Missouri
DEPARTMENT OF ELEMENTARY & SECONDARY
EDUCATION™

# End-of-Course Assessments
## Technical Report
## 2015–2016

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

Submitted to the
Missouri Department of Elementary and Secondary Education

Presented by
Questar Assessment Inc.

Questar

*The Department of Elementary and Secondary Education does not discriminate on the basis of race, color, religion, gender, national origin, age, or disability in its programs and activities. Inquiries related to Department programs and to the location of services, activities, and facilities that are accessible by persons with disabilities may be directed to the Jefferson State Office Building, Office of the General Counsel, Coordinator – Civil Rights Compliance (Title VI/Title IX/504/ADA/Age Act), 6th Floor, 205 Jefferson Street, P.O. Box 480, Jefferson City, MO 65102-0480; telephone number 573-526-4757 or TTY 800-735-2966; fax number 573-522-4883; email civilrights@dese.mo.gov.*

Developed and published under contract with Missouri Department of Elementary and Secondary Education (DESE) by Questar Assessment Inc., 5550 Upper 147th Street West, Apple Valley, MN 55124. Copyright © 2017 by Missouri DESE. All rights reserved. Only Missouri State educators and citizens may copy and/or download and print the document, located online at http://dese.mo.gov/college-careerreadiness/assessment/assessment-technical-support-materials. Any other use or reproduction of this document, in whole or in part, requires the prior written permission of Missouri DESE.

## Table of Contents

List of Abbreviations ..... viii
Chapter Summaries ..... ix
Executive Summary ..... 1
E.1. Assessment Overview ..... 1
E.2. Background ..... 2
E.3. Administration ..... 2
E.4. Student Performance ..... 3
E.5. Validity Evidence ..... 8
Chapter 1: Introduction ..... 9
1.1. Purpose of the Technical Report ..... 9
1.2. Summary of the MO EOC Assessments ..... 9
1.3. Purpose and Intended Use of Test Scores ..... 11
1.4. Administration ..... 11
1.5. Reporting the Results ..... 12
1.6. Accountability ..... 12
1.7. Missouri's Current Assessment System ..... 13
1.8. History of the MO EOC Assessments ..... 14
1.9. Organizational Support ..... 16
Chapter 2: Test Development ..... 18
2.1. Introduction ..... 18
2.2. Test Blueprints ..... 18
2.3. Test Specifications ..... 21
2.4. Item Development ..... 23
2.4.1. Item Writing ..... 24
2.4.2. Universal Design ..... 25
2.4.3. Content and Bias Review Process ..... 26
2.5. Form Construction ..... 29
2.5.1. Field-Test Selection and Administration ..... 29
2.5.2. Statistical Item Review ..... 29
2.5.3. Operational Test Selection and Administration ..... 30
2.6. Braille and Large Print Versions ..... 31
2.7. Online Forms Construction ..... 32
2.8. Quality Control for Form Construction ..... 32
2.9. Summary ..... 33
Chapter 3: Standard Setting ..... 34
3.1. Introduction ..... 34
3.2. 2015 Standard Setting ..... 34
3.2.1. Panelists ..... 35
3.2.2. Staffing ..... 35
3.2.3. Development of Achievement Level Descriptors (ALDs) ..... 35
3.2.4. Results ..... 35


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

3.3. 2015 Cutpoint Validation ..... 35
3.3.1. Panelists ..... 36
3.3.2. Staffing ..... 36
3.3.3. Development of ALDs ..... 36
3.3.4. Results ..... 36
Chapter 4: Item Analysis ..... 37
4.1. Introduction ..... 37
4.2. Item-Level Statistics ..... 38
4.3. Speededness ..... 38
4.4. Differential Item Functioning (DIF) ..... 38
4.5. Summary ..... 43
Chapter 5: Test Administration ..... 44
5.1. Introduction ..... 44
5.2. Students for Whom the MO EOC Assessments are Appropriate ..... 44
5.2.1. Students with Individualized Education Programs (IEPs) ..... 44
5.2.2. Students with Individual Accommodation Programs ..... 45
5.2.3. English Language Learner (ELL) Students ..... 45
5.3. Students for Whom a School or District is Accountable ..... 45
5.4. Dissemination of Testing Materials and Information ..... 45
5.5. District and Test Examiner Training ..... 46
5.6. Test Security ..... 46
5.6.1. Summary ..... 46
5.6.2. Detection and Prevention of Testing Irregularities ..... 47
5.7. Test Administration ..... 48
5.7.1. Test Organization ..... 48
5.7.2. Test and Ancillary Materials ..... 48
5.7.3. Preparing the Test Administration Site and the Students ..... 49
5.7.4. Directions for Administration ..... 50
5.8. Accommodations and Modifications ..... 51
5.9. Materials Handling and Return ..... 55
5.9.1. Materials Handling during Administration ..... 55
5.9.2. Questar's Secure Material Check-In Procedures ..... 55
5.10. Summary ..... 56
Chapter 6: Scoring ..... 57
6.1. Introduction ..... 57
6.2. Scoring of the PE/WPs ..... 57
6.2.1. Scorer Recruitment and Selection ..... 57
6.2.2. Scorer Training and Qualification Procedures ..... 58
6.3. Scorer Training ..... 58
6.4. Qualification ..... 59
6.4.1. Second Read Procedures ..... 59
6.4.2. Scoring Monitoring and Recalibration Procedures ..... 60
6.4.2.1. Read-Behinds ..... 60
6.4.2.2. Calibration ..... 60


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

6.4.2.3. Managing Scoring Quality (Scorer Exception Processing) ..... 60
6.5. Validity Responses ..... 61
6.5.1. Validity as Review ..... 63
6.5.2. Frequency Distribution ..... 63
6.5.3. Retraining and Resetting Scores ..... 63
6.5.4. Reporting and Data Analysis ..... 64
6.5.5. Item Types and Score Points for each Content Area ..... 64
6.5.5.1. Summer 2015 ..... 64
6.5.5.2. Fall 2015 ..... 64
6.5.5.3. Spring 2016 ..... 65
6.6. Rater Agreement ..... 65
Chapter 7: Scaling and Equating ..... 68
7.1. Introduction ..... 68
7.2. Item Response Theory (IRT) ..... 68
7.3. Scaling and Equating ..... 69
7.3.1. Scale Score Ranges ..... 69
7.3.2. Recalibration for Biology ..... 70
7.3.3. Estimation of the Slope and Intercept ..... 71
7.4. RSS Conversions ..... 71
Chapter 8: Reporting ..... 72
8.1. Introduction ..... 72
8.2. Test Scores ..... 72
8.3. Individual Student Report (ISR) ..... 73
8.4. Student Score Label ..... 74
8.5. Missouri Comprehensive Data System (MCDS) Portal ..... 75
8.5.1. Purpose and Use ..... 75
8.5.2. Administrative Reports ..... 77
Chapter 9: Summary Statistics ..... 79
9.1. Introduction ..... 79
9.2. Descriptive Statistics ..... 79
9.2.1. Total Raw Score ..... 79
9.2.2. Total Raw Score by Cluster ..... 80
9.2.3. Scale Scores ..... 82
9.2.4. By Demographic Group ..... 84
Chapter 10: Reliability ..... 85
10.1. Introduction ..... 85
10.1. Reliability ..... 85
10.1.1. Defining Reliability ..... 85
10.1.2. Reliability Coefficient ..... 85
10.1.3. Estimating Reliability ..... 86
10.1.4. Interpretation Considerations ..... 86
10.2. Reliability Evidence ..... 87
10.2.1. Standard Error of Measurement (SEM) for Raw Scores ..... 87
10.2.1.1. Traditional SEMs and Traditional Confidence Intervals (CIs) ..... 87


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

10.2.1.2. SEMs by Student Subgroup ... 87
10.2.1.3. Interpretation Considerations ... 112
10.2.2. Conditional Standard Error of Measurement (CSEM) for Scale Scores ... 113
10.2.2.1. CSEMs and Conditional CIs ... 113
10.2.2.2. CSEMs at the Proficient Cut ... 113
10.2.3. Classification Accuracy and Consistency ... 114
10.2.3.1. Classification Accuracy Results ... 115
10.2.3.2. Classification Consistency Results ... 122
Chapter 11: Validity ... 130
11.1. Introduction ... 130
11.2. Validity Evidence ... 130
11.2.1. Content Validity ... 130
11.2.1.1. Appropriateness of Content Definition ... 131
11.2.1.2. Adequacy of Content Representation ... 131
11.2.1.3. Summary of Alignment Studies ... 132
11.2.2. Internal Structure ... 132
11.2.3. Convergent and Divergent Validity ... 136
11.2.3.1. Pearson Correlations Among Assessments ... 136
11.2.3.2. Convergent and Divergent Study ... 137
11.2.4. Additional Validity Evidence ... 138
11.3. Summary ... 139
References ... 140
Appendix A: Target Point Distributions ... 142
Appendix B: Actual Point Distributions ... 163
Appendix C: Item Statistics ... 172
Appendix D: Raw-to-Scale Score (RSS) Conversions ... 197
Appendix E: Descriptive Statistics by Demographic Group ... 225
Appendix F: Achievement-Level Distributions by Demographic Group ... 245
Appendix G: Training PowerPoints ... 312
Appendix H: Accommodation Codes ... 369


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## List of Tables

Table E.1. Achievement Level Distribution for 2015–2016 ... 3
Table E.2. Achievement Level Distribution Across Years ... 5
Table 1.1. Summary of Major Events from 2008–2009 to 2015–2016 ... 10
Table 1.2. Testing Windows ... 12
Table 1.3. Organizational Support ... 16
Table 2.1. Test Construction Blueprint—English II ... 18
Table 2.2. Test Construction Blueprint—Algebra I ... 19
Table 2.3. Test Construction Blueprint—Biology ... 19
Table 2.4. Test Construction Blueprint—English I ... 20
Table 2.5. Test Construction Blueprint—Algebra II ... 20
Table 2.6. Test Construction Blueprint—Geometry ... 20
Table 2.7. Test Construction Blueprint—Government ... 21
Table 2.8. Test Construction Blueprint—American History ... 21
Table 2.9. Test Construction Blueprint—Physical Science ... 21
Table 2.10. 2007 Content/Bias Item Review Acceptance Rates ... 28
Table 2.11. 2008 Content/Bias Item Review Acceptance Rates ... 28
Table 2.12. Criteria for Flagged Items ... 30
Table 3.1. 2015 Standard Setting Results ... 35
Table 3.2. 2015 Cutpoint Validation Results ... 36
Table 4.1. Number of Students Included in the Analyses ... 37
Table 4.2. DIF Results—Summer 2015 ... 40
Table 4.3. DIF Results—Fall 2015 ... 41
Table 4.4. DIF Results—Spring 2016 ... 42
Table 5.1. Accommodation Distributions—Summer 2015 ... 52
Table 5.2. Accommodation Distributions—Fall 2015 ... 53
Table 5.3. Accommodation Distributions—Spring 2016 ... 54
Table 6.1. Summary of Validity Paper Results—Fall 2015 ... 62
Table 6.2. Summary of Validity Paper Results—Spring 2016 ... 63
Table 6.3. Rater Agreement—Summer 2015 ... 65
Table 6.4. Rater Agreement—Fall 2015 ... 66
Table 6.5. Rater Agreement —Spring 2016 ... 67
Table 7.1. Scale Score Ranges by Achievement Level ... 69
Table 7.2. Theta to Scale Score Transformation with Slopes and Intercepts ... 71
Table 8.1. Reports Available on the MCDS Portal ... 77
Table 9.1. Descriptive Statistics for Total Raw Score ... 79
Table 9.2. Descriptive Statistics for Total Raw Score by Cluster—Summer 2015 ... 80
Table 9.3. Descriptive Statistics for Total Raw Score by Cluster—Fall 2015 ... 81
Table 9.4. Descriptive Statistics for Total Raw Score by Cluster—Spring 2016 ... 82
Table 9.5. Descriptive Statistics of the Scale Scores ... 83
Table 9.6. Scale Score Cuts ... 83
Table 10.1. Alpha Coefficients and SEMs—English II, Summer 2015 ... 88
Table 10.2. Alpha Coefficients and SEMs—Algebra I, Summer 2015 ... 89


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

Table 10.3. Alpha Coefficients and SEMs—Biology, Summer 2015 ..... 90
Table 10.4. Alpha Coefficients and SEMs—English I, Summer 2015 ..... 91
Table 10.5. Alpha Coefficients and SEMs—Algebra II, Summer 2015 ..... 92
Table 10.6. Alpha Coefficients and SEMs—Geometry, Summer 2015 ..... 93
Table 10.7. Alpha Coefficients and SEMs—Government, Summer 2015 ..... 94
Table 10.8. Alpha Coefficients and SEMs—American History, Summer 2015 ..... 95
Table 10.9. Alpha Coefficients and SEMs—English II, Fall 2015 ..... 96
Table 10.10. Alpha Coefficients and SEMs—Algebra I, Fall 2015 ..... 97
Table 10.11. Alpha Coefficients and SEMs—Biology, Fall 2015 ..... 98
Table 10.12. Alpha Coefficients and SEMs—English I, Fall 2015 ..... 99
Table 10.13. Alpha Coefficients and SEMs—Algebra II, Fall 2015 ..... 100
Table 10.14. Alpha Coefficients and SEMs—Geometry, Fall 2015 ..... 101
Table 10.15. Alpha Coefficients and SEMs—Government, Fall 2015 ..... 102
Table 10.16. Alpha Coefficients and SEMs—American History, Fall 2015 ..... 103
Table 10.17. Alpha Coefficients and SEMs—English II, Spring 2016 ..... 104
Table 10.18. Alpha Coefficients and SEMs—Algebra I, Spring 2016 ..... 105
Table 10.19. Alpha Coefficients and SEMs—Biology, Spring 2016 ..... 106
Table 10.20. Alpha Coefficients and SEMs—English I, Spring 2016 ..... 107
Table 10.21. Alpha Coefficients and SEMs—Algebra II, Spring 2016 ..... 108
Table 10.22. Alpha Coefficients and SEMs—Geometry, Spring 2016 ..... 109
Table 10.23. Alpha Coefficients and SEMs—Government, Spring 2016 ..... 110
Table 10.24. Alpha Coefficients and SEMs—American History, Spring 2016 ..... 111
Table 10.25. Alpha Coefficients and SEMs—Physical Science, Spring 2016 ..... 112
Table 10.26. CSEMs at the Proficient Cut Score ..... 113
Table 10.27. Decision Table for Two Performance Levels ..... 114
Table 10.28. Decision Table for Four Performance Levels ..... 115
Table 10.29. Classification Accuracy Coefficients for Two Classifications—Summer 2015 ... 116
Table 10.30. Classification Accuracy Coefficients for Two Classifications—Fall 2015 ..... 117
Table 10.31. Classification Accuracy Coefficients for Two Classifications—Spring 2016 ..... 118
Table 10.32. Classification Accuracy Coefficients for Four Classifications—Summer 2015 ... 119
Table 10.33. Classification Accuracy Coefficients for Four Classifications—Fall 2015 ..... 120
Table 10.34. Classification Accuracy Coefficients for Four Classifications—Spring 2016 ..... 121
Table 10.35. Classification Consistency Coefficients for Two Classifications—Summer 2015 123
Table 10.36. Classification Consistency Coefficients for Two Classifications—Fall 2015 ..... 124
Table 10.37. Classification Consistency Coefficients for Two Classifications—Spring 2016 .. 125
Table 10.38. Classification Consistency Coefficients for Four Classifications—Summer 2015 126
Table 10.39. Classification Consistency Coefficients for Four Classifications—Fall 2015 ..... 127
Table 10.40. Classification Consistency Coefficients for Four Classifications—Spring 2016 .. 128
Table 11.1. Correlation Coefficients Between Domains and Clusters—English II ..... 134
Table 11.2. Correlation Coefficients Between Domains and Clusters—Algebra I ..... 134
Table 11.3. Correlation Coefficients Between Domains and Clusters—Biology ..... 134
Table 11.4. Correlation Coefficients Between Domains and Clusters—Algebra II ..... 135
Table 11.5. Correlation Coefficients Between Domains and Clusters—English I ..... 135


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

Table 11.6. Correlation Coefficients Between Domains and Clusters—Geometry ..... 135
Table 11.7. Correlation Coefficients Between Domains and Clusters—Government ..... 135
Table 11.8. Correlation Coefficients Between Domains and Clusters—Physical Science ..... 136
Table 11.9. Pearson Correlation Among Assessments with PEs—Spring 2016 ..... 136
Table 11.10. Pearson Correlation Coefficients Among Assessments with only SRs—Spring 2016 ..... 137
Table 11.11. Pearson Correlation Among Assessments ..... 137

## List of Figures

Figure 5.1. Directions for Administering from the TAM—Geometry ..... 50
Figure 8.1. Individual Student Report (ISR)..... 74
Figure 8.2. Student Score Label..... 75


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## 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
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
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
IRT .....item response theory
ISR .....Individual Student Report
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
MOSIS .....Missouri Student Information System
NCLB.....No Child Left Behind
PE.....performance event
RS.....raw score
RSS .....raw-to-scale score
SD .....standard deviation
SE.....standard error
SEM .....standard error of measurement
SR.....selected-response
TAC .....Technical Advisory Committee
WP .....writing prompt


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Chapter Summaries

Below are summaries of the information contained in each chapter of this report.

***Executive Summary***

This section provides a high-level overview and summary of the MO EOC Assessments and the results from the 2015–2016 administration.

***Chapter 1: Introduction***

Chapter 1 provides background information about the MO EOC Assessments, as well as the 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***

Chapter 2 provides the test blueprints and test specifications for the Summer 2015, Fall 2015, and Spring 2016 administrations. Appendix A and Appendix B provide the target and actual point distributions, respectively. Information about item writing, content and bias reviews, test form construction, and statistical item review is also presented because the 2015–2016 test forms were constructed using items field tested in Spring 2008, Spring 2009, or Spring 2010. This evidence is important to the content-related validity of the MO EOC Assessment scores. This chapter also covers principles of universal design and outlines the quality control processes employed throughout the test development process. Documentation of previous test designs can be found in the technical reports located on DESE's website at http://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials.

***Chapter 3: Standard Setting***

Chapter 3 summarizes the 2015 standard setting for Physical Science and the 2015 cutpoint validation for English I, English II, Algebra I, Algebra II, and Geometry. Full reports for these meetings are provided in the *2014–2015 MO EOC Technical Report*. Information on the 2008 and 2009 standard settings can be found in the *2009–2010 MO EOC Phase I and Phase II Technical Reports*.

***Chapter 4: Item Analysis***

Chapter 4 contains item-level analysis summary information, including item difficulty and item discrimination indices, for each content area. The chapter also contains information on omit rates for the Summer 2015, Fall 2015, and Spring 2016 operational items.

***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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

***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 and the PE/WPs, including the scoring training and qualification processes, scoring procedures, and monitoring for quality assurance. Finally, this chapter provides rater agreement for the Summer 2015, Fall 2015, and Spring 2016 administrations.

***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, the scaling and equating process for the Summer 2015, Fall 2015, and Spring 2016 are provided, followed by a description of the recalibration study for Biology. Finally, the raw-to-scale score (RSS) conversion tables for the Summer 2015, Fall 2015, and Spring 2016 operational forms are presented in Appendix D.

***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 description of the state's data portal and reporting system 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.

***Chapter 11: Validity***
Chapter 11 begins with an introduction to the validity evidence for the MO EOC Assessments, followed by 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, & NCME, 2014). 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 Missouri Learning Standards, for identifying students' strengths and weaknesses, for serving as a basis for evaluating accountability plans, and for program evaluation.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Executive Summary

This technical report provides a summary of the 2015–2016 administrations of the Missouri End-of-Course (MO EOC) Assessments in English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, American History, and Physical Science. More specifically, it is designed to provide validity evidence to support the use and intended interpretation of the MO EOC test scores. The report provides details describing and verifying that the processes and procedures applied to the MO EOC Assessments adhere to professional standards and practices of educational assessment. The statistical analyses presented confirm that the MO EOC Assessments have sound psychometric properties.

Previous technical reports are often referenced to refer to historical information. They can be found on the Missouri Department of Elementary and Secondary Education (DESE) website at http://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials.

### E.1. Assessment Overview

The criterion-referenced MO EOC Assessments are designed to assess students' knowledge of the Missouri Learning Standards. The 2015–2016 school year marked the eighth operational administration of the English II, Algebra I, and Biology Assessments; the seventh operational administration of the English I, Algebra II, Geometry, Government, and American History Assessments; and the second operational administration of the Physical Science Assessment.

Prior to 2014–2015, all MO EOC Assessments were required. However, beginning in Fall 2014, districts were required to administer the English II, Algebra I, Biology, and Government Assessments to all students prior to graduation. For students who completed the Algebra I Assessment prior to high school, Algebra II is the required high school mathematics assessment for accountability purposes. Four MO EOC Assessments are optional (English I, Geometry, Physical Science, and American History).

Test forms for Biology, Government, and American History were original intact forms previously administered in other testing administrations. However, starting in Fall 2014, the following changes occurred for English I, English II, Algebra I, Algebra II, and Geometry and continued to be applied to the 2015–2016 administration:

- Revised test blueprints
- New test forms
- Alignment of existing items in English Language Arts and Mathematics to the Missouri Learning Standards
- New scoring rubrics for performance events (PEs) and change of PE scores
- Change of test length and total score points
- Addition of PEs to English I
- Updated achievement level descriptors (ALDs)


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## E.2. 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. English I, Algebra II, Geometry, Government, and American History were added the following year, and Physical Science was added in 2014–2015. The MO EOC Assessments have been administered each summer, fall, and spring since:

- 2008–2009 for English II, Algebra I, and Biology (beginning with the Fall 2008 administration)
- 2009–2010 for English I, Algebra II, Geometry, Government, and American History (beginning with the Fall 2009 administration)
- 2014–2015 for Physical Science (beginning with the Fall 2014 administration)

## E.3. 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 2015, Fall 2015, and Spring 2016 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 and demographic criteria required by Missouri's approved Elementary and Secondary Education Act (ESEA) Flexibility Waiver.

Individual student reports (ISRs) 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 the academic year. Therefore, the score reports for the 2015–2016 assessment year contained information from Summer 2015, Fall 2015, and Spring 2016.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## E.4. Student Performance

The MO EOC Assessment score matches a student's performance to a defined achievement level. 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.

- Table E.1 displays the percentage of students at each achievement level for the Summer 2015, Fall 2015, and Spring 2016 MO EOC Assessments, as well as the overall percentages for all three administrations combined. Data for Physical Science is only included for Spring 2016 because no students took the Physical Science Assessment during the Summer 2015 or Fall 2015 administrations.

- Table E.2 displays the percentage of students at each achievement level from 2008–2009 to 2015–2016 for the MO EOC Assessments. The test design was changed in Fall 2014 for English II, Algebra I, Algebra II, Biology, and Government. Therefore, it is not recommended to make direct comparisons of the 2014–2015 and 2015-2016 test results to prior results for the MO EOC Assessments. A dark vertical division is placed between the data for the 2013–2014 and 2014–2015 years to indicate caution in comparing results for the five content areas.

**Table E.1. Achievement Level Distribution for 2015–2016**

| Content Area | Achievement Level | Summer 2015 | | Fall 2015 | | Spring 2016 | | Overall | |
|---|---|---|---|---|---|---|---|---|---|
| | | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| English II | Below Basic | 91 | 21.2 | 625 | 22.6 | 2,027 | 3.2 | 2,743 | 4.2 |
| | Basic | 166 | 38.6 | 821 | 29.7 | 10,074 | 16.0 | 11,061 | 16.8 |
| | Proficient | 159 | 37.0 | 1,098 | 39.7 | 39,538 | 63.0 | 40,795 | 61.8 |
| | Advanced | 14 | 3.3 | 221 | 8.0 | 11,150 | 17.8 | 11,385 | 17.3 |
| | Below Basic + Basic | 257 | 59.8 | 1,446 | 52.3 | 12,101 | 19.2 | 13,804 | 21.0 |
| | Proficient + Advanced | 173 | 40.3 | 1,319 | 47.7 | 50,688 | 80.8 | 52,180 | 79.1 |
| | **Total** | **430** | **100.0** | **2,765** | **100.0** | **62,789** | **100.0** | **65,984** | **100.0** |
| Algebra I | Below Basic | 188 | 21.4 | 1,653 | 35.8 | 7,938 | 13.0 | 9,779 | 14.7 |
| | Basic | 206 | 23.5 | 935 | 20.2 | 11,949 | 19.6 | 13,090 | 19.7 |
| | Proficient | 390 | 44.5 | 1,417 | 30.7 | 29,691 | 48.7 | 31,498 | 47.4 |
| | Advanced | 93 | 10.6 | 617 | 13.4 | 11,393 | 18.7 | 12,103 | 18.2 |
| | Below Basic + Basic | 394 | 44.9 | 2,588 | 56.0 | 19,887 | 32.6 | 22,869 | 34.4 |
| | Proficient + Advanced | 483 | 55.1 | 2,034 | 44.1 | 41,084 | 67.4 | 43,601 | 65.6 |
| | **Total** | **877** | **100.0** | **4,622** | **100.0** | **60971** | **100.0** | **66,470** | **100.0** |
| Biology | Below Basic | 46 | 15.1 | 615 | 22.3 | 3,537 | 5.8 | 4,198 | 6.5 |
| | Basic | 137 | 44.9 | 887 | 32.1 | 16,282 | 26.5 | 17,306 | 26.8 |
| | Proficient | 105 | 34.4 | 809 | 29.3 | 28,634 | 46.6 | 29,548 | 45.8 |
| | Advanced | 17 | 5.6 | 451 | 16.3 | 13,033 | 21.2 | 13,501 | 20.9 |
| | Below Basic + Basic | 183 | 60.0 | 1,502 | 54.4 | 19,819 | 32.3 | 21,504 | 33.3 |
| | Proficient + Advanced | 122 | 40.0 | 1,260 | 45.6 | 41,667 | 67.8 | 43,049 | 66.7 |
| | **Total** | **305** | **100.0** | **2,762** | **100.0** | **61,486** | **100.0** | **64,553** | **100.0** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Content Area | Achievement Level | Summer 2015 | | Fall 2015 | | Spring 2016 | | Overall | |
|---|---|---|---|---|---|---|---|---|---|
| | | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| English I | Below Basic | 5 | 9.6 | 41 | 6.3 | 1,006 | 6.3 | 1,052 | 6.4 |
| | Basic | 24 | 46.2 | 156 | 23.8 | 4,343 | 27.4 | 4,523 | 27.3 |
| | Proficient | 20 | 38.5 | 363 | 55.3 | 8,889 | 56.0 | 9,272 | 56.0 |
| | Advanced | 3 | 5.8 | 96 | 14.6 | 1,627 | 10.3 | 1,726 | 10.4 |
| | Below Basic + Basic | 29 | 55.8 | 197 | 30.1 | 5,349 | 33.7 | 5,575 | 33.7 |
| | Proficient + Advanced | 23 | 44.3 | 459 | 69.9 | 10,516 | 66.3 | 10,998 | 66.4 |
| | **Total** | **52** | **100.0** | **656** | **100.0** | **15,865** | **100.0** | **16,573** | **100.0** |
| Algebra II | Below Basic | 7 | 17.95 | 72 | 10.40 | 2,499 | 12.63 | 2,578 | 12.56 |
| | Basic | 12 | 30.77 | 105 | 15.17 | 3,434 | 17.35 | 3,551 | 17.30 |
| | Proficient | 12 | 30.77 | 267 | 38.58 | 7,988 | 40.36 | 8,267 | 40.28 |
| | Advanced | 8 | 20.51 | 248 | 35.84 | 5,870 | 29.66 | 6,126 | 29.85 |
| | Below Basic + Basic | 19 | 48.7 | 177 | 25.6 | 5,933 | 30.0 | 6,129 | 29.9 |
| | Proficient + Advanced | 20 | 51.3 | 515 | 74.4 | 13,858 | 70.0 | 14,393 | 70.1 |
| | **Total** | **39** | **100.00** | **692** | **100.00** | **19,791** | **100.00** | **20,522** | **100.00** |
| Geometry | Below Basic | 18 | 48.65 | 115 | 17.06 | 1,780 | 20.48 | 1,913 | 20.34 |
| | Basic | 4 | 10.81 | 109 | 16.17 | 1,633 | 18.79 | 1,746 | 18.57 |
| | Proficient | 13 | 35.14 | 313 | 46.44 | 3,695 | 42.51 | 4,021 | 42.76 |
| | Advanced | 2 | 5.41 | 137 | 20.33 | 1,585 | 18.23 | 1,724 | 18.33 |
| | Below Basic + Basic | 22 | 59.5 | 224 | 33.2 | 3,413 | 39.3 | 3,659 | 38.9 |
| | Proficient + Advanced | 15 | 40.6 | 450 | 66.8 | 5,280 | 60.7 | 5,745 | 61.1 |
| | **Total** | **37** | **100.00** | **674** | **100.00** | **8,693** | **100.00** | **9,404** | **100.00** |
| Government | Below Basic | 147 | 18.65 | 1,677 | 12.11 | 4,042 | 9.09 | 5,866 | 9.92 |
| | Basic | 215 | 27.28 | 4,212 | 30.42 | 11,516 | 25.89 | 15,943 | 26.97 |
| | Proficient | 252 | 31.98 | 4,990 | 36.04 | 18,344 | 41.24 | 23,586 | 39.90 |
| | Advanced | 174 | 22.08 | 2,965 | 21.42 | 10,578 | 23.78 | 13,717 | 23.21 |
| | Below Basic + Basic | 362 | 45.9 | 5,889 | 42.5 | 15,558 | 35.0 | 21,809 | 36.9 |
| | Proficient + Advanced | 426 | 54.1 | 7,955 | 57.5 | 28,922 | 65.0 | 37,303 | 63.1 |
| | **Total** | **788** | **100.00** | **13,844** | **100.00** | **44,480** | **100.00** | **59,112** | **100.00** |
| American History | Below Basic | 18 | 23.38 | 87 | 18.71 | 2,201 | 24.04 | 2,306 | 23.78 |
| | Basic | 19 | 24.68 | 110 | 23.66 | 2,469 | 26.97 | 2,598 | 26.79 |
| | Proficient | 26 | 33.77 | 159 | 34.19 | 2,966 | 32.40 | 3,151 | 32.49 |
| | Advanced | 14 | 18.18 | 109 | 23.44 | 1,519 | 16.59 | 1,642 | 16.93 |
| | Below Basic + Basic | 37 | 48.1 | 197 | 42.4 | 4,670 | 51.0 | 4,904 | 50.6 |
| | Proficient + Advanced | 40 | 52.0 | 268 | 57.6 | 4,485 | 49.0 | 4,793 | 49.4 |
| | **Total** | **77** | **100.00** | **465** | **100.00** | **9,155** | **100.00** | **9,697** | **100.00** |
| Physical Science | Below Basic | -- | -- | -- | -- | 299 | 6.32 | 299 | 6.32 |
| | Basic | -- | -- | -- | -- | 3,103 | 65.63 | 3,103 | 65.63 |
| | Proficient | -- | -- | -- | -- | 1,106 | 23.39 | 1,106 | 23.39 |
| | Advanced | -- | -- | -- | -- | 220 | 4.65 | 220 | 4.65 |
| | Below Basic + Basic | -- | -- | -- | -- | 3,402 | 72.0 | 3,402 | 72.0 |
| | Proficient + Advanced | -- | -- | -- | -- | 1,326 | 28.0 | 1,326 | 28.0 |
| | **Total** | **--** | **--** | **--** | **--** | **4,728** | **100.00** | **4,728** | **100.00** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.2. Achievement Level Distribution Across Years**

| Content Area | Achievement Level | 2008–2009 | | 2009–2010 | | 2010–2011 | | 2011–2012 | | 2012–2013 | | 2013–2014 | | 2014–2015 | | 2015–2016 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq. | % | Freq. | % | Freq. | % | 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 | 2,691 | 4.1 | 3,515 | 5.4 | 2,743 | 4.2 |
| | Basic | 12,579 | 21.3 | 14,903 | 23.3 | 14,213 | 21.5 | 13,883 | 21.2 | 16,889 | 26.1 | 13,837 | 21.3 | 13,663 | 21.0 | 11,061 | 16.8 |
| | Proficient | 31,096 | 52.7 | 32,828 | 51.3 | 31,660 | 48.0 | 34,958 | 53.5 | 32,780 | 50.7 | 29,990 | 46.1 | 36,183 | 55.6 | 40,795 | 61.8 |
| | Advanced | 12,907 | 21.9 | 14,381 | 22.5 | 17,349 | 26.3 | 12,765 | 19.5 | 11,848 | 18.3 | 18,565 | 28.5 | 11,737 | 18.0 | 11,385 | 17.3 |
| | Below Basic + Basic | 15,008 | 25.4 | 16,830 | 26.3 | 16,982 | 25.7 | 17,636 | 26.9 | 19,977 | 30.9 | 16,528 | 25.4 | 17,178 | 26.4 | 13,804 | 21.0 |
| | Proficient + Advanced | 44,003 | 74.6 | 47,209 | 73.8 | 49,009 | 74.3 | 47,723 | 73.0 | 44,628 | 69.0 | 48,555 | 74.6 | 47,920 | 73.6 | 52,180 | 79.1 |
| | **Total** | **59,011** | **100.0** | **64,039** | **100.0** | **65,991** | **100.0** | **65,359** | **100.0** | **64,605** | **100.0** | **65,083** | **100.0** | **65,098** | **100.0** | **65,984** | **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 | 7,255 | 10.4 | 12,716 | 18.5 | 9,779 | 14.7 |
| | Basic | 20,176 | 36.2 | 22,185 | 34.5 | 20,469 | 30.2 | 23,825 | 34.5 | 23,741 | 34.2 | 24,153 | 34.7 | 13,566 | 19.7 | 13,090 | 19.7 |
| | Proficient | 21,916 | 39.3 | 26,644 | 41.4 | 27,651 | 40.7 | 24,527 | 35.5 | 28,264 | 40.8 | 24,735 | 35.6 | 29,695 | 43.2 | 31,498 | 47.4 |
| | Advanced | 8,173 | 14.7 | 11,275 | 17.5 | 13,877 | 20.4 | 14,532 | 21.0 | 11,389 | 16.4 | 13,369 | 19.2 | 12,770 | 18.6 | 12,103 | 18.2 |
| | Below Basic + Basic | 25,685 | 46.1 | 26,397 | 41.0 | 26,336 | 38.8 | 30,015 | 43.5 | 29,675 | 42.8 | 31,408 | 45.1 | 26,282 | 38.2 | 22,869 | 34.4 |
| | Proficient + Advanced | 30,089 | 54.0 | 37,919 | 58.9 | 41,528 | 61.1 | 39,059 | 56.5 | 39,653 | 57.2 | 38,104 | 54.8 | 42,465 | 61.8 | 43,601 | 65.6 |
| | **Total** | **55,774** | **100.0** | **64,316** | **100.0** | **67,864** | **100.0** | **69,074** | **100.0** | **69,328** | **100.0** | **69,512** | **100.0** | **68,747** | **100.0** | **66,470** | **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 | 4,139 | 6.4 | 2,675 | 4.0 | 4,198 | 6.5 |
| | Basic | 20,011 | 34.7 | 21,866 | 35.0 | 20,241 | 31.2 | 23,928 | 36.8 | 14,028 | 21.4 | 17,090 | 26.5 | 14,423 | 21.8 | 17,306 | 26.8 |
| | Proficient | 26,492 | 46.0 | 28,955 | 46.3 | 29,906 | 46.1 | 26,835 | 41.3 | 32,398 | 49.5 | 29,951 | 46.4 | 32,495 | 49.2 | 29,548 | 45.8 |
| | Advanced | 6,852 | 11.9 | 7,707 | 12.3 | 10,383 | 16.0 | 8,930 | 13.7 | 16,499 | 25.2 | 13,366 | 20.7 | 16,475 | 24.9 | 13,501 | 20.9 |
| | Below Basic + Basic | 24,243 | 42.0 | 25,855 | 41.4 | 24,554 | 37.9 | 29,289 | 45.0 | 16,616 | 25.4 | 21,229 | 32.9 | 17,098 | 25.8 | 21,504 | 33.3 |
| | Proficient + Advanced | 33,344 | 57.9 | 36,662 | 58.6 | 40,289 | 62.1 | 35,765 | 55.0 | 48,897 | 74.7 | 43,317 | 67.1 | 48,970 | 74.1 | 43,049 | 66.7 |
| | **Total** | **57,587** | **100.0** | **62,517** | **100.0** | **64,843** | **100.0** | **65,054** | **100.0** | **65,513** | **100.0** | **64,546** | **100.0** | **66,068** | **100.0** | **64,553** | **100.0** |
| English I | Below Basic | -- | -- | 5,325 | 12.5 | 4,641 | 10.9 | 4,317 | 9.6 | 7,173 | 11.2 | 6,042 | 9.8 | 1,194 | 6.4 | 1,052 | 6.3 |
| | Basic | -- | -- | 13,372 | 31.4 | 13,203 | 30.9 | 12,683 | 28.3 | 18,166 | 28.5 | 18,680 | 30.3 | 4,976 | 26.6 | 4,523 | 27.3 |
| | Proficient | -- | -- | 16,804 | 39.4 | 16,384 | 38.4 | 20,301 | 45.3 | 25,070 | 39.3 | 23,392 | 37.9 | 10,452 | 55.9 | 9,272 | 55.9 |
| | Advanced | -- | -- | 7,134 | 16.7 | 8,466 | 19.8 | 7,468 | 16.7 | 13,427 | 21.0 | 13,557 | 22.0 | 2,080 | 11.1 | 1,726 | 10.4 |
| | Below Basic + Basic | -- | -- | 18,697 | 43.9 | 17,844 | 41.8 | 17,000 | 37.9 | 25,339 | 39.7 | 24,722 | 40.1 | 6,170 | 33.0 | 5,575 | 33.6 |
| | Proficient + Advanced | -- | -- | 23,938 | 56.1 | 24,850 | 58.2 | 27,769 | 62.0 | 38,497 | 60.3 | 36,949 | 59.9 | 12,532 | 67.0 | 10,998 | 66.3 |
| | **Total** | **--** | **--** | **42,635** | **100.0** | **42,694** | **100.0** | **44,769** | **100.0** | **63,836** | **100.0** | **61,671** | **100.0** | **18,702** | **100.0** | **16,573** | **100.0** |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Content Area | Achievement Level | 2008–2009 | | 2009–2010 | | 2010–2011 | | 2011–2012 | | 2012–2013 | | 2013–2014 | | 2014–2015 | | 2015–2016 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| Algebra II | Below Basic | -- | -- | 4,314 | 19.3 | 1,990 | 8.6 | 2,889 | 11.2 | 2,979 | 12.4 | 2,044 | 7.8 | 3,191 | 14.7 | 2,578 | 12.6 |
| | Basic | -- | -- | 8,644 | 38.7 | 8,823 | 38.1 | 8,396 | 32.6 | 8,031 | 33.4 | 7,525 | 28.6 | 4,197 | 19.3 | 3,551 | 17.3 |
| | Proficient | -- | -- | 7,110 | 31.8 | 9,627 | 41.6 | 10,314 | 40.0 | 9,224 | 38.4 | 10,488 | 39.8 | 8,159 | 37.5 | 8,267 | 40.3 |
| | Advanced | -- | -- | 2,281 | 10.2 | 2,690 | 11.6 | 4,189 | 16.2 | 3,781 | 15.7 | 6,300 | 23.9 | 6,182 | 28.5 | 6,126 | 29.9 |
| | Below Basic + Basic | -- | -- | 12,958 | 58.0 | 10,813 | 46.7 | 11,285 | 43.8 | 11,010 | 45.8 | 9,569 | 36.4 | 7,388 | 34.0 | 6,129 | 29.9 |
| | Proficient + Advanced | -- | -- | 9,391 | 42.0 | 12,317 | 53.2 | 14,503 | 56.2 | 13,005 | 54.1 | 16,788 | 63.7 | 14,341 | 66.0 | 14,393 | 70.2 |
| | **Total** | **--** | **--** | **22,349** | **100.0** | **23,130** | **100.0** | **25,788** | **100.0** | **24,015** | **100.0** | **26,357** | **100.0** | **21,729** | **100.0** | **20,522** | **100.0** |
| Geometry | Below Basic | -- | -- | 5,199 | 18.9 | 4,487 | 16.5 | 3,799 | 12.2 | 4,279 | 13.6 | 4,007 | 10.9 | 2,282 | 18.8 | 1,913 | 20.3 |
| | Basic | -- | -- | 8,034 | 29.3 | 9,105 | 33.5 | 7,876 | 25.3 | 8,137 | 25.9 | 8,554 | 23.2 | 2,206 | 18.2 | 1,746 | 18.6 |
| | Proficient | -- | -- | 9,480 | 34.5 | 10,646 | 39.1 | 15,295 | 49.1 | 12,207 | 38.8 | 15,290 | 41.5 | 5,568 | 45.9 | 4,021 | 42.8 |
| | Advanced | -- | -- | 4,736 | 17.3 | 2,957 | 10.9 | 4,202 | 13.5 | 6,853 | 21.8 | 9,019 | 24.5 | 2,069 | 17.1 | 1,724 | 18.3 |
| | Below Basic + Basic | -- | -- | 13,233 | 48.2 | 13,592 | 50.0 | 11,675 | 37.5 | 12,416 | 39.5 | 12,561 | 34.1 | 4,488 | 37.0 | 3,659 | 38.9 |
| | Proficient + Advanced | -- | -- | 14,216 | 51.8 | 13,603 | 50.0 | 19,497 | 62.6 | 19,060 | 60.6 | 24,309 | 66.0 | 7,637 | 63.0 | 5,745 | 61.1 |
| | **Total** | **--** | **--** | **27,449** | **100.0** | **27,195** | **100.0** | **31,172** | **100.0** | **31,476** | **100.0** | **36,870** | **100.0** | **12,125** | **100.0** | **9,404** | **100.0** |
| Gov't | Below Basic | -- | -- | 7,807 | 13.4 | 4,766 | 8.2 | 6,198 | 10.6 | 6,592 | 11.0 | 6,264 | 10.3 | 4,371 | 7.2 | 5,866 | 9.9 |
| | Basic | -- | -- | 21,211 | 36.5 | 19,466 | 33.3 | 21,975 | 37.7 | 20,899 | 34.9 | 16,975 | 27.8 | 17,811 | 29.5 | 15,943 | 27.0 |
| | Proficient | -- | -- | 20,614 | 35.5 | 25,283 | 43.3 | 21,466 | 36.9 | 22,207 | 37.1 | 24,726 | 40.5 | 26,871 | 44.5 | 23,586 | 39.9 |
| | Advanced | -- | -- | 8,466 | 14.6 | 8,862 | 15.2 | 8,609 | 14.8 | 10,164 | 17.0 | 13,058 | 21.4 | 11,321 | 18.8 | 13,717 | 23.2 |
| | Below Basic + Basic | -- | -- | 29,018 | 49.9 | 24,232 | 41.5 | 28,173 | 48.3 | 27,491 | 45.9 | 23,239 | 38.1 | 22,182 | 36.7 | 21,809 | 36.9 |
| | Proficient + Advanced | -- | -- | 29,080 | 50.1 | 34,145 | 58.5 | 30,075 | 51.7 | 32,371 | 54.1 | 37,784 | 61.9 | 38,192 | 63.3 | 37,303 | 63.1 |
| | **Total** | **--** | **--** | **58,098** | **100.0** | **58,377** | **100.0** | **58,248** | **100.0** | **59,862** | **100.0** | **61,023** | **100.0** | **60,374** | **100.0** | **59,112** | **100.0** |
| Am. History | Below Basic | -- | -- | 10,551 | 31.7 | 8,654 | 25.9 | 10,085 | 25.5 | 14,712 | 27.3 | 13,050 | 25.1 | 3,087 | 25.4 | 2,306 | 23.8 |
| | Basic | -- | -- | 9,223 | 27.7 | 9,015 | 26.9 | 10,403 | 26.3 | 13,926 | 25.8 | 13,957 | 26.8 | 3,047 | 25.1 | 2,598 | 26.8 |
| | Proficient | -- | -- | 9,510 | 28.5 | 13,423 | 40.1 | 14,757 | 37.3 | 16,661 | 30.9 | 16,329 | 31.4 | 3,640 | 30.0 | 3,151 | 32.5 |
| | Advanced | -- | -- | 4,050 | 12.1 | 2,384 | 7.1 | 4,342 | 11.0 | 8,612 | 16.0 | 8,653 | 16.6 | 2,369 | 19.5 | 1,642 | 16.9 |
| | Below Basic + Basic | -- | -- | 19,774 | 59.4 | 17,669 | 52.8 | 20,488 | 51.8 | 28,638 | 53.1 | 27,007 | 51.9 | 6,134 | 50.5 | 4,904 | 50.6 |
| | Proficient + Advanced | -- | -- | 13,560 | 40.6 | 15,807 | 47.2 | 19,099 | 48.3 | 25,273 | 46.9 | 24,982 | 48.0 | 6,009 | 49.5 | 4,793 | 49.4 |
| | **Total** | **--** | **--** | **33,334** | **100.0** | **33,476** | **100.0** | **39,587** | **100.0** | **53,911** | **100.0** | **51,989** | **100.0** | **12,143** | **100.0** | **9,697** | **100.0** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Content Area | Achievement Level | 2008–2009 | | 2009–2010 | | 2010–2011 | | 2011–2012 | | 2012–2013 | | 2013–2014 | | 2014–2015 | | 2015–2016 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| Physical Science | Below Basic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 344 | 5.5 | 299 | 6.3 |
| | Basic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4,175 | 67.2 | 3,103 | 65.6 |
| | Proficient | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1,443 | 23.2 | 1,106 | 23.4 |
| | Advanced | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 250 | 4.0 | 220 | 4.7 |
| | Below Basic + Basic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4,519 | 72.7 | 3,402 | 71.9 |
| | Proficient + Advanced | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1,693 | 27.2 | 1,326 | 28.1 |
| | **Total** | **--** | **--** | **--** | **--** | **--** | **--** | **--** | **--** | **--** | **--** | **--** | **--** | **6,212** | **100.0** | **4,728** | **100.0** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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 June 2015, the U.S. Department of Education renewed the approval of Missouri's ESEA Flexibility Waiver for three years, through the end of the 2017–2018 school year. The waiver allows for one state accountability system, focus on continuous improvement, and targeting schools for support.[1]

Data for *all* tested students are used each year for purposes of item analysis and scaling and equating. 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. Through the 2011–2012 administration year, all students who took the MO EOC Assessments prior to entering high school were excluded from Missouri's high school accountability data until they enrolled in high school.

### E.5. Validity Evidence

The MO EOC Assessments are part of an integrated program of testing, accountability, and curricular and instructional support. This technical report provides details about the development and operation of the MO EOC Assessments. While Chapter 11 of this report is devoted 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 interpretation and use of scores for their intended purposes.

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



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Chapter 1: Introduction

## 1.1. Purpose of the Technical Report

This technical report provides for the historical background, statistical results, and details about the operations of the Summer 2015, Fall 2015, and Spring 2016 administrations of the Missouri End-of-Course (MO EOC) Assessments in English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, American History, and Physical Science.

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. 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 in this document. Chapter 10 contains a 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
- The processes of developing the content of the test, consulting with stakeholders, communicating about the test to users, scoring and reporting, and conducting data analysis

The documentation of each of these steps is a necessary piece of a comprehensive, defensible validity argument for the intended uses of the assessment scores. 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.

## 1.2. Summary of the MO EOC Assessments

The MO EOC Assessments are criterion-referenced assessments designed to assess students' knowledge of the Missouri Learning Standards that define the knowledge and skills students need in each grade level and course for success in college, other post-secondary training and careers.

English II, Algebra I, and Biology were developed and first administered in 2008–2009. English I, Algebra II, Geometry, Government, and American History were developed and first administered in 2009–2010. Physical Science was first administered in 2014–2015. Therefore, the 2015–2016 administration of the MO EOC Assessments marked the eighth operational year


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

for English II, Algebra I, and Biology; the seventh operational year for English I, Algebra II, Geometry, Government, and American History; and the second operational year for Physical Science. Previously used operational test forms were re-administered for all content areas for 2015–2016. Table 1.1 provides the major events that have occurred for the MO EOC Assessments from 2008–2009 to 2015–2016 to assist with the understanding and interpretation of test results throughout this report.

**Table 1.1. Summary of Major Events from 2008–2009 to 2015–2016**

| Accountability Year | Event(s) |
|---|---|
| 2008–2009 | • English II, Algebra I, and Biology were administered operationally in both paper/pencil and online format (dual platform) starting in Fall 2008. These assessments consisted of both SR items and PE/WPs. |
| 2009–2010 | • English I, Algebra II, Geometry, Government, and American History were administered operationally in both paper/pencil and online format (dual platform) starting in Fall 2009. These assessments consisted of SR items only. |
| 2010–2011 | • PE/WPs were temporarily suspended from English II, Algebra I, and Biology starting in Summer 2010.<br>• Assessments with SR items only (which include English I, Algebra II, Geometry, American History, and Government) were available in online format only. |
| 2011–2012 | • All assessments were administered online. |
| 2012–2013 | • PE/WPs were added back to English II, Algebra I, and Biology starting in Fall 2012. |
| 2013–2014 | • iPad and Chromebook administration was available for SR items in Summer 2013.<br>• iPad and Chromebook administration was available for PE/WPs starting in Fall 2013. |
| 2014–2015 | • Physical Science was administered for the first time in Fall 2014.<br>• Changes occurred for English I, English II, Algebra I, Algebra II, and Geometry, including revised blueprints, new test forms, and alignment of existing items to the Missouri Learning Standards.<br>• Beginning in Fall 2014, English II, Algebra I, Algebra II, Biology, and Government are required and English I, Geometry, Physical Science, and American History are optional. |
| 2015–2016 | • A new Biology RSS table was used to score students for the Spring 2016 administration following a recalibration study. |

For 2015–2016, the English II, Algebra I, Biology, and English I Assessments contained both selected-response (SR) items and performance events/writing prompts (PE/WPs). The Algebra II, Geometry, Government, American History, and Physical Science Assessments contained only SR items. An SR 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 item type 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.

