 2.39 contains the guidelines that were used for data review.

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Table 2.39: 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 decided 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 the review team felt were biased or inappropriate for the MO EOC Assessments were rejected. Rejected items were removed from the item pool, making them invalid for the MO EOC Assessments. Of the 690 total items reviewed for English II, Algebra I, and Biology, 91% were accepted. Of the 2,233 total items reviewed for English I, Algebra II, Geometry, Government, and American History, 93% were accepted.

2.6.3 Operational Test Selection and Administration

Riverside Publishing TDSs selected operational items for test forms for use in each administration cycle. Using IRT item difficulty values, six equivalent operational forms and one released form were selected for each content area. The operational forms are administered in the summer, fall, and spring of each administration cycle according to a prescribed form rotation schedule.

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

1. Determine form design. Each form includes item positions for operational items, field-test items, and/or linking items. Embedded field testing was discontinued in 2010–2011 due to budget constraints, and from 2010–2011 forward, field-test positions were occupied by field-test items that had been previously administered and scored.

2. Select items that meet content specifications. Each form was constructed based on the test specifications for that content area. The test specifications delineate the item distribution across assessment strands. They also outline 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) are used to ensure that the test forms meet statistical specifications. These matrices contain the following statistics: average p-values, point-

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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.[6]

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. To accommodate these students, two operational Paper/Pencil versions of each assessment were converted into Braille and Large Print as follows:

- English II, Algebra I, and Biology: Fall 2008 and Spring 2009
- English I, Algebra II, Geometry, Government, and American History: Fall 2009 and Summer 2011

Once the Braille and Large Print forms were created for each assessment, reviews were held with educators from Missouri who had specialized training in working with visually impaired students.

A Large Print form review for English II, Algebra I, and Biology was held in Jefferson City, Mo., at the DESE offices on Sept. 29, 2008. A Braille review was held in St. Louis, Mo., at the Missouri School for the Blind on Oct. 10, 2008. Braille and Large Print reviews for English I, Algebra II, Geometry, Government, and American History were held on Sept. 17 and 18, 2009, and on March 26, 2013.

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. 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 Large Print students. For the Braille version of the form, one item from English II, one item from English I, and three items from Geometry were removed because the content of the item prohibited transcription to Braille. Students taking the Braille form were given credit for these items. The EFT items were eliminated from both versions of these forms due to the irregular testing conditions and the small sample sizes for these groups. For English II, Algebra I, and Biology, the two Braille and Large Print test versions were alternated in each administration cycle through the Spring 2013 administration. For English I, Algebra II, Geometry, Government, and American History, the first Braille and Large Print test versions to be selected were used for each operational

[6] Rasch values were not available for all items when the 2008–2009 operational forms were built.

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administration since 2009–2010, and the second form is scheduled to be administered from Summer 2013 forward.

2.8 Online Forms Construction

All items were field tested in Paper/Pencil format, and all test forms were originally developed for administration in either Paper/Pencil or online format. All items were written so that they could be presented in an online delivery system without any alterations. In 2008–2009 and 2009–2010, school districts could select either a Paper/Pencil administration or online administration for all EOC Assessments. In 2010–2011, Missouri began moving toward a full implementation of online administration of all MO EOC Assessments. English I, Algebra II, Geometry, Government, and American History were available only for online administration, whereas English II, Algebra I, and Biology continued to be available in both online and Paper/Pencil. To assist in a smooth transition to online administration of all MO EOC Assessments without interruption of data trends, Riverside Publishing completed an online comparability study of the MO EOC Assessments (see Appendix A for the full report). Based on the results of the study, the MO Technical Advisory Committee (TAC) reached a consensus that the move from paper/pencil to online administration would not impact student performance.

Beginning in 2011–2012, Questar was tasked with moving all MO EOC Assessments to an online delivery platform (with the exception of the Paper/Pencil, Braille, and Large Print test forms for students needing such accommodations). More information on the current online test administration can be found in Chapter 5.

2.9 Quality Control for Test Construction

Checklists and quality control procedures accompanied 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 .35 and .90 and as many items as possible have point-biserial correlations above .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.

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- 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 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 the 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 and CLEs being assessed while simultaneously considering the overall difficulty of the forms.

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Chapter 3: Achievement-Level Setting

3.1 Introduction

Achievement-level setting (or standard setting) workshops for the MO EOC Assessments were conducted in 2008 and 2009. The 2008 standard setting applied to English II, Algebra I, and Biology, and the 2009 standard setting applied to English I, Algebra II, Geometry, Government, and American History. This chapter provides an overview of the standard setting process. For more detailed information, see Chapter 3 of the *2009–2010 MO EOC Phase I and Phase II Technical Reports* at http://dese.mo.gov/divimprove/assess/tech/index.html.

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, parents, and students to make statements about the level of proficiency of individual students and groups of students. Important information from the 2008 and 2009 standard setting events is provided since the cut scores established at those standard settings were applied to the 2012–2013 test scores.

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

The determination of three cut scores yields four achievement levels for each assessment.

3.3 Staff and Panelists

Staff from Questar, then a subcontractor to Riverside Publishing, planned and facilitated the standard setting workshops with consultation with Riverside Publishing‘s MO EOC Assessment team in 2008 and 2009. In addition to the staff from Questar, two Riverside Publishing psychometricians attended the 2008 standard setting and three Riverside Publishing psychometricians attended the 2009 standard setting. 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 DESE staff and the panelists with logistical issues. Content area specialists from Riverside Publishing‘s Content Development group were present in the panel rooms to serve as resources for content-related questions. Finally, DESE curriculum staff attended the standard setting workshops to serve as content resources to the appropriate panels.

3.4 2008 Standard Setting

Forty-six panelists participated in the 2008 standard setting workshop: 14 in English II, 15 in Algebra I, and 17 in Biology. One to three members of each panel had participated in an earlier standard setting workshop for other Missouri assessments. Most panelists had not been members

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of any of the committees for MO EOC development activities. More than half of each panel was comprised of active classroom teachers in the relevant content area; several other panel members were other professional educators such as administrators and curriculum coordinators. One or two members of each panel were business professionals with expertise in the relevant field.

3.5 2009 Standard Setting

Seventy-three panelists participated in the 2009 standard setting workshop. Three members of the English I panel and two members of the Geometry panel had participated in an earlier standard setting workshop for other Missouri assessments. A small portion (approximately 10%) 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 the MO EOC Assessments and aligned curriculum to the CLEs. More than half of each panel was comprised of active classroom teachers in the relevant content area. Several other panelists were nonteacher professional educators, such as administrators and curriculum coordinators.

3.6 Development of Achievement-Level Descriptors (ALDs)

The MO EOC Assessments utilize the same achievement level labels used for previous high school MAP assessments: 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 is able to demonstrate. As suggested by Missouri‘s Technical Advisory Committee (TAC), DESE conducted sessions devoted to developing draft ALDs prior to the standard setting workshop.

At the standard setting workshop, panelists devoted a significant portion of time 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, 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. The panelists were also allowed to make appropriate, though generally minor, revisions and refinements to the ALDs during and after standard setting.

3.7 Overview of the Standard Setting Activities

3.7.1 Methodology and Data Considerations

The specific methodology used for the standard setting event 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 MO EOC Assessments.

Consistent with the methods used for prior MAP standard setting events, the modified Angoff method allowed three distinct rounds of panelist judgments. Between the first and second rounds, Riverside Publishing provided the panelists with item-difficulty data for their consideration.

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Because operational data were not available in November for English II, Algebra I, and Biology, the item data for the 2008 standard setting were derived from the 2008 field test. Panelists were appropriately cautioned about the limitations of such data. Similarly, because operational data were not available in November for English I, Algebra II, Geometry, Government, and American History, the item data for the 2009 standard setting were derived from the Spring 2009 field test. 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 field tests.

Despite the limitations of the field-test data, panelists were provided with tentative data, 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. Missouri TAC discussions confirmed the appropriateness of the use of these projected statewide impact data.

In addition to the caveats about item level and impact data, panel facilitators clearly communicated to the panelists that the results of their standard setting activities would be purely advisory to DESE, which would then consider the recommendations and present them to the Missouri State Board of Education for approval.

3.7.2 Description of the Test Forms and Considerations

3.7.2.1 2008 Standard Setting

DESE used the MO EOC Spring 2009 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 2008–2009 test administration year.

The English II, Algebra I, and Biology Assessments were comprised of SR items and a PE/WP. Each English II and Algebra I form included a single PE/WP worth 4 points. On the Biology Assessment, the PE consisted of 11 CR items, each worth between 0 and 4 points (for a total of 20 points).

3.7.2.2 2009 Standard Setting

The English I, Algebra II, Geometry, Government, and American History Assessments were composed of only SR items. DESE used 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.

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3.8 Specific Standard Setting Activities

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

3.8.1 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, DESE briefly outlined the session purpose and intended outcomes. Next, Questar led a brief general overview titled ―What Is Standard Setting?" to ensure a common understanding of the fundamental elements of the process. Questar 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. Questar also advised the panelists that their work was advisory to DESE. This introduction was a high-level overview of the standard setting process, whereas individual facilitators provided more detail about each step in the process after the panels broke into content-specific groups.

Finally, Questar provided a general overview of the ALDs and their importance to the standard setting process. Because 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 the ALDs in the standard setting process. Following this activity, panelists divided into content-specific panel break-out rooms where all remaining work for the sessions took place.

3.8.2 Panelists Take the Operational Assessments

After reconvening in the content-area panels, panelists introduced themselves and signed DESE-provided confidentiality forms. Facilitators also introduced themselves and reiterated the high-level standard setting processes that Questar had discussed during the opening session. Facilitators then allowed the panelists time to take and score the appropriate 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 included in these forms were removed from the test books seen by the panelists. 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 prior to beginning the standard setting judgments. Following this review of the tests, each panel reacted 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.

3.8.3 Panelists Discuss and Fine-Tune the ALDs

At the standard setting workshop, panelists 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

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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. In addition, the panelists were allowed to make appropriate, though generally minor, revisions and refinements to the ALDs during and after standard setting.

All 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 student outcomes indicating performance at the Advanced, Proficient, Basic, and Below Basic levels in the content area. Panel suggestions were discussed until consensus was reached and were then recorded on the draft ALDs, a copy of which was given to each panelist or placed on chart paper displayed around the room. Panelists could later 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.

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. See the *2009–2010 MO EOC Phase I and Phase II Technical Reports* for copies of both the draft and final ALDs for the 2008 and 2009 standard setting workshops, respectively.

3.8.4 Orientation to the Modified Angoff Procedures

After completion of the ALD activity, facilitators oriented the panels to the specific tasks involved with the modified Angoff standard setting process. The modified Angoff process required 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.

For the CR item(s), panelists were to consider the average item score of minimally Proficient, minimally Advanced, and minimally Basic students. In other words, judgments for the CR items were made as whole-point values (i.e., 1, 2, 3, etc.) rather than as percentages of students answering correctly.

The facilitators included the following important points in their presentations:

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- 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 MO EOC students statewide, not just 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 second day of the standard setting workshop began with an overview of the previous day‘s activities and outcomes, after which panelists took a five-item SR qualifying test concerning the standard setting procedures they were about to use. 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.

3.8.5 Round 1 Judgments

Round 1 judgments were 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. For the SR items, each field contained a set of bubbles corresponding to the percentage of students expected to choose the correct answer. 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 were constrained to choosing multiples of 5 (i.e., 5%, 10%, 15%, etc.) as they appeared on the Rating Forms. Panelists then followed this same procedure for all the remaining SR items. For the PE/WPs, each field contained bubbles corresponding to the various point values possible for the item. Panelists made a judgment about how many points a borderline student at each achievement level would score on that item (i.e., how many points a Basic student would score, how many points a Proficient student would score, and how many points an Advanced student would score).

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.

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3.8.6 Feedback and Discussion of Round 1 Judgments

In-between Round 1 and Round 2, the Riverside Publishing psychometricians prepared reports of the Round 1 judgment results. The next 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.

Facilitators reviewed these reports with the panelists 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 that focused primarily on the panelists‘ judgments of individual items. 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 to two hours 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. For the SR items, the derived item difficulties were item p-values. For the PE/WPs, the item difficulties were average item scores. Facilitators advised the panelists that caution should be taken in interpreting the item difficulty data since the data were collected during a standalone field test (and 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.

3.8.7 Round 2 Judgments

During Round 2, panelists again made judgments independently about the percentage of students at the threshold of each achievement level that would answer each item correctly. Panelists could maintain their Round 1 judgments or revise them as they deemed appropriate. Before beginning Round 2, 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. They were also increasingly familiar with the specific items for which they were making the judgments, and many panelists had begun to formulate some or all of their Round 2 item judgments during the discussion of the Round 1 results.

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

3.8.8 Feedback and Discussion of Round 2 Judgments

When the panels reconvened, 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 (i.e., the percentage of students statewide whose performance would likely 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.

3.8.9 Round 3 of Judgments, Meeting Evaluation, and Final Inspection of the 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 that 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. See the *2009–2010 MO EOC Phase I and Phase II Technical Reports* for a copy of this evaluation form.

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

3.9 Session Results by Panel and Round

See the *2009–2010 MO EOC Phase I and Phase II Technical Reports* for the feedback reports by round. Selected data from these graphs and tables are summarized below for ease of cross-round and cross-content-area comparison.

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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 the MO EOC standard setting, all median and mean cut scores are within a single rounded raw-score point for all content areas. Therefore, the choice of a measure of central tendency for these particular panels would not markedly impact the resulting cut scores.

Table 3.1 contains the median recommended cut scores for all rounds for English II, Algebra I, and Biology, and Table 3.2 contains the median recommended cut scores for all rounds for English I, Algebra II, Geometry, Government, and American History.

Table 3.1 indicates that the panels did not markedly change their typical 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 nine sets of judgments between rounds during the 2008 standard setting (three content areas with three cut scores each), the mean change in median raw cut scores was −0.5 between Rounds 1 and 2, −1.0 between Rounds 2 and 3, and −1.5 between Rounds 1 and 3. (The median raw-score change between any pair of rounds was 0.) Though the mean changes were minimal from round to round, individual panelists changed their round-to-round recommendations by as much as 17 raw-score points. Across all panels, the mean absolute value of raw cut score changes made was 1.5 between Rounds 1 and 2, 1.9 between Rounds 2 and 3, and 2.6 between Rounds 1 and 3.

Similarly, Table 3.2 indicates that the panels did not markedly change their typical recommended cut scores across the three rounds of judgments. However, 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.)

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Table 3.1: Median Recommended Cut Scores by Content Area and Round

Cut*	Content Area								
	English II			Algebra I			Biology		
	B	P	A	B	P	A	B	P	A
Round 1	16.5	24.5	32	13	23	32	20	35	48
Round 2	16.5	25.5	33	13	23	31	19	34	46
Round 3 / Final	15.5	24	33	13	22	31	18	32	45
# Points Possible	**39**			**39**			**55**		

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

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

Cut*	Content Area														
	English I			Algebra II			Geometry			Government			Am. History		
	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
# 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. 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. That variability is especially notable in the Biology Assessment; however, this assessment is significantly longer than the others, which may partially account for the larger Round 3 variability.

Standard errors of the median judgments (SEJs) were computed for all cut scores across all panels. In no case did the Round 3 standard error reach a whole raw-score unit. Most were lower than half of a raw-score point. This indicates that the final median judgments were stable.

Table 3.3 summarizes the projected statewide percentages of students whose EOC scores would fall in each of the four achievement levels for English II, Algebra I, and Biology. Similarly, Table 3.4 summarizes the projected statewide percentages of students whose EOC scores would fall in each of the four achievement levels for English I, Algebra II, Geometry, Government, and American History.

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Table 3.3: Projected Statewide Percentages of Students Scoring in the Various Achievement Levels on the MO EOC Assessments, 2008

Assessment	Achievement Level*			
	Below Basic	Basic	Proficient	Advanced
English II	15%	31%	39%	16%
Algebra I	18%	38%	33%	11%
Biology	12%	39%	39%	10%

*Percentages may not sum to 100% due to rounding.

Table 3.4: Projected Statewide Percentages of Students Scoring in the Various Achievement Levels on the MO EOC Assessments, 2009

Content Area	Achievement Level			
	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%

3.10 Results of Panelist Evaluations

See the *2009–2010 MO EOC Phase I and Phase II Technical Reports* for the data collected from panelists on the evaluation form. Overall, these data indicate that the panelists understood what was expected of them and were comfortable with the process and the resulting cut scores.

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Chapter 4: Item Analysis

4.1 Introduction

Item analyses were conducted for the MO EOC Assessments in English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, and American History for 2012–2013. This chapter presents the summary information, which includes mean item score and discrimination indices, at the item level for each content area.

The item summary statistics presented in this section (i.e., p-values, point-biserial correlations, and omit rates) are based on the operational administrations that included responses from 3,432 students for Summer 2012, 29,845 students for Fall 2012, and 399,269 students for Spring 2013 across the eight content areas. Differential item functioning (DIF) analyses were conducted for each content area for the Summer 2012, Fall 2012, and Spring 2013 administrations.

For SR items, item difficulty is the proportion of students who gave correct responses to the item (also referred to as p-value), and the discrimination index is the point-biserial correlation between the item score and the total score based on the remaining items (also referred to as corrected point-biserial correlation).

The total score for English II, Algebra I, and Biology included both SR items and PE/WPs. For the PE/WPs, the mean score is the average of the scores students who responded to these items achieved on a scale of 0 to 4 for English II and Algebra I and on a scale of 0 to 20 for Biology. The discrimination index is the correlation between the item score and the total score based on the remaining items (also referred to as corrected point-biserial correlation).

Table 4.1 lists the number of examinees by content area for each administration that were used in the analyses.

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Table 4.1: N-Count per Content Area for Each Administration

Test Period	Content Area	N-Count
Summer 2012	English II	428
	Algebra I	888
	Biology	321
	English I	307
	Algebra II	144
	Geometry	241
	Government	839
	Am. History	264
	Total	**3,432**
Fall 2012	English II	2,940
	Algebra I	3,896
	Biology	2,837
	English I	846
	Algebra II	445
	Geometry	753
	Government	16,805
	Am. History	1,323
	Total	**29,845**
Spring 2013	English II	61,237
	Algebra I	64,544
	Biology	62,355
	English I	62,683
	Algebra II	23,426
	Geometry	30,482
	Government	42,218
	Am. History	52,324
	Total	**399,269**

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

Tables 4.2 through 4.25 summarize item difficulty, discrimination, and omit rates for the items that composed each assessment for the Summer 2012, Fall 2012, and Spring 2013 operational administrations. For SR items, the p-value is the proportion of students who answered the item correctly. For the PE/WPs, the mean value is the average student score on that item. PEs and WPs were suspended from the EOC Assessments beginning with the Summer 2010 administration due to budget constraints but were reintroduced in Fall 2012. Therefore, the Summer 2012 tables do not include the PE/WPs. 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.

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When building a test form for the MO EOC Assessment, care is taken to refrain from choosing items with p-values less than 0.30 or greater than 0.95, or with negative point biserials. When p-values and point biserials are out of range, the answer keys are checked to verify that they are correct.

Table 4.2: Item Statistics for English II, Summer 2012

N-Count: 428

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.90	0.37	0
2	0.67	0.46	0
3	0.39	0.20	0
4	0.66	0.33	0
5	0.68	0.36	0
6	0.83	0.47	0
7	0.86	0.45	0
8	0.52	0.29	0
9	0.44	0.26	0
10	0.35	0.29	0
11	0.47	0.28	0
12	0.25	0.23	0
24	0.45	0.42	0
25	0.56	0.54	0
26	0.59	0.25	0
27	0.40	0.23	0
28	0.65	0.56	0
29	0.62	0.50	0
30	0.62	0.50	0
31	0.55	0.38	0
32	0.54	0.37	0
33	0.54	0.57	0
34	0.58	0.47	0
35	0.55	0.37	0
36	0.58	0.55	0
37	0.30	0.40	0
38	0.58	0.38	0
39	0.54	0.40	0
40	0.52	0.44	0
41	0.53	0.38	0
43	0.62	0.45	0
44	0.59	0.28	0
45	0.32	0.20	0
46	0.73	0.41	0
47	0.46	0.20	0

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Table 4.3: Item Statistics for Algebra I, Summer 2012

N-Count: 888

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.59	0.40	0
2	0.71	0.46	0
3	0.58	0.24	0
4	0.80	0.33	0
5	0.70	0.41	0
10	0.84	0.43	0
11	0.66	0.50	0
12	0.74	0.47	0
13	0.30	0.38	0
14	0.65	0.50	0
15	0.67	0.42	0
16	0.42	0.23	0
17	0.52	0.42	0
18	0.43	0.31	0
19	0.59	0.47	0
20	0.45	0.26	0
21	0.50	0.30	0
26	0.53	0.36	0
27	0.36	0.36	0
28	0.55	0.45	0
29	0.61	0.36	0
30	0.45	0.46	0
31	0.45	0.24	0
32	0.63	0.49	0
33	0.46	0.34	0
34	0.53	0.58	0
35	0.45	0.47	0
36	0.47	0.42	0
37	0.23	0.03	0
38	0.21	0.21	0
43	0.23	0.20	0
44	0.21	0.07	0
45	0.43	0.24	0
46	0.37	0.33	0
47	0.25	0.39	0

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Table 4.4: Item Statistics for Biology, Summer 2012

N-Count: 321

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.82	0.43	0
2	0.84	0.38	0
3	0.74	0.36	0
4	0.61	0.29	0
5	0.69	0.46	0
10	0.70	0.42	0
11	0.60	0.49	0
12	0.57	0.54	0
13	0.65	0.20	0
14	0.44	0.48	0
15	0.46	0.37	0
16	0.63	0.51	0
17	0.48	0.18	0
18	0.34	0.49	0
19	0.53	0.43	0
20	0.60	0.47	0
21	0.44	0.23	0
26	0.46	0.49	0
27	0.51	0.37	0
28	0.51	0.49	0
29	0.42	0.43	0
30	0.56	0.43	0
31	0.42	0.29	0
32	0.34	0.25	0
33	0.36	0.28	0
34	0.43	0.25	0
35	0.40	0.09	0
36	0.45	0.35	0
37	0.43	0.30	0
38	0.36	0.20	0
43	0.40	0.34	0
44	0.45	0.39	0
45	0.25	0.20	0
46	0.32	0.20	0
47	0.34	0.11	0

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Table 4.5: Item Statistics for English I, Summer 2012

N-Count: 307

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.73	0.45	0
2	0.57	0.43	0
3	0.49	0.28	0
4	0.74	0.42	0
5	0.74	0.33	0
6	0.56	0.25	0
7	0.53	0.17	0
8	0.84	0.40	0
9	0.62	0.35	0
10	0.78	0.39	0
11	0.48	0.46	0
12	0.42	0.28	0
13	0.52	0.34	0
14	0.65	0.43	0
15	0.53	0.24	0
16	0.34	0.35	0
29	0.27	0.42	0
30	0.31	0.22	0
31	0.59	0.43	0
32	0.46	0.50	0
33	0.49	0.37	0
34	0.45	0.31	0
35	0.50	0.38	0
36	0.57	0.20	0
37	0.51	0.48	0
38	0.65	0.42	0
39	0.42	0.41	0
40	0.47	0.43	0
41	0.47	0.53	0
42	0.62	0.27	0
43	0.67	0.46	0
44	0.38	0.37	0
45	0.40	0.37	0
46	0.50	0.39	0
47	0.47	0.51	0
48	0.48	0.32	0
49	0.58	0.31	0
50	0.31	0.43	0
51	0.56	0.52	0
52	0.55	0.23	0

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Table 4.6: Item Statistics for Algebra II, Summer 2012

N-Count:144

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.40	0.28	0
2	0.73	0.29	0
3	0.43	0.28	0
4	0.47	0.26	0
5	0.72	0.35	0
6	0.43	0.42	0
7	0.49	0.31	0
8	0.40	0.28	0
9	0.48	0.29	0
10	0.42	0.34	0
16	0.77	0.27	0
17	0.31	0.42	0
18	0.58	0.27	0
19	0.52	0.37	0
20	0.31	0.32	0
21	0.43	0.29	0
22	0.44	0.29	0
23	0.31	0.31	0
24	0.21	0.23	0
25	0.33	0.40	0
26	0.22	0.41	0
27	0.63	0.40	0
28	0.39	0.34	0
29	0.31	0.31	0
30	0.42	0.28	0
31	0.17	0.16	0
32	0.40	0.47	0
33	0.33	0.43	0
34	0.50	0.31	0
35	0.38	0.39	0
41	0.44	0.43	0
42	0.46	0.12	0
43	0.40	0.29	0
44	0.30	0.36	0
45	0.40	0.28	0
46	0.42	0.16	0
47	0.37	0.37	0
48	0.35	0.23	0
49	0.20	0.34	0
50	0.32	0.29	0

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Table 4.7: Item Statistics for Geometry, Summer 2012

N-Count: 241

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.60	0.40	0
2	0.48	0.58	0
3	0.57	0.53	0
4	0.47	0.54	0
5	0.47	0.56	0
6	0.77	0.35	0
7	0.66	0.41	0
8	0.54	0.47	0
9	0.64	0.44	0
10	0.36	0.31	0
16	0.25	0.43	0
17	0.59	0.41	0
18	0.43	0.52	0
19	0.51	0.45	0
20	0.55	0.49	0
21	0.52	0.30	0
22	0.79	0.30	0
23	0.61	0.45	0
24	0.65	0.26	0
25	0.64	0.39	0
26	0.38	0.35	0
27	0.57	0.38	0
28	0.29	0.41	0
29	0.44	0.41	0
30	0.35	0.06	0
31	0.50	0.28	0
32	0.31	0.46	0
33	0.17	0.25	0
34	0.45	0.37	0
35	0.25	0.37	0
41	0.37	0.09	0
42	0.38	0.36	0
43	0.48	0.33	0
44	0.28	0.28	0
45	0.36	0.48	0
46	0.44	0.17	0
47	0.37	0.28	0
48	0.11	0.11	0
49	0.38	0.22	0
50	0.37	0.35	0

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Table 4.8: Item Statistics for Government, Summer 2012

N-Count: 839

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.60	0.30	0
2	0.66	0.49	0
3	0.68	0.42	0
4	0.45	0.20	0
5	0.48	0.39	0
6	0.74	0.47	0
7	0.71	0.52	0
8	0.56	0.44	0
9	0.41	0.62	0
10	0.63	0.49	0
16	0.55	0.50	0
17	0.74	0.50	0
18	0.59	0.47	0
19	0.38	0.59	0
20	0.79	0.42	0
21	0.76	0.39	0
22	0.53	0.51	0
23	0.78	0.36	0
24	0.67	0.47	0
25	0.74	0.45	0
26	0.43	0.39	0
27	0.65	0.49	0
28	0.64	0.41	0
29	0.43	0.31	0
30	0.62	0.42	0
31	0.55	0.50	0
32	0.53	0.39	0
33	0.57	0.29	0
34	0.49	0.36	0
35	0.58	0.49	0
41	0.53	0.40	0
42	0.71	0.40	0
43	0.66	0.35	0
44	0.56	0.54	0
45	0.44	0.40	0
46	0.46	0.30	0
47	0.53	0.45	0
48	0.67	0.64	0
49	0.72	0.43	0
50	0.68	0.50	0

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Table 4.9: Item Statistics for American History, Summer 2012

N-Count: 264

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.48	0.37	0
2	0.53	0.40	0
3	0.45	0.33	0
4	0.60	0.48	0
5	0.30	0.24	0
6	0.64	0.40	0
7	0.59	0.49	0
8	0.50	0.45	0
9	0.47	0.39	0
10	0.37	0.33	0
16	0.50	0.46	0
17	0.47	0.42	0
18	0.62	0.29	0
19	0.42	0.35	0
20	0.49	0.25	0
21	0.80	0.23	0
22	0.48	0.49	0
23	0.50	0.25	0
24	0.39	0.02	0
25	0.47	0.38	0
26	0.49	0.22	0
27	0.50	0.39	0
28	0.42	0.31	0
29	0.27	0.28	0
30	0.40	0.21	0
31	0.68	0.57	0
32	0.57	0.29	0
33	0.23	0.21	0
34	0.44	0.44	0
35	0.52	0.50	0
41	0.58	0.45	0
42	0.65	0.42	0
43	0.31	0.16	0
44	0.40	0.49	0
45	0.52	0.46	0
46	0.61	0.43	0
47	0.49	0.45	0
48	0.59	0.53	0
49	0.44	0.46	0
50	0.61	0.44	0

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Table 4.10: Item Statistics for English II, Fall 2012

N-Count: 2,940

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.83	0.28	0
2	0.74	0.42	0
3	0.63	0.54	0
4	0.88	0.46	0
5	0.31	0.17	0
6	0.33	0.41	0
7	0.84	0.35	0
8	0.66	0.41	0
9	0.79	0.51	0
10	0.62	0.50	0
11	0.41	0.38	0
12	0.42	0.33	0
25	0.89	0.48	0
26	0.69	0.65	0
27	0.43	0.20	0
28	0.56	0.49	0
29	0.57	0.41	0
30	0.76	0.54	0
31	0.35	0.29	0
32	0.48	0.31	0
33	0.75	0.56	0
34	0.48	0.37	0
35	0.76	0.52	0
36	0.63	0.55	0
37	0.72	0.61	0
38	0.59	0.35	0
39	0.58	0.52	0
40	0.61	0.57	0
41	0.75	0.57	0
42	0.71	0.59	0
43	0.40	0.35	0
44	0.31	0.21	0
45	0.62	0.43	0
46	0.29	0.19	0
47	0.62	0.41	0
PE*	1.84	0.68	0

* The English II PE is worth a total of 4 raw score points.

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Table 4.11: Item Statistics for Algebra I, Fall 2012

N-Count: 3,896

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.80	0.44	0
2	0.61	0.51	0
3	0.79	0.48	0
4	0.66	0.59	0
5	0.61	0.54	0
6	0.65	0.53	0
7	0.70	0.48	0
8	0.74	0.59	0
9	0.78	0.53	0
10	0.69	0.53	0
11	0.72	0.46	0
12	0.74	0.52	0
25	0.56	0.51	0
26	0.71	0.54	0
27	0.69	0.60	0
28	0.57	0.56	0
29	0.52	0.52	0
30	0.59	0.48	0
31	0.57	0.48	0
32	0.57	0.45	0
33	0.55	0.44	0
34	0.51	0.55	0
35	0.44	0.23	0
36	0.42	0.56	0
37	0.65	0.56	0
38	0.43	0.32	0
39	0.45	0.45	0
40	0.44	0.50	0
41	0.27	0.24	0
42	0.49	0.46	0
43	0.36	0.30	0
44	0.44	0.33	0
45	0.39	0.53	0
46	0.27	0.38	0
47	0.50	0.43	0
PE*	1.32	0.81	0

* The Algebra I PE is worth a total of 4 raw score points.

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Table 4.12: Item Statistics for Biology, Fall 2012

N-Count: 2,837

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.83	0.41	0
2	0.50	0.35	0
3	0.84	0.47	0
4	0.37	0.16	0
5	0.48	0.51	0
10	0.88	0.44	0
11	0.70	0.47	0
12	0.55	0.44	0
13	0.57	0.47	0
14	0.47	0.61	0
15	0.62	0.37	0
16	0.65	0.44	0
17	0.58	0.49	0
18	0.42	0.34	0
19	0.54	0.48	0
20	0.74	0.39	0
21	0.56	0.53	0
26	0.47	0.33	0
27	0.63	0.53	0
28	0.39	0.50	0
29	0.67	0.51	0
30	0.54	0.46	0
31	0.32	0.28	0
32	0.45	0.31	0
33	0.54	0.53	0
34	0.68	0.56	0
35	0.76	0.27	0
36	0.51	0.20	0
37	0.51	0.35	0
38	0.57	0.43	0
43	0.58	0.38	0
44	0.41	0.42	0
45	0.48	0.35	0
46	0.59	0.55	0
47	0.32	0.37	0
PE1*	0.65	0.51	0
PE2	0.60	0.59	0
PE3	0.43	0.56	0
PE4	1.28	0.64	0
PE5	2.24	0.77	0
PE6	1.27	0.54	0
PE7	1.08	0.66	0
PE8	1.07	0.65	0
PE9	0.72	0.59	0
PE10	1.00	0.59	0

* PE1 = 1 pt. PE3 = 1 pt. PE5 = 4 pts. PE7 = 2 pts. PE9 = 3 pts.
PE2 = 1 pt. PE4 = 2 pts. PE6 = 2 pts. PE8 = 2 pts. PE10 = 2 pts.

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Table 4.13: Item Statistics for English I, Fall 2012

N-Count: 846

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.67	0.39	0
2	0.52	0.15	0
3	0.41	0.27	0
4	0.68	0.47	0
5	0.71	0.23	0
6	0.37	0.16	0
7	0.81	0.50	0
8	0.76	0.20	0
9	0.82	0.51	0
10	0.75	0.44	0
11	0.77	0.42	0
12	0.62	0.35	0
13	0.70	0.50	0
14	0.49	0.21	0
15	0.47	0.24	0
16	0.79	0.42	0
29	0.79	0.50	0
30	0.44	0.40	0
31	0.48	0.31	0
32	0.79	0.48	0
33	0.63	0.42	0
34	0.72	0.44	0
35	0.84	0.26	0
36	0.67	0.47	0
37	0.81	0.39	0
38	0.47	0.27	0
39	0.65	0.41	0
40	0.65	0.47	0
41	0.64	0.41	0
42	0.50	0.35	0
43	0.47	0.36	0
44	0.67	0.40	0
45	0.70	0.54	0
46	0.79	0.45	0
47	0.67	0.52	0
48	0.80	0.61	0
49	0.58	0.50	0
50	0.48	0.42	0
51	0.36	0.12	0
52	0.76	0.41	0

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Table 4.14: Item Statistics for Algebra II, Fall 2012

N-Count: 445

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.82	0.46	0
2	0.73	0.36	0
3	0.88	0.28	0
4	0.51	0.35	0
5	0.46	0.37	0
6	0.79	0.44	0
7	0.68	0.49	0
8	0.58	0.35	0
9	0.86	0.40	0
10	0.72	0.23	0
16	0.76	0.48	0
17	0.68	0.41	0
18	0.76	0.39	0
19	0.88	0.46	0
20	0.60	0.43	0
21	0.55	0.36	0
22	0.75	0.35	0
23	0.69	0.38	0
24	0.42	0.41	0
25	0.78	0.56	0
26	0.73	0.40	0
27	0.84	0.20	0
28	0.70	0.52	0
29	0.68	0.34	0
30	0.53	0.39	0
31	0.59	0.34	0
32	0.88	0.32	0
33	0.69	0.39	0
34	0.65	0.51	0
35	0.87	0.36	0
41	0.62	0.37	0
42	0.51	0.26	0
43	0.92	0.42	0
44	0.62	0.47	0
45	0.51	0.41	0
46	0.71	0.49	0
47	0.52	0.35	0
48	0.68	0.34	0
49	0.51	0.39	0
50	0.88	0.43	0

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Table 4.15: Item Statistics for Geometry, Fall 2012

N-Count: 753

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.92	0.44	0
2	0.84	0.32	0
3	0.71	0.36	0
4	0.64	0.41	0
5	0.91	0.39	0
6	0.88	0.35	0
7	0.53	0.40	0
8	0.49	0.31	0
9	0.65	0.22	0
10	0.68	0.52	0
16	0.67	0.21	0
17	0.83	0.53	0
18	0.74	0.41	0
19	0.44	0.37	0
20	0.65	0.41	0
21	0.77	0.51	0
22	0.46	0.51	0
23	0.75	0.50	0
24	0.69	0.52	0
25	0.59	0.42	0
26	0.65	0.48	0
27	0.51	0.31	0
28	0.70	0.39	0
29	0.71	0.42	0
30	0.54	0.31	0
31	0.74	0.43	0
32	0.47	0.41	0
33	0.52	0.30	0
34	0.87	0.55	0
35	0.29	0.27	0
41	0.48	0.24	0
42	0.87	0.48	0
43	0.81	0.36	0
44	0.61	0.33	0
45	0.88	0.35	0
46	0.53	0.47	0
47	0.58	0.42	0
48	0.80	0.28	0
49	0.43	0.23	0
50	0.56	0.51	0

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Table 4.16: Item Statistics for Government, Fall 2012

N-Count: 16,805

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.75	0.45	0
2	0.54	0.52	0
3	0.79	0.41	0
4	0.75	0.35	0
5	0.90	0.32	0
6	0.77	0.40	0
7	0.78	0.46	0
8	0.74	0.47	0
9	0.62	0.43	0
10	0.50	0.29	0
16	0.56	0.27	0
17	0.66	0.38	0
18	0.74	0.45	0
19	0.64	0.34	0
20	0.55	0.30	0
21	0.79	0.19	0
22	0.32	0.23	0
23	0.27	0.35	0
24	0.66	0.34	0
25	0.62	0.49	0
26	0.44	0.38	0
27	0.41	0.18	0
28	0.51	0.41	0
29	0.62	0.46	0
30	0.66	0.48	0
31	0.29	0.24	0
32	0.51	0.58	0
33	0.37	0.30	0
34	0.66	0.44	0
35	0.39	0.41	0
41	0.52	0.51	0
42	0.72	0.37	0
43	0.63	0.53	0
44	0.48	0.31	0
45	0.80	0.50	0
46	0.68	0.48	0
47	0.50	0.28	0
48	0.79	0.42	0
49	0.71	0.38	0
50	0.79	0.36	0

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Table 4.17: Item Statistics for American History, Fall 2012

N-Count: 1,323

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.63	0.31	0
2	0.50	0.43	0
3	0.90	0.38	0
4	0.75	0.29	0
5	0.77	0.43	0
6	0.81	0.44	0
7	0.81	0.43	0
8	0.64	0.40	0
9	0.39	0.28	0
10	0.54	0.40	0
16	0.38	0.17	0
17	0.30	0.16	0
18	0.36	0.28	0
19	0.51	0.34	0
20	0.50	0.35	0
21	0.74	0.24	0
22	0.35	0.20	0
23	0.66	0.48	0
24	0.42	0.41	0
25	0.47	0.25	0
26	0.28	0.15	0
27	0.50	0.19	0
28	0.39	0.24	0
29	0.39	0.21	0
30	0.37	0.27	0
31	0.61	0.42	0
32	0.29	0.18	0
33	0.63	0.44	0
34	0.45	0.18	0
35	0.72	0.51	0
41	0.54	0.35	0
42	0.72	0.42	0
43	0.66	0.41	0
44	0.61	0.30	0
45	0.70	0.55	0
46	0.69	0.47	0
47	0.49	0.37	0
48	0.67	0.35	0
49	0.58	0.48	0
50	0.75	0.39	0

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Table 4.18: Item Statistics for English II, Spring 2013

N-Count: 61,237

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.95	0.35	0
2	0.81	0.43	0
3	0.45	0.22	0
4	0.71	0.25	0
5	0.79	0.40	0
6	0.94	0.45	0
7	0.95	0.39	0
8	0.66	0.34	0
9	0.53	0.34	0
10	0.55	0.33	0
11	0.56	0.30	0
12	0.36	0.34	0
25	0.78	0.54	0
26	0.70	0.29	0
27	0.53	0.37	0
28	0.87	0.54	0
29	0.81	0.46	0
30	0.78	0.42	0
31	0.67	0.42	0
32	0.71	0.39	0
33	0.81	0.61	0
34	0.75	0.52	0
35	0.71	0.35	0
36	0.77	0.47	0
37	0.44	0.44	0
38	0.73	0.47	0
39	0.75	0.50	0
40	0.69	0.42	0
41	0.69	0.33	0
42	0.83	0.46	0
43	0.81	0.48	0
44	0.71	0.36	0
45	0.39	0.25	0
46	0.85	0.41	0
47	0.54	0.32	0
PE*	2.34	0.61	0

* The English II PE is worth a total of 4 raw score points.

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Table 4.19: Item Statistics for Algebra I, Spring 2013

N-Count: 64,544

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.95	0.35	0
2	0.81	0.43	0
3	0.45	0.22	0
4	0.71	0.25	0
5	0.79	0.40	0
10	0.94	0.45	0
11	0.95	0.39	0
12	0.66	0.34	0
13	0.53	0.34	0
14	0.55	0.33	0
15	0.56	0.30	0
16	0.36	0.34	0
17	0.78	0.54	0
18	0.70	0.29	0
19	0.53	0.37	0
20	0.87	0.54	0
21	0.81	0.46	0
26	0.78	0.42	0
27	0.67	0.42	0
28	0.71	0.39	0
29	0.81	0.61	0
30	0.75	0.52	0
31	0.71	0.35	0
32	0.77	0.47	0
33	0.44	0.44	0
34	0.73	0.47	0
35	0.75	0.50	0
36	0.69	0.42	0
37	0.69	0.33	0
38	0.83	0.46	0
43	0.81	0.48	0
44	0.71	0.36	0
45	0.39	0.25	0
46	0.85	0.41	0
47	0.54	0.32	0
PE*	1.60	0.70	0

* The Algebra I PE is worth a total of 4 raw score points.

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Table 4.20: Item Statistics for Biology, Spring 2013

N-Count: 62,355

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.93	0.41	0
2	0.93	0.30	0
3	0.85	0.30	0
4	0.78	0.47	0
5	0.85	0.38	0
10	0.84	0.40	0
11	0.80	0.53	0
12	0.80	0.50	0
13	0.75	0.27	0
14	0.64	0.42	0
15	0.60	0.32	0
16	0.81	0.40	0
17	0.64	0.38	0
18	0.64	0.54	0
19	0.71	0.43	0
20	0.82	0.45	0
21	0.58	0.39	0
26	0.66	0.41	0
27	0.70	0.33	0
28	0.74	0.54	0
29	0.66	0.49	0
30	0.77	0.52	0
31	0.62	0.41	0
32	0.41	0.19	0
33	0.54	0.38	0
34	0.58	0.35	0
35	0.43	0.10	0
36	0.57	0.41	0
37	0.56	0.37	0
38	0.44	0.25	0
43	0.53	0.41	0
44	0.59	0.42	0
45	0.38	0.33	0
46	0.40	0.28	0
47	0.41	0.26	0
PE1*	0.71	0.47	0
PE2	0.69	0.45	0
PE3	0.61	0.48	0
PE4	1.82	0.65	0
PE5	1.30	0.53	0
PE6	2.22	0.55	0
PE7	2.68	0.68	0
PE8	1.34	0.56	0
PE9	0.98	0.24	0
PE10	0.97	0.23	0

* PE1 = 1 pt. PE3 = 1 pt. PE5 = 2 pts. PE7 = 4 pts. PE9 = 1 pt.
PE2 = 1 pt. PE4 = 3 pts. PE6 = 3 pts. PE8 = 3 pts. PE10 = 1 pt.

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Table 4.21: Item Statistics for English I, Spring 2013

N-Count: 62,683

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.85	0.47	0
2	0.71	0.47	0
3	0.57	0.31	0
4	0.85	0.42	0
5	0.83	0.38	0
6	0.60	0.24	0
7	0.58	0.24	0
8	0.92	0.40	0
9	0.71	0.25	0
10	0.85	0.40	0
11	0.68	0.44	0
12	0.56	0.39	0
13	0.66	0.42	0
14	0.74	0.45	0
15	0.58	0.29	0
16	0.47	0.46	0
29	0.43	0.50	0
30	0.37	0.23	0
31	0.69	0.42	0
32	0.62	0.50	0
33	0.59	0.33	0
34	0.55	0.32	0
35	0.63	0.44	0
36	0.67	0.28	0
37	0.68	0.54	0
38	0.75	0.45	0
39	0.59	0.49	0
40	0.63	0.49	0
41	0.64	0.56	0
42	0.68	0.35	0
43	0.73	0.49	0
44	0.49	0.39	0
45	0.53	0.48	0
46	0.61	0.46	0
47	0.67	0.47	0
48	0.59	0.37	0
49	0.72	0.46	0
50	0.44	0.42	0
51	0.75	0.51	0
52	0.62	0.25	0

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Table 4.22: Item Statistics for Algebra II, Spring 2013

N-Count: 23,426

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.66	0.42	0
2	0.82	0.28	0
3	0.67	0.46	0
4	0.50	0.29	0
5	0.84	0.28	0
6	0.69	0.45	0
7	0.75	0.41	0
8	0.51	0.27	0
9	0.65	0.42	0
10	0.59	0.34	0
16	0.85	0.22	0
17	0.41	0.38	0
18	0.76	0.40	0
19	0.78	0.36	0
20	0.62	0.35	0
21	0.59	0.38	0
22	0.65	0.33	0
23	0.54	0.47	0
24	0.39	0.38	0
25	0.66	0.38	0
26	0.42	0.45	0
27	0.86	0.38	0
28	0.57	0.45	0
29	0.45	0.41	0
30	0.74	0.38	0
31	0.33	0.31	0
32	0.76	0.47	0
33	0.59	0.51	0
34	0.63	0.38	0
35	0.56	0.43	0
41	0.74	0.44	0
42	0.54	0.24	0
43	0.70	0.39	0
44	0.40	0.44	0
45	0.62	0.44	0
46	0.54	0.31	0
47	0.53	0.44	0
48	0.48	0.41	0
49	0.48	0.48	0
50	0.51	0.36	0

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Table 4.23: Item Statistics for Geometry, Spring 2013

N-Count: 30,482

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.77	0.37	0
2	0.79	0.50	0
3	0.83	0.47	0
4	0.74	0.43	0
5	0.78	0.52	0
6	0.87	0.33	0
7	0.83	0.36	0
8	0.78	0.54	0
9	0.80	0.42	0
10	0.51	0.46	0
16	0.46	0.50	0
17	0.71	0.43	0
18	0.71	0.39	0
19	0.74	0.50	0
20	0.79	0.45	0
21	0.64	0.15	0
22	0.89	0.22	0
23	0.75	0.36	0
24	0.75	0.37	0
25	0.78	0.29	0
26	0.65	0.45	0
27	0.78	0.38	0
28	0.59	0.51	0
29	0.64	0.35	0
30	0.39	0.26	0
31	0.63	0.41	0
32	0.41	0.42	0
33	0.38	0.49	0
34	0.63	0.41	0
35	0.46	0.50	0
41	0.47	0.35	0
42	0.46	0.39	0
43	0.60	0.34	0
44	0.52	0.40	0
45	0.57	0.50	0
46	0.51	0.34	0
47	0.47	0.31	0
48	0.22	0.34	0
49	0.46	0.33	0
50	0.52	0.41	0

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Table 4.24: Item Statistics for Government, Spring 2013

N-Count: 42,218

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.60	0.32	0
2	0.67	0.46	0
3	0.69	0.37	0
4	0.39	0.21	0
5	0.52	0.39	0
6	0.77	0.43	0
7	0.76	0.46	0
8	0.62	0.42	0
9	0.42	0.61	0
10	0.69	0.43	0
16	0.58	0.53	0
17	0.77	0.46	0
18	0.64	0.40	0
19	0.44	0.60	0
20	0.81	0.37	0
21	0.82	0.40	0
22	0.63	0.52	0
23	0.78	0.35	0
24	0.68	0.49	0
25	0.80	0.44	0
26	0.45	0.36	0
27	0.69	0.50	0
28	0.71	0.40	0
29	0.43	0.34	0
30	0.67	0.36	0
31	0.62	0.48	0
32	0.65	0.46	0
33	0.55	0.31	0
34	0.49	0.36	0
35	0.60	0.50	0
41	0.54	0.38	0
42	0.74	0.38	0
43	0.71	0.36	0
44	0.59	0.54	0
45	0.46	0.37	0
46	0.49	0.36	0
47	0.59	0.47	0
48	0.75	0.58	0
49	0.75	0.48	0
50	0.69	0.49	0

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Table 4.25: Item Statistics for American History, Spring 2013

N-Count: 52,324

Item #	P-Value/Mean	Corrected Point-Biserial Correlation	Omit Rate (%)
1	0.66	0.44	0
2	0.64	0.40	0
3	0.65	0.45	0
4	0.73	0.49	0
5	0.40	0.38	0
6	0.72	0.44	0
7	0.67	0.39	0
8	0.57	0.39	0
9	0.65	0.49	0
10	0.41	0.22	0
16	0.60	0.54	0
17	0.62	0.50	0
18	0.64	0.26	0
19	0.45	0.32	0
20	0.59	0.27	0
21	0.85	0.19	0
22	0.66	0.55	0
23	0.49	0.24	0
24	0.41	0.25	0
25	0.57	0.38	0
26	0.49	0.27	0
27	0.61	0.40	0
28	0.47	0.30	0
29	0.40	0.33	0
30	0.50	0.37	0
31	0.79	0.42	0
32	0.61	0.30	0
33	0.35	0.32	0
34	0.48	0.42	0
35	0.60	0.45	0
41	0.69	0.46	0
42	0.77	0.42	0
43	0.38	0.29	0
44	0.62	0.52	0
45	0.62	0.47	0
46	0.67	0.28	0
47	0.56	0.51	0
48	0.73	0.52	0
49	0.52	0.46	0
50	0.73	0.51	0

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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, students are expected to have ample time to finish all items and prompts.

Item omit rates, especially for items appearing later in a test, are a gauge of potential test speededness. The ―Omit Rate” column in Tables 4.2 through 4.25 shows the percentage of students who omitted each SR 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 Differential Item Functioning (DIF)

Differential item functioning (DIF) occurs when an item has difficulty measures that vary substantially across subgroups of examinees with comparable ability. DIF was examined using the Mantel-Haenszel (MH) (1959) procedure for SR items and WINSTEPS for the PE/WPs.The Mantel-Haenszel method is a nonparametric approach to DIF. In the MH procedure, total raw scores are held constant while an 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, if 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 the following:

	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.

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The critical values of the ETS categorizations are 1.00 and 1.50 on the delta scale for categories A (negligible DIF), B (slight to moderate DIF), and C (moderate to severe DIF). 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 contained in the Summer 2012, Fall 2012, and Spring 2013 operational administrations are summarized in Tables 4.26, 4.27, and 4.28, respectively. In these analyses, male and white students were used as the reference group, and female, black, and Hispanic students were considered the focal group.

Table 4.26: Frequency Distribution of DIF Categories for the Summer 2012 Operational Assessments

Test	Group****	N-Count***	SR Items*				
			A**	B**	B–**	C**	C–**
Summer 2012							
English II	M/F	262/166	--	--	--	--	--
	W/B	210/182	--	--	--	--	--
	W/H	210/25	--	--	--	--	--
Algebra I	M/F	503/385	34	0	1	0	0
	W/B	413/405	33	1	0	0	1
	W/H	413/40	--	--	--	--	--
Biology	M/F	173/148	--	--	--	--	--
	W/B	163/140	--	--	--	--	--
	W/H	163/12	--	--	--	--	--
English I	M/F	180/127	--	--	--	--	--
	W/B	133/149	--	--	--	--	--
	W/H	133/11	--	--	--	--	--
Algebra II	M/F	87/57	--	--	--	--	--
	W/B	45/95	--	--	--	--	--
	W/H	45/2	--	--	--	--	--
Geometry	M/F	121/118	--	--	--	--	--
	W/B	57/163	--	--	--	--	--
	W/H	57/12	--	--	--	--	--
Government	M/F	376/463	34	2	4	0	0
	W/B	612/132	--	--	--	--	--
	W/H	612/56	--	--	--	--	--
Am. History	M/F	146/118	--	--	--	--	--
	W/B	129/118	--	--	--	--	--
	W/H	129/12	--	--	--	--	--

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

*The Mantel-Haenszel procedure is applied for the SR items.
**DIF categories: A, negligible; B, slight to moderate; and C, moderate to severe.
***DIF was not performed when the focal group n-count was less than 200.
****DIF contrast groups: M/F, male versus female; W/B, white versus black; and W/H, white versus Hispanic.

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Table 4.27: Frequency Distribution of DIF Categories for the Fall 2012 Operational Assessments

Test	Group****	N-Count***	SR Items*					PE/WPs*				
			A**	B**	B–**	C**	C–**	A**	B**	B–**	C**	C–**
Fall 2012												
English II	M/F	1,575/1,362	35	0	0	0	0	1	0	0	0	0
	W/B	1,502/1,171	34	0	1	0	0	1	0	0	0	0
	W/H	1,502/142	--	--	--	--	--	--	--	--	--	--
Algebra I	M/F	2,120/1,772	35	0	0	0	0	1	0	0	0	0
	W/B	2,787/772	35	0	0	0	0	1	0	0	0	0
	W/H	2,787/182	--	--	--	--	--	--	--	--	--	--
Biology	M/F	1,520/1,313	32	1	2	0	0	10	0	0	0	0
	W/B	1,919/620	35	0	0	0	0	10	0	0	0	0
	W/H	1,920/165	--	--	--	--	--	--	--	--	--	--
English I	M/F	458/388	35	2	1	1	1					
	W/B	655/108	--	--	--	--	--					
	W/H	655/46	--	--	--	--	--					
Algebra II	M/F	197/248	39	0	0	0	1					
	W/B	320/63	--	--	--	--	--					
	W/H	320/28	--	--	--	--	--					
Geometry	M/F	387/366	36	2	1	1						
	W/B	562/88	--	--	--	--	--					
	W/H	562/50	--	--	--	--	--					
Government	M/F	8,465/8,340	40	0	0	0	0					
	W/B	12,095/3,219	40	0	0	0	0					
	W/H	12,095/741	40	0	0	0	0					
Am. History	M/F	669/654	37	1	2	0	0					
	W/B	1,030/164	--	--	--	--	--					
	W/H	1,030/68	--	--	--	--	--					

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

*The Mantel-Haenszel procedure is applied for the SR items and WINSTEPS for the PE/WPs.
**DIF categories: A, negligible; B, slight to moderate; and C, moderate to severe.
***DIF was not performed when the focal group n-count was less than 200.
****DIF contrast groups: M/F, male versus female; W/B, white versus black; and W/H, white versus Hispanic.

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Table 4.28: Frequency Distribution of DIF Categories for the Spring 2013 Operational Assessments

Test	Group***	N-Count	SR Items*					PE/WPs*				
			A**	B**	B–**	C**	C–**	A**	B**	B–**	C**	C–**
Spring 2013												
English II	M/F	30,733/30,445	40	0	0	0	0	0	1	0	0	0
	W/B	47,446/8,860	40	0	0	0	0	1	0	0	0	0
	W/H	47,446/2,473	40	0	0	0	0	1	0	0	0	0
Algebra I	M/F	32,540/31,971	35	0	0	0	0	1	0	0	0	0
	W/B	48,892/10,002	33	0	2	0	0	1	0	0	0	0
	W/H	48,892/2,844	33	0	2	0	0	1	0	0	0	0
Biology	M/F	31,354/30,976	35	0	0	0	0	10	0	0	0	0
	W/B	48,230/9,118	34	0	1	0	0	9	0	1	0	0
	W/H	48,230/2,489	34	0	1	0	0	10	0	0	0	0
English I	M/F	31,660/31,011	39	0	1	0	0					
	W/B	48,596/8,927	39	1	0	0	0					
	W/H	48,596/2,613	40	0	0	0	0					
Algebra II	M/F	10,877/12,549	38	0	2	0	0					
	W/B	19,341/2,488	37	1	2	0	0					
	W/H	19,341/784	38	2	0	0	0					
Geometry	M/F	14,823/15,659	37	1	1	0	1					
	W/B	24,827/3,350	36	2	2	0	0					
	W/H	24,827/1,184	40	0	0	0	0					
Government	M/F	21,591/20,626	38	0	2	0	0					
	W/B	33,866/5,152	39	1	0	0	0					
	W/H	33,866/1,546	40	0	0	0	0					
Am. History	M/F	26,596/25,726	39	0	1	0	0					
	W/B	41,477/6,936	38	0	2	0	0					
	W/H	41,477/1,968	40	0	0	0	0					

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

*The Mantel-Haenszel procedure is applied for the SR items and WINSTEPS for the PE/WPs.
**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 black; and W/H, white versus Hispanic.

4.5 Summary

The item analyses provided in this chapter show that the MO EOC Assessments have sound psychometric 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, DIF statistics based on data from the 2012–2013 operational administrations show the items to be generally free from statistical bias.

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Chapter 5: Test Administration

5.1 Introduction

This chapter contains information about DESE and Questar processes that ensure the standardized administration of the MO EOC Assessments. The Standards (AERA, APA, and NCME, 1999) state, ―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 MO EOC Assessments in different locations and under different circumstances have comparable opportunities for success.

The EOC Test Administration Manual contains detailed information about the testing guidelines, materials handling, and standardized administration instructions for the MO EOC Assessments. While this manual is not included here, much of the information contained in this chapter can be found in it.

For the MO EOC Assessments, the 2011–2012 administration year was the first in which districts were required to use an online delivery format unless a Paper/Pencil, Braille, or Large Print version was required for a student as indicated in the student‘s Individualized Education Program (IEP) and marked as an accommodation in iTester Admin. The Test Administration Manual contains information specific to the registration for and administration of the MO EOC Assessments. This process was continued for the 2012–2013 administration year. Question uses the iTester system to manage and deliver the MO EOC Online Assessments. iTester Admin is an administrative application that supports the management of students, Test Examiners, and test sessions. iTester Student is a test-delivery application used by students to take their tests.

5.2 Students for Whom the MO 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 belongs to the local district. The MO EOC Assessments are based on CLEs rather than on 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 (IEPs)

A student with disabilities, as classified under the Individuals with Disabilities Education Act (IDEA), has an IEP that, in part, governs whether a particular assessment is appropriate for the student. In the case of the MO 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 required EOC Assessments. If, however, a student‘s disability qualifies him or her to take the MAP-Alternate Assessment (MAP-A) for students with severe cognitive disabilities, that student will not be required to participate in the MO EOC Assessments.

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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 MO 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 (ELL) Students

Students who have been enrolled in a school in the United States for 12 consecutive months or less at the time of test administration may be exempted by the local school district from taking the English I and English II Assessments. The students must, however, participate in other required MO EOC Assessments, although their scores do not count for school accountability purposes.

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 MO 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 MO 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 as ―In 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

All test administration information, including the Test Administration Manual and training webinars, were posted to the Questar iTester Administration site for District Test Coordinators (DTCs), School Test Coordinators (STCs), Examiners, and Information Technology Coordinators (ITCs). One week prior to the start of the testing window, Questar distributed all password information for the online system by e-mail to district and school level users participating in the current EOC administration. Districts had the opportunity to order the Braille and Large Print editions of the assessment from Questar. The District Test Coordinator downloaded and printed the accommodated Paper/Pencil test edition through the iTester Admin site, as needed for students in the district. The District Test Coordinator was responsible for inventorying all Paper/Pencil materials, as well as disseminating the online test information to the test administrators. The District Test Coordinator was also responsible for answering all district questions about test procedures and the iTester online system. If the District Test Coordinator needed assistance with a question, he/she could contact Questar‘s Missouri Customer Service through the designated phone number and/or e-mail address.

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5.5 District and Test Examiner Training

Both Questar and DESE were responsible for training the district staff on EOC test administration. DESE provided two standardized training webinars, scripts, and PowerPoint presentations on the Test Administration Manual, state procedures, and general testing issues. One training session was provided for Test Coordinators and the other was provided for Test Examiners. These training resources were available both on the DESE website and in iTester Admin.

Questar provided training on iTester Admin and iTester Student systems. Questar training contained propriety information and was only available in iTester Admin. All Test Coordinators and Test Examiners were to view these standardized trainings prior to test administration. The District Test Coordinator was allowed to provide supplemental training on local issues, (e.g., schedules). Both DESE and Questar were available to answer any questions the districts may have about the MO EOC Assessment administration.

5.6 Test Security

The MO EOC Assessment test books (Paper/Pencil, Large Print, and Braille) and online assessments were secure. Test Coordinators were 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 were not responsible for testing. Additionally, written or oral discussion of specific MO EOC Assessment items breaches the security and integrity of the test. In accordance with the Standards, the Test Administration Manual contained explicit instructions about test security for Test Coordinators and Test Examiners.[7]

Standardized training was required for all District and School Test Coordinators, Examiners, translators, proctors, and any district staff who had responsibilities in testing. Each test book shipped to the district or downloaded and printed by the district contained secure barcode information for tracking purposes. Questar used this information to ensure that districts used the materials assigned to them for testing and returning all of their secure materials after the completion of testing. The Paper/Pencil forms included a bar code on each page of the document. Upon return to Questar, the barcode information on each test was verified. Questar then followed up with the appropriate district(s) regarding any missing materials to ensure return or destruction (if materials were contaminated).

When the tests were delivered online, Test Examiners did not have access to the student screens for the online assessment, only to the test administrator features. Students had unique, secure logins to access the MO EOC Assessments they were registered for, and these logins were disabled after the student had tested. Once Session II was added for PEs or a WP the students also had a Session Access code given to them by the teacher at the start of the session to ensure that students accessed the correct session of the test. Test items, as well as student responses, were encrypted during transmission to and from student computers. Student tests must be in progress or completed by 6 p.m. every evening of testing as tests were automatically submitted by iTester each evening.

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

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5.6.1 MO EOC Cheating Prevention

To protect the validity and fairness of scores on the MO EOC assessments, DESE has implemented measures to prevent and detect cheating. Possible cheating violations on the MO EOC Assessments include the following:

- Copying and reviewing MO EOC Assessment items with students
- Cueing students during testing either verbally or with written materials on the classroom walls
- Cueing students nonverbally, such as tapping or nodding the head
- Using a calculator on an EOC Assessment that does not allow calculator use, unless specified by the student's IEP
- Using a calculator that contains stored equations or connects to the Internet
- Splitting sessions into two parts
- Ignoring the standardized directions in the test books
- Paraphrasing parts of the assessment to students
- Changing or completing (or allowing other school personnel to change or complete) student answers
- Allowing accommodations that are not written in the Individualized Education Program (IEP)
- Allowing accommodations for students who do not have an IEP
- Allowing students to use dictionaries on parts of the MO EOC Assessment other than the WP
- Defining terms on the test

To detect cheating, DESE has implemented the following steps for the MO EOC Assessments:

1. School officials, parents, and other interested parties call or email DESE to report a testing concern or allegation.
2. A narrative of the conversation, if reported orally, is written and read back to the individual reporting the concern.
3. The superintendent of the district in which the allegation is made is then contacted and read the narrative or email.
4. A letter is sent to confirm the conversation and to ask the superintendent to investigate the claim.
5. An MO EOC Assessment Quality Assurance Concern District Response Report[8] is sent for the superintendent to use for replying to the allegation

DESE also implemented a self-monitoring process whereby District Test Coordinators completed a Quality Assurance (QA) self-monitoring form[9] during the 2012–2013 school year. This QA process was issued to District Test Coordinators in an administrative memo.[10] The form was designed to be used by District Test Coordinators as part of their regular supervision process throughout the assessment window, and it allowed districts to monitor and strengthen their administration of the MO EOC Assessments. The questions on the form were designed to focus attention and help districts examine important areas of assessment training, administration, and test security.

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[8] View this report online at http://dese.mo.gov/divimprove/assess/documents/EOC-Quality-Assurance-District-Report.pdf.
[9] View the QA form online at http://www.dese.mo.gov/divimprove/assess/documents/asmt-eoc-self-qa-2013.pdf.
[10] View the memo online athttp://www.dese.mo.gov/am/ccr/documents/CCR-13-004.pdf.

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District Test Coordinators were asked to complete one MO EOC form for one EOC classroom. Regarding cheating prevention, the form asked District Test Coordinators to ―Explain the district's test security plan" and answer the question,―What preventative measures are taken to curb cheating within the computer lab?" District Test Coordinators were urged to report testing irregularities or concerns immediately to the Assessment Section at assessment@dese.mo.gov or (573) 751-3545. DESE also performed onsite spot checks of quality assurance procedures during the Spring testing window.

Upon receiving reported testing irregularities, DESE would request Questar to perform statistical analyses to detect and flag unusual responses and follow up with decisions appropriate to the situation.

5.7 Test Administration

5.7.1 Test Organization

Students took the MO EOC Assessments in one or two sessions depending on the content area. The MO EOC Assessments for Summer 2012, Fall 2012, and Spring 2013 for English II, Algebra I, and Biology contained SR items and a PE/WP. English I, Algebra II, Geometry, Government, and American History contained only SR items. All assessments were administered online unless the student's IEP specified a Braille/Large Print or Paper/Pencil administration. Each SR item consisted of a stem followed by four response options, and the student clicked an answer choice. The tests were not timed. Students were encouraged to complete an online practice test of iTester prior to testing. This practice test included 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 were responsible for providing all MO EOC Assessment materials to Test Examiners. The materials provided by Questar and/or DESE included the following:

- *Test Administration Manual* (electronic copy)
- Large Print, and/or Braille test materials
- Return kit materials for accommodated test materials
- Accommodated Paper/Pencil test booklet (printed from the iTester system by the school district)

Students taking an accommodated version of the MO EOC Assessments needed the following additional materials, which were not provided by Questar or DESE:

- No. 2 pencils
- Scratch paper

For the online assessment, each student needed a computer with a monitor, mouse, and keyboard. Adequate space should have been left between workstations. Students could use scratch, grid, or

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draft paper and a writing utensil while taking the online assessment. The Test Examiner needed the following:

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

Additionally, students taking either the Paper/Pencil or online version were allowed to use a calculator for the Algebra I, Algebra II, and Geometry Assessments. (This was not required.)

Calculators could not contain stored equations or functions at the time of the EOC Mathematics Assessments. Test Examiners were responsible for ensuring and verifying that calculators with the ability to store functions and equations (e.g., a graphing or a scientific calculator) had the memory cleared before and after each Mathematics Assessment.

Calculators could not have internet connectivity or be able to connect to anyone inside or outside the classroom during testing. Students could not use a calculator on a laptop or other portable computer, pocket organizer, cell phone, device with a typewriter-style keyboard, electronic writing pad, or pen-input device unless a particular assistive device was required for a student and was specified on his or her IEP.

5.7.3 Preparing the Test Administration Site and the Students

Before students began the assessment using the online system, a representative of the district or school was responsible for the following tasks:

- Read the entire *Test Administration Manual*
- Review the DESE and Questar trainings regarding the EOCs
- Run a workstation readiness on each workstation used for testing
- Ensure that the iTester Student is downloaded to each workstation for test delivery
- Provide an upload to DESE (precode file) of all students that will be testing for the current administration of the EOCs (the precode file is a data file containing one record per student and each student is assigned a unique MOSIS ID. The purpose of the data file is to identify students, Examiners, and content areas for testing.)
- Input identification information for students who were not included in the precode file
- Specify district testing windows within the Missouri statewide test administration window

Additionally, the Test Examiner was responsible for setting and verifying class information and setting students‘ testing status codes and/or accommodations information in the online system.

Students were NOT allowed to use electronic devices such as cellular phones, digital cameras, gaming devices, or scanners during the testing session. However, students could use calculators during the Algebra I, Algebra II, and Geometry test sessions. (See section 5.7.2 for more information regarding calculator usage and restrictions.)

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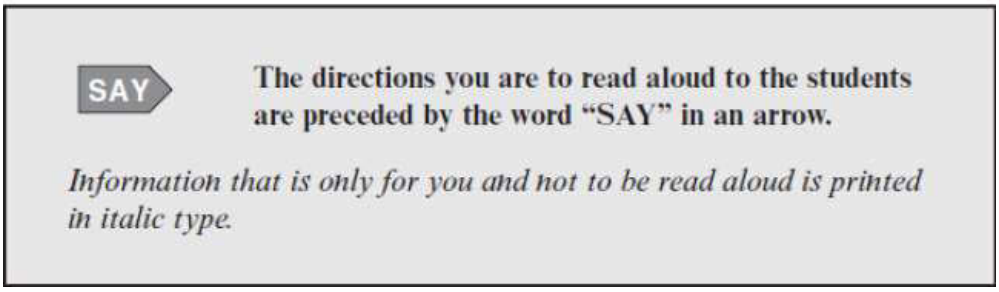
5.7.4 Directions for Administration

In accordance with Standard 5.1,[11] specific standardized directions for administration were printed in the Test Administration Manual. Directions to be read aloud to the students were printed in bold type and had a callout arrow in the margin for clarity. Information for the teacher that should not be read aloud was in italic type. Figure 5.1 provides an example of the type styles used in the Test Administration Manual to differentiate between spoken and unspoken instructions. Figure 5.2 provides an example of a script from the Government EOC Assessment.

Figure 5.1: Examples of Type Styles Used to Differentiate between Spoken and Unspoken Instructions in the Test Administration Manual



[11] **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).

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Figure 5.2: Example Script from the Test Administration Manual for the Government EOC Assessment

Directions for Administering the Government Assessment Online

SAY **For the questions in this test, 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 Government. Click 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 your work.**

SAY **On your desktop, locate the icon titled "iTester_MOEOC."**

Double-click this icon and the program will launch. Once the program has opened, you will see the login page for iTester Student.

Do not enter anything until you have been instructed to do so.

Can everyone see the login page?

An example of the login page is below. Please be sure all students are on this page before proceeding with instructions.

Assist students as needed. The next step is to walk the students through logging into iTester Student. The username for all students is their MOSIS ID. For each content area tested, the student will receive a unique password.

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5.8 Accommodations and Modifications

A student's IEP team had the responsibility and authority to determine individual accommodations to support and ensure his or her participation in the MO EOC Assessments. Students who were English Language Learners (ELL) were also able to receive allowable accommodations to support and ensure participation in the MO EOC Assessments. Allowable accommodations were intended to assist the student by reducing the effects of his or her disability without reducing performance expectations. Allowable accommodations for the MO EOC Assessments included, but were not limited to, the following:

- A student may receive a modified version of the testing materials, such as the Braille, Large Print, or Paper/Pencil 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 English I and English II Assessments, 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 MO EOC Assessments were able to be provided:

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

In accordance with Standard 5.2,[12] Test Examiners indicated an accommodation, when allowed by a student's IEP and used for the MO EOC Assessment, by checking the appropriate box(es) for the student in iTester Admin.

Tables 5.1, 5.2, and 5.3 contain information about the percentage of students who received each type of allowable accommodation for each MO EOC Assessment for Summer 2012, Fall 2012, and Spring 2013, respectively. The most prevalent type of accommodation across all MO EOC Assessments and administrations was testing in a small group.

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

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Table 5.1: Frequency and Percentage of Students Receiving Each Type of Allowable Accommodation on the Summer 2012 MO EOC Assessments

Accommodation	English II		Algebra I		Biology	
	Freq.	%	Freq.	%	Freq.	%
Braille	--	--	--	--	--	--
Large Print	1	0.23	--	--	--	--
Oral Reading	--	--	--	--	7	2.18
Oral Reading—Blind/Partial Sight	--	--	9	1.01	--	--
Signing of Assessment	--	--	--	--	--	--
Paraphrasing	--	--	--	--	--	--
Other Administrations	--	--	--	--	--	--
Oral Reading in Native Language	--	--	--	--	--	--
Extended Time	--	--	--	--	--	--
Administered Using More Than Allotted Periods	2	0.47	6	0.68	7	2.18
Other Timing	--	--	7	0.79	--	--
Use of Scribe	--	--	--	--	--	--
Use of Calculator, Math Tables, etc.	--	--	--	--	1	0.31
Using Bilingual Dictionary	--	--	--	--	--	--
Other Response	--	--	--	--	--	--
Testing Individually	--	--	--	--	--	--
Testing in Small Group	5	1.17	14	1.58	11	3.43
Other Setting	--	--	--	--	--	--

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Table 5.1 (cont.): Frequency and Percentage of Students Receiving Each Type of Allowable Accommodation on the Summer 2012 MO EOC Assessments

Accommodation	English I		Algebra II		Geometry		Government		Am. History	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Braille	--	--	--	--	--	--	--	--	--	--
Large Print	--	--	--	--	--	--	--	--	--	--
Oral Reading	--	--	1	0.69	--	--	16	1.91	2	0.76
Oral Reading—Blind/Partial Sight	--	--	--	--	--	--	--	--	--	--
Signing of Assessment	--	--	--	--	--	--	--	--	--	--
Paraphrasing	--	--	--	--	--	--	--	--	--	--
Other Administrations	--	--	--	--	--	--	--	--	--	--
Oral Reading in Native Language	--	--	--	--	--	--	--	--	--	--
Extended Time	--	--	--	--	--	--	--	--	--	--
Administered Using More Than Allotted Periods	11	3.58	1	0.69	3	1.25	5	0.60	2	0.76
Other Timing	--	--	--	--	--	--	1	0.12	--	--
Use of Scribe	--	--	--	--	--	--	--	--	--	--
Use of Calculator, Math Tables, etc.	--	--	--	--	--	--	--	--	--	--
Using Bilingual Dictionary	--	--	--	--	--	--	--	--	--	--
Other Response	--	--	--	--	--	--	--	--	--	--
Testing Individually	--	--	--	--	--	--	1	0.12	1	0.38
Testing in Small Group	11	3.58	1	0.69	3	1.25	21	2.50	4	1.52
Other Setting	--	--	--	--	--	--	--	--	--	--

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Table 5.2: Frequency and Percentage of Students Receiving Each Type of Allowable Accommodation on the Fall 2012 MO EOC Assessments

Accommodation	English II		Algebra I		Biology	
	Freq.	%	Freq.	%	Freq.	%
Braille	--	--	--	--	--	--
Large Print	2	0.07	4	0.10	3	0.11
Oral Reading	--	--	129	3.31	91	3.21
Oral Reading—Blind/Partial Sight	--	--	--	--	--	--
Signing of Assessment	--	--	--	--	--	--
Paraphrasing	--	--	--	--	--	--
Other Administrations	--	--	--	--	--	--
Oral Reading in Native Language	--	--	1	0.03	2	0.07
Extended Time	--	--	--	--	--	--
Administered Using More Than Allotted Periods	43	1.46	56	1.44	34	1.20
Other Timing	26	0.88	47	1.21	24	0.85
Use of Scribe	3	0.10	2	0.05	3	0.11
Use of Calculator, Math Tables, etc.	2	0.07	--	--	18	0.63
Using Bilingual Dictionary	--	--	--	--	3	0.11
Other Response	--	--	--	--	--	--
Testing Individually	7	0.24	25	0.64	19	0.67
Testing in Small Group	103	3.50	209	5.36	152	5.36
Other Setting	2	0.07	4	0.10	1	0.04

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Table 5.2 (cont.): Frequency and Percentage of Students Receiving Each Type of Allowable Accommodation on the Fall 2012 MO EOC Assessments

Accommodation	English I		Algebra II		Geometry		Government		Am. History	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Braille	--	--	--	--	--	--	2	0.01	1	0.08
Large Print	--	--	--	--	--	--	6	0.04	--	--
Oral Reading	--	--	2	0.45	12	1.59	514	3.06	28	2.12
Oral Reading—Blind/Partial Sight	--	--	--	--	--	--	--	--	--	--
Signing of Assessment	--	--	--	--	--	--	2	0.01	--	--
Paraphrasing	--	--	--	--	--	--	--	--	--	--
Other Administrations	--	--	--	--	--	--	4	0.02	1	0.08
Oral Reading in Native Language	--	--	--	--	1	0.13	1	0.01	--	--
Extended Time	--	--	--	--	--	--	--	--	--	--
Administered Using More Than Allotted Periods	2	0.24	--	--	--	--	111	0.66	10	0.76
Other Timing	1	0.12	2	0.45	15	1.99	108	0.64	11	0.83
Use of Scribe	--	--	--	--	--	--	6	0.04	3	0.23
Use of Calculator, Math Tables, etc.	1	0.12	--	--	--	--	15	0.09	1	0.08
Using Bilingual Dictionary	--	--	--	--	1	0.13	2	0.01	1	0.08
Other Response	--	--	--	--	--	--	3	0.02	--	--
Testing Individually	--	--	--	--	--	--	60	0.36	1	0.08
Testing in Small Group	12	1.42	7	1.57	26	3.45	735	4.37	41	3.10
Other Setting	--	--	--	--	--	--	29	0.17	--	--

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Table 5.3: Frequency and Percentage of Students Receiving Each Type of Allowable Accommodation on the Spring 2013 MO EOC Assessments

Accommodation	English II		Algebra I		Biology	
	Freq.	%	Freq.	%	Freq.	%
Braille	7	0.01	7	0.01	7	0.01
Large Print	24	0.04	27	0.04	26	0.04
Oral Reading	23	0.04	1,904	2.95	2,299	3.69
Oral Reading—Blind/Partial Sight	3	0.01	--	--	--	--
Signing of Assessment	--	--	20	0.03	21	0.03
Paraphrasing	--	--	1	0.00	--	--
Other Administrations	46	0.08	39	0.06	24	0.04
Oral Reading in Native Language	--	--	48	0.07	31	0.05
Extended Time	--	--	--	--	--	--
Administered Using More Than Allotted Periods	1,016	1.66	999	1.55	1,088	1.75
Other Timing	488	0.80	452	0.70	452	0.73
Use of Scribe	72	0.12	59	0.09	61	0.10
Use of Calculator, Math Tables, etc.	80	0.13	--	--	443	0.71
Using Bilingual Dictionary	--	--	5	0.01	10	0.02
Other Response	11	0.02	19	0.03	15	0.02
Testing Individually	247	0.40	283	0.44	247	0.40
Testing in Small Group	3,248	5.30	3,284	5.09	3,387	5.43
Other Setting	87	0.14	116	0.18	108	0.17

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Table 5.3 (cont.): Frequency and Percentage of Students Receiving Each Type of Allowable Accommodation on the Spring 2013 MO EOC Assessments

Accommodation	English I		Algebra II		Geometry		Government		Am. History	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Braille	6	0.01	1	0.00	1	0.00	6	0.01	4	0.01
Large Print	18	0.03	12	0.05	5	0.02	23	0.05	16	0.03
Oral Reading	9	0.01	127	0.54	351	1.15	1,494	3.54	1,663	3.18
Oral Reading—Blind/Partial Sight	1	0.00	2	0.01	--	--	--	--	--	--
Signing of Assessment	--	--	--	--	1	0.00	23	0.05	22	0.04
Paraphrasing	1	0.00	--	--	--	--	--	--	--	--
Other Administrations	38	0.06	--	--	1	0.00	40	0.10	6	0.01
Oral Reading in Native Language	--	--	--	--	--	--	21	0.05	11	0.02
Extended Time	--	--	--	--	--	--	--	--	--	--
Administered Using More Than Allotted Periods	951	1.52	94	0.40	214	0.70	797	1.89	908	1.74
Other Timing	412	0.66	68	0.29	174	0.57	327	0.78	252	0.48
Use of Scribe	52	0.08	5	0.02	9	0.03	22	0.05	31	0.06
Use of Calculator, Math Tables, etc.	71	0.11	--	--	--	--	75	0.18	103	0.20
Using Bilingual Dictionary	--	--	2	0.01	2	0.01	2	0.01	3	0.01
Other Response	8	0.01	2	0.01	2	0.01	5	0.01	7	0.01
Testing Individually	239	0.38	24	0.10	44	0.14	186	0.44	193	0.37
Testing in Small Group	3,054	4.87	243	1.04	736	2.42	2,289	5.42	2,498	4.77
Other Setting	69	0.11	12	0.05	11	0.04	82	0.19	66	0.13

5.9 Materials Handling and Return

The Test Administration Manual contained detailed instructions for how schools and districts should collect and package the Paper/Pencil, Braille, and/or Large Print testing materials at the end of the test administration. For Test Examiners, these activities included, but were not limited to, the following:

- Collecting test books from the students using the accommodated editions
- Returning all used and unused test books to the School 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)

For School Test Coordinators, these activities included, but were not limited to, the following:

- Collecting testing materials from the Test Examiners
- Returning all test books (scorable and nonscorable) to the District Test Coordinator
- Destroying all unused answer sheets and other nonsecure testing materials

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

- Verify 100% return of test books
- Complete the Test Book Accountability Form and fax it to Questar

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

5.9.1 Questar's Secure Material Check-In Procedures

Questar adhered to strict quality assurance procedures in order to ensure that all accommodated version test booklets were returned and accounted for. The check-in procedures included multiple steps to ensure that no test booklets were overlooked. All staff members received thorough and specific training before they participated in the check-in of test booklets.

Upon receipt of accommodated test booklets from the school districts, boxes were kept in a secure location and remained sealed until check-in. If a box had to be opened for any reason, it was immediately resealed.

Two teams checked in the secure materials. The first team prepared the test booklets for scanning. One district box was opened at a time, and secure test booklets were separated from ancillary materials and stacked on carts to be checked in. This process was repeated for all boxes for a district to ensure that all materials returned to Questar at the same time were checked in at the same time. Once the first team filled the cart(s) with all the secure materials from a district, the cart(s) was passed to a second team.

The second team checked in each test booklet by scanning the secure barcode into Questar‘s database. Operators worked in teams of two at computers equipped with barcode scanners. Operator 1 counted and scanned enough secure documents to fill a storage box. The operator verified that the database collected the same number of barcodes. If there was a discrepancy, an immediate reconciliation took place. Each ID number (barcode number) had a check digit that ensured that all numbers were correctly read by the scanner and that no ID number was miskeyed when manually entered. If a barcode was damaged or not readable, the operator manually entered the barcode number into the system. After this process was complete, the box of secure materials was handed to Operator 2 and scanned a second time. The database verified that the same barcode numbers were read during the scanning of the box or an immediate reconciliation took place. After verification, the secure materials were placed in a Questar box for storage. The scanning system provided audible and onscreen cues to alert operators of scanning discrepancies.

Further validity checks were done before each box was sealed to ensure that there were no ID barcode scanning discrepancies and that all ID numbers were correct. The validity checks also ensured that the ID numbers and the quantity in each box matched what was entered into the database. Finally, each box was placed on a pallet and stored.

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Post check-in procedures were also performed prior to notifying the districts of missing secure materials. For any district that was missing a secure material, an individual box-by-box hand search was conducted in an attempt to locate the secure material(s). If an unaccounted secure material was found, the material was then coded into the database by a Questar supervisor and Questar's Program Management team was notified. If unaccounted-for material(s) were not found during the box-by-box hand search, the material(s) was considered missing and the district was notified via the Secure Missing Material Report process.

5.10 Summary

The distribution, administration, and collection of the MO EOC Assessments was carefully communicated and executed in the detailed Test Administration Manual. All standards related to test security, administration, and accommodations were 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 Administration Manual for the MO EOC Assessments.

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Chapter 6: Scoring

6.1 Introduction

The MO EOC Assessment forms containing the SR items were processed and scored by Questar. SR items were automatically scored against a fixed key immediately after a test is submitted by the student. Each test form is tested entering 100% correct responses and 100% incorrect responses through both desktop and tablet clients, and each test score is validated as part of a comprehensive end-to-end process culminating in final reports. The PE/WPs were processed and scored by Pearson, and this chapter outlines the processes Pearson used to develop scoring materials for the PE/WPs, receive and scan student responses, hire and train scorers, score the PE/WPs, and maintain control of the quality of the scoring processes.

6.2 Scoring Requiring Human Judgement

Standard 5.9[13] relates specifically to item scoring that requires human judgment. The Standards suggest specific procedures that should be followed to ensure that handscoring of open-ended items is consistent and fair. The following sections outline the processes that were established and followed for handscoring of the PE/WPs in the MO EOC Assessments.

6.3 Scoring of the PE/WPs

The MO EOC Assessments for English II contained a WP, while the Algebra I and Biology Assessments contain PEs. The PE/WPs required students to respond with extended written answers to questions on given topics or to a series of questions regarding specific events. Questar transferred test responses periodically to the scoring contractor using a SIF 2.0r1 compliant protocol. As the scoring contractor, Pearson had responsibilities to score the PEs and WPs for English II, Algebra I, and Biology and return the score data in a SIF 2.0r1 compliant format to Questar.

The following sections outline Pearson‘s processes for scoring of the PE/WPs in the MO EOC Assessments for the 2012–2013 test administrations. PE/WPs introduced in previous test forms were reintroduced in the Fall 2012 and Spring 2013 administrations. The WPs were scored using automated scoring while other PEs were scored by human raters. Information regarding inter-rater reliability (IRR) for PE/WPs is included in Chapter 10.

6.3.1 Scorer Recruitment and Selection

Scoring quality starts with the recruitment process and extends through screening and placement (assigning scorers to prompts based on their skills and experience), training, qualification, and scoring. Pearson accessed a large pool of educated candidates to professionally evaluate assessment prompts. Pearson narrowed the selection to Missouri residents who have scored before and then hired Missouri residents who were new to scoring to help score the assessment.

[13] **Standard 5.9:** When test scoring involves human judgment, scoring rubrics should specify criteria for scoring. Adherence to established scoring criteria should be monitored and checked regularly. Monitoring procedures should be documented (pp. 64–65).

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Pearson carefully selected scorers according to their strengths and background. All scorers had, at a minimum, a four-year college degree. The following steps show an overview of key processes:

1. Process Timeline and Recruitment Tool: Pearson used a web-based application to collect data on scorer education, prior scoring experience, teaching credentials, work status, and other key information to screen candidates.

2. Initial Screening: Candidate data was analyzed and prospective scorers prioritized.

3. Interviews: Pearson conducted phone or online interviews to collect additional data for scorer screening and placement.

4. Offer: Pearson sent offer letters to prospective scorers detailing project requirements, timelines, and quality standards contingent upon proof of degree.

5. Verification: Degrees were verified through the National Student Clearinghouse or the institution. Prior experience was provided through hard copy documentation.

6. Final Documentation and Project Placement: Scorers signed confidentiality agreements agreeing to keep all information and student responses confidential. Only scorers who successfully completed training and qualifying were allowed to evaluate student responses.

7. Computer Certification for New Scorers: Prior to training, scorers completed computer testing to validate they had no questions and that no hardware or software issues existed.