Testing for the MO EOC Assessments is conducted during three state-designated windows each year for summer, fall, and spring. These tests are designed to be administered in approximately


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

one testing period and are not strictly timed. The 2015–2016 MO EOC Assessments were offered primarily in an online administration mode with Paper/Pencil, Braille, or Large Print forms available for students requiring accommodations.

### 1.3. Purpose and Intended Use of Test Scores

Standard 1.1 states that "The test developer should set forth clearly how test scores are intended to be interpreted and consequently used. The population(s) for which a test is intended should be delimited clearly, and the construct or constructs that the test is intended to assess should be described clearly" (AERA, APA, and NCME, 2014, p. 23). 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

The MO EOC Assessments assess the Missouri Learning Standards and were created to meet the needs of Missouri districts, schools, teachers, and students while also meeting state and federal requirements. Evidence of students' progress in meeting the Missouri Learning Standards 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 student performance to help make informed decisions about educational issues and to drive student services throughout the state.

The interpretative argument involves the interpretation of student performance in terms of individual achievement on the state standards and the conversion of these scores to performance levels (Kane, 2006). Student scores should facilitate proper interpretations while minimizing misinterpretations and unwarranted inferences. The intended interpretation of the MO EOC Assessment scores is that the scores indicate students' progress toward mastering the Missouri Learning Standards. The MO EOC Assessments incorporate meaning of the test scores by anchoring the performance level cut scores to known scale score values.

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.

### 1.4. Administration

Table 1.2 displays the 2015–2016 MO EOC testing windows. 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. 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 1.2. Testing Windows**

| Test Period | Dates |
|---|---|
| Summer 2015 | June 8 – Aug. 28, 2015 |
| Fall 2015 | Oct. 5, 2015 – Jan. 22, 2016 |
| Spring 2016 | Feb. 15 – May 27, 2016 |

Districts can offer EOC course content in any grade and in a variety of 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 appropriate content.

### 1.5. Reporting the Results

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. Districts may also use locally designed assessments aligned to the Missouri Learning Standards to provide more detailed information for each student in specific test areas.

Individual Student Reports (ISRs) and student raw scores are available to a district five business days after the close of their district testing 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.

### 1.6. 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 English II and Algebra I.

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 and 2013–2014, districts were required to administer the English II, Algebra I, Biology, English I, Government, and American History Assessments to all students prior to graduation. Beginning in Fall 2014, districts were required to administer the English II, Algebra I, Biology, and Government Assessments to all students prior to graduation. For students who completed the Algebra I Assessment prior to high school, Algebra II is the required high school mathematics assessment for accountability purposes.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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. Scores are considered for accountability purposes at the time the student is assessed and in the building that provided the instruction.

Data analyses included in this technical report are for the total assessed population, which includes students who have not yet reached the secondary level. The data analyses are based on a combination of assessment results and DESE-provided demographic criteria required under Missouri's approved ESEA Flexibility Waiver. Data for Physical Science are only included for Spring 2016 because no students took the Physical Science Assessment during the Summer 2015 or Fall 2015 administrations.

### 1.7. 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 include the following:

- English II
- Algebra I
- Biology
- English I
- Algebra II
- Geometry
- Government
- American History
- Physical Science

The statewide assessment program also 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## 1.8. 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.

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/show-me-standards.

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. In 2008, the high school GLEs were clustered into Course-Level Expectations (CLEs) to define content within typical high school courses of study in English, Mathematics, Social Studies, and Science. Archived GLEs and CLEs are available on the DESE website at http://dese.mo.gov/college-career-readiness/curriculum/missouri-learning-standards.

The MO EOC Assessments assess students' progress toward the Missouri Learning Standards, which are Missouri's content standards. The Missouri Learning Standards are aligned to the Show-Me Standards. They define the knowledge and skills students need in each grade level and course for success in college, other post-secondary training and careers. The Missouri Learning Standards include clearer, fewer and deeper expectations for English language arts and math, and literacy standards in other subjects. These standards help ensure students learn basic and higher-order skills, including problem solving and critical thinking. They give school administrators, teachers, parents and students a roadmap for learning expectations for each grade and course.

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:


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

- 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.

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


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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. Similarly, beginning in Summer 2010, PE/WPs were suspended from the English II, Algebra I, and Biology Assessments due to budget constraints but were added back in beginning with the Fall 2012 administration.

### 1.9. 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. Table 1.3 summarizes the main activities for each group involved with the 2015–2016 MO EOC administrations.

**Table 1.3. 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<br>• Create and update the Test Administration Manual, Software Installation Guides, and other ancillary materials<br>• Conduct psychometric analyses, reporting, linking/equating studies, and associated tasks<br>• Provide all needed prepress work for program materials through camera-ready art<br>• 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<br>• Account for secure test books received after testing<br>• Provide a direct customer service line, including technical support and general support to the program and customer interactions |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Group | Responsibilities |
|---|---|
| | • Store materials after testing<br>• Participate in and present at Technical Advisory Committee (TAC) meetings<br>• Score all SR items and the PE/WPs<br>• Produce and distribute all score reports and the Guide for Interpreting Results<br>• Complete the technical report for DESE<br>• Provide online enrollment and pre-ID system for use by Missouri districts<br>• Provide online testing interface and online test administration site<br>• Package and distribute materials<br>• Barcode test books with security IDs |
| **Districts** | • Distribute materials to the school buildings, track all secure materials, and promptly return all materials, including transcribed test forms, for scoring<br>• Assist in the timely resolution of scoring alerts<br>• 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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Chapter 2: Test Development

### 2.1. Introduction

All the EOC tests were intact forms previously administered in other testing administrations. Most recently, beginning in Fall 2014, new test forms were developed for English I, English II, Algebra I, Algebra II, and Geometry for the following reasons:

- Revised test blueprints
- New test forms
- Alignment of existing items in English Language Arts and Mathematics to the Missouri Learning Standards
- New scoring rubrics for PEs and change of PE scores
- Change of test length and total score points
- Addition of PEs to English I
- Updated ALDs

According to the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 2014) (hereafter referred to as the Standards), "Important validity evidence can be obtained from an analysis of the relationship between the content of a test and the construct it is intended to measure" (p. 14). Accordingly, the descriptions of the test development procedures included in the MO EOC technical reports provide validity evidence of the MO EOC Assessments. Documentation of test development from previous administrations, including the test designs, can be found in previous technical reports, located on DESE's website at http://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials.

### 2.2. Test Blueprints

Test blueprints specify the relative percentage of items in each high-level content strand. Tables 2.1 – 2.9 provide the Summer 2015, Fall 2015, and Spring 2016 test construction blueprints for English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, American History, and Physical Science.

**Table 2.1. Test Construction Blueprint—English II**

| Claim | Category | Big Idea | Target #Points | Point Range | Range of Emphasis |
|---|---|---|---|---|---|
| Reading | Claim 1a | Apply reading skills to demonstrate the ability to integrate key ideas and details, interpret and analyze the craft and structure of texts, and evaluate the knowledge and ideas found in literary texts | 15 | 15 | 33% |
| Reading | Claim 1b | Apply reading skills to demonstrate the ability to integrate key ideas and details, interpret and analyze the craft and structure of texts, and evaluate the knowledge and ideas found in informational text | 15 | 15 | 33% |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Claim | Category | Big Idea | Target #Points | Point Range | Range of Emphasis |
|---|---|---|---|---|---|
| Writing | Claim 2a | Demonstrate the ability to produce a variety of text types and purposes | 10 | 10 | 22% |
| Writing | Claim 2b | Demonstrate a command of the convention of standard English, appropriate grade-level acquisition of vocabulary | 5 | 5 | 11% |
| | | **Total** | 45 | 45 | 100% |

**Table 2.2. Test Construction Blueprint—Algebra I**

| Content Strand | Target #Points | Point Range | Range of Emphasis |
|---|---|---|---|
| Number and Quantity | 3 | 2–4 | 5–10% |
| Algebra | 17 | 14–21 | 35–53% |
| Functions | 15 | 11–20 | 28–50% |
| Stats and Probability | 5 | 3–6 | 8–15% |
| **Total** | 40 | 40 | 100% |

**Table 2.3. Test Construction Blueprint—Biology**

| Content Strand | Target #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 have 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 2.4. Test Construction Blueprint—English I**

| Claim | Category | Big Idea | Target #Points | Point Range | Range of Emphasis |
|---|---|---|---|---|---|
| Reading | Claim 1a | Apply reading skills to demonstrate the ability to integrate key ideas and details, interpret and analyze the craft and structure of texts, and evaluate the knowledge and ideas found in literary texts | 15 | 15 | 33% |
| Reading | Claim 1b | Apply reading skills to demonstrate the ability to integrate key ideas and details, interpret and analyze the craft and structure of texts, and evaluate the knowledge and ideas found in informational text | 15 | 15 | 33% |
| Writing | Claim 2a | Demonstrate the ability to produce a variety of text types and purposes | 10 | 10 | 22% |
| Writing | Claim 2b | Demonstrate a command of the convention of standard English, appropriate grade-level acquisition of vocabulary | 5 | 5 | 11% |
| | | **Total** | 45 | 45 | 100% |

**Table 2.5. Test Construction Blueprint—Algebra II**

| Content Strand | Target #Points | Point Range | Range of Emphasis |
|---|---|---|---|
| Number and Quantity | 0 | 0–4 | 0–10% |
| Algebra | 17 | 16–22 | 40–55% |
| Functions | 23 | 18–24 | 45–60% |
| Stats and Probability | 0 | 0–6 | 0–15% |
| **Total** | 40 | 40 | 100% |

**Table 2.6. Test Construction Blueprint—Geometry**

| Content Strand | Point Range | Range of Emphasis |
|---|---|---|
| Geometry | 34–40 | 85–100% |
| Stats and Probability | 0–6 | 0–15% |
| **Total** | 40 | 100% |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 2.7. Test Construction Blueprint—Government**

| Content Strand | Target #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% | -- | -- |

*Point ranges are determined using a 10 percent tolerance.

**Table 2.8. Test Construction Blueprint—American History**

| Content Strand | Target #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% | -- | -- |

*Point ranges are determined using a 10 percent tolerance.

**Table 2.9. Test Construction Blueprint—Physical Science**

| Content Strand | Point Range | Range of Emphasis |
|---|---|---|
| Properties and Principles of Matter and Energy | 25–30 | 55–66% |
| Properties and Principle of Force and Motion | 15–20 | 33–44% |
| **Total** | 40 | 100% |

## 2.3. Test Specifications

Standard 1.11[2] addresses the appropriateness of test content and its relationship to a solid validity argument. Additionally, Standard 4.2[3] defines test specifications and provides examples of the type of information that should be included in a specifications document. The test specifications describe the content and format of the test and delineate the ideal number of items and points assessed for each standard.

[2] **Standard 1.11:** When the rationale for test score interpretation for a given use rests in part on the appropriateness of test content, the procedures followed in specifying and generating test content should be described and justified with reference to the intended population to be tested and 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. 26).

[3] **Standard 4.2:** In addition to describing intended uses of the test, the test specifications should define the content of the test, the proposed test length, the item formats, the desired psychometric properties of the test items and the test, and the ordering of items and sections. Test specifications should also specify the amount of time allowed for testing; directions for the test takers; procedures to be used for test administration, including permissible variations; any materials to be used; and scoring and reporting procedures. Specifications for computer-based tests should include a description of any hardware and software requirements (pp. 85–86).



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

Appendix A contains the 2015–2016 target point distributions. Appendix B contains the actual point distributions. Details on the development and use of the test specification documents for previous MO EOC test forms can be found in previous technical reports on DESE's website at http://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials.

The following is an overview of the 2015–2016 test specifications:

- **English II**
  - The English II Assessment has 35 SR items and 3 WPs with a score range from 2–4.

- **Algebra I**
  - The Algebra I Assessment measures student achievement in the following content strands:
    - Number and Quantity
    - Algebra
    - Functions
    - Statistics and Probability

  - The 40 SR items are aligned to the strands listed above. Four PEs are aligned to Algebra. The score for the PEs ranges from 1–4 and is scored on an item-specific rubric.

- **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

  - 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.

- **English I**
  - The English II Assessment has 35 SR items and 3 WPs with a score range from 2–4.

- **Algebra II**
  - The Algebra II Assessment measures student achievement in the following content strands:
    - Number and Quantity


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

        - Algebra
        - Functions
        - Statistics and Probability

    - The 40 SR items are aligned to two strands, Algebra and Functions.

- **Geometry**
    - The Geometry Assessment measures student achievement in the following content strands:
        - Geometry
        - Statistics and Probability

    - The 40 SR items are aligned to Geometry.

- **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

- **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

- **Physical Science**
    - The Physical Science Assessment measures student achievement in the following content and process strands:
        - Properties and Principles of Matter and Energy
        - Properties and Principles of Force and Motion

    - The 45 SR items are aligned to the two strands listed above.

### 2.4. Item Development

Item development was not conducted for 2015–2016. However, content-related evidence of validity supporting test interpretation is presented in terms of how the MO EOC Assessments were assembled. Therefore, this section includes historical information regarding both item-development procedures and content coverage from Riverside Publishing.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

The forms for the Fall 2008 through the Spring 2016 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 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 and 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.

*2.4.1. 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 test development specialists created all the test items, including the PEs. English II passages and WPs and English I passages were developed by item writers trained by Riverside Publishing, Riverside Publishing test development specialists, 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 test development specialists. 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 test development specialists conducted training sessions with the item writers and provided instructions on avoiding bias and stereotyping of groups and individuals based on gender, race, ethnicity, religion, age, language, socioeconomic group, and disability. Riverside Publishing test development specialists also


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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 DOK levels.

Riverside Publishing test development specialists trained item writers to enter content into the company's electronic content management system. During training, each item writer wrote several items and received feedback on them. Participants also received feedback through the content management system as Riverside Publishing test development specialists responded to teachers' items as they were submitted. As items were produced, they were continuously reviewed, revised, edited, and evaluated by Riverside Publishing test development specialists 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 records to maintain a workflow that generated items in assessment strands and CLEs as required by the test blueprint. All items and passages went through several rounds of internal reviews, including content and editorial reviews. Riverside Publishing test development specialists reviewed each item with respect to alignment, clarity, and correspondence with item specifications.

*2.4.2. Universal Design*

Riverside Publishing test development specialists 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 items.

According to the NCEO Synthesis Report 44 (Thompson, Johnstone, & 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

- 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 test development specialists 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 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.

*2.4.3. Content and Bias Review Process*

Standard 4.8[4] addresses the importance of item review by 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

[4] **Standard 4.8:** The test review process should include empirical analyses and/or the use of expert judges to review items and scoring criteria. When expert judges are used, their qualifications, relevant experiences, and demographic characteristics should be documented, along with instructions and training in the item review process that the judges receive (p. 88).


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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:

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

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.)


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

- ☐ 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 2.10 and 2.11 show the number of items reviewed in 2007 and 2008, respectively. The accepted items in Table 2.10 were placed in a pool of items from which the 2008 standalone field-test forms were built. The accepted items in Table 2.11 were placed on EFT forms in the 2009 operational administrations.

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 2.10. 2007 Content/Bias Item Review Acceptance Rates**

| Content Area | Total #Items Presented for Review | #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 2.11. 2008 Content/Bias Item Review Acceptance Rates**

| Content Area | Total #Items Presented for Review | #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% |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## 2.5. Form Construction

### *2.5.1. 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 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.

### *2.5.2. 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 test development specialists 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.

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 reviewed regarding 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)


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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 2.12 contains the guidelines that were used for data review.

**Table 2.12. 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.

### *2.5.3. Operational Test Selection and Administration*

Riverside Publishing test development specialists 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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-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.[5]

### 2.6. 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 Spring 2013

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 Braille and Large Print reviews for Physical Science were held on February 5–6, 2015, in Jefferson City, MO.

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

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


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

Print test versions were alternated in each administration cycle through the Spring 2014 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 administration since 2009–2010. The second form was used in Fall 2013 and Spring 2014. For 2015–2016, a single Braille and Large Print test version was used for all MO EOC assessments except Government, where two forms alternated across the three administrations.

### 2.7. 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 the *2013–2014 MO EOC Technical Report*, Appendix C, 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 affect 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.

### 2.8. Quality Control for Form Construction

Checklists and quality control procedures accompanied each stage of form construction. 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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

**2.9. Summary**

The MO EOC Assessments provide an indication of student progress toward achieving the knowledge and skills identified in the Missouri Learning Standards. Just as the content 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 content standards being assessed while simultaneously considering the overall difficulty of the forms.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Chapter 3: Standard Setting

## 3.1. Introduction

As shown below, standard setting workshops for the MO EOC Assessments were conducted in 2008, 2009, and 2015. A cutpoint validation workshop was also conducted in 2015.

- The 2008 standard setting applied to English II, Algebra I, and Biology.
- The 2009 standard setting applied to English I, Algebra II, Geometry, Government, and American History.
- The 2015 standard setting applied to Physical Science.
- The 2015 cutpoint validation applied to English I, English II, Algebra I, Algebra II, and Geometry.

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 2015 standard setting and cutpoint validation events is provided because the cut scores established at the workshops were applied to the 2015–2016 test scores. For more detailed information on the 2015 standard setting and cutpoint validation, see Chapter 3 in the *2014–2015 MO EOC Technical Report* at http://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials. For information on the 2008 and 2009 standard settings, see Chapter 3 of the *2009–2010 MO EOC Phase I and Phase II Technical Reports*.

## 3.2. 2015 Standard Setting

Physical Science was administered for the first time in Fall 2014. A standard setting in February 2015 took place to establish recommended cut scores using the Angoff method. The main goal of the 2015 standard setting was to establish three cut scores for the Physical Science MO EOC Assessment:

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 final standard setting report for Physical Science is provided in the *2014–2015 MO EOC Technical Report*.

The Angoff method required panelists to estimate the percentage of students meeting the borderline definition that would respond correctly to each item. Panelists then estimated that percentage for every borderline student definition (i.e., panelists had to estimate these percentages for each cut score recommendation). The overall recommended cut score was computed from the expected scores for individual items.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

### *3.2.1. Panelists*

Seven panelists participated in the 2015 standard setting workshop for Physical Science. Panelists included classroom teachers who taught Physical Science, Biology and Chemistry in Missouri schools; had administered the MO EOC Assessments in their respective content area; and were familiar with the standards.

### *3.2.2. Staffing*

Questar provided staff members experienced in conducting standard setting to facilitate the panelist group. The facilitator was experienced with the Angoff and modified Angoff methods, and all panelists were trained on the method prior to implementation with ample time for any questions to be addressed. Psychometricians and a statistical analyst attended the workshop to assist with data analysis, oversee data quality control, and observe the activities. A Questar program manager was present to serve as a resource for questions related to the meeting logistics. DESE was also available during the standard setting workshop.

### *3.2.3. Development of Achievement Level Descriptors (ALDs)*

Because Physical Science was administered for the first time in Fall 2014, Questar worked with DESE to create draft ALDs for Physical Science prior to the standard setting. During the workshop, the draft ALDs were used as guidelines for evaluating student performance and were beneficial to the panelists as they defined the borderline students and established recommended cut scores. Panelists also discussed and fine-tuned the draft ALDs during the meeting. At the conclusion of the standard setting, DESE collected the panelist recommendations for ALD revisions for consideration in the final wording of the Physical Science ALDs.

### *3.2.4. Results*

Table 3.1 presents the recommend raw cut scores based on item ratings.

**Table 3.1. 2015 Standard Setting Results**

| Basic RS | Proficient RS | Advanced RS |
|---|---|---|
| 12 | 24 | 33 |

## 3.3. 2015 Cutpoint Validation

A cutpoint validation workshop was conducted in February 2015 for English II, Algebra I, English I, Algebra II, and Geometry. Changes to the test forms were not enough to justify conducting a full standard setting process for these content areas, so cutpoint validation occurred instead to review the existing cut scores to determine if they were still appropriate. The main goal of the cutpoint validation was to validate the existing cut scores for the English II, Algebra I, English I, Algebra II, and Geometry Assessments following changes to the assessments. Refer to Chapter 2, Section 2.1 for a description of the changes that took place beginning for the Fall 2014 administration. The final cutpoint validation report is provided in the *2014–2015 MO EOC Technical Report*.

Because the modified Angoff method was used for the initial 2008 and 2009 standard settings, the panelists received an overview of this method prior to reviewing the cutpoints in order to understand how the cutpoints were originally set. The focus of cutpoint validation was to revisit


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

cutpoints that have been previously established. The steps involved were reviewing the Fall 2014 operational form, discussing and fine-tuning the ALDs, reviewing the impact data, reviewing the ordered item booklet with the existing cutpoints indicated, and adjusting the cutpoints as needed. Therefore, cutpoint validation was not a simple replication of the standard setting process.

### *3.3.1. Panelists*

Nineteen panelists participated in the 2015 cutpoint validation workshop. Panelists included classroom teachers who taught English Language Arts and Mathematics in Missouri schools, had administered the MO EOC Assessments in their respective content area, and were familiar with the standards.

### *3.3.2. Staffing*

Questar provided staff members experienced in conducting cutpoint validation to facilitate the panelist groups. Most facilitators held doctorates in educational measurement, and all panelists were trained on the method prior to implementation with ample time for any questions to be addressed. Psychometricians and statistical analysts also attended the workshop to oversee quality control, observe the activities, and provide statistical and technical support when needed. A Questar program manager was also present, as well as DESE staff members.

### *3.3.3. Development of ALDs*

ALDs for English I, English II, Algebra I, Algebra II, and Geometry were revised prior to the 2015 cutpoint validation workshop to align to the Missouri Learning Standards. Questar team created draft ALDs for DESE to review. Questar then reviewed the ALDs with DESE and updated them based on DESE's feedback. During cutpoint validation, the draft ALDs were used as guidelines for evaluating student performance and were beneficial to the panelists as they evaluated impact data and reviewed the cut scores. Panelists also discussed and fine-tuned the draft ALDs during the meeting. At the conclusion of the cutpoint validation, DESE collected the panelist recommendations for ALD revisions for consideration in the final wording of the ALDs

### *3.3.4. Results*

Table 3.2 presents the recommended cut scores from the cutpoint validation workshop. These new cuts will be used for future assessments.

**Table 3.2. 2015 Cutpoint Validation Results**

| | Basic | | | Proficient | | | Advanced | | |
|---|---|---|---|---|---|---|---|---|---|
| **Content Area** | **Theta** | **RS** | **SS** | **Theta** | **RS** | **SS** | **Theta** | **RS** | **SS** |
| English I | -0.55 | 18 | 175 | 0.58 | 27 | 199 | 2.01 | 37 | 232 |
| English II | -0.69 | 17 | 180 | 0.45 | 27 | 198 | 2.06 | 38 | 225 |
| Algebra I | -0.14 | 13 | 190 | 0.46 | 19 | 203 | 1.63 | 32 | 226 |
| Algebra II | 0.26 | 16 | 197 | 0.85 | 21 | 208 | 1.92 | 29 | 228 |
| Geometry | -0.23 | 16 | 185 | 0.38 | 21 | 199 | 1.64 | 30 | 225 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Chapter 4: Item Analysis

## 4.1. Introduction

This chapter presents the item analysis summary information, which includes mean item scores and discrimination indices, at the item level for each content area. These item summary statistics (i.e., *p*-values, point-biserial correlations, and omit rates) are based on the operational administrations that included responses from 2,605 students for Summer 2015, 26,480 students for Fall 2015, and 287,958 students for Spring 2016 across all content areas, as shown in Table 4.1. Differential item functioning (DIF) analyses were also conducted for each content area and administration.

**Table 4.1. Number of Students Included in the Analyses**

| Test Period | Content Area | N-Count |
|---|---|---|
| Summer 2015 | English II | 430 |
| | Algebra I | 877 |
| | Biology | 305 |
| | English I | 52 |
| | Algebra II | 39 |
| | Geometry | 37 |
| | Government | 788 |
| | Am. History | 77 |
| | **Total** | **2,605** |
| Fall 2015 | English II | 2,765 |
| | Algebra I | 4,622 |
| | Biology | 2,762 |
| | English I | 656 |
| | Algebra II | 692 |
| | Geometry | 674 |
| | Government | 13,844 |
| | Am. History | 465 |
| | **Total** | **26,480** |
| Spring 2016 | English II | 62,789 |
| | Algebra I | 60,971 |
| | Biology | 61,486 |
| | English I | 15,865 |
| | Algebra II | 19,791 |
| | Geometry | 8,693 |
| | Government | 44,480 |
| | Am. History | 9,155 |
| | Physical Science | 4,728 |
| | **Total** | **287,958** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

### 4.2. Item-Level Statistics

Appendix C presents the item difficulty, discrimination, and omit rates for all items on each assessment for the Summer 2015, Fall 2015, and Spring 2016 operational administrations. Field test items are not included in the tables. The results indicate that the items measure achievement across a range of difficulty and that most items are correlated with the total test score, thereby discriminating between low- and high-performing students.

For SR items, item difficulty is the proportion of students who gave correct responses to the item (also referred to as *p*-value). For PE/WP items, the mean score is the average of the scores students who responded to these items. 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). Both item difficulty and item discrimination are expressed in the raw score metric.

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.

### 4.3. Speededness

The consequence of time limits on students' scores is called *speededness*. A test is speeded if examinees do not have time to respond to all items on the test. Examinees may receive a lower score 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. 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. 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.

Item omit rates, especially for items appearing later in a test, are a gauge of potential test speededness. The "Omit Rate" column in Appendix C shows the percentage of students who omitted each SR item for each MO EOC Assessment. As shown in the tables, the omit rates are negligible or zero for most 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. DIF analyses for the MO EOC Assessments presented in this technical report are meant for reporting the results for the purposes of this report only. Items flagged for DIF were still used to score students.

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 & Holland, 1992).


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

With the groups matched on raw score, 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.

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.

Table 4.2, Table 4.3, and Table 4.4 present the results of the DIF analyses for the items included on the Summer 2015, Fall 2015, and Spring 2016 operational forms, 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. DIF analyses were performed when there was a minimum of 200 students in the focal group. As shown in the tables, none of the PEs or WPs showed C-level DIF and very few SR items showed C-level DIF.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 4.2. DIF Results—Summer 2015**

| Content Area | Group**** | N-Count*** | SR Items* | | | | | PE/WPs* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A** | B** | B–** | C** | C–** | A** | B** | B–** | C** | C–** |
| **Summer 2015** | | | | | | | | | | | | |
| English II | M/F | 264/166 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | W/B | 210/172 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | W/H | 210/40 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Algebra I | M/F | 467/410 | 40 | -- | -- | -- | -- | 4 | -- | -- | -- | -- |
| | W/B | 546/268 | 31 | 5 | 2 | 1 | 1 | 2 | 2 | -- | -- | -- |
| | W/H | 546/49 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Biology | M/F | 161/144 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | W/B | 150/130 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | W/H | 150/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| English I | M/F | 30/22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | W/B | 30/9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | W/H | 30/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Algebra II | M/F | 15/24 | -- | -- | -- | -- | -- | | | | | |
| | W/B | 19/3 | -- | -- | -- | -- | -- | | | | | |
| | W/H | 19/17 | -- | -- | -- | -- | -- | | | | | |
| Geometry | M/F | 19/18 | -- | -- | -- | -- | -- | | | | | |
| | W/B | 17/14 | -- | -- | -- | -- | -- | | | | | |
| | W/H | 17/3 | -- | -- | -- | -- | -- | | | | | |
| Government | M/F | 356/432 | 39 | -- | 1 | -- | -- | | | | | |
| | W/B | 544/137 | -- | -- | -- | -- | -- | | | | | |
| | W/H | 544/62 | -- | -- | -- | -- | -- | | | | | |
| Am. History | M/F | 26/51 | -- | -- | -- | -- | -- | | | | | |
| | W/B | 60/6 | -- | -- | -- | -- | -- | | | | | |
| | W/H | 60/4 | -- | -- | -- | -- | -- | | | | | |

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

*The MH procedure is applied for the SR items. WINSTEPS is applied 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 4.3. DIF Results—Fall 2015**

| Content Area | Group**** | N-Count*** | SR Items* | | | | | PE/WPs* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A** | B** | B–** | C** | C–** | A** | B** | B–** | C** | C–** |
| **Fall 2015** | | | | | | | | | | | | |
| English II | M/F | 1,496/1,269 | 35 | -- | -- | -- | -- | 3 | -- | -- | -- | -- |
| | W/B | 1,320/1,114 | 34 | -- | -- | 1 | -- | 3 | -- | -- | -- | -- |
| | W/H | 1,320/200 | 32 | 1 | 2 | -- | -- | 3 | -- | -- | -- | -- |
| Algebra I | M/F | 2,438/2,180 | 40 | -- | -- | -- | -- | 3 | -- | -- | -- | -- |
| | W/B | 3,157/911 | 40 | -- | -- | -- | -- | 3 | -- | -- | -- | -- |
| | W/H | 3,157/341 | 39 | -- | 1 | -- | -- | 3 | -- | -- | -- | -- |
| Biology | M/F | 1,488/1,273 | 34 | 1 | -- | -- | -- | 13 | -- | -- | -- | -- |
| | W/B | 1,749/641 | 34 | -- | -- | 1 | -- | 12 | 1 | -- | -- | -- |
| | W/H | 1,749/199 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| English I | M/F | 343/313 | 31 | 1 | 2 | -- | 1 | 2 | -- | 1 | -- | -- |
| | W/B | 523/49 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | W/H | 523/51 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Algebra II | M/F | 326/366 | 37 | -- | 2 | -- | 1 | | | | | |
| | W/B | 526/76 | -- | -- | -- | -- | -- | | | | | |
| | W/H | 526/32 | -- | -- | -- | -- | -- | | | | | |
| Geometry | M/F | 349/325 | 34 | 2 | 3 | 1 | -- | | | | | |
| | W/B | 492/73 | -- | -- | -- | -- | -- | | | | | |
| | W/H | 492/50 | -- | -- | -- | -- | -- | | | | | |
| Government | M/F | 6,985/6,853 | 39 | -- | 1 | -- | -- | | | | | |
| | W/B | 9,704/2,628 | 38 | 1 | 1 | -- | -- | | | | | |
| | W/H | 9,704/719 | 38 | 1 | 1 | -- | -- | | | | | |
| Am. History | M/F | 258/206 | 32 | 2 | -- | 2 | 4 | | | | | |
| | W/B | 369/41 | -- | -- | -- | -- | -- | | | | | |
| | W/H | 369/30 | -- | -- | -- | -- | -- | | | | | |

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

*The MH procedure is applied for the SR items. WINSTEPS is applied 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 4.4. DIF Results—Spring 2016**

| Content Area | Group*** | N-Count | SR Items* | | | | | PE/WPs* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A** | B** | B–** | C** | C–** | A** | B** | B–** | C** | C–** |
| **Spring 2016** | | | | | | | | | | | | |
| English II | M/F | 31,745/31,023 | 34 | -- | 1 | -- | -- | 3 | -- | -- | -- | -- |
| | W/B | 47,474/9,263 | 33 | -- | 2 | -- | -- | 3 | -- | -- | -- | -- |
| | W/H | 47,474/2,994 | 35 | -- | -- | -- | -- | 3 | -- | -- | -- | -- |
| Algebra I | M/F | 30,470/30,474 | 40 | -- | -- | -- | -- | 4 | -- | -- | -- | -- |
| | W/B | 45,557/9,125 | 39 | -- | -- | -- | 1 | 4 | -- | -- | -- | -- |
| | W/H | 45,557/3,177 | 39 | -- | 1 | -- | -- | 4 | -- | -- | -- | -- |
| Biology | M/F | 30,835/30,619 | 33 | 1 | 1 | -- | -- | 10 | -- | -- | -- | -- |
| | W/B | 46,480/9,089 | 35 | -- | -- | -- | -- | 10 | -- | -- | -- | -- |
| | W/H | 46,480/2,963 | 35 | -- | -- | -- | -- | 10 | -- | -- | -- | -- |
| English I | M/F | 7,859/7,999 | 35 | -- | -- | -- | -- | 1 | -- | 2 | -- | -- |
| | W/B | 13,282/1,217 | 34 | -- | 1 | -- | -- | 3 | -- | -- | -- | -- |
| | W/H | 13,282/721 | 33 | -- | 1 | -- | 1 | 3 | -- | -- | -- | -- |
| Algebra II | M/F | 9,275/10,515 | 39 | -- | 1 | -- | -- | | | | | |
| | W/B | 16,510/1,277 | 40 | -- | -- | -- | -- | | | | | |
| | W/H | 16,510/827 | 40 | -- | -- | -- | -- | | | | | |
| Geometry | M/F | 4,176/4,512 | 39 | -- | 1 | -- | -- | | | | | |
| | W/B | 7,385/489 | 38 | 1 | 1 | -- | -- | | | | | |
| | W/H | 7,385/392 | 39 | 1 | -- | -- | -- | | | | | |
| Government | M/F | 22,480/21,979 | 40 | -- | -- | -- | -- | | | | | |
| | W/B | 34,061/6,350 | 39 | 1 | -- | -- | -- | | | | | |
| | W/H | 34,061/2,162 | 40 | -- | -- | -- | -- | | | | | |
| Am. History | M/F | 4,583/4,568 | 36 | -- | 3 | 1 | -- | | | | | |
| | W/B | 8,157/387 | 37 | 1 | 2 | -- | -- | | | | | |
| | W/H | 8,157/265 | 39 | 1 | -- | -- | -- | | | | | |
| Physical Science | M/F | 2,435/2,292 | 41 | -- | 3 | -- | 1 | | | | | |
| | W/B | 4,234/187 | -- | -- | -- | -- | -- | | | | | |
| | W/H | 4,234/139 | -- | -- | -- | -- | -- | | | | | |

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

*The MH procedure is applied for the SR items. WINSTEPS is applied 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

### 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. In addition, 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 2015–2016 operational administrations show that item difficulty does not depend on group membership after conditioning on student ability.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# 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, & NCME, 2014) state, "For tests designed to assess the test taker's knowledge, skills, abilities, or other personal characteristics, standardization helps to ensure that all test takers have the same opportunity to demonstrate their competencies" (p. 111). In other words, 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.

Questar uses its online assessment platform to manage and deliver the MO EOC Online Assessments. This platform has two components:

- Student Test Delivery – The online testing student client is a small-footprint, secure browser application that is downloaded to the students' workstations to allow uninterrupted testing and failsafe protection of student responses in the event of a connection loss.
- Administration and Reporting System – The online testing system administration system is a web application that allows districts, schools, and teachers/proctors to manage their students and assessments.

For the MO EOC Assessments, 2011–2012 was the first year 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 on the online test administration site. The Test Administration Manual contains information specific to the registration for and administration of the MO EOC Assessments. This process was continued for 2015–2016.

## 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 Missouri Learning Standards rather than on GLEs. Therefore, when the content of the Missouri Learning Standards 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


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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 participate in the MO EOC Assessments.

*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 in the United States for 12 cumulative months or less since school age 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. The other MO EOC Assessments that all students, including ELL students, are required to take are Algebra I, Biology and Government.

### 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 online test administration site for District Test Coordinators, School Test Coordinators, Examiners, and Information Technology Coordinators. 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 online administration 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 online


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

assessment platform. 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.

### 5.5. District and Test Examiner Training

Both Questar and DESE were responsible for training the district staff on EOC test administration. DESE provided training webinars, scripts, and PowerPoint presentations on the Test Administration Manual, state procedures, and general testing issues. These training resources were available both on the DESE website and on the online test administration site. Appendix G contains the 2015–2016 training PowerPoint presentations for the MO EOC assessments.

Questar provided training on the online assessment platform. Questar training contained propriety information and was only available on the test administration site. 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

#### *5.6.1. Summary*

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.[6]

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. For tests with multiple sessions (those including a PE/WP), the students also had a Session Access code given to them by the teacher at the start of the

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


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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.

*5.6.2. Detection and Prevention of Testing Irregularities*

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 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
- Allowing students to access cell phones or other electronic devices during testing

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 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.[7] This QA process was issued to District Test Coordinators in an administrative memo.[8] 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

[7] View the QA form online at http://dese.mo.gov/sites/default/files/asmt-eoc-self-qa-2014.pdf.
[8] View the memo online at http://dese.mo.gov/sites/default/files/am/documents/CCR-14-001.pdf.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

Assessments. The questions on the form were designed to focus attention and help districts examine important areas of assessment training, administration, and test security.

District Test Coordinators were asked to complete one MO EOC quality assurance 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.

When testing irregularities were reported, DESE was able to request that Questar perform statistical analyses to detect and flag unusual response patterns. DESE then worked with districts to establish procedures for follow-up 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. 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 the online assessment platform 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 online assessment platform 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, or a tablet device. Adequate space should have been left between workstations. Students could use scratch, grid, or draft paper and a writing utensil while taking the online assessment. The Test Examiner needed the following:


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

- 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 test on each workstation used for testing
- Ensure that the online test delivery system 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.)


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

*5.7.4. Directions for Administration*

In accordance with Standard 6.1,[9] 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 a script from the 2015–2016 Test Administration Manual (TAM) for the Geometry EOC Assessment.

**Figure 5.1. Directions for Administering from the TAM—Geometry**

**Geometry Assessment Online**

**Directions for Administering**

*Distribute scratch, unlabeled grid or graph paper. If you have decided the students should use calculators for this assessment, make sure all students have a working calculator. Hard copies of the Mathematics Reference Sheet may also be distributed.*

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 Geometry. You may use a calculator and scratch paper to work through the questions. The Mathematics Reference Sheet is available during testing by clicking the reference sheet icon. 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.**

**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.*

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



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

### 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 (ELLs) 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 6.3,[10] 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 the online test administration site.

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 2015, Fall 2015, and Spring 2016, respectively. The most prevalent type of accommodation for the Summer 2015, Fall 2015 and Spring 2016 administrations across all MO EOC Assessments was testing in "Other Setting." See Appendix H for a list of accommodation codes from the 2015–2016 Test Administration Manual.

[10] **Standard 6.3:** Changes or disruptions to standardized test administration procedures or scoring should be documented and reported to the test user (p. 115).


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 5.1. Accommodation Distributions—Summer 2015**

| Accommodation | English II | | Algebra I | | Biology | | English I | | Algebra II | | Geometry | | Government | | Am. History | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| Braille | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Large Print | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oral Reading | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oral Reading— Blind/Partial Sight | 5 | 1.16 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oral Reading—Paper/Pencil Only | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Signing of Assessment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Paper Based Assessment—Paper/Pencil Only | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oral Reading in Native Language ELA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Use of Scribe | -- | -- | 1 | 0.11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Speech to Text Online not Embedded | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Abacus | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 1.30 |
| Multiplication Table | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 1.30 |
| Specialized Calculator | 1 | 0.23 | -- | -- | 1 | 0.33 | -- | -- | -- | -- | -- | -- | -- | -- | 2 | 2.60 |
| Alternate Response | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oral Reading Assistive Technology | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0.13 | 3 | 3.90 |
| Oral Reading Any—not Embedded | -- | -- | 5 | 0.57 | 5 | 1.64 | -- | -- | -- | -- | -- | -- | 2 | 0.25 | 3 | 3.90 |
| Color Contrast—Paper/Pencil | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Color Overlay—Paper/Pencil | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Magnification | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Masking | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Translation | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oral Reading in Native Language Non ELA | -- | -- | 1 | 0.11 | 1 | 0.33 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Use of Scribe Non ELA Writing without IEP or 504 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bilingual Dictionary on Writing Performance Task for ELL | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other Setting | 14 | 3.26 | 19 | 2.17 | 15 | 4.92 | 1 | 1.92 | -- | -- | 1 | 2.70 | 6 | 0.76 | 6 | 7.79 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 5.2. Accommodation Distributions—Fall 2015**

| Accommodation | English II | | Algebra I | | Biology | | English I | | Algebra II | | Geometry | | Government | | Am. History | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| Braille | -- | -- | 2 | 0.04 | 1 | 0.04 | -- | -- | -- | -- | -- | -- | 1 | 0.01 | 1 | 0.22 |
| Large Print | -- | -- | 2 | 0.04 | -- | -- | -- | -- | -- | -- | -- | -- | 5 | 0.04 | -- | -- |
| Oral Reading | 6 | 0.22 | -- | -- | -- | -- | 6 | 0.92 | -- | -- | -- | -- | -- | -- | -- | -- |
| Oral Reading— Blind/Partial Sight | 30 | 1.09 | -- | -- | -- | -- | 14 | 2.13 | -- | -- | -- | -- | -- | -- | -- | -- |
| Oral Reading—Paper/Pencil Only | 4 | 0.15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Signing of Assessment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Paper Based Assessment—Paper/Pencil Only | -- | -- | 4 | 0.09 | 1 | 0.04 | -- | -- | -- | -- | 1 | 0.15 | 4 | 0.03 | -- | -- |
| Oral Reading in Native Language ELA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Use of Scribe | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Speech to Text Online not Embedded | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Abacus | -- | -- | 1 | 0.02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Multiplication Table | -- | -- | 6 | 0.13 | 1 | 0.04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Specialized Calculator | -- | -- | 4 | 0.09 | 1 | 0.04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Alternate Response | -- | -- | 1 | 0.02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oral Reading Assistive Technology | 1 | 0.04 | 7 | 0.15 | 9 | 0.33 | -- | -- | -- | -- | 8 | 1.19 | 18 | 0.13 | 8 | 1.72 |
| Oral Reading Any—not Embedded | 24 | 0.87 | 132 | 2.86 | 59 | 2.14 | 2 | 0.31 | 4 | 0.58 | 16 | 2.37 | 283 | 2.04 | 19 | 4.09 |
| Color Contrast—Paper/Pencil | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Color Overlay—Paper/Pencil | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Magnification | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0.01 | -- | -- |
| Masking | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | -- | -- |
| Translation | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4 | 0.03 | -- | -- |
| Oral Reading in Native Language Non ELA | 2 | 0.07 | 1 | 0.02 | 2 | 0.07 | -- | -- | -- | -- | -- | -- | 16 | 0.12 | -- | -- |
| Use of Scribe Non ELA Writing without IEP or 504 | 3 | 0.11 | 3 | 0.07 | 2 | 0.07 | -- | -- | -- | -- | -- | -- | 7 | 0.05 | -- | -- |
| Bilingual Dictionary on Writing Performance Task for ELL | 7 | 0.25 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other Setting | 94 | 3.40 | 196 | 4.24 | 103 | 3.73 | 30 | 4.57 | 9 | 1.30 | 44 | 6.53 | 450 | 3.25 | 34 | 7.31 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 5.3. Accommodation Distributions—Spring 2016**

| Accommodation | English II | | Algebra I | | Biology | | English I | | Algebra II | | Geometry | | Government | | Am. History | | Ph. Science | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| Braille | 2 | 0.00 | 7 | 0.01 | 5 | 0.01 | 1 | 0.01 | -- | -- | 1 | 0.01 | 5 | 0.01 | -- | -- | -- | -- |
| Large Print | 19 | 0.03 | 20 | 0.03 | 27 | 0.04 | 6 | 0.04 | 1 | 0.01 | 4 | 0.05 | 16 | 0.04 | 4 | 0.04 | 1 | 0.02 |
| Oral Reading | 25 | 0.04 | -- | -- | -- | -- | 29 | 0.18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oral Reading— Blind/Partial Sight | 1,368 | 2.18 | -- | -- | -- | -- | 458 | 2.89 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oral Reading—Paper/Pencil Only | 2 | 0.00 | -- | -- | -- | -- | 2 | 0.01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Signing of Assessment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Paper Based Assessment—Paper/Pencil Only | 88 | 0.14 | 88 | 0.14 | 73 | 0.12 | 1 | 0.01 | 10 | 0.05 | 1 | 0.01 | 97 | 0.22 | 1 | 0.01 | 1 | 0.02 |
| Oral Reading in Native Language ELA | 4 | 0.01 | -- | -- | -- | -- | 1 | 0.01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Use of Scribe | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Speech to Text Online not Embedded | 13 | 0.02 | 13 | 0.02 | 6 | 0.01 | 7 | 0.04 | -- | -- | -- | -- | 1 | 0.00 | 1 | 0.01 | -- | -- |
| Abacus | -- | -- | 1 | 0.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Multiplication Table | 7 | 0.01 | 75 | 0.12 | 20 | 0.03 | 2 | 0.01 | 1 | 0.01 | 4 | 0.05 | 1 | 0.00 | -- | -- | 7 | 0.15 |
| Specialized Calculator | 2 | 0.00 | 66 | 0.11 | 41 | 0.07 | 1 | 0.01 | 1 | 0.01 | 6 | 0.07 | 5 | 0.01 | -- | -- | 3 | 0.06 |
| Alternate Response | 10 | 0.02 | 10 | 0.02 | 9 | 0.02 | 1 | 0.01 | -- | -- | -- | -- | 4 | 0.01 | -- | -- | -- | -- |
| Oral Reading Assistive Technology | 42 | 0.07 | 100 | 0.16 | 98 | 0.16 | 29 | 0.18 | 6 | 0.03 | 23 | 0.27 | 84 | 0.19 | 23 | 0.25 | 5 | 0.11 |
| Oral Reading Any—not Embedded | 729 | 1.16 | 1,827 | 3.00 | 2,310 | 3.76 | 213 | 1.34 | 47 | 0.24 | 110 | 1.27 | 1,670 | 3.75 | 368 | 4.02 | 195 | 4.12 |
| Color Contrast—Paper/Pencil | 1 | 0.00 | 2 | 0.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Color Overlay—Paper/Pencil | 1 | 0.00 | 15 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Magnification | 3 | 0.01 | 6 | 0.01 | 6 | 0.01 | -- | -- | 1 | 0.01 | 1 | 0.01 | 5 | 0.01 | 2 | 0.02 | -- | -- |
| Masking | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Translation | 5 | 0.01 | 7 | 0.01 | 8 | 0.01 | -- | -- | -- | -- | -- | -- | 6 | 0.01 | -- | -- | -- | -- |
| Oral Reading in Native Language Non ELA | 23 | 0.04 | 47 | 0.08 | 80 | 0.13 | 1 | 0.01 | 4 | 0.02 | 6 | 0.07 | 28 | 0.06 | 1 | 0.01 | -- | -- |
| Use of Scribe Non ELA Writing without IEP or 504 | 82 | 0.13 | 55 | 0.09 | 61 | 0.10 | 34 | 0.21 | 1 | 0.01 | 2 | 0.02 | 24 | 0.05 | 10 | 0.11 | 7 | 0.15 |
| Bilingual Dictionary on Writing Performance Task for ELL | 97 | 0.15 | -- | -- | -- | -- | 41 | 0.26 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other Setting | 3,521 | 5.61 | 3,185 | 5.22 | 3,319 | 5.40 | 903 | 5.69 | 142 | 0.72 | 275 | 3.16 | 2,333 | 5.25 | 532 | 5.81 | 255 | 5.39 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## 5.9. Materials Handling and Return

### *5.9.1. Materials Handling during Administration*

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

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.

### *5.9.2. 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


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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.

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. This was also communicated to DESE, who would then follow up with discretion.

### 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Chapter 6: Scoring

## 6.1. Introduction

The MO EOC Assessment forms 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 scored by Questar's qualified scorers. This chapter outlines the processes used to implement 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 of the PE/WPs

Questar handscored the English II and English I Assessments, which contained WPs, and the Algebra I and Biology Assessments, which contained 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.

The following sections outline Questar's processes for scoring of the PE/WPs in the MO EOC Assessments for 2015–2016, which was consistent for all three administrations (Summer 2015, Fall 2015, and Spring 2016). The PE/WPs were scored by human raters.

### *6.2.1. 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. Questar accessed a large pool of educated candidates to professionally evaluate assessment prompts.

Questar 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: Questar used a web-based application to collect data on scorer education, prior scoring experience, and other key information to screen candidates currently in the database system.

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

3. Offer: Questar contacted prospective scorers detailing project requirements, timelines, and quality standards.

4. 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

### *6.2.2. Scorer Training and Qualification Procedures*

Questar content specialists reviewed training materials provided by DESE. Questar scoring staff communicated with DESE during this process regarding item questions or clarifications.

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.

- 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 MO EOC performance events and writing prompts. Questar's digital scoring system programmatically enforced qualification rules.

The training materials were inherited from the previous vendor. DESE provided any new training materials since the transition of the program to Questar. DESE provided the Algebra responses used for the training materials. The responses were pre-designated as either training or qualifying sets. Per DESE's request, the Biology Crickets training materials were updated from paper/pencil to online responses. The new online responses mirrored the paper/pencil responses in content and scores.

## 6.3. 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 MO EOC Assessments. 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 steps used during the training of the items:

- Scoring for Questar: 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.

- Questar Scoring System: Scorers were trained on the internal scoring system.

- Scoring the Missouri Project: Specifics were provided regarding the Missouri Project. DESE and Questar worked collaboratively so the scorers understood the project.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

- Scoring the Item: This training process walked the scorers through the anchor papers, practice and qualification papers. The scorers proceeded through the qualification process and, upon qualifying, they continued on to operational scoring.

- Additional Training: Before operational scoring could begin, information on how to handle unscorable student responses as well as alert responses was provided.

Scoring started for the scorer once all of the steps were successfully completed.

**6.4. Qualification**

If applicants did not successfully complete the training and qualifying requirements, they were not allowed to score any MO 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. The range of possible scores is noted below. The 4-point items have possible score points of 0, 1, 2, 3 and 4 or 1, 2, 3, and 4 depending on the item. All other hand-scored items have 0 as the lowest score. Perfect agreement is based on agreement to the answer key.

- 4-point items
  - (0–4, 1–4)
  - 2 sets of 10 papers
  - 80% exact agreement on one of two sets
  - Scorers saw both sets. If they passed the first, the second was a review.

- 3-point items
  - (0–3)
  - 2 sets of 10 papers
  - 85% exact agreement on one of two sets
  - Scorers saw both sets. If they passed the first, the second was a review.

- 2-point items
  - (0–2)
  - 2 sets of 10 papers
  - 95% exact 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% exact agreement on one of two sets
  - Scorers saw both sets. If they passed the first, the second was a review.

*6.4.1. Second Read Procedures*

Rater agreement is the agreement between the first and second scores assigned to student responses. Rater agreement indices include exact, adjacent, and nonadjacent agreement. Guidelines for rater agreement are determined in accordance with customer requirements and


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

Questar scoring standards for exact and adjacent agreement. Questar scoring staff used rater agreement results as one factor in determining the needs for continuing training and intervention on individual levels.

Questar's scoring system included comprehensive rater agreement reports that allowed scoring directors to monitor both individual and group performance. After the first score was applied, the system automatically sent the 10th document to a different scorer for a second read. Reader one provided the score of record, and the second read was for rater agreement purposes only.

### *6.4.2. Scoring Monitoring and Recalibration Procedures*

#### *6.4.2.1. Read-Behinds*

The process of reading behind scorers (hereafter referred to as a read-behind) was a major responsibility of Questar's content staff and a primary tool for guarding against scorer drift. Questar's scoring system's integrated read-behind tool allowed Questar staff to review the scores assigned to individual student responses by any given scorer. The team leads used an internal report to monitor and ensure consistent scoring.

Questar's content staff 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 to give customized feedback and remediation to individual scorers.

#### *6.4.2.2. Calibration*

Content staff used calibration sets as needed 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 given 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.

Calibration sets are developed throughout the scoring window, using responses that serve as training examples, both in one-on-one and group situations. Calibration sets are also used after a weekend off, if needed. These papers are shredded after the project is complete.

#### *6.4.2.3. 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 Questar policies. Intervention included calibration, retraining, direct counseling and review of


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

papers, and requalification. Scorer exception processing allowed Questar'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, staff monitoring this process would interrupt their scoring process to review anchor papers or take other steps to improve their scoring. Through this process, Questar's scoring system could provide an additional training/requalification set, and if performance was not improved, could lock scorers out of the scoring system. This process prevented scorers from continuing to score if standards were not maintained.

Because the system monitored scorers and provided the scorers' information quickly, Questar's content staff continually focused on quality control measures. These measures included read-behinds, calibration, and responding to questions in the review queue. Content staff was able to spend more time working directly with scorers who had questions.

### 6.5. Validity Responses

Validity responses are pre-scored responses strategically interspersed in the pool of operational responses. These responses are not distinguishable from operational responses and scorers' scores are only accepted for monitoring purposes, not in replacement of the true score.

The use of validity responses provides an objective procedure that helps ensure that scorers are applying the same standards throughout the project. This procedure offers feedback on the accuracy and consistency of individual scorers and groups of scorers assigned to a given item. Questar's validity mechanism provides an objective and systematic check of accuracy. It verifies that scorers are applying the same standards throughout the project and, therefore, guards against scorer drift and ultimately group drift. This procedure provides immediate feedback on individual scorers and the group as a whole.

Validity papers are actual student responses chosen by the scoring director as examples that clearly earn certain scores. There is only one scoring director per content area. Following the standards established, scoring directors assigned "true scores" to validity responses to compare how often scorers match them throughout the scoring session. The validity pool included responses encompassing the entire score range for each item. Scorers scored them without being aware they were scoring validity papers rather than operational responses. Validity responses were sent to scorers throughout the project.

Each MO EOC content area was set to contain validity papers at a frequency rate determined by the range of scores and complexity of each item. This means that each scorer would see a validity paper at varying times throughout the project. The scorers could not distinguish a validity paper from an operational response because these papers are pulled from operational scoring. The process of selecting validity papers and keeping the pool fresh, was to select papers scored by expert readers. Questar's system allows a team leader, scoring director, or content specialist to score validity items using a hierarchical approval process to ensure the score has been adequately confirmed. For instance, if a score of 3 was given by a team leader, it could not be selected for a validity response unless confirmed and approved by the scoring director. If the validity response has been chosen by the scoring director, the response must be confirmed and approved by the content specialist.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

Tables 6.1 and 6.2 show the summaries of the validity paper results at the end of the project for the Fall 2015 and Spring 2016 administrations, respectively. The "Rater Agreement Plan" column indicates the expected percent of agreement given the maximum points available for the item. A higher percent was expected for items with fewer points, and a lower percent was expected for items with more points. For example, the rater agreement plan was 100 percent for 1-point items and 80 percent for 4-point items. The "Rater Agreement Actual" column shows the obtained rater agreement. The variance is the difference between the actual and planned rater agreement. Positive values indicate that the actual agreement was higher than the planned agreement, whereas negative values indicate that the actual agreement was lower than the planned agreement.

Summer 2015 validity paper results are unavailable due to the low n-counts and small number of scorers. Because Summer 2015 had such low n-counts, responses were read by expert scorers such as the scoring director and team leaders.

**Table 6.1. Summary of Validity Paper Results—Fall 2015**

| Item | N-Count | #Points | Rater Agreement Plan | Rater Agreement Actual | Variance |
|---|---|---|---|---|---|
| English I – 100085793 | 656 | 4 | 80% | 87% | 7% |
| English II – 100085792 | 2,738 | 4 | 80% | 89% | 9% |
| Algebra I – 100076622-1 | 4,536 | 4 | 80% | 96% | 16% |
| Algebra I – 100076622-2 | 4,536 | 2 | 95% | 96% | 1% |
| Algebra I – 100076622-3 | 4,536 | 4 | 80% | 86% | 6% |
| Biology 1 – 100089024 | 2,729 | 1 | 100% | 99% | -1% |
| Biology 2 – 100089025 | 2,719 | 1 | 100% | 99% | -1% |
| Biology 3 – 100089036 | 2,712 | 1 | 100% | 98% | -2% |
| Biology 4 – 100089027 | 2,719 | 1 | 100% | 95% | -5% |
| Biology 5 – 100089029 | 2,628 | 3 | 85% | 85% | 0% |
| Biology 6 – 100089030 | 2,647 | 4 | 80% | 90% | 10 |
| Biology 7 – 100089038 | 2,715 | 1 | 100% | 99% | -1% |
| Biology 8 – 100089040 | 2,696 | 1 | 100% | 100% | 0% |
| Biology 9 – 100089034 | 2,674 | 1 | 100% | 95% | -5% |
| Biology 10 – 100089033 | 2,640 | 2 | 95% | 90% | -5% |
| Biology 11 – 100089039 | 2,652 | 1 | 100% | 94% | -6% |
| Biology 12 – 100089035 | 2,623 | 2 | 95% | 88% | -7% |
| Biology 13 – 100089022 | 2,629 | 1 | 100% | 94% | -6% |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 6.2. Summary of Validity Paper Results—Spring 2016**

| Item | N-Count | #Points | Rater Agreement Plan | Rater Agreement Actual | Variance |
|---|---|---|---|---|---|
| English I – 100085793 | 15,844 | 4 | 80% | 87% | 7% |
| English II – 100085923 | 62,594 | 4 | 80% | 85% | 5% |
| Algebra I – 100076683-1 | 60,765 | 2 | 95% | 95% | 0% |
| Algebra I – 100076683-2 | 60,765 | 4 | 80% | 83% | 3% |
| Algebra I – 100076683-3 | 60,765 | 1 | 100% | 100% | 0% |
| Algebra I – 100076683-4 | 60,765 | 3 | 85% | 88% | 3% |
| Biology 1 – 100076797 | 61,276 | 1 | 100% | 93% | -7% |
| Biology 2 – 100076798 | 61,213 | 1 | 100% | 91% | -9% |
| Biology 3 – 100076799 | 61,228 | 1 | 100% | 98% | -2% |
| Biology 4 – 100076807 | 61,231 | 2 | 95% | 96% | 1% |
| Biology 5 – 100076801 | 61,048 | 4 | 80% | 85% | 5% |
| Biology 6 – 100076803 | 61,145 | 2 | 95% | 86% | -9% |
| Biology 7 – 100076808 | 60,979 | 2 | 95% | 92% | -3% |
| Biology 8 – 100076802 | 60,999 | 2 | 95% | 85% | -10% |
| Biology 9 – 100076804 | 60,003 | 3 | 85% | 85% | 0% |
| Biology 10 – 100076805 | 60,873 | 2 | 95% | 86% | -9% |

### *6.5.1. Validity as Review*

Selected validity responses were annotated by the content staff and flagged for review. If a scorer incorrectly scored one of these responses, content staff would address this with the scorer. This feedback helped in preventing scorer drift. Once a scorer received a validity response, it was not re-administered.

### *6.5.2. 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. Questar evaluated any anomalous scoring trends at the item and scorer level and intervened with the individuals involved. Anomalous scoring trends were determined by comparing individual reader distribution of scores to the overall group distribution of scores. Frequency distribution reports showed a breakdown of score points assigned on a given item. Expressed in percentages, data in these reports showed how often scorers, individually and as a group, assigned each score point.

### *6.5.3. Retraining and Resetting Scores*

Questar's electronic scoring system has the ability to purge the scores assigned by a scorer whose work was deemed substandard. In those cases, the scores assigned by that individual would be cleared from the database. The responses would then be rerouted to qualified scorers and rescored according to the original scoring design. The scoring system also allows scoring leadership to reset scores for a date range or an item. Questar has not had to use this process to-date during this project. If it had, that reader would have been removed from the project.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

*6.5.4. Reporting and Data Analysis*

Questar's digital scoring system automatically captured and tracked all score data. By reviewing up-to-date scorer performance statistics, Questar 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 Questar scoring leadership staff at any time via the digital scoring system. Questar's reports gave daily and cumulative statistics and provided individual and group average agreement percentages.

*6.5.5. Item Types and Score Points for each Content Area*

*6.5.5.1. Summer 2015*

English Writing Prompts:

- English I contained a narrative essay prompt, with score points 1–4, 1–4 and 0–2
- English II contained an explanatory essay prompt, with score points 1–4, 1–4 and 0–2

Algebra I Performance Event: Multi-part (4 sections) with a graphing task. 0–4 score points

Biology Performance Event:

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

*6.5.5.2. Fall 2015*

English Writing Prompts:

- English I contained a narrative essay prompt, with score points 1–4, 1–4 and 0–2
- English II contained an explanatory essay prompt, with score points 1–4, 1–4 and 0–2

Algebra I Performance Event: Multi-part (3 sections) with a graphing task. 0–4 score points

Biology Performance Event:

- 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. 0–1 score points
- Item 5 – Constructed response, extended response 0–3 score points
- Item 6 – Graphing task, extended response. 0–4 score points
- Item 7 – Constructed response. 0–1 score points


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

- Item 8 – Constructed response. 0–1 score points
- Item 9 – Constructed response. 0–1 score points
- Item 10 – Constructed response. 0–2 score points
- Item 11 – Constructed response. 0–1 score points
- Item 12 – Constructed response. 0–2 score points
- Item 13 – Constructed response. 0–1 score points

*6.5.5.3. Spring 2016*

English Writing Prompts:

- English I was a narrative essay prompt, with score points 1–4, 1–4 and 0–2
- English II was an explanatory essay prompt, with score points 1–4, 1–4 and 0–2

Algebra I Performance Event: Multi-part (4 sections) with a graphing task. 0–4 score points

Biology Performance Event:

- 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. 0–4 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 response 0–3 score points
- Item 10 – Constructed response. 0–2 score points

## 6.6. Rater Agreement

Rater agreement provides evidence supporting scorer consistency. Tables 6.3, 6.4, and 6.5 depict the perfect and adjacent rater agreement for each item for Summer 2015, Fall 2015, and Spring 2016, respectively. The tables also provide the total *n*-count for each item and the *n*-count of double reads (i.e., the responses that received a second read). The agreement rates were calculated based on the double reads. Because Summer 2015 had low *n*-counts, responses were read by expert scorers such as the scoring director and team leaders.

**Table 6.3. Rater Agreement—Summer 2015**

| Item | # of Score Points | N-Count | N-Count of Double Reads | Perfect Agreement Plan | Perfect Agreement Actual | Perfect + Adjacent Plan | Perfect + Adjacent Actual |
|---|---|---|---|---|---|---|---|
| **Summer 2015** | | | | | | | |
| English I – 100085793 | 4 | 55 | 4 | 80% | 100 | 100% | 100 |
| English II – 100085923 | 4 | 433 | – | 80% | – | 100% | – |
| Algebra I – 100076683-1 | 2 | 875 | 162 | 95% | 80 | 100% | 95 |
| Algebra I – 100076683-2 | 4 | 875 | 122 | 80% | 80 | 100% | 98 |
| Algebra I – 100076683-3 | 1 | 875 | 148 | 100% | 97 | 100% | 98 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Item | # of Score Points | N-Count | N-Count of Double Reads | Perfect Agreement Plan | Perfect Agreement Actual | Perfect + Adjacent Plan | Perfect + Adjacent Actual |
|---|---|---|---|---|---|---|---|
| Algebra I – 100076683-4 | 3 | 875 | 162 | 85% | 83 | 100% | 98 |
| Biology 1 – 100075983 | 1 | 305 | – | 100% | – | 100% | – |
| Biology 2 – 100075984 | 1 | 300 | – | 100% | – | 100% | – |
| Biology 3 – 100075985 | 1 | 305 | – | 100% | – | 100% | – |
| Biology 4 – 100075986 | 3 | 303 | – | 85% | – | 100% | – |
| Biology 5 – 100075992 | 2 | 305 | – | 95% | – | 100% | – |
| Biology 6 – 100075987 | 3 | 300 | – | 85% | – | 100% | – |
| Biology 7 – 100075989 | 4 | 300 | – | 80% | – | 100% | – |
| Biology 8 – 100075988 | 3 | 291 | – | 85% | – | 100% | – |
| Biology 9 – 100075990 | 1 | 280 | – | 100% | – | 100% | – |
| Biology 10 – 100075991 | 1 | 299 | – | 100% | – | 100% | – |

**Table 6.4. Rater Agreement—Fall 2015**

| Item | # of Score Points | N-Count | N-Count of Double Reads | Perfect Agreement Plan | Perfect Agreement Actual | Perfect + Adjacent Plan | Perfect + Adjacent Actual |
|---|---|---|---|---|---|---|---|
| **Fall 2015** | | | | | | | |
| English I – 100085793 | 4 | 656 | 94 | 80% | 87% | 100% | 100% |
| English II – 100085792 | 4 | 2,738 | 388 | 80% | 89% | 100% | 100% |
| Algebra I – 100076622-1 | 4 | 4,536 | 898 | 80% | 96% | 100% | 100% |
| Algebra I – 100076622-2 | 2 | 4,536 | 860 | 95% | 96% | 100% | 99% |
| Algebra I – 100076622-3 | 4 | 4,536 | 794 | 80% | 86% | 100% | 98% |
| Biology 1 – 100089024 | 1 | 2,729 | 540 | 100% | 99% | 100% | 99% |
| Biology 2 – 100089025 | 1 | 2,719 | 534 | 100% | 99% | 100% | 100% |
| Biology 3 – 100089036 | 1 | 2,712 | 528 | 100% | 98% | 100% | 100% |
| Biology 4 – 100089027 | 1 | 2,719 | 530 | 100% | 95% | 100% | 100% |
| Biology 5 – 100089029 | 3 | 2,628 | 502 | 85% | 85% | 100% | 99% |
| Biology 6 – 100089030 | 4 | 2,647 | 500 | 80% | 90% | 100% | 99% |
| Biology 7 – 100089038 | 1 | 2,715 | 536 | 100% | 99% | 100% | 100% |
| Biology 8 – 100089040 | 1 | 2,696 | 530 | 100% | 100% | 100% | 100% |
| Biology 9 – 100089034 | 1 | 2,674 | 508 | 100% | 95% | 100% | 99% |
| Biology 10 – 100089033 | 2 | 2,640 | 502 | 95% | 90% | 100% | 99% |
| Biology 11 – 100089039 | 1 | 2,652 | 510 | 100% | 94% | 100% | 100% |
| Biology 12 – 100089035 | 2 | 2,623 | 502 | 95% | 88% | 100% | 99% |
| Biology 13 – 100089022 | 1 | 2,629 | 496 | 100% | 94% | 100% | 99% |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 6.5. Rater Agreement —Spring 2016**

| Item | # of Score Points | N-Count | N-Count of Double Reads | Perfect Agreement Plan | Perfect Agreement Actual | Perfect + Adjacent Plan | Perfect + Adjacent Actual |
|---|---|---|---|---|---|---|---|
| **Spring 2016** | | | | | | | |
| English I – 100085793 | 4 | 15,844 | 2,866 | 80% | 87% | 100% | 100% |
| English II – 100085923 | 4 | 62,594 | 12,130 | 80% | 85% | 100% | 100% |
| Algebra I – 100076683-1 | 2 | 60,765 | 11,982 | 95% | 95% | 100% | 100% |
| Algebra I – 100076683-2 | 4 | 60,765 | 10,432 | 80% | 83% | 100% | 99% |
| Algebra I – 100076683-3 | 1 | 60,765 | 11,464 | 100% | 100% | 100% | 100% |
| Algebra I – 100076683-4 | 3 | 60,765 | 11,682 | 85% | 88% | 100% | 100% |
| Biology 1 – 100076797 | 1 | 61,276 | 12,220 | 100% | 93% | 100% | 99% |
| Biology 2 – 100076798 | 1 | 61,213 | 12,202 | 100% | 91% | 100% | 99% |
| Biology 3 – 100076799 | 1 | 61,228 | 12,214 | 100% | 98% | 100% | 100% |
| Biology 4 – 100076807 | 2 | 61,231 | 12,198 | 95% | 96% | 100% | 100% |
| Biology 5 – 100076801 | 4 | 61,048 | 12,136 | 80% | 85% | 100% | 100% |
| Biology 6 – 100076803 | 2 | 61,145 | 12,188 | 95% | 86% | 100% | 100% |
| Biology 7 – 100076808 | 2 | 60,979 | 12,134 | 95% | 92% | 100% | 100% |
| Biology 8 – 100076802 | 2 | 60,999 | 12,144 | 95% | 85% | 100% | 100% |
| Biology 9 – 100076804 | 3 | 60,003 | 11,864 | 85% | 85% | 100% | 100% |
| Biology 10 – 100076805 | 2 | 60,873 | 12,142 | 95% | 86% | 100% | 100% |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## 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 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. A pre-equating model (Kolen & Brennan, 2004) 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 IRT models used for equating, followed by an overview of the scaling and equating procedures.

The Summer 2015, Fall 2015, and Spring 2016 administrations used previously administered test forms for all content areas and the RSS conversions already in existence. However, a special recalibration study for Biology was undertaken to investigate item parameter shift. Students from the Spring 2016 administration were scored using the RSS conversion table based on the recalibration. Beginning in Fall 2014, five content areas (English I, English II, Algebra I, Algebra II, and Geometry) had updated test forms, so a post-equating was completed in 2014–2015 for those assessments.

Detailed procedures for scaling and equating for the 2014–2015 administration are provided in the *2014–2015 MO EOC Technical Report*. Scaling and equating procedures for the Summer 2014 and previous administrations—as well as for the Biology, Government, and American History, which used previously intact forms—are provided in the *2009–2010 MO EOC Phase I Technical Report* and the *2009–2010 MO EOC Phase II Technical Report* located on the DESE website at http://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials.

### 7.2. Item Response Theory (IRT)

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 $\theta$, is

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

where $\theta$ = 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 $\theta$, is


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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

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

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 & Stone, 1979), while the partial credit model (Masters, 1982) was used to calibrate the PE/WPs.

## 7.3. Scaling and Equating

### *7.3.1. Scale Score Ranges*

Table 7.1 presents the scale score ranges for Summer 2015, Fall 2015 and Spring 2016.

**Table 7.1. Scale Score Ranges by Achievement Level**

| Content Area | Achievement Level | Scale Score Range |
|---|---|---|
| English II | Below Basic | 100–181 |
| | Basic | 182–199 |
| | Proficient | 200–224 |
| | Advanced | 225–250 |
| Algebra I | Below Basic | 100–186 |
| | Basic | 187–199 |
| | Proficient | 200–224 |
| | Advanced | 225–250 |
| Biology | Below Basic | 100–176 |
| | Basic | 177–199 |
| | Proficient | 200–224 |
| | Advanced | 225–250 |
| English I | Below Basic | 100–179 |
| | Basic | 180–199 |
| | Proficient | 200–224 |
| | Advanced | 225–250 |
| Algebra II | Below Basic | 100–185 |
| | Basic | 186–199 |
| | Proficient | 200–224 |
| | Advanced | 225–250 |
| Geometry | Below Basic | 100–188 |
| | Basic | 189–199 |
| | Proficient | 200–224 |
| | Advanced | 225–250 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Content Area | Achievement Level | Scale Score Range |
|---|---|---|
| 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 |
| Physical Science | Below Basic | 100–167 |
| | Basic | 168–199 |
| | Proficient | 200–224 |
| | Advanced | 225–250 |

*7.3.2. Recalibration for Biology*

Due to the drop in student performance observed for the Spring 2016 Biology Assessment, the Missouri Technical Advisory Committee (TAC) and DESE requested that Questar recalibrate the Biology forms to minimize variations in test results statewide due to form differences. The result was a set of updated Biology RSS tables used for assigning student performance levels so that the tables are more equivalent across the test forms.

Because the Biology forms did not have common items or common students, the approach recommended by the TAC was to combine data from the most recent large Spring administrations. Specifically, the Spring 2014, 2015, and 2016 administrations were combined into one large free run calibration using Winsteps to place items from all three forms onto a common theta scale. The assumption was that the students testing each Spring were similar to each other.

The following steps describe the procedure:

1. Prepare the data so that the Spring 2014, 2015, and 2016 data are in the same file but occupy separate columns.
2. Run Winsteps to simultaneously calibrate the data from the three years together, centering on people.
3. Run Winsteps separately by year using an item anchor file to create a raw score to theta table for each test form.
4. Generate the RSS table and apply the appropriate scale score rounding rules.

The results indicated that performance rates regressed toward the mean of the different forms yielding less variation between forms. The Basic, Proficient, and Advanced cut scores for the Spring 2016 form changed from 19 to 17, 34 to 31, and 46 to 44, respectively. Students who took the Spring 2016 Biology Assessment were rescored with the recalibrated RSS conversion table.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

*7.3.3. Estimation of the Slope and Intercept*

Table 7.2 presents the slopes and intercepts for the RSS linear transformation.

**Table 7.2. Theta to Scale Score Transformation with Slopes and Intercepts**

| | Basic | | Proficient | | Advanced | | | |
|---|---|---|---|---|---|---|---|---|
| **Content Area** | **Theta** | **SS** | **Theta** | **SS** | **Theta** | **SS** | **Slope** | **Intercept** |
| English II | -0.69 | 182 | 0.45 | 200 | 2.06 | 225 | 15.54 | 192.98 |
| Algebra I | -0.14 | 187 | 0.46 | 200 | 1.63 | 225 | 21.43 | 190.11 |
| Biology | -0.69 | 177 | 0.51 | 200 | 1.79 | 225 | 19.53 | 189.99 |
| English I | -0.55 | 180 | 0.58 | 200 | 2.01 | 225 | 17.55 | 189.76 |
| Algebra II | 0.26 | 186 | 0.85 | 200 | 1.92 | 225 | 23.25 | 180.34 |
| Geometry | -0.23 | 189 | 0.38 | 200 | 1.64 | 225 | 19.76 | 192.51 |
| Government | -0.56 | 179 | 0.56 | 200 | 1.86 | 225 | 19.11 | 189.37 |
| American History | -0.11 | 182 | 0.56 | 200 | 1.49 | 225 | 26.64 | 185.19 |
| Physical Science | -1.23 | 168 | 0.14 | 200 | 1.21 | 225 | 23.43 | 196.62 |

## 7.4. RSS Conversions

Appendix D provides the RSS conversions for Summer 2015, Fall 2015, and Spring 2016.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# 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 regarding 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. Districts may also use locally designed assessments aligned to the Missouri Learning Standards 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 all of the raw data collected for each administration. Questar also provides a Guide to Interpreting Results for 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 are provided in the online assessment platform for all assessment windows. Student Score Labels are provided in hard copy to districts following each administration.

## 8.2. Test Scores

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. ALDs provide details about the content expectations that students at each level meet or exceed. The scores are scaled in several ways: raw scores, scale scores (derived from the Rasch model), and achievement level (based on scale score cuts) that 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. Missouri 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.

To determine the achievement level scores, Questar converted each student's raw score points earned into a scale score that ranged from 100 to 250, as described in Chapter 7. The scale score determined the student's achievement level. For all content areas, a scale score of 200 to 224 was considered Proficient, and a scale score of 225 and above was considered Advanced. Each achievement level represented standards of performance for each assessed content area. Test results were 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, IEP status, and accommodations used during testing. Scores are reported to schools and districts in annually published reports (see Chapter 9 for more information).

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 MO EOC scores account for at least 10 percent but not more than 25


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

percent of a student's grade in a course with a corresponding MO EOC Assessment. Districts receive students' 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/sites/default/files/asmt-eoc-curved-percentages.pdf). Teachers are counseled to interpret individual student scores only in the context of other assessment results and their own experience.

### 8.3. Individual Student Report (ISR)

The 2015–2016 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.

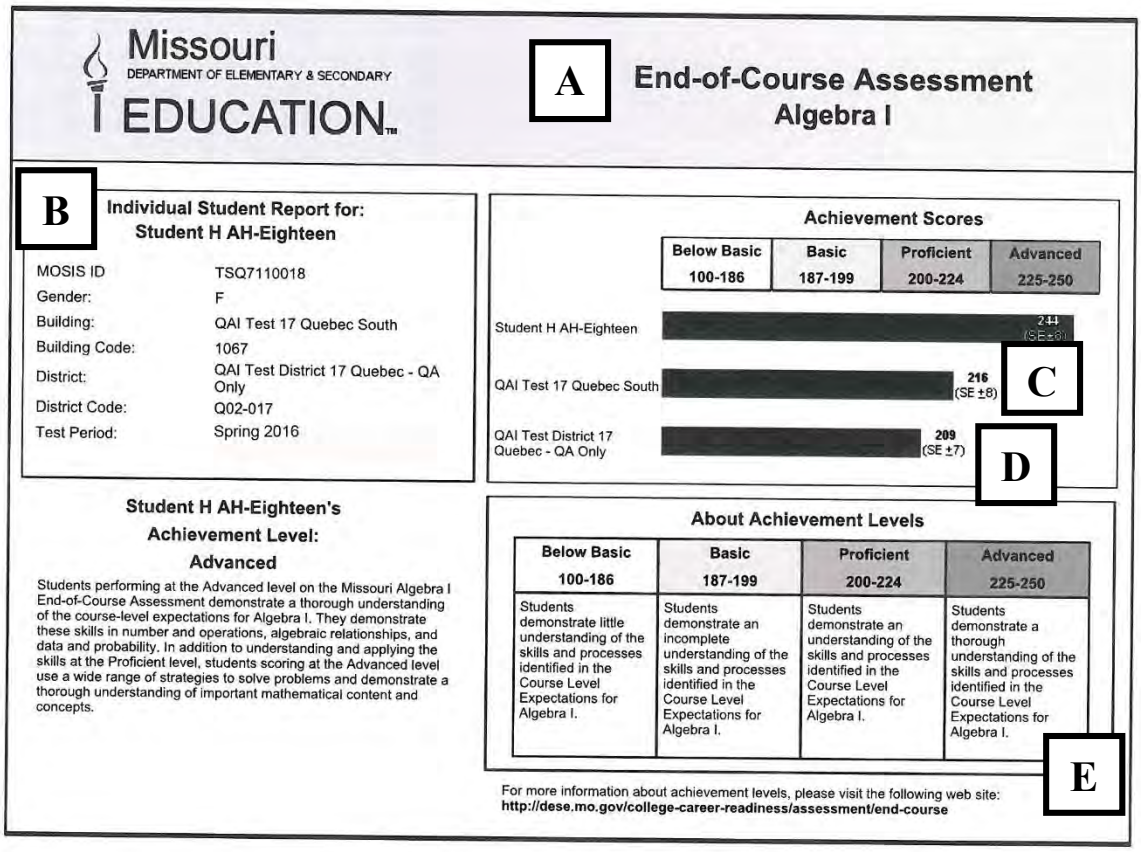
C. The individual student's results are presented numerically as a three-digit scale score with the SE. An accompanying bar graph to the right of the scale score illustrates the achievement level obtained by the student. Achievement levels (whether Below Basic, Basic, Proficient, or Advanced) are based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


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**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:
Student H AH-Eighteen

| | |
|---|---|
| MOSIS ID | TSQ7110018 |
| Gender: | F |
| Building: | QAI Test 17 Quebec South |
| Building Code: | 1067 |
| District: | QAI Test District 17 Quebec - QA Only |
| District Code: | Q02-017 |
| Test Period: | Spring 2016 |

Achievement Scores

| Below Basic | Basic | Proficient | Advanced |
|---|---|---|---|
| 100-186 | 187-199 | 200-224 | 225-250 |

Student H AH-Eighteen 244 (SE ±8)

QAI Test 17 Quebec South 216 (SE ±8)

QAI Test District 17 Quebec - QA Only 209 (SE ±7)

C

D

Student H AH-Eighteen's
Achievement Level:
Advanced

Students performing at the Advanced level on the Missouri Algebra I End-of-Course Assessment demonstrate a thorough understanding of the 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 Proficient level, students scoring at the Advanced level use a wide range of strategies to solve problems and demonstrate a thorough understanding of important mathematical content and concepts.

About Achievement Levels

| Below Basic 100-186 | Basic 187-199 | 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. |

For more information about achievement levels, please visit the following web site:
http://dese.mo.gov/college-career-readiness/assessment/end-course

E

## 8.4. Student Score Label

The 2015–2016 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Figure 8.2. Student Score Label**

| | | |
|---|---|---|
| ARNETT, BELINDA | A | *Missouri End-of-Course* B |
| MOSIS ID: 9999999999 | | *English II* |
| Building: Washington HS | | |
| District: Jefferson | C | Scale Score: 213 |
| Test Period: Spring 2016 | | Achievement Level: Proficient |

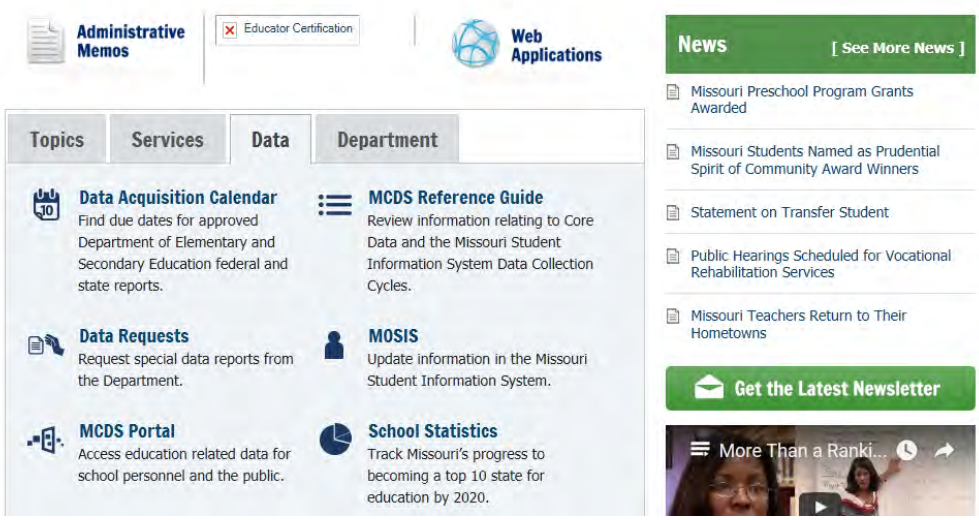
## 8.5. Missouri Comprehensive Data System (MCDS) Portal

### *8.5.1. Purpose and Use*

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 DESE'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, DESE 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.

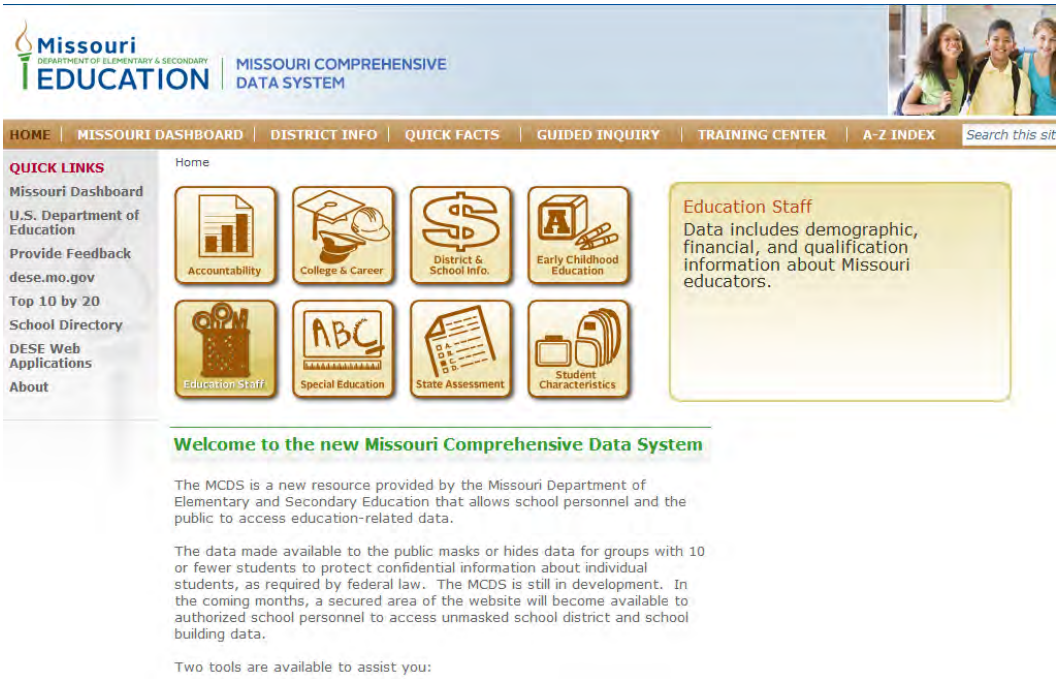
Users access MCDS from a link to the portal on the Department's homepage (http://dese.mo.gov/). From there, they access the data portal directly through the MCDS link, as shown in the following image.



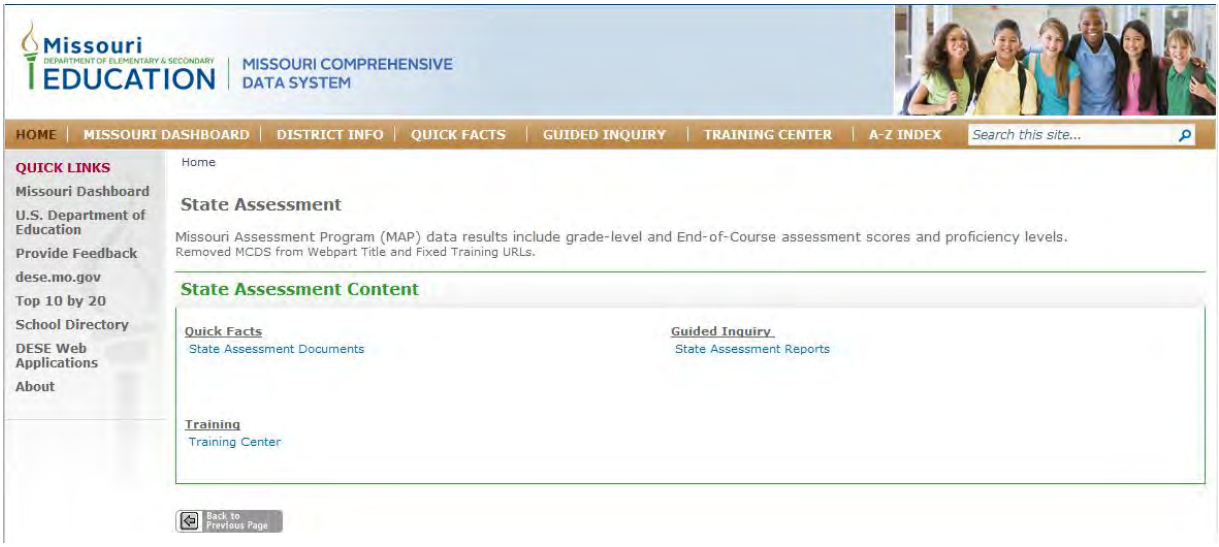


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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.




On the State Assessment page, a Guided Inquiry link allows users to create summary administrative reports, achievement level reports, and historical AYP reports. Authenticated users can also download student-level data from the Guided Inquiry link.





Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

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 |
| | Guided Inquiry - State Assessment Administrative: EOC History Report |
| **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 |

### *8.5.2. 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. Additionally, a historical report of the student's EOC participation is located within the Administrative Reports.

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


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

who has been in the school for less than one year and in the country for less than three years, if the student is an LEP/ELL Title 3, the number of months the LEP/ELL student has been in the United States, the student's disability diagnosis, and if the student is Title 1.

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

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

EOC History Report: This report lists the history of MO EOC completion for all students in the school or district.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Chapter 9: Summary Statistics

### 9.1. Introduction

This chapter provides descriptive statistics for the number correct raw score and scale scores for each of the eight MO EOC Assessments from the Summer 2015 and Fall 2015 administration and for each of the nine MO EOC Assessments from the Spring 2016 administration. Statistics include n-counts, means, standard deviations (SD), minimum and maximum values, and a variety of data disaggregation.

### 9.2. Descriptive Statistics

*9.2.1. 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 | #Items | #Pts. Possible | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|---|
| Summer 2015 | English II | 430 | 38 | 45 | 4 | 41 | 23.83 | 8.09 |
| | Algebra I | 877 | 44 | 50 | 4 | 45 | 19.82 | 8.31 |
| | Biology | 305 | 45 | 55 | 1 | 53 | 26.71 | 10.58 |
| | English I | 52 | 38 | 45 | 10 | 39 | 25.50 | 6.97 |
| | Algebra II | 39 | 40 | 40 | 8 | 38 | 22.08 | 7.36 |
| | Geometry | 37 | 40 | 40 | 2 | 35 | 17.60 | 7.18 |
| | Government | 788 | 40 | 40 | 4 | 40 | 24.88 | 9.21 |
| | Am. History | 77 | 40 | 40 | 8 | 37 | 23.75 | 7.14 |
| Fall 2015 | English II | 2,765 | 38 | 45 | 0 | 44 | 25.99 | 8.60 |
| | Algebra I | 4,622 | 43 | 50 | 0 | 50 | 21.92 | 9.77 |
| | Biology | 2,762 | 48 | 55 | 0 | 55 | 29.41 | 12.42 |
| | English I | 656 | 38 | 45 | 6 | 43 | 29.42 | 6.99 |
| | Algebra II | 692 | 40 | 40 | 5 | 40 | 25.20 | 7.17 |
| | Geometry | 674 | 40 | 40 | 6 | 40 | 22.97 | 7.08 |
| | Government | 13,844 | 40 | 40 | 0 | 40 | 25.45 | 8.30 |
| | Am. History | 465 | 40 | 40 | 7 | 39 | 24.57 | 7.18 |
| Spring 2016 | English II | 62,789 | 38 | 45 | 0 | 45 | 31.73 | 6.58 |
| | Algebra I | 60,971 | 44 | 50 | 0 | 50 | 22.78 | 8.99 |
| | Biology | 61,486 | 45 | 55 | 0 | 55 | 34.63 | 10.15 |
| | English I | 15,865 | 38 | 45 | 1 | 44 | 28.75 | 6.57 |
| | Algebra II | 19,791 | 40 | 40 | 1 | 40 | 24.76 | 7.46 |
| | Geometry | 8,693 | 40 | 40 | 3 | 40 | 22.14 | 7.43 |
| | Government | 44,480 | 40 | 40 | 0 | 40 | 27.06 | 7.62 |
| | Am. History | 9,155 | 40 | 40 | 3 | 40 | 23.11 | 7.07 |
| | Physical Science | 4,728 | 45 | 45 | 6 | 43 | 20.20 | 6.40 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

*9.2.2. Total Raw Score by Cluster*

Tables 9.2, 9.3, and 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 Cluster—Summer 2015**

| Test Period | Content Area | Cluster | #Pts. Possible | #Items | Mean | SD | SEM |
|---|---|---|---|---|---|---|---|
| Summer 2015 | English II | Reading | 35 | 35 | 17.94 | 6.42 | 2.62 |
| | | Writing | 10 | 3 | 5.94 | 2.31 | 0.81 |
| | Algebra I | Number and Quantity | 3 | 3 | 1.05 | 0.89 | 0.77 |
| | | Algebra | 27 | 21 | 9.00 | 4.53 | 2.38 |
| | | Functions | 15 | 15 | 6.93 | 2.99 | 1.74 |
| | | Statistics and Probability | 5 | 5 | 2.86 | 1.38 | 0.98 |
| | Biology | Characteristics and Interactions of Living Organisms | 22 | 22 | 9.84 | 3.81 | 2.17 |
| | | Changes in Ecosystems and Interactions of Organisms with their Environments | 13 | 13 | 7.66 | 3.30 | 1.52 |
| | | Scientific Inquiry | 20 | 10 | 9.39 | 4.81 | 2.16 |
| | English I | Reading | 35 | 35 | 18.39 | 6.00 | 2.58 |
| | | Writing | 10 | 3 | 7.12 | 1.70 | 0.72 |
| | Algebra II | Algebra | 16 | 16 | 8.85 | 3.12 | 1.78 |
| | | Functions | 24 | 24 | 13.23 | 4.92 | 2.19 |
| | Geometry | Geometry | 33 | 33 | 14.51 | 5.81 | 2.48 |
| | | Statistics and Probability | 7 | 7 | 3.08 | 1.80 | 1.17 |
| | Government | Principles and Processes of Governance Systems | 20 | 20 | 12.51 | 4.58 | 1.91 |
| | | Principles of Constitutional Democracy | 20 | 20 | 12.36 | 5.01 | 1.85 |
| | Am. History | Missouri, United States, and World History | 40 | 40 | 23.75 | 7.14 | 2.71 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 9.3. Descriptive Statistics for Total Raw Score by Cluster—Fall 2015**

| Test Period | Content Area | Cluster | #Pts. Possible | #Items | Mean | SD | SEM |
|---|---|---|---|---|---|---|---|
| Fall 2015 | English II | Reading | 35 | 35 | 19.30 | 7.01 | 2.61 |
| | | Writing | 10 | 3 | 6.77 | 2.21 | 0.67 |
| | Algebra I | Number and Quantity | 3 | 3 | 1.23 | 1.01 | 0.75 |
| | | Algebra | 23 | 19 | 8.86 | 4.74 | 2.22 |
| | | Functions | 19 | 16 | 9.13 | 4.18 | 2.09 |
| | | Statistics and Probability | 5 | 5 | 2.72 | 1.30 | 1.00 |
| | Biology | Characteristics and Interactions of Living Organisms | 22 | 22 | 11.94 | 4.84 | 2.08 |
| | | Changes in Ecosystems and Interactions of Organisms with their Environments | 13 | 13 | 7.93 | 3.34 | 1.48 |
| | | Scientific Inquiry | 20 | 13 | 9.64 | 5.36 | 2.14 |
| | English I | Reading | 35 | 35 | 21.64 | 5.89 | 2.46 |
| | | Writing | 10 | 3 | 7.89 | 1.44 | 0.62 |
| | Algebra II | Algebra | 18 | 18 | 11.50 | 3.55 | 1.75 |
| | | Functions | 22 | 22 | 13.70 | 4.22 | 2.01 |
| | Geometry | Geometry | 33 | 33 | 18.82 | 5.77 | 2.49 |
| | | Statistics and Probability | 7 | 7 | 4.15 | 1.79 | 1.12 |
| | Government | Principles and Processes of Governance Systems | 20 | 20 | 12.48 | 4.34 | 1.93 |
| | | Principles of Constitutional Democracy | 20 | 20 | 12.95 | 4.36 | 1.87 |
| | Am. History | Missouri, United States, and World History | 40 | 40 | 24.57 | 7.18 | 2.73 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 9.4. Descriptive Statistics for Total Raw Score by Cluster—Spring 2016**

| Test Period | Content Area | Cluster | #Pts. Possible | #Items | Mean | SD | SEM |
|---|---|---|---|---|---|---|---|
| Spring 2016 | English II | Reading | 35 | 35 | 23.96 | 5.77 | 2.36 |
| | | Writing | 10 | 3 | 7.81 | 1.30 | 0.56 |
| | Algebra I | Number and Quantity | 3 | 3 | 1.19 | 0.96 | 0.77 |
| | | Algebra | 27 | 21 | 10.70 | 5.05 | 2.45 |
| | | Functions | 15 | 15 | 7.74 | 3.09 | 1.71 |
| | | Statistics and Probability | 5 | 5 | 3.15 | 1.36 | 0.95 |
| | Biology | Characteristics and Interactions of Living Organisms | 22 | 22 | 13.39 | 4.45 | 2.03 |
| | | Changes in Ecosystems and Interactions of Organisms with their Environments | 13 | 13 | 9.21 | 2.68 | 1.43 |
| | | Scientific Inquiry | 20 | 10 | 12.07 | 4.34 | 2.11 |
| | English I | Reading | 35 | 35 | 21.14 | 5.73 | 2.49 |
| | | Writing | 10 | 3 | 7.64 | 1.37 | 0.62 |
| | Algebra II | Algebra | 16 | 16 | 9.76 | 3.32 | 1.68 |
| | | Functions | 24 | 24 | 15.00 | 4.73 | 2.11 |
| | Geometry | Geometry | 33 | 33 | 18.18 | 6.06 | 2.47 |
| | | Statistics and Probability | 7 | 7 | 3.96 | 1.81 | 1.14 |
| | Government | Principles and Processes of Governance Systems | 20 | 20 | 13.43 | 3.94 | 1.87 |
| | | Principles of Constitutional Democracy | 20 | 20 | 13.63 | 4.11 | 1.84 |
| | Am. History | Missouri, United States, and World History | 40 | 40 | 23.10 | 7.07 | 2.78 |
| | Physical Science | Properties and Principles of Force and Motion | 29 | 16 | 7.39 | 2.47 | 1.70 |
| | | Properties and Principles of Matter and Energy | 29 | 16 | 12.82 | 4.61 | 2.45 |

### *9.2.3. Scale Scores*

Table 9.5 summarizes the descriptive statistics of scale scores for each MO EOC Assessment by administration. The scale score range is 100 to 250 for every content area. Table 9.6 then summarizes the minimum scale score needed to obtain each level of achievement. As shown in the table, the cut scores for the achievement levels of Proficient and Advanced are 200 and 225, respectively, for each content area.

The number and percentage of students in each achievement level by content area from 2008–2009 to 2015–2016 are provided in Table E.2 as part of the executive summary.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 9.5. Descriptive Statistics of the Scale Scores**

| Test Period | Content Area | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|
| Summer 2015 | English II | 430 | 152 | 236 | 194.30 | 15.60 |
| | Algebra I | 877 | 153 | 250 | 201.11 | 17.78 |
| | Biology | 305 | 111 | 250 | 193.83 | 19.48 |
| | English I | 52 | 162 | 232 | 196.67 | 16.12 |
| | Algebra II | 39 | 159 | 250 | 202.85 | 22.80 |
| | Geometry | 37 | 132 | 243 | 191.84 | 20.44 |
| | Government | 788 | 145 | 250 | 202.33 | 24.06 |
| | Am. History | 77 | 146 | 250 | 200.70 | 24.40 |
| Fall 2015 | English II | 2,765 | 105 | 250 | 196.21 | 18.83 |
| | Algebra I | 4,622 | 100 | 250 | 197.47 | 21.98 |
| | Biology | 2,762 | 100 | 250 | 196.37 | 24.29 |
| | English I | 656 | 150 | 250 | 206.01 | 16.97 |
| | Algebra II | 692 | 146 | 250 | 213.30 | 22.21 |
| | Geometry | 674 | 158 | 250 | 206.59 | 19.13 |
| | Government | 13,844 | 100 | 250 | 203.69 | 21.92 |
| | Am. History | 465 | 142 | 250 | 203.62 | 24.67 |
| Spring 2016 | English II | 62,789 | 111 | 250 | 210.33 | 14.34 |
| | Algebra I | 60,971 | 100 | 250 | 207.29 | 18.79 |
| | Biology | 61,486 | 100 | 250 | 207.90 | 19.49 |
| | English I | 15,865 | 117 | 250 | 204.27 | 15.66 |
| | Algebra II | 19,791 | 104 | 250 | 210.69 | 22.84 |
| | Geometry | 8,693 | 141 | 250 | 204.46 | 20.07 |
| | Government | 44,480 | 100 | 250 | 206.43 | 20.98 |
| | Am. History | 9,155 | 114 | 250 | 198.57 | 24.00 |
| | Physical Science | 4,728 | 145 | 250 | 190.24 | 17.50 |

**Table 9.6. Scale Score Cuts**

| Content Area | Basic | Proficient | Advanced |
|---|---|---|---|
| English II | 182 | 200 | 225 |
| Algebra I | 187 | 200 | 225 |
| Biology | 178 | 200 | 225 |
| English I | 180 | 200 | 225 |
| Algebra II | 186 | 200 | 225 |
| Geometry | 189 | 200 | 225 |
| Government | 179 | 200 | 225 |
| Am. History | 182 | 200 | 225 |
| Physical Science | 168 | 200 | 225 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

### *9.2.4. By Demographic Group*

Descriptive statistics of scale scores and percentage distributions of students' achievement levels by demographic groups are summarized in Appendix E and Appendix F. 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.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Chapter 10: Reliability

## 10.1. Introduction

DESE is required 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.

## 10.1. Reliability

### *10.1.1. Defining Reliability*

According to the *Standards for Educational and Psychological Testing*, reliability is defined as "the degree to which test scores for a group of test takers are consistent over repeated applications of a measurement procedure and hence are inferred to be dependable and repeatable for an individual test taker; the degree to which scores are free of random errors of measurement for a given group" (AERA, APA, & NCME, 2014, p. 222—223.)

Reliability is intended to reflect the degree of inconsistency in test scores due to random error. Some examples of random error sources include the occasion of testing, the selection of items, and hand scorers. Multiple sources of random error exist, yet most reliability indices only reflect a single source of error. Test users should try to understand what type of error is being considered by the reported reliability index, and even more importantly, what types of error are not. Systematic error sources also exist and can artificially increase reliability, while at the same time, decreasing the validity of any inferences made about test scores.

Test scores can also be affected by characteristics of the testing instrument. For example, test length must be considered when evaluating reliability. Test scores based on more items tend to be more reliable than test scores based on fewer items. Additionally, reliability coefficients are group specific and tend to be higher in populations that are more heterogeneous and lower in populations that are more homogeneous.

Understanding the distinction between relative error and absolute error is also important. Many reliability indices only reflect relative error. Relative error is of interest when the relative ordering of students based on their test scores is of interest; the specific scores received do not matter. When the specific score values are important (e.g., if cut scores are used), then absolute error is important. There is more error variance when considering the absolute scores of examinees, which suggests lower reliability.