6.3.2 Scorer Training and Qualification Procedures

Pearson content specialists designed training materials based on scoring training materials from DESE. To build the training sets, Pearson content specialists reviewed detailed notes and records received from DESE. Pearson scoring staff communicated with DESE during this process to maintain the decisions and intent of the original sets. After the training sets had been refined, they were submitted to DESE for review and approval.

Training materials included the following:

- Anchor Sets: The anchor set is the primary reference for scorers as they internalize the rubric during training. All scorers had access to the anchor set while scoring and were directed to refer to it regularly.

- Practice Sets: Practice sets were used to help trainees develop experience in independently applying the scoring guide or rubric to student responses. The practice sets provided guidance and practice for trainees in defining the line between score points, as well as applying the scoring criteria to a wider range of types of responses.

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- Qualification Sets: All qualifying sets were used to confirm that scorer trainees had grasped the scoring criteria and were able to accurately assign the range of scores to student responses. Scorer trainees had to demonstrate acceptable performance on these sets by meeting a predetermined standard for accuracy to qualify to score MAP EOC performance events and writing prompts. Pearson‘s digital scoring system programmatically enforced qualification rules.

6.3.3 Automated Scoring of WPs

Pearson performance scoring staff scored at least 500 responses per WP. From these responses, a representative sample reflecting the full range of student responses and scores was selected for training and calibrating the scoring engine, Intelligent Essay Assessor (IEA). The responses were 100% double-scored by human scorers, with the resolution of discrepant scores. Once the human scoring of the responses was completed, IEA was calibrated to score in a matter of days.

- Once trained, IEA‘s performance on each prompt were compared against human scoring performance.
- The IEA score was closer to a true score (i.e., more accurate) because the IEA score was based on the average of multiple scorers compared to a single or double-human score.
- When IEA‘s performance was comparable or better, it was used to score all responses with 10% percent human scoring. In addition, any responses that IEA could not confidently score was directed to a human for scoring.

6.4 Scorer Training

Scorers went through online training and qualifying prior to scoring, including reviewing scoring guidelines and procedures. This training provided scorers with a clear understanding of the training materials and scoring protocols of the MAP EOC. Scorers were expected to read and review annotations of the training materials with focused direction given by scoring directors or content specialists. The following are the modules used by Pearson during the training of the items:

- Scoring for Pearson: This gave a brief overview of what scoring is, the tools provided to help the scorers, and the individuals who would support the scorers during the project.

- Pearson Scoring System: This module trained the scorers on the internal scoring system.

- Scoring the Missouri Project: This module provided specifics regarding the Missouri Project. DESE and Pearson worked collaboratively so the scorers understood the project.

- Scoring the Item: This module walked the scorers through the anchor papers, practice and qualification papers. The scorers proceeded through the qualification process at the end of this module. If they passed qualification they continued on to the following modules

- Pearson Scoring System Part 2: This module was only accessible after the scorer qualified. It provided a more in-depth instruction of Pearson‘s internal scoring system.

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- Before you Score: This module provided information on how to handle unscorable student responses and provided further information on quality metrics the scorer was required to meet to be able to continue scoring.

Scoring started for the scorer once all modules were successfully completed.

6.5 Qualification

If applicants did not successfully complete the training and qualifying requirements, they were not allowed to score any MAP EOC student responses. Furthermore, qualified scorers were dismissed if their scoring performance did not meet defined standards. Below are the qualification standards that must have been met in order to score the Missouri Project:

- 4-point items
  - (0-4, 1-4 and 0-3)
  - 2 sets of 10 papers
  - 80% perfect agreement on one of two sets
  - Scorers saw both sets. If they passed the first, the second was a review.
  - Scoring started for the scorer after the final two modules were completed.

- 2- and 3-point items
  - (0-2)
  - 2 sets of 10 papers
  - 90% perfect agreement on one of two sets
  - Scorers saw both sets. If they passed the first, the second was a review.

- 1-point items
  - (0-1)
  - 2 sets of 10 papers
  - 100% perfect agreement on one of two sets
  - Scorers saw both sets. If they passed the first, the second was a review. Scoring started for the scorer after the final two modules were completed.

6.5.1 Second Read Procedures

Inter-Rater Reliability (IRR) is the agreement between the first and second scores assigned to student responses. IRR measurements include exact, adjacent, and nonadjacent agreement. Guidelines for IRR are determined in accordance with customer requirements and Pearson scoring standards for exact and adjacent agreement. Pearson scoring staff used IRR statistics as one factor in determining the needs for continuing training and intervention on both individual and group levels.

Pearson's scoring system included comprehensive IRR reports that allowed Pearson‘s content staff to monitor both individual and group performance. Based on reviews of these reports, scoring experts targeted individuals for increased backreading and feedback, and if necessary, retraining.

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The scoring hierarchy was as follows:

- First score if there are no other scores
- First score if the scores are adjacent when a second read occurs
- Back Reading score because it is assigned by a higher-level scoring expert
- Resolution score is always used when the first and second reads are not adjacent.

Ten percent of student responses were read and scored independently by two different scorers (10% second scoring). Second scoring allowed the Pearson scoring staff to monitor the performance of scorers and did not contribute to a student‘s score. Pearson used the second scores to provide scoring IRR statistics and monitor scorer performance. The digital scoring system allowed automatic and randomly distributed responses for second scoring; scorers had no indication whether a response had been scored previously or what the previous score was.

6.5.2 Scoring Monitoring and Recalibration Procedures

6.5.2.1 Backreading

Backreading was a major responsibility of Pearson‘s content staff and a primary tool for guarding against scorer drift. Pearson‘s scoring system‘s integrated backreading tool allowed Pearson staff to review the scores assigned to individual student responses by any given scorer.

Pearson‘s content area could perform a search for the following:

- Responses scored by a particular scorer
- Responses receiving a particular score point
- Responses with scores that agree with, are adjacent to, or are non-adjacent to each other
- Combinations of these features

Content staff reviewed responses to confirm that the scores were correctly assigned and given customized feedback and remediation to individual scorers.

6.5.2.2 Calibration

Content staff used calibration sets to reinforce scoring standards, introduce scoring decisions, or correct scoring issues and trends. The primary goal of calibration was to continue training and to reinforce the scoring standards. Calibration sets may be ―on the line” between score points or might contain unusual examples that are challenging to score and therefore useful for reinforcing the scoring rubric. Online calibration sets could be sent to entire groups, a subset of scorers, or individual scorers, as needed, to score independently. These annotated sample responses promoted accuracy by exploring project-specific issues, score boundaries, or types of responses that were particularly challenging to score consistently. After scoring an online calibration set, scorers could ask questions and seek clarification of the score point or annotation.

6.5.2.3 Managing Scoring Quality (Scorer Exception Processing)

Content staff, often along with a project manager or human resource representative, intervened when scorer performance statistics did not meet quality standards or a scorer violated other Pearson policies. Intervention included calibration, retraining, direct counseling and review of

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papers, and requalification. Scorer exception processing allowed Pearson's project managers to define intervals at which the scoring system would check scorer validity for exact and adjacent agreement. If scorers were below pre-set standards, messages automatically went out, interrupting their scoring process, to encourage scorers to work with scoring content, review anchor papers, or take other steps to improve their scoring. Through this process, Pearson‘s scoring system could automatically send an additional training/requalification set, and if performance was not improved, could lock scorers out of the scoring system. This automated process prevented scorers from continuing to score if standards were not maintained.

Because the system monitored scorers and provided the scorers information automatically, Pearson‘s content staff continually focused on quality control measures. These measures included backreading and messaging, calibration, and responding to questions in the review queue. Content staff was able to spend more time working directly with scorers who called or whom Pearson proactively contacted.

6.5.2.4 Validity

Validity responses are pre-scored responses strategically interspersed in the pool of live responses. These responses are not distinguishable from live responses and scorers' scores are only accepted for monitoring purposes, not in replacement of the pre-determined true scores. The use of validity responses provided an objective procedure that helped make sure scorers were applying the same standards throughout the project. This procedure offered feedback on the accuracy and consistency of individual scorers and groups of scorers assigned to a given item. Pearson‘s validity mechanism provided an objective and systematic check of accuracy. It verified that scorers applied the same standards throughout the project and, therefore, guarded against scorer drift and, ultimately, group drift. This procedure provided immediate feedback on individual scorers and the group as a whole. Validity papers are actual student responses chosen by content specialists as examples that clearly earn certain scores. Following the standards established, content staff assigned ―true scores” to validity responses to compare how often scorers matched them throughout the scoring sessions. The validity pool included responses encompassing the entire score range for each item. Scorers scored them without being aware that they were scoring validity papers rather than live responses. Validity responses were sent to scorers throughout the project.

6.5.2.5 Validity as Review

Select validity responses were annotated by the content staff and flagged for review. If a scorer incorrectly scored one of these responses, it would appear on the scorer‘s screen with the true score, the score he or she assigned, and an annotation. This feedback helped in preventing scorer drift. Once a scorer received feedback about a specific validity response, the response was flagged so the scorer did not receive it again.

6.5.2.6 Frequency Distribution

Frequency distribution, or the number or percentage of scores assigned at each score point of a rubric, was another key metric tracked and managed during scoring. Pearson evaluated any anomalous scoring trends at the item and scorer level and intervened with the individuals involved. Frequency distribution reports showed a breakdown of score points assigned on a

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given item. Expressed in percentages, data in these reports showed how often scorers, individually and as a group, assigned each score point.

6.5.2.7 *Retraining and Resetting Scores*

Pearson‘s electronic scoring system could purge the scores assigned by a scorer whose work was deemed substandard and allowed scoring leadership staff to reset scores by individual scorer, date range, or item. In those cases, the scores assigned by that individual were cleared from the database and the affected responses were reset. The responses were then rerouted to qualified scorers and rescored according to the original scoring design. Pearson used this process as needed during the project.

6.5.2.8 *Reporting and Data Analysis*

Pearson‘s digital scoring system automatically captured and tracked all score data. By reviewing up-to-date scorer performance statistics, Pearson could quickly identify particular scorers whose performance fell outside of group norms while also keeping close track of the group as a whole. Reports for use in quality monitoring and project completion status were generated and updated automatically and were available to Pearson scoring leadership staff at any time via the digital scoring system. Pearson‘s reports gave daily and cumulative statistics and provided individual and group average agreement percentages.

6.5.3 Description of the Item Types and Score Points for each Content Area

6.5.3.1 *Fall 2012*

English: English II was a persuasive essay prompt, with score points 1-4.

Algebra: Multi-part (7 sections) with a graphing task. 0-4 score points.

Biology:
Item 1 – Constructed response. 0–1 score points
Item 2 – Constructed response. 0–1 score points
Item 3 – Constructed response. 0–1 score points
Item 4 – Constructed response. 0–2 score points.
Item 5 – Graphing task, extended response. 0–5 score points
Item 6 – Constructed response. 0–2 score points
Item 7 – Constructed response. 0–2 score points
Item 8 – Constructed response. 0–2 score points.
Item 9 – Constructed response, extended item. 0–3 score points
Item 10 – Constructed response. 0–2 score points.

6.5.3.2 *Spring 2013*

English: English II was a descriptive essay prompt, with score points 1–4 (although some students used narrative elements or mode to deliver their response).

Algebra: Multi-part (5 sections). 0–4 score points

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Biology:
Item 1 – Constructed response. 0–1 score points.
Item 2 – Constructed response. 0–1 score points.
Item 3 – Constructed response. 0–1 score points.
Item 4 – Constructed response. 0–3 score points.
Item 5 – Constructed response. 0–2 score points
Item 6 – Constructed response. 0–3 score points.
Item 7 – Graphing task, extended response. 0–4 score points.
Item 8 – Constructed response, extended item. 0–3 score points.
Item 9 – Constructed response. 0–1 score points.
Item 10 – Constructed response. 0–1 score points.

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Chapter 7: Scaling and Equating

7.1 Introduction

This chapter details the scaling and equating procedures implemented for the MO EOC Assessments. The equating methods described in this chapter serve to maintain consistency of the MO EOC Assessments score scales over time and ensure that the achievement levels are applied consistently from year to year. In the 2012–2013 testing year, previously administered test forms were re-used and raw score to scale score conversions were already in existence. No equating was needed. However, the scaling and equating procedures established for the program and documented in previous technical reports are included here, as they are important psychometric procedures for the MO EOC Assessments.

A pre-equating model[14] has been used to produce scoring conversions for each MO EOC Assessment since the establishment of the program. This chapter begins with a description of the item response theory (IRT) models used for equating, which is followed by an overview of the scaling and equating procedures for the operational assessments.

7.2 Item Response Theory

WINSTEPS software (Linacre, 2006b) was used to perform the scaling and equating for the MO EOC Assessments during the administrations with and without PEs. WINSTEPS is designed to produce a single scale by jointly analyzing data from students‘ responses to both SR items and PE/WPs. SR items were calibrated using the Rasch model (Rasch, 1960; Wright and Stone, 1979), while the partial credit model (Masters 1982) was used to calibrate the PE/WPs.

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 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.

Masters (1982) developed the partial credit model as an extension of the Rasch model to handle polytomous items, or items that allow for partially correct responses (e.g., open-ended items).

For an item with possible scores ranging from zero to J, the probability of obtaining score j on item i, given θ, is

[14] Kolen and Brennan, 2004

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$$P_{ij:}\theta) = (\frac{e^{\sum_{k=0(}^{j}(\theta - d_{ik})}}{\sum_{x=0(}^{l(} e^{\sum_{k=0(}^{j(}(\theta - d_{ik})}},$$

where $d_{ij}$is the difference between the overall item difficulty, b_i, and the step parameter γ_{ij} for level j of item i, and the sum of step parameters is zero across all levels of item i.

7.3 Scaling and Equating

IRT pre-equating involves scaling item parameters and equating test forms based on field-test data before the forms are administered operationally. Note, however, that for the 2008–2009 year the forms were pre-equated retroactively (after the Spring 2009 operational administration) to allow for a one-time re-centering of the item pool using Spring 2009 operational data. The following approach was used for pre-equating these MO EOC Assessments:

1. Calibrate all 2008 standalone field-test forms concurrently without constraint.
2. Establish the base scale through calibration of the Spring 2009 operational forms without constraint.
3. Examine the stability of the common items from the two calibrations (i.e., the operational form items).
4. Re-center the 2008 item bank to the 2009 base scale.
5. Place the 2009 embedded field-test items onto the 2009 operational scale.
6. Perform fixed calibrations on the Summer 2009, Fall 2009, and Spring 2010 operational forms.
7. Place the 2010 embedded field-test items onto the 2009 operational scale.

Detailed procedures used for conducting scaling and equating are provided for the assessments that consist of SR items and PEs in the *2008–2009 MO EOC Phase I Technical Report* and the *2009–2010 MO EOC Phase I Technical Report*. Similarly, detailed procedures used for conducting scaling and equating are provided for the assessments that consist of SR items only in the *2009–2010 MO EOC Phase II Technical Report*.[15]

7.3.1 Scaling Transformations

Total scores for the MO EOC Assessments are 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 7.1.

[15] Missouri technical reports can be found online at http://dese.mo.gov/divimprove/assess/tech/index.html.

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Table 7.1: Form: Scale Score Ranges for the MO EOC Assessment Achievement Levels

Assessment	Achievement Level	Scale Score Range
English II	Below Basic	100–179
	Basic	180–199
	Proficient	200–224
	Advanced	225–250
Algebra I	Below Basic	100–176
	Basic	177–199
	Proficient	200–224
	Advanced	225–250
Biology	Below Basic	100–176
	Basic	177–199
	Proficient	200–224
	Advanced	225–250
English I	Below Basic	100–176
	Basic	177–199
	Proficient	200–224
	Advanced	225–250
Algebra II	Below Basic	100–181
	Basic	182–199
	Proficient	200–224
	Advanced	225–250
Geometry	Below Basic	100–181
	Basic	182–199
	Proficient	200–224
	Advanced	225–250
Government	Below Basic	100–178
	Basic	179–199
	Proficient	200–224
	Advanced	225–250
Am. History	Below Basic	100–181
	Basic	182–199
	Proficient	200–224
	Advanced	225–250

According to the *2009–2010 MO EOC Phase I and Phase II Technical Reports*, the procedure used to transform raw scores to scale scores was described as the following:

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:

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

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 adapted from Kolen and Brennan (2004, p. 337). For both the Spring 2009 base scale for English II, Algebra I, and Biology and the Spring 2010 base scale for English I, Algebra II, Geometry, Government, and American History, sc(y1) was 200 and sc(y2) was 225. Slopes and intercepts of the transformation functions are summarized in Table 7.2. These same slopes and intercepts will be applied to all future forms for each content area.

Table 7.2: Summary of Slopes and Intercepts of Theta to Scale Score Transformation Functions by Content Area[16]

Content Area	Basic			Proficient			Advanced			Slope	Intercept
	Raw Score	Theta	Scale Score	Raw Score	Theta	Scale Score	Raw Score	Theta	Scale Score		
English II	15	-0.71	180	24	0.51	200	33	2.04	225	16.35	191.72
Algebra I	13	-0.80	177	22	0.36	200	31	1.61	225	19.96	192.83
Biology	18	-0.69	177	32	0.51	200	45	1.79	225	19.53	189.99
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 also applied:

- 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.

[16] Scaling transformations were adjusted when PEs were removed (see p. 113 of the *2010–2011 MO EOC Phase I Technical Report*). These transformations are irrelevant in 2012–2013 since PEs were restored to the tests. Therefore, original transformations for these tests were used as documented in the *2008–2009 MO EOC Phase I Technical Report* and the *2009–2010 MO EOC Phase I Technical Report*, found online at http://dese.mo.gov/divimprove/assess/tech/index.html.

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Tables 7.3 to 7.26 provide the raw score to scale score conversions for Summer 2012, Fall 2012, and Spring 2013.

Table 7.3: Raw Score to Scale Score Conversions for Summer 2012, English II

Raw Score	Scale Score	*CSEM*
0	106	30
1	127	17
2	139	12
3	146	10
4	152	9
5	156	8
6	160	8
7	164	7
8	167	7
9	170	7
10	172	6
11	175	6
12	177	6
13	180	6
14	182	6
15	184	6
16	186	6
17	188	6
18	190	6
19	192	6
20	194	6
21	197	6
22	200	6
23	201	6
24	204	6
25	206	6
26	209	7
27	212	7
28	215	7
29	218	8
30	225	8
31	226	9
32	232	10
33	239	12
34	250	17
35	250	30

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Table 7.4: Raw Score to Scale Score Conversions for Summer 2012, Algebra I

Raw Score	Scale Score	*CSEM*
0	100	37
1	114	21
2	129	15
3	138	12
4	145	11
5	151	10
6	156	9
7	160	9
8	164	9
9	167	8
10	171	8
11	174	8
12	177	8
13	180	8
14	182	7
15	185	7
16	188	7
17	190	7
18	193	7
19	196	7
20	200	7
21	201	7
22	204	8
23	207	8
24	210	8
25	213	8
26	217	8
27	220	9
28	225	9
29	228	9
30	233	10
31	239	11
32	245	12
33	250	15
34	250	21
35	250	37

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Table 7.5: Raw Score to Scale Score Conversions for Summer 2012, Biology

Raw Score	Scale Score	*CSEM*
0	100	34
1	119	19
2	133	14
3	141	11
4	147	10
5	152	9
6	157	9
7	161	8
8	164	8
9	167	8
10	170	7
11	173	7
12	176	7
13	178	7
14	181	7
15	183	7
16	186	7
17	188	7
18	190	7
19	193	7
20	195	7
21	198	7
22	200	7
23	203	7
24	205	7
25	208	7
26	211	7
27	214	8
28	217	8
29	221	8
30	225	9
31	230	10
32	236	11
33	244	13
34	250	19
35	250	34

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Table 7.6: Raw Score to Scale Score Conversions for Summer 2012, 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

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Table 7.7: Raw Score to Scale Score Conversions for Summer 2012, 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

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Table 7.8: Raw Score to Scale Score Conversions for Summer 2012, 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

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Table 7.9: Raw Score to Scale Score Conversions for Summer 2012, 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

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Table 7.10: Raw Score to Scale Score Conversions for Summer 2012, Am. 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

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Table 7.11: Raw Score to Scale Score Conversions for Fall 2012, English II

Raw Score	Scale Score	*CSEM*
0	101	30
1	121	17
2	133	12
3	140	10
4	146	9
5	150	8
6	154	8
7	158	7
8	161	7
9	164	7
10	166	7
11	169	6
12	171	6
13	174	6
14	176	6
15	180	6
16	181	6
17	183	6
18	185	6
19	187	6
20	189	6
21	192	6
22	194	6
23	196	6
24	200	6
25	201	6
26	203	6
27	206	6
28	208	7
29	211	7
30	214	7
31	217	7
32	221	8
33	225	8
34	228	9
35	233	9
36	239	11
37	248	13
38	250	17
39	250	30

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Table 7.12: Raw Score to Scale Score Conversions for Fall 2012, Algebra I

Raw Score	Scale Score	*CSEM*
0	100	37
1	113	20
2	128	15
3	137	12
4	144	11
5	149	10
6	154	9
7	158	9
8	161	8
9	165	8
10	168	8
11	171	8
12	174	7
13	177	7
14	179	7
15	182	7
16	184	7
17	187	7
18	189	7
19	192	7
20	194	7
21	196	7
22	200	7
23	201	7
24	204	7
25	206	7
26	209	7
27	212	7
28	215	8
29	218	8
30	221	8
31	225	8
32	228	9
33	232	9
34	236	10
35	242	11
36	249	12
37	250	15
38	250	20
39	250	37

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Table 7.13: Raw Score to Scale Score Conversions for Fall 2012, Biology

Raw Score	Scale Score	*CSEM*
0	100	36
1	107	20
2	121	14
3	130	12
4	136	10
5	141	10
6	146	9
7	149	8
8	153	8
9	156	7
10	158	7
11	161	7
12	163	7
13	165	6
14	167	6
15	169	6
16	171	6
17	173	6
18	175	6
19	177	6
20	178	6
21	180	6
22	181	6
23	183	6
24	185	5
25	186	5
26	188	5
27	189	5
28	191	5
29	192	5
30	194	5
31	195	5
32	197	5
33	198	6
34	200	6
35	201	6
36	203	6
37	205	6
38	206	6
39	208	6
40	210	6
41	212	6

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Raw Score	Scale Score	*CSEM*
42	214	6
43	216	7
44	218	7
45	221	7
46	225	7
47	226	8
48	229	8
49	233	9
50	237	9
51	242	10
52	248	12
53	250	14
54	250	20
55	250	36

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Table 7.14: Raw Score to Scale Score Conversions for Fall 2012, English I

Raw Score	Scale Score	*CSEM*
0	100	41
1	101	23
2	117	16
3	127	14
4	134	12
5	140	11
6	145	10
7	150	10
8	153	9
9	157	9
10	160	8
11	163	8
12	166	8
13	169	8
14	172	8
15	175	8
16	177	8
17	180	7
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	202	8
27	205	8
28	208	8
29	211	8
30	214	8
31	217	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

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Table 7.15: Raw Score to Scale Score Conversions for Fall 2012, Algebra II

Raw Score	Scale Score	*CSEM*
0	100	37
1	111	21
2	126	15
3	135	12
4	142	11
5	147	10
6	152	9
7	156	9
8	160	8
9	163	8
10	166	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	202	7
25	204	7
26	206	7
27	209	7
28	212	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

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Table 7.16: Raw Score to Scale Score Conversions for Fall 2012, Geometry

Raw Score	Scale Score	*CSEM*
0	100	41
1	100	23
2	117	16
3	127	14
4	134	12
5	140	11
6	145	10
7	150	10
8	154	9
9	158	9
10	161	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	8
21	193	8
22	195	8
23	200	8
24	201	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	233	10
35	238	11
36	244	12
37	250	14
38	250	16
39	250	23
40	250	41

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Table 7.17: Raw Score to Scale Score Conversions for Fall 2012, 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	163	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	6
19	187	6
20	189	6
21	191	6
22	194	7
23	196	7
24	198	7
25	200	7
26	203	7
27	205	7
28	208	7
29	210	7
30	213	7
31	216	8
32	219	8
33	225	8
34	227	9
35	231	10
36	236	10
37	243	12
38	250	14
39	250	20
40	250	35

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Table 7.18: Raw Score to Scale Score Conversions for Fall 2012, Am. History

Raw Score	Scale Score	*CSEM*
0	100	49
1	100	27
2	100	20
3	111	16
4	119	15
5	127	13
6	133	12
7	138	12
8	143	11
9	148	11
10	152	10
11	156	10
12	159	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	192	9
23	195	9
24	200	9
25	201	9
26	204	9
27	208	10
28	211	10
29	215	10
30	219	10
31	225	11
32	227	11
33	232	12
34	237	12
35	243	13
36	250	14
37	250	16
38	250	20
39	250	27
40	250	49

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Table 7.19: Raw Score to Scale Score Conversions for Spring 2013, English II

Raw Score	Scale Score	*CSEM*
0	106	30
1	126	17
2	138	12
3	145	10
4	151	9
5	155	8
6	159	8
7	162	7
8	165	7
9	168	6
10	170	6
11	173	6
12	175	6
13	177	6
14	180	6
15	181	6
16	183	5
17	184	5
18	186	5
19	188	5
20	190	5
21	192	6
22	194	6
23	195	6
24	197	6
25	200	6
26	202	6
27	204	6
28	206	6
29	209	7
30	212	7
31	214	7
32	218	7
33	225	8
34	226	9
35	231	9
36	237	11
37	245	13
38	250	18
39	250	31

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Table 7.20: Raw Score to Scale Score Conversions for Spring 2013, Algebra I

Raw Score	Scale Score	*CSEM*
0	100	37
1	114	20
2	128	15
3	138	12
4	144	11
5	150	10
6	155	9
7	159	9
8	162	8
9	166	8
10	169	8
11	172	8
12	177	7
13	178	7
14	180	7
15	183	7
16	185	7
17	188	7
18	190	7
19	192	7
20	195	7
21	197	7
22	200	7
23	202	7
24	204	7
25	207	7
26	209	7
27	212	7
28	215	7
29	217	8
30	221	8
31	225	8
32	227	9
33	231	9
34	236	10
35	241	11
36	248	12
37	250	15
38	250	20
39	250	37

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Table 7.21: Raw Score to Scale Score Conversions for Spring 2013, Biology

Raw Score	Scale Score	*CSEM*
0	100	36
1	111	20
2	125	14
3	134	12
4	140	10
5	145	10
6	149	9
7	153	8
8	156	8
9	159	8
10	162	7
11	165	7
12	167	7
13	170	7
14	172	6
15	174	6
16	177	6
17	178	6
18	180	6
19	182	6
20	183	6
21	185	6
22	187	6
23	189	6
24	190	6
25	192	6
26	193	6
27	195	6
28	197	6
29	198	6
30	200	6
31	201	6
32	203	6
33	205	6
34	206	6
35	208	6
36	209	6
37	211	6
38	212	6
39	214	6
40	216	6
41	218	6

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Raw Score	Scale Score	*CSEM*
42	219	6
43	221	6
44	225	6
45	226	7
46	228	7
47	231	7
48	233	8
49	237	8
50	241	9
51	245	10
52	250	12
53	250	14
54	250	20
55	250	36

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Table 7.22: Raw Score to Scale Score Conversions for Spring 2013, 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

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Table 7.23: Raw Score to Scale Score Conversions for Spring 2013, 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

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Table 7.24: Raw Score to Scale Score Conversions for Spring 2013, 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

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Table 7.25: Raw Score to Scale Score Conversions for Spring 2013, 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

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Table 7.26: Raw Score to Scale Score Conversions for Spring 2013, Am. 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

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Chapter 8: Reporting

8.1 Introduction

The purpose of reporting assessment data is to communicate test results to students, parents, teachers, administrators, and other stakeholders. The 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 and skills with respect to a 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 CLEs to provide more detailed information for each student in specific test areas.

Questar delivers a General Research File (GRF) to DESE at the end of each test administration that contains the individual responses and their score to each item in each test. In addition, Questar provides a Guide to Interpreting Results to DESE to post on their website that provides explanations of the CLEs and ALDs for each content area, as well as samples of the Individual Student Report (ISR) and the Student Score Label with descriptions of the information they contain. ISRs were provided in the iTester system for all assessment windows. Student Score Label were provided in hard copy to districts following each administration.

For each testing event, Questar converted each student‘s raw score points earned into an EOC scale score, as described in Chapter 7 of this report. A student received an EOC scale score when he or she had 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 II, Algebra I, Biology, 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 field-test data from the 2008 field test for English II, Algebra I, and Biology and the 2009 field-test forms for English I, Algebra II, Geometry, Government, and American History—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 of this report.

No test provides a perfect measure of a student‘s ability 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 with a new test of comparable difficulty, he or she would likely obtain a slightly different score. The expected 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.

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8.2 Individual Student Report (ISR)

The 2012–2013 Individual Student Report (ISR) provides information about performance on the MO EOC Assessment, describing the results in terms of four levels of achievement in a content area. It is used for measuring 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 parent-teacher conferences and for permanent recordkeeping. 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 MO EOC Assessment. A student at the Proficient or Advanced level has met the standard.

A sample of the ISR appears in Figure 8.1. A brief description of selected parts of the report is as follows:

A. The heading of the ISR 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 Below Basic, Basic, Proficient, or Advanced) 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 achievement level. 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.

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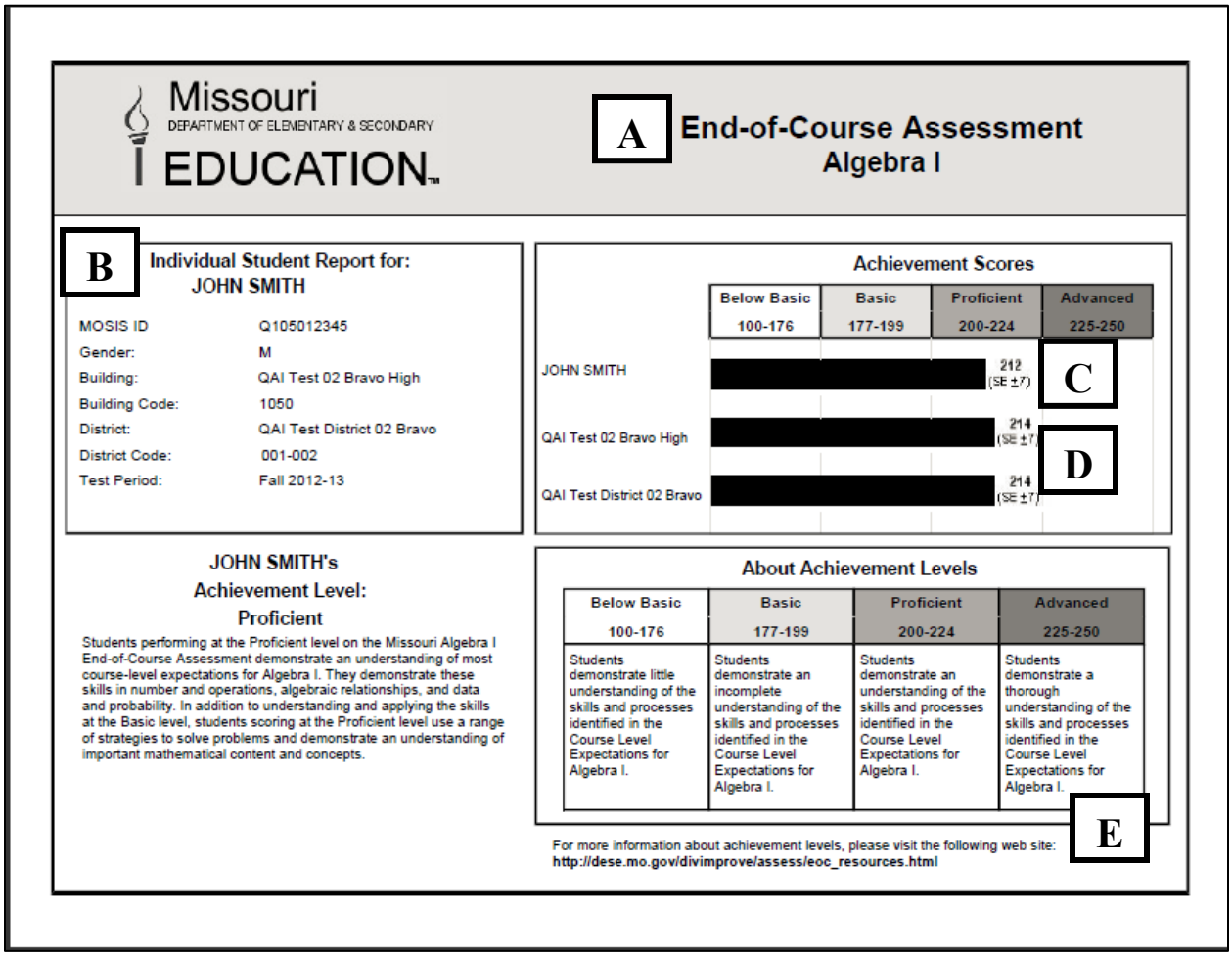
Figure 8.1: Individual Student Report (ISR)



Missouri DEPARTMENT OF ELEMENTARY & SECONDARY EDUCATION

A

End-of-Course Assessment
Algebra I

B

Individual Student Report for:
JOHN SMITH

MOSIS ID	Q105012345
Gender:	M
Building:	QAI Test 02 Bravo High
Building Code:	1050
District:	QAI Test District 02 Bravo
District Code:	001-002
Test Period:	Fall 2012-13

Achievement Scores

	Below Basic 100-176	Basic 177-199	Proficient 200-224	Advanced 225-250
JOHN SMITH	212 (SE ±7)			
QAI Test 02 Bravo High	214 (SE ±7)			
QAI Test District 02 Bravo	214 (SE ±7)			

C

D

JOHN SMITH's
Achievement Level:
Proficient

Students performing at the Proficient level on the Missouri Algebra I End-of-Course Assessment demonstrate an understanding of most course-level expectations for Algebra I. They demonstrate these skills in number 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.

About Achievement Levels

Below Basic 100-176	Basic 177-199	Proficient 200-224	Advanced 225-250
Students demonstrate little understanding of the skills and processes identified in the Course Level Expectations for Algebra I.	Students demonstrate an incomplete understanding of the skills and processes identified in the Course Level Expectations for Algebra I.	Students demonstrate an understanding of the skills and processes identified in the Course Level Expectations for Algebra I.	Students demonstrate a thorough understanding of the skills and processes identified in the Course Level Expectations for Algebra I.

E

For more information about achievement levels, please visit the following web site:
http://dese.mo.gov/divimprove/assess/eoc_resources.html

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8.3 Student Score Label

The 2012–2013 Student Score Label provides a summary of a student‘s results on the MO EOC Assessment. A separate label is produced for each content area tested. The individual label provides the student‘s biographic data, scale score, and achievement level. The labels have adhesive backing so they can be easily transferred onto the student record folders.

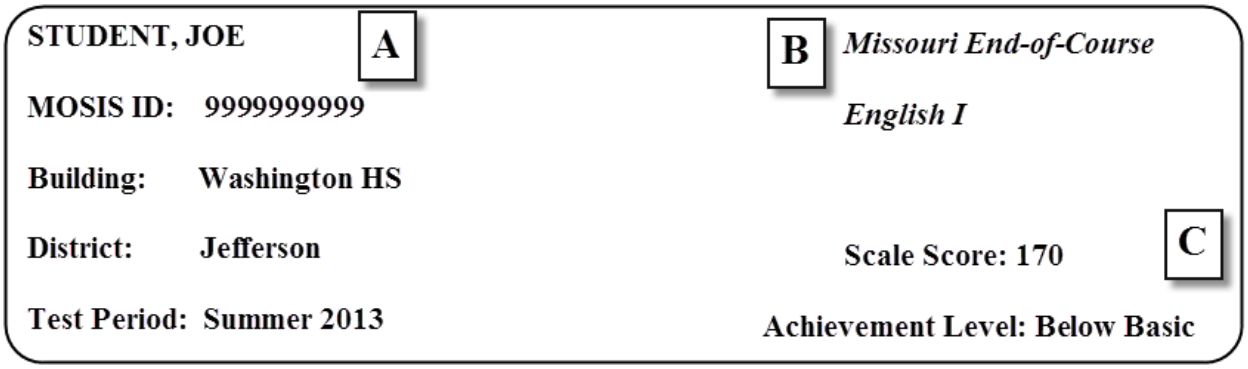
A sample label is shown in Figure 8.2. A brief description of selected parts of the label is as follows:

A. The left side of the label shows the student‘s name and identifying information.

B. The upper right side 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 lower right side shows the student‘s scale score and achievement level.

Figure 8.2: Student Score Label



8.4 Missouri Comprehensive Data System Portal

For the first two years of MO EOC Assessment administration, summary-level EOC results were available to school district personnel in a set of standard reporting configurations through the Department‘s Crystal Reporting system. Reporting options included administrative reports, adequate yearly progress (AYP) reports, achievement level reports, content standard reports, and item analysis reports. Beginning with the 2011–2012 school year, the Department transitioned all assessment reporting to the state‘s data portal, the Missouri Comprehensive Data System (MCDS). MCDS provides the general public with access to high-level EOC summary reports and allows school district personnel with appropriate permissions to access EOC data at a variety of levels. Through MCDS, designated district personnel are able to request on-demand, customized reports that are configured and disaggregated in ways that best meet their needs for such activities as evaluating programs, revising curriculum, and improving teaching and learning.

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Users access MCDS from a link to the portal on the Department's homepage (http://dese.mo.gov/). From there, they access the data portal directly through the MCDS link.

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Secure content is available through a link at the top of the MCDS portal's homepage. District users with appropriate permissions can log in to access data. Once users have logged in, they are returned to the MCDS portal page where they can locate EOC data through the State Assessment link.

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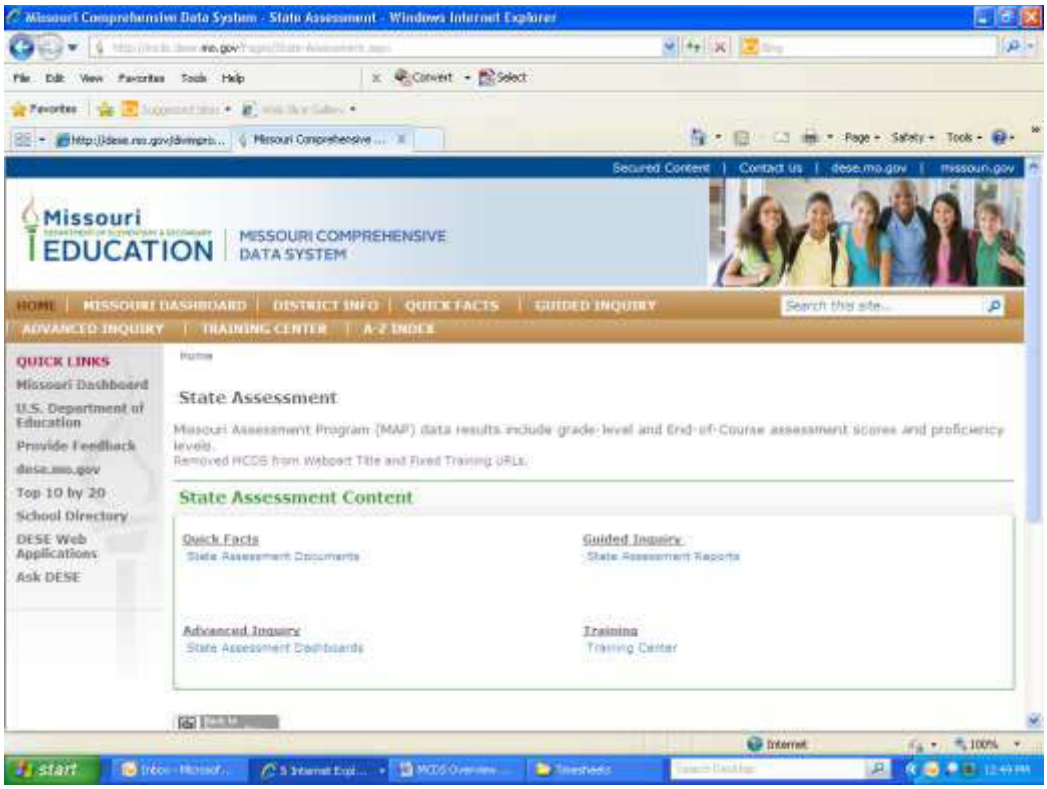
On the State Assessment page, a Guided Inquiry link allows users to create summary Administrative reports, Achievement Level reports, and AYP reports. Authenticated users may also download student level data from the Quick Facts link on the Guided Inquiry page.



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Missouri EDUCATION | MISSOURI COMPREHENSIVE DATA SYSTEM

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- Education Staff
- Special Education
- State Assessment
- Student Characteristics

All Site Content

Home > Guided Inquiry > State Assessment

State Assessment

State Assessment Data Category

For those authenticated users, with Student Level Data access, raw MAP data may be downloaded from the Quick Facts State Assessment page.

Administrative

Type	Name	Description
	District Historical MAP Proficiency	Contains historical MAP proficiency results for districts and schools.
	District MAP Proficiency by Grade	Contains MAP Proficiency by content area grade level for districts and schools.
	EOC History Report	Contains all End-of-Course (EOC) assessment taken by a student.
	EOC Student Banking	Contains data about students who participated in Algebra I and English II prior to grade nine. Students in this report are used for AYP accountability purposes when they enroll for the first time in grade nine on the September count date.
	Level Not Determined	Contains the list of students by school who didn't receive a valid MAP score in subject area for which the district is accountable.
	MAP Participation Invalidation	Contains the list of students that were invalidated. These students are still participants for Accountability purposes.
	MAP Scale Score Summary	Contains the achievement level, scale score and Terra Nova percentile for each student in a building by year, content area, grade and examiner.
	MAP Student Achievement Level	Contains the achievement level for each student in a building by year, content area and grade.
	MAP Student Demographics	Contains the demographics for each student in a building by year, content area and grade.
	MAP-A Student Report	Contains the achievement level and scale score for each MAP-A student in a building by year, content area, and grade.

Achievement Level - 4 Levels

Type	Name	Description
	Achievement Level 4 Chart	Contains aggregate data of student categories and types performing in the top two achievement levels displayed in charts.
	Achievement Level 4 Report	Contains aggregate data of student categories and types by achievement level.

AYP - Federal Accountability

Type	Name	Description
	AYP - Additional Indicator	Contains school and district/LEA attendance and graduation rate data used for AYP accountability purposes.
	AYP - Grid	
	AYP - Growth Targets Met	Students in this report are on track to be proficient and are used for AYP growth model calculations.
	AYP - Growth Trajectory	Contains data about student growth trajectories for determining if a student is on track to be proficient in four years or by eighth grade.
	AYP - Summary	Contains school and district/LEA group totals, overall met and sanction.
	AYP - Supporting Data	Contains detailed subgroup data for federal accountability reporting.