### *10.1.2. Reliability Coefficient*

Classical test theory (CTT) provides a means for quantifying reliability. In CTT, an observed measurement, such as test score ($X$) is defined as a composite of true score ($T$) and an associated random error component ($E$):

$$X = T + E.$$


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

The definitions and assumptions in CTT lead to several important properties. For example, it can be demonstrated that observed score variance equals the sum of (1) the variance in true scores—true individual differences in the attribute being measured, and (2) the variance from random fluctuations due to the imperfections in the measurement process (error variance).

$$\sigma_x^2 = \sigma_t^2 + \sigma_e^2$$

Normally a covariance term is required when adding variances, but it is not in this case as true scores and errors are assumed to be uncorrelated in CTT. The reliability coefficient expresses the consistency of test scores as the ratio of true-score variance to total observed-score variance.

$$\rho_{x_1 x_2} = \frac{\sigma_t^2}{\sigma_x^2}$$

Reliability coefficients theoretically range from 0.0 to 1.0, although the extremes are never achieved in applied testing programs. Larger coefficients are more desirable because they indicate that test scores are less influenced by random error. If all test score variance were true, the scores would be perfectly consistent and the index would equal 1.0. The index would be 0.0 if none of the test score variance were true. Such scores would be pure random noise (i.e., all measurement error).

*10.1.3. Estimating Reliability*

The reliability of a specific test cannot be directly estimated from the equation above. Although several different reliability indices exist, an industry-standard index for describing internal consistency reliability based on a single test administration is coefficient alpha (Cronbach, 1951), which provides an estimate of reliability that is mathematically equivalent to the average of all possible split-half reliability estimates computed by the Rulon method. 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 computed as follows:

$$\alpha = \left(\frac{p}{1-p}\right)\left(1 - \frac{\sum_{j=1}^{p} \sigma_{Y_j}^2}{\sigma_X^2}\right)$$

*10.1.4. Interpretation Considerations*

Coefficient alpha indicates the internal consistency of the responses over a set of items measuring an underlying trait, in this case, academic achievement in the MO EOC content tests. As an internal consistency index, it can be conceptualized as indicating the extent to which an exchangeable set of items from the same domain would result in a similar rank ordering of students.

Relative error is reflected by coefficient alpha. Further, coefficient alpha is only sensitive to random errors due to the sampling of items. It does not take into account other random sources of error (e.g., variations associated with the linking process; daily fluctuation in student health and behavior, the testing environment; rater inconsistency).


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## 10.2. Reliability Evidence

Reliability evidence for the 2015–2016 MO EOC Assessments includes the following:

- Standard error of measurement (SEM) for raw scores
- Conditional standard error of measurement (CSEM) for Scale Scores
- Classification accuracy and consistency
- Rate agreement (presented in Section 6.6)

### *10.2.1. Standard Error of Measurement (SEM) for Raw Scores*

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.

#### *10.2.1.1. Traditional SEMs and Traditional Confidence Intervals (CIs)*

The SEM is defined as the standard deviation of the distribution of observed scores for students with identical true scores. (The standard deviation is a measure of the dispersion of the observed scores; for the normal distribution, about 32 percent of observations are more than one standard deviation above or below the mean.)

The SEM formula:

$$SEM = \sigma_X\sqrt{1-\alpha}$$

indicates that the value of the SEM depends on both the reliability coefficient and the standard deviation of test scores.

SEMs allow statements regarding the overall precision of test scores. SEMs help place "reasonable limits" (Gulliksen, 1950) around observed scores through construction of an approximate score band or confidence intervals (CIs). These bands are constructed by taking the observed scores, *X*, and adding and subtracting a multiplicative factor of the SEM. As an example, students with a given true score will have observed scores that fall between +/-1 SEM about two-thirds of the time.

#### *10.2.1.2. SEMs by Student Subgroup*

Separate analyses were performed for each EOC content area. Tables 10.1 – 10.25 provide the SEMs for the total population and for select student subgroups. For each table, samples sizes less than 50 are not reported for effect size, reliability and SEM.

Separate reliability coefficients, estimated through coefficient alpha, are reported for each group of students as well, provided at least 50 students are in the group. The reliabilities for all students range from 0.84 to 0.92, with the exception of Physical Science which had a reliability of 0.78 for the Spring 2016 administration. The SEMs range from a low of 2.51 for the English II Spring test to a high of 3.58 for the Biology Summer administration.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

An effect size is reported within each group, provided minimal sample size requirements are met. The 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 calculated using Cohen's *d* equation:

$$d = \frac{\bar{X}_F - \bar{X}_R}{\hat{\sigma}_X},$$

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 1.0 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 sizes are also 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.

**Table 10.1. Alpha Coefficients and SEMs—English II, Summer 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 430 | 23.83 | 8.09 | -- | 0.87 | 2.95 |
| **Gender** | | | | | | |
| Female | 166 | 23.39 | 8.15 | -0.09 | 0.87 | 2.90 |
| Male | 264 | 24.11 | 8.05 | -- | 0.86 | 2.98 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 3 | 32.67 | 6.35 | -- | -- | -- |
| Asian | 3 | 29.33 | 5.51 | -- | -- | -- |
| Pacific Islander | 2 | 23.00 | 5.66 | -- | -- | -- |
| Black (not Hispanic) | 172 | 22.35 | 7.46 | -0.24 | 0.84 | 2.97 |
| Hispanic | 40 | 26.93 | 6.75 | -- | -- | -- |
| White (not Hispanic) | 210 | 24.25 | 8.61 | -- | 0.88 | 2.94 |
| Multi-racial | -- | -- | -- | -- | -- | -- |
| **LEP** | | | | | | |
| No | 407 | 23.78 | 8.20 | -- | 0.87 | 2.95 |
| Yes | 17 | 24.06 | 5.49 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 382 | 24.10 | 8.11 | -- | 0.87 | 2.95 |
| Yes | 42 | 20.95 | 7.59 | -- | -- | -- |
| **Migrant** | | | | | | |
| No | 424 | 23.79 | 8.10 | -- | 0.87 | 2.95 |
| Yes | -- | -- | -- | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **FRL** | | | | | | |
| No | 156 | 24.06 | 8.82 | -- | 0.89 | 2.97 |
| Yes | 268 | 23.63 | 7.66 | -0.05 | 0.85 | 2.94 |
| **Title I** | | | | | | |
| No | 399 | 23.48 | 8.11 | -- | 0.87 | 2.96 |
| Yes | 25 | 28.64 | 6.36 | -- | -- | -- |
| **Accommodations** | | | | | | |
| No | 416 | 23.96 | 8.11 | -- | 0.87 | 2.94 |
| Yes | 14 | 19.86 | 6.40 | -- | -- | -- |

**Table 10.2. Alpha Coefficients and SEMs—Algebra I, Summer 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 877 | 19.82 | 8.31 | -- | 0.85 | 3.21 |
| **Gender** | | | | | | |
| Female | 410 | 20.43 | 8.43 | 0.14 | 0.85 | 3.21 |
| Male | 467 | 19.30 | 8.17 | -- | 0.85 | 3.21 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | -- | -- | -- | -- | -- | -- |
| Asian | 7 | 20.29 | 9.03 | -- | -- | -- |
| Pacific Islander | -- | -- | -- | -- | -- | -- |
| Black (not Hispanic) | 268 | 16.51 | 7.65 | -0.61 | 0.84 | 3.08 |
| Hispanic | 49 | 21.10 | 7.87 | -- | -- | -- |
| White (not Hispanic) | 546 | 21.39 | 8.19 | -- | 0.84 | 3.25 |
| Multi-racial | 7 | 15.57 | 6.75 | -- | -- | -- |
| **LEP** | | | | | | |
| No | 858 | 19.85 | 8.27 | -- | 0.85 | 3.22 |
| Yes | 12 | 21.25 | 10.79 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 806 | 20.25 | 8.33 | -- | 0.85 | 3.22 |
| Yes | 64 | 15.05 | 6.25 | -0.64 | 0.76 | 3.07 |
| **Migrant** | | | | | | |
| No | 870 | 19.87 | 8.30 | -- | 0.85 | 3.21 |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 423 | 21.70 | 8.49 | -- | 0.85 | 3.24 |
| Yes | 447 | 18.14 | 7.74 | -0.44 | 0.83 | 3.17 |
| **Title I** | | | | | | |
| No | 783 | 19.15 | 7.93 | -- | 0.84 | 3.21 |
| Yes | 87 | 26.37 | 8.81 | 0.90 | 0.87 | 3.17 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **Accommodations** | | | | | | |
| No | 857 | 19.94 | 8.33 | -- | 0.85 | 3.21 |
| Yes | 20 | 14.70 | 4.78 | -- | -- | -- |

**Table 10.3. Alpha Coefficients and SEMs—Biology, Summer 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 305 | 26.71 | 10.58 | -- | 0.89 | 3.58 |
| **Gender** | | | | | | |
| Female | 144 | 26.31 | 11.12 | -0.07 | 0.89 | 3.62 |
| Male | 161 | 27.06 | 10.10 | -- | 0.88 | 3.55 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | -- | -- | -- | -- | -- | -- |
| Asian | -- | -- | -- | -- | -- | -- |
| Pacific Islander | 1 | 28.00 | -- | -- | -- | -- |
| Black (not Hispanic) | 130 | 24.29 | 10.55 | -0.40 | 0.89 | 3.52 |
| Hispanic | 20 | 28.50 | 9.80 | -- | -- | -- |
| White (not Hispanic) | 150 | 28.43 | 10.39 | -- | 0.88 | 3.62 |
| Multi-racial | 4 | 31.00 | 11.63 | -- | -- | -- |
| **LEP** | | | | | | |
| No | 286 | 26.94 | 10.70 | -0.36 | 0.89 | 3.59 |
| Yes | 12 | 23.08 | 8.82 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 267 | 27.13 | 10.80 | -- | 0.89 | 3.60 |
| Yes | 31 | 23.81 | 8.77 | -- | -- | -- |
| **Migrant** | | | | | | |
| No | 298 | 26.79 | 10.64 | -- | 0.89 | 3.58 |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 110 | 27.60 | 10.64 | -- | 0.88 | 3.66 |
| Yes | 188 | 26.31 | 10.64 | -0.12 | 0.89 | 3.54 |
| **Title I** | | | | | | |
| No | 258 | 25.62 | 10.29 | -- | 0.88 | 3.58 |
| Yes | 40 | 34.33 | 9.84 | -- | -- | -- |
| **Accommodations** | | | | | | |
| No | 290 | 26.96 | 10.66 | -- | 0.89 | 3.59 |
| Yes | 15 | 21.80 | 7.67 | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.4. Alpha Coefficients and SEMs—English I, Summer 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 52 | 25.50 | 6.97 | -- | 0.84 | 2.78 |
| **Gender** | | | | | | |
| Female | 22 | 25.68 | 7.84 | -- | -- | -- |
| Male | 30 | 25.37 | 6.39 | -- | -- | -- |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 1 | 28.00 | -- | -- | -- | -- |
| Asian | -- | -- | -- | -- | -- | -- |
| Pacific Islander | -- | -- | -- | -- | -- | -- |
| Black (not Hispanic) | 9 | 25.78 | 6.04 | -- | -- | -- |
| Hispanic | 12 | 22.92 | 6.63 | -- | -- | -- |
| White (not Hispanic) | 30 | 26.37 | 7.41 | -- | -- | -- |
| Multi-racial | -- | -- | -- | -- | -- | -- |
| **LEP** | | | | | | |
| No | 45 | 26.33 | 6.69 | -- | -- | -- |
| Yes | 7 | 20.14 | 6.72 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 50 | 25.88 | 6.72 | -- | 0.83 | 2.76 |
| Yes | 2 | 16.00 | 8.49 | -- | -- | -- |
| **Migrant** | | | | | | |
| No | 52 | 25.50 | 6.97 | -- | 0.84 | 2.78 |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 12 | 27.83 | 7.07 | -- | -- | -- |
| Yes | 40 | 24.80 | 6.87 | -- | -- | -- |
| **Title I** | | | | | | |
| No | 38 | 25.89 | 7.76 | -- | -- | -- |
| Yes | 14 | 24.43 | 4.16 | -- | -- | -- |
| **Accommodations** | | | | | | |
| No | 51 | 25.57 | 7.02 | -- | 0.84 | 2.78 |
| Yes | 1 | 22.00 | -- | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.5. Alpha Coefficients and SEMs—Algebra II, Summer 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 39 | 22.08 | 7.36 | -- | -- | -- |
| **Gender** | | | | | | |
| Female | 24 | 21.96 | 6.74 | -- | -- | -- |
| Male | 15 | 22.27 | 8.51 | -- | -- | -- |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | -- | -- | -- | -- | -- | -- |
| Asian | -- | -- | -- | -- | -- | -- |
| Pacific Islander | -- | -- | -- | -- | -- | -- |
| Black (not Hispanic) | 3 | 15.33 | 6.43 | -- | -- | -- |
| Hispanic | 17 | 21.76 | 7.55 | -- | -- | -- |
| White (not Hispanic) | 19 | 23.42 | 7.05 | -- | -- | -- |
| Multi-racial | -- | -- | -- | -- | -- | -- |
| **LEP** | | | | | | |
| No | 33 | 22.30 | 7.79 | -- | -- | -- |
| Yes | 6 | 20.83 | 4.62 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 38 | 22.26 | 7.37 | -- | -- | -- |
| Yes | 1 | 15.00 | -- | -- | -- | -- |
| **Migrant** | | | | | | |
| No | 39 | 22.08 | 7.36 | -- | -- | -- |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 18 | 23.61 | 6.59 | -- | -- | -- |
| Yes | 21 | 20.76 | 7.89 | -- | -- | -- |
| **Title I** | | | | | | |
| No | 25 | 21.92 | 7.31 | -- | -- | -- |
| Yes | 14 | 22.36 | 7.73 | -- | -- | -- |
| **Accommodations** | | | | | | |
| No | 39 | 22.08 | 7.36 | -- | -- | -- |
| Yes | -- | -- | -- | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.6. Alpha Coefficients and SEMs—Geometry, Summer 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 37 | 17.60 | 7.18 | -- | -- | -- |
| **Gender** | | | | | | |
| Female | 18 | 16.17 | 6.29 | -- | -- | -- |
| Male | 19 | 18.95 | 7.86 | -- | -- | -- |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | -- | -- | -- | -- | -- | -- |
| Asian | -- | -- | -- | -- | -- | -- |
| Pacific Islander | 1 | 5.00 | -- | -- | -- | -- |
| Black (not Hispanic) | 14 | 18.43 | 6.61 | -- | -- | -- |
| Hispanic | 3 | 13.67 | 2.31 | -- | -- | -- |
| White (not Hispanic) | 17 | 18.35 | 8.10 | -- | -- | -- |
| Multi-racial | 2 | 17.50 | 2.12 | -- | -- | -- |
| **LEP** | | | | | | |
| No | 35 | 18.03 | 7.04 | -- | -- | -- |
| Yes | 2 | 10.00 | 7.07 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 35 | 18.09 | 6.87 | -- | -- | -- |
| Yes | 2 | 9.00 | 9.90 | -- | -- | -- |
| **Migrant** | | | | | | |
| No | 37 | 17.59 | 7.18 | -- | -- | -- |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 19 | 17.95 | 7.96 | -- | -- | -- |
| Yes | 18 | 17.22 | 6.47 | -- | -- | -- |
| **Title I** | | | | | | |
| No | 24 | 16.54 | 7.75 | -- | -- | -- |
| Yes | 13 | 19.54 | 5.77 | -- | -- | -- |
| **Accommodations** | | | | | | |
| No | 36 | 17.64 | 7.28 | -- | -- | -- |
| Yes | 1 | 16.00 | -- | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.7. Alpha Coefficients and SEMs—Government, Summer 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 788 | 24.88 | 9.21 | -- | 0.92 | 2.66 |
| **Gender** | | | | | | |
| Female | 432 | 24.71 | 9.10 | -0.04 | 0.91 | 2.67 |
| Male | 356 | 25.08 | 9.35 | -- | 0.92 | 2.64 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 2 | 18.50 | 7.78 | -- | -- | -- |
| Asian | 22 | 28.23 | 10.95 | -- | -- | -- |
| Pacific Islander | 4 | 24.50 | 7.94 | -- | -- | -- |
| Black (not Hispanic) | 137 | 20.80 | 9.36 | -0.56 | 0.91 | 2.77 |
| Hispanic | 62 | 22.56 | 8.16 | -0.37 | 0.88 | 2.78 |
| White (not Hispanic) | 544 | 25.85 | 8.91 | -- | 0.91 | 2.63 |
| Multi-racial | 17 | 31.71 | 6.35 | -- | -- | -- |
| **LEP** | | | | | | |
| No | 744 | 25.16 | 9.22 | -- | 0.92 | 2.64 |
| Yes | 31 | 19.39 | 7.63 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 729 | 25.54 | 9.05 | -- | 0.92 | 2.64 |
| Yes | 46 | 15.24 | 6.01 | -- | -- | -- |
| **Migrant** | | | | | | |
| No | 775 | 24.93 | 9.23 | -- | 0.92 | 2.66 |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 460 | 27.25 | 8.80 | -- | 0.92 | 2.55 |
| Yes | 315 | 21.55 | 8.79 | -0.65 | 0.90 | 2.79 |
| **Title I** | | | | | | |
| No | 756 | 24.91 | 9.26 | -- | 0.92 | 2.65 |
| Yes | 19 | 25.79 | 8.22 | -- | -- | -- |
| **Accommodations** | | | | | | |
| No | 782 | 24.96 | 9.19 | -- | 0.92 | 2.66 |
| Yes | 6 | 14.17 | 3.97 | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.8. Alpha Coefficients and SEMs—American History, Summer 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 77 | 23.75 | 7.14 | -- | 0.86 | 2.71 |
| **Gender** | | | | | | |
| Female | 51 | 22.84 | 7.62 | -- | 0.87 | 2.71 |
| Male | 26 | 25.54 | 5.82 | -- | -- | -- |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 1 | 25.00 | -- | -- | -- | -- |
| Asian | 3 | 29.00 | 3.00 | -- | -- | -- |
| Pacific Islander | -- | -- | -- | -- | -- | -- |
| Black (not Hispanic) | 6 | 16.33 | 7.71 | -- | -- | -- |
| Hispanic | 4 | 22.75 | 4.57 | -- | -- | -- |
| White (not Hispanic) | 60 | 24.23 | 7.11 | -- | 0.86 | 2.68 |
| Multi-racial | 3 | 24.67 | 6.35 | -- | -- | -- |
| **LEP** | | | | | | |
| No | 74 | 24.14 | 6.91 | -- | 0.85 | 2.71 |
| Yes | 2 | 10.00 | 2.83 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 67 | 24.61 | 6.90 | -- | 0.85 | 2.68 |
| Yes | 9 | 17.44 | 6.37 | -- | -- | -- |
| **Migrant** | | | | | | |
| No | 76 | 23.76 | 7.19 | -- | 0.86 | 2.71 |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 54 | 25.46 | 6.55 | -- | 0.83 | 2.67 |
| Yes | 22 | 19.59 | 7.12 | -- | -- | -- |
| **Title I** | | | | | | |
| No | 76 | 23.76 | 7.19 | -- | 0.86 | 2.71 |
| Yes | -- | -- | -- | -- | -- | -- |
| **Accommodations** | | | | | | |
| No | 71 | 24.48 | 6.89 | -- | 0.85 | 2.70 |
| Yes | 6 | 15.17 | 3.97 | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.9. Alpha Coefficients and SEMs—English II, Fall 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 2,765 | 25.99 | 8.60 | -- | 0.89 | 2.90 |
| **Gender** | | | | | | |
| Female | 1,269 | 27.17 | 8.23 | 0.26 | 0.88 | 2.82 |
| Male | 1,496 | 24.99 | 8.78 | -- | 0.89 | 2.95 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 11 | 24.73 | 10.88 | -- | -- | -- |
| Asian | 47 | 28.36 | 9.09 | -- | -- | -- |
| Pacific Islander | 8 | 24.88 | 6.96 | -- | -- | -- |
| Black (not Hispanic) | 1,114 | 24.85 | 8.04 | -0.27 | 0.87 | 2.93 |
| Hispanic | 200 | 24.20 | 8.24 | -0.33 | 0.87 | 2.97 |
| White (not Hispanic) | 1,320 | 27.11 | 8.85 | -- | 0.90 | 2.86 |
| Multi-racial | 65 | 26.95 | 9.87 | -0.02 | 0.92 | 2.80 |
| **LEP** | | | | | | |
| No | 2,623 | 26.31 | 8.56 | -- | 0.89 | 2.89 |
| Yes | 140 | 19.86 | 6.77 | -0.76 | 0.79 | 3.11 |
| **IEP** | | | | | | |
| No | 2,378 | 26.80 | 8.53 | -- | 0.89 | 2.87 |
| Yes | 385 | 20.96 | 7.21 | -0.70 | 0.82 | 3.05 |
| **Migrant** | | | | | | |
| No | 2,762 | 25.99 | 8.60 | -- | 0.89 | 2.90 |
| Yes | 1 | 25.00 | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 760 | 28.71 | 8.40 | -- | 0.89 | 2.74 |
| Yes | 2,003 | 24.95 | 8.45 | -0.45 | 0.88 | 2.95 |
| **Title I** | | | | | | |
| No | 2,440 | 26.43 | 8.63 | -- | 0.89 | 2.88 |
| Yes | 323 | 22.62 | 7.52 | -0.45 | 0.84 | 3.02 |
| **Accommodations** | | | | | | |
| No | 2,643 | 26.22 | 8.59 | -- | 0.89 | 2.89 |
| Yes | 122 | 21.07 | 7.25 | -0.60 | 0.83 | 3.03 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.10. Alpha Coefficients and SEMs—Algebra I, Fall 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 4,622 | 21.92 | 9.77 | -- | 0.89 | 3.31 |
| **Gender** | | | | | | |
| Female | 2,181 | 22.63 | 9.63 | 0.14 | 0.88 | 3.31 |
| Male | 2,441 | 21.30 | 9.85 | -- | 0.89 | 3.31 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 20 | 16.55 | 7.54 | -- | -- | -- |
| Asian | 83 | 31.58 | 11.93 | 0.84 | 0.92 | 3.27 |
| Pacific Islander | 4 | 17.25 | 6.34 | -- | -- | -- |
| Black (not Hispanic) | 911 | 17.19 | 7.35 | -0.64 | 0.81 | 3.17 |
| Hispanic | 341 | 20.49 | 8.18 | -0.28 | 0.85 | 3.21 |
| White (not Hispanic) | 3,161 | 23.24 | 9.91 | -- | 0.89 | 3.34 |
| Multi-racial | 102 | 21.57 | 10.39 | -0.17 | 0.90 | 3.26 |
| **LEP** | | | | | | |
| No | 4,417 | 22.05 | 9.82 | -- | 0.89 | 3.31 |
| Yes | 172 | 18.92 | 8.16 | -0.32 | 0.85 | 3.19 |
| **IEP** | | | | | | |
| No | 3,996 | 22.85 | 9.81 | -- | 0.89 | 3.32 |
| Yes | 593 | 15.74 | 6.89 | -0.75 | 0.79 | 3.15 |
| **Migrant** | | | | | | |
| No | 4,589 | 21.94 | 9.78 | -- | 0.89 | 3.31 |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 2,281 | 25.35 | 10.22 | -- | 0.89 | 3.35 |
| Yes | 2,308 | 18.56 | 8.01 | -0.74 | 0.84 | 3.23 |
| **Title I** | | | | | | |
| No | 4,016 | 22.50 | 9.95 | -- | 0.89 | 3.32 |
| Yes | 573 | 17.97 | 7.33 | -0.47 | 0.81 | 3.16 |
| **Accommodations** | | | | | | |
| No | 4,391 | 22.22 | 9.82 | -- | 0.89 | 3.32 |
| Yes | 231 | 16.29 | 6.70 | -0.61 | 0.77 | 3.18 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.11. Alpha Coefficients and SEMs—Biology, Fall 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 2,762 | 29.41 | 12.42 | -- | 0.92 | 3.43 |
| **Gender** | | | | | | |
| Female | 1,274 | 30.34 | 12.08 | 0.14 | 0.92 | 3.45 |
| Male | 1,488 | 28.60 | 12.65 | -- | 0.93 | 3.39 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 18 | 33.61 | 12.62 | -- | -- | -- |
| Asian | 74 | 39.95 | 11.66 | 0.65 | 0.94 | 2.95 |
| Pacific Islander | 7 | 24.14 | 11.42 | -- | -- | -- |
| Black (not Hispanic) | 641 | 21.54 | 9.47 | -0.93 | 0.87 | 3.40 |
| Hispanic | 199 | 26.01 | 10.88 | -0.51 | 0.90 | 3.45 |
| White (not Hispanic) | 1,750 | 32.16 | 12.10 | -- | 0.92 | 3.41 |
| Multi-racial | 73 | 30.62 | 12.79 | -0.13 | 0.93 | 3.39 |
| **LEP** | | | | | | |
| No | 2,669 | 29.74 | 12.41 | -- | 0.92 | 3.43 |
| Yes | 88 | 19.26 | 8.00 | -0.85 | 0.82 | 3.35 |
| **IEP** | | | | | | |
| No | 2,417 | 30.47 | 12.30 | -- | 0.92 | 3.43 |
| Yes | 340 | 21.83 | 10.60 | -0.71 | 0.90 | 3.34 |
| **Migrant** | | | | | | |
| No | 2,756 | 29.41 | 12.43 | -- | 0.92 | 3.43 |
| Yes | 1 | 14.00 | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 1,271 | 36.42 | 10.94 | -- | 0.91 | 3.31 |
| Yes | 1,486 | 23.40 | 10.30 | -1.23 | 0.89 | 3.43 |
| **Title I** | | | | | | |
| No | 2,378 | 30.67 | 12.45 | -- | 0.92 | 3.42 |
| Yes | 379 | 21.45 | 8.80 | -0.77 | 0.85 | 3.39 |
| **Accommodations** | | | | | | |
| No | 2,642 | 29.70 | 12.41 | -- | 0.92 | 3.43 |
| Yes | 120 | 22.84 | 10.80 | -0.56 | 0.91 | 3.31 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.12. Alpha Coefficients and SEMs—English I, Fall 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 656 | 29.42 | 6.99 | -- | 0.85 | 2.66 |
| **Gender** | | | | | | |
| Female | 313 | 30.25 | 6.94 | 0.23 | 0.85 | 2.69 |
| Male | 343 | 28.65 | 6.97 | -- | 0.86 | 2.65 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 6 | 27.33 | 6.98 | -- | -- | -- |
| Asian | 9 | 32.78 | 4.94 | -- | -- | -- |
| Pacific Islander | 3 | 31.33 | 3.79 | -- | -- | -- |
| Black (not Hispanic) | 49 | 25.20 | 8.45 | -- | -- | -- |
| Hispanic | 51 | 26.20 | 7.40 | -0.58 | 0.86 | 2.78 |
| White (not Hispanic) | 523 | 30.07 | 6.65 | -- | 0.85 | 2.61 |
| Multi-racial | 15 | 29.87 | 6.13 | -- | -- | -- |
| **LEP** | | | | | | |
| No | 640 | 29.62 | 6.87 | -- | 0.85 | 2.65 |
| Yes | 16 | 21.06 | 6.81 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 602 | 29.96 | 6.73 | -- | 0.85 | 2.64 |
| Yes | 54 | 23.37 | 7.07 | -0.98 | 0.83 | 2.89 |
| **Migrant** | | | | | | |
| No | 656 | 29.41 | 6.99 | -- | 0.85 | 2.66 |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 437 | 31.28 | 6.11 | -- | 0.83 | 2.50 |
| Yes | 219 | 25.69 | 7.17 | -0.86 | 0.84 | 2.91 |
| **Title I** | | | | | | |
| No | 635 | 29.63 | 6.88 | -- | 0.85 | 2.65 |
| Yes | 21 | 22.81 | 7.26 | -- | -- | -- |
| **Accommodations** | | | | | | |
| No | 626 | 29.71 | 6.88 | -- | 0.85 | 2.65 |
| Yes | 30 | 23.17 | 6.38 | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.13. Alpha Coefficients and SEMs—Algebra II, Fall 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 692 | 25.20 | 7.17 | -- | 0.86 | 2.67 |
| **Gender** | | | | | | |
| Female | 366 | 24.73 | 7.03 | -0.14 | 0.85 | 2.70 |
| Male | 326 | 25.73 | 7.30 | -- | 0.87 | 2.64 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 4 | 23.50 | 4.12 | -- | -- | -- |
| Asian | 27 | 26.81 | 5.97 | -- | -- | -- |
| Pacific Islander | 4 | 18.00 | 8.08 | -- | -- | -- |
| Black (not Hispanic) | 76 | 19.13 | 7.91 | -1.01 | 0.87 | 2.82 |
| Hispanic | 32 | 25.06 | 6.24 | -- | -- | -- |
| White (not Hispanic) | 526 | 26.08 | 6.73 | -- | 0.85 | 2.63 |
| Multi-racial | 23 | 24.91 | 7.24 | -- | -- | -- |
| **LEP** | | | | | | |
| No | 681 | 25.27 | 7.11 | -- | 0.86 | 2.67 |
| Yes | 11 | 20.82 | 9.71 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 678 | 25.28 | 7.10 | -- | 0.86 | 2.67 |
| Yes | 14 | 21.43 | 9.35 | -- | -- | -- |
| **Migrant** | | | | | | |
| No | 692 | 25.20 | 7.17 | -- | 0.86 | 2.67 |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 536 | 25.95 | 7.02 | -- | 0.86 | 2.64 |
| Yes | 156 | 22.63 | 7.08 | -0.47 | 0.85 | 2.78 |
| **Title I** | | | | | | |
| No | 679 | 25.22 | 7.14 | -- | 0.86 | 2.67 |
| Yes | 13 | 24.00 | 8.73 | -- | -- | -- |
| **Accommodations** | | | | | | |
| No | 683 | 25.30 | 7.13 | -- | 0.86 | 2.67 |
| Yes | 9 | 17.22 | 5.78 | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.14. Alpha Coefficients and SEMs—Geometry, Fall 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 674 | 22.97 | 7.08 | -- | 0.85 | 2.74 |
| **Gender** | | | | | | |
| Female | 325 | 22.66 | 7.41 | -0.08 | 0.86 | 2.73 |
| Male | 349 | 23.26 | 6.76 | -- | 0.84 | 2.74 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 3 | 23.00 | 6.24 | -- | -- | -- |
| Asian | 26 | 26.77 | 6.28 | -- | -- | -- |
| Pacific Islander | 4 | 18.75 | 5.85 | -- | -- | -- |
| Black (not Hispanic) | 73 | 19.10 | 6.32 | -0.65 | 0.80 | 2.84 |
| Hispanic | 50 | 21.06 | 6.99 | -0.36 | 0.84 | 2.79 |
| White (not Hispanic) | 492 | 23.57 | 7.02 | -- | 0.85 | 2.72 |
| Multi-racial | 26 | 23.00 | 6.95 | -- | -- | -- |
| **LEP** | | | | | | |
| No | 661 | 23.04 | 7.07 | -- | 0.85 | 2.73 |
| Yes | 13 | 19.38 | 7.07 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 621 | 23.43 | 6.92 | -- | 0.84 | 2.73 |
| Yes | 53 | 17.55 | 6.80 | -0.85 | 0.83 | 2.81 |
| **Migrant** | | | | | | |
| No | 674 | 22.97 | 7.08 | -- | 0.85 | 2.74 |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 497 | 24.01 | 6.99 | -- | 0.85 | 2.71 |
| Yes | 177 | 20.05 | 6.50 | -0.58 | 0.82 | 2.79 |
| **Title I** | | | | | | |
| No | 673 | 22.97 | 7.08 | -- | 0.85 | 2.74 |
| Yes | 1 | 18.00 | -- | -- | -- | -- |
| **Accommodations** | | | | | | |
| No | 630 | 23.35 | 6.97 | -- | 0.85 | 2.73 |
| Yes | 44 | 17.45 | 6.33 | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.15. Alpha Coefficients and SEMs—Government, Fall 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 13,844 | 25.45 | 8.30 | -- | 0.90 | 2.68 |
| **Gender** | | | | | | |
| Female | 6,857 | 25.15 | 8.15 | -0.07 | 0.89 | 2.71 |
| Male | 6,987 | 25.74 | 8.42 | -- | 0.90 | 2.66 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 60 | 24.78 | 8.68 | -0.21 | 0.90 | 2.68 |
| Asian | 384 | 29.43 | 8.21 | 0.37 | 0.91 | 2.43 |
| Pacific Islander | 35 | 21.77 | 8.31 | -- | -- | -- |
| Black (not Hispanic) | 2,628 | 21.66 | 7.93 | -0.60 | 0.87 | 2.83 |
| Hispanic | 720 | 23.35 | 8.04 | -0.39 | 0.88 | 2.79 |
| White (not Hispanic) | 9,709 | 26.46 | 8.06 | -- | 0.89 | 2.64 |
| Multi-racial | 308 | 26.35 | 8.16 | -0.01 | 0.90 | 2.64 |
| **LEP** | | | | | | |
| No | 13,580 | 25.59 | 8.25 | -- | 0.89 | 2.68 |
| Yes | 248 | 17.79 | 7.33 | -0.95 | 0.84 | 2.90 |
| **IEP** | | | | | | |
| No | 12,510 | 26.12 | 8.05 | -- | 0.89 | 2.66 |
| Yes | 1,318 | 19.12 | 7.93 | -0.87 | 0.87 | 2.86 |
| **Migrant** | | | | | | |
| No | 13,827 | 25.45 | 8.30 | -- | 0.90 | 2.68 |
| Yes | 1 | 19.00 | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 7,955 | 27.91 | 7.68 | -- | 0.89 | 2.57 |
| Yes | 5,873 | 22.12 | 7.94 | -0.74 | 0.87 | 2.82 |
| **Title I** | | | | | | |
| No | 13,018 | 25.63 | 8.28 | -- | 0.90 | 2.68 |
| Yes | 810 | 22.51 | 8.09 | -0.38 | 0.88 | 2.81 |
| **Accommodations** | | | | | | |
| No | 13,305 | 25.74 | 8.20 | -- | 0.89 | 2.67 |
| Yes | 539 | 18.26 | 7.24 | -0.92 | 0.84 | 2.91 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.16. Alpha Coefficients and SEMs—American History, Fall 2015**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 465 | 24.57 | 7.18 | -- | 0.86 | 2.73 |
| **Gender** | | | | | | |
| Female | 207 | 23.29 | 6.99 | -0.33 | 0.84 | 2.77 |
| Male | 258 | 25.60 | 7.17 | -- | 0.86 | 2.68 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 2 | 26.00 | 1.41 | -- | -- | -- |
| Asian | 8 | 24.75 | 8.43 | -- | -- | -- |
| Pacific Islander | 4 | 14.75 | 4.57 | -- | -- | -- |
| Black (not Hispanic) | 41 | 21.56 | 7.10 | -- | -- | -- |
| Hispanic | 30 | 23.67 | 6.68 | -- | -- | -- |
| White (not Hispanic) | 370 | 24.96 | 7.12 | -- | 0.86 | 2.70 |
| Multi-racial | 10 | 28.70 | 5.83 | -- | -- | -- |
| **LEP** | | | | | | |
| No | 457 | 24.70 | 7.15 | -- | 0.86 | 2.72 |
| Yes | 8 | 17.38 | 4.69 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 412 | 25.20 | 6.86 | -- | 0.84 | 2.71 |
| Yes | 53 | 19.68 | 7.76 | -0.79 | 0.87 | 2.82 |
| **Migrant** | | | | | | |
| No | 465 | 24.57 | 7.18 | -- | 0.86 | 2.73 |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 317 | 26.00 | 6.84 | -- | 0.85 | 2.67 |
| Yes | 148 | 21.50 | 6.92 | -0.66 | 0.83 | 2.84 |
| **Title I** | | | | | | |
| No | 450 | 24.67 | 7.16 | -- | 0.86 | 2.72 |
| Yes | 15 | 21.53 | 7.19 | -- | -- | -- |
| **Accommodations** | | | | | | |
| No | 431 | 25.01 | 6.94 | -- | 0.85 | 2.72 |
| Yes | 34 | 18.94 | 7.78 | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.17. Alpha Coefficients and SEMs—English II, Spring 2016**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 62,789 | 31.73 | 6.58 | -- | 0.85 | 2.51 |
| **Gender** | | | | | | |
| Female | 31,033 | 32.77 | 6.04 | 0.32 | 0.84 | 2.43 |
| Male | 31,756 | 30.70 | 6.91 | -- | 0.86 | 2.57 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 250 | 31.26 | 6.77 | -0.20 | 0.86 | 2.53 |
| Asian | 1,257 | 33.17 | 6.97 | 0.11 | 0.88 | 2.42 |
| Pacific Islander | 134 | 29.25 | 7.31 | -0.53 | 0.87 | 2.64 |
| Black (not Hispanic) | 9,268 | 27.96 | 7.29 | -0.72 | 0.86 | 2.73 |
| Hispanic | 2,994 | 30.39 | 6.63 | -0.35 | 0.85 | 2.58 |
| White (not Hispanic) | 47,489 | 32.52 | 6.13 | -- | 0.84 | 2.45 |
| Multi-racial | 1,397 | 31.69 | 6.46 | -0.13 | 0.85 | 2.52 |
| **LEP** | | | | | | |
| No | 61,465 | 31.86 | 6.51 | -- | 0.85 | 2.50 |
| Yes | 1,280 | 25.54 | 6.94 | -0.97 | 0.84 | 2.80 |
| **IEP** | | | | | | |
| No | 56,727 | 32.53 | 5.96 | -- | 0.83 | 2.45 |
| Yes | 6,018 | 24.21 | 7.30 | -1.36 | 0.84 | 2.90 |
| **Migrant** | | | | | | |
| No | 62,731 | 31.73 | 6.57 | -- | 0.85 | 2.51 |
| Yes | 14 | 26.43 | 7.75 | -- | -- | -- |
| **FRL** | | | | | | |
| No | 35,210 | 33.54 | 5.57 | -- | 0.82 | 2.38 |
| Yes | 27,535 | 29.41 | 7.02 | -0.66 | 0.86 | 2.65 |
| **Title I** | | | | | | |
| No | 58,775 | 31.98 | 6.46 | -- | 0.85 | 2.49 |
| Yes | 3,970 | 28.02 | 7.19 | -0.61 | 0.86 | 2.71 |
| **Accommodations** | | | | | | |
| No | 58,952 | 32.22 | 6.23 | -- | 0.84 | 2.48 |
| Yes | 3,837 | 24.14 | 7.04 | -1.29 | 0.83 | 2.90 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.18. Alpha Coefficients and SEMs—Algebra I, Spring 2016**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 60,971 | 22.78 | 8.99 | -- | 0.87 | 3.24 |
| **Gender** | | | | | | |
| Female | 30,487 | 22.99 | 8.77 | 0.05 | 0.86 | 3.24 |
| Male | 30,484 | 22.57 | 9.20 | -- | 0.88 | 3.24 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 282 | 20.58 | 8.32 | -0.34 | 0.85 | 3.23 |
| Asian | 1,269 | 29.80 | 9.91 | 0.69 | 0.90 | 3.15 |
| Pacific Islander | 130 | 20.28 | 8.30 | -0.37 | 0.85 | 3.21 |
| Black (not Hispanic) | 9,129 | 18.12 | 7.44 | -0.63 | 0.82 | 3.17 |
| Hispanic | 3,179 | 21.33 | 8.35 | -0.26 | 0.85 | 3.23 |
| White (not Hispanic) | 45,577 | 23.63 | 8.93 | -- | 0.87 | 3.24 |
| Multi-racial | 1,405 | 23.21 | 8.89 | -0.05 | 0.87 | 3.24 |
| **LEP** | | | | | | |
| No | 59,476 | 22.88 | 8.99 | -- | 0.87 | 3.24 |
| Yes | 1,425 | 18.99 | 7.97 | -0.43 | 0.84 | 3.19 |
| **IEP** | | | | | | |
| No | 55,076 | 23.60 | 8.80 | -- | 0.86 | 3.24 |
| Yes | 5,825 | 15.12 | 6.96 | -0.98 | 0.81 | 3.05 |
| **Migrant** | | | | | | |
| No | 60,888 | 22.79 | 8.99 | -- | 0.87 | 3.24 |
| Yes | 13 | 18.69 | 4.19 | -- | -- | -- |
| **FRL** | | | | | | |
| No | 32,395 | 25.50 | 8.95 | -- | 0.87 | 3.23 |
| Yes | 28,506 | 19.71 | 7.98 | -0.68 | 0.84 | 3.21 |
| **Title I** | | | | | | |
| No | 55,551 | 23.14 | 8.99 | -- | 0.87 | 3.24 |
| Yes | 5,350 | 19.17 | 8.17 | -0.44 | 0.85 | 3.20 |
| **Accommodations** | | | | | | |
| No | 57,439 | 23.28 | 8.89 | -- | 0.87 | 3.24 |
| Yes | 3,532 | 14.74 | 6.34 | -0.97 | 0.77 | 3.05 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.19. Alpha Coefficients and SEMs—Biology, Spring 2016**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 61,486 | 34.63 | 10.15 | -- | 0.89 | 3.35 |
| **Gender** | | | | | | |
| Female | 30,640 | 34.74 | 9.93 | 0.02 | 0.89 | 3.34 |
| Male | 30,846 | 34.53 | 10.35 | -- | 0.90 | 3.33 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 238 | 32.76 | 9.78 | -0.34 | 0.88 | 3.37 |
| Asian | 1,224 | 38.74 | 10.64 | 0.28 | 0.91 | 3.15 |
| Pacific Islander | 137 | 30.25 | 10.20 | -0.61 | 0.88 | 3.47 |
| Black (not Hispanic) | 9,094 | 27.73 | 10.04 | -0.86 | 0.88 | 3.49 |
| Hispanic | 2,965 | 32.05 | 9.80 | -0.42 | 0.88 | 3.44 |
| White (not Hispanic) | 46,504 | 36.05 | 9.57 | -- | 0.88 | 3.29 |
| Multi-racial | 1,324 | 34.87 | 9.63 | -0.12 | 0.88 | 3.34 |
| **LEP** | | | | | | |
| No | 60,125 | 34.83 | 10.07 | -- | 0.89 | 3.34 |
| Yes | 1,323 | 25.71 | 9.53 | -0.91 | 0.86 | 3.53 |
| **IEP** | | | | | | |
| No | 55,364 | 35.80 | 9.48 | -- | 0.88 | 3.31 |
| Yes | 6,084 | 24.02 | 9.82 | -1.24 | 0.88 | 3.46 |
| **Migrant** | | | | | | |
| No | 61,439 | 34.64 | 10.14 | -- | 0.89 | 3.34 |
| Yes | 9 | 26.22 | 9.12 | -- | -- | -- |
| **FRL** | | | | | | |
| No | 34,522 | 37.68 | 9.05 | -- | 0.87 | 3.23 |
| Yes | 26,926 | 30.74 | 10.13 | -0.73 | 0.88 | 3.45 |
| **Title I** | | | | | | |
| No | 57,423 | 35.12 | 9.96 | -- | 0.89 | 3.33 |
| Yes | 4,025 | 27.76 | 10.29 | -0.74 | 0.88 | 3.49 |
| **Accommodations** | | | | | | |
| No | 57,785 | 35.33 | 9.78 | -- | 0.88 | 3.32 |
| Yes | 3,701 | 23.68 | 9.41 | -1.19 | 0.86 | 3.47 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.20. Alpha Coefficients and SEMs—English I, Spring 2016**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 15,865 | 28.75 | 6.57 | -- | 0.84 | 2.64 |
| **Gender** | | | | | | |
| Female | 8,003 | 29.64 | 6.26 | 0.27 | 0.83 | 2.58 |
| Male | 7,862 | 27.85 | 6.74 | -- | 0.84 | 2.69 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 98 | 28.56 | 7.07 | -0.09 | 0.84 | 2.80 |
| Asian | 173 | 29.47 | 7.67 | 0.05 | 0.88 | 2.65 |
| Pacific Islander | 28 | 25.32 | 6.70 | -- | -- | -- |
| Black (not Hispanic) | 1,217 | 25.64 | 6.80 | -0.55 | 0.84 | 2.74 |
| Hispanic | 722 | 26.83 | 6.91 | -0.36 | 0.85 | 2.71 |
| White (not Hispanic) | 13,288 | 29.17 | 6.39 | -- | 0.83 | 2.62 |
| Multi-racial | 339 | 27.87 | 7.08 | -0.20 | 0.85 | 2.72 |
| **LEP** | | | | | | |
| No | 15,555 | 28.88 | 6.50 | -- | 0.84 | 2.64 |
| Yes | 295 | 22.10 | 6.71 | -1.04 | 0.82 | 2.86 |
| **IEP** | | | | | | |
| No | 14,550 | 29.36 | 6.20 | -- | 0.82 | 2.61 |
| Yes | 1,300 | 22.01 | 6.75 | -1.18 | 0.81 | 2.92 |
| **Migrant** | | | | | | |
| No | 15,840 | 28.76 | 6.56 | -- | 0.84 | 2.64 |
| Yes | 10 | 18.80 | 6.44 | -- | -- | -- |
| **FRL** | | | | | | |
| No | 7,965 | 30.61 | 5.92 | -- | 0.81 | 2.55 |
| Yes | 7,885 | 26.88 | 6.65 | -0.59 | 0.83 | 2.73 |
| **Title I** | | | | | | |
| No | 14,774 | 28.80 | 6.57 | -- | 0.84 | 2.64 |
| Yes | 1,076 | 28.23 | 6.40 | -0.09 | 0.83 | 2.65 |
| **Accommodations** | | | | | | |
| No | 14,849 | 29.22 | 6.29 | -- | 0.83 | 2.61 |
| Yes | 1,016 | 21.88 | 6.61 | -1.16 | 0.81 | 2.91 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.21. Alpha Coefficients and SEMs—Algebra II, Spring 2016**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 19,791 | 24.76 | 7.46 | -- | 0.87 | 2.70 |
| **Gender** | | | | | | |
| Female | 10,516 | 24.17 | 7.29 | -0.17 | 0.86 | 2.73 |
| Male | 9,275 | 25.42 | 7.59 | -- | 0.88 | 2.66 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 78 | 22.99 | 7.67 | -0.28 | 0.87 | 2.76 |
| Asian | 634 | 29.85 | 6.83 | 0.66 | 0.87 | 2.41 |
| Pacific Islander | 33 | 24.91 | 6.92 | -- | -- | -- |
| Black (not Hispanic) | 1,278 | 20.66 | 7.04 | -0.59 | 0.84 | 2.83 |
| Hispanic | 827 | 22.61 | 7.38 | -0.33 | 0.86 | 2.79 |
| White (not Hispanic) | 16,510 | 25.01 | 7.34 | -- | 0.87 | 2.70 |
| Multi-racial | 431 | 24.19 | 7.53 | -0.11 | 0.87 | 2.73 |
| **LEP** | | | | | | |
| No | 19,561 | 24.80 | 7.45 | -- | 0.87 | 2.70 |
| Yes | 222 | 21.06 | 7.43 | -0.50 | 0.86 | 2.81 |
| **IEP** | | | | | | |
| No | 19,490 | 24.82 | 7.44 | -- | 0.87 | 2.70 |
| Yes | 293 | 20.41 | 7.53 | -0.59 | 0.86 | 2.82 |
| **Migrant** | | | | | | |
| No | 19,782 | 24.76 | 7.46 | -- | 0.87 | 2.70 |
| Yes | 1 | 21.00 | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 14,401 | 25.84 | 7.26 | -- | 0.87 | 2.66 |
| Yes | 5,382 | 21.85 | 7.18 | -0.55 | 0.85 | 2.81 |
| **Title I** | | | | | | |
| No | 19,191 | 24.89 | 7.43 | -- | 0.87 | 2.70 |
| Yes | 592 | 20.38 | 6.83 | -0.61 | 0.83 | 2.83 |
| **Accommodations** | | | | | | |
| No | 19,639 | 24.80 | 7.44 | -- | 0.87 | 2.70 |
| Yes | 152 | 19.26 | 7.12 | -0.74 | 0.84 | 2.85 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.22. Alpha Coefficients and SEMs—Geometry, Spring 2016**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 8,693 | 22.14 | 7.43 | -- | 0.87 | 2.72 |
| **Gender** | | | | | | |
| Female | 4,515 | 21.64 | 7.39 | -0.14 | 0.86 | 2.73 |
| Male | 4,178 | 22.68 | 7.42 | -- | 0.87 | 2.70 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 51 | 21.25 | 6.58 | -0.14 | 0.83 | 2.74 |
| Asian | 184 | 31.38 | 7.21 | 1.26 | 0.90 | 2.23 |
| Pacific Islander | 11 | 15.00 | 5.59 | -- | -- | -- |
| Black (not Hispanic) | 489 | 19.15 | 7.39 | -0.43 | 0.86 | 2.78 |
| Hispanic | 393 | 20.40 | 7.43 | -0.26 | 0.86 | 2.75 |
| White (not Hispanic) | 7,389 | 22.25 | 7.24 | -- | 0.86 | 2.72 |
| Multi-racial | 176 | 20.61 | 7.16 | -0.23 | 0.85 | 2.77 |
| **LEP** | | | | | | |
| No | 8,524 | 22.20 | 7.42 | -- | 0.87 | 2.72 |
| Yes | 165 | 19.31 | 7.13 | -0.39 | 0.85 | 2.79 |
| **IEP** | | | | | | |
| No | 8,297 | 22.43 | 7.32 | -- | 0.86 | 2.72 |
| Yes | 392 | 16.17 | 7.13 | -0.86 | 0.85 | 2.77 |
| **Migrant** | | | | | | |
| No | 8,689 | 22.14 | 7.42 | -- | 0.87 | 2.72 |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 5,222 | 23.49 | 7.47 | -- | 0.87 | 2.69 |
| Yes | 3,467 | 20.11 | 6.88 | -0.47 | 0.84 | 2.77 |
| **Title I** | | | | | | |
| No | 8,271 | 22.20 | 7.47 | -- | 0.87 | 2.72 |
| Yes | 418 | 20.93 | 6.44 | -0.17 | 0.81 | 2.78 |
| **Accommodations** | | | | | | |
| No | 8,408 | 22.39 | 7.34 | -- | 0.86 | 2.72 |
| Yes | 285 | 14.90 | 6.26 | -1.03 | 0.80 | 2.78 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.23. Alpha Coefficients and SEMs—Government, Spring 2016**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 44,480 | 27.06 | 7.62 | -- | 0.88 | 2.62 |
| **Gender** | | | | | | |
| Female | 21,988 | 26.62 | 7.42 | -0.12 | 0.87 | 2.66 |
| Male | 22,492 | 27.50 | 7.79 | -- | 0.89 | 2.58 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 179 | 26.69 | 7.68 | -0.18 | 0.88 | 2.62 |
| Asian | 755 | 28.43 | 7.86 | 0.06 | 0.90 | 2.52 |
| Pacific Islander | 88 | 23.16 | 7.13 | -0.66 | 0.84 | 2.84 |
| Black (not Hispanic) | 6,354 | 22.64 | 7.51 | -0.73 | 0.86 | 2.83 |
| Hispanic | 2,162 | 25.15 | 7.61 | -0.39 | 0.87 | 2.73 |
| White (not Hispanic) | 34,078 | 27.99 | 7.31 | -- | 0.88 | 2.57 |
| Multi-racial | 864 | 26.96 | 7.65 | -0.14 | 0.88 | 2.63 |
| **LEP** | | | | | | |
| No | 43,564 | 27.19 | 7.58 | -- | 0.88 | 2.62 |
| Yes | 891 | 20.90 | 7.02 | -0.83 | 0.83 | 2.89 |
| **IEP** | | | | | | |
| No | 40,149 | 27.85 | 7.21 | -- | 0.87 | 2.59 |
| Yes | 4,306 | 19.77 | 7.50 | -1.12 | 0.85 | 2.89 |
| **Migrant** | | | | | | |
| No | 44,449 | 27.07 | 7.62 | -- | 0.88 | 2.62 |
| Yes | 6 | 20.50 | 5.86 | -- | -- | -- |
| **FRL** | | | | | | |
| No | 25,345 | 29.25 | 6.81 | -- | 0.87 | 2.50 |
| Yes | 19,110 | 24.18 | 7.67 | -0.70 | 0.87 | 2.77 |
| **Title I** | | | | | | |
| No | 41,370 | 27.42 | 7.52 | -- | 0.88 | 2.61 |
| Yes | 3,085 | 22.30 | 7.38 | -0.68 | 0.85 | 2.85 |
| **Accommodations** | | | | | | |
| No | 41,793 | 27.54 | 7.40 | -- | 0.88 | 2.60 |
| Yes | 2,687 | 19.65 | 7.17 | -1.07 | 0.84 | 2.91 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.24. Alpha Coefficients and SEMs—American History, Spring 2016**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 9,155 | 23.11 | 7.07 | -- | 0.85 | 2.78 |
| **Gender** | | | | | | |
| Female | 4,570 | 22.09 | 6.92 | -0.29 | 0.84 | 2.81 |
| Male | 4,585 | 24.12 | 7.06 | -- | 0.85 | 2.74 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 62 | 24.66 | 7.18 | 0.21 | 0.85 | 2.74 |
| Asian | 97 | 25.42 | 6.72 | 0.31 | 0.84 | 2.72 |
| Pacific Islander | 14 | 22.29 | 9.66 | -- | -- | -- |
| Black (not Hispanic) | 387 | 20.57 | 7.45 | -0.37 | 0.86 | 2.82 |
| Hispanic | 265 | 22.60 | 6.97 | -0.09 | 0.84 | 2.81 |
| White (not Hispanic) | 8,161 | 23.21 | 7.03 | -- | 0.84 | 2.78 |
| Multi-racial | 169 | 22.67 | 6.76 | -0.08 | 0.83 | 2.81 |
| **LEP** | | | | | | |
| No | 9,059 | 23.14 | 7.06 | -- | 0.85 | 2.78 |
| Yes | 89 | 19.70 | 6.21 | -0.49 | 0.78 | 2.93 |
| **IEP** | | | | | | |
| No | 8,380 | 23.62 | 6.88 | -- | 0.84 | 2.77 |
| Yes | 768 | 17.52 | 6.57 | -0.89 | 0.81 | 2.89 |
| **Migrant** | | | | | | |
| No | 9,148 | 23.11 | 7.06 | -- | 0.85 | 2.78 |
| Yes | -- | -- | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 5,265 | 24.60 | 6.84 | -- | 0.84 | 2.73 |
| Yes | 3,883 | 21.08 | 6.85 | -0.51 | 0.83 | 2.84 |
| **Title I** | | | | | | |
| No | 8,776 | 23.18 | 7.06 | -- | 0.85 | 2.78 |
| Yes | 372 | 21.32 | 7.03 | -0.26 | 0.84 | 2.84 |
| **Accommodations** | | | | | | |
| No | 8,596 | 23.51 | 6.94 | -- | 0.84 | 2.77 |
| Yes | 559 | 16.93 | 6.04 | -0.96 | 0.77 | 2.92 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.25. Alpha Coefficients and SEMs—Physical Science, Spring 2016**

| Group | N-Count | Mean Raw Score | SD Raw Score | Effect Size | Reliability | SEM |
|---|---|---|---|---|---|---|
| **All Students** | 4,728 | 20.20 | 6.40 | -- | 0.78 | 2.99 |
| **Gender** | | | | | | |
| Female | 2,293 | 19.63 | 6.07 | -0.17 | 0.75 | 3.01 |
| Male | 2,435 | 20.74 | 6.66 | -- | 0.80 | 2.96 |
| **Ethnicity** | | | | | | |
| American Indian/Alaskan Native | 25 | 18.92 | 7.05 | -- | -- | -- |
| Asian | 31 | 21.03 | 6.74 | -- | -- | -- |
| Pacific Islander | 3 | 19.33 | 5.13 | -- | -- | -- |
| Black (not Hispanic) | 187 | 16.81 | 5.49 | -0.56 | 0.70 | 3.02 |
| Hispanic | 139 | 19.09 | 5.88 | -0.21 | 0.74 | 3.01 |
| White (not Hispanic) | 4,235 | 20.40 | 6.41 | -- | 0.78 | 2.98 |
| Multi-racial | 108 | 19.86 | 6.28 | -0.08 | 0.77 | 3.00 |
| **LEP** | | | | | | |
| No | 4,686 | 20.24 | 6.40 | -- | 0.78 | 2.99 |
| Yes | 39 | 16.87 | 5.50 | -- | -- | -- |
| **IEP** | | | | | | |
| No | 4,295 | 20.63 | 6.37 | -- | 0.78 | 2.98 |
| Yes | 430 | 15.96 | 5.04 | -0.75 | 0.64 | 3.02 |
| **Migrant** | | | | | | |
| No | 4,724 | 20.21 | 6.40 | -- | 0.78 | 2.99 |
| Yes | 1 | 15.00 | -- | -- | -- | -- |
| **FRL** | | | | | | |
| No | 2,436 | 21.71 | 6.54 | -- | 0.80 | 2.96 |
| Yes | 2,289 | 18.61 | 5.85 | -0.50 | 0.73 | 3.01 |
| **Title I** | | | | | | |
| No | 4,446 | 20.31 | 6.46 | -- | 0.79 | 2.99 |
| Yes | 279 | 18.59 | 5.22 | -0.27 | 0.67 | 3.01 |
| **Accommodations** | | | | | | |
| No | 4,454 | 20.50 | 6.38 | -- | 0.78 | 2.98 |
| Yes | 274 | 15.41 | 4.64 | -0.81 | 0.58 | 3.01 |

#### *10.2.1.3. Interpretation Considerations*

The SEM approach only provides a single numerical estimate for constructing confidence intervals for examinees regardless of their score level. In reality, such confidence intervals vary according to a student's score. Consequently, care should be taken using the SEM for students with extreme scores. Because test reliabilities and standard deviations are group specific, the same is true for SEMs and CIs. For the MO EOC, the SEM approach is calculated using raw scores, and as such, the resulting confidence interval bands are in the raw-score metric.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

### *10.2.2. Conditional Standard Error of Measurement (CSEM) for Scale Scores*

#### *10.2.2.1. CSEMs and Conditional CIs*

Rasch-based CSEMs are also used for the MO EOC assessments. CSEMs also allow statements regarding the precision of individual test scores by helping derive reasonable limits around observed scaled scores through construction of approximate score bands, referred to as conditional confidence intervals (CIs). Any given test will have CSEMs that vary as a function of the scaled scores. This makes the CSEM especially useful in characterizing measurement precision around a score level used for decision making, such as a cut score used for identifying students who meet a given performance standard.

MO EOC CSEMs come from the Winsteps program and are based on the principle of statistical information. The CSEM at any given point on the ability (θ, theta) continuum is defined as the reciprocal of the square root of the test information function derived from the Rasch scaling model. In the formula, $CSEM(\hat{\theta})$ is the conditional standard error of measurement, and $I(\hat{\theta})$ is the test information function:

$$CSEM(\theta) = \frac{1}{\sqrt{I(\theta)}}.$$

Test information depends on the sum of the corresponding information functions for the test items. Item information depends on each item's unique conditional item score variance as determined from its difficulty parameters and conditional item score variance. The formula provides the CSEMs on the Rasch ability (θ) metric.

#### *10.2.2.2. CSEMs at the Proficient Cut*

CSEMs are 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 10.26. The CSEM values were between 5 and 7 scale-score points for English II, Algebra I, Biology, English I, Geometry, and Government and between 8 and 9 scale-score points for Algebra II, American History, and Physical Science. CSEMs for the other scale scores are reported in Appendix D. 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).

**Table 10.26. CSEMs at the Proficient Cut Score**

| Test Period | Content Area | SS Cut* | CSEM |
|---|---|---|---|
| Summer 2015 | English II | 200 | 5 |
| | Algebra I | 200 | 7 |
| | Biology | 200 | 6 |
| | English I | 200 | 6 |
| | Algebra II | 200 | 8 |
| | Geometry | 200 | 7 |
| | Government | 200 | 6 |
| | Am. History | 200 | 9 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Test Period | Content Area | SS Cut* | CSEM |
|---|---|---|---|
| Fall 2015 | English II | 200 | 6 |
| | Algebra I | 200 | 7 |
| | Biology | 200 | 6 |
| | English I | 200 | 6 |
| | Algebra II | 200 | 8 |
| | Geometry | 200 | 7 |
| | Government | 200 | 7 |
| | Am. History | 200 | 9 |
| Spring 2016 | English II | 200 | 5 |
| | Algebra I | 200 | 7 |
| | Biology | 200 | 6 |
| | English I | 200 | 6 |
| | Algebra II | 200 | 8 |
| | Geometry | 200 | 7 |
| | Government | 200 | 7 |
| | Am. History | 200 | 9 |
| | Physical Science | 200 | 8 |

*See Appendix D for the CSEM at each scale score.

### *10.2.3. Classification Accuracy and Consistency*

In accountability testing programs, there is great interest in knowing how accurately students are classified into performance categories. Tables 10.27 and 10.28 illustrate the decision tables for two and four performance levels, respectively. The proportion of consistent decisions, φ, is computed by taking the sum of the diagonal entries, which indicate the proportion of students classified into the same performance level by the two forms. The results presented in this section show that, overall, the classification accuracy and consistency statistics provide additional support that the MO EOC Assessments have good measurement precision and sound psychometric properties.

**Table 10.27. Decision Table for Two Performance Levels**

| | | Test One | | |
|---|---|---|---|---|
| | | **Level I** | **Level II** | **Marginal** |
| **Test Two** | **Level I** | $\phi_{11}$ | $\phi_{12}$ | $\phi_{1\bullet}$ |
| | **Level II** | $\phi_{21}$ | $\phi_{22}$ | $\phi_{2\bullet}$ |
| | **Marginal** | $\phi_{\bullet 1}$ | $\phi_{\bullet 2}$ | 1 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.28. Decision Table for Four Performance Levels**

| | | Test One | | | | |
|---|---|---|---|---|---|---|
| | | **Level I** | **Level II** | **Level III** | **Level IV** | **Marginal** |
| **Test Two** | **Level I** | $\phi_{11}$ | $\phi_{12}$ | $\phi_{13}$ | $\phi 1_4$ | $\phi_{1\bullet}$ |
| | **Level II** | $\phi_{21}$ | $\phi_{22}$ | $\phi_{23}$ | $\phi_{24}$ | $\phi_{2\bullet}$ |
| | **Level I** | $\phi_{31}$ | $\phi_{32}$ | $\phi_{33}$ | $\phi_{34}$ | $\phi_{3\bullet}$ |
| | **Level II** | $\phi_{41}$ | $\phi_{42}$ | $\phi_{43}$ | $\phi_{44}$ | $\phi_{4\bullet}$ |
| | **Marginal** | $\phi_{\bullet 1}$ | $\phi_{\bullet 2}$ | $\phi_{\bullet 3}$ | $\phi_{\bullet 4}$ | 1 |

The proportions of consistent decisions, φ, for two and four categories are computed by the following two formulas, respectively:

$$\varphi = \varphi_{11} + \varphi_{22}$$

$$\varphi = \varphi_{11} + \varphi_{22} + \varphi_{33} + \varphi_{44}$$

The method used for estimating the reliability of performance-level classification decisions as described by Livingston and Lewis (1995) provides estimates of classification accuracy and classification consistency. Classification accuracy describes the extent to which examinees are classified in the same way as they would be on the basis of the average of all possible forms of a test. Classification consistency describes the extent to which examinees are classified in the same way as they would be on the basis of a single form of a test other than the one for which data are available. Questar used the BB-CLASS software program (Brennan, 2004a) to compute the results.

For classification accuracy, the Livingston and Lewis procedure compares the actual observed score distribution with the true score distribution predicted from the model (Brennan, 2004b). In the classification accuracy tables, the rows represent category true scores and columns represent expected observed scores for the categories under the model. The probability of a correct classification is the sum of the diagonal. The false negative rate is calculated from the sum of the lower off-diagonal values, while the false positive rate is calculated from the sum of the upper off-diagonal values.

For classification consistency, the Livingston and Lewis procedure compares the actual observed score distribution with the observed score distribution for an alternate form predicted from the model. In the classification consistency tables, the rows and columns represent the expected observed scores for categories in the model. Three indices are provided: the proportion of consistent decisions, the chance proportion of decisions, and kappa.

*10.2.3.1. Classification Accuracy Results*

The results in Tables 10.29 – 10.31 show the classification accuracy for two performance levels (Below Basic and Basic vs. Proficient and Advanced) for each MO EOC Assessment by administration. The probability of correct classification results show the estimates were 0.88 or higher. The results in Tables 10.32 – 10.34 show the classification accuracy for four performance


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

levels (Below Basic, Basic, Proficient, Advanced) for each MO EOC Assessment by administration. The probability of correct classification estimates ranged from 0.68 for the Algebra II Summer 2015 results to 0.82 for the Physical Science Spring 2016 results. As expected, the higher number of performance levels result in lower consistency because there is more opportunity for misclassification.

**Table 10.29. Classification Accuracy Coefficients for Two Classifications—Summer 2015**

| Content Area | Classification | Below Basic + Basic | Proficient + Advanced | Marginal | Prob. of Correct Classification |
|---|---|---|---|---|---|
| English II | Below Basic + Basic | 0.5951 | 0.0569 | 0.6520 | 0.8979 |
| | Proficient + Advanced | 0.0451 | 0.3028 | 0.3479 | |
| | Marginal | 0.6402 | 0.3597 | 1.0000 | |
| Algebra I | Below Basic + Basic | 0.4607 | 0.0640 | 0.5247 | 0.8853 |
| | Proficient + Advanced | 0.0506 | 0.4246 | 0.4752 | |
| | Marginal | 0.5113 | 0.4886 | 1.0000 | |
| Biology | Below Basic + Basic | 0.5605 | 0.0541 | 0.6146 | 0.8995 |
| | Proficient + Advanced | 0.0463 | 0.3391 | 0.3854 | |
| | Marginal | 0.6068 | 0.3932 | 1.0000 | |
| English I | Below Basic + Basic | 0.5352 | 0.0653 | 0.6004 | 0.8823 |
| | Proficient + Advanced | 0.0525 | 0.3471 | 0.3996 | |
| | Marginal | 0.5877 | 0.4124 | 1.0000 | |
| Algebra I | Below Basic + Basic | 0.4755 | 0.0667 | 0.5422 | 0.8917 |
| | Proficient + Advanced | 0.0416 | 0.4162 | 0.4578 | |
| | Marginal | 0.5171 | 0.4829 | 1.0000 | |
| Geometry | Below Basic + Basic | 0.5805 | 0.0655 | 0.6460 | 0.8810 |
| | Proficient + Advanced | 0.0535 | 0.3005 | 0.3541 | |
| | Marginal | 0.6340 | 0.3660 | 1.0000 | |
| Government | Below Basic + Basic | 0.4568 | 0.0407 | 0.4975 | 0.9245 |
| | Proficient + Advanced | 0.0348 | 0.4677 | 0.5025 | |
| | Marginal | 0.4916 | 0.5084 | 1.0000 | |
| Am. History | Below Basic + Basic | 0.4328 | 0.0583 | 0.4911 | 0.8896 |
| | Proficient + Advanced | 0.0522 | 0.4568 | 0.5089 | |
| | Marginal | 0.4850 | 0.5150 | 1.0000 | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.30. Classification Accuracy Coefficients for Two Classifications—Fall 2015**

| Content Area | Classification | Below Basic + Basic | Proficient + Advanced | Marginal | Prob. of Correct Classification |
|---|---|---|---|---|---|
| English II | Below Basic + Basic | 0.5290 | 0.0526 | 0.5816 | 0.9020 |
| | Proficient + Advanced | 0.0454 | 0.3730 | 0.4184 | |
| | Marginal | 0.5744 | 0.4256 | 1.0000 | |
| Algebra I | Below Basic + Basic | 0.5394 | 0.0478 | 0.5872 | 0.9146 |
| | Proficient + Advanced | 0.0376 | 0.3753 | 0.4128 | |
| | Marginal | 0.5769 | 0.4231 | 1.0000 | |
| Biology | Below Basic + Basic | 0.5200 | 0.0418 | 0.5618 | 0.9217 |
| | Proficient + Advanced | 0.0365 | 0.4017 | 0.4382 | |
| | Marginal | 0.5566 | 0.4434 | 1.0000 | |
| English I | Below Basic + Basic | 0.2835 | 0.0524 | 0.3358 | 0.8857 |
| | Proficient + Advanced | 0.0619 | 0.6022 | 0.6642 | |
| | Marginal | 0.3454 | 0.6546 | 1.0000 | |
| Algebra I | Below Basic + Basic | 0.2485 | 0.0531 | 0.3016 | 0.8952 |
| | Proficient + Advanced | 0.0517 | 0.6467 | 0.6984 | |
| | Marginal | 0.3002 | 0.6998 | 1.0000 | |
| Geometry | Below Basic + Basic | 0.3628 | 0.0699 | 0.4326 | 0.8772 |
| | Proficient + Advanced | 0.0529 | 0.5144 | 0.5674 | |
| | Marginal | 0.4157 | 0.5843 | 1.0000 | |
| Government | Below Basic + Basic | 0.4184 | 0.0481 | 0.4665 | 0.9100 |
| | Proficient + Advanced | 0.0419 | 0.4916 | 0.5335 | |
| | Marginal | 0.4603 | 0.5397 | 1.0000 | |
| Am. History | Below Basic + Basic | 0.4108 | 0.0575 | 0.4683 | 0.8939 |
| | Proficient + Advanced | 0.0486 | 0.4831 | 0.5317 | |
| | Marginal | 0.4594 | 0.5406 | 1.0000 | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.31. Classification Accuracy Coefficients for Two Classifications—Spring 2016**

| Content Area | Classification | Below Basic + Basic | Proficient + Advanced | Marginal | Prob. of Correct Classification |
|---|---|---|---|---|---|
| English II | Below Basic + Basic | 0.1750 | 0.0378 | 0.2128 | 0.9083 |
| | Proficient + Advanced | 0.0539 | 0.7333 | 0.7872 | |
| | Marginal | 0.2289 | 0.7711 | 1.0000 | |
| Algebra I | Below Basic + Basic | 0.3304 | 0.0581 | 0.3884 | 0.8897 |
| | Proficient + Advanced | 0.0523 | 0.5593 | 0.6116 | |
| | Marginal | 0.3826 | 0.6174 | 1.0000 | |
| Biology | Below Basic + Basic | 0.3035 | 0.0472 | 0.3507 | 0.9041 |
| | Proficient + Advanced | 0.0487 | 0.6006 | 0.6493 | |
| | Marginal | 0.3522 | 0.6478 | 1.0000 | |
| English I | Below Basic + Basic | 0.3189 | 0.0584 | 0.3772 | 0.8772 |
| | Proficient + Advanced | 0.0645 | 0.5583 | 0.6228 | |
| | Marginal | 0.3833 | 0.6167 | 1.0000 | |
| Algebra I | Below Basic + Basic | 0.3136 | 0.0588 | 0.3723 | 0.8933 |
| | Proficient + Advanced | 0.0479 | 0.5797 | 0.6277 | |
| | Marginal | 0.3615 | 0.6385 | 1.0000 | |
| Geometry | Below Basic + Basic | 0.4255 | 0.0623 | 0.4878 | 0.8923 |
| | Proficient + Advanced | 0.0454 | 0.4668 | 0.5122 | |
| | Marginal | 0.4710 | 0.5291 | 1.0000 | |
| Government | Below Basic + Basic | 0.3676 | 0.0550 | 0.4226 | 0.8976 |
| | Proficient + Advanced | 0.0473 | 0.5301 | 0.5774 | |
| | Marginal | 0.4149 | 0.5851 | 1.0000 | |
| Am. History | Below Basic + Basic | 0.4906 | 0.0594 | 0.5500 | 0.8932 |
| | Proficient + Advanced | 0.0474 | 0.4026 | 0.4500 | |
| | Marginal | 0.5381 | 0.4619 | 1.0000 | |
| Physical Science | Below Basic + Basic | 0.7055 | 0.0569 | 0.7624 | 0.9095 |
| | Proficient + Advanced | 0.0335 | 0.2040 | 0.2376 | |
| | Marginal | 0.7390 | 0.2609 | 1.0000 | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.32. Classification Accuracy Coefficients for Four Classifications—Summer 2015**

| Content Area | Classification | Below Basic | Basic | Proficient | Advanced | Marginal | Prob. of Correct Classification |
|---|---|---|---|---|---|---|---|
| English II | Below Basic | 0.1738 | 0.0400 | 0.0000 | 0.0000 | 0.2138 | 0.7902 |
| | Basic | 0.0535 | 0.3279 | 0.0569 | 0.0000 | 0.4382 | |
| | Proficient | 0.0000 | 0.0451 | 0.2744 | 0.0104 | 0.3299 | |
| | Advanced | 0.0000 | 0.0000 | 0.0040 | 0.0141 | 0.0181 | |
| | Marginal | 0.2273 | 0.4129 | 0.3352 | 0.0245 | 1.0000 | |
| Algebra I | Below Basic | 0.1749 | 0.0589 | 0.0027 | 0.0000 | 0.2365 | 0.7200 |
| | Basic | 0.0634 | 0.1636 | 0.0613 | 0.0000 | 0.2883 | |
| | Proficient | 0.0019 | 0.0487 | 0.2974 | 0.0276 | 0.3756 | |
| | Advanced | 0.0000 | 0.0000 | 0.0155 | 0.0842 | 0.0997 | |
| | Marginal | 0.2402 | 0.2712 | 0.3769 | 0.1117 | 1.0000 | |
| Biology | Below Basic | 0.1578 | 0.0312 | 0.0000 | 0.0000 | 0.1890 | 0.7978 |
| | Basic | 0.0439 | 0.3277 | 0.0541 | 0.0000 | 0.4256 | |
| | Proficient | 0.0000 | 0.0463 | 0.2824 | 0.0187 | 0.3474 | |
| | Advanced | 0.0000 | 0.0000 | 0.0080 | 0.0300 | 0.0380 | |
| | Marginal | 0.2017 | 0.4051 | 0.3445 | 0.0487 | 1.0000 | |
| English I | Below Basic | 0.1006 | 0.0344 | 0.0001 | 0.0000 | 0.1350 | 0.7677 |
| | Basic | 0.0561 | 0.3441 | 0.0652 | 0.0000 | 0.4654 | |
| | Proficient | 0.0001 | 0.0524 | 0.2979 | 0.0172 | 0.3676 | |
| | Advanced | 0.0000 | 0.0000 | 0.0069 | 0.0251 | 0.0320 | |
| | Marginal | 0.1568 | 0.4309 | 0.3701 | 0.0423 | 1.0000 | |
| Algebra I | Below Basic | 0.1981 | 0.0922 | 0.0102 | 0.0000 | 0.3006 | 0.6810 |
| | Basic | 0.0656 | 0.1195 | 0.0564 | 0.0001 | 0.2416 | |
| | Proficient | 0.0034 | 0.0382 | 0.1933 | 0.0317 | 0.2666 | |
| | Advanced | 0.0000 | 0.0000 | 0.0212 | 0.1701 | 0.1912 | |
| | Marginal | 0.2671 | 0.2500 | 0.2810 | 0.2019 | 1.0000 | |
| Geometry | Below Basic | 0.3647 | 0.0519 | 0.0062 | 0.0000 | 0.4228 | 0.7435 |
| | Basic | 0.0579 | 0.1060 | 0.0593 | 0.0000 | 0.2231 | |
| | Proficient | 0.0053 | 0.0482 | 0.2554 | 0.0213 | 0.3302 | |
| | Advanced | 0.0000 | 0.0000 | 0.0064 | 0.0175 | 0.0239 | |
| | Marginal | 0.4279 | 0.2061 | 0.3272 | 0.0388 | 1.0000 | |
| Government | Below Basic | 0.1564 | 0.0465 | 0.0001 | 0.0000 | 0.2030 | 0.7849 |
| | Basic | 0.0444 | 0.2096 | 0.0406 | 0.0000 | 0.2946 | |
| | Proficient | 0.0001 | 0.0348 | 0.2318 | 0.0281 | 0.2947 | |
| | Advanced | 0.0000 | 0.0000 | 0.0206 | 0.1871 | 0.2078 | |
| | Marginal | 0.2009 | 0.2908 | 0.2931 | 0.2152 | 1.0000 | |
| Am. History | Below Basic | 0.1906 | 0.0439 | 0.0019 | 0.0000 | 0.2364 | 0.7221 |
| | Basic | 0.0527 | 0.1456 | 0.0562 | 0.0002 | 0.2547 | |
| | Proficient | 0.0017 | 0.0504 | 0.2449 | 0.0443 | 0.3414 | |
| | Advanced | 0.0000 | 0.0000 | 0.0266 | 0.1409 | 0.1676 | |
| | Marginal | 0.2451 | 0.2399 | 0.3296 | 0.1854 | 1.0000 | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.33. Classification Accuracy Coefficients for Four Classifications—Fall 2015**

| Content Area | Classification | Below Basic | Basic | Proficient | Advanced | Marginal | Prob. of Correct Classification |
|---|---|---|---|---|---|---|---|
| English II | Below Basic | 0.1927 | 0.0386 | 0.0001 | 0.0000 | 0.2314 | 0.7839 |
| | Basic | 0.0484 | 0.2494 | 0.0525 | 0.0000 | 0.3503 | |
| | Proficient | 0.0001 | 0.0453 | 0.2959 | 0.0208 | 0.3620 | |
| | Advanced | 0.0000 | 0.0000 | 0.0104 | 0.0459 | 0.0563 | |
| | Marginal | 0.2412 | 0.3332 | 0.3589 | 0.0667 | 1.0000 | |
| Algebra I | Below Basic | 0.3250 | 0.0563 | 0.0029 | 0.0000 | 0.3842 | 0.7692 |
| | Basic | 0.0474 | 0.1107 | 0.0449 | 0.0000 | 0.2030 | |
| | Proficient | 0.0018 | 0.0357 | 0.2217 | 0.0254 | 0.2846 | |
| | Advanced | 0.0000 | 0.0000 | 0.0164 | 0.1119 | 0.1282 | |
| | Marginal | 0.3742 | 0.2027 | 0.2858 | 0.1373 | 1.0000 | |
| Biology | Below Basic | 0.2040 | 0.0367 | 0.0000 | 0.0000 | 0.2407 | 0.8002 |
| | Basic | 0.0409 | 0.2384 | 0.0417 | 0.0000 | 0.3210 | |
| | Proficient | 0.0000 | 0.0365 | 0.2408 | 0.0265 | 0.3039 | |
| | Advanced | 0.0000 | 0.0000 | 0.0175 | 0.1169 | 0.1344 | |
| | Marginal | 0.2450 | 0.3116 | 0.3000 | 0.1434 | 1.0000 | |
| English I | Below Basic | 0.0458 | 0.0134 | 0.0000 | 0.0000 | 0.0592 | 0.7757 |
| | Basic | 0.0282 | 0.1961 | 0.0523 | 0.0000 | 0.2766 | |
| | Proficient | 0.0001 | 0.0618 | 0.4478 | 0.0458 | 0.5555 | |
| | Advanced | 0.0000 | 0.0000 | 0.0226 | 0.0861 | 0.1087 | |
| | Marginal | 0.0742 | 0.2712 | 0.5227 | 0.1319 | 1.0000 | |
| Algebra I | Below Basic | 0.0814 | 0.0324 | 0.0041 | 0.0000 | 0.1179 | 0.7267 |
| | Basic | 0.0462 | 0.0885 | 0.0489 | 0.0002 | 0.1837 | |
| | Proficient | 0.0045 | 0.0471 | 0.2617 | 0.0519 | 0.3653 | |
| | Advanced | 0.0000 | 0.0000 | 0.0381 | 0.2951 | 0.3332 | |
| | Marginal | 0.1321 | 0.1681 | 0.3527 | 0.3471 | 1.0000 | |
| Geometry | Below Basic | 0.1303 | 0.0580 | 0.0085 | 0.0000 | 0.1968 | 0.6946 |
| | Basic | 0.0643 | 0.1102 | 0.0614 | 0.0000 | 0.2359 | |
| | Proficient | 0.0055 | 0.0474 | 0.2927 | 0.0368 | 0.3824 | |
| | Advanced | 0.0000 | 0.0000 | 0.0236 | 0.1614 | 0.1850 | |
| | Marginal | 0.2001 | 0.2156 | 0.3862 | 0.1981 | 1.0000 | |
| Government | Below Basic | 0.0989 | 0.0390 | 0.0001 | 0.0000 | 0.1380 | 0.7679 |
| | Basic | 0.0482 | 0.2324 | 0.0480 | 0.0000 | 0.3285 | |
| | Proficient | 0.0001 | 0.0418 | 0.2695 | 0.0325 | 0.3439 | |
| | Advanced | 0.0000 | 0.0000 | 0.0224 | 0.1672 | 0.1896 | |
| | Marginal | 0.1472 | 0.3132 | 0.3400 | 0.1997 | 1.0000 | |
| Am. History | Below Basic | 0.1666 | 0.0514 | 0.0026 | 0.0000 | 0.2207 | 0.7156 |
| | Basic | 0.0547 | 0.1380 | 0.0547 | 0.0002 | 0.2477 | |
| | Proficient | 0.0020 | 0.0466 | 0.2216 | 0.0435 | 0.3137 | |
| | Advanced | 0.0000 | 0.0000 | 0.0287 | 0.1893 | 0.2180 | |
| | Marginal | 0.2233 | 0.2361 | 0.3076 | 0.2330 | 1.0000 | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.34. Classification Accuracy Coefficients for Four Classifications—Spring 2016**

| Content Area | Classification | Below Basic | Basic | Proficient | Advanced | Marginal | Prob. of Correct Classification |
|---|---|---|---|---|---|---|---|
| English II | Below Basic | 0.0194 | 0.0061 | 0.0000 | 0.0000 | 0.0255 | 0.8092 |
| | Basic | 0.0154 | 0.1341 | 0.0378 | 0.0000 | 0.1872 | |
| | Proficient | 0.0001 | 0.0539 | 0.5518 | 0.0508 | 0.6565 | |
| | Advanced | 0.0000 | 0.0000 | 0.0268 | 0.1039 | 0.1307 | |
| | Marginal | 0.0349 | 0.1940 | 0.6164 | 0.1547 | 1.0000 | |
| Algebra I | Below Basic | 0.0997 | 0.0401 | 0.0023 | 0.0000 | 0.1421 | 0.7333 |
| | Basic | 0.0537 | 0.1368 | 0.0558 | 0.0000 | 0.2463 | |
| | Proficient | 0.0022 | 0.0500 | 0.3340 | 0.0380 | 0.4242 | |
| | Advanced | 0.0000 | 0.0000 | 0.0247 | 0.1628 | 0.1874 | |
| | Marginal | 0.1557 | 0.2269 | 0.4167 | 0.2007 | 1.0000 | |
| Biology | Below Basic | 0.0336 | 0.0140 | 0.0000 | 0.0000 | 0.0476 | 0.7919 |
| | Basic | 0.0293 | 0.2266 | 0.0472 | 0.0000 | 0.3031 | |
| | Proficient | 0.0000 | 0.0487 | 0.3566 | 0.0413 | 0.4465 | |
| | Advanced | 0.0000 | 0.0000 | 0.0277 | 0.1751 | 0.2028 | |
| | Marginal | 0.0629 | 0.2893 | 0.4314 | 0.2164 | 1.0000 | |
| English I | Below Basic | 0.0386 | 0.0130 | 0.0000 | 0.0000 | 0.0517 | 0.7832 |
| | Basic | 0.0301 | 0.2371 | 0.0583 | 0.0000 | 0.3256 | |
| | Proficient | 0.0001 | 0.0644 | 0.4520 | 0.0354 | 0.5519 | |
| | Advanced | 0.0000 | 0.0000 | 0.0155 | 0.0554 | 0.0709 | |
| | Marginal | 0.0688 | 0.3145 | 0.5259 | 0.0908 | 1.0000 | |
| Algebra I | Below Basic | 0.1070 | 0.0481 | 0.0057 | 0.0000 | 0.1607 | 0.7173 |
| | Basic | 0.0544 | 0.1041 | 0.0530 | 0.0001 | 0.2116 | |
| | Proficient | 0.0039 | 0.0441 | 0.2386 | 0.0428 | 0.3292 | |
| | Advanced | 0.0000 | 0.0000 | 0.0308 | 0.2676 | 0.2984 | |
| | Marginal | 0.1652 | 0.1963 | 0.3280 | 0.3105 | 1.0000 | |
| Geometry | Below Basic | 0.1973 | 0.0686 | 0.0082 | 0.0000 | 0.2741 | 0.7142 |
| | Basic | 0.0575 | 0.1021 | 0.0541 | 0.0000 | 0.2137 | |
| | Proficient | 0.0043 | 0.0411 | 0.2590 | 0.0312 | 0.3356 | |
| | Advanced | 0.0000 | 0.0000 | 0.0208 | 0.1558 | 0.1766 | |
| | Marginal | 0.2591 | 0.2118 | 0.3420 | 0.1871 | 1.0000 | |
| Government | Below Basic | 0.0419 | 0.0274 | 0.0002 | 0.0000 | 0.0696 | 0.7522 |
| | Basic | 0.0552 | 0.2430 | 0.0548 | 0.0000 | 0.3530 | |
| | Proficient | 0.0002 | 0.0471 | 0.2822 | 0.0374 | 0.3669 | |
| | Advanced | 0.0000 | 0.0000 | 0.0254 | 0.1851 | 0.2105 | |
| | Marginal | 0.0974 | 0.3176 | 0.3626 | 0.2225 | 1.0000 | |
| Am. History | Below Basic | 0.2220 | 0.0589 | 0.0025 | 0.0000 | 0.2834 | 0.7150 |
| | Basic | 0.0585 | 0.1512 | 0.0567 | 0.0002 | 0.2666 | |
| | Proficient | 0.0018 | 0.0457 | 0.2138 | 0.0380 | 0.2992 | |
| | Advanced | 0.0000 | 0.0000 | 0.0227 | 0.1280 | 0.1507 | |
| | Marginal | 0.2823 | 0.2558 | 0.2957 | 0.1662 | 1.0000 | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Content Area | Classification | Below Basic | Basic | Proficient | Advanced | Marginal | Prob. of Correct Classification |
|---|---|---|---|---|---|---|---|
| Physical Science | Below Basic | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.8181 |
| | Basic | 0.0697 | 0.6359 | 0.0569 | 0.0000 | 0.7624 | |
| | Proficient | 0.0000 | 0.0335 | 0.1516 | 0.0149 | 0.2000 | |
| | Advanced | 0.0000 | 0.0000 | 0.0069 | 0.0307 | 0.0376 | |
| | Marginal | 0.0697 | 0.6694 | 0.2154 | 0.0456 | 1.0000 | |

*10.2.3.2. Classification Consistency Results*

Tables 10.35 – 10.37 display the classification consistency for two performance levels (Below Basic and Basic vs. Proficient and Advanced) for each MO EOC Assessment by administration. The proportions of consistent decisions are 0.83 or higher across the content areas and administrations. The chance proportions of consistent decision classification were in the 0.50 to 0.60 range, with the exception of the Spring 2016 Physical Science and English II assessments that were 0.61 and 0.65, respectively. Since there are only two classifications, the chance of correctly classifying students is quite high. All kappa values were 0.63 or higher.

Tables 10.38 – 10.40 display the classification consistency results for four performance levels (Below Basic, Basic, Proficient, Advanced) for each MO EOC Assessment by administration. The proportions of consistent decision classification ranged from 0.58 to 0.73. With four performance levels, the chance proportions of consistent decisions were lower, with most in the 0.2 to 0.4 range. All kappa values were 0.44 or higher. Consistent with the classification accuracy results, the results for the two performance levels demonstrated greater precision in classifying students compared to the results for the four performance levels because there is greater opportunity for misclassification.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.35. Classification Consistency Coefficients for Two Classifications—Summer 2015**

| Content Area | Classification | Below Basic + Basic | Proficient + Advanced | Marginal | Prob. of Consistent Decisions | Chance Prob. Of Consistent Decisions | Kappa |
|---|---|---|---|---|---|---|---|
| English II | Below Basic + Basic | 0.5686 | 0.0717 | 0.6403 | 0.8567 | 0.5394 | 0.6889 |
| | Proficient + Advanced | 0.0717 | 0.2881 | 0.3598 | | | |
| | Marginal | 0.6403 | 0.3598 | 1.0000 | | | |
| Algebra I | Below Basic + Basic | 0.4306 | 0.0808 | 0.5114 | 0.8384 | 0.5003 | 0.6766 |
| | Proficient + Advanced | 0.0808 | 0.4078 | 0.4886 | | | |
| | Marginal | 0.5114 | 0.4886 | 1.0000 | | | |
| Biology | Below Basic + Basic | 0.5364 | 0.0705 | 0.6068 | 0.8591 | 0.5228 | 0.7047 |
| | Proficient + Advanced | 0.0705 | 0.3228 | 0.3932 | | | |
| | Marginal | 0.6068 | 0.3932 | 1.0000 | | | |
| English I | Below Basic + Basic | 0.5051 | 0.0825 | 0.5877 | 0.8349 | 0.5154 | 0.6594 |
| | Proficient + Advanced | 0.0825 | 0.3298 | 0.4123 | | | |
| | Marginal | 0.5877 | 0.4123 | 1.0000 | | | |
| Algebra I | Below Basic + Basic | 0.4389 | 0.0782 | 0.5171 | 0.8436 | 0.5006 | 0.6868 |
| | Proficient + Advanced | 0.0782 | 0.4047 | 0.4829 | | | |
| | Marginal | 0.5171 | 0.4829 | 1.0000 | | | |
| Geometry | Below Basic + Basic | 0.5509 | 0.0831 | 0.6341 | 0.8338 | 0.5359 | 0.6418 |
| | Proficient + Advanced | 0.0831 | 0.2829 | 0.3660 | | | |
| | Marginal | 0.6341 | 0.3660 | 1.0000 | | | |
| Government | Below Basic + Basic | 0.4383 | 0.0534 | 0.4916 | 0.8933 | 0.5001 | 0.7865 |
| | Proficient + Advanced | 0.0534 | 0.4550 | 0.5084 | | | |
| | Marginal | 0.4916 | 0.5084 | 1.0000 | | | |
| Am. History | Below Basic + Basic | 0.4075 | 0.0775 | 0.4850 | 0.8451 | 0.5005 | 0.6899 |
| | Proficient + Advanced | 0.0775 | 0.4376 | 0.5150 | | | |
| | Marginal | 0.4850 | 0.5150 | 1.0000 | | | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.36. Classification Consistency Coefficients for Two Classifications—Fall 2015**

| Content Area | Classification | Below Basic + Basic | Proficient + Advanced | Marginal | Prob. of Consistent Decisions | Chance Prob. Of Consistent Decisions | Kappa |
|---|---|---|---|---|---|---|---|
| English II | Below Basic + Basic | 0.5056 | 0.0688 | 0.5744 | 0.8624 | 0.5111 | 0.7186 |
| | Proficient + Advanced | 0.0688 | 0.3568 | 0.4256 | | | |
| | Marginal | 0.5744 | 0.4256 | 1.0000 | | | |
| Algebra I | Below Basic + Basic | 0.5165 | 0.0604 | 0.5769 | 0.8792 | 0.5118 | 0.7525 |
| | Proficient + Advanced | 0.0604 | 0.3627 | 0.4231 | | | |
| | Marginal | 0.5769 | 0.4231 | 1.0000 | | | |
| Biology | Below Basic + Basic | 0.5014 | 0.0552 | 0.5566 | 0.8896 | 0.5064 | 0.7764 |
| | Proficient + Advanced | 0.0552 | 0.3883 | 0.4434 | | | |
| | Marginal | 0.5566 | 0.4434 | 1.0000 | | | |
| English I | Below Basic + Basic | 0.2655 | 0.0799 | 0.3454 | 0.8401 | 0.5478 | 0.6465 |
| | Proficient + Advanced | 0.0799 | 0.5747 | 0.6546 | | | |
| | Marginal | 0.3454 | 0.6546 | 1.0000 | | | |
| Algebra I | Below Basic + Basic | 0.2266 | 0.0735 | 0.3002 | 0.8529 | 0.5790 | 0.6499 |
| | Proficient + Advanced | 0.0735 | 0.6263 | 0.6998 | | | |
| | Marginal | 0.3002 | 0.6998 | 1.0000 | | | |
| Geometry | Below Basic + Basic | 0.3288 | 0.0869 | 0.4157 | 0.8263 | 0.5142 | 0.6423 |
| | Proficient + Advanced | 0.0869 | 0.4975 | 0.5843 | | | |
| | Marginal | 0.4157 | 0.5843 | 1.0000 | | | |
| Government | Below Basic + Basic | 0.3969 | 0.0634 | 0.4603 | 0.8731 | 0.5032 | 0.7447 |
| | Proficient + Advanced | 0.0634 | 0.4762 | 0.5397 | | | |
| | Marginal | 0.4603 | 0.5397 | 1.0000 | | | |
| Am. History | Below Basic + Basic | 0.3847 | 0.0748 | 0.4595 | 0.8504 | 0.5033 | 0.6989 |
| | Proficient + Advanced | 0.0748 | 0.4658 | 0.5406 | | | |
| | Marginal | 0.4595 | 0.5406 | 1.0000 | | | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.37. Classification Consistency Coefficients for Two Classifications—Spring 2016**

| Content Area | Classification | Below Basic + Basic | Proficient + Advanced | Marginal | Prob. of Consistent Decisions | Chance Prob. Of Consistent Decisions | Kappa |
|---|---|---|---|---|---|---|---|
| English II | Below Basic + Basic | 0.1644 | 0.0645 | 0.2289 | 0.8710 | 0.6470 | 0.6346 |
| | Proficient + Advanced | 0.0645 | 0.7066 | 0.7711 | | | |
| | Marginal | 0.2289 | 0.7711 | 1.0000 | | | |
| Algebra I | Below Basic + Basic | 0.3051 | 0.0775 | 0.3826 | 0.8442 | 0.5276 | 0.6720 |
| | Proficient + Advanced | 0.0775 | 0.5391 | 0.6166 | | | |
| | Marginal | 0.3826 | 0.6166 | 1.0000 | | | |
| Biology | Below Basic + Basic | 0.2849 | 0.0673 | 0.3522 | 0.8654 | 0.5437 | 0.7051 |
| | Proficient + Advanced | 0.0673 | 0.5805 | 0.6478 | | | |
| | Marginal | 0.3522 | 0.6478 | 1.0000 | | | |
| English I | Below Basic + Basic | 0.2976 | 0.0857 | 0.3833 | 0.8286 | 0.5272 | 0.6374 |
| | Proficient + Advanced | 0.0857 | 0.5310 | 0.6167 | | | |
| | Marginal | 0.3833 | 0.6167 | 1.0000 | | | |
| Algebra I | Below Basic + Basic | 0.2860 | 0.0755 | 0.3615 | 0.8491 | 0.5384 | 0.6730 |
| | Proficient + Advanced | 0.0755 | 0.5630 | 0.6385 | | | |
| | Marginal | 0.3615 | 0.6385 | 1.0000 | | | |
| Geometry | Below Basic + Basic | 0.3943 | 0.0766 | 0.4710 | 0.8468 | 0.5017 | 0.6925 |
| | Proficient + Advanced | 0.0766 | 0.4524 | 0.5291 | | | |
| | Marginal | 0.4710 | 0.5291 | 1.0000 | | | |
| Government | Below Basic + Basic | 0.3428 | 0.0722 | 0.4149 | 0.8557 | 0.5145 | 0.7028 |
| | Proficient + Advanced | 0.0722 | 0.5130 | 0.5851 | | | |
| | Marginal | 0.4149 | 0.5851 | 1.0000 | | | |
| Am. History | Below Basic + Basic | 0.4628 | 0.0753 | 0.5381 | 0.8494 | 0.5029 | 0.6971 |
| | Proficient + Advanced | 0.0753 | 0.3866 | 0.4619 | | | |
| | Marginal | 0.5381 | 0.4619 | 1.0000 | | | |
| Physical Science | Below Basic + Basic | 0.6743 | 0.0648 | 0.7391 | 0.8705 | 0.6143 | 0.6642 |
| | Proficient + Advanced | 0.0648 | 0.1962 | 0.2610 | | | |
| | Marginal | 0.7391 | 0.2610 | 1.0000 | | | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.38. Classification Consistency Coefficients for Four Classifications—Summer 2015**

| Content Area | Classification | Below Basic | Basic | Proficient | Advanced | Marginal | Prob. of Consistent Decisions | Chance Prob. Of Consistent Decisions | Kappa |
|---|---|---|---|---|---|---|---|---|---|
| English II | Below Basic | 0.1618 | 0.0645 | 0.0010 | 0.0000 | 0.2273 | 0.7068 | 0.3352 | 0.5589 |
| | Basic | 0.0645 | 0.2778 | 0.0707 | 0.0000 | 0.4129 | | | |
| | Proficient | 0.0010 | 0.0707 | 0.2531 | 0.0105 | 0.3352 | | | |
| | Advanced | 0.0000 | 0.0000 | 0.0105 | 0.0140 | 0.0245 | | | |
| | Marginal | 0.2273 | 0.4129 | 0.3352 | 0.0245 | 1.0000 | | | |
| Algebra I | Below Basic | 0.1527 | 0.0762 | 0.0113 | 0.0000 | 0.2402 | 0.6249 | 0.2858 | 0.4747 |
| | Basic | 0.0762 | 0.1254 | 0.0694 | 0.0001 | 0.2712 | | | |
| | Proficient | 0.0113 | 0.0694 | 0.2658 | 0.0305 | 0.3769 | | | |
| | Advanced | 0.0000 | 0.0001 | 0.0305 | 0.0810 | 0.1117 | | | |
| | Marginal | 0.2402 | 0.2712 | 0.3769 | 0.1117 | 1.0000 | | | |
| Biology | Below Basic | 0.1488 | 0.0524 | 0.0005 | 0.0000 | 0.2017 | 0.7159 | 0.3259 | 0.5786 |
| | Basic | 0.0524 | 0.2828 | 0.0699 | 0.0001 | 0.4051 | | | |
| | Proficient | 0.0005 | 0.0699 | 0.2549 | 0.0192 | 0.3445 | | | |
| | Advanced | 0.0000 | 0.0001 | 0.0192 | 0.0294 | 0.0487 | | | |
| | Marginal | 0.2017 | 0.4051 | 0.3445 | 0.0487 | 1.0000 | | | |
| English I | Below Basic | 0.0935 | 0.0619 | 0.0014 | 0.0000 | 0.1568 | 0.6763 | 0.3490 | 0.5027 |
| | Basic | 0.0619 | 0.2878 | 0.0811 | 0.0001 | 0.4309 | | | |
| | Proficient | 0.0014 | 0.0811 | 0.2702 | 0.0174 | 0.3701 | | | |
| | Advanced | 0.0000 | 0.0001 | 0.0174 | 0.0248 | 0.0423 | | | |
| | Marginal | 0.1568 | 0.4309 | 0.3701 | 0.0423 | 1.0000 | | | |
| Algebra I | Below Basic | 0.1541 | 0.0929 | 0.0200 | 0.0001 | 0.2671 | 0.5844 | 0.2536 | 0.4432 |
| | Basic | 0.0929 | 0.0990 | 0.0572 | 0.0009 | 0.2500 | | | |
| | Proficient | 0.0200 | 0.0572 | 0.1671 | 0.0367 | 0.2810 | | | |
| | Advanced | 0.0001 | 0.0009 | 0.0367 | 0.1643 | 0.2019 | | | |
| | Marginal | 0.2671 | 0.2500 | 0.2810 | 0.2019 | 1.0000 | | | |
| Geometry | Below Basic | 0.3432 | 0.0653 | 0.0194 | 0.0000 | 0.4279 | 0.6633 | 0.3342 | 0.4943 |
| | Basic | 0.0653 | 0.0772 | 0.0634 | 0.0003 | 0.2061 | | | |
| | Proficient | 0.0194 | 0.0634 | 0.2245 | 0.0200 | 0.3272 | | | |
| | Advanced | 0.0000 | 0.0003 | 0.0200 | 0.0185 | 0.0388 | | | |
| | Marginal | 0.4279 | 0.2061 | 0.3272 | 0.0388 | 1.0000 | | | |
| Gov't | Below Basic | 0.1373 | 0.0622 | 0.0014 | 0.0000 | 0.2009 | 0.7003 | 0.2572 | 0.5966 |
| | Basic | 0.0622 | 0.1767 | 0.0518 | 0.0001 | 0.2908 | | | |
| | Proficient | 0.0014 | 0.0518 | 0.2056 | 0.0343 | 0.2931 | | | |
| | Advanced | 0.0000 | 0.0001 | 0.0343 | 0.1808 | 0.2152 | | | |
| | Marginal | 0.2009 | 0.2908 | 0.2931 | 0.2152 | 1.0000 | | | |
| Am. History | Below Basic | 0.1750 | 0.0607 | 0.0094 | 0.0000 | 0.2451 | 0.6263 | 0.2606 | 0.4946 |
| | Basic | 0.0607 | 0.1112 | 0.0665 | 0.0015 | 0.2399 | | | |
| | Proficient | 0.0094 | 0.0665 | 0.2050 | 0.0487 | 0.3296 | | | |
| | Advanced | 0.0000 | 0.0015 | 0.0487 | 0.1352 | 0.1854 | | | |
| | Marginal | 0.2451 | 0.2399 | 0.3296 | 0.1854 | 1.0000 | | | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.39. Classification Consistency Coefficients for Four Classifications—Fall 2015**