Back to Previous Page

Missouri Comprehensive Data System
Home | Quick Facts | Guided Inquiry | Advanced Inquiry

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An unlimited number and configuration of reports may be created through MCDS. In addition to Administrative Reports, the MCDS portal also provides an unlimited configuration of summary reports, as shown in Table 8.1, that are beyond the scope of this technical report. Additional information and training pertaining to MCDS capabilities are available on DESE's website at http://mcds.dese.mo.gov/trainingcenter/Pages/default.aspx.

Table 8.1: Reports Available on the MCDS Portal

Report Type	Report
Administrative Reports	Guided Inquiry - State Assessment Administrative: MAP Scale Score Summary
	Guided Inquiry - State Assessment Administrative: MAP Student Demographics
	Guided Inquiry - State Assessment Administrative: MAP Participation Invalidation
	Guided Inquiry - State Assessment Administrative: MAP Student Achievement Level
Achievement Level Reports	Guided Inquiry - State Assessment Achievement Level - 4 Levels: Achievement Level 4 Report
	Guided Inquiry - State Assessment Achievement Level - 4 Levels: Achievement Level 4 Charts
Content Standards Report	Guided Inquiry - State Assessment Content Standard - Item Analysis: Content Standard Summary
Item Analysis Expanded Reports	Guided Inquiry - State Assessment Content Standard - Item Analysis: Content Standard IBD
	Guided Inquiry - State Assessment Content Standard - Item Analysis: Goal Process IBD

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 (FRL), 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

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the student is an LEP/ELL Title 3, the number of months the LEP/ELL student has been in the U.S., 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 tested, grade level, achievement level, and scale score for each content area tested.

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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 eight MO EOC Assessments from the Summer 2012, Fall 2012, and Spring 2013 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

Table 9.1 summarizes the descriptive statistics for total raw score (RS) by test administration (test period) and content area; the total number of students who took the particular MO EOC Assessment (n-count); the minimum, maximum, and mean raw scores; and the SD.

Table 9.1: Descriptive Statistics for Total Raw Score

Test Period	Content Area	N-Count	Min.	Max.	Mean	SD
Summer 2012	English II	428	3	34	19.386	6.275
	Algebra I	888	0	34	17.58	5.954
	Biology	321	5	34	17.545	5.847
	English I	307	0	38	21.205	7.139
	Algebra II	144	6	37	16.59	6.020
	Geometry	241	0	37	18.386	6.996
	Government	839	5	40	23.874	8.318
	Am. History	264	5	40	19.807	7.215
Fall 2012	English II	2,940	0	37	22.832	7.317
	Algebra I	3,896	0	39	21.142	8.891
	Biology	2,837	4	55	30.056	11.897
	English I	846	6	39	25.689	6.961
	Algebra II	445	7	40	27.551	6.893
	Geometry	753	8	40	26.389	6.888
	Government	16,805	0	40	24.422	7.131
	Am. History	1,323	3	39	22.508	6.285
Spring 2013	English II	61,237	0	39	26.909	6.364
	Algebra I	64,544	0	39	22.789	7.362
	Biology	62,355	0	55	36.276	9.731
	English I	62,683	0	40	25.805	7.438
	Algebra II	23,426	1	40	24.372	7.220
	Geometry	30,482	2	40	25.231	7.246
	Government	42,218	0	40	25.247	7.998
	Am. History	52,324	0	40	23.536	7.436

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9.3 Descriptive Statistics for Total Raw Score by Cluster

Tables 9.2 through 9.4 summarize the number correct RS—including the average raw score, the SD, and the standard error of measurement (SEM)—by test administration (test period), content area, and cluster. More information on SEM is provided in Chapter 10.

Table 9.2: Descriptive Statistics for Total Raw Score by Test Administration, Content Area, and Cluster—Summer 2012

Test Period	Content Area	Cluster	Mean	SD	SEM
Summer 2012	English II	Reading	16.66	5.65	2.44
		Writing	2.72	1.25	1.02
	Algebra I	Number and Operations	4.35	1.77	1.27
		Algebraic Relationships	8.47	3.49	1.97
		Data and Probability	4.76	1.80	1.21
	Biology	Characteristics and Interactions of Living Organisms	9.85	3.41	2.19
		Changes in Ecosystems and Interactions of Organisms with their Environments	7.70	3.11	1.55
	English I	Reading	21.21	7.14	2.88
	Algebra II	Algebraic Relationships	4.35	1.77	--
		Data and Probability	8.47	3.49	--
		Numbers and Operations	4.76	1.80	1.30
	Geometry	Algebraic Relationships	9.85	3.41	2.48
		Geometric and Spatial Relationships	7.70	3.11	1.63
		Measurement	--	--	--
	Government	Principles and Processes of Governance Systems	11.58	4.38	--
		Principles of Constitutional Democracy	12.29	4.40	3.18
	Am. History	Missouri, United States, and World History	19.81	7.22	2.90

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Table 9.3: Descriptive Statistics for Total Raw Score by Test Administration, Content Area, and Cluster—Fall 2012

Test Period	Content Area	Cluster	Mean	SD	SEM
Fall 2012	English II	Reading	18.78	6.11	2.28
		Writing	2.24	1.25	1.01
	Algebra I	Number and Operations	4.81	2.17	1.18
		Algebraic Relationships	11.95	5.55	2.13
		Data and Probability	4.39	1.96	1.25
	Biology	Characteristics and Interactions of Living Organisms	11.60	4.73	2.08
		Changes in Ecosystems and Interactions of Organisms with their Environments	8.14	3.11	1.50
		Scientific Inquiry	10.34	5.31	2.09
	English I	Reading	25.69	6.96	2.72
	Algebra II	Algebraic Relationships	4.81	2.17	1.31
		Data and Probability	11.95	5.55	2.56
		Numbers and Operations	4.39	1.96	1.38
	Geometry	Algebraic Relationships	11.60	4.73	3.21
		Geometric and Spatial Relationships	8.14	3.11	1.59
		Measurement	10.34	5.31	3.11
	Government	Principles and Processes of Governance Systems	12.59	4.00	--
		Principles of Constitutional Democracy	11.83	3.64	2.68
	Am. History	Missouri, United States, and World History	22.50	6.29	2.83

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Table 9.4: Descriptive Statistics for Total Raw Score by Test Administration, Content Area, and Cluster—Spring 2013

Test Period	Content Area	Cluster	Mean	SD	SEM
Spring 2013	English II	Reading	20.46	4.99	2.13
		Writing	3.31	1.18	0.93
	Algebra I	Number and Operations	5.21	1.86	1.20
		Algebraic Relationships	12.10	4.78	2.28
		Data and Probability	5.48	1.67	1.11
	Biology	Characteristics and Interactions of Living Organisms	12.97	4.14	2.08
		Changes in Ecosystems and Interactions of Organisms with their Environments	10.00	2.65	1.34
		Scientific Inquiry	13.32	4.33	2.19
	English I	Reading	25.81	7.43	2.72
	Algebra II	Algebraic Relationships	5.21	1.86	--
		Data and Probability	12.10	4.78	--
		Numbers and Operations	5.48	1.67	1.05
	Geometry	Algebraic Relationships	12.97	4.14	2.79
		Geometric and Spatial Relationships	10.00	2.65	1.25
		Measurement	13.32	4.33	2.49
	Government	Principles and Processes of Governance Systems	12.35	4.22	--
		Principles of Constitutional Democracy	12.89	4.21	3.05
	Am. History	Missouri, United States, and World History	23.54	7.44	2.81

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9.4 Descriptive Statistics for Scale Scores by Test Administration and Content Area

Descriptive statistics of scale scores and percentage distributions of students‘ achievement levels are summarized in Tables 9.5 and 9.6. Table 9.5 summarizes student scale scores by each MO EOC Assessment for the Summer 2012, Fall 2012, and Spring 2013 administrations. Table 9.6 lists the percentage and frequency of students in each achievement level.

Table 9.5: Scale Score Distributions for Each MO EOC Assessment

Descriptive Statistics						
Test Period	**Content Area**	**N-Count**	**Min.**	**Max.**	**Mean**	**SD**
Summer 2012	English II	428	146	250	194.04	15.47
	Algebra I	888	100	250	192.27	17.88
	Biology	321	152	250	189.66	15.88
	English I	307	100	250	191.01	20.62
	Algebra II	144	152	245	182.89	15.42
	Geometry	241	100	250	184.90	21.02
	Government	839	150	250	199.53	21.29
	Am. History	264	130	250	184.63	23.30
Fall 2012	English II	2,940	101	248	197.04	18.48
	Algebra I	3,896	100	250	198.07	25.51
	Biology	2,837	136	250	194.74	21.71
	English I	846	145	250	203.38	20.22
	Algebra II	445	156	250	212.81	19.70
	Geometry	753	154	250	209.16	21.20
	Government	16,805	100	250	200.84	18.97
	Am. History	1,323	111	250	193.87	21.46
Spring 2013	English II	61,237	106	250	206.51	16.21
	Algebra I	64,544	100	250	202.54	20.19
	Biology	62,355	100	250	211.11	18.03
	English I	62,683	100	250	204.29	22.32
	Algebra II	23,426	112	250	202.54	19.54
	Geometry	30,482	117	250	205.40	22.39
	Government	42,218	100	250	202.99	20.96
	Am. History	52,324	100	250	197.13	25.08

The scale score range is 100 to 250 for every content area. Table 9.6 summarizes the minimum scale score needed to obtain each level of achievement. Note that the cut scores for the achievement levels of Proficient and Advanced are 200 and 225, respectively, for each content area.

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Table 9.6: Scale Score Cuts by Content Area

Content Area	Basic	Proficient	Advanced
English II	180	200	225
Algebra I	177	200	225
Biology	178	200	225
English I	177	200	225
Algebra II	182	200	225
Geometry	182	200	225
Government	179	200	225
Am. History	182	200	225

Tables 9.7 through 9.9 show the number of participating students and the proportion in each level of achievement across years and administrations by content area. Table 9.10 shows the percentage of students in each achievement level by test administration and content area from Fall 2008 to Spring 2013, and Table 9.11 shows the percentage of students in each achievement level by content area for the entire administration year from 2008–2009 to 2012–2013.

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Table 9.7: Achievement-Level Distributions for Each MO EOC Assessment—Summer 2012

Test Period	Content Area	Achievement Level	Freq.	%*
Summer 2012	English II	Below Basic	60	13.97
		Basic	198	46.31
		Proficient	148	34.54
		Advanced	22	5.17
		Total	428	100.00
	Algebra I	Below Basic	161	18.15
		Basic	381	42.90
		Proficient	301	33.88
		Advanced	45	5.06
		Total	888	100.00
	Biology	Below Basic	70	21.78
		Basic	175	54.56
		Proficient	64	19.91
		Advanced	12	3.74
		Total	321	100.00
	English I	Below Basic	77	25.08
		Basic	132	43.01
		Proficient	74	24.09
		Advanced	24	7.81
		Total	307	100.00
	Algebra II	Below Basic	71	49.28
		Basic	56	38.94
		Proficient	13	9.02
		Advanced	4	2.75
		Total	144	100.00
	Geometry	Below Basic	106	44.00
		Basic	79	32.78
		Proficient	45	18.70
		Advanced	11	4.51
		Total	241	100.00
	Government	Below Basic	136	16.17
		Basic	295	35.20
		Proficient	289	34.43
		Advanced	119	14.19
		Total	839	100.00
	Am. History	Below Basic	119	45.10
		Basic	74	28.05
		Proficient	57	21.56
		Advanced	14	5.28
		Total	264	100.00

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Table 9.8: Achievement-Level Distributions for Each MO EOC Assessment—Fall 2012

Test Period	Content Area	Achievement Level	Freq.	%
Fall 2012	English II	Below Basic	499	16.94
		Basic	908	30.91
		Proficient	1,312	44.66
		Advanced	221	7.48
		Total	2,940	100.00
	Algebra I	Below Basic	815	20.90
		Basic	1,226	31.46
		Proficient	1,096	28.16
		Advanced	759	19.47
		Total	3,896	100.00
	Biology	Below Basic	590	20.79
		Basic	1,049	36.96
		Proficient	880	31.02
		Advanced	318	11.22
		Total	2,837	100.00
	English I	Below Basic	92	10.89
		Basic	235	27.83
		Proficient	381	44.99
		Advanced	138	16.28
		Total	846	100.00
	Algebra II	Below Basic	29	6.49
		Basic	65	14.63
		Proficient	200	44.99
		Advanced	151	33.88
		Total	445	100.00
	Geometry	Below Basic	70	9.35
		Basic	148	19.69
		Proficient	330	43.78
		Advanced	205	27.17
		Total	753	100.00
	Government	Below Basic	1,557	9.24
		Basic	6,721	40.04
		Proficient	6,122	36.41
		Advanced	2,405	14.30
		Total	16,805	100.00
	Am. History	Below Basic	361	27.28
		Basic	327	24.75
		Proficient	523	39.49
		Advanced	112	8.47
		Total	1,323	100.00

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Table 9.9: Achievement-Level Distributions for Each MO EOC Assessment—Spring 2013

Test Period	Content Area	Achievement Level	Freq.	%
Spring 2013	English II	Below Basic	2,529	4.18
		Basic	15,783	25.74
		Proficient	31,320	51.15
		Advanced	11,605	18.92
		Total	61,237	100.00
	Algebra I	Below Basic	4,958	7.70
		Basic	22,134	34.32
		Proficient	26,867	41.58
		Advanced	10,585	16.39
		Total	64,544	100.00
	Biology	Below Basic	1,928	3.08
		Basic	12,804	20.57
		Proficient	31,454	50.49
		Advanced	16,169	25.96
		Total	62,355	100.00
	English I	Below Basic	7,004	11.22
		Basic	17,799	28.38
		Proficient	24,615	39.27
		Advanced	13,265	21.12
		Total	62,683	100.00
	Algebra II	Below Basic	2,879	12.32
		Basic	7,910	33.77
		Proficient	9,011	38.50
		Advanced	3,626	15.51
		Total	23,426	100.00
	Geometry	Below Basic	4,103	13.42
		Basic	7,910	25.96
		Proficient	11,832	38.83
		Advanced	6,637	21.78
		Total	30,482	100.00
	Government	Below Basic	4,899	11.55
		Basic	13,883	32.89
		Proficient	15,796	37.40
		Advanced	7,640	18.15
		Total	42,218	100.00
	Am. History	Below Basic	14,232	27.17
		Basic	13,525	25.85
		Proficient	16,081	30.69
		Advanced	8,486	16.17
		Total	52,324	100.00

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Table 9.10: Percentage of Students in Each Achievement Level by Test Administration and Content Area

Content Area	Achievement Level	Test Administration									
		Fall 2008		Spring 2009		Summer 2009		Fall 2009		Spring 2010	
		Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
English II	Below Basic	52	3.9	2,377	4.1	74	10.5	23	1.6	1,830	3.0
	Basic	258	19.6	12,321	21.4	318	45.0	325	22.9	14,260	23.0
	Proficient	693	52.6	30,403	52.7	286	40.5	884	62.2	31,658	51.1
	Advanced	314	23.8	12,593	21.8	28	4.0	190	13.4	14,163	22.9
	Total	1,317	100	57,694	100	706	100	1,422	100	61,911	100
Algebra I	Below Basic	141	6.3	5,368	10.0	271	21.1	208	8.4	3,733	6.2
	Basic	621	27.6	19,555	36.5	629	49.0	963	38.7	20,593	34.0
	Proficient	1,094	48.7	20,822	38.9	320	24.9	943	37.9	25,381	41.9
	Advanced	392	17.4	7,781	14.5	64	5.0	374	15.0	10,837	17.9
	Total	2,248	100	53,526	100	1,284	100	2,488	100	60,544	100
Biology	Below Basic	84	4.5	4,148	7.4	99	20.2	187	8.8	3,703	6.2
	Basic	576	31.1	19,435	34.9	270	55.0	706	33.3	20,890	34.9
	Proficient	954	51.4	25,538	45.8	104	21.2	867	40.9	27,984	46.7
	Advanced	241	13.0	6,611	11.9	18	3.7	362	17.1	7,327	12.2
	Total	1,855	100	55,732	100	491	100	2,122	100	59,904	100
English I	Below Basic	--	--	--	--	--	--	42	13.2	5,283	12.5
	Basic	--	--	--	--	--	--	118	37.1	13,254	31.3
	Proficient	--	--	--	--	--	--	105	33.0	16,699	39.5
	Advanced	--	--	--	--	--	--	53	16.7	7,081	16.7
	Total	--	--	--	--	--	--	318	100	42,317	100
Algebra II	Below Basic	--	--	--	--	--	--	48	9.1	4,266	19.5
	Basic	--	--	--	--	--	--	174	33.1	8,470	38.8
	Proficient	--	--	--	--	--	--	201	38.3	6,909	31.7
	Advanced	--	--	--	--	--	--	102	19.4	2,179	10.0
	Total	--	--	--	--	--	--	525	100	21,824	100
Geometry	Below Basic	--	--	--	--	--	--	48	8.1	5,151	19.2
	Basic	--	--	--	--	--	--	121	20.5	7,913	29.5
	Proficient	--	--	--	--	--	--	234	39.6	9,246	34.4
	Advanced	--	--	--	--	--	--	188	31.8	4,548	16.9
	Total	--	--	--	--	--	--	591	100	26,858	100
Government	Below Basic	--	--	--	--	--	--	3,179	15.0	4,628	12.5
	Basic	--	--	--	--	--	--	7,501	35.4	13,710	37.1
	Proficient	--	--	--	--	--	--	7,470	35.3	13,144	35.6
	Advanced	--	--	--	--	--	--	3,018	14.3	5,448	14.8
	Total	--	--	--	--	--	--	21,168	100	36,930	100
Am. History	Below Basic	--	--	--	--	--	--	166	23.8	10,385	31.8
	Basic	--	--	--	--	--	--	176	25.2	9,047	27.7
	Proficient	--	--	--	--	--	--	235	33.7	9,275	28.4
	Advanced	--	--	--	--	--	--	121	17.3	3,929	12.0
	Total	--	--	--	--	--	--	698	100	32,636	100

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Table 9.10 (continued): Percentage of Students in Each Achievement Level by Test Administration and Content Area

Content Area	Achievement Level	Test Administration											
		Summer 2010		Fall 2010		Spring 2011		Summer 2011		Fall 2011		Spring 2012	
		Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
English II	Below Basic	76	16.0	145	7.9	2,548	4.0	44	14.1	386	12.8	3,323	5.4
	Basic	213	44.7	537	29.3	13,463	21.1	132	42.2	1,050	34.8	12,701	20.5
	Proficient	168	35.3	780	42.6	30,712	48.2	121	38.7	1,301	43.1	33,536	54.1
	Advanced	19	4.0	371	20.2	16,959	26.6	16	5.1	285	9.4	12,464	20.1
	Total	476	100	1,833	100	63,682	100	313	100	3,022	100	62,024	100
Algebra I	Below Basic	133	11.8	353	12.9	5,381	8.4	85	13.5	794	19.9	5,311	8.2
	Basic	562	49.9	993	36.2	18,914	29.6	335	53.3	1,212	30.3	22,278	34.6
	Proficient	340	30.2	721	26.3	26,590	41.5	167	26.6	1,116	27.9	23,244	36.1
	Advanced	91	8.1	674	24.6	13,112	20.5	42	6.7	877	21.9	13,613	21.1
	Total	1,126	100	2,741	100	63,997	100	629	100	3,999	100	64,446	100
Biology	Below Basic	89	23.2	292	12.2	3,932	6.3	56	20.1	501	16.5	4,804	7.8
	Basic	160	41.7	831	34.8	19,250	31.0	137	49.1	1,269	41.9	22,522	36.5
	Proficient	117	30.5	760	31.8	29,029	46.8	74	26.5	916	30.2	25,845	41.9
	Advanced	18	4.7	508	21.2	9,857	15.9	12	4.3	343	11.3	8,575	13.9
	Total	384	100	2,391	100	62,068	100	279	100	3,029	100	61,746	100
English I	Below Basic	37	18.9	40	12.2	4,564	10.8	57	23.2	40	18.2	4,220	9.5
	Basic	81	41.3	87	26.6	13,035	30.9	110	44.7	69	31.4	12,504	28.2
	Proficient	64	32.7	116	35.5	16,204	38.4	66	26.8	71	32.4	20,164	45.5
	Advanced	14	7.1	84	25.7	8,368	19.8	13	5.3	40	18.2	7,415	16.7
	Total	196	100	327	100	42,171	100	246	100	220	100	44,303	100
Algebra II	Below Basic	39	34.5	46	9.0	1,905	8.5	57	46.0	41	8.0	2,791	11.1
	Basic	62	54.9	155	30.3	8,606	38.2	55	44.4	112	21.8	8,229	32.7
	Proficient	10	8.8	226	44.2	9,391	41.7	10	8.1	216	42.0	10,088	40.1
	Advanced	2	1.8	84	16.4	2,604	11.6	2	1.6	145	28.2	4,042	16.1
	Total	113	100	511	100	22,506	100	124	100	514	100	25,150	100
Geometry	Below Basic	96	41.9	143	16.3	4,248	16.3	61	31.8	128	17.6	3,610	11.9
	Basic	95	41.5	227	25.9	8,783	33.7	77	40.1	140	19.2	7,659	25.3
	Proficient	34	14.8	321	36.6	10,291	39.4	45	23.4	226	31.0	15,024	49.7
	Advanced	4	1.7	187	21.3	2,766	10.6	9	4.7	235	32.2	3,958	13.1
	Total	229	100	878	100	26,088	100	192	100	729	100	30,251	100
Government	Below Basic	177	20.1	1,591	9.0	2,998	7.5	69	8.4	2,689	15.6	3,440	8.6
	Basic	304	34.5	6,540	37.2	12,622	31.6	342	41.7	6,345	36.8	15,288	38.0
	Proficient	246	27.9	7,411	42.1	17,626	44.2	297	36.2	5,778	33.5	15,391	38.3
	Advanced	154	17.5	2,047	11.6	6,661	16.7	113	13.8	2,416	14.0	6,080	15.1
	Total	881	100	17,589	100	39,907	100	821	100	17,228	100	40,199	100
Am. History	Below Basic	26	56.5	170	26.1	8,458	24.3	97	52.4	213	25.6	9,775	25.3
	Basic	8	17.4	165	25.3	8,842	25.4	48	26.0	209	25.2	10,146	26.3
	Proficient	10	21.7	231	35.4	13,182	37.9	36	19.5	287	34.5	14,434	37.4
	Advanced	2	4.3	86	13.2	2,296	12.4	4	2.2	122	14.7	4,216	10.9
	Total	46	100	652	100	34,778	100	185	100	831	100	38,571	100

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Table 9.10 (continued): Percentage of Students in Each Achievement Level by Test Administration and Content Area

Content Area	Achievement Level	Test Administration					
		Summer 2012		Fall 2012		Spring 2013	
		Freq.	%	Freq.	%	Freq.	%
English II	Below Basic	60	14.0	499	16.9	2,529	4.1
	Basic	198	46.3	908	30.9	15,783	25.8
	Proficient	148	34.5	1,312	44.7	31,320	51.1
	Advanced	22	5.2	221	7.5	11,605	19.0
	Total	428	100	2,940	100	61,237	100
Algebra I	Below Basic	161	18.2	815	20.9	4,958	7.7
	Basic	381	42.9	1,226	31.5	22,134	34.3
	Proficient	301	33.9	1,096	28.2	26,867	41.6
	Advanced	45	5.1	759	19.5	10,585	16.4
	Total	888	100	3,896	100	64,544	100
Biology	Below Basic	70	21.8	590	20.8	1,928	3.1
	Basic	175	54.6	1,049	37.0	12,804	20.5
	Proficient	64	19.9	880	31.0	31,454	50.4
	Advanced	12	3.7	318	11.2	16,169	25.9
	Total	321	100	2,837	100	62,355	100
English I	Below Basic	77	25.1	92	10.9	7,004	11.2
	Basic	132	43.0	235	27.8	17,799	28.4
	Proficient	74	24.1	381	45.0	24,615	39.3
	Advanced	24	7.8	138	16.3	13,265	21.2
	Total	307	100	846	100	62,683	100
Algebra II	Below Basic	71	49.3	29	6.5	2,879	12.3
	Basic	56	38.9	65	14.6	7,910	33.8
	Proficient	13	9.0	200	45.0	9,011	38.5
	Advanced	4	2.8	151	33.9	3,626	15.5
	Total	144	100	445	100	23,426	100
Geometry	Below Basic	106	44.0	70	9.4	4,103	13.5
	Basic	79	32.8	148	19.7	7,910	25.9
	Proficient	45	18.7	330	43.8	11,832	38.8
	Advanced	11	4.4	205	27.2	6,637	21.8
	Total	241	100	753	100	30,482	100
Government	Below Basic	136	16.2	1,557	9.2	4,899	11.6
	Basic	295	35.2	6,721	40.0	13,883	32.9
	Proficient	289	34.4	6,122	36.4	15,796	37.4
	Advanced	119	14.2	2,405	14.3	7,640	18.1
	Total	839	100	16,805	100	42,218	100
Am. History	Below Basic	119	45.1	361	27.3	14,232	27.2
	Basic	74	28.1	327	24.8	13,525	25.8
	Proficient	57	21.6	523	39.5	16,081	30.7
	Advanced	14	5.3	112	8.5	8,486	16.2
	Total	264	100	1,323	100	52,324	100

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Table 9.11: Percentage of Students in Each Achievement Level by Administration Year and Content Area

Content Area	Achievement Level	Administration Year									
		2008–2009		2009–2010		2010–2011		2011–2012		2012–2013	
		Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
English II	Below Basic	2,429	4.1	1,927	3.0	2,769	4.2	3,753	5.7	3,088	4.8
	Basic	12,579	21.3	14,903	23.3	14,213	21.5	13,883	21.2	16,889	26.1
	Proficient	31,096	52.7	32,828	51.3	31,660	48.0	34,958	53.5	32,780	50.7
	Advanced	12,907	21.9	14,381	22.5	17,349	26.3	12,765	19.5	11,848	18.3
	Total	59,011	100.0	64,039	100.0	65,991	100.0	65,359	100.0	64,605	100.0
Algebra I	Below Basic	5,509	9.9	4,212	6.5	5,867	8.6	6,190	9.0	5,934	8.6
	Basic	20,176	36.2	22,185	34.5	20,469	30.2	23,825	34.5	23,741	34.2
	Proficient	21,916	39.3	26,644	41.4	27,651	40.7	24,527	35.5	28,264	40.8
	Advanced	8,173	14.7	11,275	17.5	13,877	20.4	14,532	21.0	11,389	16.4
	Total	55,774	100.0	64,316	100.0	67,864	100.0	69,074	100.0	69,328	100.0
Biology	Below Basic	4,232	7.3	3,989	6.4	4,313	6.7	5,361	8.2	2,588	4.0
	Basic	20,011	34.7	21,866	35.0	20,241	31.2	23,928	36.8	14,028	21.4
	Proficient	26,492	46.0	28,955	46.3	29,906	46.1	26,835	41.3	32,398	49.5
	Advanced	6,852	11.9	7,707	12.3	10,383	16.0	8,930	13.7	16,499	25.2
	Total	57,587	100.0	62,517	100.0	64,843	100.0	65,054	100.0	65,513	100.0
English I	Below Basic	--	--	5,325	12.5	4,641	10.9	4,317	9.6	7,173	11.2
	Basic	--	--	13,372	31.4	13,203	30.9	12,683	28.3	18,166	28.5
	Proficient	--	--	16,804	39.4	16,384	38.4	20,301	45.3	25,070	39.3
	Advanced	--	--	7,134	16.7	8,466	19.8	7,468	16.7	13,427	21.0
	Total	--	--	42,635	100.0	42,694	100.0	44,769	100.0	63,836	100.0
Algebra II	Below Basic	--	--	4,314	19.3	1,990	8.6	2,889	11.2	2,979	12.4
	Basic	--	--	8,644	38.7	8,823	38.1	8,396	32.6	8,031	33.4
	Proficient	--	--	7,110	31.8	9,627	41.6	10,314	40.0	9,224	38.4
	Advanced	--	--	2,281	10.2	2,690	11.6	4,189	16.2	3,781	15.7
	Total	--	--	22,349	100.0	23,130	100.0	25,788	100.0	24,015	100.0
Geometry	Below Basic	--	--	5,199	18.9	4,487	16.5	3,799	12.2	4,279	13.6
	Basic	--	--	8,034	29.3	9,105	33.5	7,876	25.3	8,137	25.9
	Proficient	--	--	9,480	34.5	10,646	39.1	15,295	49.1	12,207	38.8
	Advanced	--	--	4,736	17.3	2,957	10.9	4,202	13.5	6,853	21.8
	Total	--	--	27,449	100.0	27,195	100.0	31,172	100.0	31,476	100.0
Government	Below Basic	--	--	7,807	13.4	4,766	8.2	6,198	10.6	6,592	11.0
	Basic	--	--	21,211	36.5	19,466	33.3	21,975	37.7	20,899	34.9
	Proficient	--	--	20,614	35.5	25,283	43.3	21,466	36.9	22,207	37.1
	Advanced	--	--	8,466	14.6	8,862	15.2	8,609	14.8	10,164	17.0
	Total	--	--	58,098	100.0	58,377	100.0	58,248	100.0	59,862	100.0
Am. History	Below Basic	--	--	10,551	31.7	8,654	24.4	10,085	25.5	14,712	27.3
	Basic	--	--	9,223	27.7	9,015	25.4	10,403	26.3	13,926	25.8
	Proficient	--	--	9,510	28.5	13,423	37.8	14,757	37.3	16,661	30.9
	Advanced	--	--	4,050	12.1	2,384	6.7	4,342	11.0	8,612	16.0
	Total	--	--	33,334	100.0	35,476	100.0	39,587	100.0	53,911	100.0

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Table 9.10 demonstrates that percentages of students at each achievement level for the 2012–2013 testing year are consistent with historical data for comparable test administrations except those for Biology during the Spring 2013 administration. For Biology, noticeable growth is observed in the Spring 2013 results where 50% of the students reached the Proficient level and 26% attained the Advanced level. Historically, the percentages of students in those categories ranged between 42% and 47% at the Proficient level and between 12% and 16% at the Advanced level.

Special analysis was conducted to investigate possible reasons that may attribute to growth in Biology. Since Biology, as with English II and Algebra I, was administered without PEs in Fall 2011 and a raw score to scale score conversion was created, the conversion was applied to the SR total scores from the Spring 2013 administration. The results, shown in Table 9.12, demonstrate that, when PEs were excluded, the percentages of students at each achievement level are consistent with historical data. Similar analyses were also conducted for English II and Algebra I. As expected, the results for these two tests show that percentages of students at each achievement level are similar with or without PEs.

Growth in Biology comes primarily from growth in the performance of PEs. PEs, after being suspended from Summer 2010 to Summer 2012, were restored to the tests in Fall 2012. In addition, 2012–2013 was the year when student performance on the Biology EOC became, for the first time, part of accountability measures. Consequently, teaching and learning on related content became a focal part of instructional practices. Unlike English II and Algebra I that each consist of one PE/WP with a maximum of 4 points, Biology PEs had a total of 20 points in Spring 2013, constituting slightly more than one third of the total 55 points on the assessment. Therefore, growth in PEs becomes prominent for Biology.

Table 9.12: Percentage of Students in Each Achievement Level Excluding PEs for the Spring 2013 Administration

Content Area	Achievement Level	SR Only	
		Spring 2013	
		Freq.	%
English II	Below Basic	2,818	4.60
	Basic	13,041	21.30
	Proficient	32,643	53.31
	Advanced	12,735	20.80
	Total	61,237	100.00
Algebra I	Below Basic	5,642	8.74
	Basic	19,361	30.00
	Proficient	27,406	42.46
	Advanced	12,135	18.80
	Total	64,544	100.00
Biology	Below Basic	3,890	6.24
	Basic	20,168	32.34
	Proficient	28,452	45.63
	Advanced	9,845	15.79
	Total	62,355	100.00

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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 9.13 through 9.60. The results are only reported for groups with 10 or more students.

The demographic variables included are gender, ethnicity, migrant status, free and reduced lunch (FRL), limited English proficient (LEP), Title I, individualized education program (IEP), and accommodations.

Table 9.13: Scale Score Distributions by Demographic Group—Gender, Summer 2012

Test Period	Content Area	Gender	N-Count	Min.	Max.	Mean	SD
Summer 2012	English II	Female	166	164	232	194.80	15.68
		Male	262	146	250	193.56	15.35
	Algebra I	Female	385	145	245	191.19	17.03
		Male	503	100	250	193.10	18.48
	Biology	Female	148	152	250	189.39	16.31
		Male	173	157	244	189.88	15.55
	English I	Female	127	100	250	192.63	23.46
		Male	180	153	250	189.87	18.33
	Algebra II	Female	57	163	221	183.93	11.83
		Male	87	152	245	182.21	17.41
	Geometry	Female	120	100	250	183.53	21.63
		Male	121	141	234	186.27	20.38
	Government	Female	463	157	250	199.37	19.91
		Male	376	150	250	199.72	22.89
	Am. History	Female	118	130	241	183.25	23.64
		Male	146	141	250	185.75	23.05

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Table 9.14: Scale Score Distributions by Demographic Group—Gender, Fall 2012

Test Period	Content Area	Gender	N-Count	Min.	Max.	Mean	SD
Fall 2012	English II	Female	1,364	133	248	199.05	17.81
		Male	1,576	101	248	195.30	18.88
	Algebra I	Female	1,773	100	250	199.15	24.76
		Male	2,123	100	250	197.17	26.09
	Biology	Female	1,316	136	250	195.00	21.58
		Male	1,521	136	250	194.51	21.83
	English I	Female	388	157	250	205.02	19.82
		Male	458	145	250	202.00	20.47
	Algebra II	Female	248	156	250	211.32	19.4
		Male	197	166	250	214.69	19.97
	Geometry	Female	366	154	250	209.19	20.63
		Male	387	158	250	209.13	21.76
	Government	Female	8,340	100	250	199.78	18.18
		Male	8,465	128	250	201.89	19.67
	Am. History	Female	654	111	250	191.22	19.98
		Male	669	119	250	196.45	22.54

Table 9.15: Scale Score Distributions by Demographic Group—Gender, Spring 2013

Test Period	Content Area	Gender	N-Count	Min.	Max.	Mean	SD
Spring 2013	English II	Female	30,472	106	250	208.96	15.88
		Male	30,765	106	250	204.09	16.18
	Algebra I	Female	31,987	100	250	202.92	19.74
		Male	32,557	100	250	202.17	20.62
	Biology	Female	30,986	100	250	211.11	17.54
		Male	31,369	100	250	211.11	18.50
	English I	Female	31,013	100	250	206.50	22.23
		Male	31,670	100	250	202.12	22.21
	Algebra II	Female	12,549	143	250	201.38	18.87
		Male	10,877	112	250	203.87	20.20
	Geometry	Female	15,659	127	250	204.22	22.20
		Male	14,823	117	250	206.64	22.53
	Government	Female	20,627	100	250	201.50	20.22
		Male	21,591	100	250	204.41	21.55
	Am. History	Female	25,726	100	250	194.14	24.04
		Male	26,598	100	250	200.01	25.72

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Table 9.16: Scale Score Distributions by Demographic Group—Ethnicity, Summer 2012

Test Period	Content Area	Ethnicity	N-Count	Min.	Max.	Mean	SD
Summer 2012	English II	American Indian/ Alaskan Native	--	--	--	--	--
		Asian	--	--	--	--	--
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	182	156	232	190.71	12.74
		Hispanic	25	164	226	199.16	16.30
		White (not Hispanic)	210	146	250	195.83	16.92
		Multi-racial	--	--	--	--	--
	Algebra I	American Indian/ Alaskan Native	--	--	--	--	--
		Asian	--	--	--	--	--
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	405	100	239	186.28	16.29
		Hispanic	40	151	228	193.93	18.51
		White (not Hispanic)	413	145	250	197.57	17.71
		Multi-racial	13	174	239	196.23	17.65
	Biology	American Indian/ Alaskan Native	--	--	--	--	--
		Asian	--	--	--	--	--
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	140	152	244	184.10	14.42
		Hispanic	12	170	211	192.58	14.79
		White (not Hispanic)	163	164	250	194.19	15.83
		Multi-racial	--	--	--	--	--

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Table 9.16 (continued): Scale Score Distributions by Demographic Group—Ethnicity, Summer 2012

Test Period	Content Area	Ethnicity	N-Count	Min.	Max.	Mean	SD
Summer 2012	English I	American Indian/ Alaskan Native	--	--	--	--	--
		Asian	--	--	--	--	--
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	149	157	234	185.46	16.26
		Hispanic	11	157	229	198.73	18.53
		White (not Hispanic)	133	100	250	197.24	22.23
		Multi-racial	--	--	--	--	--
	Algebra II	American Indian/ Alaskan Native	--	--	--	--	--
		Asian	--	--	--	--	--
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	95	152	233	180.21	12.81
		Hispanic	--	--	--	--	--
		White (not Hispanic)	45	163	245	188.11	19.32
		Multi-racial	--	--	--	--	--
	Geometry	American Indian/ Alaskan Native	--	--	--	--	--
		Asian	--	--	--	--	--
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	165	100	229	179.22	18.90
		Hispanic	12	154	221	190.25	19.03
		White (not Hispanic)	57	161	250	199.98	20.70
		Multi-racial	--	--	--	--	--
	Government	American Indian/ Alaskan Native	--	--	--	--	--
		Asian	28	172	250	212.57	22.85
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	132	150	240	188.40	19.22
		Hispanic	56	157	234	196.82	17.43
		White (not Hispanic)	612	157	250	201.52	21.12
		Multi-racial	--	--	--	--	--
	Am. History	American Indian/ Alaskan Native	--	--	--	--	--
		Asian	--	--	--	--	--
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	118	130	221	172.69	18.93
		Hispanic	12	167	225	187.08	16.31
		White (not Hispanic)	129	130	250	195.49	22.52
		Multi-racial	--	--	--	--	--

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Table 9.17: Scale Score Distribution by Demographic Group—Ethnicity, Fall 2012

Test Period	Content Area	Ethnicity	N-Count	Min.	Max.	Mean	SD
Fall 2012	English II	American Indian/ Alaskan Native	11	158	228	192.64	24.41
		Asian	43	133	233	196.93	25.25
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	1,172	133	248	192.79	16.69
		Hispanic	142	158	239	191.18	17.95
		White (not Hispanic)	1,503	133	248	200.76	18.59
		Multi-racial	62	101	248	203.26	21.88
	Algebra I	American Indian/ Alaskan Native	15	149	228	187.53	26.08
		Asian	75	149	250	210.64	27.46
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	772	100	250	183.30	20.06
		Hispanic	183	128	250	194.16	22.18
		White (not Hispanic)	2,790	100	250	202.10	25.45
		Multi-racial	54	144	250	200.76	23.37
	Biology	American Indian/ Alaskan Native	10	149	226	189.50	24.53
		Asian	56	161	250	212.04	25.01
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	623	136	242	180.01	16.18
		Hispanic	165	141	242	191.93	20.53
		White (not Hispanic)	1,920	141	250	199.21	20.92
		Multi-racial	57	149	250	198.49	22.47

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Table 9.17 (continued): Scale Score Distributions by Demographic Group—Ethnicity, Fall 2012

Test Period	Content Area	Ethnicity	N-Count	Min.	Max.	Mean	SD
Fall 2012	English I	American Indian/ Alaskan Native	--	--	--	--	--
		Asian	19	169	240	213.37	17.06
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	108	145	225	187.21	18.33
		Hispanic	46	160	247	199.22	20.76
		White (not Hispanic)	655	153	250	206.12	19.17
		Multi-racial	12	157	225	199.50	22.87
	Algebra II	American Indian/ Alaskan Native	--	--	--	--	--
		Asian	14	182	250	214.79	22.23
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	63	156	247	198.37	21.35
		Hispanic	28	178	241	211.82	17.15
		White (not Hispanic)	320	163	250	215.03	18.23
		Multi-racial	19	187	250	224.42	18.13
	Geometry	American Indian/ Alaskan Native	--	--	--	--	--
		Asian	23	190	250	219.87	18.95
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	88	154	250	193.45	20.25
		Hispanic	50	161	238	206.50	15.56
		White (not Hispanic)	562	158	250	211.60	20.84
		Multi-racial	23	174	238	211.04	17.84
	Government	American Indian/ Alaskan Native	89	156	243	200.29	18.69
		Asian	418	159	250	210.84	21.53
		Pacific Islander	32	152	236	194.06	19.98
		Black (not Hispanic)	3,219	128	250	191.13	16.52
		Hispanic	741	128	250	195.99	17.12
		White (not Hispanic)	12,095	100	250	203.39	18.63
		Multi-racial	211	156	250	201.45	19.01
	Am. History	American Indian/ Alaskan Native	--	--	--	--	--
		Asian	27	138	237	194.22	24.83
		Pacific Islander	--	--	--	--	--
		Black (not Hispanic)	164	111	232	179.39	22.38
		Hispanic	68	143	227	188.60	20.59
		White (not Hispanic)	1,030	133	250	196.54	20.31
		Multi-racial	26	152	237	194.81	21.35

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Table 9.18: Scale Score Distribution by Demographic Group—Ethnicity, Spring 2013

Test Period	Content Area	Ethnicity	N-Count	Min.	Max.	Mean	SD
Spring 2013	English II	American Indian/ Alaskan Native	275	162	250	207.45	15.45
		Asian	1,112	162	250	211.51	17.85
		Pacific Islander	104	168	245	203.12	15.96
		Black (not Hispanic)	8,882	106	250	196.97	15.43
		Hispanic	2,474	138	250	203.43	15.36
		White (not Hispanic)	47,480	106	250	208.36	15.7
		Multi-racial	910	106	250	205.73	16.06
	Algebra I	American Indian/ Alaskan Native	310	150	250	201.24	20.08
		Asian	1,222	100	250	213.65	22.44
		Pacific Islander	125	162	250	201.73	20.29
		Black (not Hispanic)	10,013	100	250	189.96	18.38
		Hispanic	2,847	100	250	199.83	19.17
		White (not Hispanic)	48,910	100	250	205.01	19.51
		Multi-racial	1,117	100	250	202.46	19.39
	Biology	American Indian/ Alaskan Native	298	159	250	211.08	17.47
		Asian	1,162	153	250	216.64	21.25
		Pacific Islander	116	153	250	205.69	18.88
		Black (not Hispanic)	9,134	100	250	198.50	17.77
		Hispanic	2,490	149	250	206.31	17.93
		White (not Hispanic)	48,238	100	250	213.64	16.91
		Multi-racial	917	159	250	210.71	17.56

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Table 9.18 (continued): Scale Score Distributions by Demographic Group—Ethnicity, Spring 2013

Test Period	Content Area	Ethnicity	N-Count	Min.	Max.	Mean	SD
Spring 2013	English I	American Indian/ Alaskan Native	285	145	250	201.88	21.96
		Asian	1,090	145	250	210.56	23.72
		Pacific Islander	117	100	247	195.78	22.35
		Black (not Hispanic)	8,932	100	250	190.98	20.88
		Hispanic	2,614	100	250	198.33	21.44
		White (not Hispanic)	48,602	100	250	206.96	21.65
		Multi-racial	1,043	126	250	203.71	21.68
	Algebra II	American Indian/ Alaskan Native	121	166	250	200.79	18.76
		Asian	358	160	250	209.28	21.87
		Pacific Islander	35	169	239	201.66	19.44
		Black (not Hispanic)	2,488	148	250	191.42	16.88
		Hispanic	784	148	250	199.56	18.18
		White (not Hispanic)	19,341	112	250	203.95	19.36
		Multi-racial	299	152	250	204.26	21.01
	Geometry	American Indian/ Alaskan Native	160	150	250	202.49	21.77
		Asian	470	150	250	218.68	25.01
		Pacific Islander	65	161	250	202.72	23.43
		Black (not Hispanic)	3,350	127	250	190.86	21.36
		Hispanic	1,184	146	250	200.42	21.07
		White (not Hispanic)	24,827	117	250	207.39	21.68
		Multi-racial	426	141	250	204.68	23.63
	Government	American Indian/ Alaskan Native	223	154	250	198.95	19.51
		Asian	713	100	250	207.74	23.18
		Pacific Islander	73	157	250	199.92	21.49
		Black (not Hispanic)	5,152	100	250	190.67	18.83
		Hispanic	1,546	145	250	196.46	20.26
		White (not Hispanic)	33,867	100	250	205.09	20.56
		Multi-racial	644	154	250	202.83	20.05
	Am. History	American Indian/ Alaskan Native	242	150	250	198.56	22.46
		Asian	958	100	250	203.47	26.65
		Pacific Islander	89	130	241	189.53	23.60
		Black (not Hispanic)	6,936	100	250	182.76	23.75
		Hispanic	1,969	100	250	190.90	24.79
		White (not Hispanic)	41,477	100	250	199.68	24.40
		Multi-racial	653	141	250	197.36	24.99

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Table 9.19: Scale Score Distribution by Demographic Group—Migrant Status, Summer 2012

Test Period	Content Area	Migrant	N-Count	Min.	Max.	Mean	SD
Summer 2012	English II	No	414	146	250	194.19	15.44
		Yes	--	--	--	--	--
	Algebra I	No	874	100	250	192.41	17.82
		Yes	--	--	--	--	--
	Biology	No	307	152	250	189.70	15.89
		Yes	--	--	--	--	--
	English I	No	306	100	250	190.97	20.63
		Yes	--	--	--	--	--
	Algebra II	No	140	152	245	183.08	15.58
		Yes	--	--	--	--	--
	Geometry	No	238	100	250	184.76	20.92
		Yes	--	--	--	--	--
	Government	No	825	150	250	199.70	21.20
		Yes	--	--	--	--	--
	Am. History	No	257	130	250	184.36	23.48
		Yes	--	--	--	--	--

Table 9.20: Scale Score Distribution by Demographic Group—Migrant Status, Fall 2012

Test Period	Content Area	Migrant	N-Count	Min.	Max.	Mean	SD
Fall 2012	English II	No	2,933	101	248	197.05	18.48
		Yes	--	--	--	--	--
	Algebra I	No	3,886	100	250	198.11	25.45
		Yes	--	--	--	--	--
	Biology	No	2,831	136	250	194.78	21.71
		Yes	--	--	--	--	--
	English I	No	845	145	250	203.36	20.22
		Yes	--	--	--	--	--
	Algebra II	No	444	156	250	212.90	19.63
		Yes	--	--	--	--	--
	Geometry	No	753	154	250	209.16	21.20
		Yes	--	--	--	--	--
	Government	No	16,782	100	250	200.86	18.97
		Yes	--	--	--	--	--
	Am. History	No	1,322	111	250	193.88	21.47
		Yes	--	--	--	--	--

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Table 9.21: Scale Score Distribution by Demographic Group—Migrant Status, Spring 2013

Test Period	Content Area	Migrant	N-Count	Min.	Max.	Mean	SD
Spring 2013	English II	No	61,172	106	250	206.52	16.21
		Yes	20	168	226	194.65	13.79
	Algebra I	No	64,451	100	250	202.55	20.19
		Yes	18	169	212	191.28	12.79
	Biology	No	62,290	100	250	211.13	18.02
		Yes	22	159	228	196.18	16.04
	English I	No	62,600	100	250	204.31	22.32
		Yes	22	149	218	181.73	17.53
	Algebra II	No	23,413	112	250	202.54	19.54
		Yes	--	--	--	--	--
	Geometry	No	30,449	117	250	205.40	22.40
		Yes	--	--	--	--	--
	Government	No	42,170	100	250	203.00	20.96
		Yes	18	161	229	191.67	19.76
	Am. History	No	52,271	100	250	197.14	25.07
		Yes	18	145	203	178.11	15.14

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Table 9.22: Scale Distributions by Demographic Group—Free and Reduced Lunch, Summer 2012

Test Period	Content Area	FRL	N-Count	Min.	Max.	Mean	SD
Summer 2012	English II	No	210	146	250	194.07	17.02
		Yes	204	156	232	194.31	13.67
	Algebra I	No	470	145	250	193.74	18.16
		Yes	404	100	250	190.87	17.30
	Biology	No	168	152	250	189.70	16.71
		Yes	139	157	244	189.70	14.89
	English I	No	125	100	250	195.42	23.32
		Yes	181	153	247	187.89	17.98
	Algebra II	No	63	156	221	182.75	13.30
		Yes	77	152	245	183.35	17.31
	Geometry	No	111	141	250	189.36	20.63
		Yes	127	100	234	180.74	20.42
	Government	No	530	157	250	202.79	21.39
		Yes	295	150	250	194.16	19.70
	Am. History	No	124	141	250	189.44	23.99
		Yes	133	130	235	179.62	22.04

Table 9.23: Scale Distributions by Demographic Group—Free and Reduced Lunch, Fall 2012

Test Period	Content Area	FRL	N-Count	Min.	Max.	Mean	SD
Fall 2012	English II	No	1,328	133	248	202.85	18.40
		Yes	1,606	101	239	192.24	17.11
	Algebra I	No	2,150	100	250	206.13	25.21
		Yes	1736	100	250	188.17	22.02
	Biology	No	1,543	136	250	202.62	21.93
		Yes	1288	136	248	185.40	17.27
	English I	No	526	157	250	208.23	18.11
		Yes	319	145	250	195.34	20.99
	Algebra II	No	320	166	250	215.74	18.52
		Yes	124	156	250	205.57	20.58
	Geometry	No	532	154	250	212.50	20.66
		Yes	221	154	250	201.13	20.37
	Government	No	9,897	100	250	205.94	18.82
		Yes	6,892	128	250	193.56	16.67
	Am. History	No	817	119	250	198.28	20.53
		Yes	505	111	237	186.75	21.05

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Table 9.24: Scale Distributions by Demographic Group—Free and Reduced Lunch, Spring 2013

Test Period	Content Area	FRL	N-Count	Min.	Max.	Mean	SD
Spring 2013	English II	No	36,126	106	250	210.69	15.40
		Yes	25,066	106	250	200.51	15.44
	Algebra I	No	36,340	100	250	207.85	19.47
		Yes	28,129	100	250	195.70	19.00
	Biology	No	36,934	100	250	215.84	16.81
		Yes	25,378	100	250	204.26	17.52
	English I	No	35,679	100	250	210.50	20.97
		Yes	26,943	100	250	196.10	21.39
	Algebra II	No	15,546	112	250	205.19	19.56
		Yes	7,869	143	250	197.30	18.41
	Geometry	No	18,906	117	250	208.99	22.06
		Yes	11,547	127	250	199.51	21.69
	Government	No	25,938	100	250	208.03	20.36
		Yes	16,250	100	250	194.97	19.33
	Am. History	No	30,923	100	250	203.25	24.04
		Yes	21,366	100	250	188.29	23.87

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Table 9.25: Scale Score Distributions by Demographic Group—Limited English Proficient, Summer 2012

Test Period	Content Area	LEP	N-Count	Min.	Max.	Mean	SD
Summer 2012	English II	No	404	146	250	194.28	15.46
		Yes	10	164	212	190.30	14.89
	Algebra I	No	859	100	250	192.58	17.84
		Yes	15	160	201	183.07	13.93
	Biology	No	304	152	250	189.76	15.89
		Yes	--	--	--	--	--
	English I	No	296	100	250	191.54	20.46
		Yes	10	153	208	173.90	19.48
	Algebra II	No	140	152	245	183.08	15.58
		Yes	--	--	--	--	--
	Geometry	No	236	100	250	184.89	20.91
		Yes	--	--	--	--	--
	Government	No	806	150	250	200.11	21.21
		Yes	19	157	212	182.53	12.00
	Am. History	No	248	130	250	184.78	23.71
		Yes	--	--	--	--	--

Table 9.26: Scale Score Distributions by Demographic Group—Limited English Proficient, Fall 2012

Test Period	Content Area	LEP	N-Count	Min.	Max.	Mean	SD
Fall 2012	English II	No	2,844	101	248	197.50	18.42
		Yes	90	158	221	182.60	13.81
	Algebra I	No	3,797	100	250	198.34	25.50
		Yes	89	128	249	188.10	20.88
	Biology	No	2,762	136	250	195.18	21.71
		Yes	69	149	216	179.04	14.69
	English I	No	821	145	250	203.81	20.14
		Yes	24	160	225	188.00	17.23
	Algebra II	No	437	156	250	213.06	19.62
		Yes	--	--	--	--	--
	Geometry	No	733	154	250	209.26	21.27
		Yes	20	165	250	205.45	18.50
	Government	No	16,483	100	250	201.13	18.92
		Yes	306	128	250	186.32	15.79
	Am. History	No	1,285	111	250	194.46	21.34
		Yes	37	138	204	173.81	15.65

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Table 9.27: Scale Score Distributions by Demographic Group—Limited English Proficient, Spring 2013

Test Period	Content Area	LEP	N-Count	Min.	Max.	Mean	SD
Spring 2013	English II	No	60,175	106	250	206.74	16.15
		Yes	1,017	155	245	193.24	13.83
	Algebra I	No	63,080	100	250	202.75	20.16
		Yes	1,389	100	250	193.47	19.51
	Biology	No	61,169	100	250	211.43	17.88
		Yes	1,143	149	250	194.86	18.34
	English I	No	61,583	100	250	204.63	22.23
		Yes	1,039	100	250	185.12	19.03
	Algebra II	No	23,226	112	250	202.59	19.55
		Yes	189	152	250	195.62	17.61
	Geometry	No	30,120	117	250	205.52	22.35
		Yes	333	127	250	194.27	24.02
	Government	No	41,592	100	250	203.25	20.9
		Yes	596	145	249	185.37	16.90
	Am. History	No	51,514	100	250	197.43	25.01
		Yes	775	100	250	177.68	21.56

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Table 9.28: Scale Score Distributions by Demographic Group—Title I, Summer 2012

Test Period	Content Area	Title I	N-Count	Min.	Max.	Mean	SD
Summer 2012	English II	No	378	146	250	194.76	15.30
		Yes	36	156	218	188.19	15.92
	Algebra I	No	790	100	250	193.24	17.62
		Yes	84	151	233	184.68	17.85
	Biology	No	274	152	250	191.03	16.00
		Yes	33	164	200	178.64	9.35
	English I	No	306	100	250	190.97	20.63
		Yes	--	--	--	--	--
	Algebra II	No	138	152	245	182.91	15.52
		Yes	--	--	--	--	--
	Geometry	No	217	100	250	183.47	20.73
		Yes	21	154	229	198.14	18.35
	Government	No	778	150	250	200.28	21.33
		Yes	47	167	218	190.19	16.43
	Am. History	No	256	130	250	184.35	23.52
		Yes	--	--	--	--	--

Table 9.29: Scale Score Distributions by Demographic Group—Title I, Fall 2012

Test Period	Content Area	Title I	N-Count	Min.	Max.	Mean	SD
Fall 2012	English II	No	2,598	133	248	198.63	18.07
		Yes	336	101	239	184.78	16.92
	Algebra I	No	3,605	100	250	199.74	25.22
		Yes	281	100	221	177.20	18.03
	Biology	No	2,558	136	250	196.69	21.55
		Yes	273	141	242	176.90	13.50
	English I	No	780	145	250	204.10	20.34
		Yes	65	157	234	194.54	16.52
	Algebra II	No	444	156	250	212.90	19.63
		Yes	--	--	--	--	--
	Geometry	No	753	154	250	209.16	21.20
		Yes	--	--	--	--	--
	Government	No	15,746	100	250	201.41	18.88
		Yes	1,043	128	250	192.55	18.38
	Am. History	No	1,268	119	250	194.97	20.80
		Yes	54	111	211	168.19	20.90

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Table 9.30: Scale Score Distributions by Demographic Group—Title I, Spring 2013

Test Period	Content Area	Title I	N-Count	Min.	Max.	Mean	SD
Spring 2013	English II	No	57,094	106	250	207.23	16.04
		Yes	4,098	106	250	196.60	15.28
	Algebra I	No	59,195	100	250	203.46	19.91
		Yes	5,274	100	250	192.24	20.42
	Biology	No	58,539	100	250	212.04	17.65
		Yes	3,773	100	250	196.84	17.76
	English I	No	58,311	100	250	205.34	22.03
		Yes	4,311	100	250	190.29	21.40
	Algebra II	No	22,653	112	250	202.83	19.54
		Yes	762	156	250	193.85	17.62
	Geometry	No	29,467	117	250	205.69	22.34
		Yes	986	146	250	196.82	22.29
	Government	No	40,188	100	250	203.73	20.79
		Yes	2,000	138	250	188.35	18.91
	Am. History	No	49,215	100	250	198.37	24.71
		Yes	3,074	100	250	177.45	22.48

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Table 9.31: Scale Score Distributions by Demographic Group—Students with IEPs, Summer 2012

Test Period	Content Area	IEP	N-Count	Min.	Max.	Mean	SD
Summer 2012	English II	No	370	146	250	194.68	15.46
		Yes	44	156	226	190.02	14.87
	Algebra I	No	761	145	250	193.21	17.41
		Yes	113	100	250	187.04	19.62
	Biology	No	269	152	250	189.95	16.30
		Yes	38	164	217	187.92	12.61
	English I	No	268	100	250	192.99	20.57
		Yes	38	157	240	176.71	14.78
	Algebra II	No	124	152	245	184.16	15.83
		Yes	16	163	193	174.69	10.47
	Geometry	No	226	100	250	185.73	20.97
		Yes	12	154	179	166.50	7.08
	Government	No	751	150	250	200.95	21.15
		Yes	74	157	234	187.07	17.25
	Am. History	No	224	130	250	186.49	23.25
		Yes	33	130	235	169.94	19.89

Table 9.32: Scale Score Distributions by Demographic Group—Students with IEPs, Fall 2012

Test Period	Content Area	IEP	N-Count	Min.	Max.	Mean	SD
Fall 2012	English II	No	2,545	133	248	199.41	17.68
		Yes	389	101	225	181.57	15.89
	Algebra I	No	3,357	100	250	201.28	24.76
		Yes	529	100	250	177.97	19.98
	Biology	No	2,431	136	250	197.34	21.14
		Yes	400	136	242	179.24	18.40
	English I	No	778	153	250	204.78	19.64
		Yes	67	145	240	186.97	19.83
	Algebra II	No	432	156	250	213.31	19.48
		Yes	12	172	235	198.17	20.25
	Geometry	No	705	154	250	210.08	20.69
		Yes	48	154	250	195.63	24.13
	Government	No	15,073	100	250	202.36	18.66
		Yes	1,716	143	250	187.66	16.37
	Am. History	No	1,205	111	250	195.55	20.94
		Yes	117	133	227	176.69	19.21

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Table 9.33: Scale Score Distributions by Demographic Group—Students with IEPs, Spring 2013

Test Period	Content Area	IEP	N-Count	Min.	Max.	Mean	SD
Spring 2013	English II	No	55,088	106	250	208.39	15.22
		Yes	6,104	106	250	189.59	15.01
	Algebra I	No	57,959	100	250	204.68	19.20
		Yes	6,510	100	250	183.58	18.80
	Biology	No	55,981	100	250	213.10	16.99
		Yes	6,331	100	250	193.66	17.46
	English I	No	56,646	100	250	206.71	21.14
		Yes	5,976	100	250	181.46	20.18
	Algebra II	No	22,762	112	250	202.99	19.36
		Yes	653	143	250	186.89	19.30
	Geometry	No	28,965	127	250	206.50	21.86
		Yes	1,488	117	250	183.96	21.87
	Government	No	37,940	100	250	204.92	20.34
		Yes	4,248	100	250	185.84	18.48
	Am. History	No	47,444	100	250	199.06	24.43
		Yes	4,845	100	250	178.34	23.48

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Table 9.34: Scale Score Distributions by Demographic Group—Students with Accommodations, Summer 2012

Test Period	Content Area	Accom.	N-Count	Min.	Max.	Mean	SD
Summer 2012	English II	No	425	146	250	194.11	15.48
		Yes	--	--	--	--	--
	Algebra I	No	871	100	250	192.47	17.73
		Yes	17	156	250	182.06	22.60
	Biology	No	309	152	250	189.68	16.05
		Yes	12	176	217	189.08	11.17
	English I	No	296	100	250	191.53	20.75
		Yes	11	163	192	177.09	9.35
	Algebra II	No	143	152	245	182.88	15.47
		Yes	--	--	--	--	--
	Geometry	No	238	100	250	185.13	21.02
		Yes	--	--	--	--	--
	Government	No	818	150	250	199.91	21.36
		Yes	21	172	202	184.62	10.24
	Am. History	No	260	130	250	184.67	23.45
		Yes	--	--	--	--	--

Table 9.35: Scale Score Distributions by Demographic Group—Students with Accommodations, Fall 2012

Test Period	Content Area	Accom.	N-Count	Min.	Max.	Mean	SD
Fall 2012	English II	No	2,865	101	248	197.64	18.24
		Yes	75	150	206	174.23	12.53
	Algebra I	No	3,694	100	250	199.28	25.36
		Yes	202	128	236	175.91	16.65
	Biology	No	2,688	136	250	195.72	21.56
		Yes	149	141	229	176.99	16.11
	English I	No	843	145	250	203.51	20.14
		Yes	--	--	--	--	--
	Algebra II	No	441	156	250	212.92	19.70
		Yes	--	--	--	--	--
	Geometry	No	730	154	250	209.77	20.89
		Yes	23	158	250	189.74	22.25
	Government	No	16,128	100	250	201.48	18.87
		Yes	677	128	247	185.64	14.65
	Am. History	No	1,283	111	250	194.48	21.21
		Yes	40	133	225	174.18	20.30

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Table 9.36: Scale Score Distributions by Demographic Group—Students with Accommodations, Spring 2013

Test Period	Content Area	Accom.	N-Count	Min.	Max.	Mean	SD
Spring 2013	English II	No	59,529	106	250	207.07	15.86
		Yes	1,708	106	250	187.05	16.59
	Algebra I	No	61,795	100	250	203.46	19.81
		Yes	2,749	100	250	181.72	17.34
	Biology	No	59,217	100	250	212.19	17.48
		Yes	3,138	145	250	190.84	16.04
	English I	No	61,149	100	250	204.93	22.00
		Yes	1,534	100	250	178.62	19.98
	Algebra II	No	23,181	112	250	202.71	19.48
		Yes	245	148	250	186.18	18.13
	Geometry	No	29,914	117	250	205.90	22.15
		Yes	568	127	250	179.07	19.21
	Government	No	40,194	100	250	203.99	20.67
		Yes	2,024	100	250	183.04	16.32
	Am. History	No	50,071	100	250	198.16	24.75
		Yes	2,253	100	250	174.09	20.77

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Table 9.37: Achievement-Level Distributions—Gender, Summer 2012

Test Period	Content Area	Gender	Achievement Level	Freq.	%
Summer 2012	English II	Female	Below Basic	26	15.66
			Basic	69	41.57
			Proficient	60	36.14
			Advanced	11	6.63
			Total	166	100.00
		Male	Below Basic	34	12.98
			Basic	129	49.24
			Proficient	88	33.59
			Advanced	11	4.20
			Total	262	100.00
	Algebra I	Female	Below Basic	75	19.48
			Basic	172	44.68
			Proficient	123	31.95
			Advanced	15	3.90
			Total	385	100.00
		Male	Below Basic	86	17.10
			Basic	209	41.55
			Proficient	178	35.39
			Advanced	30	5.96
			Total	503	100.00
	Biology	Female	Below Basic	31	20.95
			Basic	83	56.08
			Proficient	29	19.59
			Advanced	5	3.38
			Total	148	100.00
		Male	Below Basic	39	22.54
			Basic	92	53.18
			Proficient	35	20.23
			Advanced	7	4.05
			Total	173	100.00

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Table 9.37 (continued): Achievement-Level Distributions—Gender, Summer 2012

Test Period	Content Area	Gender	Achievement Level	Freq.	%
Summer 2012	English I	Female	Below Basic	30	23.62
			Basic	55	43.31
			Proficient	26	20.47
			Advanced	16	12.60
			Total	127	100.00
		Male	Below Basic	47	26.11
			Basic	77	42.78
			Proficient	48	26.67
			Advanced	8	4.44
			Total	180	100.00
	Algebra II	Female	Below Basic	27	47.37
			Basic	23	40.35
			Proficient	7	12.28
			Advanced	--	--
			Total	57	100.00
		Male	Below Basic	44	50.57
			Basic	33	37.93
			Proficient	6	6.90
			Advanced	4	4.60
			Total	87	100.00
	Geometry	Female	Below Basic	57	47.50
			Basic	37	30.83
			Proficient	21	17.50
			Advanced	5	4.17
			Total	120	100.00
		Male	Below Basic	49	40.50
			Basic	42	34.71
			Proficient	24	19.83
			Advanced	6	4.96
			Total	121	100.00
	Government	Female	Below Basic	58	12.53
			Basic	179	38.66
			Proficient	175	37.80
			Advanced	51	11.02
			Total	463	100.00
		Male	Below Basic	78	20.74
			Basic	116	30.85
			Proficient	114	30.32
			Advanced	68	18.09
			Total	376	100.00
	Am. History	Female	Below Basic	54	45.76
			Basic	33	27.97
			Proficient	25	21.19
			Advanced	6	5.08
			Total	118	100.00
		Male	Below Basic	65	44.52
			Basic	41	28.08
			Proficient	32	21.92
			Advanced	8	5.48
			Total	146	100.00

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Table 9.38: Achievement-Level Distributions—Gender, Fall 2012

Test Period	Content Area	Gender	Achievement Level	Freq.	%
Fall 2012	English II	Female	Below Basic	173	12.68
			Basic	430	31.52
			Proficient	637	46.70
			Advanced	124	9.09
			Total	1,364	100.00
		Male	Below Basic	326	20.69
			Basic	478	30.33
			Proficient	675	42.83
			Advanced	97	6.15
			Total	1,576	100.00
	Algebra I	Female	Below Basic	339	19.12
			Basic	549	30.96
			Proficient	532	30.01
			Advanced	353	19.91
			Total	1,773	100.00
		Male	Below Basic	476	22.42
			Basic	677	31.89
			Proficient	564	26.57
			Advanced	406	19.12
			Total	2,123	100.00
	Biology	Female	Below Basic	271	20.59
			Basic	493	37.46
			Proficient	400	30.40
			Advanced	152	11.55
			Total	1,316	100.00
		Male	Below Basic	319	20.97
			Basic	556	36.55
			Proficient	480	31.56
			Advanced	166	10.91
			Total	1,521	100.00

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Table 9.38 (continued): Achievement-Level Distributions—Gender, Fall 2012

Test Period	Content Area	Gender	Achievement Level	Freq.	%
Fall 2012	English I	Female	Below Basic	41	10.57
			Basic	90	23.20
			Proficient	188	48.45
			Advanced	69	17.78
			Total	388	100.00
		Male	Below Basic	51	11.14
			Basic	145	31.66
			Proficient	193	42.14
			Advanced	69	15.07
			Total	458	100.00
	Algebra II	Female	Below Basic	16	6.45
			Basic	41	16.53
			Proficient	114	45.97
			Advanced	77	31.05
			Total	248	100.00
		Male	Below Basic	13	6.60
			Basic	24	12.18
			Proficient	86	43.65
			Advanced	74	37.56
			Total	197	100.00
	Geometry	Female	Below Basic	34	9.29
			Basic	66	18.03
			Proficient	168	45.90
			Advanced	98	26.78
			Total	366	100.00
		Male	Below Basic	36	9.30
			Basic	82	21.19
			Proficient	162	41.86
			Advanced	107	27.65
			Total	387	100.00
	Government	Female	Below Basic	762	9.14
			Basic	3,549	42.55
			Proficient	3,009	36.08
			Advanced	1,020	12.23
			Total	8,340	100.00
		Male	Below Basic	795	9.39
			Basic	3,172	37.47
			Proficient	3,113	36.77
			Advanced	1,385	16.36
			Total	8,465	100.00
	Am. History	Female	Below Basic	188	28.75
			Basic	188	28.75
			Proficient	248	37.92
			Advanced	30	4.59
			Total	654	100.00
		Male	Below Basic	173	25.86
			Basic	139	20.78
			Proficient	275	41.11
			Advanced	82	12.26
			Total	669	100.00

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Table 9.39: Achievement-Level Distributions—Gender, Spring 2013

Test Period	Content Area	Gender	Achievement Level	Freq.	%
Spring 2013	English II	Female	Below Basic	812	2.66
			Basic	6,657	21.85
			Proficient	16,028	52.60
			Advanced	6,975	22.89
			Total	30,472	100.00
		Male	Below Basic	1,717	5.58
			Basic	9,126	29.66
			Proficient	15,292	49.71
			Advanced	4,630	15.05
			Total	30,765	100.00
	Algebra I	Female	Below Basic	2,180	6.82
			Basic	11,070	34.61
			Proficient	13,490	42.17
			Advanced	5,247	16.40
			Total	31,987	100.00
		Male	Below Basic	2,778	8.53
			Basic	11,064	33.98
			Proficient	13,377	41.09
			Advanced	5,338	16.40
			Total	32,557	100.00
	Biology	Female	Below Basic	871	2.81
			Basic	6,269	20.23
			Proficient	16,008	51.66
			Advanced	7,838	25.30
			Total	30,986	100.00
		Male	Below Basic	1,057	3.37
			Basic	6,535	20.83
			Proficient	15,446	49.24
			Advanced	8,331	26.56
			Total	31,369	100.00

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Table 9.39 (continued): Achievement-Level Distributions—Gender, Spring 2013

Test Period	Content Area	Gender	Achievement Level	Freq.	%
Spring 2013	English I	Female	Below Basic	2,904	9.36
			Basic	8,292	26.74
			Proficient	12,261	39.54
			Advanced	7,556	24.36
			Total	31,013	100.00
		Male	Below Basic	4,100	12.95
			Basic	9,507	30.02
			Proficient	12,354	39.01
			Advanced	5,709	18.03
			Total	31,670	100.00
	Algebra II	Female	Below Basic	1,598	12.73
			Basic	4,461	35.55
			Proficient	4,801	38.26
			Advanced	1,689	13.46
			Total	12,549	100.00
		Male	Below Basic	1,281	11.78
			Basic	3,449	31.71
			Proficient	4,210	38.71
			Advanced	1,937	17.81
			Total	10,877	100.00
	Geometry	Female	Below Basic	2,273	14.52
			Basic	4,227	26.99
			Proficient	6,006	38.35
			Advanced	3,153	20.14
			Total	15,659	100.00
		Male	Below Basic	1,830	12.35
			Basic	3,683	24.85
			Proficient	5,826	39.30
			Advanced	3,484	23.50
			Total	14,823	100.00
	Government	Female	Below Basic	2,424	11.75
			Basic	7,374	35.75
			Proficient	7,618	36.93
			Advanced	3,211	15.57
			Total	20,627	100.00
		Male	Below Basic	2,475	11.46
			Basic	6,509	30.15
			Proficient	8,178	37.88
			Advanced	4,429	20.51
			Total	21,591	100.00
	Am. History	Female	Below Basic	7,797	30.31
			Basic	7,239	28.14
			Proficient	7,496	29.14
			Advanced	3,194	12.42
			Total	25,726	100.00
		Male	Below Basic	6,435	24.19
			Basic	6,286	23.63
			Proficient	8,585	32.28
			Advanced	5,292	19.90
			Total	26,598	100.00

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Table 9.40: Achievement-Level Distribution—Ethnicity, Summer 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Summer 2012	English II	American Indian/ Alaskan Native	Below Basic	--	--
			Basic	2	66.67
			Proficient	1	33.33
			Advanced	--	--
			Total	3	100.00
		Asian	Below Basic	--	--
			Basic	2	40.00
			Proficient	2	40.00
			Advanced	1	20.00
			Total	5	100.00
		Pacific Islander	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
		Black (not Hispanic)	Below Basic	28	15.38
			Basic	97	53.30
			Proficient	55	30.22
			Advanced	2	1.10
			Total	182	100.00
		Hispanic	Below Basic	3	12.00
			Basic	8	32.00
			Proficient	11	44.00
			Advanced	3	12.00
			Total	25	100.00
		White (not Hispanic)	Below Basic	29	13.81
			Basic	88	41.90
			Proficient	78	37.14
			Advanced	15	7.14
			Total	210	100.00
		Multi-racial	Below Basic	--	--
			Basic	1	33.33
			Proficient	1	33.33
			Advanced	1	33.33
			Total	3	100.00

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Table 9.40 (continued): Achievement-Level Distributions—Ethnicity, Summer 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Summer 2012	Algebra I	American Indian/ Alaskan Native	Below Basic	--	--
			Basic	3	50.00
			Proficient	3	50.00
			Advanced	--	--
			Total	6	100.00
		Asian	Below Basic	--	--
			Basic	3	33.33
			Proficient	6	66.67
			Advanced	--	--
			Total	9	100.00
		Pacific Islander	Below Basic	1	50.00
			Basic	--	--
			Proficient	1	50.00
			Advanced	--	--
			Total	2	100.00
		Black (not Hispanic)	Below Basic	107	26.42
			Basic	201	49.63
			Proficient	89	21.98
			Advanced	8	1.98
			Total	405	100.00
		Hispanic	Below Basic	8	20.00
			Basic	13	32.50
			Proficient	16	40.00
			Advanced	3	7.50
			Total	40	100.00
		White (not Hispanic)	Below Basic	44	10.65
			Basic	153	37.05
			Proficient	183	44.31
			Advanced	33	7.99
			Total	413	100.00
		Multi-racial	Below Basic	1	7.69
			Basic	8	61.54
			Proficient	3	23.08
			Advanced	1	7.69
			Total	13	100.00

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Table 9.40 (continued): Achievement-Level Distributions—Ethnicity, Summer 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Summer 2012	Biology	American Indian/ Alaskan Native	Below Basic	--	--
			Basic	1	100.00
			Proficient	--	--
			Advanced	--	--
			Total	1	100.00
		Asian	Below Basic	--	--
			Basic	2	100.00
			Proficient	--	--
			Advanced	--	--
			Total	2	100.00
		Pacific Islander	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
		Black (not Hispanic)	Below Basic	45	32.14
			Basic	76	54.29
			Proficient	17	12.14
			Advanced	2	1.43
			Total	140	100.00
		Hispanic	Below Basic	3	25.00
			Basic	4	33.33
			Proficient	5	41.67
			Advanced	--	--
			Total	12	100.00
		White (not Hispanic)	Below Basic	21	12.88
			Basic	91	55.83
			Proficient	41	25.15
			Advanced	10	6.13
			Total	163	100.00
		Multi-racial	Below Basic	1	33.33
			Basic	1	33.33
			Proficient	1	33.33
			Advanced	--	--
			Total	3	100.00

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Table 9.40 (continued): Achievement-Level Distributions—Ethnicity, Summer 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Summer 2012	English I	American Indian/ Alaskan Native	Below Basic	--	--
			Basic	--	--
			Proficient	1	100.00
			Advanced	--	--
			Total	1	100.00
		Asian	Below Basic	5	62.50
			Basic	1	12.50
			Proficient	1	12.50
			Advanced	1	12.50
			Total	8	100.00
		Pacific Islander	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
		Black (not Hispanic)	Below Basic	53	35.57
			Basic	61	40.94
			Proficient	31	20.81
			Advanced	4	2.68
			Total	149	100.00
		Hispanic	Below Basic	1	9.09
			Basic	6	54.55
			Proficient	3	27.27
			Advanced	1	9.09
			Total	11	100.00
		White (not Hispanic)	Below Basic	16	12.03
			Basic	62	46.62
			Proficient	38	28.57
			Advanced	17	12.78
			Total	133	100.00
		Multi-racial	Below Basic	2	40.00
			Basic	2	40.00
			Proficient	--	--
			Advanced	1	20.00
			Total	5	100.00

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Table 9.40 (continued): Achievement-Level Distributions—Ethnicity, Summer 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Summer 2012	Algebra II	American Indian/ Alaskan Native	Below Basic	--	--
			Basic	1	100.00
			Proficient	--	--
			Advanced	--	--
			Total	1	100.00
		Asian	Below Basic	--	--
			Basic	1	100.00
			Proficient	--	--
			Advanced	--	--
			Total	1	100.00
		Pacific Islander	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
		Black (not Hispanic)	Below Basic	51	53.68
			Basic	38	40.00
			Proficient	5	5.26
			Advanced	1	1.05
			Total	95	100.00
		Hispanic	Below Basic	1	50.00
			Basic	1	50.00
			Proficient	--	--
			Advanced	--	--
			Total	2	100.00
		White (not Hispanic)	Below Basic	19	42.22
			Basic	15	33.33
			Proficient	8	17.78
			Advanced	3	6.67
			Total	45	100.00
		Multi-racial	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--

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Table 9.40 (continued): Achievement-Level Distributions—Ethnicity, Summer 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Summer 2012	Geometry	American Indian/ Alaskan Native	Below Basic	--	--
			Basic	1	100.00
			Proficient	--	--
			Advanced	--	--
			Total	1	100.00
		Asian	Below Basic	--	--
			Basic	1	100.00
			Proficient	--	--
			Advanced	--	--
			Total	1	100.00
		Pacific Islander	Below Basic	--	--
			Basic	1	100.00
			Proficient	--	--
			Advanced	--	--
			Total	1	100.00
		Black (not Hispanic)	Below Basic	93	56.36
			Basic	48	29.09
			Proficient	21	12.73
			Advanced	3	1.82
			Total	165	100.00
		Hispanic	Below Basic	2	16.67
			Basic	7	58.33
			Proficient	3	25.00
			Advanced	--	--
			Total	12	100.00
		White (not Hispanic)	Below Basic	9	15.79
			Basic	19	33.33
			Proficient	21	36.84
			Advanced	8	14.04
			Total	57	100.00
		Multi-racial	Below Basic	2	50.00
			Basic	2	50.00
			Proficient	--	--
			Advanced	--	--
			Total	4	100.00

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Table 9.40 (continued): Achievement-Level Distributions—Ethnicity, Summer 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Summer 2012	Government	American Indian/ Alaskan Native	Below Basic	1	25.00
			Basic	2	50.00
			Proficient	--	--
			Advanced	1	25.00
			Total	4	100.00
		Asian	Below Basic	1	3.57
			Basic	7	25.00
			Proficient	13	46.43
			Advanced	7	25.00
			Total	28	100.00
		Pacific Islander	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
		Black (not Hispanic)	Below Basic	46	34.85
			Basic	50	37.88
			Proficient	30	22.73
			Advanced	6	4.55
			Total	132	100.00
		Hispanic	Below Basic	9	16.07
			Basic	23	41.07
			Proficient	18	32.14
			Advanced	6	10.71
			Total	56	100.00
		White (not Hispanic)	Below Basic	79	12.91
			Basic	210	34.31
			Proficient	225	36.76
			Advanced	98	16.01
			Total	612	100.00
		Multi-racial	Below Basic	--	--
			Basic	3	42.86
			Proficient	3	42.86
			Advanced	1	14.29
			Total	7	100.00

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Table 9.40 (continued): Achievement-Level Distributions—Ethnicity, Summer 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Summer 2012	Am. History	American Indian/ Alaskan Native	Below Basic	--	--
			Basic	--	--
			Proficient	1	100.00
			Advanced	--	--
			Total	1	100.00
		Asian	Below Basic	4	100.00
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	4	100.00
		Pacific Islander	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
		Black (not Hispanic)	Below Basic	78	66.10
			Basic	28	23.73
			Proficient	12	10.17
			Advanced	--	--
			Total	118	100.00
		Hispanic	Below Basic	5	41.67
			Basic	5	41.67
			Proficient	1	8.33
			Advanced	1	8.33
			Total	12	100.00
		White (not Hispanic)	Below Basic	32	24.81
			Basic	41	31.78
			Proficient	43	33.33
			Advanced	13	10.08
			Total	129	100.00
		Multi-racial	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--

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Table 9.41: Achievement-Level Distributions—Ethnicity, Fall 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Fall 2012	English II	American Indian/ Alaskan Native	Below Basic	3	27.27
			Basic	2	18.18
			Proficient	5	45.45
			Advanced	1	9.09
			Total	11	100.00
		Asian	Below Basic	12	27.91
			Basic	9	20.93
			Proficient	13	30.23
			Advanced	9	20.93
			Total	43	100.00
		Pacific Islander	Below Basic	2	28.57
			Basic	5	71.43
			Proficient	--	--
			Advanced	--	--
			Total	7	100.00
		Black (not Hispanic)	Below Basic	238	20.31
			Basic	441	37.63
			Proficient	459	39.16
			Advanced	34	2.90
			Total	1,172	100.00
		Hispanic	Below Basic	37	26.06
			Basic	50	35.21
			Proficient	49	34.51
			Advanced	6	4.23
			Total	142	100.00
		White (not Hispanic)	Below Basic	202	13.44
			Basic	386	25.68
			Proficient	753	50.10
			Advanced	162	10.78
			Total	1,503	100.00
		Multi-racial	Below Basic	5	8.06
			Basic	15	24.19
			Proficient	33	53.23
			Advanced	9	14.52
			Total	62	100.00

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Table 9.41 (continued): Achievement-Level Distributions—Ethnicity, Fall 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Fall 2012	Algebra I	American Indian/ Alaskan Native	Below Basic	7	46.67
			Basic	2	13.33
			Proficient	4	26.67
			Advanced	2	13.33
			Total	15	100.00
		Asian	Below Basic	8	10.67
			Basic	19	25.33
			Proficient	21	28.00
			Advanced	27	36.00
			Total	75	100.00
		Pacific Islander	Below Basic	2	28.57
			Basic	4	57.14
			Proficient	--	--
			Advanced	1	14.29
			Total	7	100.00
		Black (not Hispanic)	Below Basic	285	36.92
			Basic	322	41.71
			Proficient	137	17.75
			Advanced	28	3.63
			Total	772	100.00
		Hispanic	Below Basic	42	22.95
			Basic	71	38.80
			Proficient	45	24.59
			Advanced	25	13.66
			Total	183	100.00
		White (not Hispanic)	Below Basic	462	16.56
			Basic	797	28.57
			Proficient	865	31.00
			Advanced	666	23.87
			Total	2,790	100.00
		Multi-racial	Below Basic	9	16.67
			Basic	11	20.37
			Proficient	24	44.44
			Advanced	10	18.52
			Total	54	100.00

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Table 9.41 (continued): Achievement-Level Distributions—Ethnicity, Fall 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Fall 2012	Biology	American Indian/ Alaskan Native	Below Basic	3	30.00
			Basic	4	40.00
			Proficient	2	20.00
			Advanced	1	10.00
			Total	10	100.00
		Asian	Below Basic	7	12.50
			Basic	7	12.50
			Proficient	20	35.71
			Advanced	22	39.29
			Total	56	100.00
		Pacific Islander	Below Basic	3	50.00
			Basic	2	33.33
			Proficient	--	--
			Advanced	1	16.67
			Total	6	100.00
		Black (not Hispanic)	Below Basic	247	39.65
			Basic	307	49.28
			Proficient	58	9.31
			Advanced	11	1.77
			Total	623	100.00
		Hispanic	Below Basic	36	21.82
			Basic	68	41.21
			Proficient	47	28.48
			Advanced	14	8.48
			Total	165	100.00
		White (not Hispanic)	Below Basic	287	14.95
			Basic	636	33.13
			Proficient	736	38.33
			Advanced	261	13.59
			Total	1,920	100.00
		Multi-racial	Below Basic	7	12.28
			Basic	25	43.86
			Proficient	17	29.82
			Advanced	8	14.04
			Total	57	100.00

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Table 9.41 (continued): Achievement-Level Distributions—Ethnicity, Fall 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Fall 2012	English I	American Indian/ Alaskan Native	Below Basic	--	--
			Basic	1	25.00
			Proficient	2	50.00
			Advanced	1	25.00
			Total	4	100.00
		Asian	Below Basic	1	5.26
			Basic	1	5.26
			Proficient	12	63.16
			Advanced	5	26.32
			Total	19	100.00
		Pacific Islander	Below Basic	1	50.00
			Basic	--	--
			Proficient	--	--
			Advanced	1	50.00
			Total	2	100.00
		Black (not Hispanic)	Below Basic	35	32.41
			Basic	44	40.74
			Proficient	28	25.93
			Advanced	1	0.93
			Total	108	100.00
		Hispanic	Below Basic	6	13.04
			Basic	15	32.61
			Proficient	17	36.96
			Advanced	8	17.39
			Total	46	100.00
		White (not Hispanic)	Below Basic	47	7.18
			Basic	171	26.11
			Proficient	317	48.40
			Advanced	120	18.32
			Total	655	100.00
		Multi-racial	Below Basic	2	16.67
			Basic	3	25.00
			Proficient	5	41.67
			Advanced	2	16.67
			Total	12	100.00

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Table 9.41 (continued): Achievement-Level Distributions—Ethnicity, Fall 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Fall 2012	Algebra II	American Indian/ Alaskan Native	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
		Asian	Below Basic	--	--
			Basic	3	21.43
			Proficient	5	35.71
			Advanced	6	42.86
			Total	14	100.00
		Pacific Islander	Below Basic	--	--
			Basic	1	100.00
			Proficient	--	--
			Advanced	--	--
			Total	1	100.00
		Black (not Hispanic)	Below Basic	16	25.40
			Basic	14	22.22
			Proficient	24	38.10
			Advanced	9	14.29
			Total	63	100.00
		Hispanic	Below Basic	1	3.57
			Basic	6	21.43
			Proficient	11	39.29
			Advanced	10	35.71
			Total	28	100.00
		White (not Hispanic)	Below Basic	12	3.75
			Basic	39	12.19
			Proficient	156	48.75
			Advanced	113	35.31
			Total	320	100.00
		Multi-racial	Below Basic	--	--
			Basic	2	10.53
			Proficient	4	21.05
			Advanced	13	68.42
			Total	19	100.00