| Content Area | Classification | Below Basic | Basic | Proficient | Advanced | Marginal | Prob. of Consistent Decisions | Chance Prob. Of Consistent Decisions | Kappa |
|---|---|---|---|---|---|---|---|---|---|
| English II | Below Basic | 0.1800 | 0.0594 | 0.0018 | 0.0000 | 0.2412 | 0.6992 | 0.3024 | 0.5688 |
| | Basic | 0.0594 | 0.2069 | 0.0670 | 0.0000 | 0.3332 | | | |
| | Proficient | 0.0018 | 0.0670 | 0.2679 | 0.0223 | 0.3589 | | | |
| | Advanced | 0.0000 | 0.0000 | 0.0223 | 0.0444 | 0.0667 | | | |
| | Marginal | 0.2412 | 0.3332 | 0.3589 | 0.0667 | 1.0000 | | | |
| Algebra I | Below Basic | 0.2977 | 0.0666 | 0.0100 | 0.0000 | 0.3742 | 0.6872 | 0.2817 | 0.5646 |
| | Basic | 0.0666 | 0.0857 | 0.0502 | 0.0002 | 0.2027 | | | |
| | Proficient | 0.0100 | 0.0502 | 0.1962 | 0.0294 | 0.2858 | | | |
| | Advanced | 0.0000 | 0.0002 | 0.0294 | 0.1077 | 0.1373 | | | |
| | Marginal | 0.3742 | 0.2027 | 0.2858 | 0.1373 | 1.0000 | | | |
| Biology | Below Basic | 0.1904 | 0.0538 | 0.0008 | 0.0000 | 0.2450 | 0.7200 | 0.2677 | 0.6177 |
| | Basic | 0.0538 | 0.2033 | 0.0543 | 0.0001 | 0.3116 | | | |
| | Proficient | 0.0008 | 0.0543 | 0.2140 | 0.0310 | 0.3000 | | | |
| | Advanced | 0.0000 | 0.0001 | 0.0310 | 0.1123 | 0.1434 | | | |
| | Marginal | 0.2450 | 0.3116 | 0.3000 | 0.1434 | 1.0000 | | | |
| English I | Below Basic | 0.0442 | 0.0285 | 0.0014 | 0.0000 | 0.0742 | 0.6863 | 0.3697 | 0.5024 |
| | Basic | 0.0285 | 0.1642 | 0.0784 | 0.0002 | 0.2712 | | | |
| | Proficient | 0.0014 | 0.0784 | 0.3946 | 0.0484 | 0.5227 | | | |
| | Advanced | 0.0000 | 0.0002 | 0.0484 | 0.0833 | 0.1319 | | | |
| | Marginal | 0.0742 | 0.2712 | 0.5227 | 0.1319 | 1.0000 | | | |
| Algebra I | Below Basic | 0.0722 | 0.0448 | 0.0149 | 0.0001 | 0.1321 | 0.6395 | 0.2906 | 0.4918 |
| | Basic | 0.0448 | 0.0647 | 0.0570 | 0.0015 | 0.1681 | | | |
| | Proficient | 0.0149 | 0.0570 | 0.2189 | 0.0619 | 0.3527 | | | |
| | Advanced | 0.0001 | 0.0015 | 0.0619 | 0.2836 | 0.3471 | | | |
| | Marginal | 0.1321 | 0.1681 | 0.3527 | 0.3471 | 1.0000 | | | |
| Geometry | Below Basic | 0.1091 | 0.0689 | 0.0221 | 0.0000 | 0.2001 | 0.6036 | 0.2749 | 0.4533 |
| | Basic | 0.0689 | 0.0819 | 0.0644 | 0.0004 | 0.2156 | | | |
| | Proficient | 0.0221 | 0.0644 | 0.2573 | 0.0424 | 0.3862 | | | |
| | Advanced | 0.0000 | 0.0004 | 0.0424 | 0.1553 | 0.1981 | | | |
| | Marginal | 0.2001 | 0.2156 | 0.3862 | 0.1981 | 1.0000 | | | |
| Gov't | Below Basic | 0.0869 | 0.0585 | 0.0018 | 0.0000 | 0.1472 | 0.6789 | 0.2752 | 0.5570 |
| | Basic | 0.0585 | 0.1931 | 0.0614 | 0.0002 | 0.3132 | | | |
| | Proficient | 0.0018 | 0.0614 | 0.2381 | 0.0387 | 0.3400 | | | |
| | Advanced | 0.0000 | 0.0002 | 0.0387 | 0.1609 | 0.1997 | | | |
| | Marginal | 0.1472 | 0.3132 | 0.3400 | 0.1997 | 1.0000 | | | |
| Am. History | Below Basic | 0.1464 | 0.0663 | 0.0106 | 0.0001 | 0.2233 | 0.6191 | 0.2545 | 0.4891 |
| | Basic | 0.0663 | 0.1057 | 0.0624 | 0.0017 | 0.2361 | | | |
| | Proficient | 0.0106 | 0.0624 | 0.1852 | 0.0494 | 0.3076 | | | |
| | Advanced | 0.0001 | 0.0017 | 0.0494 | 0.1819 | 0.2330 | | | |
| | Marginal | 0.2233 | 0.2361 | 0.3076 | 0.2330 | 1.0000 | | | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 10.40. Classification Consistency Coefficients for Four Classifications—Spring 2016**

| Content Area | Classification | Below Basic | Basic | Proficient | Advanced | Marginal | Prob. of Consistent Decisions | Chance Prob. Of Consistent Decisions | Kappa |
|---|---|---|---|---|---|---|---|---|---|
| English II | Below Basic | 0.0192 | 0.0150 | 0.0007 | 0.0000 | 0.0349 | 0.7313 | 0.4427 | 0.5179 |
| | Basic | 0.0150 | 0.1152 | 0.0637 | 0.0000 | 0.1940 | | | |
| | Proficient | 0.0007 | 0.0637 | 0.4971 | 0.0549 | 0.6164 | | | |
| | Advanced | 0.0000 | 0.0000 | 0.0549 | 0.0998 | 0.1547 | | | |
| | Marginal | 0.0349 | 0.1940 | 0.6164 | 0.1547 | 1.0000 | | | |
| Algebra I | Below Basic | 0.0881 | 0.0568 | 0.0107 | 0.0000 | 0.1557 | 0.6432 | 0.2896 | 0.4977 |
| | Basic | 0.0568 | 0.1033 | 0.0666 | 0.0002 | 0.2269 | | | |
| | Proficient | 0.0107 | 0.0666 | 0.2953 | 0.0441 | 0.4167 | | | |
| | Advanced | 0.0000 | 0.0002 | 0.0441 | 0.1564 | 0.2007 | | | |
| | Marginal | 0.1557 | 0.2269 | 0.4167 | 0.2007 | 1.0000 | | | |
| Biology | Below Basic | 0.0323 | 0.0300 | 0.0007 | 0.0000 | 0.0629 | 0.7086 | 0.3206 | 0.5710 |
| | Basic | 0.0300 | 0.1927 | 0.0665 | 0.0002 | 0.2893 | | | |
| | Proficient | 0.0007 | 0.0665 | 0.3158 | 0.0485 | 0.4314 | | | |
| | Advanced | 0.0000 | 0.0002 | 0.0485 | 0.1677 | 0.2164 | | | |
| | Marginal | 0.0629 | 0.2893 | 0.4314 | 0.2164 | 1.0000 | | | |
| English I | Below Basic | 0.0378 | 0.0300 | 0.0011 | 0.0000 | 0.0688 | 0.6960 | 0.3884 | 0.5029 |
| | Basic | 0.0300 | 0.1999 | 0.0845 | 0.0001 | 0.3145 | | | |
| | Proficient | 0.0011 | 0.0845 | 0.4039 | 0.0363 | 0.5259 | | | |
| | Advanced | 0.0000 | 0.0001 | 0.0363 | 0.0544 | 0.0908 | | | |
| | Marginal | 0.0688 | 0.3145 | 0.5259 | 0.0908 | 1.0000 | | | |
| Algebra I | Below Basic | 0.0900 | 0.0589 | 0.0163 | 0.0001 | 0.1652 | 0.6296 | 0.2698 | 0.4927 |
| | Basic | 0.0589 | 0.0783 | 0.0580 | 0.0011 | 0.1963 | | | |
| | Proficient | 0.0163 | 0.0580 | 0.2029 | 0.0509 | 0.3280 | | | |
| | Advanced | 0.0001 | 0.0011 | 0.0509 | 0.2585 | 0.3105 | | | |
| | Marginal | 0.1652 | 0.1963 | 0.3280 | 0.3105 | 1.0000 | | | |
| Geometry | Below Basic | 0.1641 | 0.0756 | 0.0194 | 0.0000 | 0.2591 | 0.6223 | 0.2640 | 0.4868 |
| | Basic | 0.0756 | 0.0790 | 0.0570 | 0.0003 | 0.2118 | | | |
| | Proficient | 0.0194 | 0.0570 | 0.2290 | 0.0366 | 0.3420 | | | |
| | Advanced | 0.0000 | 0.0003 | 0.0366 | 0.1502 | 0.1871 | | | |
| | Marginal | 0.2591 | 0.2118 | 0.3420 | 0.1871 | 1.0000 | | | |
| Gov't | Below Basic | 0.0418 | 0.0529 | 0.0028 | 0.0000 | 0.0974 | 0.6618 | 0.2913 | 0.5228 |
| | Basic | 0.0529 | 0.1953 | 0.0690 | 0.0004 | 0.3176 | | | |
| | Proficient | 0.0028 | 0.0690 | 0.2467 | 0.0441 | 0.3626 | | | |
| | Advanced | 0.0000 | 0.0004 | 0.0441 | 0.1780 | 0.2225 | | | |
| | Marginal | 0.0974 | 0.3176 | 0.3626 | 0.2225 | 1.0000 | | | |
| Am. History | Below Basic | 0.1974 | 0.0745 | 0.0104 | 0.0000 | 0.2823 | 0.6170 | 0.2602 | 0.4822 |
| | Basic | 0.0745 | 0.1165 | 0.0635 | 0.0014 | 0.2558 | | | |
| | Proficient | 0.0104 | 0.0635 | 0.1801 | 0.0418 | 0.2957 | | | |
| | Advanced | 0.0000 | 0.0014 | 0.0418 | 0.1230 | 0.1662 | | | |
| | Marginal | 0.2823 | 0.2558 | 0.2957 | 0.1662 | 1.0000 | | | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Content Area | Classification | Below Basic | Basic | Proficient | Advanced | Marginal | Prob. of Consistent Decisions | Chance Prob. Of Consistent Decisions | Kappa |
|---|---|---|---|---|---|---|---|---|---|
| Physical Science | Below Basic | 0.0124 | 0.0569 | 0.0004 | 0.0000 | 0.0697 | 0.7258 | 0.5014 | 0.4501 |
| | Basic | 0.0569 | 0.5482 | 0.0641 | 0.0003 | 0.6694 | | | |
| | Proficient | 0.0004 | 0.0641 | 0.1354 | 0.0155 | 0.2154 | | | |
| | Advanced | 0.0000 | 0.0003 | 0.0155 | 0.0299 | 0.0456 | | | |
| | Marginal | 0.0697 | 0.6694 | 0.2154 | 0.0456 | 1.0000 | | | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Chapter 11: Validity

## 11.1. Introduction

Validity is the most fundamental consideration in educational and psychological testing. It refers to "the degree to which evidence and theory support the interpretations of test scores for proposed uses of tests" (AERA, APA, & NCME, 2014, p. 11). According to the Standards,

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

This chapter summarizes the validity evidence as it relates to the purpose and intended use of the MO EOC test results (refer to Section 1.3 of this technical report). It begins with validity evidence related to test content in terms of the adequacy and appropriateness of the MO EOC Assessments for measuring progress on the Missouri Learning Standards. Validity evidence based on the internal structure of the MO EOC Assessments is then provided through a correlational analysis of MO EOC Assessment content clusters. References to specific standards are provided where appropriate.

While this chapter summarizes evidence that supports claims about the validity and uses of the MO EOC Assessment scores, this entire technical report provides evidence related to the validity argument. Some of this evidence is cross-referenced. The procedural and empirical evidence available, along with the rationale presented in this chapter, provide support for the standards-based interpretations of the MO EOC Assessments.

Since test forms used in the 2015–2016 testing year were intact forms that had been previously administered, relevant information documented in previous technical reports is included in this chapter to provide historical information and to assist with the construction of the validity argument for the MO EOC Assessment scores.

## 11.2. Validity Evidence

### *11.2.1. Content 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 address Standard 4,12[11], which specifically relates to the definition and development of test content.

[11] **Standard 4.12:** Test developers should document the extent to which the content domain of a test represents the domain defined in the test specifications. (p. 89).



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

*11.2.1.1. 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.

*11.2.1.2. Adequacy of Content Representation*

Adequacy of the content representation of the MO EOC Assessments is important because the tests must provide an indication of student progress toward achieving the knowledge and skills identified in the Missouri Learning Standards and they must fulfill the requirements of the Every Student Succeeds Act (ESSA).

The MO EOC Assessments assess students' progress toward the Missouri Learning Standards, which are Missouri's content standards. Adequate representation of the content domains defined in the content standards is assured through the use of a test blueprint and a documented test construction process. The content standards were taken into consideration in the writing of SR items. 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. Specific efforts to ensure content validity are summarized below.

- Items were developed to include a wide array of contexts and cultures.
- Detailed test and item/passage development specifications were established; tests included sufficient numbers of items; and items were adequately distributed across content, levels of cognitive complexity, and difficulty.
- Qualified item writers were provided training.
- Each newly developed item was first reviewed by content specialists and editors to make sure that all items were aligned with the content standards. Appropriateness for the intended grade was also considered, as well as depth of knowledge, graphics, grammar/punctuation, language demand, and distractor reasonableness.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

- Missouri teachers from diverse ethnic and geographical backgrounds reviewed the items to ensure all items were accessible to as many students as possible.
- Missouri teachers were trained to create clear and simple instructions.
- Content and bias review committees reviewed the items following specific criteria.

Additional evidence to support the content validity of the MO EOC Assessments was provided in Chapter 2. Chapter 2 outlined the target strand and content standard point distributions on the English II, Algebra I, Biology, English I, Algebra II, Geometry, Government, American History and Physical Science operational forms.

*11.2.1.3. Summary of Alignment Studies*

Each assessment must align with and proportionally represent the subdomains of the test blueprint. Following development of all MO EOC Assessments prior to 2014–2015, 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 review at http://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials.

To summarize, the alignment studies evaluated whether the assessments represent the full range of content standards and measure student knowledge in the manner and at the level of complexity specified by the content standards. Both studies investigated alignment for English II, Algebra I and Biology.

The first study evaluated the alignment of a single form for the Spring and Summer 2009 Assessments (Taylor, Webb, Koger, Koger, & Thacker, 2009). The results indicated that the forms were fully aligned for most criteria. All content area tests fell short of achieving the cognitive complexity specified in the standards on one or both forms. In addition, the Biology forms were partially aligned for the range of knowledge that is represented on the form.

The second study evaluated the alignment of a single form for the Fall 2009, Summer 2010, and Spring 2011 assessments (Taylor, Campbell, Deatz, Dvorak, Koger, & Thacker, 2011). The results indicated that the 2009 forms were partially or fully aligned to the standards for all criteria. When considering the multiple-choice items only, the Biology forms were partially aligned for all criteria. The Algebra I forms were fully aligned for all criteria with the exception of partial alignment for DOK on two of the three forms. The English II forms were partially aligned for all criterial with the exception of weak alignment for DOK on two of the three forms.

*11.2.2. Internal Structure*

The item analyses shown in Appendix C revealed that the MO EOC Assessments have sound psychometric properties. The *p*-value ranges were sufficiently broad, indicating that the items measure achievement across a broad range of difficulty. Item-test correlations, indicators of item discrimination, are also provided. Almost all items had acceptable discrimination values (i.e., discrimination values > 0.15). Some extremely difficult items had low discrimination values that were likely attenuated by their difficulty.

Empirical investigation of DIF strengthens the validity evidence related to score interpretations for students in particular groups by evaluating potential sources of construct-irrelevant variance.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

DIF results might be better considered as internal—structure validity evidence. Statistical analyses results are provided in Chapter 4. The results indicated that none of the PE/WP items were flagged for DIF and that either no or very few SR items were flagged for DIF across subjects and administrations.

Standard 1.13[12] 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.

Tables 11.1 – 11.8 summarize correlation coefficients among test domains and clusters for English II, Algebra I, Biology, Algebra II, Geometry, Government, and Physical Science.[13] Because the correlation coefficients will be affected by the limited number of items measuring each domain, the correlation coefficient between two content standard clusters may be artificially low because of measurement error. Therefore, the correlations are corrected for attenuation. The formula for the correlation coefficient statistically corrected for attenuation ($r_{ca}$) is Spearman's formula

$$r_{ca} = \frac{r_{xy}}{\sqrt{r_{xx} r_{yy}}}$$

Where $r_{xy}$ is the correlation between content clusters, $r_{xx}$ is the reliability of one content cluster, and $r_{yy}$ is the reliability of the other content cluster.

The tables report the Pearson correlations below the diagonal, the correlations corrected for attenuation above the diagonal, and Cronbach's coefficient alpha of the cluster scores on the diagonal in bolded text.

The corrected correlations between clusters within each assessment are strong (> 0.70), with many correlations approaching or exceeding 0.90. The corrected correlations for the English Reading and Writing clusters tended to be lower (within the 0.60 to 0.70 range). The uncorrected correlations were observed to be in the moderate (0.30 to 0.70) to strong range, indicating the expected relationships between the clusters.

These results suggest that the cluster scores are appropriately related to each other. Each content area test is comprised of two or more content clusters measuring a single construct or dimension. Evidence is provided that a unidimensional construct is measured on each of the MO EOC Assessments supporting the validity of the test construct.

[12] **Standard 1.13:** If the rationale for a test score interpretation for a given use depends on premises about the relationships among test items or among parts of the test, evidence concerning the internal structure of the test should be provided (p. 26–270).

[13] Because American History has only one content cluster, correlation coefficients were not calculated.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 11.1. Correlation Coefficients Between Domains and Clusters—English II**

| | | #Points | Reading | Writing |
|---|---|---|---|---|
| Summer 2015 | Reading | 35 | **0.83** | 0.71 |
| | Writing | 10 | 0.61 | **0.88** |
| Fall 2015 | Reading | 35 | **0.86** | 0.69 |
| | Writing | 10 | 0.61 | **0.91** |
| Spring 2016 | Reading | 35 | **0.83** | 0.61 |
| | Writing | 10 | 0.51 | **0.81** |

**Table 11.2. Correlation Coefficients Between Domains and Clusters—Algebra I**

| | | #Points | Number and Quantity | Algebra | Functions | Statistics and Probability |
|---|---|---|---|---|---|---|
| Summer 2015 | Number and Quantity | 3 | **0.25** | 0.92 | 0.81 | 0.79 |
| | Algebra | 27 | 0.39 | **0.72** | 1.01 | 0.96 |
| | Functions | 15 | 0.33 | 0.70 | **0.66** | 1.01 |
| | Statistics and Probability | 5 | 0.28 | 0.58 | 0.58 | **0.50** |
| Fall 2015 | Number and Quantity | 3 | **0.46** | 0.81 | 0.76 | 0.76 |
| | Algebra | 23 | 0.48 | **0.78** | 0.99 | 0.97 |
| | Functions | 19 | 0.44 | 0.76 | **0.75** | 1.05 |
| | Statistics and Probability | 5 | 0.33 | 0.55 | 0.59 | **0.41** |
| Spring 2016 | Number and Quantity | 3 | **0.37** | 0.86 | 0.82 | 0.75 |
| | Algebra | 27 | 0.46 | **0.76** | 0.99 | 0.93 |
| | Functions | 15 | 0.41 | 0.72 | **0.69** | 0.97 |
| | Statistics and Probability | 5 | 0.33 | 0.58 | 0.58 | **0.51** |

**Table 11.3. Correlation Coefficients Between Domains and Clusters—Biology**

| | | #Points | Characteristics and Interactions | Changes in Ecosystems | Scientific Inquiry |
|---|---|---|---|---|---|
| Summer 2015 | Characteristics and Interactions | 22 | **0.68** | 0.95 | 0.87 |
| | Changes in Ecosystems | 13 | 0.69 | **0.79** | 0.78 |
| | Scientific Inquiry | 20 | 0.64 | 0.62 | **0.80** |
| Fall 2015 | Characteristics and Interactions | 22 | **0.81** | 0.93 | 0.91 |
| | Changes in Ecosystems | 13 | 0.75 | **0.80** | 0.91 |
| | Scientific Inquiry | 20 | 0.75 | 0.74 | **0.84** |
| Spring 2016 | Characteristics and Interactions | 22 | **0.79** | 0.90 | 0.86 |
| | Changes in Ecosystems | 13 | 0.68 | **0.72** | 0.86 |
| | Scientific Inquiry | 20 | 0.67 | 0.63 | **0.76** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 11.4. Correlation Coefficients Between Domains and Clusters—Algebra II**

| | | #Points | Algebra | Functions |
|---|---|---|---|---|
| Summer 2015 | Algebra | 16 | **0.67** | 0.90 |
| | Functions | 24 | 0.66 | **0.80** |
| Fall 2015 | Algebra | 18 | **0.76** | 0.91 |
| | Functions | 22 | 0.70 | **0.77** |
| Spring 2016 | Algebra | 16 | **0.74** | 0.92 |
| | Functions | 24 | 0.71 | **0.80** |

**Table 11.5. Correlation Coefficients Between Domains and Clusters—English I**

| | | #Points | Reading | Writing |
|---|---|---|---|---|
| Summer 2015 | Reading | 35 | **0.81** | 0.58 |
| | Writing | 10 | 0.47 | **0.82** |
| Fall 2015 | Reading | 35 | **0.83** | 0.71 |
| | Writing | 10 | 0.58 | **0.82** |
| Spring 2016 | Reading | 35 | **0.81** | 0.63 |
| | Writing | 10 | 0.51 | **0.80** |

**Table 11.6. Correlation Coefficients Between Domains and Clusters—Geometry**

| | | #Points | Geometry | Statistics and Probability |
|---|---|---|---|---|
| Summer 2015 | Geometry | 33 | **0.82** | 1.02 |
| | Statistics and Probability | 7 | 0.70 | **0.58** |
| Fall 2015 | Geometry | 33 | **0.81** | 0.95 |
| | Statistics and Probability | 7 | 0.66 | **0.60** |
| Spring 2016 | Geometry | 33 | **0.83** | 0.97 |
| | Statistics and Probability | 7 | 0.69 | **0.61** |

**Table 11.7. Correlation Coefficients Between Domains and Clusters—Government**

| | | #Points | Principles and Processes of Governance Systems | Principles in Constitutional Democracy |
|---|---|---|---|---|
| Summer 2015 | Principles and Processes of Governance Systems | 20 | **0.83** | 1.00 |
| | Principles in Constitutional Democracy | 20 | 0.85 | **0.86** |
| Fall 2015 | Principles and Processes of Governance Systems | 20 | **0.80** | 1.01 |
| | Principles in Constitutional Democracy | 20 | 0.82 | **0.82** |
| Spring 2016 | Principles and Processes of Governance Systems | 20 | **0.77** | 1.01 |
| | Principles in Constitutional Democracy | 20 | 0.79 | **0.80** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table 11.8. Correlation Coefficients Between Domains and Clusters—Physical Science**

| | | #Points | Properties and Principles of Matter and Energy | Properties and Principles of Force and Motion |
|---|---|---|---|---|
| **Spring 2016** | **Properties and Principles of Matter and Energy** | 29 | **0.52** | 0.98 |
| | **Properties and Principles of Force and Motion** | 16 | 0.60 | **0.72** |

### *11.2.3. Convergent and Divergent Validity*

Convergent validity examines the extent to which theoretically related constructs are empirically related, whereas divergent validity examines the extent to which theoretically unrelated constructs are empirically unrelated. The Standards state the following regarding convergent and divergent validity: "Relationships between test scores and other measures intended to assess the same or similar constructs provide convergent evidence, whereas relationships between test scores and measures purportedly of different constructs provide discriminant evidence" (AERA, APA, & NCME, 2014, p. 16–17). 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.

#### *11.2.3.1. Pearson Correlations Among Assessments*

Table 11.9 shows evidence of divergent validity for the content areas with both SRs and PE/WPs. The data sets used for the analysis were drawn from the Spring 2016 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 11.9 shows the Pearson correlation coefficients between scale scores for Spring 2016. 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 (0.58) is in a range typical of achievement constructs that are positively related primarily by virtue of their relation to general school achievement.

For English II and Biology, challenging language and reading on both tests could account for the higher correlation value (0.73). This correlation value is in the range of the correlations among high school MAP content area tests (the precursor to the MO EOC Assessments) as reported in the Missouri Assessment Program Technical Report, 2008 (Missouri Department of Elementary and Secondary Education, 2008).

**Table 11.9. Pearson Correlation Among Assessments with PEs—Spring 2016**

| | English II | Algebra I | Biology | English I |
|---|---|---|---|---|
| **English II** | 1.00 | 0.58 | 0.73 | 0.61 |
| **Algebra I** | | 1.00 | 0.70 | 0.54 |
| **Biology** | | | 1.00 | 0.74 |
| **English I** | | | | 1.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

The data presented in Table 11.10 show evidence of divergent validity for the content areas with only SR items. The data sets used for the analysis were drawn from the Spring 2016 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 11.10 shows the Pearson correlation coefficients between scale scores.

**Table 11.10. Pearson Correlation Coefficients Among Assessments with only SRs—Spring 2016**

| | Algebra II | Geometry | Government | Am. History | Physical Science |
|---|---|---|---|---|---|
| **Algebra II** | 1.00 | 0.78 | 0.54 | 0.46 | 0.70 |
| **Geometry** | | 1.00 | 0.50 | 0.48 | 0.62 |
| **Government** | | | 1.00 | 0.83 | 0.76 |
| **Am. History** | | | | 1.00 | 0.65 |
| **Physical Science** | | | | | 1.00 |

The results shown in Table 11.10 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 (0.78), and Government and American History (0.83) are higher than the correlations between the dissimilar constructs of Algebra II and American History (0.46).

Table 11.11 provides more evidence of discriminant validity with correlations between content areas with PE/WPs (rows) and content areas with only SR items (columns). Evidence of discriminant validity emerges when comparing correlations between the similar contents of Algebra I and Geometry (0.85), Algebra I and Algebra II (0.77), and Biology and Physical Science (0.63), as well as the dissimilar contents of English II and Algebra II (0.40) and English II and Geometry (0.45).

**Table 11.11. Pearson Correlation Among Assessments**

| | Algebra II | Geometry | Government | Am. History | Physical Science |
|---|---|---|---|---|---|
| **English II** | 0.40 | 0.45 | 0.72 | 0.57 | 0.48 |
| **Algebra I** | 0.77 | 0.85 | 0.62 | 0.45 | 0.60 |
| **Biology** | 0.61 | 0.65 | 0.78 | 0.67 | 0.63 |
| **English I** | 0.46 | 0.50 | 0.75 | 0.63 | 0.60 |

*11.2.3.2. Convergent and Divergent Study*

To gather validity evidence for the MO EOC assessments, DESE commissioned a full convergent and divergent study. The relationships between the MO EOC Assessments across the


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

2009, 2010, and 2011 administrations were examined using correlational data. Eight tests and three major groups comprised the Missouri EOC Assessments: English (English I, English II), mathematics (Algebra I, Algebra II, Geometry), and social studies (Government, American History). Biology was the only science subject.

The findings from the convergent validity evidence showed that the assessments within the major groupings were strongly related to each other. That is, strong correlations were found between the English I and English II test scores, and likewise for the mathematics and the social studies tests.

The findings from the divergent validity evidence showed that that assessments from other groupings were moderately related to each other. For example, the mathematics assessments were moderately related to the English and social studies assessments. There were a couple of exceptions. For example, the English and Government assessments showed strong relationships for some administrations, likely because both content areas involve a fair amount of reading. 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.

For the full report on this study, see the *2011–2012 MO EOC Technical Report*, Appendix B, at http://dese.mo.gov/college-career-readiness/assessment/assessment-technical-support-materials.

*11.2.4. Additional Validity Evidence*

Validity evidence related to other standards is described below.

- Standard 1.8[14] relates to the characteristics of the sample of test takers from which validity evidence is inferred. The sample of examinees from which the validity evidence for the MO EOC Assessments was referred to in Chapter 9 of this report. Section 10.2 report provides the raw score mean and standard deviation by demographic group Appendix E summarizes the descriptive statistics of scale scores, and Appendix F summarizes the percentage distributions of students' achievement levels by demographic group.

- Standard 1.9[15] 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 standard setting and cutpoint validation processes. When cut scores are critical to the interpretation of test results, the procedural validity of the processes used to establish those scores also should be addressed. Chapter 3 contains summary information about the standard setting procedures used for the MO EOC Assessments.

[14] **Standard 1.8:** The composition of any sample of test takers from which validity evidence is obtained should be described in as much detail as is practical and permissible, including major relevant sociodemographic and developmental characteristics (p. 25).

[15] **Standard 1.9:** 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. 25).



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

Overall, the panelists' feedback from both workshops indicated that they understood the process and were comfortable with their cut score recommendations. Human judgment is also a component of handscoring. From Spring 2008 through Spring 2010 and again in 2014-2015 and 2015–2016, PE/WPs were handscored. Chapter 6 contains detailed information about the processes involved with Questar's handscoring of the 2015–2016 PE/WPs, including scorer selection and training.

- Standard 1.10[16] 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 accommodated administrations, including the testing environment, materials distribution and security, Test Examiner training, student preparation, and allowable accommodations.

### 11.3. Summary

The validation process involves the ongoing collection of a variety of evidence to support the proposed test-score interpretations and uses. It is not an all-or-nothing property of a test; rather, 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 validity evidence for the MO EOC Assessments' stated purposes. This chapter provided a summary of the evidence presented elsewhere in the technical report and provided 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 achievement level cuts.

Post-administration test analyses supported the technical quality of the MO EOC Assessments. Validity of score inferences is bolstered when test scores are consistent. Here, the reliabilities of the total test scores are very good, ranging from 0.78 to 0.92 across the content areas and administrations for the 2015–2016 test forms. CSEMs were between 5 and 9 scale score points at the cut scores. Additionally, DIF) regarding gender and ethnicity helps address construct-irrelevant variance, which presents a serious threat to the validity of inferences made from achievement test scores.

[16] **Standard 1.10:** When validity evidence includes statistical analyses of test results, either alone or together with data on other variables, the conditions under which the data were collected should be described in enough detail that users can judge the relevance of the statistical findings to local conditions. Attention should be drawn to any features of validation data collection that are likely to differ from typical operational testing conditions and that could plausibly influence test performance (p. 26).


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## References


American Educational Research Association (AERA), American Psychological Association (APA), & National Council on Measurement in Education (NCME). (2014). *Standards for educational and psychological testing*. Washington, D.C.: AERA.

Baker, E. L., & Linn, R. L. (2002). *Validity issues for accountability systems*. Technical report 585. Los Angeles: Center for the Study of Evaluation.

Brennan, R. L. (1998). Misconceptions at the intersection of measurement theory and practice. *Educational Measurement: Issues and Practice, 17(1).* Wiley Online Library: 5–9.

Brennan, R. L. (2001). An essay on the history and future of reliability from the perspective of replications. *Journal of Educational Measurement, 38(4)*, 295–317.

Brennan, R. L. (2004a). BB-CLASS: Beta-Binomial Classification Consistency and Accuracy (Version 1.1) [Computer Software].

Brennan, R. L. (2004b). *Manual for BB-CLASS: A computer program that uses the beta-binomial model for classification consistency and accuracy*. Iowa City: Center for Advanced Studies in Measurement and Assessment (CASMA).

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16(3)*, 297–334.

Cronbach, L. J., & Shavelson, R. J. (2004). My current thoughts on coefficient alpha and successor procedures. *Educational and Psychological Measurement, 64(3)*, 391–418.

Dorans, N. J., & Holland, P. W. (1992). *DIF detection and description: Mantel-Haenszel and standardization* (ETS Research Report No. RR-92-10).

Feldt, L. S., & Brennan, R. L. (1989). Reliability. In R. L. Linn (Ed.), *Educational measurement* (3rd ed., pp. 105–146). New York: Macmillan.

Gulliksen, H. (1950). *Theory of mental tests*. New York: Wiley.

Hambleton, R. K, & Novick, M. R. (1973). Toward an integration of theory and method for criterion-referenced tests. *Journal of Educational Measurement*. JSTOR, 159–70.

Huynh, H. (1976). On the reliability of decisions in domain-referenced testing. *Journal of Educational Measurement, 13*, 253–264.

Huynh, H. (1979). Statistical inference for two reliability indices in mastery testing based on the beta-binomial model. *Journal of Educational Statistics, 4(3),* 231–246.

Kane, M. T. (2006). Validation. In R. L. Brennan (Ed.), *Educational measurement* (4rd ed., pp. 17–64). Westport, CT: Praeger. Kolen, M. J., & Brennan, R. L. (2004). *Test equating, scaling, and linking: Methods and practices* (2nd ed.). New York: Springer-Verlag.

Linacre, J. M. (2006a). *A user's guide to WINSTEPS Rasch-model computer programs*. Chicago: Winsteps.

Linacre, J. M. (2006b). WINSTEPS® (Version 3.64) [Computer Software].




Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

Livingston, S. A., & Lewis, C. (1995). Estimating the consistency and accuracy of classifications based on test scores. *Journal of Educational Measurement, 32*, 179-197.

Mantel, N., & Haenszel, W. (1959). Statistical aspects of the analysis of data from retrospective studies of disease. *Journal of National Cancer Institute, 22,* 719–748.

Masters, G. N. (1982). A Rasch model for partial credit scoring. *Psychometrika, 47(2),* 149–174.

Rasch, G. (1960). *Probabilistic models for some intelligence and attainment tests*. Copenhagen: Danish Institute for Educational Research.

Taylor, L. R., Campbell, H. L., Deatz, R. C., Dvorak, R. N., Kroger, L. E., & Thacker, A. A. (2011). End-of-Course (EOC) assessment forms alignment validation study: Technical report. (Report No. FR-10-77). Alexandria, Virginia: HumRRO.

Taylor, L. R., Webb, N. L., Koger, M. E., Kroger, L. E., & Thacker, A. A. (2009). End-of-Course (EOC) assessment forms alignment validation study: Technical report. (Report No. DR-09-84). Alexandria, Virginia: HumRRO.

Thompson, S. J., Johnstone, C. J., & Thurlow, M. L. (2002). *Universal design applied to large scale assessments* (Synthesis Report 44). Minneapolis: University of Minnesota, National Center on Educational Outcomes. Retrieved December 21, 2009, from http://education.umn.edu/NCEO/OnlinePubs/Synthesis44.html

Wright, B. D., & Stone, M. H. (1979). *Best test design*. Chicago: MESA Press


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Appendix A: Target Point Distributions

**Table A.1. Target Point Distributions—English II**

| Claim | Anchors | Missouri Learning Standards (MLS) | DOK Limit | Range of Points per MLS |
|---|---|---|---|---|
| **Reading** | | | | |
| 1a Literacy | Apply reading skills to demonstrate the ability the integrate key ideas and details | • Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.<br>• Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.<br>• Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme. | 3 | 15 |
| | Interpret and analyze the craft and structure of texts | • Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone.<br>• Analyze how an author's choices concerning how to structure a text, order events within it (e.g., parallel plots), and manipulate time (e.g., pacing, flashbacks) create such effects as mystery, tension, or surprise.<br>• Analyze a particular point of view or cultural experience reflected in a work of literature from outside the United States, drawing on a wide reading of world literature. | 3 | |
| | Evaluate the knowledge and ideas found in literary texts | • Analyze the representation of a subject or a key scene in two different artistic mediums, including what is emphasized or absent in each treatment.<br>• Analyze how an author draws on and transforms source material in a specific work. | 3 | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Claim | Anchors | Missouri Learning Standards (MLS) | DOK Limit | Range of Points per MLS |
|---|---|---|---|---|
| 1b Informational | Apply reading skills to demonstrate the ability the integrate key ideas and details | • Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.<br>• Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.<br>• Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them. | 3 | 15 |
| | Interpret and analyze the craft and structure of texts | • Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone.<br>• Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text.<br>• Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose. | 3 | |
| | Evaluate the knowledge and ideas found in informational texts | • Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.<br>• Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.<br>• Analyze seminal U.S. documents of historical and literary significance, including how they address related themes and concepts. | 3 | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Claim | Anchors | Missouri Learning Standards (MLS) | DOK Limit | Range of Points per MLS |
|---|---|---|---|---|
| **Writing** | | | | |
| 2a | Demonstrate the ability to produce a variety of text types and purposes | • Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.<br>• Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.<br>• Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. | 3 | 10 |
| 2b | Demonstrate a command of the conventions of standard English | • Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.<br>• Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. | 2 | |
| | Appropriate grade-level acquisition of vocabulary | • Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies.<br>• Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.<br>• Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. | 2 | 5 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table A.2. Target Point Distributions—Algebra I**

| Claim | Anchors | Missouri Learning Standards (MLS) | DOK Limit | Range of Points per MLS |
|---|---|---|---|---|
| **Number & Quantity** | | | | |
| Number & Quantity | Real Number System | • Rewrite expressions involving radicals and rational exponents using the properties of exponents.<br>• Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 51/3 to be the cube root of 5 | 2 | 2–4 |
| | Quantities | • Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br>• Define appropriate quantities for the purpose of descriptive modeling.<br>• Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. | 2 | |
| **Algebra** | | | | |
| Algebra | Seeing Structure in Expressions | • Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).<br>• Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. | 2 | 14–21 |
| | Arithmetic with polynomials and Rational Expressions | • Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. | 3 | |
| | Creating Equations | • Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R<br>• Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.<br>• Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.<br>• Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. | 3 | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Claim | Anchors | Missouri Learning Standards (MLS) | DOK Limit | Range of Points per MLS |
|---|---|---|---|---|
| | Reasoning with Equations and Inequalities | • Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.<br>• Solve quadratic equations in one variable.<br>• Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.<br>• Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. | 3 | |
| **Functions** | | | | |
| Functions | Interpreting Functions | • Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br>• For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.<br>• Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).<br>• Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x). | 3 | 11–20 |
| | Building Functions | • Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.<br>• Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. | 3 | |
| | Linear, Quadratic and Exponential Models | • Distinguish between situations that can be modeled with linear functions and with exponential functions.<br>• Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.<br>• Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs | 2 | |
| **Stats & Probability** | | | | |
| Stats & Probability | Interpreting Categorical and Quantitative Data | • Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. | 2 | 3–6 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table A.3. Target Point Distributions—Biology I**

| Big Idea | Concept | CLE | DOK Limit | Range of Points per CLE |
|---|---|---|---|---|
| **Characteristics and Interactions of Living Organisms Strand** | | | | |
| 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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Big Idea | Concept | CLE | DOK Limit | Range of Points per CLE |
|---|---|---|---|---|
| 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 |
| 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 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Big Idea | Concept | CLE | DOK Limit | Range of Points per CLE |
|---|---|---|---|---|
| | | 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** | | | | |
| 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 |
| 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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Big Idea | Concept | CLE | DOK Limit | Range of Points per CLE |
|---|---|---|---|---|
| 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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table A.4. Target Point Distributions—English I**

| Claim | Anchors | Missouri Learning Standards (MLS) | DOK Limit | Range of Points per MLS |
|---|---|---|---|---|
| | | **Reading** | | |
| 1a Literacy | Apply reading skills to demonstrate the ability the integrate key ideas and details | • Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.<br>• Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.<br>• Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme. | 3 | 15 |
| | Interpret and analyze the craft and structure of texts | • Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone.<br>• Analyze how an author's choices concerning how to structure a text, order events within it (e.g., parallel plots), and manipulate time (e.g., pacing, flashbacks) create such effects as mystery, tension, or surprise.<br>• Analyze a particular point of view or cultural experience reflected in a work of literature from outside the United States, drawing on a wide reading of world literature. | 3 | |
| | Evaluate the knowledge and ideas found in literary texts | • Analyze the representation of a subject or a key scene in two different artistic mediums, including what is emphasized or absent in each treatment.<br>• Analyze how an author draws on and transforms source material in a specific work. | 3 | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Claim | Anchors | Missouri Learning Standards (MLS) | DOK Limit | Range of Points per MLS |
|---|---|---|---|---|
| 1b Informational | Apply reading skills to demonstrate the ability the integrate key ideas and details | • Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.<br>• Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.<br>• Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them. | 3 | 15 |
| | Interpret and analyze the craft and structure of texts | • Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone.<br>• Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text.<br>• Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose. | 3 | |
| | Evaluate the knowledge and ideas found in informational texts | • Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.<br>• Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.<br>• Analyze seminal U.S. documents of historical and literary significance, including how they address related themes and concepts. | 3 | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Claim | Anchors | Missouri Learning Standards (MLS) | DOK Limit | Range of Points per MLS |
|---|---|---|---|---|
| **Writing** | | | | |
| 2a | Demonstrate the ability to produce a variety of text types and purposes | • Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.<br>• Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.<br>• Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. | 3 | 6–8 |
| 2b | Demonstrate a command of the conventions of standard English | • Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.<br>• Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. | 2 | 1–2 |
| | Appropriate grade-level acquisition of vocabulary | • Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies.<br>• Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.<br>• Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. | 2 | 3–5 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table A.5. Target Point Distributions—Algebra II**

| Claim | Anchors | Missouri Learning Standards (MLS) | DOK Limit | Range of Points per MLS |
|---|---|---|---|---|
| **Number & Quantity** | | | | |
| Number & Quantity | Complex Number System | • Use the relation i2 = –1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.<br>• Solve quadratic equations with real coefficients that have complex solutions | 2 | 0–4 |
| **Algebra** | | | | |
| Algebra | Seeing Structure in Expressions | • Interpret expressions that represent a quantity in terms of its context<br>• Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2)<br>• Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression | 3 | 16–22 |
| | Arithmetic with Polynomials and Rational Expressions | • Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials<br>• Identify zeros of polynomials when suiTable Aactorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.<br>• Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system. | | |
| | Creating Equations | • Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.<br>• Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.<br>• Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. | | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Claim | Anchors | Missouri Learning Standards (MLS) | DOK Limit | Range of Points per MLS |
|---|---|---|---|---|
| | Reasoning with Equations and Inequalities | • Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.<br>• Solve quadratic equations in one variable.<br>• Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.<br>• Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. | | |
| **Functions** | | | | |
| Functions | Interpreting Functions | • Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br>• Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.<br>• Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). | 3 | 18–24 |
| | Building Functions | • Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs.<br>• Find inverse functions. | | |
| | Linear, Quadratic and Exponential Models | • Distinguish between situations that can be modeled with linear functions and with exponential functions.<br>• Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).<br>• Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.<br>• For exponential models, express as a logarithm the solution to abct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology. | | |
| **Stats & Probability** | | | | |
| Stats & Probability | Interpreting Categorical and Quantitative Data | • Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>• Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.<br>• Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.<br>• Evaluate and compare strategies on the basis of expected values. | 3 | 0–6 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table A.6. Target Point Distributions—Geometry**

| Claim | Anchors | Missouri Learning Standards (MLS) | DOK Limit | Range of Points per MLS |
|---|---|---|---|---|
| **Geometry** | | | | |
| Geometry | Congruence | • Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.<br>• Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs.<br>• Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.<br>• Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.<br>• Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.<br>• Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.<br>• Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.<br>• Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.<br>• Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. | 3 | 34–40 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Claim | Anchors | Missouri Learning Standards (MLS) | DOK Limit | Range of Points per MLS |
|---|---|---|---|---|
| | Similarity, Right Triangles and Trigonometry | • Verify experimentally the properties of dilations given by a center and a scale factor<br>• Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.<br>• Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.<br>• Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.<br>• Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. | | |
| | Circles | • Prove that all circles are similar.<br>• Identify and describe relationships among inscribed angles, radii, and chords. | | |
| | Expressing Geometric Properties with Equations | • Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.<br>• Use coordinates to prove simple geometric theorems algebraically.<br>• Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems<br>• Find the point on a directed line segment between two given points that partitions the segment in a given ratio<br>• Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula | | |
| | Geometric Measurement and Dimensions | • Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems<br>• Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects | | |
| | Linear, Quadratic and Exponential Models | • Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios) | | |
| **Stats & Probability** | | | | |
| Stats & Probability | Conditional Probability and the Rules of Probability | • Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems<br>• Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects | 3 | 0–6 |
| | Using Probability to Make Decisions | | | |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table A.7. Target Point Distributions—Government**

NOTE: Some Big Ideas are not represented in this table because they are not assessed at this course level.

| Big Idea | Concept | CLE | DOK Limit | Range of Points per CLE |
|---|---|---|---|---|
| **Principles of Constitutional Democracy Strand** | | | | |
| 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:<br>a. checks and balances<br>b. separation of powers<br>c. federalism<br>d. representation<br>e. popular sovereignty<br>f. due process of law<br>g. judicial review | 3 | 2–4 |
| | | Determine the civic responsibilities of individual citizens | 2 | 2–4 |
| | | Assess the changing roles of government:<br>a. philosophy<br>b. limits<br>c. duties | 2 | 2–4 |
| | | Describe the historical foundations of the U.S. governmental system as reflected in the following documents:<br>a. Magna Carta<br>b. Enlightenment writings of Hobbes, Locke, Rousseau, Montesquieu, and the Social Contract Theory<br>c. Mayflower Compact<br>d. Declaration of Independence<br>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:<br>a. U.S. Constitution<br>b. Federalist Papers<br>c. Amendments to the Constitution, emphasizing the Bill of Rights<br>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 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Big Idea | Concept | CLE | DOK Limit | Range of Points per CLE |
|---|---|---|---|---|
| **Principles and Processes of Governance Systems Strand** | | | | |
| 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:<br>a. limited government<br>b. majority rule and minority rights<br>c. constitution and civil rights<br>d. checks and balances<br>e. merits of the above principles | 2 | 4–5 |
| | Processes of governmental systems | Explain the processes pertaining to:<br>a. selection of political leaders (with an emphasis on presidential and parliamentary systems)<br>b. functions and styles of leadership (including authoritarian, democratic, and laissez-faire)<br>c. governmental systems<br>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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table A.8. Target Distributions—American History**

NOTE: Some Big Ideas are not represented in this table because they are not assessed at this course level.

| Big Idea | Concept | CLE | DOK Limit | Range of Points per CLE |
|---|---|---|---|---|
| **Missouri, United States, and World History Strand** | | | | |
| 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:<br>a. motivations for immigration<br>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:<br>a. Reconstruction<br>b. struggle for civil rights<br>c. expanding role of government<br>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:<br>a. natural resources, labor, and capital resources<br>b. supply and demand (shortages and surpluses)<br>c. business cycle<br>d. government regulation and deregulation<br>e. unemployment and full employment<br>f. inflation and deflation<br>g. savings and investment<br>h. profit | 3 | 2 |
| | Principles and purposes of government | Explain the importance of the following principles of government since Reconstruction<br>a. majority rule and minority rights<br>b. constitution and civil rights<br>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 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Big Idea | Concept | CLE | DOK Limit | Range of Points per 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<br>a. impact of geographic factors<br>b. role of the frontier and agriculture<br>c. impact of technological change and urbanization on land, resources, society, politics, and culture<br>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:<br>a. how monopolies affect people's lives and how they are regulated<br>b. how boycotts, strikes, and embargoes affect trade and people's options<br>c. monetary policy (why the Federal Reserve System influences interest rates and money supply)<br>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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Big Idea | Concept | CLE | DOK Limit | Range of Points per 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<br>a. isolationism<br>b. immigration policy<br>c. Manifest Destiny<br>d. imperialism<br>e. two world wars<br>f. Cold War<br>g. New Deal<br>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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Appendix B: Actual Point Distributions

# English II

**Table B.1. Actual Point Distributions—English II, Summer 2015**

| | Blueprint Target | | | | Actual | | | |
|---|---|---|---|---|---|---|---|---|
| | #Items | | #Points | | #Items | | #Points | |
| **Reporting Category** | **SR** | **WP** | **SR** | **WP** | **SR** | **WP** | **SR** | **WP** |
| Reading – Claim 1a | 15 | | 15 | | 15 | | 15 | |
| Reading – Claim 1b | 15 | | 15 | | 15 | | 15 | |
| Writing – Claim 2a | | 2 | | 8 | | 2 | | 8 |
| Writing – Claim 2b | 5 | 1 | 5 | 2 | 5 | 1 | 5 | 2 |
| **Total** | **35** | **3** | **45** | **10** | **35** | **3** | **35** | **10** |

**Table B.2. Actual Point Distributions—English II, Fall 2015**

| | Blueprint Target | | | | Actual | | | |
|---|---|---|---|---|---|---|---|---|
| | #Items | | #Points | | #Items | | #Points | |
| **Reporting Category** | **SR** | **WP** | **SR** | **WP** | **SR** | **WP** | **SR** | **WP** |
| Reading – Claim 1a | 15 | | 15 | | 15 | | 15 | |
| Reading – Claim 1b | 15 | | 15 | | 15 | | 15 | |
| Writing – Claim 2a | | 2 | | 8 | | 2 | | 8 |
| Writing – Claim 2b | 5 | 1 | 5 | 2 | 5 | 1 | 5 | 2 |
| **Total** | **35** | **3** | **45** | **10** | **35** | **3** | **35** | **10** |