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Table 9.41 (continued): Achievement-Level Distributions—Ethnicity, Fall 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Fall 2012	Geometry	American Indian/ Alaskan Native	Below Basic	2	33.33
			Basic	3	50.00
			Proficient	1	16.67
			Advanced	--	--
			Total	6	100.00
		Asian	Below Basic	--	--
			Basic	3	13.04
			Proficient	10	43.48
			Advanced	10	43.48
			Total	23	100.00
		Pacific Islander	Below Basic	--	--
			Basic	1	100.00
			Proficient	--	--
			Advanced	--	--
			Total	1	100.00
		Black (not Hispanic)	Below Basic	26	29.55
			Basic	22	25.00
			Proficient	34	38.64
			Advanced	6	6.82
			Total	88	100.00
		Hispanic	Below Basic	2	4.00
			Basic	10	20.00
			Proficient	30	60.00
			Advanced	8	16.00
			Total	50	100.00
		White (not Hispanic)	Below Basic	39	6.94
			Basic	105	18.68
			Proficient	244	43.42
			Advanced	174	30.96
			Total	562	100.00
		Multi-racial	Below Basic	1	4.35
			Basic	4	17.39
			Proficient	11	47.83
			Advanced	7	30.43
			Total	23	100.00

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Table 9.41 (continued): Achievement-Level Distributions—Ethnicity, Fall 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Fall 2012	Government	American Indian/ Alaskan Native	Below Basic	9	10.11
			Basic	39	43.82
			Proficient	30	33.71
			Advanced	11	12.36
			Total	89	100.00
		Asian	Below Basic	26	6.22
			Basic	94	22.49
			Proficient	158	37.80
			Advanced	140	33.49
			Total	418	100.00
		Pacific Islander	Below Basic	6	18.75
			Basic	14	43.75
			Proficient	9	28.13
			Advanced	3	9.38
			Total	32	100.00
		Black (not Hispanic)	Below Basic	620	19.26
			Basic	1,638	50.89
			Proficient	826	25.66
			Advanced	135	4.19
			Total	3,219	100.00
		Hispanic	Below Basic	93	12.55
			Basic	339	45.75
			Proficient	255	34.41
			Advanced	54	7.29
			Total	741	100.00
		White (not Hispanic)	Below Basic	783	6.47
			Basic	4,515	37.33
			Proficient	4,766	39.40
			Advanced	2,031	16.79
			Total	12,095	100.00
		Multi-racial	Below Basic	20	9.48
			Basic	82	38.86
			Proficient	78	36.97
			Advanced	31	14.69
			Total	211	100.00

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Table 9.41 (continued): Achievement-Level Distributions—Ethnicity, Fall 2012

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Fall 2012	Am. History	American Indian/ Alaskan Native	Below Basic	2	40.00
			Basic	--	--
			Proficient	3	60.00
			Advanced	--	--
			Total	5	100.00
		Asian	Below Basic	8	29.63
			Basic	7	25.93
			Proficient	7	25.93
			Advanced	5	18.52
			Total	27	100.00
		Pacific Islander	Below Basic	3	100.00
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	3	100.00
		Black (not Hispanic)	Below Basic	86	52.44
			Basic	41	25.00
			Proficient	31	18.90
			Advanced	6	3.66
			Total	164	100.00
		Hispanic	Below Basic	29	42.65
			Basic	15	22.06
			Proficient	18	26.47
			Advanced	6	8.82
			Total	68	100.00
		White (not Hispanic)	Below Basic	228	22.14
			Basic	253	24.56
			Proficient	457	44.37
			Advanced	92	8.93
			Total	1,030	100.00
		Multi-racial	Below Basic	5	19.23
			Basic	11	42.31
			Proficient	7	26.92
			Advanced	3	11.54
			Total	26	100.00

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Table 9.42: Achievement-Level Distributions—Ethnicity, Spring 2013

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Spring 2013	English II	American Indian/ Alaskan Native	Below Basic	8	2.91
			Basic	64	23.27
			Proficient	148	53.82
			Advanced	55	20.00
			Total	275	100.00
		Asian	Below Basic	40	3.60
			Basic	221	19.87
			Proficient	494	44.42
			Advanced	357	32.10
			Total	1,112	100.00
		Pacific Islander	Below Basic	6	5.77
			Basic	34	32.69
			Proficient	50	48.08
			Advanced	14	13.46
			Total	104	100.00
		Black (not Hispanic)	Below Basic	886	9.98
			Basic	3,894	43.84
			Proficient	3,613	40.68
			Advanced	489	5.51
			Total	8,882	100.00
		Hispanic	Below Basic	135	5.46
			Basic	765	30.92
			Proficient	1,257	50.81
			Advanced	317	12.81
			Total	2,474	100.00
		White (not Hispanic)	Below Basic	1,414	2.98
			Basic	10,573	22.27
			Proficient	25,272	53.23
			Advanced	10,221	21.53
			Total	47,480	100.00
		Multi-racial	Below Basic	40	4.40
			Basic	232	25.49
			Proficient	486	53.41
			Advanced	152	16.70
			Total	910	100.00

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Table 9.42 (continued): Achievement-Level Distributions—Ethnicity, Spring 2013

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Spring 2013	Algebra I	American Indian/ Alaskan Native	Below Basic	24	7.74
			Basic	116	37.42
			Proficient	122	39.35
			Advanced	48	15.48
			Total	310	100.00
		Asian	Below Basic	53	4.34
			Basic	255	20.87
			Proficient	455	37.23
			Advanced	459	37.56
			Total	1,222	100.00
		Pacific Islander	Below Basic	9	7.20
			Basic	51	40.80
			Proficient	46	36.80
			Advanced	19	15.20
			Total	125	100.00
		Black (not Hispanic)	Below Basic	1,896	18.94
			Basic	4,983	49.77
			Proficient	2,694	26.91
			Advanced	440	4.39
			Total	10,013	100.00
		Hispanic	Below Basic	233	8.18
			Basic	1,116	39.20
			Proficient	1,149	40.36
			Advanced	349	12.26
			Total	2,847	100.00
		White (not Hispanic)	Below Basic	2,664	5.45
			Basic	15,225	31.13
			Proficient	21,920	44.82
			Advanced	9,101	18.61
			Total	48,910	100.00
		Multi-racial	Below Basic	79	7.07
			Basic	388	34.74
			Proficient	481	43.06
			Advanced	169	15.13
			Total	1,117	100.00

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Table 9.42 (continued): Achievement-Level Distributions—Ethnicity, Spring 2013

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Spring 2013	Biology	American Indian/ Alaskan Native	Below Basic	6	2.01
			Basic	65	21.81
			Proficient	163	54.70
			Advanced	64	21.48
			Total	298	100.00
		Asian	Below Basic	46	3.96
			Basic	182	15.66
			Proficient	449	38.64
			Advanced	485	41.74
			Total	1,162	100.00
		Pacific Islander	Below Basic	5	4.31
			Basic	38	32.76
			Proficient	52	44.83
			Advanced	21	18.10
			Total	116	100.00
		Black (not Hispanic)	Below Basic	938	10.27
			Basic	3,581	39.21
			Proficient	3,895	42.64
			Advanced	720	7.88
			Total	9,134	100.00
		Hispanic	Below Basic	115	4.62
			Basic	717	28.80
			Proficient	1,207	48.47
			Advanced	451	18.11
			Total	2,490	100.00
		White (not Hispanic)	Below Basic	796	1.65
			Basic	8,016	16.62
			Proficient	25,219	52.28
			Advanced	14,207	29.45
			Total	48,238	100.00
		Multi-racial	Below Basic	22	2.40
			Basic	205	22.36
			Proficient	469	51.15
			Advanced	221	24.10
			Total	917	100.00

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Table 9.42 (continued): Achievement-Level Distributions—Ethnicity, Spring 2013

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Spring 2013	English I	American Indian/ Alaskan Native	Below Basic	35	12.28
			Basic	86	30.18
			Proficient	106	37.19
			Advanced	58	20.35
			Total	285	100.00
		Asian	Below Basic	95	8.72
			Basic	249	22.84
			Proficient	376	34.50
			Advanced	370	33.94
			Total	1,090	100.00
		Pacific Islander	Below Basic	22	18.80
			Basic	40	34.19
			Proficient	44	37.61
			Advanced	11	9.40
			Total	117	100.00
		Black (not Hispanic)	Below Basic	2,231	24.98
			Basic	3,597	40.27
			Proficient	2,483	27.80
			Advanced	621	6.95
			Total	8,932	100.00
		Hispanic	Below Basic	403	15.42
			Basic	932	35.65
			Proficient	932	35.65
			Advanced	347	13.27
			Total	2,614	100.00
		White (not Hispanic)	Below Basic	4,107	8.45
			Basic	12,597	25.92
			Proficient	20,244	41.65
			Advanced	11,654	23.98
			Total	48,602	100.00
		Multi-racial	Below Basic	111	10.64
			Basic	298	28.57
			Proficient	430	41.23
			Advanced	204	19.56
			Total	1,043	100.00

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Table 9.42 (continued): Achievement-Level Distributions—Ethnicity, Spring 2013

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Spring 2013	Algebra II	American Indian/ Alaskan Native	Below Basic	16	13.22
			Basic	41	33.88
			Proficient	46	38.02
			Advanced	18	14.88
			Total	121	100.00
		Asian	Below Basic	21	5.87
			Basic	110	30.73
			Proficient	128	35.75
			Advanced	99	27.65
			Total	358	100.00
		Pacific Islander	Below Basic	3	8.57
			Basic	15	42.86
			Proficient	9	25.71
			Advanced	8	22.86
			Total	35	100.00
		Black (not Hispanic)	Below Basic	698	28.05
			Basic	1,052	42.28
			Proficient	613	24.64
			Advanced	125	5.02
			Total	2,488	100.00
		Hispanic	Below Basic	123	15.69
			Basic	265	33.80
			Proficient	313	39.92
			Advanced	83	10.59
			Total	784	100.00
		White (not Hispanic)	Below Basic	1,977	10.22
			Basic	6,343	32.80
			Proficient	7,786	40.26
			Advanced	3,235	16.73
			Total	19,341	100.00
		Multi-racial	Below Basic	41	13.71
			Basic	84	28.09
			Proficient	116	38.80
			Advanced	58	19.40
			Total	299	100.00

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Table 9.42 (continued): Achievement-Level Distributions—Ethnicity, Spring 2013

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Spring 2013	Geometry	American Indian/ Alaskan Native	Below Basic	28	17.50
			Basic	37	23.13
			Proficient	65	40.63
			Advanced	30	18.75
			Total	160	100.00
		Asian	Below Basic	33	7.02
			Basic	80	17.02
			Proficient	145	30.85
			Advanced	212	45.11
			Total	470	100.00
		Pacific Islander	Below Basic	14	21.54
			Basic	19	29.23
			Proficient	16	24.62
			Advanced	16	24.62
			Total	65	100.00
		Black (not Hispanic)	Below Basic	1,122	33.49
			Basic	1075	32.09
			Proficient	882	26.33
			Advanced	271	8.09
			Total	3,350	100.00
		Hispanic	Below Basic	204	17.23
			Basic	363	30.66
			Proficient	450	38.01
			Advanced	167	14.10
			Total	1,184	100.00
		White (not Hispanic)	Below Basic	2,638	10.63
			Basic	6,218	25.05
			Proficient	10,131	40.81
			Advanced	5,840	23.52
			Total	24,827	100.00
		Multi-racial	Below Basic	64	15.02
			Basic	118	27.70
			Proficient	143	33.57
			Advanced	101	23.71
			Total	426	100.00

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Table 9.42 (continued): Achievement-Level Distributions—Ethnicity, Spring 2013

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Spring 2013	Government	American Indian/ Alaskan Native	Below Basic	32	14.35
			Basic	85	38.12
			Proficient	84	37.67
			Advanced	22	9.87
			Total	223	100.00
		Asian	Below Basic	82	11.50
			Basic	172	24.12
			Proficient	270	37.87
			Advanced	189	26.51
			Total	713	100.00
		Pacific Islander	Below Basic	13	17.81
			Basic	23	31.51
			Proficient	26	35.62
			Advanced	11	15.07
			Total	73	100.00
		Black (not Hispanic)	Below Basic	1,400	27.17
			Basic	2,154	41.81
			Proficient	1,288	25.00
			Advanced	310	6.02
			Total	5,152	100.00
		Hispanic	Below Basic	298	19.28
			Basic	590	38.16
			Proficient	486	31.44
			Advanced	172	11.13
			Total	1,546	100.00
		White (not Hispanic)	Below Basic	3,001	8.86
			Basic	10,655	31.46
			Proficient	13,381	39.51
			Advanced	6,830	20.17
			Total	33,867	100.00
		Multi-racial	Below Basic	73	11.34
			Basic	204	31.68
			Proficient	261	40.53
			Advanced	106	16.46
			Total	644	100.00

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Table 9.42 (continued): Achievement-Level Distributions—Ethnicity, Spring 2013

Test Period	Content Area	Ethnicity	Achievement Level	Freq.	%
Spring 2013	Am. History	American Indian/ Alaskan Native	Below Basic	55	22.73
			Basic	70	28.93
			Proficient	79	32.64
			Advanced	38	15.70
			Total	242	100.00
		Asian	Below Basic	202	21.09
			Basic	205	21.40
			Proficient	321	33.51
			Advanced	230	24.01
			Total	958	100.00
		Pacific Islander	Below Basic	34	38.20
			Basic	23	25.84
			Proficient	24	26.97
			Advanced	8	8.99
			Total	89	100.00
		Black (not Hispanic)	Below Basic	3,443	49.64
			Basic	1,806	26.04
			Proficient	1,299	18.73
			Advanced	388	5.59
			Total	6,936	100.00
		Hispanic	Below Basic	719	36.52
			Basic	533	27.07
			Proficient	497	25.24
			Advanced	220	11.17
			Total	1,969	100.00
		White (not Hispanic)	Below Basic	9,606	23.16
			Basic	10,721	25.85
			Proficient	13,649	32.91
			Advanced	7,501	18.08
			Total	41,477	100.00
		Multi-racial	Below Basic	173	26.49
			Basic	167	25.57
			Proficient	212	32.47
			Advanced	101	15.47
			Total	653	100.00

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Table 9.43: Achievement-Level Distributions—Migrant, Summer 2012

Test Period	Content Area	Migrant	Achievement Level	Freq.	%
Summer 2012	English II	No	Below Basic	57	13.77
			Basic	189	45.65
			Proficient	147	35.51
			Advanced	21	5.07
			Total	414	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Algebra I	No	Below Basic	154	17.62
			Basic	377	43.14
			Proficient	299	34.21
			Advanced	44	5.03
			Total	874	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Biology	No	Below Basic	67	21.82
			Basic	166	54.07
			Proficient	63	20.52
			Advanced	11	3.58
			Total	307	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--

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Table 9.43 (continued): Achievement-Level Distributions—Migrant, Summer 2012

Test Period	Content Area	Migrant	Achievement Level	Freq.	%
Summer 2012	English I	No	Below Basic	77	25.16
			Basic	132	43.14
			Proficient	73	23.86
			Advanced	24	7.84
			Total	306	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Algebra II	No	Below Basic	68	48.57
			Basic	55	39.29
			Proficient	13	9.29
			Advanced	4	2.86
			Total	140	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Geometry	No	Below Basic	105	44.12
			Basic	78	32.77
			Proficient	45	18.91
			Advanced	10	4.20
			Total	238	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Government	No	Below Basic	130	15.76
			Basic	292	35.39
			Proficient	286	34.67
			Advanced	117	14.18
			Total	825	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Am. History	No	Below Basic	119	46.30
			Basic	68	26.46
			Proficient	56	21.79
			Advanced	14	5.45
			Total	257	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--

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Table 9.44: Achievement-Level Distributions—Migrant, Fall 2012

Test Period	Content Area	Migrant	Achievement Level	Freq.	%
Fall 2012	English II	No	Below Basic	496	16.91
			Basic	907	30.92
			Proficient	1,310	44.66
			Advanced	220	7.50
			Total	2,933	100.00
		Yes	Below Basic	--	--
			Basic	1	100.00
			Proficient	--	--
			Advanced	--	--
			Total	1	100.00
	Algebra I	No	Below Basic	810	20.84
			Basic	1,224	31.5
			Proficient	1,095	28.18
			Advanced	757	19.48
			Total	3,886	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Biology	No	Below Basic	587	20.73
			Basic	1,046	36.95
			Proficient	880	31.08
			Advanced	318	11.23
			Total	2,831	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--

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Table 9.44 (continued): Achievement-Level Distributions—Migrant, Fall 2012

Test Period	Content Area	Migrant	Achievement Level	Freq.	%
Fall 2012	English I	No	Below Basic	92	10.89
			Basic	235	27.81
			Proficient	380	44.97
			Advanced	138	16.33
			Total	845	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Algebra II	No	Below Basic	28	6.31
			Basic	65	14.64
			Proficient	200	45.05
			Advanced	151	34.01
			Total	444	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Geometry	No	Below Basic	70	9.30
			Basic	148	19.65
			Proficient	330	43.82
			Advanced	205	27.22
			Total	753	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Government	No	Below Basic	1,551	9.24
			Basic	6,710	39.98
			Proficient	6,116	36.44
			Advanced	2,405	14.33
			Total	16,782	100.00
		Yes	Below Basic	2	28.57
			Basic	2	28.57
			Proficient	3	42.86
			Advanced	--	--
			Total	7	100.00
	Am. History	No	Below Basic	360	27.23
			Basic	327	24.74
			Proficient	523	39.56
			Advanced	112	8.47
			Total	1,322	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--

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Table 9.45: Achievement-Level Distributions—Migrant, Spring 2013

Test Period	Content Area	Migrant	Achievement Level	Freq.	%
Spring 2013	English II	No	Below Basic	2,520	4.12
			Basic	15,752	25.75
			Proficient	31,302	51.17
			Advanced	11,598	18.96
			Total	61,172	100.00
		Yes	Below Basic	2	10.00
			Basic	11	55.00
			Proficient	6	30.00
			Advanced	1	5.00
			Total	20	100.00
	Algebra I	No	Below Basic	4,944	7.67
			Basic	22,093	34.28
			Proficient	26,840	41.64
			Advanced	10,574	16.41
			Total	64,451	100.00
		Yes	Below Basic	2	11.11
			Basic	9	50.00
			Proficient	7	38.89
			Advanced	--	--
			Total	18	100.00
	Biology	No	Below Basic	1,922	3.09
			Basic	12,772	20.50
			Proficient	31,430	50.46
			Advanced	16,166	25.95
			Total	62,290	100.00
		Yes	Below Basic	2	9.09
			Basic	10	45.45
			Proficient	9	40.91
			Advanced	1	4.55
			Total	22	100.00

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Table 9.45 (continued): Achievement-Level Distributions—Migrant, Spring 2013

Test Period	Content Area	Migrant	Achievement Level	Freq.	%
Spring 2013	English I	No	Below Basic	6,976	11.14
			Basic	17,771	28.39
			Proficient	24,596	39.29
			Advanced	13,257	21.18
			Total	62,600	100.00
		Yes	Below Basic	8	36.36
			Basic	10	45.45
			Proficient	4	18.18
			Advanced	--	--
			Total	22	100.00
	Algebra II	No	Below Basic	2,875	12.28
			Basic	7,906	33.77
			Proficient	9,008	38.47
			Advanced	3,624	15.48
			Total	23,413	100.00
		Yes	Below Basic	1	50.00
			Basic	1	50.00
			Proficient	--	--
			Advanced	--	--
			Total	2	100.00
	Geometry	No	Below Basic	4,101	13.47
			Basic	7,901	25.95
			Proficient	11,816	38.81
			Advanced	6,631	21.78
			Total	30,449	100.00
		Yes	Below Basic	--	--
			Basic	2	50.00
			Proficient	2	50.00
			Advanced	--	--
			Total	4	100.00
	Government	No	Below Basic	4,878	11.57
			Basic	13,868	32.89
			Proficient	15,787	37.44
			Advanced	7,637	18.11
			Total	42,170	100.00
		Yes	Below Basic	6	33.33
			Basic	5	27.78
			Proficient	6	33.33
			Advanced	1	5.56
			Total	18	100.00
	Am. History	No	Below Basic	14,201	27.17
			Basic	13,513	25.85
			Proficient	16,074	30.75
			Advanced	8,483	16.23
			Total	52,271	100.00
		Yes	Below Basic	8	44.44
			Basic	8	44.44
			Proficient	2	11.11
			Advanced	--	--
			Total	18	100.00

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Table 9.46: Achievement-Level Distributions—Free and Reduced Lunch, Summer 2012

Test Period	Content Area	FRL	Achievement Level	Freq.	%
Summer 2012	English II	No	Below Basic	36	17.14
			Basic	87	41.43
			Proficient	72	34.29
			Advanced	15	7.14
			Total	210	100.00
		Yes	Below Basic	21	10.29
			Basic	102	50.00
			Proficient	75	36.76
			Advanced	6	2.94
			Total	204	100.00
	Algebra I	No	Below Basic	79	16.81
			Basic	193	41.06
			Proficient	167	35.53
			Advanced	31	6.60
			Total	470	100.00
		Yes	Below Basic	75	18.56
			Basic	184	45.54
			Proficient	132	32.67
			Advanced	13	3.22
			Total	404	100.00
	Biology	No	Below Basic	42	25.00
			Basic	83	49.40
			Proficient	36	21.43
			Advanced	7	4.17
			Total	168	100.00
		Yes	Below Basic	25	17.99
			Basic	83	59.71
			Proficient	27	19.42
			Advanced	4	2.88
			Total	139	100.00

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Table 9.46 (continued): Achievement-Level Distributions—Free and Reduced Lunch, Summer 2012

Test Period	Content Area	FRL	Achievement Level	Freq.	%
Summer 2012	English I	No	Below Basic	23	18.40
			Basic	55	44.00
			Proficient	31	24.80
			Advanced	16	12.80
			Total	125	100.00
		Yes	Below Basic	54	29.83
			Basic	77	42.54
			Proficient	42	23.20
			Advanced	8	4.420
			Total	181	100.00
	Algebra II	No	Below Basic	27	42.86
			Basic	29	46.03
			Proficient	7	11.11
			Advanced	--	--
			Total	63	100.00
		Yes	Below Basic	41	53.25
			Basic	26	33.77
			Proficient	6	7.79
			Advanced	4	5.19
			Total	77	100.00
	Geometry	No	Below Basic	38	34.23
			Basic	38	34.23
			Proficient	28	25.23
			Advanced	7	6.31
			Total	111	100.00
		Yes	Below Basic	67	52.76
			Basic	40	31.50
			Proficient	17	13.39
			Advanced	3	2.36
			Total	127	100.00
	Government	No	Below Basic	72	13.58
			Basic	160	30.19
			Proficient	207	39.06
			Advanced	91	17.17
			Total	530	100.00
		Yes	Below Basic	58	19.66
			Basic	132	44.75
			Proficient	79	26.78
			Advanced	26	8.81
			Total	295	100.00
	Am. History	No	Below Basic	46	37.1
			Basic	34	27.42
			Proficient	34	27.42
			Advanced	10	8.06
			Total	124	100.00
		Yes	Below Basic	73	54.89
			Basic	34	25.56
			Proficient	22	16.54
			Advanced	4	3.01
			Total	133	100.00

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Table 9.47: Achievement-Level Distributions—Free and Reduced Lunch, Fall 2012

Test Period	Content Area	FRL	Achievement Level	Freq.	%
Fall 2012	English II	No	Below Basic	141	10.62
			Basic	317	23.87
			Proficient	702	52.86
			Advanced	168	12.65
			Total	1,328	100.00
		Yes	Below Basic	355	22.10
			Basic	591	36.80
			Proficient	608	37.86
			Advanced	52	3.24
			Total	1,606	100.00
	Algebra I	No	Below Basic	291	13.53
			Basic	522	24.28
			Proficient	722	33.58
			Advanced	615	28.60
			Total	2,150	100.00
		Yes	Below Basic	519	29.90
			Basic	702	40.44
			Proficient	373	21.49
			Advanced	142	8.18
			Total	1,736	100.00
	Biology	No	Below Basic	205	13.29
			Basic	420	27.22
			Proficient	630	40.83
			Advanced	288	18.66
			Total	1,543	100.00
		Yes	Below Basic	382	29.66
			Basic	626	48.60
			Proficient	250	19.41
			Advanced	30	2.33
			Total	1,288	100.00

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Table 9.47 (continued): Achievement-Level Distributions—Free and Reduced Lunch, Fall 2012

Test Period	Content Area	FRL	Achievement Level	Freq.	%
Fall 2012	English I	No	Below Basic	24	4.56
			Basic	129	24.52
			Proficient	268	50.95
			Advanced	105	19.96
			Total	526	100.00
		Yes	Below Basic	68	21.32
			Basic	106	33.23
			Proficient	112	35.11
			Advanced	33	10.34
			Total	319	100.00
	Algebra II	No	Below Basic	14	4.38
			Basic	31	9.69
			Proficient	156	48.75
			Advanced	119	37.19
			Total	320	100.00
		Yes	Below Basic	14	11.29
			Basic	34	27.42
			Proficient	44	35.48
			Advanced	32	25.81
			Total	124	100.00
	Geometry	No	Below Basic	33	6.20
			Basic	89	16.73
			Proficient	238	44.74
			Advanced	172	32.33
			Total	532	100.00
		Yes	Below Basic	37	16.74
			Basic	59	26.70
			Proficient	92	41.63
			Advanced	33	14.93
			Total	221	100.00
	Government	No	Below Basic	522	5.27
			Basic	3,196	32.29
			Proficient	4,179	42.22
			Advanced	2,000	20.21
			Total	9,897	100.00
		Yes	Below Basic	1,031	14.96
			Basic	3,516	51.02
			Proficient	1,940	28.15
			Advanced	405	5.88
			Total	6,892	100.00
	Am. History	No	Below Basic	166	20.32
			Basic	192	23.50
			Proficient	365	44.68
			Advanced	94	11.51
			Total	817	100.00
		Yes	Below Basic	194	38.42
			Basic	135	26.73
			Proficient	158	31.29
			Advanced	18	3.56
			Total	505	100.00

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Table 9.48: Achievement-Level Distributions—Free and Reduced Lunch, Spring 2013

Test Period	Content Area	FRL	Achievement Level	Freq.	%
Spring 2013	English II	No	Below Basic	755	2.09
			Basic	6,441	17.83
			Proficient	19,683	54.48
			Advanced	9,247	25.60
			Total	36,126	100.00
		Yes	Below Basic	1,767	7.05
			Basic	9,322	37.19
			Proficient	11,625	46.38
			Advanced	2,352	9.38
			Total	25,066	100.00
	Algebra I	No	Below Basic	1,497	4.12
			Basic	9,758	26.85
			Proficient	16,782	46.18
			Advanced	8,303	22.85
			Total	36,340	100.00
		Yes	Below Basic	3,449	12.26
			Basic	12,344	43.88
			Proficient	10,065	35.78
			Advanced	2,271	8.07
			Total	28,129	100.00
	Biology	No	Below Basic	510	1.38
			Basic	4,943	13.38
			Proficient	18,830	50.98
			Advanced	12,651	34.25
			Total	36,934	100.00
		Yes	Below Basic	1,414	5.57
			Basic	7,839	30.89
			Proficient	12,609	49.68
			Advanced	3,516	13.85
			Total	25,378	100.00

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Table 9.48 (continued): Achievement-Level Distributions—Free and Reduced Lunch, Spring 2013

Test Period	Content Area	FRL	Achievement Level	Freq.	%
Spring 2013	English I	No	Below Basic	2,034	5.70
			Basic	7,900	22.14
			Proficient	15,438	43.27
			Advanced	10,307	28.89
			Total	35,679	100.00
		Yes	Below Basic	4,950	18.37
			Basic	9,881	36.67
			Proficient	9,162	34.01
			Advanced	2,950	10.95
			Total	26,943	100.00
	Algebra II	No	Below Basic	1,424	9.16
			Basic	4,890	31.46
			Proficient	6,320	40.65
			Advanced	2,912	18.73
			Total	15,546	100.00
		Yes	Below Basic	1,452	18.45
			Basic	3,017	38.34
			Proficient	2,688	34.16
			Advanced	712	9.05
			Total	7,869	100.00
	Geometry	No	Below Basic	1,862	9.85
			Basic	4,385	23.19
			Proficient	7,699	40.72
			Advanced	4,960	26.24
			Total	18,906	100.00
		Yes	Below Basic	2,239	19.39
			Basic	3,518	30.47
			Proficient	4,119	35.67
			Advanced	1,671	14.47
			Total	11,547	100.00
	Government	No	Below Basic	1,738	6.70
			Basic	7,138	27.52
			Proficient	10,867	41.90
			Advanced	6,195	23.88
			Total	25,938	100.00
		Yes	Below Basic	3,146	19.36
			Basic	6,735	41.45
			Proficient	4,926	30.31
			Advanced	1,443	8.88
			Total	16,250	100.00
	Am. History	No	Below Basic	5,705	18.45
			Basic	7,578	24.51
			Proficient	10,953	35.42
			Advanced	6,687	21.62
			Total	30,923	100.00
		Yes	Below Basic	8,504	39.8
			Basic	5,943	27.82
			Proficient	5,123	23.98
			Advanced	1,796	8.41
			Total	21,366	100.00

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Table 9.49: Achievement-Level Distributions—Limited English Proficient, Summer 2012

Test Period	Content Area	LEP	Achievement Level	Freq.	%
Summer 2012	English II	No	Below Basic	55	13.61
			Basic	185	45.79
			Proficient	143	35.40
			Advanced	21	5.20
			Total	404	100.00
		Yes	Below Basic	2	20.00
			Basic	4	40.00
			Proficient	4	40.00
			Advanced	--	--
			Total	10	100.00
	Algebra I	No	Below Basic	149	17.35
			Basic	371	43.19
			Proficient	295	34.34
			Advanced	44	5.12
			Total	859	100.00
		Yes	Below Basic	5	33.33
			Basic	6	40.00
			Proficient	4	26.67
			Advanced	--	--
			Total	15	100.00
	Biology	No	Below Basic	66	21.71
			Basic	165	54.28
			Proficient	62	20.39
			Advanced	11	3.62
			Total	304	100.00
		Yes	Below Basic	1	33.33
			Basic	1	33.33
			Proficient	1	33.33
			Advanced	--	--
			Total	3	100.00

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Table 9.49 (continued): Achievement-Level Distributions—Limited English Proficient, Summer 2012

Test Period	Content Area	LEP	Achievement Level	Freq.	%
Summer 2012	English I	No	Below Basic	71	23.99
			Basic	129	43.58
			Proficient	72	24.32
			Advanced	24	8.11
			Total	296	100.00
		Yes	Below Basic	6	60.00
			Basic	3	30.00
			Proficient	1	10.00
			Advanced	--	--
			Total	10	100.00
	Algebra II	No	Below Basic	68	48.57
			Basic	55	39.29
			Proficient	13	9.29
			Advanced	4	2.86
			Total	140	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Geometry	No	Below Basic	104	44.07
			Basic	77	32.63
			Proficient	45	19.07
			Advanced	10	4.24
			Total	236	100.00
		Yes	Below Basic	1	50.00
			Basic	1	50.00
			Proficient	--	--
			Advanced	--	--
			Total	2	100.00
	Government	No	Below Basic	124	15.38
			Basic	280	34.74
			Proficient	285	35.36
			Advanced	117	14.52
			Total	806	100.00
		Yes	Below Basic	6	31.58
			Basic	12	63.16
			Proficient	1	5.26
			Advanced	--	--
			Total	19	100.00
	Am. History	No	Below Basic	112	45.16
			Basic	66	26.61
			Proficient	56	22.58
			Advanced	14	5.65
			Total	248	100.00
		Yes	Below Basic	7	77.78
			Basic	2	22.22
			Proficient	--	--
			Advanced	--	--
			Total	9	100.00

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Table 9.50: Achievement-Level Distributions—Limited English Proficient, Fall 2012

Test Period	Content Area	LEP	Achievement Level	Freq.	%
Fall 2012	English II	No	Below Basic	457	16.07
			Basic	868	30.52
			Proficient	1,299	45.68
			Advanced	220	7.74
			Total	2,844	100.00
		Yes	Below Basic	39	43.33
			Basic	40	44.44
			Proficient	11	12.22
			Advanced	--	--
			Total	90	100.00
	Algebra I	No	Below Basic	788	20.75
			Basic	1,179	31.05
			Proficient	1,080	28.44
			Advanced	750	19.75
			Total	3,797	100.00
		Yes	Below Basic	22	24.72
			Basic	45	50.56
			Proficient	15	16.85
			Advanced	7	7.87
			Total	89	100.00
	Biology	No	Below Basic	556	20.13
			Basic	1,015	36.75
			Proficient	873	31.61
			Advanced	318	11.51
			Total	2,762	100.00
		Yes	Below Basic	31	44.93
			Basic	31	44.93
			Proficient	7	10.14
			Advanced	--	--
			Total	69	100.00

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Table 9.50 (continued): Achievement-Level Distributions—Limited English Proficient, Fall 2012

Test Period	Content Area	LEP	Achievement Level	Freq.	%
Fall 2012	English I	No	Below Basic	86	10.48
			Basic	224	27.28
			Proficient	374	45.55
			Advanced	137	16.69
			Total	821	100.00
		Yes	Below Basic	6	25.00
			Basic	11	45.83
			Proficient	6	25.00
			Advanced	1	4.17
			Total	24	100.00
	Algebra II	No	Below Basic	27	6.18
			Basic	63	14.42
			Proficient	198	45.31
			Advanced	149	34.10
			Total	437	100.00
		Yes	Below Basic	1	14.29
			Basic	2	28.57
			Proficient	2	28.57
			Advanced	2	28.57
			Total	7	100.00
	Geometry	No	Below Basic	68	9.28
			Basic	144	19.65
			Proficient	318	43.38
			Advanced	203	27.69
			Total	733	100.00
		Yes	Below Basic	2	10.00
			Basic	4	20.00
			Proficient	12	60.00
			Advanced	2	10.00
			Total	20	100.00
	Government	No	Below Basic	1,464	8.88
			Basic	6,556	39.77
			Proficient	6,065	36.80
			Advanced	2,398	14.55
			Total	16,483	100.00
		Yes	Below Basic	89	29.08
			Basic	156	50.98
			Proficient	54	17.65
			Advanced	7	2.29
			Total	306	100.00
	Am. History	No	Below Basic	335	26.07
			Basic	318	24.75
			Proficient	520	40.47
			Advanced	112	8.72
			Total	1,285	100.00
		Yes	Below Basic	25	67.57
			Basic	9	24.32
			Proficient	3	8.11
			Advanced	--	--
			Total	37	100.00

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Table 9.51: Achievement-Level Distributions—Limited English Proficient, Spring 2013

Test Period	Content Area	LEP	Achievement Level	Freq.	%
Spring 2013	English II	No	Below Basic	2,370	3.94
			Basic	15,258	25.36
			Proficient	30,980	51.48
			Advanced	11,567	19.22
			Total	60,175	100.00
		Yes	Below Basic	152	14.95
			Basic	505	49.66
			Proficient	328	32.25
			Advanced	32	3.15
			Total	1,017	100.00
	Algebra I	No	Below Basic	4,748	7.53
			Basic	21,421	33.96
			Proficient	26,455	41.94
			Advanced	10,456	16.58
			Total	63,080	100.00
		Yes	Below Basic	198	14.25
			Basic	681	49.03
			Proficient	392	28.22
			Advanced	118	8.50
			Total	1,389	100.00
	Biology	No	Below Basic	1,756	2.87
			Basic	12,274	20.07
			Proficient	31,046	50.75
			Advanced	16,093	26.31
			Total	61,169	100.00
		Yes	Below Basic	168	14.70
			Basic	508	44.44
			Proficient	393	34.38
			Advanced	74	6.47
			Total	1,143	100.00

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Table 9.51 (continued): Achievement-Level Distributions—Limited English Proficient, Spring 2013

Test Period	Content Area	LEP	Achievement Level	Freq.	%
Spring 2013	English I	No	Below Basic	6,650	10.80
			Basic	17,314	28.11
			Proficient	24,387	39.60
			Advanced	13,232	21.49
			Total	61,583	100.00
		Yes	Below Basic	334	32.15
			Basic	467	44.95
			Proficient	213	20.50
			Advanced	25	2.41
			Total	1,039	100.00
	Algebra II	No	Below Basic	2,835	12.21
			Basic	7,835	33.73
			Proficient	8,949	38.53
			Advanced	3,607	15.53
			Total	23,226	100.00
		Yes	Below Basic	41	21.69
			Basic	72	38.10
			Proficient	59	31.22
			Advanced	17	8.99
			Total	189	100.00
	Geometry	No	Below Basic	3,997	13.27
			Basic	7,810	25.93
			Proficient	11,723	38.92
			Advanced	6,590	21.88
			Total	30,120	100.00
		Yes	Below Basic	104	31.23
			Basic	93	27.93
			Proficient	95	28.53
			Advanced	41	12.31
			Total	333	100.00
	Government	No	Below Basic	4,661	11.21
			Basic	13,626	32.76
			Proficient	15,682	37.70
			Advanced	7,623	18.33
			Total	41,592	100.00
		Yes	Below Basic	223	37.42
			Basic	247	41.44
			Proficient	111	18.62
			Advanced	15	2.52
			Total	596	100.00
	Am. History	No	Below Basic	13,759	26.71
			Basic	13,331	25.88
			Proficient	15,961	30.98
			Advanced	8,463	16.43
			Total	51,514	100.00
		Yes	Below Basic	450	58.06
			Basic	190	24.52
			Proficient	115	14.84
			Advanced	20	2.58
			Total	775	100.00

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Table 9.52: Achievement-Level Distributions—Title I, Summer 2012

Test Period	Content Area	Title I	Achievement Level	Freq.	%
Summer 2012	English II	No	Below Basic	46	12.17
			Basic	176	46.56
			Proficient	135	35.71
			Advanced	21	5.56
			Total	378	100.00
		Yes	Below Basic	11	30.56
			Basic	13	36.11
			Proficient	12	33.33
			Advanced	--	--
			Total	36	100.00
	Algebra I	No	Below Basic	125	15.82
			Basic	340	43.04
			Proficient	285	36.08
			Advanced	40	5.06
			Total	790	100.00
		Yes	Below Basic	29	34.52
			Basic	37	44.05
			Proficient	14	16.67
			Advanced	4	4.76
			Total	84	100.00
	Biology	No	Below Basic	50	18.25
			Basic	151	55.11
			Proficient	62	22.63
			Advanced	11	4.01
			Total	274	100.00
		Yes	Below Basic	17	51.52
			Basic	15	45.45
			Proficient	1	3.03
			Advanced	--	--
			Total	33	100.00

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Table 9.52 (continued): Achievement-Level Distributions—Title I, Summer 2012

Test Period	Content Area	Title I	Achievement Level	Freq.	%
Summer 2012	English I	No	Below Basic	77	25.16
			Basic	132	43.14
			Proficient	73	23.86
			Advanced	24	7.84
			Total	306	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Algebra II	No	Below Basic	67	48.55
			Basic	55	39.86
			Proficient	12	8.70
			Advanced	4	2.90
			Total	138	100.00
		Yes	Below Basic	1	50.00
			Basic	--	--
			Proficient	1	50.00
			Advanced	--	--
			Total	2	100.00
	Geometry	No	Below Basic	102	47.00
			Basic	72	33.18
			Proficient	35	16.13
			Advanced	8	3.69
			Total	217	100.00
		Yes	Below Basic	3	14.29
			Basic	6	28.57
			Proficient	10	47.62
			Advanced	2	9.52
			Total	21	100.00
	Government	No	Below Basic	115	14.78
			Basic	274	35.22
			Proficient	272	34.96
			Advanced	117	15.04
			Total	778	100.00
		Yes	Below Basic	15	31.91
			Basic	18	38.30
			Proficient	14	29.79
			Advanced	--	--
			Total	47	100.00
	Am. History	No	Below Basic	119	46.48
			Basic	67	26.17
			Proficient	56	21.88
			Advanced	14	5.47
			Total	256	100.00
		Yes	Below Basic	--	--
			Basic	1	100.00
			Proficient	--	--
			Advanced	--	--
			Total	1	100.00

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Table 9.53: Achievement-Level Distributions—Title I, Fall 2012

Test Period	Content Area	Title I	Achievement Level	Freq.	%
Fall 2012	English II	No	Below Basic	377	14.51
			Basic	778	29.95
			Proficient	1,227	47.23
			Advanced	216	8.31
			Total	2,598	100.00
		Yes	Below Basic	119	35.42
			Basic	130	38.69
			Proficient	83	24.70
			Advanced	4	1.19
			Total	336	100.00
	Algebra I	No	Below Basic	675	18.72
			Basic	1,112	30.85
			Proficient	1,061	29.43
			Advanced	757	21.00
			Total	3,605	100.00
		Yes	Below Basic	135	48.04
			Basic	112	39.86
			Proficient	34	12.10
			Advanced	--	--
			Total	281	100.00
	Biology	No	Below Basic	463	18.10
			Basic	907	35.46
			Proficient	871	34.05
			Advanced	317	12.39
			Total	2,558	100.00
		Yes	Below Basic	124	45.42
			Basic	139	50.92
			Proficient	9	3.30
			Advanced	1	0.37
			Total	273	100.00

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Table 9.53 (continued): Achievement-Level Distributions—Title I, Fall 2012

Test Period	Content Area	Title I	Achievement Level	Freq.	%
Fall 2012	English I	No	Below Basic	83	10.64
			Basic	207	26.54
			Proficient	354	45.38
			Advanced	136	17.44
			Total	780	100.00
		Yes	Below Basic	9	13.85
			Basic	28	43.08
			Proficient	26	40.00
			Advanced	2	3.08
			Total	65	100.00
	Algebra II	No	Below Basic	28	6.31
			Basic	65	14.64
			Proficient	200	45.05
			Advanced	151	34.01
			Total	444	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Geometry	No	Below Basic	70	9.30
			Basic	148	19.65
			Proficient	330	43.82
			Advanced	205	27.22
			Total	753	100.00
		Yes	Below Basic	--	--
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	--	--
	Government	No	Below Basic	1,348	8.56
			Basic	6,223	39.52
			Proficient	5,842	37.10
			Advanced	2,333	14.82
			Total	15,746	100.00
		Yes	Below Basic	205	19.65
			Basic	489	46.88
			Proficient	277	26.56
			Advanced	72	6.90
			Total	1,043	100.00
	Am. History	No	Below Basic	319	25.16
			Basic	318	25.08
			Proficient	519	40.93
			Advanced	112	8.83
			Total	1,268	100.00
		Yes	Below Basic	41	75.93
			Basic	9	16.67
			Proficient	4	7.41
			Advanced	--	--
			Total	54	100.00

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Table 9.54: Achievement-Level Distributions—Title I, Spring 2013