**Table B.3. Actual Point Distributions—English II, Spring 2016**

| | Blueprint Target | | | | Actual | | | |
|---|---|---|---|---|---|---|---|---|
| | #Items | | #Points | | #Items | | #Points | |
| **Reporting Category** | **SR** | **WP** | **SR** | **WP** | **SR** | **WP** | **SR** | **WP** |
| Reading – Claim 1a | 15 | | 15 | | 15 | | 15 | |
| Reading – Claim 1b | 15 | | 15 | | 15 | | 15 | |
| Writing – Claim 2a | | 2 | | 8 | | 2 | | 8 |
| Writing – Claim 2b | 5 | 1 | 5 | 2 | 5 | 1 | 5 | 2 |
| **Total** | **35** | **3** | **45** | **10** | **35** | **3** | **35** | **10** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Algebra I

**Table B.4. Actual Point Distributions—Algebra I, Summer 2015**

| | Blueprint Target | | | | Actual | | | |
|---|---|---|---|---|---|---|---|---|
| | #Items | | #Points | | #Items | | #Points | |
| **Reporting Category** | **SR** | **PE** | **SR** | **PE** | **SR** | **PE** | **SR** | **PE** |
| Number and Quantity | 4 | | 4 | | 4 | | 4 | |
| Algebra | 17 | 4 | 17 | 10 | 17 | 4 | 17 | 10 |
| Function | 14 | | 14 | | 14 | | 14 | |
| Stats and Probability | 5 | | 5 | | 5 | | 5 | |
| **Total** | **40** | **4** | **40** | **10** | **40** | **4** | **40** | **10** |

**Table B.5. Actual Point Distributions—Algebra I, Fall 2015**

| | Blueprint Target | | | | Actual | | | |
|---|---|---|---|---|---|---|---|---|
| | #Items | | #Points | | #Items | | #Points | |
| **Reporting Category** | **SR** | **PE** | **SR** | **PE** | **SR** | **PE** | **SR** | **PE** |
| Number and Quantity | 4 | | 4 | | 3 | | 3 | |
| Algebra | 17 | 4 | 17 | 10 | 17 | 2 | 17 | 6 |
| Function | 14 | | 14 | | 15 | 1 | 15 | 4 |
| Stats and Probability | 5 | | 5 | | 5 | | 5 | |
| **Total** | **40** | **4** | **40** | **10** | **40** | **3** | **40** | **10** |

**Table B.6. Actual Point Distributions—Algebra I, Spring 2016**

| | Blueprint Target | | | | Actual | | | |
|---|---|---|---|---|---|---|---|---|
| | #Items | | #Points | | #Items | | #Points | |
| **Reporting Category** | **SR** | **PE** | **SR** | **PE** | **SR** | **PE** | **SR** | **PE** |
| Number and Quantity | 4 | | 4 | | 4 | | 4 | |
| Algebra | 17 | 4 | 17 | 10 | 17 | 4 | 17 | 10 |
| Function | 14 | | 14 | | 14 | | 14 | |
| Stats and Probability | 5 | | 5 | | 5 | | 5 | |
| **Total** | **40** | **4** | **40** | **10** | **40** | **4** | **40** | **10** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Biology

**Table B.7. Actual Point Distributions—Biology, Summer 2015 Biology**

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

**Table B.8. Actual Point Distributions—Biology, Fall 2015 Biology**

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

**Table B.9. Actual Point Distributions—Biology, Spring 2016**

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


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# English I

**Table B.10. Actual Point Distributions—English I, Summer 2015**

| | Blueprint Target | | | | Actual | | | |
|---|---|---|---|---|---|---|---|---|
| | #Items | | #Points | | #Items | | #Points | |
| **Reporting Category** | **SR** | **WP** | **SR** | **WP** | **SR** | **WP** | **SR** | **WP** |
| Reading – Claim 1a | 15 | | 15 | | 15 | | 15 | |
| Reading – Claim 1b | 15 | | 15 | | 15 | | 15 | |
| Writing – Claim 2a | | 2 | | 8 | | 2 | | 8 |
| Writing – Claim 2b | 5 | 1 | 5 | 2 | 5 | 1 | 5 | 2 |
| **Total** | **35** | **3** | **35** | **10** | **35** | **3** | **35** | **10** |

**Table B.11. Actual Point Distributions—English I, Fall 2015**

| | Blueprint Target | | | | Actual | | | |
|---|---|---|---|---|---|---|---|---|
| | #Items | | #Points | | #Items | | #Points | |
| **Reporting Category** | **SR** | **WP** | **SR** | **WP** | **SR** | **WP** | **SR** | **WP** |
| Reading – Claim 1a | 15 | | 15 | | 15 | | 15 | |
| Reading – Claim 1b | 15 | | 15 | | 15 | | 15 | |
| Writing – Claim 2a | | 2 | | 8 | | 2 | | 8 |
| Writing – Claim 2b | 5 | 1 | 5 | 2 | 5 | 1 | 5 | 2 |
| **Total** | **35** | **3** | **35** | **10** | **35** | **3** | **35** | **10** |

**Table B.12. Actual Point Distributions—English I, Spring 2016**

| | Blueprint Target | | | | Actual | | | |
|---|---|---|---|---|---|---|---|---|
| | #Items | | #Points | | #Items | | #Points | |
| **Reporting Category** | **SR** | **WP** | **SR** | **WP** | **SR** | **WP** | **SR** | **WP** |
| Reading – Claim 1a | 15 | | 15 | | 15 | | 15 | |
| Reading – Claim 1b | 15 | | 15 | | 15 | | 15 | |
| Writing – Claim 2a | | 2 | | 8 | | 2 | | 8 |
| Writing – Claim 2b | 5 | 1 | 5 | 2 | 5 | 1 | 5 | 2 |
| **Total** | **35** | **3** | **35** | **10** | **35** | **3** | **35** | **10** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Algebra II

**Table B.13. Actual Point Distributions—Algebra II, Summer 2015**

| | Target | Actual |
|---|---|---|
| **Reporting Category** | **#Items/Points (SR)** | **#Items/Points (SR)** |
| Number and Quantity | 0–4 | 0 |
| Algebra | 16–22 | 16 |
| Function | 18–24 | 24 |
| Stats and Probability | 0–6 | 0 |
| **Total** | **40** | **40** |

**Table B.14. Actual Point Distributions—Algebra II, Fall 2015**

| | Target | Actual |
|---|---|---|
| **Reporting Category** | **#Items/Points (SR)** | **#Items/Points (SR)** |
| Number and Quantity | 0–4 | 0 |
| Algebra | 16–22 | 17 |
| Function | 18–24 | 23 |
| Stats and Probability | 0–6 | 0 |
| **Total** | **40** | **40** |

**Table B.15. Actual Point Distributions—Algebra II, Spring 2016**

| | Target | Actual |
|---|---|---|
| **Reporting Category** | **#Items/Points (SR)** | **#Items/Points (SR)** |
| Number and Quantity | 0–4 | 0 |
| Algebra | 16–22 | 16 |
| Function | 18–24 | 24 |
| Stats and Probability | 0–6 | 0 |
| **Total** | **40** | **40** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Geometry

**Table B.16. Actual Point Distributions—Geometry, Summer 2015**

| Reporting Category | Target #Items/Points (SR) | Actual #Items/Points (SR) |
|---|---|---|
| Geometry | 40 | 40 |
| **Total** | **40** | **40** |

**Table B.17. Actual Point Distributions—Geometry, Fall 2015**

| Reporting Category | Target #Items/Points (SR) | Actual #Items/Points (SR) |
|---|---|---|
| Geometry | 40 | 40 |
| **Total** | **40** | **40** |

**Table B.18. Actual Point Distributions—Geometry, Spring 2016**

| Reporting Category | Target #Items/Points (SR) | Actual #Items/Points (SR) |
|---|---|---|
| Geometry | 40 | 40 |
| **Total** | **40** | **40** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Government

**Table B.19. Actual Point Distributions—Government, Summer 2015**

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

**Table B.20. Actual Point Distributions—Government, Fall 2015**

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

**Table B.21. Actual Point Distributions—Government, Spring 2016**

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


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# American History

**Table B.22. Actual Point Distributions—American History, Summer 2015**

| Reporting Category | Target #Items/Points (SR) | Actual #Items/Points (SR) |
|---|---|---|
| History | 14–18 | 16 |
| Government | 7–9 | 8 |
| Economics | 7–9 | 8 |
| Geography | 7–9 | 8 |
| **Total** | **40** | **40** |

**Table B.23. Actual Point Distributions—American History, Fall 2015**

| Reporting Category | Target #Items/Points (SR) | Actual #Items/Points (SR) |
|---|---|---|
| History | 14–18 | 16 |
| Government | 7–9 | 8 |
| Economics | 7–9 | 8 |
| Geography | 7–9 | 8 |
| **Total** | **40** | **40** |

**Table B.24. Actual Point Distributions—American History, Spring 2016**

| Reporting Category | Target #Items/Points (SR) | Actual #Items/Points (SR) |
|---|---|---|
| History | 14–18 | 16 |
| Government | 7–9 | 8 |
| Economics | 7–9 | 8 |
| Geography | 7–9 | 8 |
| **Total** | **40** | **40** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Physical Science

**Table B.25. Actual Point Distributions—Physical Science, Spring 2016**

| Reporting Category | Target #Items/Points (SR) | Actual #Items/Points (SR) |
|---|---|---|
| Properties and Principles of Matter and Energy | 25–30 | 29 |
| Properties and Principles of Force and Motion | 15–20 | 16 |
| **Total** | **40** | **45** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Appendix C: Item Statistics

**Table C.1. Item Statistics—English II, Summer 2015**

N-Count: 430

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.69 | 0.35 | 0.00 |
| 2 | 0.34 | 0.03 | 0.00 |
| 3 | 0.70 | 0.39 | 0.00 |
| 4 | 0.38 | 0.24 | 1.00 |
| 5 | 0.62 | 0.35 | 0.00 |
| 6 | 0.82 | 0.28 | 0.00 |
| 7 | 0.62 | 0.40 | 0.00 |
| 14 | 0.54 | 0.27 | 0.00 |
| 15 | 0.43 | 0.24 | 0.00 |
| 16 | 0.65 | 0.37 | 0.00 |
| 17 | 0.56 | 0.39 | 0.00 |
| 18 | 0.17 | 0.15 | 0.00 |
| 19 | 0.54 | 0.39 | 1.00 |
| 20 | 0.26 | 0.17 | 0.00 |
| 21 | 0.45 | 0.19 | 1.00 |
| 22 | 0.58 | 0.46 | 0.00 |
| 23 | 0.25 | 0.12 | 0.00 |
| 24 | 0.60 | 0.28 | 0.00 |
| 31 | 0.69 | 0.53 | 0.00 |
| 32 | 0.57 | 0.54 | 0.00 |
| 33 | 0.44 | 0.22 | 0.00 |
| 34 | 0.65 | 0.49 | 0.00 |
| 35 | 0.46 | 0.36 | 0.00 |
| 36 | 0.72 | 0.49 | 0.00 |
| 37 | 0.41 | 0.29 | 0.00 |
| 38 | 0.60 | 0.48 | 0.00 |
| 39 | 0.29 | 0.21 | 0.00 |
| 40 | 0.71 | 0.51 | 0.00 |
| 41 | 0.53 | 0.44 | 0.00 |
| 42 | 0.46 | 0.33 | 0.00 |
| 43 | 0.47 | 0.37 | 0.00 |
| 44 | 0.40 | 0.32 | 0.00 |
| 45 | 0.37 | 0.24 | 0.00 |
| 46 | 0.23 | -0.08 | 0.00 |
| 47 | 0.76 | 0.56 | 0.00 |
| PE1* | 2.28 | 0.65 | 1.00 |
| PE2 | 2.30 | 0.65 | 1.00 |
| PE3 | 1.36 | 0.62 | 1.00 |

*PE1 = 4pts. PE2 = 4pts. PE3 = 2pts.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.2. Item Statistics—Algebra I, Summer 2015**

N-Count: 877

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.31 | 0.31 | 0.00 |
| 2 | 0.27 | 0.27 | 0.00 |
| 4 | 0.33 | 0.18 | 0.00 |
| 5 | 0.59 | 0.37 | 0.00 |
| 6 | 0.83 | 0.39 | 0.00 |
| 8 | 0.43 | 0.19 | 0.00 |
| 10 | 0.22 | -0.12 | 0.00 |
| 11 | 0.09 | 0.06 | 0.00 |
| 12 | 0.45 | 0.32 | 0.00 |
| 13 | 0.71 | 0.49 | 0.00 |
| 14 | 0.57 | 0.42 | 0.00 |
| 16 | 0.30 | 0.30 | 0.00 |
| 17 | 0.29 | 0.10 | 0.00 |
| 18 | 0.70 | 0.48 | 0.00 |
| 20 | 0.33 | 0.39 | 0.00 |
| 21 | 0.63 | 0.44 | 0.00 |
| 22 | 0.47 | 0.18 | 0.00 |
| 23 | 0.61 | 0.42 | 0.00 |
| 24 | 0.61 | 0.29 | 0.00 |
| 25 | 0.33 | 0.38 | 0.00 |
| 26 | 0.27 | 0.29 | 0.00 |
| 27 | 0.41 | 0.48 | 0.00 |
| 28 | 0.28 | 0.14 | 0.00 |
| 29 | 0.39 | 0.22 | 0.00 |
| 31 | 0.66 | 0.36 | 0.00 |
| 32 | 0.46 | 0.53 | 0.00 |
| 33 | 0.33 | 0.09 | 0.00 |
| 34 | 0.43 | 0.13 | 0.00 |
| 36 | 0.43 | 0.34 | 0.00 |
| 37 | 0.20 | 0.34 | 0.00 |
| 38 | 0.39 | 0.29 | 0.00 |
| 40 | 0.21 | -0.04 | 0.00 |
| 41 | 0.34 | 0.05 | 0.00 |
| 42 | 0.51 | 0.43 | 0.00 |
| 43 | 0.60 | 0.38 | 0.00 |
| 44 | 0.27 | 0.03 | 0.00 |
| 45 | 0.44 | 0.25 | 0.00 |
| 48 | 0.38 | 0.25 | 0.00 |
| 49 | 0.49 | 0.42 | 0.00 |
| 50 | 0.77 | 0.34 | 0.00 |
| PE1* | 0.99 | 0.55 | 1.00 |
| PE2 | 0.56 | 0.58 | 1.00 |
| PE3 | 0.39 | 0.56 | 1.00 |
| PE4 | 0.63 | 0.55 | 1.00 |

*PE1 = 2pts. PE2 = 4pts. PE3 = 1pt. PE4 = 3pts.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.3. Item Statistics for Biology, Summer 2015**

N-Count: 305

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.82 | 0.36 | 0.00 |
| 2 | 0.82 | 0.41 | 0.00 |
| 3 | 0.80 | 0.37 | 0.00 |
| 4 | 0.53 | 0.34 | 0.00 |
| 5 | 0.67 | 0.46 | 1.00 |
| 10 | 0.68 | 0.44 | 0.00 |
| 11 | 0.63 | 0.49 | 1.00 |
| 12 | 0.57 | 0.45 | 0.00 |
| 13 | 0.60 | 0.19 | 0.00 |
| 14 | 0.46 | 0.39 | 0.00 |
| 15 | 0.44 | 0.30 | 0.00 |
| 16 | 0.55 | 0.38 | 1.00 |
| 17 | 0.45 | 0.30 | 1.00 |
| 18 | 0.38 | 0.37 | 1.00 |
| 19 | 0.55 | 0.41 | 1.00 |
| 20 | 0.59 | 0.52 | 1.00 |
| 21 | 0.48 | 0.21 | 1.00 |
| 26 | 0.46 | 0.46 | 1.00 |
| 27 | 0.57 | 0.40 | 1.00 |
| 28 | 0.50 | 0.43 | 1.00 |
| 29 | 0.40 | 0.41 | 1.00 |
| 30 | 0.54 | 0.34 | 1.00 |
| 31 | 0.41 | 0.23 | 1.00 |
| 32 | 0.31 | 0.11 | 1.00 |
| 33 | 0.41 | 0.24 | 1.00 |
| 34 | 0.46 | 0.36 | 1.00 |
| 35 | 0.43 | 0.04 | 1.00 |
| 36 | 0.45 | 0.34 | 1.00 |
| 37 | 0.46 | 0.35 | 1.00 |
| 38 | 0.38 | 0.25 | 1.00 |
| 43 | 0.35 | 0.18 | 1.00 |
| 44 | 0.42 | 0.26 | 1.00 |
| 45 | 0.32 | 0.30 | 1.00 |
| 46 | 0.31 | 0.16 | 1.00 |
| 47 | 0.31 | 0.16 | 1.00 |
| PE1* | 0.55 | 0.46 | 1.00 |
| PE2 | 0.49 | 0.41 | 1.00 |
| PE3 | 0.43 | 0.42 | 2.00 |
| PE4 | 1.24 | 0.68 | 1.00 |
| PE5 | 0.84 | 0.43 | 3.00 |
| PE6 | 1.70 | 0.55 | 3.00 |
| PE7 | 1.69 | 0.61 | 6.00 |
| PE8 | 0.85 | 0.51 | 10.00 |
| PE9 | 0.93 | 0.37 | 3.00 |
| PE10 | 0.90 | 0.44 | 3.00 |

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



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.4. Item Statistics—English I, Summer 2015**

N-Count: 52

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.65 | 0.22 | 0.00 |
| 2 | 0.67 | 0.41 | 0.00 |
| 3 | 0.46 | 0.07 | 0.00 |
| 4 | 0.64 | 0.30 | 0.00 |
| 5 | 0.50 | 0.38 | 2.00 |
| 6 | 0.85 | 0.45 | 0.00 |
| 7 | 0.69 | 0.40 | 0.00 |
| 8 | 0.73 | 0.38 | 0.00 |
| 9 | 0.77 | 0.48 | 0.00 |
| 10 | 0.64 | 0.29 | 0.00 |
| 11 | 0.60 | 0.54 | 0.00 |
| 12 | 0.73 | 0.38 | 0.00 |
| 13 | 0.44 | 0.07 | 0.00 |
| 14 | 0.21 | 0.05 | 0.00 |
| 15 | 0.15 | 0.05 | 0.00 |
| 16 | 0.15 | 0.24 | 0.00 |
| 17 | 0.50 | 0.34 | 0.00 |
| 18 | 0.65 | 0.37 | 0.00 |
| 19 | 0.52 | 0.32 | 0.00 |
| 20 | 0.29 | 0.31 | 0.00 |
| 21 | 0.81 | 0.27 | 0.00 |
| 22 | 0.67 | 0.36 | 0.00 |
| 23 | 0.75 | 0.55 | 0.00 |
| 24 | 0.23 | 0.24 | 0.00 |
| 25 | 0.21 | 0.16 | 0.00 |
| 26 | 0.31 | -0.09 | 0.00 |
| 27 | 0.52 | 0.34 | 0.00 |
| 28 | 0.19 | 0.24 | 0.00 |
| 29 | 0.48 | 0.13 | 0.00 |
| 30 | 0.77 | 0.42 | 0.00 |
| 31 | 0.52 | 0.57 | 0.00 |
| 32 | 0.58 | 0.14 | 0.00 |
| 33 | 0.48 | 0.48 | 0.00 |
| 34 | 0.56 | 0.41 | 0.00 |
| 35 | 0.46 | 0.33 | 0.00 |
| PE1* | 2.73 | 0.54 | 0.00 |
| PE2 | 2.83 | 0.37 | 0.00 |
| PE3 | 1.56 | 0.61 | 0.00 |

*PE1 = 4pts. PE2 = 4pts. PE3 = 2pts.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.5. Item Statistics—Algebra II, Summer 2015**

N-Count: 39

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.69 | 0.35 | 0.00 |
| 2 | 0.77 | 0.18 | 0.00 |
| 3 | 0.56 | 0.33 | 0.00 |
| 4 | 0.62 | 0.20 | 0.00 |
| 5 | 0.59 | 0.37 | 0.00 |
| 6 | 0.36 | 0.51 | 0.00 |
| 8 | 0.49 | 0.44 | 0.00 |
| 10 | 0.72 | 0.34 | 0.00 |
| 11 | 0.82 | 0.10 | 0.00 |
| 12 | 0.59 | 0.35 | 0.00 |
| 13 | 0.36 | 0.11 | 0.00 |
| 14 | 0.54 | 0.30 | 0.00 |
| 15 | 0.74 | 0.45 | 0.00 |
| 16 | 0.33 | 0.16 | 0.00 |
| 17 | 0.46 | 0.23 | 0.00 |
| 18 | 0.44 | 0.28 | 0.00 |
| 19 | 0.41 | 0.56 | 0.00 |
| 20 | 0.64 | 0.45 | 0.00 |
| 21 | 0.39 | 0.40 | 0.00 |
| 22 | 0.62 | 0.44 | 0.00 |
| 23 | 0.69 | 0.25 | 0.00 |
| 24 | 0.72 | 0.21 | 0.00 |
| 27 | 0.49 | 0.41 | 0.00 |
| 28 | 0.49 | 0.24 | 0.00 |
| 29 | 0.59 | 0.42 | 0.00 |
| 30 | 0.62 | 0.25 | 0.00 |
| 31 | 0.69 | 0.37 | 0.00 |
| 34 | 0.33 | 0.32 | 0.00 |
| 37 | 0.33 | 0.23 | 0.00 |
| 39 | 0.54 | 0.39 | 0.00 |
| 40 | 0.56 | 0.49 | 0.00 |
| 41 | 0.85 | 0.19 | 0.00 |
| 42 | 0.26 | 0.06 | 0.00 |
| 44 | 0.41 | 0.51 | 0.00 |
| 45 | 0.39 | 0.49 | 0.00 |
| 46 | 0.67 | 0.20 | 0.00 |
| 47 | 0.67 | 0.50 | 0.00 |
| 48 | 0.33 | 0.30 | 0.00 |
| 49 | 0.54 | 0.49 | 0.00 |
| 50 | 0.80 | 0.08 | 0.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.6. Item Statistics—Geometry, Summer 2015**

N-Count: 37

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.68 | 0.58 | 0.00 |
| 2 | 0.43 | 0.25 | 0.00 |
| 3 | 0.24 | 0.29 | 0.00 |
| 4 | 0.38 | 0.37 | 0.00 |
| 5 | 0.60 | 0.29 | 0.00 |
| 6 | 0.27 | 0.22 | 0.00 |
| 7 | 0.19 | 0.48 | 0.00 |
| 8 | 0.22 | 0.44 | 0.00 |
| 9 | 0.76 | 0.43 | 0.00 |
| 10 | 0.54 | 0.35 | 0.00 |
| 11 | 0.35 | -0.06 | 0.00 |
| 12 | 0.76 | 0.36 | 0.00 |
| 13 | 0.32 | 0.45 | 0.00 |
| 14 | 0.22 | 0.34 | 0.00 |
| 15 | 0.78 | 0.41 | 0.00 |
| 16 | 0.51 | 0.49 | 0.00 |
| 17 | 0.32 | 0.52 | 0.00 |
| 18 | 0.32 | 0.18 | 0.00 |
| 19 | 0.60 | 0.44 | 0.00 |
| 20 | 0.43 | 0.25 | 0.00 |
| 21 | 0.49 | 0.43 | 0.00 |
| 22 | 0.46 | 0.31 | 0.00 |
| 23 | 0.76 | 0.42 | 0.00 |
| 24 | 0.38 | 0.48 | 0.00 |
| 25 | 0.46 | 0.36 | 0.00 |
| 26 | 0.60 | 0.50 | 0.00 |
| 27 | 0.46 | 0.38 | 0.00 |
| 28 | 0.65 | 0.13 | 0.00 |
| 29 | 0.03 | -0.11 | 0.00 |
| 30 | 0.46 | 0.41 | 0.00 |
| 31 | 0.46 | 0.30 | 0.00 |
| 32 | 0.73 | 0.49 | 0.00 |
| 33 | 0.19 | 0.37 | 0.00 |
| 34 | 0.38 | 0.21 | 0.00 |
| 35 | 0.70 | 0.42 | 0.00 |
| 36 | 0.35 | 0.08 | 3.00 |
| 37 | 0.30 | 0.21 | 0.00 |
| 38 | 0.19 | 0.21 | 0.00 |
| 39 | 0.51 | 0.42 | 0.00 |
| 40 | 0.14 | -0.09 | 0.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.7. Item Statistics—Government, Summer 2015**

N-Count: 788

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.75 | 0.30 | 0.00 |
| 2 | 0.77 | 0.46 | 0.00 |
| 3 | 0.74 | 0.35 | 0.00 |
| 4 | 0.79 | 0.51 | 0.00 |
| 5 | 0.75 | 0.46 | 0.00 |
| 6 | 0.57 | 0.49 | 0.00 |
| 7 | 0.58 | 0.37 | 0.00 |
| 8 | 0.54 | 0.41 | 0.00 |
| 9 | 0.69 | 0.50 | 0.00 |
| 10 | 0.39 | 0.28 | 0.00 |
| 16 | 0.74 | 0.34 | 0.00 |
| 17 | 0.43 | 0.38 | 0.00 |
| 18 | 0.70 | 0.46 | 0.00 |
| 19 | 0.66 | 0.50 | 0.00 |
| 20 | 0.58 | 0.31 | 0.00 |
| 21 | 0.69 | 0.59 | 0.00 |
| 22 | 0.44 | 0.35 | 0.00 |
| 23 | 0.65 | 0.36 | 0.00 |
| 24 | 0.57 | 0.44 | 0.00 |
| 25 | 0.68 | 0.55 | 0.00 |
| 26 | 0.62 | 0.42 | 0.00 |
| 27 | 0.45 | 0.34 | 0.00 |
| 28 | 0.55 | 0.38 | 0.00 |
| 29 | 0.56 | 0.50 | 0.00 |
| 30 | 0.61 | 0.40 | 0.00 |
| 31 | 0.54 | 0.56 | 0.00 |
| 32 | 0.52 | 0.40 | 0.00 |
| 33 | 0.58 | 0.42 | 0.00 |
| 34 | 0.60 | 0.52 | 0.00 |
| 35 | 0.66 | 0.58 | 0.00 |
| 41 | 0.55 | 0.44 | 0.00 |
| 42 | 0.71 | 0.59 | 0.00 |
| 43 | 0.66 | 0.50 | 0.00 |
| 44 | 0.65 | 0.44 | 0.00 |
| 45 | 0.73 | 0.59 | 0.00 |
| 46 | 0.65 | 0.53 | 0.00 |
| 47 | 0.48 | 0.46 | 0.00 |
| 48 | 0.63 | 0.48 | 0.00 |
| 49 | 0.65 | 0.41 | 0.00 |
| 50 | 0.78 | 0.50 | 1.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.8. Item Statistics—American History, Summer 2015**

N-Count: 77

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.84 | 0.35 | 0.00 |
| 2 | 0.87 | 0.36 | 0.00 |
| 3 | 0.48 | 0.25 | 0.00 |
| 4 | 0.64 | 0.45 | 0.00 |
| 5 | 0.82 | 0.35 | 0.00 |
| 6 | 0.69 | 0.28 | 0.00 |
| 7 | 0.81 | 0.24 | 0.00 |
| 8 | 0.62 | 0.16 | 0.00 |
| 9 | 0.66 | 0.51 | 0.00 |
| 10 | 0.68 | 0.39 | 0.00 |
| 16 | 0.43 | 0.17 | 0.00 |
| 17 | 0.61 | 0.43 | 0.00 |
| 18 | 0.53 | 0.48 | 0.00 |
| 19 | 0.68 | 0.53 | 0.00 |
| 20 | 0.60 | 0.12 | 0.00 |
| 21 | 0.62 | 0.50 | 0.00 |
| 22 | 0.79 | 0.46 | 0.00 |
| 23 | 0.26 | 0.03 | 0.00 |
| 24 | 0.51 | 0.44 | 0.00 |
| 25 | 0.69 | 0.31 | 0.00 |
| 26 | 0.39 | 0.40 | 0.00 |
| 27 | 0.35 | 0.18 | 0.00 |
| 28 | 0.30 | 0.32 | 0.00 |
| 29 | 0.57 | 0.43 | 0.00 |
| 30 | 0.51 | 0.31 | 0.00 |
| 31 | 0.87 | 0.46 | 0.00 |
| 32 | 0.36 | 0.24 | 0.00 |
| 33 | 0.48 | 0.25 | 0.00 |
| 34 | 0.51 | 0.36 | 0.00 |
| 35 | 0.66 | 0.09 | 0.00 |
| 41 | 0.26 | 0.41 | 0.00 |
| 42 | 0.60 | 0.49 | 0.00 |
| 43 | 0.36 | 0.33 | 0.00 |
| 44 | 0.79 | 0.31 | 0.00 |
| 45 | 0.26 | 0.22 | 0.00 |
| 46 | 0.81 | 0.51 | 0.00 |
| 47 | 0.81 | 0.53 | 0.00 |
| 48 | 0.83 | 0.48 | 0.00 |
| 49 | 0.52 | 0.10 | 0.00 |
| 50 | 0.70 | 0.32 | 0.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.9. Item Statistics—English II, Fall 2015**

N-Count: 2,765

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.51 | 0.14 | 0.00 |
| 2 | 0.67 | 0.41 | 1.00 |
| 3 | 0.78 | 0.46 | 0.00 |
| 4 | 0.52 | 0.26 | 0.00 |
| 5 | 0.84 | 0.47 | 0.00 |
| 6 | 0.68 | 0.43 | 1.00 |
| 7 | 0.76 | 0.49 | 0.00 |
| 14 | 0.59 | 0.50 | 0.00 |
| 15 | 0.72 | 0.40 | 0.00 |
| 16 | 0.60 | 0.51 | 0.00 |
| 17 | 0.34 | 0.14 | 0.00 |
| 18 | 0.62 | 0.42 | 0.00 |
| 19 | 0.51 | 0.33 | 0.00 |
| 20 | 0.61 | 0.38 | 0.00 |
| 21 | 0.45 | 0.23 | 0.00 |
| 22 | 0.53 | 0.34 | 0.00 |
| 23 | 0.46 | 0.34 | 0.00 |
| 24 | 0.32 | 0.08 | 0.00 |
| 31 | 0.71 | 0.43 | 0.00 |
| 32 | 0.54 | 0.30 | 0.00 |
| 33 | 0.51 | 0.46 | 0.00 |
| 34 | 0.31 | 0.10 | 0.00 |
| 35 | 0.55 | 0.24 | 0.00 |
| 36 | 0.38 | 0.18 | 0.00 |
| 37 | 0.48 | 0.38 | 0.00 |
| 38 | 0.45 | 0.32 | 0.00 |
| 39 | 0.44 | 0.31 | 0.00 |
| 40 | 0.57 | 0.48 | 0.00 |
| 41 | 0.52 | 0.49 | 0.00 |
| 42 | 0.64 | 0.53 | 0.00 |
| 43 | 0.30 | 0.29 | 1.00 |
| 44 | 0.64 | 0.47 | 0.00 |
| 45 | 0.54 | 0.50 | 1.00 |
| 46 | 0.53 | 0.39 | 1.00 |
| 47 | 0.71 | 0.50 | 1.00 |
| PE1* | 2.58 | 0.66 | 1.00 |
| PE2 | 2.59 | 0.67 | 1.00 |
| PE3 | 1.59 | 0.61 | 1.00 |

*PE1 = 4 pts. PE2 = 4 pts. PE3 = 2 pts.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.10. Item Statistics—Algebra I, Fall 2015**

N-Count: 4,617

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.48 | 0.30 | 0.00 |
| 2 | 0.48 | 0.12 | 0.00 |
| 4 | 0.32 | 0.23 | 0.00 |
| 5 | 0.88 | 0.35 | 0.00 |
| 6 | 0.45 | 0.46 | 0.00 |
| 8 | 0.39 | 0.24 | 0.00 |
| 10 | 0.69 | 0.49 | 0.00 |
| 11 | 0.45 | 0.37 | 0.00 |
| 12 | 0.19 | 0.34 | 0.00 |
| 13 | 0.48 | 0.49 | 0.00 |
| 14 | 0.44 | 0.33 | 1.00 |
| 16 | 0.54 | 0.51 | 0.00 |
| 17 | 0.38 | 0.40 | 0.00 |
| 18 | 0.44 | 0.43 | 0.00 |
| 20 | 0.52 | 0.49 | 0.00 |
| 21 | 0.53 | 0.36 | 0.00 |
| 22 | 0.29 | 0.13 | 0.00 |
| 23 | 0.62 | 0.42 | 0.00 |
| 24 | 0.34 | 0.15 | 0.00 |
| 25 | 0.56 | 0.17 | 0.00 |
| 26 | 0.39 | 0.24 | 0.00 |
| 27 | 0.82 | 0.34 | 0.00 |
| 28 | 0.77 | 0.41 | 0.00 |
| 29 | 0.34 | 0.37 | 0.00 |
| 31 | 0.46 | 0.37 | 0.00 |
| 32 | 0.35 | 0.33 | 0.00 |
| 33 | 0.52 | 0.44 | 0.00 |
| 34 | 0.60 | 0.46 | 0.00 |
| 36 | 0.40 | 0.39 | 0.00 |
| 37 | 0.64 | 0.42 | 0.00 |
| 38 | 0.45 | 0.51 | 0.00 |
| 40 | 0.35 | 0.29 | 0.00 |
| 41 | 0.51 | 0.32 | 0.00 |
| 42 | 0.61 | 0.53 | 0.00 |
| 43 | 0.41 | 0.23 | 0.00 |
| 44 | 0.48 | 0.19 | 0.00 |
| 45 | 0.43 | 0.38 | 0.00 |
| 48 | 0.51 | 0.45 | 0.00 |
| 49 | 0.55 | 0.54 | 0.00 |
| 50 | 0.33 | 0.35 | 1.00 |
| PE1* | 1.02 | 0.67 | 2.00 |
| PE2 | 0.93 | 0.41 | 2.00 |
| PE3 | 0.67 | 0.55 | 2.00 |

*PE1 = 4 pts. PE3 = 4 pts. PE2 = 2 pts.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.11. Item Statistics—Biology, Fall 2015**

N-Count: 2,761

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.75 | 0.50 | 0.00 |
| 2 | 0.62 | 0.45 | 0.00 |
| 3 | 0.71 | 0.45 | 0.00 |
| 4 | 0.71 | 0.44 | 0.00 |
| 5 | 0.62 | 0.31 | 0.00 |
| 10 | 0.61 | 0.45 | 0.00 |
| 11 | 0.37 | 0.35 | 0.00 |
| 12 | 0.63 | 0.29 | 0.00 |
| 13 | 0.59 | 0.35 | 0.00 |
| 14 | 0.38 | 0.37 | 0.00 |
| 15 | 0.48 | 0.45 | 0.00 |
| 16 | 0.70 | 0.43 | 0.00 |
| 17 | 0.47 | 0.40 | 0.00 |
| 18 | 0.76 | 0.56 | 0.00 |
| 19 | 0.55 | 0.39 | 0.00 |
| 20 | 0.57 | 0.38 | 0.00 |
| 21 | 0.26 | 0.21 | 0.00 |
| 26 | 0.63 | 0.53 | 0.00 |
| 27 | 0.74 | 0.56 | 0.00 |
| 28 | 0.57 | 0.52 | 0.00 |
| 29 | 0.47 | 0.42 | 0.00 |
| 30 | 0.72 | 0.50 | 0.00 |
| 31 | 0.65 | 0.30 | 0.00 |
| 32 | 0.48 | 0.34 | 0.00 |
| 33 | 0.48 | 0.29 | 0.00 |
| 34 | 0.44 | 0.22 | 0.00 |
| 35 | 0.42 | 0.39 | 0.00 |
| 36 | 0.56 | 0.52 | 0.00 |
| 37 | 0.71 | 0.57 | 0.00 |
| 38 | 0.59 | 0.35 | 0.00 |
| 43 | 0.58 | 0.49 | 0.00 |
| 44 | 0.43 | 0.42 | 0.00 |
| 45 | 0.59 | 0.40 | 0.00 |
| 46 | 0.47 | 0.43 | 1.00 |
| 47 | 0.58 | 0.30 | 0.00 |
| PE1* | 0.65 | 0.56 | 1.00 |
| PE2 | 0.65 | 0.54 | 2.00 |
| PE3 | 0.77 | 0.49 | 2.00 |
| PE4 | 0.63 | 0.48 | 2.00 |
| PE5 | 1.02 | 0.59 | 5.00 |
| PE6 | 1.74 | 0.73 | 4.00 |
| PE7 | 0.76 | 0.42 | 2.00 |
| PE8 | 0.46 | 0.55 | 2.00 |
| PE9 | 0.75 | 0.51 | 3.00 |
| PE10 | 0.81 | 0.53 | 5.00 |
| PE11 | 0.53 | 0.54 | 4.00 |
| PE12 | 0.59 | 0.45 | 5.00 |
| PE13 | 0.53 | 0.57 | 5.00 |

*PE1 = 1pt. PE2 = 1pt. PE3 = 1pt. PE4 = 1pt. PE5 = 3pts. PE6 = 4pts. PE7 = 1pt. PE8 = 1pt. PE9 = 1pt. PE10 = 2pts. PE11 = 1pt. PE12 = 2pts. PE13 = 1pt.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.12. Item Statistics—English I, Fall 2015**

N-Count: 656

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.86 | 0.38 | 0.00 |
| 2 | 0.69 | 0.31 | 0.00 |
| 3 | 0.39 | 0.03 | 0.00 |
| 4 | 0.69 | 0.33 | 1.00 |
| 5 | 0.75 | 0.43 | 0.00 |
| 6 | 0.94 | 0.36 | 0.00 |
| 7 | 0.84 | 0.48 | 0.00 |
| 8 | 0.84 | 0.46 | 1.00 |
| 9 | 0.91 | 0.46 | 0.00 |
| 10 | 0.73 | 0.30 | 0.00 |
| 11 | 0.68 | 0.48 | 1.00 |
| 12 | 0.85 | 0.51 | 0.00 |
| 13 | 0.55 | 0.23 | 0.00 |
| 14 | 0.19 | 0.05 | 0.00 |
| 15 | 0.35 | 0.25 | 0.00 |
| 16 | 0.24 | 0.18 | 0.00 |
| 17 | 0.70 | 0.37 | 0.00 |
| 18 | 0.74 | 0.39 | 0.00 |
| 19 | 0.52 | 0.34 | 0.00 |
| 20 | 0.32 | 0.19 | 0.00 |
| 21 | 0.70 | 0.25 | 0.00 |
| 22 | 0.69 | 0.31 | 0.00 |
| 23 | 0.85 | 0.34 | 0.00 |
| 24 | 0.48 | 0.48 | 0.00 |
| 25 | 0.34 | 0.30 | 0.00 |
| 26 | 0.37 | 0.11 | 0.00 |
| 27 | 0.67 | 0.32 | 0.00 |
| 28 | 0.27 | 0.10 | 0.00 |
| 29 | 0.55 | 0.25 | 0.00 |
| 30 | 0.83 | 0.36 | 0.00 |
| 31 | 0.62 | 0.51 | 0.00 |
| 32 | 0.67 | 0.39 | 0.00 |
| 33 | 0.61 | 0.38 | 0.00 |
| 34 | 0.59 | 0.42 | 0.00 |
| 35 | 0.60 | 0.33 | 1.00 |
| PE1* | 3.01 | 0.57 | 1.00 |
| PE2 | 3.02 | 0.59 | 1.00 |
| PE3 | 1.86 | 0.48 | 1.00 |

*PE1 = 4 pts. PE2 = 4 pts. PE3 = 2 pts.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.13. Item Statistics—Algebra II, Fall 2015**

N-Count: 692

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.41 | 0.35 | 0.00 |
| 2 | 0.64 | 0.28 | 0.00 |
| 3 | 0.45 | 0.28 | 0.00 |
| 4 | 0.81 | 0.26 | 0.00 |
| 5 | 0.68 | 0.43 | 0.00 |
| 6 | 0.40 | 0.21 | 0.00 |
| 8 | 0.51 | 0.46 | 0.00 |
| 10 | 0.45 | 0.33 | 0.00 |
| 11 | 0.83 | 0.47 | 0.00 |
| 12 | 0.83 | 0.42 | 0.00 |
| 13 | 0.87 | 0.38 | 0.00 |
| 14 | 0.76 | 0.45 | 0.00 |
| 15 | 0.80 | 0.42 | 0.00 |
| 16 | 0.57 | 0.40 | 0.00 |
| 17 | 0.92 | 0.35 | 0.00 |
| 18 | 0.64 | 0.26 | 0.00 |
| 19 | 0.79 | 0.33 | 0.00 |
| 20 | 0.85 | 0.34 | 0.00 |
| 21 | 0.72 | 0.48 | 0.00 |
| 22 | 0.68 | 0.31 | 0.00 |
| 23 | 0.70 | 0.36 | 0.00 |
| 24 | 0.74 | 0.43 | 0.00 |
| 27 | 0.39 | 0.22 | 0.00 |
| 28 | 0.81 | 0.40 | 0.00 |
| 29 | 0.33 | 0.16 | 0.00 |
| 30 | 0.38 | 0.42 | 0.00 |
| 31 | 0.54 | 0.28 | 0.00 |
| 34 | 0.66 | 0.35 | 0.00 |
| 37 | 0.76 | 0.46 | 0.00 |
| 39 | 0.40 | 0.34 | 0.00 |
| 40 | 0.68 | 0.25 | 0.00 |
| 41 | 0.63 | 0.40 | 0.00 |
| 42 | 0.64 | 0.35 | 0.00 |
| 44 | 0.37 | 0.32 | 0.00 |
| 45 | 0.41 | 0.32 | 0.00 |
| 46 | 0.51 | 0.25 | 0.00 |
| 47 | 0.81 | 0.41 | 0.00 |
| 48 | 0.65 | 0.19 | 0.00 |
| 49 | 0.69 | 0.39 | 0.00 |
| 50 | 0.52 | 0.30 | 0.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.14. Item Statistics—Geometry, Fall 2015**

N-Count: 674

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.84 | 0.42 | 0.00 |
| 2 | 0.51 | 0.29 | 0.00 |
| 3 | 0.34 | 0.36 | 0.00 |
| 4 | 0.48 | 0.34 | 0.00 |
| 5 | 0.71 | 0.10 | 0.00 |
| 6 | 0.61 | 0.35 | 0.00 |
| 7 | 0.43 | 0.43 | 0.00 |
| 8 | 0.29 | 0.39 | 0.00 |
| 9 | 0.81 | 0.22 | 0.00 |
| 10 | 0.75 | 0.33 | 0.00 |
| 11 | 0.34 | 0.11 | 0.00 |
| 12 | 0.81 | 0.38 | 0.00 |
| 13 | 0.51 | 0.38 | 0.00 |
| 14 | 0.38 | 0.46 | 0.00 |
| 15 | 0.91 | 0.24 | 0.00 |
| 16 | 0.60 | 0.30 | 0.00 |
| 17 | 0.50 | 0.32 | 0.00 |
| 18 | 0.53 | 0.40 | 0.00 |
| 19 | 0.73 | 0.43 | 0.00 |
| 20 | 0.51 | 0.26 | 0.00 |
| 21 | 0.69 | 0.36 | 0.00 |
| 22 | 0.66 | 0.31 | 0.00 |
| 23 | 0.84 | 0.23 | 0.00 |
| 24 | 0.54 | 0.43 | 0.00 |
| 25 | 0.69 | 0.34 | 0.00 |
| 26 | 0.76 | 0.39 | 0.00 |
| 27 | 0.59 | 0.35 | 0.00 |
| 28 | 0.75 | 0.29 | 0.00 |
| 29 | 0.26 | 0.28 | 0.00 |
| 30 | 0.58 | 0.29 | 0.00 |
| 31 | 0.64 | 0.32 | 0.00 |
| 32 | 0.73 | 0.23 | 0.00 |
| 33 | 0.50 | 0.49 | 0.00 |
| 34 | 0.52 | 0.37 | 0.00 |
| 35 | 0.68 | 0.31 | 0.00 |
| 36 | 0.46 | 0.43 | 0.00 |
| 37 | 0.36 | 0.22 | 0.00 |
| 38 | 0.27 | 0.31 | 0.00 |
| 39 | 0.64 | 0.30 | 0.00 |
| 40 | 0.23 | 0.26 | 0.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.15. Item Statistics—Government, Fall 2015**

N-Count: 13,838

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.61 | 0.26 | 0.00 |
| 2 | 0.68 | 0.41 | 0.00 |
| 3 | 0.70 | 0.32 | 0.00 |
| 4 | 0.38 | 0.18 | 0.00 |
| 5 | 0.58 | 0.38 | 0.00 |
| 6 | 0.74 | 0.39 | 0.00 |
| 7 | 0.76 | 0.45 | 0.00 |
| 8 | 0.62 | 0.40 | 0.00 |
| 9 | 0.45 | 0.58 | 0.00 |
| 10 | 0.68 | 0.42 | 0.00 |
| 16 | 0.60 | 0.50 | 0.00 |
| 17 | 0.79 | 0.44 | 0.00 |
| 18 | 0.66 | 0.39 | 0.00 |
| 19 | 0.45 | 0.55 | 0.00 |
| 20 | 0.82 | 0.36 | 0.00 |
| 21 | 0.81 | 0.37 | 0.00 |
| 22 | 0.64 | 0.50 | 0.00 |
| 23 | 0.79 | 0.33 | 0.00 |
| 24 | 0.69 | 0.46 | 0.00 |
| 25 | 0.78 | 0.43 | 0.00 |
| 26 | 0.40 | 0.28 | 0.00 |
| 27 | 0.70 | 0.49 | 0.00 |
| 28 | 0.68 | 0.37 | 0.00 |
| 29 | 0.45 | 0.31 | 0.00 |
| 30 | 0.67 | 0.31 | 0.00 |
| 31 | 0.63 | 0.47 | 0.00 |
| 32 | 0.61 | 0.39 | 0.00 |
| 33 | 0.55 | 0.24 | 0.00 |
| 34 | 0.53 | 0.34 | 0.00 |
| 35 | 0.61 | 0.48 | 0.00 |
| 41 | 0.51 | 0.34 | 0.00 |
| 42 | 0.74 | 0.36 | 0.00 |
| 43 | 0.72 | 0.34 | 0.00 |
| 44 | 0.59 | 0.51 | 0.00 |
| 45 | 0.49 | 0.35 | 0.00 |
| 46 | 0.51 | 0.33 | 0.00 |
| 47 | 0.60 | 0.45 | 0.00 |
| 48 | 0.75 | 0.56 | 0.00 |
| 49 | 0.75 | 0.47 | 0.00 |
| 50 | 0.69 | 0.45 | 0.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.16. Item Statistics—American History, Fall 2015**

N-Count: 464

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.80 | 0.40 | 0.00 |
| 2 | 0.91 | 0.19 | 0.00 |
| 3 | 0.73 | 0.31 | 0.00 |
| 4 | 0.67 | 0.39 | 0.00 |
| 5 | 0.84 | 0.26 | 0.00 |
| 6 | 0.77 | 0.27 | 0.00 |
| 7 | 0.72 | 0.34 | 0.00 |
| 8 | 0.56 | 0.25 | 0.00 |
| 9 | 0.74 | 0.41 | 0.00 |
| 10 | 0.71 | 0.28 | 0.00 |
| 16 | 0.54 | 0.38 | 0.00 |
| 17 | 0.67 | 0.48 | 0.00 |
| 18 | 0.49 | 0.31 | 0.00 |
| 19 | 0.61 | 0.33 | 0.00 |
| 20 | 0.58 | 0.36 | 0.00 |
| 21 | 0.65 | 0.39 | 0.00 |
| 22 | 0.85 | 0.41 | 0.00 |
| 23 | 0.28 | 0.20 | 0.00 |
| 24 | 0.56 | 0.35 | 0.00 |
| 25 | 0.57 | 0.16 | 0.00 |
| 26 | 0.37 | 0.38 | 0.00 |
| 27 | 0.45 | 0.36 | 0.00 |
| 28 | 0.33 | 0.15 | 0.00 |
| 29 | 0.61 | 0.49 | 0.00 |
| 30 | 0.52 | 0.34 | 0.00 |
| 31 | 0.74 | 0.41 | 0.00 |
| 32 | 0.48 | 0.21 | 0.00 |
| 33 | 0.49 | 0.35 | 0.00 |
| 34 | 0.53 | 0.27 | 0.00 |
| 35 | 0.46 | 0.15 | 0.00 |
| 41 | 0.44 | 0.40 | 0.00 |
| 42 | 0.60 | 0.29 | 0.00 |
| 43 | 0.54 | 0.43 | 0.00 |
| 44 | 0.84 | 0.30 | 0.00 |
| 45 | 0.39 | 0.34 | 0.00 |
| 46 | 0.73 | 0.41 | 0.00 |
| 47 | 0.85 | 0.44 | 0.00 |
| 48 | 0.82 | 0.43 | 0.00 |
| 49 | 0.49 | 0.28 | 0.00 |
| 50 | 0.65 | 0.47 | 0.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.17. Item Statistics—English II, Spring 2016**

N-Count: 62,768

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.81 | 0.33 | 0.00 |
| 2 | 0.42 | 0.16 | 0.00 |
| 3 | 0.84 | 0.26 | 0.00 |
| 4 | 0.51 | 0.31 | 0.00 |
| 5 | 0.79 | 0.29 | 0.00 |
| 6 | 0.94 | 0.30 | 0.00 |
| 7 | 0.77 | 0.37 | 0.00 |
| 14 | 0.67 | 0.31 | 0.00 |
| 15 | 0.58 | 0.20 | 0.00 |
| 16 | 0.85 | 0.34 | 0.00 |
| 17 | 0.74 | 0.25 | 0.00 |
| 18 | 0.38 | 0.23 | 0.00 |
| 19 | 0.79 | 0.49 | 0.00 |
| 20 | 0.39 | 0.25 | 0.00 |
| 21 | 0.61 | 0.31 | 0.00 |
| 22 | 0.82 | 0.48 | 0.00 |
| 23 | 0.39 | 0.22 | 0.00 |
| 24 | 0.80 | 0.45 | 0.00 |
| 31 | 0.87 | 0.41 | 0.00 |
| 32 | 0.84 | 0.54 | 0.00 |
| 33 | 0.53 | 0.16 | 0.00 |
| 34 | 0.86 | 0.48 | 0.00 |
| 35 | 0.67 | 0.42 | 0.00 |
| 36 | 0.90 | 0.44 | 0.00 |
| 37 | 0.66 | 0.38 | 0.00 |
| 38 | 0.84 | 0.52 | 0.00 |
| 39 | 0.45 | 0.25 | 0.00 |
| 40 | 0.90 | 0.45 | 0.00 |
| 41 | 0.79 | 0.44 | 0.00 |
| 42 | 0.64 | 0.37 | 0.00 |
| 43 | 0.72 | 0.43 | 0.00 |
| 44 | 0.56 | 0.36 | 0.00 |
| 45 | 0.50 | 0.25 | 0.00 |
| 46 | 0.23 | -0.05 | 0.00 |
| 47 | 0.92 | 0.42 | 0.00 |
| PE1* | 2.96 | 0.52 | 0.00 |
| PE2 | 2.99 | 0.52 | 0.00 |
| PE3 | 1.86 | 0.45 | 0.00 |