Test Period	Content Area	Title I	Achievement Level	Freq.	%
Spring 2013	English II	No	Below Basic	2,086	3.65
			Basic	13,913	24.37
			Proficient	29,735	52.08
			Advanced	11,360	19.90
			Total	57,094	100.00
		Yes	Below Basic	436	10.64
			Basic	1,850	45.14
			Proficient	1,573	38.38
			Advanced	239	5.83
			Total	4,098	100.00
	Algebra I	No	Below Basic	3,939	6.65
			Basic	19,786	33.43
			Proficient	25,333	42.80
			Advanced	10,137	17.12
			Total	59,195	100.00
		Yes	Below Basic	1,007	19.09
			Basic	2,316	43.91
			Proficient	1,514	28.71
			Advanced	437	8.29
			Total	5,274	100.00
	Biology	No	Below Basic	1,497	2.56
			Basic	11,161	19.07
			Proficient	29,980	51.21
			Advanced	15,901	27.16
			Total	58,539	100.00
		Yes	Below Basic	427	11.32
			Basic	1,621	42.96
			Proficient	1,459	38.67
			Advanced	266	7.05
			Total	3,773	100.00

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Table 9.54 (continued): Achievement-Level Distributions—Title I, Spring 2013

Test Period	Content Area	Title I	Achievement Level	Freq.	%
Spring 2013	English I	No	Below Basic	5,837	10.01
			Basic	16,061	27.54
			Proficient	23,473	40.25
			Advanced	12,940	22.19
			Total	58,311	100.00
		Yes	Below Basic	1,147	26.61
			Basic	1,720	39.90
			Proficient	1,127	26.14
			Advanced	317	7.35
			Total	4,311	100.00
	Algebra II	No	Below Basic	2,690	11.87
			Basic	7,603	33.56
			Proficient	8,783	38.77
			Advanced	3,577	15.79
			Total	22,653	100.00
		Yes	Below Basic	186	24.41
			Basic	304	39.90
			Proficient	225	29.53
			Advanced	47	6.17
			Total	762	100.00
	Geometry	No	Below Basic	3,863	13.11
			Basic	7,592	25.76
			Proficient	11,514	39.07
			Advanced	6,498	22.05
			Total	29,467	100.00
		Yes	Below Basic	238	24.14
			Basic	311	31.54
			Proficient	304	30.83
			Advanced	133	13.49
			Total	986	100.00
	Government	No	Below Basic	4,231	10.53
			Basic	13,064	32.51
			Proficient	15,365	38.23
			Advanced	7,528	18.73
			Total	40,188	100.00
		Yes	Below Basic	653	32.65
			Basic	809	40.45
			Proficient	428	21.40
			Advanced	110	5.50
			Total	2,000	100.00
	Am. History	No	Below Basic	12,383	25.16
			Basic	12,795	26.00
			Proficient	15,668	31.84
			Advanced	8,369	17.00
			Total	49,215	100.00
		Yes	Below Basic	1,826	59.40
			Basic	726	23.62
			Proficient	408	13.27
			Advanced	114	3.71
			Total	3,074	100.00

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Table 9.55: Achievement-Level Distributions—Individualized Education Program, Summer 2012

Test Period	Content Area	IEP	Achievement Level	Freq.	%
Summer 2012	English II	No	Below Basic	48	12.97
			Basic	168	45.41
			Proficient	134	36.22
			Advanced	20	5.41
			Total	370	100.00
		Yes	Below Basic	9	20.45
			Basic	21	47.73
			Proficient	13	29.55
			Advanced	1	2.27
			Total	44	100.00
	Algebra I	No	Below Basic	124	16.29
			Basic	325	42.71
			Proficient	274	36.01
			Advanced	38	4.99
			Total	761	100.00
		Yes	Below Basic	30	26.55
			Basic	52	46.02
			Proficient	25	22.12
			Advanced	6	5.31
			Total	113	100.00
	Biology	No	Below Basic	61	22.68
			Basic	140	52.04
			Proficient	57	21.19
			Advanced	11	4.09
			Total	269	100.00
		Yes	Below Basic	6	15.79
			Basic	26	68.42
			Proficient	6	15.79
			Advanced	--	--
			Total	38	100.00

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Table 9.55 (continued): Achievement-Level Distributions—Individualized Education Program, Summer 2012

Test Period	Content Area	IEP	Achievement Level	Freq.	%
Summer 2012	English I	No	Below Basic	56	20.90
			Basic	117	43.66
			Proficient	72	26.87
			Advanced	23	8.58
			Total	268	100.00
		Yes	Below Basic	21	55.26
			Basic	15	39.47
			Proficient	1	2.63
			Advanced	1	2.63
			Total	38	100.00
	Algebra II	No	Below Basic	58	46.77
			Basic	49	39.52
			Proficient	13	10.48
			Advanced	4	3.23
			Total	124	100.00
		Yes	Below Basic	10	62.50
			Basic	6	37.50
			Proficient	--	--
			Advanced	--	--
			Total	16	100.00
	Geometry	No	Below Basic	93	41.15
			Basic	78	34.51
			Proficient	45	19.91
			Advanced	10	4.42
			Total	226	100.00
		Yes	Below Basic	12	100.00
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	12	100.00
	Government	No	Below Basic	105	13.98
			Basic	259	34.49
			Proficient	274	36.48
			Advanced	113	15.05
			Total	751	100.00
		Yes	Below Basic	25	33.78
			Basic	33	44.59
			Proficient	12	16.22
			Advanced	4	5.41
			Total	74	100.00
	Am. History	No	Below Basic	93	41.52
			Basic	63	28.13
			Proficient	55	24.55
			Advanced	13	5.80
			Total	224	100.00
		Yes	Below Basic	26	78.79
			Basic	5	15.15
			Proficient	1	3.03
			Advanced	1	3.03
			Total	33	100.00

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Table 9.56: Achievement-Level Distributions—Individualized Education Program, Fall 2012

Test Period	Content Area	IEP	Achievement Level	Freq.	%
Fall 2012	English II	No	Below Basic	329	12.93
			Basic	757	29.74
			Proficient	1,241	48.76
			Advanced	218	8.57
			Total	2,545	100.00
		Yes	Below Basic	167	42.93
			Basic	151	38.82
			Proficient	69	17.74
			Advanced	2	0.51
			Total	389	100.00
	Algebra I	No	Below Basic	527	15.70
			Basic	1,062	31.64
			Proficient	1,030	30.68
			Advanced	738	21.98
			Total	3,357	100.00
		Yes	Below Basic	283	53.50
			Basic	162	30.62
			Proficient	65	12.29
			Advanced	19	3.59
			Total	529	100.00
	Biology	No	Below Basic	393	16.17
			Basic	906	37.27
			Proficient	822	33.81
			Advanced	310	12.75
			Total	2,431	100.00
		Yes	Below Basic	194	48.50
			Basic	140	35.00
			Proficient	58	14.50
			Advanced	8	2.00
			Total	400	100.00

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Table 9.56 (continued): Achievement-Level Distributions—Individualized Education Program, Fall 2012

Test Period	Content Area	IEP	Achievement Level	Freq.	%
Fall 2012	English I	No	Below Basic	69	8.87
			Basic	211	27.12
			Proficient	364	46.79
			Advanced	134	17.22
			Total	778	100.00
		Yes	Below Basic	23	34.33
			Basic	24	35.82
			Proficient	16	23.88
			Advanced	4	5.97
			Total	67	100.00
	Algebra II	No	Below Basic	25	5.79
			Basic	61	14.12
			Proficient	196	45.37
			Advanced	150	34.72
			Total	432	100.00
		Yes	Below Basic	3	25.00
			Basic	4	33.33
			Proficient	4	33.33
			Advanced	1	8.33
			Total	12	100.00
	Geometry	No	Below Basic	56	7.94
			Basic	136	19.29
			Proficient	316	44.82
			Advanced	197	27.94
			Total	705	100.00
		Yes	Below Basic	14	29.17
			Basic	12	25.00
			Proficient	14	29.17
			Advanced	8	16.67
			Total	48	100.00
	Government	No	Below Basic	1,108	7.35
			Basic	5,824	38.64
			Proficient	5,787	38.39
			Advanced	2,354	15.62
			Total	15,073	100.00
		Yes	Below Basic	445	25.93
			Basic	888	51.75
			Proficient	332	19.35
			Advanced	51	2.97
			Total	1,716	100.00
	Am. History	No	Below Basic	289	23.98
			Basic	300	24.90
			Proficient	506	41.99
			Advanced	110	9.13
			Total	1,205	100.00
		Yes	Below Basic	71	60.68
			Basic	27	23.08
			Proficient	17	14.53
			Advanced	2	1.71
			Total	117	100.00

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Table 9.57: Achievement-Level Distributions—Individualized Education Program, Spring 2013

Test Period	Content Area	IEP	Achievement Level	Freq.	%
Spring 2013	English II	No	Below Basic	1,289	2.34
			Basic	12,465	22.63
			Proficient	29,877	54.24
			Advanced	11,457	20.80
			Total	55,088	100.00
		Yes	Below Basic	1,233	20.20
			Basic	3,298	54.03
			Proficient	1,431	23.44
			Advanced	142	2.33
			Total	6,104	100.00
	Algebra I	No	Below Basic	2,863	4.94
			Basic	18,958	32.71
			Proficient	25,773	44.47
			Advanced	10,365	17.88
			Total	57,959	100.00
		Yes	Below Basic	2,083	32.00
			Basic	3,144	48.29
			Proficient	1,074	16.50
			Advanced	209	3.21
			Total	6,510	100.00
	Biology	No	Below Basic	1,003	1.79
			Basic	9,729	17.38
			Proficient	29,408	52.53
			Advanced	15,841	28.30
			Total	55,981	100.00
		Yes	Below Basic	921	14.55
			Basic	3,053	48.22
			Proficient	2,031	32.08
			Advanced	326	5.15
			Total	6,331	100.00

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Table 9.57 (continued): Achievement-Level Distributions—Individualized Education Program, Spring 2013

Test Period	Content Area	IEP	Achievement Level	Freq.	%
Spring 2013	English I	No	Below Basic	4,364	7.70
			Basic	15,568	27.48
			Proficient	23,662	41.77
			Advanced	13,052	23.04
			Total	56,646	100.00
		Yes	Below Basic	2,620	43.84
			Basic	2,213	37.03
			Proficient	938	15.70
			Advanced	205	3.43
			Total	5,976	100.00
	Algebra II	No	Below Basic	2,596	11.40
			Basic	7,681	33.74
			Proficient	8,893	39.07
			Advanced	3,592	15.78
			Total	22,762	100.00
		Yes	Below Basic	280	42.88
			Basic	226	34.61
			Proficient	115	17.61
			Advanced	32	4.90
			Total	653	100.00
	Geometry	No	Below Basic	3,358	11.59
			Basic	7,498	25.89
			Proficient	11,567	39.93
			Advanced	6,542	22.59
			Total	28,965	100.00
		Yes	Below Basic	743	49.93
			Basic	405	27.22
			Proficient	251	16.87
			Advanced	89	5.98
			Total	1,488	100.00
	Government	No	Below Basic	3,277	8.64
			Basic	12,144	32.01
			Proficient	15,074	39.73
			Advanced	7,445	19.62
			Total	37,940	100.00
		Yes	Below Basic	1,607	37.83
			Basic	1,729	40.70
			Proficient	719	16.93
			Advanced	193	4.54
			Total	4,248	100.00
	Am. History	No	Below Basic	11,325	23.87
			Basic	12,499	26.34
			Proficient	15,358	32.37
			Advanced	8,262	17.41
			Total	47,444	100.00
		Yes	Below Basic	2,884	59.53
			Basic	1,022	21.09
			Proficient	718	14.82
			Advanced	221	4.56
			Total	4,845	100.00

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Table 9.58: Achievement-Level Distributions—Accommodations, Summer 2012

Test Period	Content Area	Accom.	Achievement Level	Freq.	%
Summer 2012	English II	No	Below Basic	59	13.88
			Basic	196	46.12
			Proficient	148	34.82
			Advanced	22	5.18
			Total	425	100.00
		Yes	Below Basic	1	33.33
			Basic	2	66.67
			Proficient	--	--
			Advanced	--	--
			Total	3	100.00
	Algebra I	No	Below Basic	155	17.80
			Basic	372	42.71
			Proficient	300	34.44
			Advanced	44	5.05
			Total	871	100.00
		Yes	Below Basic	6	35.29
			Basic	9	52.94
			Proficient	1	5.88
			Advanced	1	5.88
			Total	17	100.00
	Biology	No	Below Basic	69	22.33
			Basic	165	53.40
			Proficient	63	20.39
			Advanced	12	3.88
			Total	309	100.00
		Yes	Below Basic	1	8.33
			Basic	10	83.33
			Proficient	1	8.33
			Advanced	--	--
			Total	12	100.00

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Table 9.58 (continued): Achievement-Level Distributions—Accommodations, Summer 2012

Test Period	Content Area	Accom.	Achievement Level	Freq.	%
Summer 2012	English I	No	Below Basic	72	24.32
			Basic	126	42.57
			Proficient	74	25.00
			Advanced	24	8.11
			Total	296	100.00
		Yes	Below Basic	5	45.45
			Basic	6	54.55
			Proficient	--	--
			Advanced	--	--
			Total	11	100.00
	Algebra II	No	Below Basic	71	49.65
			Basic	55	38.46
			Proficient	13	9.09
			Advanced	4	2.80
			Total	143	100.00
		Yes	Below Basic	--	--
			Basic	1	100.00
			Proficient	--	--
			Advanced	--	--
			Total	1	100.00
	Geometry	No	Below Basic	103	43.28
			Basic	79	33.19
			Proficient	45	18.91
			Advanced	11	4.62
			Total	238	100.00
		Yes	Below Basic	3	100.00
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	3	100.00
	Government	No	Below Basic	129	15.77
			Basic	284	34.72
			Proficient	286	34.96
			Advanced	119	14.55
			Total	818	100.00
		Yes	Below Basic	7	33.33
			Basic	11	52.38
			Proficient	3	14.29
			Advanced	--	--
			Total	21	100.00
	Am. History	No	Below Basic	117	45.00
			Basic	72	27.69
			Proficient	57	21.92
			Advanced	14	5.38
			Total	260	100.00
		Yes	Below Basic	2	50.00
			Basic	2	50.00
			Proficient	--	--
			Advanced	--	--
			Total	4	100.00

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Table 9.59: Achievement-Level Distributions—Accommodations, Fall 2012

Test Period	Content Area	Accom.	Achievement Level	Freq.	%
Fall 2012	English II	No	Below Basic	448	15.64
			Basic	890	31.06
			Proficient	1,306	45.58
			Advanced	221	7.71
			Total	2,865	100.00
		Yes	Below Basic	51	68.00
			Basic	18	24.00
			Proficient	6	8.00
			Advanced	--	--
			Total	75	100.00
	Algebra I	No	Below Basic	705	19.09
			Basic	1,155	31.27
			Proficient	1,079	29.21
			Advanced	755	20.44
			Total	3,694	100.00
		Yes	Below Basic	110	54.46
			Basic	71	35.15
			Proficient	17	8.42
			Advanced	4	1.98
			Total	202	100.00
	Biology	No	Below Basic	512	19.05
			Basic	993	36.94
			Proficient	866	32.22
			Advanced	317	11.79
			Total	2,688	100.00
		Yes	Below Basic	78	52.35
			Basic	56	37.58
			Proficient	14	9.40
			Advanced	1	0.67
			Total	149	100.00

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Table 9.59 (continued): Achievement-Level Distributions—Accommodations, Fall 2012

Test Period	Content Area	Accom.	Achievement Level	Freq.	%
Fall 2012	English I	No	Below Basic	89	10.56
			Basic	235	27.88
			Proficient	381	45.20
			Advanced	138	16.37
			Total	843	100.00
		Yes	Below Basic	3	100.00
			Basic	--	--
			Proficient	--	--
			Advanced	--	--
			Total	3	100.00
	Algebra II	No	Below Basic	28	6.35
			Basic	65	14.74
			Proficient	197	44.67
			Advanced	151	34.24
			Total	441	100.00
		Yes	Below Basic	1	25.00
			Basic	--	--
			Proficient	3	75.00
			Advanced	--	--
			Total	4	100.00
	Geometry	No	Below Basic	61	8.36
			Basic	140	19.18
			Proficient	326	44.66
			Advanced	203	27.81
			Total	730	100.00
		Yes	Below Basic	9	39.13
			Basic	8	34.78
			Proficient	4	17.39
			Advanced	2	8.70
			Total	23	100.00
	Government	No	Below Basic	1,372	8.51
			Basic	6,340	39.31
			Proficient	6,021	37.33
			Advanced	2,395	14.85
			Total	16,128	100.00
		Yes	Below Basic	185	27.33
			Basic	381	56.28
			Proficient	101	14.92
			Advanced	10	1.48
			Total	677	100.00
	Am. History	No	Below Basic	334	26.03
			Basic	321	25.02
			Proficient	517	40.30
			Advanced	111	8.65
			Total	1,283	100.00
		Yes	Below Basic	27	67.50
			Basic	6	15.00
			Proficient	6	15.00
			Advanced	1	2.50
			Total	40	100.00

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Table 9.60: Achievement-Level Distributions—Accommodations, Spring 2013

Test Period	Content Area	Accom.	Achievement Level	Freq.	%
Spring 2013	English II	No	Below Basic	2,126	3.57
			Basic	14,834	24.92
			Proficient	30,994	52.07
			Advanced	11,575	19.44
			Total	59,529	100.00
		Yes	Below Basic	403	23.59
			Basic	949	55.56
			Proficient	326	19.09
			Advanced	30	1.76
			Total	1,708	100.00
	Algebra I	No	Below Basic	4,045	6.55
			Basic	20,717	33.53
			Proficient	26,500	42.88
			Advanced	10,533	17.05
			Total	61,795	100.00
		Yes	Below Basic	913	33.21
			Basic	1,417	51.55
			Proficient	367	13.35
			Advanced	52	1.89
			Total	2,749	100.00
	Biology	No	Below Basic	1,394	2.35
			Basic	11,166	18.86
			Proficient	30,566	51.62
			Advanced	16,091	27.17
			Total	59,217	100.00
		Yes	Below Basic	534	17.02
			Basic	1,638	52.20
			Proficient	888	28.30
			Advanced	78	2.49
			Total	3,138	100.00

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Table 9.60 (continued): Achievement-Level Distributions—Accommodations, Spring 2013

Test Period	Content Area	Accom.	Achievement Level	Freq.	%
Spring 2013	English I	No	Below Basic	6,237	10.20
			Basic	17,265	28.23
			Proficient	24,421	39.94
			Advanced	13,226	21.63
			Total	61,149	100.00
		Yes	Below Basic	767	50.00
			Basic	534	34.81
			Proficient	194	12.65
			Advanced	39	2.54
			Total	1,534	100.00
	Algebra II	No	Below Basic	2,775	11.97
			Basic	7,821	33.74
			Proficient	8,968	38.69
			Advanced	3,617	15.60
			Total	23,181	100.00
		Yes	Below Basic	104	42.45
			Basic	89	36.33
			Proficient	43	17.55
			Advanced	9	3.67
			Total	245	100.00
	Geometry	No	Below Basic	3,766	12.59
			Basic	7,754	25.92
			Proficient	11,774	39.36
			Advanced	6,620	22.13
			Total	29,914	100.00
		Yes	Below Basic	337	59.33
			Basic	156	27.46
			Proficient	58	10.21
			Advanced	17	2.99
			Total	568	100.00
	Government	No	Below Basic	4,042	10.06
			Basic	13,054	32.48
			Proficient	15,497	38.56
			Advanced	7,601	18.91
			Total	40,194	100.00
		Yes	Below Basic	857	42.34
			Basic	829	40.96
			Proficient	299	14.77
			Advanced	39	1.93
			Total	2,024	100.00
	Am. History	No	Below Basic	12,704	25.37
			Basic	13,084	26.13
			Proficient	15,849	31.65
			Advanced	8,434	16.84
			Total	50,071	100.00
		Yes	Below Basic	1,528	67.82
			Basic	441	19.57
			Proficient	232	10.30
			Advanced	52	2.31
			Total	2,253	100.00

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Chapter 10: Reliability

10.1 Introduction

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 MO 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. 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.

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 random error component:

$$X = T + \text{error}.$$

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 in the equation above is critical in defining 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 test forms, which is also equal to the proportion of true score variance to observed score variance,

$$\rho_{x_1 x_{2(}} = (\frac{\sigma_t^{2(}}{\sigma_{x(}^2}$$

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The CTT definition of the SEM can be derived from the above as the following:

$$\sigma_e = \sigma_{x(} \sqrt{1 - \rho_{x_1 x_{2(}}}$$

10.2.2 Estimating Reliability

The reliability and SEM of a specific test cannot be estimated directly from the equations above. However, reliability can be estimated via the correlation of scores on forms assumed to be parallel (equivalence reliability), from test-retest data (stability reliability), or 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 standard 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. For a test consisting of p items, in which the item scores Y_j are summed to get a total score X, coefficient alpha is as follows:

$$\alpha = \left(\frac{p(}{1 - p(}\right)\left(1 - \frac{\sum_{j=1}^{p(} \sigma_{Y_j}^2}{\sigma_{X(}^2}\right)$$

10.2.3 Sources of Measurement Error

Errors in measurement can result from environmental factors and examinee factors. To reduce other sources of measurement error, the scoring of student responses to SR items was done electronically.

The PEs and WPs are also susceptible to scoring error due to the differences among raters,and ambiguity in the scoring rubric. In order to minimize the effect of these errors, rubrics were written to balance generality and specificity and to cover the range of student responses, while at the same time allowing raters to easily identify the response characteristics distinguishing each score category. To minimize rater error, raters were thoroughly trained and monitored throughout the scoring process. Only raters who met criteria for consistent scoring during training were retained as scorers.

10.3 Evidence of Raw-Score Internal Consistency

Consistency of individual student performance was estimated using Cronbach's coefficient alpha, which 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:

When using coefficient alpha, the 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."[17] SEMs were estimated by using alpha as the estimate of reliability, and the observed raw score standard deviation as the estimate of the population score standard deviation:

[17] Traub, 1994, p. 114

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$$SEM = (\sigma_X \sqrt{1 - \alpha}($$

Separate analyses were performed for each EOC content Area. Tables 10.1 through 10.25 show the SEMs based on the raw-score metric for the total population and for select student subgroups. A separate reliability coefficient, estimated through coefficient alpha, is reported for each group of students, provided at least 30 students are in the group.

Finally, an effect size is reported within each group, provided minimal sample size requirements are met. Effect size is a measure of how much the scores of two groups of students differ from each other. It is based on score standard deviations, and is defined by the following equation, also known as Cohen‘s *d*:

$$d = (\frac{\bar{X}_{F(} - (\bar{X}_R}{\sigma_{X(}}$$

where the numerator is the difference in average scores between a focal and a reference group, and the denominator is an estimate of total score standard deviation. In this case, the standard deviations across groups were pooled to generate the standard deviation estimate.

An effect size of one is equivalent to a difference of one standard deviation. An effect size of .8 is considered large; an effect size of .5 is considered medium; an effect size of .2 is considered small.

Effect size is reported whenever the reference and focal groups each have a minimum of 50 students.

Following EOC program convention, the reference groups are gender = Male, ethnicity = White, LEP status = no, IEP status = no, Migrant status = no, FRL status = no, Title 1 status = no, and Accommodations status = no.

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Table 10.1: Alpha Coefficients and Standard Errors of Measurement, English II, Summer 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	428	19.39	6.28	--	0.82	2.65
Gender						
Female	166	19.68	6.44	0.08	0.83	2.64
Male	262	19.20	6.18		0.82	2.65
Ethnicity						
American Indian/ Alaskan Native	3	20.00	2.65	--	--	--
Asian	5	24.60	5.18	--	--	--
Pacific Islander	--	--	--	--	--	--
Black (not Hispanic)	182	18.09	5.44	-0.32	0.75	2.70
Hispanic	25	21.48	6.53	--	--	--
White (not Hispanic)	210	20.06	6.72	--	0.85	2.61
Multi-racial	3	23.67	9.45	--	--	--
LEP						
No	404	19.49	6.27	--	0.82	2.65
Yes	10	18.00	6.48	--	--	--
IEP						
No	370	19.65	6.25	--	0.82	2.64
Yes	44	17.77	6.27	--	0.81	2.72
Migrant						
No	414	19.45	6.27	--	0.82	2.65
Yes	--	--	--	--	--	--
FRL						
No	210	19.34	6.77	--	0.85	2.62
Yes	204	19.57	5.73	0.04	0.78	2.67
Title I						
No	378	19.69	6.18	--	0.82	2.64
Yes	36	17.00	6.77	--	0.85	2.66
Accommodations						
No	425	19.42	6.28	--	0.82	2.65
Yes	3	15.00	5.29	--	--	--

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Table 10.2: Alpha Coefficients and Standard Errors of Measurement, Algebra I, Summer 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	888	17.58	5.95	--	0.80	2.64
Gender						
Female	385	17.21	5.78	-0.01	0.79	2.66
Male	503	17.87	6.07	--	0.81	2.63
Ethnicity						
American Indian/ Alaskan Native	6	19.00	4.94	--	--	--
Asian	9	21.11	3.92	--	--	--
Pacific Islander	2	18.00	9.90	--	--	--
Black (not Hispanic)	405	15.57	5.41	-0.67	0.75	2.68
Hispanic	40	18.20	6.26	--	0.82	2.62
White (not Hispanic)	413	19.35	5.88	--	0.80	2.60
Multi-racial	13	18.77	5.67	--	--	--
LEP						
No	859	17.68	5.93	--	0.80	2.64
Yes	15	14.47	4.93	--	--	--
IEP						
No	761	17.89	5.86	--	0.80	2.64
Yes	113	15.87	6.14	-0.34	0.81	2.66
Migrant						
No	874	17.63	5.93	--	0.80	2.64
Yes	--	--	--	--	--	--
FRL						
No	470	18.03	6.08	--	0.81	2.62
Yes	404	17.16	5.72	-0.15	0.78	2.66
Title I						
No	790	17.91	5.85	--	0.80	2.64
Yes	84	14.96	6.00	-0.50	0.80	2.65
Accommodations						
No	871	17.65	5.91	--	0.80	2.64
Yes	17	14.00	7.04	--	--	--

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Table 10.3: Alpha Coefficients and Standard Errors of Measurement, Biology, Summer 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	321	17.55	5.85	--	0.79	2.70
Gender						
Female	148	17.43	5.94	-0.04	0.79	2.71
Male	173	17.64	5.78		0.78	2.70
Ethnicity						
American Indian/ Alaskan Native	1	21.00	--	--	--	--
Asian	2	17.00	2.83	--	--	--
Pacific Islander	--	--	--	--	--	--
Black (not Hispanic)	140	15.46	5.39	-0.68	0.74	2.74
Hispanic	12	18.83	5.89	--	--	--
White (not Hispanic)	163	19.23	5.70	--	0.78	2.66
Multi-racial	3	17.33	8.39	--	--	--
LEP						
No	304	17.59	5.85	--	0.79	2.70
Yes	3	15.33	6.81	--	--	--
IEP						
No	269	17.64	5.97	--	0.80	2.69
Yes	38	17.00	4.93	--	0.69	2.76
Migrant						
No	307	17.56	5.85	--	0.79	2.70
Yes	--	--	--	--	--	--
FRL						
No	168	17.55	6.10	--	0.81	2.67
Yes	139	17.58	5.55	0.01	0.76	2.73
Title I						
No	274	18.07	5.86	--	0.79	2.69
Yes	33	13.33	3.70	--	0.46	2.72
Accommodations						
No	309	17.55	5.90	--	0.79	2.7
Yes	12	17.42	4.38	--	--	--

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Table 10.4: Alpha Coefficients and Standard Errors of Measurement, English I, Summer 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	307	21.21	7.14	--	0.84	2.88
Gender						
Female	127	21.72	7.83	0.12	0.87	2.81
Male	180	20.84	6.61		0.81	2.92
Ethnicity						
American Indian/ Alaskan Native	1	29.00	--	--	--	--
Asian	8	17.25	10.99	--	--	--
Pacific Islander	--	--	--	--	--	--
Black (not Hispanic)	149	19.23	6.06	-0.63	0.76	2.94
Hispanic	11	24.27	6.54	--	--	--
White (not Hispanic)	133	23.43	7.29	--	0.85	2.81
Multi-racial	5	19.00	8.97	--	--	--
LEP						
No	296	21.39	7.07	--	0.83	2.88
Yes	10	15.20	7.18	--	--	--
IEP						
No	268	21.94	7.07	--	0.84	2.86
Yes	38	15.87	5.15	--	0.68	2.94
Migrant						
No	306	21.19	7.14	--	0.84	2.88
Yes	--	--	--	--	--	--
FRL						
No	125	22.72	7.67	--	0.86	2.82
Yes	181	20.13	6.57	-0.37	0.80	2.91
Title I						
No	306	21.19	7.14	--	0.84	2.88
Yes	--	--	--	--	--	--
Accommodations						
No	296	21.40	7.17	--	0.84	2.87
Yes	11	16.09	3.56	--	--	--

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Table 10.5: Alpha Coefficients and Standard Errors of Measurement, Algebra II, Summer 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	144	16.59	6.02	--	0.77	2.89
Gender						
Female	57	17.04	4.96	0.12	0.65	2.94
Male	87	16.30	6.63		0.81	2.86
Ethnicity						
American Indian/ Alaskan Native	1	20.00	--	--	--	--
Asian	1	18.00	--	--	--	--
Pacific Islander	--	--	--	--	--	--
Black (not Hispanic)	95	15.55	5.08	-0.52	0.67	2.91
Hispanic	2	18.50	4.95	--	--	--
White (not Hispanic)	45	18.60	7.43	--	0.85	2.83
Multi-racial	--	--	--	--	--	--
LEP						
No	140	16.67	6.08	--	0.77	2.90
Yes	--	--	--	--	--	--
IEP						
No	124	17.10	6.18	--	0.78	2.90
Yes	16	13.38	4.08	--	--	--
Migrant						
No	140	16.67	6.08	--	0.77	2.90
Yes	--	--	--	--	--	--
FRL						
No	63	16.63	5.43	--	0.71	2.93
Yes	77	16.70	6.60	0.01	0.81	2.87
Title I						
No	138	16.60	6.04	--	0.77	2.90
Yes	2	21.50	9.19	--	--	--
Accommodations						
No	143	16.59	6.04	--	0.77	2.89
Yes	1	17.00	--	--	--	--

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Table 10.6: Alpha Coefficients and Standard Errors of Measurement, Geometry, Summer 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	241	18.39	7.00	--	0.83	2.92
Gender						
Female	120	17.94	6.89	-0.13	0.81	3.02
Male	121	18.83	7.10		0.84	2.83
Ethnicity						
American Indian/ Alaskan Native	1	22.00	--	--	--	--
Asian	1	21.00	--	--	--	--
Pacific Islander	1	23.00	--	--	--	--
Black (not Hispanic)	165	16.46	6.21	-1.10	0.77	2.98
Hispanic	12	20.33	6.64	--	--	--
White (not Hispanic)	57	23.46	6.96	--	0.84	2.78
Multi-racial	4	17.00	4.55	--	--	--
LEP						
No	236	18.39	6.96	--	0.82	2.93
Yes	2	13.00	7.07	--	--	--
IEP						
No	226	18.69	6.95	--	0.82	2.94
Yes	12	11.75	2.26	--	--	--
Migrant						
No	238	18.34	6.96	--	0.82	2.92
Yes	--	--	--	--	--	--
FRL						
No	111	19.85	7.08	--	0.84	2.84
Yes	127	17.02	6.61	-0.42	0.79	3.00
Title I						
No	217	17.88	6.85	--	0.82	2.93
Yes	21	23.14	6.36	--	--	--
Accommodations						
No	238	18.47	6.99	--	0.83	2.92
Yes	3	12.00	3.61	--	--	--

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Table 10.7: Alpha Coefficients and Standard Errors of Measurement, Government, Summer 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	839	23.87	8.32	--	0.89	2.76
Gender						
Female	463	23.91	7.87	0.01	0.88	2.78
Male	376	23.83	8.85	--	0.91	2.72
Ethnicity						
American Indian/ Alaskan Native	4	23.00	9.56	--	--	--
Asian	28	28.61	8.22	--	--	--
Pacific Islander	--	--	--	--	--	--
Black (not Hispanic)	132	19.45	8.03	-0.64	0.87	2.86
Hispanic	56	23.07	7.26	-0.20	0.85	2.83
White (not Hispanic)	612	24.66	8.15	--	0.89	2.73
Multi-racial	7	26.71	6.60	--	--	--
LEP						
No	806	24.11	8.26	--	0.89	2.75
Yes	19	16.95	5.24	--	--	--
IEP						
No	751	24.45	8.20	--	0.89	2.74
Yes	74	18.80	7.22	-0.70	0.84	2.90
Migrant						
No	825	23.94	8.28	--	0.89	2.76
Yes	--	--	--	--	--	--
FRL						
No	530	25.16	8.23	--	0.89	2.71
Yes	295	21.75	7.90	-0.42	0.87	2.84
Title I						
No	778	24.16	8.28	--	0.89	2.75
Yes	47	20.26	7.28	--	0.85	2.83
Accommodations						
No	818	24.03	8.33	--	0.89	2.75
Yes	21	17.86	4.77	--	--	--

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Table 10.8: Alpha Coefficients and Standard Errors of Measurement, Am. History, Summer 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	264	19.81	7.22	--	0.84	2.90
Gender						
Female	118	19.38	7.29	-0.11	0.84	2.91
Male	146	20.15	7.16	--	0.84	2.89
Ethnicity						
American Indian/ Alaskan Native	1	27.00	--	--	--	--
Asian	4	16.25	1.26	--	--	--
Pacific Islander	--	--	--	--	--	--
Black (not Hispanic)	118	16.07	5.96	-1.11	0.76	2.93
Hispanic	12	20.58	5.16	--	--	--
White (not Hispanic)	129	23.21	6.84	--	0.83	2.84
Multi-racial	--	--	--	--	--	--
LEP						
No	248	19.85	7.34	--	0.84	2.90
Yes	9	16.00	3.54	--	--	--
IEP						
No	224	20.40	7.20	--	0.84	2.90
Yes	33	15.12	6.00	--	0.77	2.90
Migrant						
No	257	19.72	7.27	--	0.84	2.90
Yes	--	--	--	--	--	--
FRL						
No	124	21.28	7.38	--	0.85	2.89
Yes	133	18.26	6.88	-0.43	0.82	2.91
Title I						
No	256	19.71	7.28	--	0.84	2.90
Yes	1	21.00	--	--	--	--
Accommodations						
No	260	19.82	7.26	--	0.84	2.90
Yes	4	19.00	3.92	--	--	--

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Table 10.9: Alpha Coefficients and Standard Errors of Measurement, English II, Fall 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	2,940	22.83	7.32	--	0.86	2.69
Gender						
Female	1,364	23.64	6.98	0.21	0.85	2.67
Male	1,576	22.14	7.53		0.87	2.70
Ethnicity						
American Indian/ Alaskan Native	11	20.91	9.83	--	--	--
Asian	43	22.72	9.37	--	0.91	2.78
Pacific Islander	7	16.71	5.02	--	--	--
Black (not Hispanic)	1,172	21.18	6.88	-0.44	0.84	2.73
Hispanic	142	20.49	7.37	-0.52	0.87	2.7
White (not Hispanic)	1,503	24.28	7.23	--	0.87	2.65
Multi-racial	62	25.44	7.31	0.16	0.87	2.62
LEP						
No	2,844	23.02	7.28	--	0.86	2.69
Yes	90	16.92	5.87	-0.84	0.76	2.87
IEP						
No	2,545	23.80	6.94	--	0.85	2.66
Yes	389	16.53	6.52	-1.06	0.81	2.81
Migrant						
No	2,933	22.84	7.31	--	0.86	2.69
Yes	1	19.00	--	--	--	--
FRL						
No	1,328	25.08	7.05	--	0.86	2.63
Yes	1,606	20.98	7.00	-0.58	0.85	2.73
Title I						
No	2,598	23.47	7.13	--	0.86	2.67
Yes	336	17.91	6.81	-0.78	0.83	2.77
Accommodations						
No	2,865	23.08	7.20	--	0.86	2.69
Yes	75	13.36	5.31	-1.36	0.72	2.81

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Table 10.10: Alpha Coefficients and Standard Errors of Measurement, Algebra I, Fall 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	3,896	21.14	8.89	--	0.90	2.74
Gender						
Female	1,773	21.53	8.67	0.08	0.90	2.73
Male	2,123	20.82	9.06	--	0.91	2.75
Ethnicity						
American Indian/ Alaskan Native	15	17.67	9.47	--	--	--
Asian	75	25.32	9.26	0.31	0.92	2.64
Pacific Islander	7	18.14	9.65	--	--	--
Black (not Hispanic)	772	15.91	7.14	-0.79	0.85	2.79
Hispanic	183	19.74	7.86	-0.32	0.87	2.83
White (not Hispanic)	2,790	22.57	8.81	--	0.91	2.70
Multi-racial	54	22.39	8.37	-0.02	0.89	2.76
LEP						
No	3,797	21.24	8.90	--	0.91	2.74
Yes	89	17.52	7.33	-0.42	0.85	2.85
IEP						
No	3,357	22.29	8.61	--	0.90	2.72
Yes	529	13.97	7.03	-0.99	0.85	2.76
Migrant						
No	3,886	21.15	8.88	--	0.90	2.74
Yes	--	--	--	--	--	--
FRL						
No	2,150	23.98	8.67	--	0.91	2.67
Yes	1,736	17.66	7.83	-0.76	0.87	2.79
Title I						
No	3,605	21.73	8.80	--	0.90	2.73
Yes	281	13.79	6.17	-0.92	0.80	2.74
Accommodations						
No	3,694	21.58	8.82	--	0.90	2.74
Yes	202	13.16	5.94	-0.97	0.79	2.72

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Table 10.11: Alpha Coefficients and Standard Errors of Measurement, Biology, Fall 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	2,837	30.06	11.90	--	0.92	3.45
Gender						
Female	1,316	30.17	11.82	0.02	0.91	3.45
Male	1,521	29.95	11.97	--	0.92	3.43
Ethnicity						
American Indian/ Alaskan Native	10	27.40	13.50	--	--	--
Asian	56	38.64	12.38	0.53	0.94	3.15
Pacific Islander	6	23.33	14.92	--	--	--
Black (not Hispanic)	623	21.73	9.13	-1.00	0.85	3.5
Hispanic	165	28.56	11.49	-0.36	0.91	3.46
White (not Hispanic)	1,920	32.61	11.38	--	0.91	3.39
Multi-racial	57	31.91	11.61	-0.06	0.91	3.42
LEP						
No	2,762	30.31	11.88	--	0.92	3.44
Yes	69	21.12	8.57	-0.78	0.84	3.44
IEP						
No	2,431	31.51	11.51	--	0.91	3.42
Yes	400	21.41	10.39	-0.89	0.89	3.45
Migrant						
No	2,831	30.08	11.89	--	0.92	3.45
Yes	--	--	--	--	--	--
FRL						
No	1,543	34.42	11.66	--	0.92	3.33
Yes	1,288	24.88	9.92	-0.87	0.87	3.52
Title I						
No	2,558	31.17	11.76	--	0.91	3.43
Yes	273	19.85	7.47	-0.99	0.79	3.42
Accommodations						
No	2,688	30.61	11.78	--	0.92	3.43
Yes	149	20.05	9.18	-0.91	0.86	3.43

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Table 10.12: Alpha Coefficients and Standard Errors of Measurement, English I, Fall 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	846	25.69	6.96	--	0.85	2.72
Gender						
Female	388	26.27	6.85	0.15	0.85	2.68
Male	458	25.20	7.02	--	0.85	2.75
Ethnicity						
American Indian/ Alaskan Native	4	27.25	6.24	--	--	--
Asian	19	29.21	5.72	--	--	--
Pacific Islander	2	22.50	14.85	--	--	--
Black (not Hispanic)	108	20.04	6.83	-1.01	0.82	2.92
Hispanic	46	24.15	7.23	--	0.85	2.80
White (not Hispanic)	655	26.65	6.48	--	0.83	2.68
Multi-racial	12	24.42	8.25	--	--	--
LEP						
No	821	25.84	6.92	--	0.85	2.72
Yes	24	20.21	6.39	--	--	--
IEP						
No	778	26.18	6.71	--	0.84	2.70
Yes	67	19.87	7.19	-0.94	0.84	2.91
Migrant						
No	845	25.68	6.96	--	0.85	2.72
Yes	--	--	--	--	--	--
FRL						
No	526	27.40	6.03	--	0.81	2.66
Yes	319	22.84	7.46	-0.69	0.86	2.82
Title I						
No	780	25.93	6.97	--	0.85	2.71
Yes	65	22.69	6.10	-0.47	0.78	2.88
Accommodations						
No	843	25.74	6.93	--	0.85	2.72
Yes	3	12.67	2.52	--	--	--

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Table 10.13: Alpha Coefficients and Standard Errors of Measurement, Algebra II, Fall 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	445	27.55	6.89	--	0.86	2.62
Gender						
Female	248	27.07	6.86	-0.16	0.85	2.64
Male	197	28.16	6.90	--	0.86	2.59
Ethnicity						
American Indian/ Alaskan Native	--	--	--	--	--	--
Asian	14	27.86	7.54	--	--	--
Pacific Islander	1	20.00	--	--	--	--
Black (not Hispanic)	63	22.24	7.92	-0.94	0.87	2.81
Hispanic	28	27.39	6.33	--	--	--
White (not Hispanic)	320	28.40	6.25	--	0.83	2.59
Multi-racial	19	31.26	5.83	--	--	--
LEP						
No	437	27.64	6.85	--	0.85	2.62
Yes	7	24.00	7.23	--	--	--
IEP						
No	432	27.73	6.78	--	0.85	2.61
Yes	12	22.25	7.85	--	--	--
Migrant						
No	444	27.59	6.86	--	0.85	2.62
Yes	--	--	--	--	--	--
FRL						
No	320	28.61	6.29	--	0.83	2.58
Yes	124	24.94	7.56	-0.55	0.87	2.72
Title I						
No	444	27.59	6.86	--	0.85	2.62
Yes	--	--	--	--	--	--
Accommodations						
No	441	27.59	6.89	--	0.86	2.62
Yes	4	23.50	7.33	--	--	--

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Table 10.14: Alpha Coefficients and Standard Errors of Measurement, Geometry, Fall 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	753	26.39	6.89	--	0.85	2.65
Gender						
Female	366	26.41	6.68	0.01	0.84	2.66
Male	387	26.37	7.09	--	0.86	2.64
Ethnicity						
American Indian/ Alaskan Native	6	19.67	5.09	--	--	--
Asian	23	29.87	5.59	--	--	--
Pacific Islander	1	19.00	--	--	--	--
Black (not Hispanic)	88	21.18	7.03	-0.89	0.84	2.84
Hispanic	50	25.78	5.35	-0.21	0.74	2.75
White (not Hispanic)	562	27.17	6.68	--	0.85	2.61
Multi-racial	23	27.04	5.90	--	--	--
LEP						
No	733	26.42	6.91	--	0.85	2.65
Yes	20	25.35	6.23	--	--	--
IEP						
No	705	26.70	6.68	--	0.84	2.64
Yes	48	21.75	8.17	--	0.88	2.78
Migrant						
No	753	26.39	6.89	--	0.85	2.65
Yes	--	--	--	--	--	--
FRL						
No	532	27.48	6.59	--	0.84	2.60
Yes	221	23.76	6.90	-0.56	0.84	2.76
Title I						
No	753	26.39	6.89	--	0.85	2.65
Yes	--	--	--	--	--	--
Accommodations						
No	730	26.60	6.76	--	0.85	2.64
Yes	23	19.65	7.54	--	--	--

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Table 10.15: Alpha Coefficients and Standard Errors of Measurement, Government, Fall 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	16,805	24.42	7.13	--	0.85	2.73
Gender						
Female	8,340	24.06	6.92	-0.10	0.84	2.74
Male	8,465	24.78	7.31	--	0.86	2.71
Ethnicity						
American Indian/ Alaskan Native	89	24.27	7.07	-0.17	0.85	2.71
Asian	418	27.88	7.50	0.36	0.89	2.54
Pacific Islander	32	21.84	7.85	--	0.88	2.76
Black (not Hispanic)	3,219	20.67	6.70	-0.69	0.82	2.87
Hispanic	741	22.66	6.74	-0.40	0.82	2.82
White (not Hispanic)	12,095	25.41	6.87	--	0.85	2.69
Multi-racial	211	24.66	7.16	-0.11	0.86	2.71
LEP						
No	16,483	24.53	7.1	--	0.85	2.73
Yes	306	18.70	6.34	-0.82	0.79	2.92
IEP						
No	15,073	25.02	6.94	--	0.85	2.71
Yes	1,716	19.20	6.65	-0.84	0.81	2.90
Migrant						
No	16,782	24.43	7.13	--	0.85	2.73
Yes	7	20.86	6.94	--	--	--
FRL						
No	9,897	26.36	6.8	--	0.85	2.65
Yes	6,892	21.65	6.67	-0.70	0.82	2.84
Title I						
No	15,746	24.64	7.07	--	0.85	2.72
Yes	1,043	21.20	7.27	-0.49	0.85	2.85
Accommodations						
No	16,128	24.68	7.06	--	0.85	2.72
Yes	677	18.39	6.01	-0.89	0.76	2.94

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Table 10.16: Alpha Coefficients and Standard Errors of Measurement, Am. History, Fall 2012

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	1,323	22.51	6.29	--	0.80	2.83
Gender						
Female	654	21.76	5.90	-0.24	0.77	2.85
Male	669	23.23	6.56		0.82	2.80
Ethnicity						
American Indian/ Alaskan Native	5	23.40	5.81	--	--	--
Asian	27	22.52	7.09	--	--	--
Pacific Islander	3	15.00	2.65	--	--	--
Black (not Hispanic)	164	18.24	6.41	-0.84	0.80	2.88
Hispanic	68	20.88	6.16	-0.41	0.79	2.84
White (not Hispanic)	1,030	23.30	5.96	--	0.78	2.81
Multi-racial	26	22.81	6.29	--	--	--
LEP						
No	1,285	22.68	6.24	--	0.8	2.82
Yes	37	16.51	4.70	--	0.61	2.92
IEP						
No	1,205	23.01	6.11	--	0.79	2.81
Yes	117	17.38	5.77	-0.93	0.74	2.96
Migrant						
No	1,322	22.51	6.29	--	0.80	2.83
Yes	--	--	--	--	--	--
FRL						
No	817	23.80	5.97	--	0.78	2.79
Yes	505	20.43	6.24	-0.56	0.79	2.89
Title I						
No	1,268	22.83	6.11	--	0.79	2.82
Yes	54	15.04	5.72	-1.28	0.75	2.86
Accommodations						
No	1,283	22.69	6.21	--	0.79	2.83
Yes	40	16.60	6.03	--	0.77	2.88

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Table 10.17: Alpha Coefficients and Standard Errors of Measurement, English II, Spring 2013

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	61,237	26.91	6.36	--	0.83	2.60
Gender						
Female	30,472	27.86	5.97	0.30	0.82	2.55
Male	30,765	25.96	6.59	--	0.84	2.63
Ethnicity						
American Indian/ Alaskan Native	275	27.33	6.04	-0.05	0.82	2.58
Asian	1,112	28.49	6.54	0.14	0.85	2.51
Pacific Islander	104	25.55	6.49	-0.35	0.83	2.67
Black (not Hispanic)	8,882	23.05	6.76	-0.75	0.83	2.81
Hispanic	2,474	25.75	6.36	-0.32	0.83	2.65
White (not Hispanic)	47,480	27.66	6.00	--	0.82	2.56
Multi-racial	910	26.68	6.36	-0.16	0.83	2.63
LEP						
No	60,175	27.01	6.32	--	0.83	2.60
Yes	1,017	21.30	6.53	-0.90	0.81	2.86
IEP						
No	55,088	27.72	5.77	--	0.8	2.55
Yes	6,104	19.60	6.76	-1.38	0.82	2.89
Migrant						
No	61,172	26.91	6.36	--	0.83	2.60
Yes	20	22.05	6.50	--	--	--
FRL						
No	36,126	28.55	5.64	--	0.80	2.50
Yes	25,066	24.55	6.59	-0.66	0.83	2.72
Title I						
No	57,094	27.21	6.23	--	0.83	2.59
Yes	4,098	22.84	6.73	-0.70	0.83	2.77
Accommodations						
No	59,529	27.15	6.19	--	0.83	2.58
Yes	1,708	18.58	6.82	-1.38	0.81	3.01

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Table 10.18: Alpha Coefficients and Standard Errors of Measurement, Algebra I, Spring 2013

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	64,544	22.79	7.36	--	0.86	2.75
Gender						
Female	31,987	22.93	7.21	0.04	0.86	2.74
Male	32,557	22.65	7.51	--	0.87	2.76
Ethnicity						
American Indian/ Alaskan Native	310	22.33	7.40	-0.20	0.86	2.76
Asian	1,222	26.56	7.63	0.40	0.88	2.62
Pacific Islander	125	22.37	7.44	-0.19	0.86	2.76
Black (not Hispanic)	10,013	18.09	6.89	-0.80	0.83	2.81
Hispanic	2,847	21.81	7.10	-0.27	0.85	2.78
White (not Hispanic)	48,910	23.72	7.07	--	0.85	2.72
Multi-racial	1,117	22.81	7.08	-0.13	0.85	2.75
LEP						
No	63,080	22.87	7.35	--	0.86	2.75
Yes	1,389	19.37	7.23	-0.48	0.85	2.81
IEP						
No	57,959	23.59	6.97	--	0.85	2.73
Yes	6,510	15.66	6.88	-1.14	0.83	2.82
Migrant						
No	64,451	22.79	7.36	--	0.86	2.75
Yes	18	18.61	5.14	--	--	--
FRL						
No	36,340	24.74	6.95	--	0.85	2.68
Yes	28,129	20.27	7.11	-0.64	0.84	2.8
Title I						
No	59,195	23.14	7.24	--	0.86	2.74
Yes	5,274	18.93	7.59	-0.58	0.86	2.8
Accommodations						
No	61,795	23.14	7.21	--	0.86	2.74
Yes	2,749	14.96	6.32	-1.14	0.80	2.84

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Table 10.19: Alpha Coefficients and Standard Errors of Measurement, Biology, Spring 2013

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	62,355	36.28	9.73	--	0.88	3.39
Gender						
Female	30,986	36.30	9.52	0.01	0.87	3.39
Male	31,369	36.25	9.94	--	0.88	3.38
Ethnicity						
American Indian/ Alaskan Native	298	36.23	9.36	-0.16	0.87	3.38
Asian	1,162	38.86	10.89	0.13	0.91	3.24
Pacific Islander	116	33.32	10.48	-0.48	0.89	3.52
Black (not Hispanic)	9,134	29.29	10.04	-0.91	0.87	3.60
Hispanic	2,490	33.63	9.98	-0.45	0.88	3.50
White (not Hispanic)	48,238	37.69	9.00	--	0.86	3.31
Multi-racial	917	36.04	9.49	-0.18	0.87	3.38
LEP						
No	61,169	36.45	9.64	--	0.88	3.38
Yes	1,143	27.22	10.33	-0.96	0.88	3.61
IEP						
No	55,981	37.40	9.06	--	0.86	3.33
Yes	6,331	26.44	9.85	-1.20	0.87	3.58
Migrant						
No	62,290	36.29	9.73	--	0.88	3.39
Yes	22	28.00	9.29	--	--	--
FRL						
No	36,934	38.85	8.77	--	0.86	3.25
Yes	25,378	32.55	9.84	-0.68	0.87	3.53
Title I						
No	58,539	36.80	9.48	--	0.87	3.36
Yes	3,773	28.31	10.02	-0.89	0.87	3.59
Accommodations						
No	59,217	36.88	9.38	--	0.87	3.36
Yes	3,138	24.83	9.11	-1.29	0.84	3.60

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Table 10.20: Alpha Coefficients and Standard Errors of Measurement, English I, Spring 2013

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	62,683	25.81	7.44	--	0.87	2.72
Gender						
Female	31,013	26.52	7.31	0.19	0.87	2.69
Male	31,670	25.10	7.50	--	0.87	2.75
Ethnicity						
American Indian/ Alaskan Native	285	25.01	7.48	-0.24	0.86	2.76
Asian	1,090	27.68	7.60	0.13	0.88	2.59
Pacific Islander	117	23.00	7.49	-0.52	0.86	2.80
Black (not Hispanic)	8,932	21.26	7.35	-0.76	0.85	2.86
Hispanic	2,614	23.83	7.40	-0.41	0.86	2.80
White (not Hispanic)	48,602	26.72	7.12	--	0.86	2.69
Multi-racial	1,043	25.63	7.22	-0.15	0.86	2.73
LEP						
No	61,583	25.92	7.40	--	0.86	2.72
Yes	1,039	19.20	6.80	-0.91	0.82	2.90
IEP						
No	56,646	26.65	6.96	--	0.85	2.70
Yes	5,976	17.84	7.11	-1.26	0.83	2.91
Migrant						
No	62,600	25.81	7.43	--	0.87	2.72
Yes	22	17.95	6.49	--	--	--
FRL						
No	35,679	27.89	6.73	--	0.85	2.63
Yes	26,943	23.06	7.43	-0.69	0.86	2.83
Title I						
No	58,311	26.16	7.31	--	0.86	2.71
Yes	4,311	21.01	7.50	-0.70	0.85	2.87
Accommodations						
No	61,149	26.03	7.31	--	0.86	2.71
Yes	1,534	16.83	6.88	-1.26	0.81	2.97

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Table 10.21: Alpha Coefficients and Standard Errors of Measurement, Algebra II, Spring 2013

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	23,426	24.37	7.22	--	0.85	2.77
Gender						
Female	12,549	23.97	7.06	-0.12	0.84	2.79
Male	10,877	24.84	7.37	--	0.86	2.75
Ethnicity						
American Indian/ Alaskan Native	121	23.72	7.07	-0.17	0.84	2.81
Asian	358	26.65	7.61	0.24	0.88	2.66
Pacific Islander	35	23.97	7.37	--	0.85	2.82
Black (not Hispanic)	2,488	20.11	6.70	-0.68	0.81	2.88
Hispanic	784	23.33	6.95	-0.22	0.84	2.82
White (not Hispanic)	19,341	24.92	7.09	--	0.85	2.76
Multi-racial	299	24.94	7.69	0.01	0.87	2.74
LEP						
No	23,226	24.39	7.22	--	0.85	2.77
Yes	189	21.76	6.93	-0.37	0.83	2.86
IEP						
No	22,762	24.55	7.14	--	0.85	2.77
Yes	653	18.22	7.41	-0.89	0.85	2.89
Migrant						
No	23,413	24.37	7.22	--	0.85	2.77
Yes	2	16.50	7.78	--	--	--
FRL						
No	15,546	25.36	7.09	--	0.85	2.74
Yes	7,869	22.42	7.07	-0.42	0.84	2.84
Title I						
No	22,653	24.48	7.21	--	0.85	2.77
Yes	762	21.06	6.85	-0.48	0.83	2.84
Accommodations						
No	23,181	24.44	7.19	--	0.85	2.77
Yes	245	17.97	7.07	-0.90	0.82	2.97

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Table 10.22: Alpha Coefficients and Standard Errors of Measurement, Geometry, Spring 2013

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	30,482	25.23	7.25	--	0.86	2.68
Gender						
Female	15,659	24.85	7.23	-0.11	0.86	2.7
Male	14,823	25.63	7.24	--	0.87	2.65
Ethnicity						
American Indian/ Alaskan Native	160	24.37	7.31	-0.22	0.86	2.72
Asian	470	29.20	7.64	0.47	0.90	2.44
Pacific Islander	65	24.29	7.80	-0.23	0.88	2.68
Black (not Hispanic)	3,350	20.37	7.29	-0.79	0.85	2.83
Hispanic	1,184	23.64	7.03	-0.33	0.85	2.75
White (not Hispanic)	24,827	25.90	6.95	--	0.85	2.65
Multi-racial	426	24.90	7.58	-0.14	0.88	2.66
LEP						
No	30,120	25.27	7.23	--	0.86	2.68
Yes	333	21.48	8.04	-0.52	0.88	2.78
IEP						
No	28,965	25.60	7.04	--	0.86	2.67
Yes	1,488	17.96	7.45	-1.08	0.86	2.82
Migrant						
No	30,449	25.23	7.25	--	0.86	2.68
Yes	4	23.25	5.56	--	--	--
FRL						
No	18,906	26.40	7.01	--	0.86	2.63
Yes	11,547	23.31	7.22	-0.44	0.85	2.75
Title I						
No	29,467	25.33	7.22	--	0.86	2.67
Yes	986	22.37	7.45	-0.41	0.86	2.77
Accommodations						
No	29,914	25.40	7.15	--	0.86	2.67
Yes	568	16.27	6.56	-1.28	0.81	2.84

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Table 10.23: Alpha Coefficients and Standard Errors of Measurement, Government, Spring 2013

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	42,218	25.25	8.00	--	0.89	2.71
Gender						
Female	20,627	24.73	7.83	-0.13	0.88	2.74
Male	21,591	25.75	8.13	--	0.89	2.68
Ethnicity						
American Indian/ Alaskan Native	223	23.81	7.86	-0.29	0.88	2.77
Asian	713	26.87	8.39	0.10	0.90	2.61
Pacific Islander	73	23.99	8.25	-0.27	0.89	2.75
Black (not Hispanic)	5,152	20.36	7.76	-0.74	0.86	2.86
Hispanic	1,546	22.70	8.06	-0.44	0.88	2.8
White (not Hispanic)	33,867	26.08	7.73	--	0.88	2.68
Multi-racial	644	25.26	7.74	-0.11	0.88	2.73
LEP						
No	41,592	25.35	7.96	--	0.88	2.71
Yes	596	18.18	7.19	-0.90	0.84	2.90
IEP						
No	37,940	26.03	7.65	--	0.88	2.69
Yes	4,248	18.28	7.59	-1.01	0.86	2.88
Migrant						
No	42,170	25.26	8.00	--	0.89	2.71
Yes	18	20.94	8.43	--	--	--
FRL						
No	25,938	27.20	7.48	--	0.88	2.63
Yes	16,250	22.14	7.81	-0.66	0.87	2.83
Title I						
No	40,188	25.55	7.89	--	0.88	2.70
Yes	2,000	19.34	7.82	-0.79	0.87	2.86
Accommodations						
No	40,194	25.65	7.83	--	0.88	2.70
Yes	2,024	17.16	6.88	-1.09	0.82	2.92

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Table 10.24: Alpha Coefficients and Standard Errors of Measurement, Am. History, Spring 2013

Group	N-Count	Mean Raw Score	SD Raw Score	Effect Size	Reliability	SEM
All Students	52,324	23.54	7.44	--	0.86	2.81
Gender						
Female	25,726	22.67	7.21	-0.23	0.84	2.85
Male	26,598	24.37	7.55		0.87	2.77
Ethnicity						
American Indian/ Alaskan Native	242	24.03	6.69	-0.04	0.82	2.85
Asian	958	25.38	7.72	0.15	0.87	2.74
Pacific Islander	89	21.27	7.19	-0.42	0.84	2.92
Black (not Hispanic)	6,936	19.18	7.25	-0.71	0.84	2.91
Hispanic	1,969	21.67	7.48	-0.37	0.85	2.87
White (not Hispanic)	41,477	24.31	7.19	--	0.85	2.79
Multi-racial	653	23.62	7.43	-0.10	0.86	2.81
LEP						
No	51,514	23.63	7.41	--	0.86	2.81
Yes	775	17.64	6.68	-0.81	0.81	2.93
IEP						
No	47,444	24.13	7.21	--	0.85	2.80
Yes	4,845	17.79	7.17	-0.88	0.84	2.91
Migrant						
No	52,271	23.54	7.43	--	0.86	2.81
Yes	18	17.78	4.88	--	--	--
FRL						
No	30,923	25.37	6.99	--	0.84	2.76
Yes	21,366	20.90	7.26	-0.63	0.84	2.89
Title I						
No	49,215	23.91	7.31	--	0.85	2.81
Yes	3,074	17.56	6.88	-0.87	0.82	2.91
Accommodations						
No	50,071	23.85	7.32	--	0.85	2.81
Yes	2,253	16.48	6.39	-1.01	0.79	2.93

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10.4 Conditional Standard Error Estimates for Scale Scores

The overall SEM in Tables 10.1 to 10.24 represent the standard deviations of projected replications of the testing procedure averaged over all students. In contrast, conditional standard errors of measurement (CSEMs) are conditioned on the ability of the student. Rasch-based CSEMs (CSEM (θ)) for each scale score are defined as the reciprocal of the square root of the test information function (I(θ)) at the point on the ability continuum that corresponds to each scale score (Hambleton and Swaminathan, 1985):

$$CSEM(\theta) = \frac{1}{\sqrt{I(\theta)}}.$$

CSEMs 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 CSEMs for the Proficient cut scores for the MO EOC Assessments are presented in Table 10.25. CSEMs for other scale scores are reported in Chapter 7 of this report. Note that CSEMs are smaller in the middle of the score distribution than at the extremes. This pattern is expected for CSEMs based on item response theory (IRT). The value for all CSEMs was either 6 or 7 scale-score points for English II, Algebra I, and Biology and between 7 and 9 scale-score points for English I, Algebra II, Geometry, Government, and American History.

Table 10.25: CSEMs at the Proficient Cut Score

Test Period	Content Area	SS Cut*	CSEM
Summer 2012	English II	200	6
	Algebra I	200	7
	Biology	200	7
	English I	200	8
	Algebra II	200	7
	Geometry	200	7
	Government	200	7
	Am. History	200	9
Fall 2012	English II	200	6
	Algebra I	200	7
	Biology	200	6
	English I	200	8
	Algebra II	200	7
	Geometry	200	8
	Government	200	7
	Am. History	200	9
Spring 2013	English II	200	6
	Algebra I	200	7
	Biology	200	6
	English I	200	8
	Algebra II	200	7
	Geometry	200	8
	Government	200	7
	Am. History	200	9

* See Tables 7.3 through 7.26 in Chapter 7 for the CSEM at each scale score.

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10.5 Evidence Supporting Scorer Reliability

10.5.1 Inter-rater Reliabilities

Pearson performed the scoring of the PE/WPs for the 2012–2013 MO EOC administration, and the following statistics are reported by Pearson. Please see Chapter 6 for more information on Pearson's scoring procedures. Table 10.26 depicts the inter-rater reliability including perfect and adjacent agreement for each item for each administration window. The table also provides the n-count for each item.

Table 10.26: Inter-rater Reliability for Fall 2012 and Spring 2013

Item	N-Count	Perfect Agreement Plan	Perfect Agreement Actual	Perfect + Adjacent Plan	Perfect + Adjacent Actual
Fall Items					
Algebra – 100076683	3,828	80%	73%	95%	98%
English – 1000776784	2,897	80%	72%	95%	100%
Biology 1-100076797	2,801	100%	93%	100%	100%
Biology 2 - 100076798	2,802	100%	97%	100%	100%
Biology 3 - 100076799	2,802	100%	99%	100%	100%
Biology 4 – 100076807	2,802	90%	95%	100%	100%
Biology 5 – 100076801	2,802	80%	88%	95%	99%
Biology 6 – 100076803	2,802	90%	88%	100%	100%
Biology 7 – 100076808	2,801	90%	93%	100%	100%
Biology 8 – 100076802	2,802	90%	88%	100%	100%
Biology 9 – 100076804	2,799	85%	87%	95%	99%
Biology 10 - 100076805	2,802	90%	82%	100%	100%
Spring Items					
Algebra – 100076683	64,354	80%	70%	95%	99%
English – 1000776784	61,013	80%	71%	95%	99%
Biology 1-100076797	63,332	100%	92%	100%	100%
Biology 2 - 100076798	63,332	100%	87%	100%	100%
Biology 3 - 100076799	63,332	100%	99%	100%	100%
Biology 4 – 100076807	63,332	85%	82%	95%	99%
Biology 5 – 100076801	63,332	90%	78%	100%	98%
Biology 6 – 100076803	63,332	85%	88%	95%	99%
Biology 7 – 100076808	63,332	80%	78%	95%	98%
Biology 8 – 100076802	63,332	85%	61%	95%	94%
Biology 9 – 100076804	63,332	100%	100%	100%	100%
Biology 10 - 100076805	63,332	100%	100%	100%	100%

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10.6 Reliability of Classifications

Decision consistency is the extent to which a student‘s achievement level can be replicated given a second, parallel form of the test. As in previous years, the reliability of student achievement-level classifications (Below Basic, Basic, Proficient, and Advanced) was evaluated using a computer program developed by Huynh (1979). This program is based on the beta-binomial model that also provides standard errors (SEs) 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, standard deviation, 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). The Kappa indices are shown in Table 10.27.

Table 10.29 shows the decision consistency (Huynh, 1979) measure for each achievement level by content area. Across achievement levels and content areas, the decision consistency indices (p) are typically in the 60s. A second analysis was conducted to determine the indices if a student‘s achievement was labeled _pass‘ for a classification of Proficient or Advanced, or _fail‘ for a classification of Below Basic or Basic. As indicated in Table 10.29, the indices would then be in the 80s range.

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Table 10.27: Classification Consistency Coefficients

Test Period	N-Count	#Items	Raw Cut Scores			Mean	SD	Kappa	SE (*k*)
			Basic	Proficient	Advanced				
Summer 2012									
English II	428	35	13	22	30	19.39	6.28	0.45	0.0118
Algebra I	888	35	12	20	28	17.58	5.95	0.42	0.0089
Biology	321	35	13	22	30	17.55	5.85	0.43	0.0164
English I	307	40	16	25	33	21.21	7.14	0.47	0.0141
Algebra II	144	40	16	24	33	16.59	6.02	0.44	0.0238
Geometry	241	40	17	24	32	18.39	7.00	0.47	0.0153
Government	839	40	15	25	34	23.87	8.32	0.54	0.0077
Am. History	264	40	19	25	32	19.81	7.22	0.46	0.0144
Fall 2012									
English II	2,940	36	15	24	33	22.83	7.32	0.53	0.0039
Algebra I	3,896	36	13	22	31	21.14	8.89	0.60	0.0034
Biology	2,837	45	19	34	46	30.06	11.90	0.75	0.0029
English I	846	40	16	25	33	25.69	6.96	0.47	0.0088
Algebra II	445	40	15	23	32	27.55	6.89	0.50	0.0117
Geometry	753	40	17	23	32	26.39	6.89	0.46	0.0102
Government	16,805	40	15	25	33	24.42	7.13	0.48	0.0019
Am. History	1,323	40	19	24	31	22.51	6.29	0.38	0.0082
Spring 2013									
English II	61,237	36	14	25	33	26.91	6.36	0.53	0.0010
Algebra I	64,544	36	12	22	31	22.79	7.36	0.53	0.0009
Biology	62,355	45	16	30	44	36.28	9.73	0.68	0.0007
English I	62,683	40	16	25	33	25.81	7.44	0.50	0.0010
Algebra II	23,426	40	16	24	33	24.37	7.22	0.47	0.0017
Geometry	30,482	40	17	24	32	25.23	7.25	0.47	0.0016
Government	42,218	40	15	25	34	25.25	8.00	0.53	0.0011
Am. History	52,324	40	19	25	32	23.54	7.44	0.46	0.0012

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Table 10.28: Raw Agreement Consistency Coefficients

Test Period	N-Count	#Items	Raw Cut Scores			Mean	SD	*p*	SE (*p*)
			Basic	Proficient	Advanced				
Summer 2012									
English II	428	35	13	22	30	19.39	6.28	0.65	0.0025
Algebra I	888	35	12	20	28	17.58	5.95	0.62	0.0022
Biology	321	35	13	22	30	17.55	5.85	0.65	0.0034
English I	307	40	16	25	33	21.21	7.14	0.64	0.0058
Algebra II	144	40	16	24	33	16.59	6.02	0.66	0.0136
Geometry	241	40	17	24	32	18.39	7.00	0.65	0.0109
Government	839	40	15	25	34	23.87	8.32	0.68	0.0030
Am. History	264	40	19	25	32	19.81	7.22	0.64	0.0117
Fall 2012									
English II	2,940	36	15	24	33	22.83	7.32	0.68	0.0011
Algebra I	3,896	36	13	22	31	21.14	8.89	0.70	0.0019
Biology	2,837	45	19	34	46	30.06	11.90	0.85	0.0019
English I	846	40	16	25	33	25.69	6.96	0.63	0.0031
Algebra II	445	40	15	23	32	27.55	6.89	0.67	0.0058
Geometry	753	40	17	23	32	26.39	6.89	0.64	0.0044
Government	16,805	40	15	25	33	24.42	7.13	0.65	0.0005
Am. History	1,323	40	19	24	31	22.51	6.29	0.56	0.0047
Spring 2013									
English II	61,237	36	14	25	33	26.91	6.36	0.69	0.0003
Algebra I	64,544	36	12	22	31	22.79	7.36	0.69	0.0003
Biology	62,355	45	16	30	44	36.28	9.73	0.80	0.0003
English I	62,683	40	16	25	33	25.81	7.44	0.65	0.0004
Algebra II	23,426	40	16	24	33	24.37	7.22	0.64	0.0006
Geometry	30,482	40	17	24	32	25.23	7.25	0.62	0.0008
Government	42,218	40	15	25	34	25.25	8.00	0.68	0.0004
Am. History	52,324	40	19	25	32	23.54	7.44	0.60	0.0008

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Table 10.29: Classification Consistency Coefficients (Two Classification Categories)

Test Period	N-Count	#Items	Raw Cut Scores Proficient/ Advanced	Mean	SD	Kappa	SE (*k*)
Summer 2012							
English II	428	35	22	19.39	6.28	0.60	0.0151
Algebra I	888	35	20	17.58	5.95	0.57	0.0113
Biology	321	35	22	17.55	5.85	0.54	0.0212
English I	307	40	25	21.21	7.14	0.62	0.0166
Algebra II	144	40	24	16.59	6.02	0.47	0.0389
Geometry	241	40	24	18.39	7.00	0.60	0.0219
Government	839	40	25	23.87	8.32	0.70	0.0078
Am. History	264	40	25	19.81	7.22	0.61	0.0196
Fall 2012							
English II	2,940	36	24	22.83	7.32	0.68	0.0045
Algebra I	3,896	36	22	21.14	8.89	0.76	0.0031
Biology	2,837	45	34	30.06	11.90	0.81	0.0028
English I	846	40	25	25.69	6.96	0.64	0.0097
Algebra II	445	40	23	27.55	6.89	0.63	0.0152
Geometry	753	40	23	26.39	6.89	0.63	0.0113
Government	16,805	40	25	24.42	7.13	0.64	0.0021
Am. History	1,323	40	24	22.51	6.29	0.57	0.0091
Spring 2013							
English II	61,237	36	25	26.91	6.36	0.67	0.0011
Algebra I	64,544	36	22	22.79	7.36	0.66	0.0010
Biology	62,355	45	30	36.28	9.73	0.81	0.0008
English I	62,683	40	25	25.81	7.44	0.67	0.0010
Algebra II	23,426	40	24	24.37	7.22	0.65	0.0018
Geometry	30,482	40	24	25.23	7.25	0.65	0.0016
Government	42,218	40	25	25.25	8.00	0.70	0.0012
Am. History	52,324	40	25	23.54	7.44	0.65	0.0012

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Table 10.30: Raw Agreement Consistency Coefficients (Two Classification Categories)

Test Period	N-Count	#Items	Raw Cut Scores Proficient/ Advanced	Mean	SD	*p*	SE (*p*)
Summer 2012							
English II	428	35	22	19.39	6.28	0.81	0.0069
Algebra I	888	35	20	17.58	5.95	0.80	0.0052
Biology	321	35	22	17.55	5.85	0.82	0.0078
English I	307	40	25	21.21	7.14	0.82	0.0077
Algebra II	144	40	24	16.59	6.02	0.89	0.0117
Geometry	241	40	24	18.39	7.00	0.85	0.0077
Government	839	40	25	23.87	8.32	0.85	0.0039
Am. History	264	40	25	19.81	7.22	0.85	0.0073
Fall 2012							
English II	2,940	36	24	22.83	7.32	0.84	0.0023
Algebra I	3,896	36	22	21.14	8.89	0.88	0.0015
Biology	2,837	45	34	30.06	11.90	0.91	0.0014
English I	846	40	25	25.69	6.96	0.82	0.0047
Algebra II	445	40	23	27.55	6.89	0.87	0.0052
Geometry	753	40	23	26.39	6.89	0.85	0.0043
Government	16,805	40	25	24.42	7.13	0.82	0.0011
Am. History	1,323	40	24	22.51	6.29	0.79	0.0045
Spring 2013							
English II	61,237	36	25	26.91	6.36	0.86	0.0005
Algebra I	64,544	36	22	22.79	7.36	0.85	0.0005
Biology	62,355	45	30	36.28	9.73	0.94	0.0002
English I	62,683	40	25	25.81	7.44	0.84	0.0005
Algebra II	23,426	40	24	24.37	7.22	0.83	0.0009
Geometry	30,482	40	24	25.23	7.25	0.83	0.0007
Government	42,218	40	25	25.25	8.00	0.85	0.0006
Am. History	52,324	40	25	23.54	7.44	0.83	0.0006

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Chapter 11: Validity

11.1 Introduction

Validity is the most fundamental consideration in educational and psychological testing. It is defined as ―the degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests" (AERA, APA, and NCME, 1999, p. 9). Validity evidence for the MO EOC Assessments is gathered and demonstrated from content, criterion, and construct. Since test forms used in the 2012–2013 testing year were intact forms previously administered, relevant information documented in previous technical reports is included in this chapter to provide historical information and assist with understanding validity evidence for the MO EOC Assessments.

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 the 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. 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 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 MO 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 Federal Authority for School Accountability

The U.S. Department of Education bases accountability on a school‘s achievement of annual measurable objectives (AMOs) in Reading/Language Arts and Mathematics. AMO determinations refer to the target percent proficient for each school and district during the course of one year. For Missouri schools and school districts, AMOs are set in terms of the percentage of all students, and all student groups of sufficient size, scoring Proficient or above on the required assessments including the English II and Algebra I MO EOC Assessments.

11.3 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

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the proposed use" (AERA, APA, and NCME 1999).[18] 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 DESE and publications such as the Test Administration 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.

11.4 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 (see Chapter 8 of this report for more information).

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 encouraged to consider student performance on the MO EOC Assessments in determining course grades. DESE recommends that EOC scores account for at least 10 percent but not more than 25 percent of a student's grade in a course with a corresponding MO EOC Assessment. Districts receive students' raw scores on the MO EOC Assessments within five business days after test administration, and DESE provides districts with "curved percentages" to assist teachers in appropriately considering EOC scores in determining course grades (http://dese.mo.gov/divimprove/assess/documents/asmt-eoc-curved-percentages-2012.pdf). Teachers are counseled to interpret individual student scores only in the context of other assessment results and their own experience.

[18] **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).

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11.5 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 questions and also address Standard 1.6[19] of the Standards (AERA, APA, NCME, 1999), which specifically relates to the definition and development of test content.

11.5.1 Appropriateness of Content Definition

In 1993, the Missouri legislature passed the Outstanding Schools Act (Senate Bill 380), requiring the 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, beginning in August of the 2008–2009 school year, with MO EOC Assessments in English II, Algebra I, and Biology. The remaining MO 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 Grade-Level Assessments.

11.5.2 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), and they must fulfill the requirements of NCLB.

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 are taken into consideration in the writing of SR items. Each assessment must align with and proportionally represent the subdomains of the test blueprint. Following development of all MO EOC Assessments, DESE contracted for external studies to support the alignment of the assessments to the Show-Me Standards and CLEs. Results of those studies are available for

[19] **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).

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review at http://dese.mo.gov/divimprove/assess/tech/. Evidence to support the content validity of the MO EOC Assessments was provided in Chapter 2 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 Chapter 2 and also in Chapter 4. Chapter 2 outlined the target strand and CLE point distributions on the English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, and American History operational forms.

11.6 Validity Evidence Based on the Internal Structure of the MO EOC Assessments

Standard 1.11[20] 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 English II, Algebra I, Biology, Algebra II, Geometry, and Government. Because both English I and American History have only one content cluster, correlation coefficients were not calculated for these MO 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 English II

		Reading	Writing
Summer 2012	English II	0.98	0.59
	Reading	1.00	0.43
	Writing		1.00
Fall 2012	English II	0.98	0.61
	Reading	1.00	0.48
	Writing		1.00
Spring 2013	English II	0.97	0.65
	Reading	1.00	0.51
	Writing		1.00

[20] **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).

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Table 11.2: Pearson Correlation Coefficients Between Domains and Clusters for Algebra I

		Number and Operations	Algebraic Relationships	Data and Probability
Summer 2012	Algebra I	0.75	0.92	0.78
	Number and Operations	1.00	0.53	0.47
	Algebraic Relationships		1.00	0.59
	Data and Probability			1.00
Fall 2012	Algebra I	0.86	0.97	0.83
	Number and Operations	1.00	0.76	0.65
	Algebraic Relationships		1.00	0.73
	Data and Probability			1.00
Spring 2013	Algebra I	0.80	0.96	0.77
	Number and Operations	1.00	0.65	0.55
	Algebraic Relationships		1.00	0.63
	Data and Probability			1.00

Table 11.3: Pearson Correlation Coefficients Between Domains and Clusters for Biology

		Characteristics and Interactions	Changes in Ecosystems	Scientific Inquiry[21]
Summer 2012	Biology	0.91	0.89	
	Characteristics and Interactions	1.00	0.61	
	Changes in Ecosystems		1.00	
Fall 2012	Biology	0.91	0.86	0.92
	Characteristics and Interactions	1.00	0.70	0.73
	Changes in Ecosystems		1.00	0.71
	Scientific Inquiry			1.00
Spring 2013	Biology	0.88	0.84	0.89
	Characteristics and Interactions	1.00	0.66	0.62
	Changes in Ecosystems		1.00	0.65
	Scientific Inquiry			1.00

[21] Scientific Inquiry was measured by PEs, which were not included in the Summer 2012 operational test forms.

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Table 11.4: Pearson Correlation Coefficients Between Domains and Clusters for Algebra II

		Algebraic Relationships	Data and Probability	Numbers and Operations
Summer 2012	Algebra II	0.75	0.88	0.78
	Algebraic Relationships	1.00	0.50	0.51
	Data and Probability		1.00	0.49
	Numbers and Operations			1.00
Fall 2012	Algebra II	0.79	0.94	0.76
	Algebraic Relationships	1.00	0.61	0.51
	Data and Probability		1.00	0.58
	Numbers and Operations			1.00
Spring 2013	Algebra II	0.79	0.92	0.80
	Algebraic Relationships	1.00	0.61	0.56
	Data and Probability		1.00	0.59
	Numbers and Operations			1.00

Table 11.5: Pearson Correlation Coefficients Between Domains and Clusters for Geometry

		Algebraic Relationships	Geometric and Spatial Relationships	Measurement
Summer 2012	Geometry	0.71	0.94	0.81
	Algebraic Relationships	1.00	0.53	0.45
	Geometric and Spatial Relationships		1.00	0.66
	Measurement			1.00
Fall 2012	Geometry	0.81	0.95	0.83
	Algebraic Relationships	1.00	0.66	0.59
	Geometric and Spatial Relationships		1.00	0.68
	Measurement			1.00
Spring 2013	Geometry	0.78	0.95	0.83
	Algebraic Relationships	1.00	0.62	0.55
	Geometric and Spatial Relationships		1.00	0.69
	Measurement			1.00

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Table 11.6: Pearson Correlation Coefficients Between Domains and Clusters for Government

		Principles and processes of governance systems	Principles in constitutional democracy
Summer 2012	Government	0.95	0.95
	Principles and processes of governance systems	1.00	0.80
	Principles in constitutional democracy		1.00
Fall 2012	Government	0.94	0.93
	Principles and processes of governance systems	1.00	0.74
	Principles in constitutional democracy		1.00
Spring 2013	Government	0.95	0.95
	Principles and processes of governance systems	1.00	0.80
	Principles in constitutional democracy		1.00

11.7 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." (p. 14). The MO EOC assessments were designed to measure different constructs as shown by both the standards they assess and the content coverage detailed in the test blueprints. To gather validity evidence for the MO EOC assessments, DESE commissioned a full convergent and divergent study. The results showed that, in general, the MO EOC Assessments are appropriately related to each other and measure their own content areas, regardless of when the tests are administered. The report was approved by the United Stated Department of Education during the peer review process. For the full report on this study, see Appendix B in the *2011–2012 MO EOC Technial Report* at http://dese.mo.gov/divimprove/assess/tech/index.html.

The data presented in Table 11.7 show evidence of divergent validity for the content areas with both SRs and PE/WPs, using scale scores. The data sets used for the analysis were drawn from the Spring 2013 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 three operational tests was included in the correlations. Table 11.7 shows the Pearson correlation coefficients between scale scores for the Spring 2013 administration, as well as the n-count for each correlation.

The results shown in Table 11.7 contain evidence of divergent validity. Evidence of divergent validity is supported by the lower correlations between content areas that measure dissimilar constructs. For example, the correlation between English II and Algebra I (0.59) is in a range typical of achievement constructs that are positively related primarily by virtue of their relation to general school achievement.

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For English II and Biology, challenging language and reading on both tests could account for the higher correlation value (0.71). This correlation value is still lower than the tests measuring a similar construct and are in the range of the correlations among high school MAP content 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 11.7: Pearson Correlation Among Assessments with PEs, Spring 2013

	English II	Algebra I	Biology
English II	1.00 N=61,237	0.59 N= 10,800	0.71 N=32,990
Algebra I		1.00 N=64,544	0.71 N=15,836
Biology			1.00 N=62,355

The data presented in Table 11.8 show evidence of divergent validity for the content areas with only SR items, using scale scores. The data sets used for the analysis were drawn from the Spring 2013 operational test administration. The student records 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 11.8 shows the Pearson correlation coefficients between scale scores, as well as the n-count for each correlation.

Table 11.8: Pearson Correlation Coefficients Among Assessments with only SRs, Spring 2013

	English I	Algebra I	Geometry	Government	Am. History
English I	1.00 N=62,683	0.51 N=1,357	0.54 N=7,484	0.72 N=9,087	0.70 28,729
Algebra II		1.00 N=23,426	0.79 N=1,151	0.53 N=5,395	0.49 N=5,503
Geometry			1.00 N=30,482	0.60 N-5,245	0.55 N=7,956
Government				1.00 N-42,218	0.81 N=728
Am. History					1.00 N=52,324

The results shown in Table 11.8 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 (0.79), and Government and History (0.81) are higher than the correlations between the dissimilar constructs of English I and Algebra II (0.51).

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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 content 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 11.9 provides more evidence of discriminant validity with correlations between between content areas with PE/WPs and content areas with only SR items content areas. Evidence of discriminant validity emerges when comparing correlations between the similar contents of Algebra I and Geometry (0.79), Algebra I and Algebra II (0.80), English I and English II (0.74) and the dissimilar contents of Algebra I and English I (0.60), Algebra II and English II (0.52) and Geometry and English II (0.53).

Table 11.9: Pearson Correlation Among All Assessments

	English I	Algebra II	Geometry	Government	Am. History
English II	0.74 N=61,237	0.52 N=370	0.53 N=9,130	0.72 N=6,959	0.64 N=8,912
Algebra I	0.60 N=31,217	0.80 N=225	0.79 N=462	0.60 N=8139	0.53 N=17,392
Biology	0.74 N=14,606	0.66 N=8,411	0.67 N=12,737	0.75 N=9,406	0.69 N=15,008

11.8 Additional Validity Evidence for the MO EOC Assessments

Validity evidence related to other standards is described below.

Standard 1.5[22] 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 of this report, which includes tables with descriptive statistics for raw score, scale score, and achievement-level distributions. Statistics include n-counts, means, standard deviations, minimum and maximum values, for a variety of student groups.

Standard 1.7[23] relates to human judgment at various points in the test development and reporting process. For the MO EOC Assessments, human judgment was especially prevalent during the

[22] **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).

[23] **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).

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standard setting process. Chapter 3 contains summary information about the standard setting procedures used for the MO EOC Assessments. From Spring 2008 through Spring 2010 and again in 2013, PEs and WPs were handscored. Chapter 6 contains detailed information about the processes involved with Pearson‘s handscoring of the 2013 PE/WPs, including scorer selection and training.

Standard 1.13[24] relates to the conditions under which the data used to support validity claims were collected. Chapter 5 contains information about how data were gathered in both the online and Paper/Pencil administrations, including the testing environment, materials distribution and security, Test Examiner training, student preparation, and allowable accommodations.

11.9 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 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 technical report and provides some additional types of validity evidence relevant to the content and internal structure of the assessments.

The overall technical quality of the MO EOC Assessments, as demonstrated by technical information and statistics, was sound. The Spring 2008 and Spring 2009 standalone field tests, the Spring 2009 embedded field test, and the Spring 2010 embedded field test produced pools of technically sound items, with more than a 90% retention rate after psychometric and content criteria were applied. From those pools, forms that were psychometrically similar were assembled, and that similarity helped support the pre-equating model that is in place. Application of item response theory (IRT) pre-equating resulted in congruent raw score to scale score conversions between the Summer, Fall, and Spring 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 0.77 to 0.90 across the content areas and administrations for the 2012–2013 test forms (note that test reliabilities are expectedly lower for Summer 2012 which consisted primarily retesters). Conditional standard errors of measurement (CSEMs) were between 6 and 9 scale score points at the cut scores. The item analyses also showed that the MO EOC Assessments have sound psychometric properties. The p-value ranges were sufficiently broad, indicating that the items do measure achievement across a broad range of difficulty. Most of the items had discrimination values > .15, and only three items had a value < .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 different gender and ethnic groups.

[24] **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.

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Appendix A: MO EOC Paper/Pencil vs. Online Comparability Study

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