*PE1 = 4 pts. PE2 = 4 pts. PE3 = 2 pts.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.18. Item Statistics—Algebra I, Spring 2016**

N-Count: 60,944

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.34 | 0.35 | 0.00 |
| 2 | 0.35 | 0.37 | 0.00 |
| 4 | 0.34 | 0.19 | 0.00 |
| 5 | 0.65 | 0.36 | 0.00 |
| 6 | 0.91 | 0.31 | 0.00 |
| 8 | 0.48 | 0.26 | 0.00 |
| 10 | 0.21 | -0.03 | 0.00 |
| 11 | 0.11 | 0.18 | 0.00 |
| 12 | 0.50 | 0.36 | 0.00 |
| 13 | 0.79 | 0.44 | 0.00 |
| 14 | 0.63 | 0.44 | 0.00 |
| 16 | 0.31 | 0.30 | 0.00 |
| 17 | 0.30 | 0.17 | 0.00 |
| 18 | 0.77 | 0.41 | 0.00 |
| 20 | 0.43 | 0.46 | 0.00 |
| 21 | 0.68 | 0.43 | 0.00 |
| 22 | 0.46 | 0.22 | 0.00 |
| 23 | 0.66 | 0.41 | 0.00 |
| 24 | 0.69 | 0.35 | 0.00 |
| 25 | 0.43 | 0.46 | 0.00 |
| 26 | 0.31 | 0.32 | 0.00 |
| 27 | 0.48 | 0.48 | 0.00 |
| 28 | 0.34 | 0.25 | 0.00 |
| 29 | 0.45 | 0.26 | 0.00 |
| 31 | 0.73 | 0.35 | 0.00 |
| 32 | 0.53 | 0.49 | 0.00 |
| 33 | 0.33 | 0.10 | 0.00 |
| 34 | 0.45 | 0.17 | 0.00 |
| 36 | 0.46 | 0.38 | 0.00 |
| 37 | 0.27 | 0.45 | 0.00 |
| 38 | 0.48 | 0.33 | 0.00 |
| 40 | 0.20 | 0.11 | 0.00 |
| 41 | 0.32 | 0.09 | 0.00 |
| 42 | 0.57 | 0.44 | 0.00 |
| 43 | 0.65 | 0.38 | 0.00 |
| 44 | 0.26 | 0.11 | 0.00 |
| 45 | 0.54 | 0.29 | 0.00 |
| 48 | 0.44 | 0.38 | 0.00 |
| 49 | 0.54 | 0.43 | 0.00 |
| 50 | 0.82 | 0.26 | 0.00 |
| *PE1 | 1.20 | 0.57 | 0.00 |
| PE2 | 0.85 | 0.61 | 0.00 |
| PE3 | 0.52 | 0.54 | 0.00 |
| PE4 | 1.04 | 0.55 | 0.00 |

*PE1 = 2 pts. PE2 = 4 pts. PE3 = 1 pt. PE4 = 3 pts.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.19. Item Statistics—Biology, Spring 2016**

N-Count: 61,454

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.90 | 0.35 | 0.00 |
| 2 | 0.59 | 0.27 | 0.00 |
| 3 | 0.92 | 0.40 | 0.00 |
| 4 | 0.33 | 0.19 | 0.00 |
| 5 | 0.59 | 0.45 | 0.00 |
| 10 | 0.94 | 0.34 | 0.00 |
| 11 | 0.77 | 0.34 | 0.00 |
| 12 | 0.61 | 0.39 | 0.00 |
| 13 | 0.66 | 0.42 | 0.00 |
| 14 | 0.64 | 0.53 | 0.00 |
| 15 | 0.72 | 0.32 | 0.00 |
| 16 | 0.75 | 0.30 | 0.00 |
| 17 | 0.64 | 0.41 | 0.00 |
| 18 | 0.46 | 0.29 | 0.00 |
| 19 | 0.66 | 0.35 | 0.00 |
| 20 | 0.83 | 0.29 | 0.00 |
| 21 | 0.65 | 0.46 | 0.00 |
| 26 | 0.55 | 0.32 | 0.00 |
| 27 | 0.73 | 0.43 | 0.00 |
| 28 | 0.52 | 0.44 | 0.00 |
| 29 | 0.80 | 0.40 | 0.00 |
| 30 | 0.60 | 0.39 | 0.00 |
| 31 | 0.37 | 0.26 | 0.00 |
| 32 | 0.55 | 0.33 | 0.00 |
| 33 | 0.67 | 0.43 | 0.00 |
| 34 | 0.78 | 0.48 | 0.00 |
| 35 | 0.80 | 0.22 | 0.00 |
| 36 | 0.54 | 0.18 | 0.00 |
| 37 | 0.59 | 0.25 | 0.00 |
| 38 | 0.66 | 0.45 | 0.00 |
| 43 | 0.65 | 0.35 | 0.00 |
| 44 | 0.50 | 0.35 | 0.00 |
| 45 | 0.53 | 0.28 | 0.00 |
| 46 | 0.72 | 0.51 | 0.00 |
| 47 | 0.39 | 0.34 | 0.00 |
| PE1* | 0.70 | 0.37 | 0.00 |
| PE2 | 0.74 | 0.43 | 0.00 |
| PE3 | 0.59 | 0.43 | 0.00 |
| PE4 | 1.47 | 0.49 | 0.00 |
| PE5 | 2.78 | 0.58 | 1.00 |
| PE6 | 1.34 | 0.35 | 1.00 |
| PE7 | 1.33 | 0.48 | 1.00 |
| PE8 | 1.21 | 0.48 | 1.00 |
| PE9 | 0.94 | 0.50 | 2.00 |
| PE10 | 1.04 | 0.45 | 1.00 |

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



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.20. Item Statistics—English I, Spring 2016**

N-Count: 15,858

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.83 | 0.36 | 0.00 |
| 2 | 0.66 | 0.32 | 0.00 |
| 3 | 0.42 | 0.02 | 0.00 |
| 4 | 0.63 | 0.28 | 0.00 |
| 5 | 0.71 | 0.42 | 0.00 |
| 6 | 0.95 | 0.29 | 0.00 |
| 7 | 0.83 | 0.44 | 0.00 |
| 8 | 0.81 | 0.44 | 0.00 |
| 9 | 0.88 | 0.46 | 0.00 |
| 10 | 0.69 | 0.34 | 0.00 |
| 11 | 0.71 | 0.42 | 0.00 |
| 12 | 0.83 | 0.43 | 0.00 |
| 13 | 0.58 | 0.27 | 0.00 |
| 14 | 0.21 | 0.01 | 0.00 |
| 15 | 0.33 | 0.17 | 0.00 |
| 16 | 0.21 | 0.21 | 0.00 |
| 17 | 0.68 | 0.31 | 0.00 |
| 18 | 0.71 | 0.34 | 0.00 |
| 19 | 0.53 | 0.31 | 0.00 |
| 20 | 0.30 | 0.11 | 0.00 |
| 21 | 0.73 | 0.17 | 0.00 |
| 22 | 0.70 | 0.30 | 0.00 |
| 23 | 0.82 | 0.35 | 0.00 |
| 24 | 0.41 | 0.46 | 0.00 |
| 25 | 0.31 | 0.30 | 0.00 |
| 26 | 0.36 | 0.13 | 0.00 |
| 27 | 0.65 | 0.34 | 0.00 |
| 28 | 0.27 | 0.14 | 0.00 |
| 29 | 0.54 | 0.24 | 0.00 |
| 30 | 0.85 | 0.36 | 0.00 |
| 31 | 0.57 | 0.45 | 0.00 |
| 32 | 0.67 | 0.35 | 0.00 |
| 33 | 0.56 | 0.39 | 0.00 |
| 34 | 0.60 | 0.43 | 0.00 |
| 35 | 0.61 | 0.31 | 0.00 |
| PE1* | 2.91 | 0.51 | 0.00 |
| PE2 | 2.93 | 0.52 | 0.00 |
| PE3 | 1.80 | 0.45 | 0.00 |

*PE1 = 4 pts. PE2 = 4 pts. PE3 = 2 pts.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.21. Item Statistics—Algebra II, Spring 2016**

N-Count: 19,790

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.75 | 0.43 | 0.00 |
| 2 | 0.85 | 0.27 | 0.00 |
| 3 | 0.51 | 0.41 | 0.00 |
| 4 | 0.67 | 0.27 | 0.00 |
| 5 | 0.74 | 0.45 | 0.00 |
| 6 | 0.49 | 0.40 | 0.00 |
| 8 | 0.65 | 0.42 | 0.00 |
| 10 | 0.81 | 0.34 | 0.00 |
| 11 | 0.87 | 0.33 | 0.00 |
| 12 | 0.73 | 0.36 | 0.00 |
| 13 | 0.42 | 0.34 | 0.00 |
| 14 | 0.52 | 0.37 | 0.00 |
| 15 | 0.76 | 0.40 | 0.00 |
| 16 | 0.37 | 0.14 | 0.00 |
| 17 | 0.55 | 0.30 | 0.00 |
| 18 | 0.36 | 0.17 | 0.00 |
| 19 | 0.56 | 0.44 | 0.00 |
| 20 | 0.74 | 0.39 | 0.00 |
| 21 | 0.45 | 0.12 | 0.00 |
| 22 | 0.75 | 0.29 | 0.00 |
| 23 | 0.76 | 0.43 | 0.00 |
| 24 | 0.61 | 0.38 | 0.00 |
| 27 | 0.74 | 0.33 | 0.00 |
| 28 | 0.54 | 0.43 | 0.00 |
| 29 | 0.69 | 0.40 | 0.00 |
| 30 | 0.70 | 0.30 | 0.00 |
| 31 | 0.77 | 0.46 | 0.00 |
| 34 | 0.34 | 0.35 | 0.00 |
| 37 | 0.40 | 0.46 | 0.00 |
| 39 | 0.56 | 0.31 | 0.00 |
| 40 | 0.77 | 0.45 | 0.00 |
| 41 | 0.75 | 0.35 | 0.00 |
| 42 | 0.45 | 0.37 | 0.00 |
| 44 | 0.53 | 0.34 | 0.00 |
| 45 | 0.57 | 0.45 | 0.00 |
| 46 | 0.66 | 0.37 | 0.00 |
| 47 | 0.87 | 0.27 | 0.00 |
| 48 | 0.34 | 0.30 | 0.00 |
| 49 | 0.55 | 0.45 | 0.00 |
| 50 | 0.64 | 0.24 | 0.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.22. Item Statistics—Geometry, Spring 2016**

N-Count: 8,688

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.84 | 0.37 | 0.00 |
| 2 | 0.55 | 0.36 | 0.00 |
| 3 | 0.38 | 0.32 | 0.00 |
| 4 | 0.47 | 0.33 | 0.00 |
| 5 | 0.73 | 0.20 | 0.00 |
| 6 | 0.56 | 0.34 | 0.00 |
| 7 | 0.36 | 0.38 | 0.00 |
| 8 | 0.24 | 0.36 | 0.00 |
| 9 | 0.84 | 0.28 | 0.00 |
| 10 | 0.67 | 0.39 | 0.00 |
| 11 | 0.34 | 0.14 | 0.00 |
| 12 | 0.81 | 0.37 | 0.00 |
| 13 | 0.52 | 0.39 | 0.00 |
| 14 | 0.36 | 0.41 | 0.00 |
| 15 | 0.90 | 0.27 | 0.00 |
| 16 | 0.58 | 0.41 | 0.00 |
| 17 | 0.50 | 0.35 | 0.00 |
| 18 | 0.49 | 0.42 | 0.00 |
| 19 | 0.69 | 0.42 | 0.00 |
| 20 | 0.55 | 0.28 | 0.00 |
| 21 | 0.64 | 0.38 | 0.00 |
| 22 | 0.65 | 0.37 | 0.00 |
| 23 | 0.79 | 0.25 | 0.00 |
| 24 | 0.44 | 0.41 | 0.00 |
| 25 | 0.64 | 0.41 | 0.00 |
| 26 | 0.69 | 0.39 | 0.00 |
| 27 | 0.53 | 0.32 | 0.00 |
| 28 | 0.74 | 0.38 | 0.00 |
| 29 | 0.23 | 0.30 | 0.00 |
| 30 | 0.50 | 0.35 | 0.00 |
| 31 | 0.59 | 0.34 | 0.00 |
| 32 | 0.79 | 0.38 | 0.00 |
| 33 | 0.47 | 0.47 | 0.00 |
| 34 | 0.53 | 0.37 | 0.00 |
| 35 | 0.68 | 0.27 | 0.00 |
| 36 | 0.44 | 0.40 | 0.00 |
| 37 | 0.33 | 0.23 | 0.00 |
| 38 | 0.29 | 0.39 | 0.00 |
| 39 | 0.66 | 0.42 | 0.00 |
| 40 | 0.16 | 0.24 | 0.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.23. Item Statistics—Government, Spring 2016**

N-Count: 44,459

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.70 | 0.38 | 0.00 |
| 2 | 0.60 | 0.07 | 0.00 |
| 3 | 0.42 | 0.24 | 0.00 |
| 4 | 0.87 | 0.45 | 0.00 |
| 5 | 0.58 | 0.32 | 0.00 |
| 6 | 0.89 | 0.35 | 0.00 |
| 7 | 0.81 | 0.35 | 0.00 |
| 8 | 0.70 | 0.32 | 0.00 |
| 9 | 0.75 | 0.41 | 0.00 |
| 10 | 0.80 | 0.50 | 0.00 |
| 16 | 0.50 | 0.38 | 0.00 |
| 17 | 0.39 | 0.23 | 0.00 |
| 18 | 0.70 | 0.24 | 0.00 |
| 19 | 0.77 | 0.45 | 0.00 |
| 20 | 0.82 | 0.25 | 0.00 |
| 21 | 0.72 | 0.42 | 0.00 |
| 22 | 0.67 | 0.41 | 0.00 |
| 23 | 0.54 | 0.35 | 0.00 |
| 24 | 0.56 | 0.34 | 0.00 |
| 25 | 0.70 | 0.45 | 0.00 |
| 26 | 0.70 | 0.50 | 0.00 |
| 27 | 0.71 | 0.44 | 0.00 |
| 28 | 0.57 | 0.16 | 0.00 |
| 29 | 0.76 | 0.49 | 0.00 |
| 30 | 0.78 | 0.49 | 0.00 |
| 31 | 0.80 | 0.47 | 0.00 |
| 32 | 0.68 | 0.45 | 0.00 |
| 33 | 0.64 | 0.42 | 0.00 |
| 34 | 0.71 | 0.47 | 0.00 |
| 35 | 0.77 | 0.27 | 0.00 |
| 41 | 0.65 | 0.42 | 0.00 |
| 42 | 0.60 | 0.29 | 0.00 |
| 43 | 0.85 | 0.44 | 0.00 |
| 44 | 0.52 | 0.34 | 0.00 |
| 45 | 0.80 | 0.33 | 0.00 |
| 46 | 0.60 | 0.44 | 0.00 |
| 47 | 0.44 | 0.27 | 0.00 |
| 48 | 0.76 | 0.48 | 0.00 |
| 49 | 0.63 | 0.47 | 0.00 |
| 50 | 0.60 | 0.51 | 0.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.24. Item Statistics—American History, Spring 2016**

N-Count: 9,151

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.83 | 0.33 | 0.00 |
| 2 | 0.86 | 0.20 | 0.00 |
| 3 | 0.65 | 0.35 | 0.00 |
| 4 | 0.69 | 0.41 | 0.00 |
| 5 | 0.76 | 0.35 | 0.00 |
| 6 | 0.71 | 0.31 | 0.00 |
| 7 | 0.73 | 0.32 | 0.00 |
| 8 | 0.57 | 0.22 | 0.00 |
| 9 | 0.65 | 0.38 | 0.00 |
| 10 | 0.66 | 0.33 | 0.00 |
| 16 | 0.48 | 0.26 | 0.00 |
| 17 | 0.66 | 0.46 | 0.00 |
| 18 | 0.46 | 0.32 | 0.00 |
| 19 | 0.34 | 0.26 | 0.00 |
| 20 | 0.61 | 0.27 | 0.00 |
| 21 | 0.61 | 0.40 | 0.00 |
| 22 | 0.81 | 0.39 | 0.00 |
| 23 | 0.27 | 0.14 | 0.00 |
| 24 | 0.48 | 0.29 | 0.00 |
| 25 | 0.56 | 0.19 | 0.00 |
| 26 | 0.36 | 0.33 | 0.00 |
| 27 | 0.36 | 0.30 | 0.00 |
| 28 | 0.38 | 0.17 | 0.00 |
| 29 | 0.56 | 0.45 | 0.00 |
| 30 | 0.49 | 0.35 | 0.00 |
| 31 | 0.76 | 0.37 | 0.00 |
| 32 | 0.40 | 0.30 | 0.00 |
| 33 | 0.46 | 0.27 | 0.00 |
| 34 | 0.48 | 0.28 | 0.00 |
| 35 | 0.50 | 0.22 | 0.00 |
| 41 | 0.42 | 0.41 | 0.00 |
| 42 | 0.59 | 0.36 | 0.00 |
| 43 | 0.50 | 0.39 | 0.00 |
| 44 | 0.79 | 0.33 | 0.00 |
| 45 | 0.34 | 0.27 | 0.00 |
| 46 | 0.67 | 0.44 | 0.00 |
| 47 | 0.73 | 0.46 | 0.00 |
| 48 | 0.79 | 0.42 | 0.00 |
| 49 | 0.43 | 0.12 | 0.00 |
| 50 | 0.67 | 0.40 | 0.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table C.25. Item Statistics—Physical Science, Spring 2016**

N-Count: 4,727

| Item # | P-Value/Mean | Corrected Point-Biserial Correlation | Omit Rate (%) |
|---|---|---|---|
| 1 | 0.82 | 0.32 | 0.00 |
| 2 | 0.70 | 0.29 | 0.00 |
| 3 | 0.67 | 0.30 | 0.00 |
| 4 | 0.71 | 0.23 | 0.00 |
| 5 | 0.75 | 0.27 | 0.00 |
| 6 | 0.63 | 0.30 | 0.00 |
| 7 | 0.55 | 0.19 | 0.00 |
| 8 | 0.47 | 0.44 | 0.00 |
| 9 | 0.56 | 0.35 | 0.00 |
| 10 | 0.21 | 0.04 | 0.00 |
| 11 | 0.53 | 0.00 | 0.00 |
| 12 | 0.68 | 0.36 | 0.00 |
| 13 | 0.56 | 0.31 | 0.00 |
| 14 | 0.48 | 0.39 | 0.00 |
| 15 | 0.43 | 0.28 | 0.00 |
| 16 | 0.43 | 0.13 | 0.00 |
| 17 | 0.47 | 0.14 | 0.00 |
| 18 | 0.55 | 0.30 | 0.00 |
| 19 | 0.58 | 0.31 | 0.00 |
| 20 | 0.38 | 0.29 | 0.00 |
| 21 | 0.74 | 0.21 | 0.00 |
| 22 | 0.44 | 0.29 | 0.00 |
| 23 | 0.54 | 0.31 | 0.00 |
| 24 | 0.44 | 0.36 | 0.00 |
| 25 | 0.65 | 0.26 | 0.00 |
| 26 | 0.08 | 0.09 | 0.00 |
| 27 | 0.40 | 0.34 | 0.00 |
| 28 | 0.39 | 0.27 | 0.00 |
| 29 | 0.40 | 0.36 | 0.00 |
| 30 | 0.37 | 0.16 | 0.00 |
| 31 | 0.56 | 0.32 | 0.00 |
| 32 | 0.55 | 0.25 | 0.00 |
| 33 | 0.44 | 0.39 | 0.00 |
| 34 | 0.28 | 0.13 | 0.00 |
| 35 | 0.29 | 0.21 | 0.00 |
| 36 | 0.30 | 0.11 | 0.00 |
| 37 | 0.19 | 0.14 | 0.00 |
| 38 | 0.16 | 0.03 | 0.00 |
| 39 | 0.48 | 0.37 | 0.00 |
| 40 | 0.18 | 0.07 | 0.00 |
| 41 | 0.40 | 0.24 | 0.00 |
| 42 | 0.22 | 0.20 | 0.00 |
| 43 | 0.26 | 0.27 | 0.00 |
| 44 | 0.14 | -0.09 | 0.00 |
| 45 | 0.16 | 0.04 | 0.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Appendix D: Raw-to-Scale Score (RSS) Conversions

**Table D.1. RSS Conversions—English II, Summer 2015**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 111 | 28 |
| 1 | 129 | 16 |
| 2 | 141 | 11 |
| 3 | 147 | 9 |
| 4 | 152 | 8 |
| 5 | 156 | 7 |
| 6 | 159 | 7 |
| 7 | 162 | 6 |
| 8 | 164 | 6 |
| 9 | 167 | 6 |
| 10 | 169 | 6 |
| 11 | 171 | 6 |
| 12 | 173 | 5 |
| 13 | 175 | 5 |
| 14 | 176 | 5 |
| 15 | 178 | 5 |
| 16 | 180 | 5 |
| 17 | 182 | 5 |
| 18 | 183 | 5 |
| 19 | 185 | 5 |
| 20 | 187 | 5 |
| 21 | 189 | 5 |
| 22 | 190 | 5 |
| 23 | 192 | 5 |
| 24 | 194 | 5 |
| 25 | 196 | 5 |
| 26 | 197 | 5 |
| 27 | 200 | 5 |
| 28 | 201 | 5 |
| 29 | 203 | 5 |
| 30 | 205 | 6 |
| 31 | 207 | 6 |
| 32 | 209 | 6 |
| 33 | 211 | 6 |
| 34 | 214 | 6 |
| 35 | 216 | 6 |
| 36 | 219 | 6 |
| 37 | 221 | 7 |
| 38 | 225 | 7 |
| 39 | 228 | 7 |
| 40 | 232 | 8 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 41 | 236 | 9 |
| 42 | 242 | 10 |
| 43 | 249 | 12 |
| 44 | 250 | 16 |
| 45 | 250 | 29 |

**Table D.2. RSS Conversions—Algebra I, Summer 2015**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 40 |
| 1 | 120 | 22 |
| 2 | 136 | 16 |
| 3 | 146 | 13 |
| 4 | 153 | 12 |
| 5 | 159 | 11 |
| 6 | 164 | 10 |
| 7 | 168 | 9 |
| 8 | 172 | 9 |
| 9 | 176 | 8 |
| 10 | 179 | 8 |
| 11 | 182 | 8 |
| 12 | 185 | 8 |
| 13 | 187 | 7 |
| 14 | 190 | 7 |
| 15 | 192 | 7 |
| 16 | 194 | 7 |
| 17 | 197 | 7 |
| 18 | 200 | 7 |
| 19 | 201 | 7 |
| 20 | 203 | 6 |
| 21 | 205 | 6 |
| 22 | 207 | 6 |
| 23 | 208 | 6 |
| 24 | 210 | 6 |
| 25 | 212 | 6 |
| 26 | 214 | 6 |
| 27 | 216 | 6 |
| 28 | 218 | 6 |
| 29 | 220 | 6 |
| 30 | 221 | 6 |
| 31 | 223 | 6 |
| 32 | 225 | 7 |
| 33 | 227 | 7 |
| 34 | 229 | 7 |
| 35 | 232 | 7 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 36 | 234 | 7 |
| 37 | 236 | 7 |
| 38 | 239 | 7 |
| 39 | 241 | 8 |
| 40 | 244 | 8 |
| 41 | 247 | 8 |
| 42 | 250 | 9 |
| 43 | 250 | 9 |
| 44 | 250 | 10 |
| 45 | 250 | 11 |
| 46 | 250 | 12 |
| 47 | 250 | 14 |
| 48 | 250 | 17 |
| 49 | 250 | 23 |
| 50 | 250 | 41 |

**Table D.3. RSS Conversions—Biology, Summer 2015**

| 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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 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 |
| 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 |

**Table D.4. RSS Conversions—English I, Summer 2015**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 32 |
| 1 | 117 | 18 |
| 2 | 129 | 13 |
| 3 | 137 | 10 |
| 4 | 142 | 9 |
| 5 | 147 | 8 |
| 6 | 150 | 8 |
| 7 | 154 | 7 |
| 8 | 157 | 7 |
| 9 | 159 | 7 |
| 10 | 162 | 7 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 11 | 164 | 7 |
| 12 | 167 | 6 |
| 13 | 169 | 6 |
| 14 | 171 | 6 |
| 15 | 174 | 6 |
| 16 | 176 | 6 |
| 17 | 178 | 6 |
| 18 | 180 | 6 |
| 19 | 182 | 6 |
| 20 | 184 | 6 |
| 21 | 186 | 6 |
| 22 | 189 | 6 |
| 23 | 191 | 6 |
| 24 | 193 | 6 |
| 25 | 195 | 6 |
| 26 | 197 | 6 |
| 27 | 200 | 6 |
| 28 | 201 | 6 |
| 29 | 204 | 6 |
| 30 | 206 | 6 |
| 31 | 208 | 7 |
| 32 | 211 | 7 |
| 33 | 213 | 7 |
| 34 | 216 | 7 |
| 35 | 219 | 7 |
| 36 | 222 | 7 |
| 37 | 225 | 8 |
| 38 | 228 | 8 |
| 39 | 232 | 8 |
| 40 | 237 | 9 |
| 41 | 242 | 10 |
| 42 | 248 | 11 |
| 43 | 250 | 13 |
| 44 | 250 | 18 |
| 45 | 250 | 32 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.5. RSS Conversions—Algebra II, Summer 2015**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 43 |
| 1 | 104 | 24 |
| 2 | 121 | 17 |
| 3 | 131 | 14 |
| 4 | 139 | 13 |
| 5 | 145 | 12 |
| 6 | 151 | 11 |
| 7 | 155 | 10 |
| 8 | 159 | 10 |
| 9 | 163 | 9 |
| 10 | 167 | 9 |
| 11 | 170 | 9 |
| 12 | 173 | 9 |
| 13 | 176 | 8 |
| 14 | 179 | 8 |
| 15 | 182 | 8 |
| 16 | 186 | 8 |
| 17 | 188 | 8 |
| 18 | 191 | 8 |
| 19 | 193 | 8 |
| 20 | 196 | 8 |
| 21 | 200 | 8 |
| 22 | 201 | 8 |
| 23 | 204 | 8 |
| 24 | 207 | 8 |
| 25 | 210 | 8 |
| 26 | 213 | 8 |
| 27 | 216 | 8 |
| 28 | 219 | 9 |
| 29 | 222 | 9 |
| 30 | 225 | 9 |
| 31 | 229 | 9 |
| 32 | 233 | 10 |
| 33 | 237 | 10 |
| 34 | 242 | 11 |
| 35 | 247 | 12 |
| 36 | 250 | 13 |
| 37 | 250 | 14 |
| 38 | 250 | 17 |
| 39 | 250 | 24 |
| 40 | 250 | 43 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.6. RSS Conversions—Geometry, Summer 2015**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 36 |
| 1 | 118 | 20 |
| 2 | 132 | 15 |
| 3 | 141 | 12 |
| 4 | 148 | 11 |
| 5 | 154 | 10 |
| 6 | 158 | 9 |
| 7 | 162 | 9 |
| 8 | 166 | 8 |
| 9 | 169 | 8 |
| 10 | 173 | 8 |
| 11 | 176 | 8 |
| 12 | 178 | 7 |
| 13 | 181 | 7 |
| 14 | 184 | 7 |
| 15 | 186 | 7 |
| 16 | 189 | 7 |
| 17 | 191 | 7 |
| 18 | 194 | 7 |
| 19 | 196 | 7 |
| 20 | 200 | 7 |
| 21 | 201 | 7 |
| 22 | 203 | 7 |
| 23 | 205 | 7 |
| 24 | 208 | 7 |
| 25 | 210 | 7 |
| 26 | 213 | 7 |
| 27 | 216 | 7 |
| 28 | 218 | 7 |
| 29 | 221 | 8 |
| 30 | 225 | 8 |
| 31 | 227 | 8 |
| 32 | 231 | 8 |
| 33 | 235 | 9 |
| 34 | 239 | 9 |
| 35 | 243 | 10 |
| 36 | 249 | 11 |
| 37 | 250 | 12 |
| 38 | 250 | 15 |
| 39 | 250 | 20 |
| 40 | 250 | 36 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.7. RSS Conversions—Government, Summer 2015**

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


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.8. RSS Conversions—American History, Summer 2015**

| 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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.9. RSS Conversions—English II, Fall 2015**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 105 | 28 |
| 1 | 124 | 16 |
| 2 | 135 | 11 |
| 3 | 142 | 9 |
| 4 | 146 | 8 |
| 5 | 150 | 7 |
| 6 | 153 | 7 |
| 7 | 156 | 6 |
| 8 | 159 | 6 |
| 9 | 161 | 6 |
| 10 | 163 | 6 |
| 11 | 165 | 6 |
| 12 | 167 | 6 |
| 13 | 169 | 6 |
| 14 | 172 | 6 |
| 15 | 174 | 6 |
| 16 | 176 | 6 |
| 17 | 178 | 6 |
| 18 | 179 | 6 |
| 19 | 182 | 6 |
| 20 | 183 | 5 |
| 21 | 185 | 5 |
| 22 | 187 | 5 |
| 23 | 189 | 5 |
| 24 | 191 | 5 |
| 25 | 193 | 6 |
| 26 | 195 | 6 |
| 27 | 197 | 6 |
| 28 | 200 | 6 |
| 29 | 201 | 6 |
| 30 | 203 | 6 |
| 31 | 205 | 6 |
| 32 | 208 | 6 |
| 33 | 210 | 6 |
| 34 | 212 | 6 |
| 35 | 215 | 6 |
| 36 | 218 | 7 |
| 37 | 221 | 7 |
| 38 | 225 | 7 |
| 39 | 227 | 8 |
| 40 | 232 | 8 |
| 41 | 236 | 9 |
| 42 | 242 | 10 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 43 | 250 | 12 |
| 44 | 250 | 16 |
| 45 | 250 | 29 |

**Table D.10. RSS Conversions—Algebra I, Fall 2015**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 40 |
| 1 | 107 | 22 |
| 2 | 124 | 16 |
| 3 | 134 | 14 |
| 4 | 142 | 12 |
| 5 | 148 | 11 |
| 6 | 153 | 10 |
| 7 | 158 | 10 |
| 8 | 162 | 9 |
| 9 | 166 | 9 |
| 10 | 169 | 8 |
| 11 | 172 | 8 |
| 12 | 175 | 8 |
| 13 | 178 | 8 |
| 14 | 181 | 7 |
| 15 | 183 | 7 |
| 16 | 186 | 7 |
| 17 | 188 | 7 |
| 18 | 190 | 7 |
| 19 | 193 | 7 |
| 20 | 195 | 7 |
| 21 | 197 | 7 |
| 22 | 200 | 7 |
| 23 | 201 | 7 |
| 24 | 203 | 7 |
| 25 | 205 | 7 |
| 26 | 207 | 6 |
| 27 | 209 | 6 |
| 28 | 211 | 6 |
| 29 | 213 | 6 |
| 30 | 215 | 6 |
| 31 | 217 | 6 |
| 32 | 219 | 6 |
| 33 | 221 | 7 |
| 34 | 223 | 7 |
| 35 | 225 | 7 |
| 36 | 227 | 7 |
| 37 | 229 | 7 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 38 | 231 | 7 |
| 39 | 234 | 7 |
| 40 | 236 | 8 |
| 41 | 239 | 8 |
| 42 | 242 | 8 |
| 43 | 245 | 9 |
| 44 | 249 | 9 |
| 45 | 250 | 10 |
| 46 | 250 | 11 |
| 47 | 250 | 13 |
| 48 | 250 | 16 |
| 49 | 250 | 22 |
| 50 | 250 | 39 |

**Table D.11. RSS Conversions—Biology, Fall 2015**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 36 |
| 1 | 108 | 20 |
| 2 | 122 | 14 |
| 3 | 130 | 12 |
| 4 | 137 | 10 |
| 5 | 142 | 9 |
| 6 | 146 | 9 |
| 7 | 150 | 8 |
| 8 | 153 | 8 |
| 9 | 156 | 7 |
| 10 | 159 | 7 |
| 11 | 161 | 7 |
| 12 | 164 | 7 |
| 13 | 166 | 7 |
| 14 | 168 | 6 |
| 15 | 170 | 6 |
| 16 | 172 | 6 |
| 17 | 174 | 6 |
| 18 | 177 | 6 |
| 19 | 178 | 6 |
| 20 | 180 | 6 |
| 21 | 182 | 6 |
| 22 | 183 | 6 |
| 23 | 185 | 6 |
| 24 | 187 | 6 |
| 25 | 188 | 6 |
| 26 | 190 | 6 |
| 27 | 192 | 6 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 28 | 193 | 6 |
| 29 | 195 | 6 |
| 30 | 197 | 6 |
| 31 | 198 | 6 |
| 32 | 200 | 6 |
| 33 | 202 | 6 |
| 34 | 203 | 6 |
| 35 | 205 | 6 |
| 36 | 207 | 6 |
| 37 | 209 | 6 |
| 38 | 210 | 6 |
| 39 | 212 | 6 |
| 40 | 214 | 6 |
| 41 | 216 | 6 |
| 42 | 218 | 7 |
| 43 | 221 | 7 |
| 44 | 225 | 7 |
| 45 | 226 | 7 |
| 46 | 228 | 7 |
| 47 | 231 | 8 |
| 48 | 235 | 8 |
| 49 | 238 | 9 |
| 50 | 243 | 9 |
| 51 | 248 | 10 |
| 52 | 250 | 12 |
| 53 | 250 | 14 |
| 54 | 250 | 20 |
| 55 | 250 | 36 |

**Table D.12. RSS Conversions—English I, Fall 2015**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 32 |
| 1 | 117 | 18 |
| 2 | 129 | 13 |
| 3 | 137 | 10 |
| 4 | 142 | 9 |
| 5 | 147 | 8 |
| 6 | 150 | 8 |
| 7 | 154 | 7 |
| 8 | 157 | 7 |
| 9 | 159 | 7 |
| 10 | 162 | 7 |
| 11 | 164 | 7 |
| 12 | 167 | 6 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 13 | 169 | 6 |
| 14 | 171 | 6 |
| 15 | 174 | 6 |
| 16 | 176 | 6 |
| 17 | 178 | 6 |
| 18 | 180 | 6 |
| 19 | 182 | 6 |
| 20 | 184 | 6 |
| 21 | 186 | 6 |
| 22 | 189 | 6 |
| 23 | 191 | 6 |
| 24 | 193 | 6 |
| 25 | 195 | 6 |
| 26 | 197 | 6 |
| 27 | 200 | 6 |
| 28 | 201 | 6 |
| 29 | 204 | 6 |
| 30 | 206 | 6 |
| 31 | 208 | 7 |
| 32 | 211 | 7 |
| 33 | 213 | 7 |
| 34 | 216 | 7 |
| 35 | 219 | 7 |
| 36 | 222 | 7 |
| 37 | 225 | 8 |
| 38 | 228 | 8 |
| 39 | 232 | 8 |
| 40 | 237 | 9 |
| 41 | 242 | 10 |
| 42 | 248 | 11 |
| 43 | 250 | 13 |
| 44 | 250 | 18 |
| 45 | 250 | 32 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.13. RSS Conversions—Algebra II, Fall 2015**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 43 |
| 1 | 104 | 24 |
| 2 | 121 | 17 |
| 3 | 131 | 14 |
| 4 | 139 | 13 |
| 5 | 146 | 12 |
| 6 | 151 | 11 |
| 7 | 156 | 10 |
| 8 | 160 | 10 |
| 9 | 164 | 9 |
| 10 | 168 | 9 |
| 11 | 171 | 9 |
| 12 | 174 | 9 |
| 13 | 177 | 8 |
| 14 | 180 | 8 |
| 15 | 183 | 8 |
| 16 | 186 | 8 |
| 17 | 189 | 8 |
| 18 | 192 | 8 |
| 19 | 195 | 8 |
| 20 | 197 | 8 |
| 21 | 200 | 8 |
| 22 | 203 | 8 |
| 23 | 206 | 8 |
| 24 | 208 | 8 |
| 25 | 211 | 8 |
| 26 | 214 | 8 |
| 27 | 217 | 8 |
| 28 | 220 | 9 |
| 29 | 225 | 9 |
| 30 | 227 | 9 |
| 31 | 231 | 9 |
| 32 | 235 | 10 |
| 33 | 239 | 10 |
| 34 | 243 | 11 |
| 35 | 249 | 12 |
| 36 | 250 | 13 |
| 37 | 250 | 14 |
| 38 | 250 | 17 |
| 39 | 250 | 24 |
| 40 | 250 | 43 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.14. RSS Conversions—Geometry, Fall 2015**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 36 |
| 1 | 118 | 20 |
| 2 | 132 | 15 |
| 3 | 141 | 12 |
| 4 | 148 | 11 |
| 5 | 154 | 10 |
| 6 | 158 | 9 |
| 7 | 162 | 9 |
| 8 | 166 | 8 |
| 9 | 169 | 8 |
| 10 | 173 | 8 |
| 11 | 176 | 8 |
| 12 | 178 | 7 |
| 13 | 181 | 7 |
| 14 | 184 | 7 |
| 15 | 186 | 7 |
| 16 | 189 | 7 |
| 17 | 191 | 7 |
| 18 | 194 | 7 |
| 19 | 196 | 7 |
| 20 | 200 | 7 |
| 21 | 201 | 7 |
| 22 | 203 | 7 |
| 23 | 205 | 7 |
| 24 | 208 | 7 |
| 25 | 210 | 7 |
| 26 | 213 | 7 |
| 27 | 216 | 7 |
| 28 | 218 | 7 |
| 29 | 221 | 8 |
| 30 | 225 | 8 |
| 31 | 227 | 8 |
| 32 | 231 | 8 |
| 33 | 235 | 9 |
| 34 | 239 | 9 |
| 35 | 243 | 10 |
| 36 | 249 | 11 |
| 37 | 250 | 12 |
| 38 | 250 | 15 |
| 39 | 250 | 20 |
| 40 | 250 | 36 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.15. RSS Conversions—Government, Fall 2015**

| 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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.16. RSS Conversions—American History, Fall 2015**

| 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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.17. RSS Conversions—English II, Spring 2016**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 111 | 28 |
| 1 | 129 | 16 |
| 2 | 141 | 11 |
| 3 | 147 | 9 |
| 4 | 152 | 8 |
| 5 | 156 | 7 |
| 6 | 159 | 7 |
| 7 | 162 | 6 |
| 8 | 164 | 6 |
| 9 | 167 | 6 |
| 10 | 169 | 6 |
| 11 | 171 | 6 |
| 12 | 173 | 5 |
| 13 | 175 | 5 |
| 14 | 176 | 5 |
| 15 | 178 | 5 |
| 16 | 180 | 5 |
| 17 | 182 | 5 |
| 18 | 183 | 5 |
| 19 | 185 | 5 |
| 20 | 187 | 5 |
| 21 | 189 | 5 |
| 22 | 190 | 5 |
| 23 | 192 | 5 |
| 24 | 194 | 5 |
| 25 | 196 | 5 |
| 26 | 197 | 5 |
| 27 | 200 | 5 |
| 28 | 201 | 5 |
| 29 | 203 | 5 |
| 30 | 205 | 6 |
| 31 | 207 | 6 |
| 32 | 209 | 6 |
| 33 | 211 | 6 |
| 34 | 214 | 6 |
| 35 | 216 | 6 |
| 36 | 219 | 6 |
| 37 | 221 | 7 |
| 38 | 225 | 7 |
| 39 | 228 | 7 |
| 40 | 232 | 8 |
| 41 | 236 | 9 |
| 42 | 242 | 10 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 43 | 249 | 12 |
| 44 | 250 | 16 |
| 45 | 250 | 29 |

**Table D.18. RSS Conversions—Algebra I, Spring 2016**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 40 |
| 1 | 120 | 22 |
| 2 | 136 | 16 |
| 3 | 146 | 13 |
| 4 | 153 | 12 |
| 5 | 159 | 11 |
| 6 | 164 | 10 |
| 7 | 168 | 9 |
| 8 | 172 | 9 |
| 9 | 176 | 8 |
| 10 | 179 | 8 |
| 11 | 182 | 8 |
| 12 | 185 | 8 |
| 13 | 187 | 7 |
| 14 | 190 | 7 |
| 15 | 192 | 7 |
| 16 | 194 | 7 |
| 17 | 197 | 7 |
| 18 | 200 | 7 |
| 19 | 201 | 7 |
| 20 | 203 | 6 |
| 21 | 205 | 6 |
| 22 | 207 | 6 |
| 23 | 208 | 6 |
| 24 | 210 | 6 |
| 25 | 212 | 6 |
| 26 | 214 | 6 |
| 27 | 216 | 6 |
| 28 | 218 | 6 |
| 29 | 220 | 6 |
| 30 | 221 | 6 |
| 31 | 223 | 6 |
| 32 | 225 | 7 |
| 33 | 227 | 7 |
| 34 | 229 | 7 |
| 35 | 232 | 7 |
| 36 | 234 | 7 |
| 37 | 236 | 7 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 38 | 239 | 7 |
| 39 | 241 | 8 |
| 40 | 244 | 8 |
| 41 | 247 | 8 |
| 42 | 250 | 9 |
| 43 | 250 | 9 |
| 44 | 250 | 10 |
| 45 | 250 | 11 |
| 46 | 250 | 12 |
| 47 | 250 | 14 |
| 48 | 250 | 17 |
| 49 | 250 | 23 |
| 50 | 250 | 41 |

**Table D.19. RSS Conversions—Biology, Spring 2016**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 36 |
| 1 | 108 | 20 |
| 2 | 123 | 14 |
| 3 | 132 | 12 |
| 4 | 138 | 11 |
| 5 | 144 | 10 |
| 6 | 148 | 9 |
| 7 | 152 | 8 |
| 8 | 155 | 8 |
| 9 | 159 | 8 |
| 10 | 161 | 7 |
| 11 | 164 | 7 |
| 12 | 166 | 7 |
| 13 | 169 | 7 |
| 14 | 171 | 6 |
| 15 | 173 | 6 |
| 16 | 175 | 6 |
| 17 | 177 | 6 |
| 18 | 179 | 6 |
| 19 | 181 | 6 |
| 20 | 182 | 6 |
| 21 | 184 | 6 |
| 22 | 186 | 6 |
| 23 | 187 | 6 |
| 24 | 189 | 6 |
| 25 | 191 | 6 |
| 26 | 192 | 6 |
| 27 | 194 | 6 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 28 | 195 | 6 |
| 29 | 197 | 6 |
| 30 | 199 | 6 |
| 31 | 200 | 6 |
| 32 | 202 | 6 |
| 33 | 203 | 6 |
| 34 | 205 | 6 |
| 35 | 207 | 6 |
| 36 | 209 | 6 |
| 37 | 210 | 6 |
| 38 | 212 | 6 |
| 39 | 214 | 6 |
| 40 | 216 | 6 |
| 41 | 218 | 6 |
| 42 | 220 | 6 |
| 43 | 222 | 7 |
| 44 | 225 | 7 |
| 45 | 227 | 7 |
| 46 | 230 | 7 |
| 47 | 233 | 8 |
| 48 | 236 | 8 |
| 49 | 239 | 9 |
| 50 | 243 | 9 |
| 51 | 248 | 10 |
| 52 | 250 | 12 |
| 53 | 250 | 14 |
| 54 | 250 | 20 |
| 55 | 250 | 36 |

**Table D.20. RSS Conversions—English I, Spring 2016**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 32 |
| 1 | 117 | 18 |
| 2 | 129 | 13 |
| 3 | 137 | 10 |
| 4 | 142 | 9 |
| 5 | 147 | 8 |
| 6 | 150 | 8 |
| 7 | 154 | 7 |
| 8 | 157 | 7 |
| 9 | 159 | 7 |
| 10 | 162 | 7 |
| 11 | 164 | 7 |
| 12 | 167 | 6 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 13 | 169 | 6 |
| 14 | 171 | 6 |
| 15 | 174 | 6 |
| 16 | 176 | 6 |
| 17 | 178 | 6 |
| 18 | 180 | 6 |
| 19 | 182 | 6 |
| 20 | 184 | 6 |
| 21 | 186 | 6 |
| 22 | 189 | 6 |
| 23 | 191 | 6 |
| 24 | 193 | 6 |
| 25 | 195 | 6 |
| 26 | 197 | 6 |
| 27 | 200 | 6 |
| 28 | 201 | 6 |
| 29 | 204 | 6 |
| 30 | 206 | 6 |
| 31 | 208 | 7 |
| 32 | 211 | 7 |
| 33 | 213 | 7 |
| 34 | 216 | 7 |
| 35 | 219 | 7 |
| 36 | 222 | 7 |
| 37 | 225 | 8 |
| 38 | 228 | 8 |
| 39 | 232 | 8 |
| 40 | 237 | 9 |
| 41 | 242 | 10 |
| 42 | 248 | 11 |
| 43 | 250 | 13 |
| 44 | 250 | 18 |
| 45 | 250 | 32 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.21. RSS Conversions—Algebra II, Spring 2016**

| Raw Score | Scale Score | *CSEM* |
|---|---|---|
| 0 | 100 | 43 |
| 1 | 104 | 24 |
| 2 | 121 | 17 |
| 3 | 131 | 14 |
| 4 | 139 | 13 |
| 5 | 145 | 12 |
| 6 | 151 | 11 |
| 7 | 155 | 10 |
| 8 | 159 | 10 |
| 9 | 163 | 9 |
| 10 | 167 | 9 |
| 11 | 170 | 9 |
| 12 | 173 | 9 |
| 13 | 176 | 8 |
| 14 | 179 | 8 |
| 15 | 182 | 8 |
| 16 | 186 | 8 |
| 17 | 188 | 8 |
| 18 | 191 | 8 |
| 19 | 193 | 8 |
| 20 | 196 | 8 |
| 21 | 200 | 8 |
| 22 | 201 | 8 |
| 23 | 204 | 8 |
| 24 | 207 | 8 |
| 25 | 210 | 8 |
| 26 | 213 | 8 |
| 27 | 216 | 8 |
| 28 | 219 | 9 |
| 29 | 222 | 9 |
| 30 | 225 | 9 |
| 31 | 229 | 9 |
| 32 | 233 | 10 |
| 33 | 237 | 10 |
| 34 | 242 | 11 |
| 35 | 247 | 12 |
| 36 | 250 | 13 |
| 37 | 250 | 14 |
| 38 | 250 | 17 |
| 39 | 250 | 24 |
| 40 | 250 | 43 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.22. RSS Conversions—Geometry, Spring 2016**

| Raw Score | Scale Score | CSEM |
|---|---|---|
| 0 | 100 | 36 |
| 1 | 118 | 20 |
| 2 | 132 | 15 |
| 3 | 141 | 12 |
| 4 | 148 | 11 |
| 5 | 154 | 10 |
| 6 | 158 | 9 |
| 7 | 162 | 9 |
| 8 | 166 | 8 |
| 9 | 169 | 8 |
| 10 | 173 | 8 |
| 11 | 176 | 8 |
| 12 | 178 | 7 |
| 13 | 181 | 7 |
| 14 | 184 | 7 |
| 15 | 186 | 7 |
| 16 | 189 | 7 |
| 17 | 191 | 7 |
| 18 | 194 | 7 |
| 19 | 196 | 7 |
| 20 | 200 | 7 |
| 21 | 201 | 7 |
| 22 | 203 | 7 |
| 23 | 205 | 7 |
| 24 | 208 | 7 |
| 25 | 210 | 7 |
| 26 | 213 | 7 |
| 27 | 216 | 7 |
| 28 | 218 | 7 |
| 29 | 221 | 8 |
| 30 | 225 | 8 |
| 31 | 227 | 8 |
| 32 | 231 | 8 |
| 33 | 235 | 9 |
| 34 | 239 | 9 |
| 35 | 243 | 10 |
| 36 | 249 | 11 |
| 37 | 250 | 12 |
| 38 | 250 | 15 |
| 39 | 250 | 20 |
| 40 | 250 | 36 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.23. RSS Conversions—Government, Spring 2016**

| 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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.24. RSS Conversions—American History, Spring 2016**

| 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 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table D.25. RSS Conversions—Physical Science, Spring 2016**

| Raw Score | Scale Score | *CSEM* |
|---|---|---|
| 0 | 100 | 43 |
| 1 | 100 | 24 |
| 2 | 115 | 17 |
| 3 | 126 | 14 |
| 4 | 134 | 13 |
| 5 | 140 | 12 |
| 6 | 145 | 11 |
| 7 | 150 | 10 |
| 8 | 154 | 10 |
| 9 | 158 | 9 |
| 10 | 161 | 9 |
| 11 | 165 | 9 |
| 12 | 168 | 9 |
| 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 | 192 | 8 |
| 22 | 195 | 8 |
| 23 | 197 | 8 |
| 24 | 200 | 8 |
| 25 | 203 | 8 |
| 26 | 205 | 8 |
| 27 | 208 | 8 |
| 28 | 210 | 8 |
| 29 | 213 | 8 |
| 30 | 216 | 8 |
| 31 | 219 | 8 |
| 32 | 222 | 8 |
| 33 | 225 | 9 |
| 34 | 228 | 9 |
| 35 | 232 | 9 |
| 36 | 235 | 9 |
| 37 | 239 | 10 |
| 38 | 244 | 10 |
| 39 | 249 | 11 |
| 40 | 250 | 12 |
| 41 | 250 | 13 |
| 42 | 250 | 15 |
| 43 | 250 | 17 |
| 44 | 250 | 24 |
| 45 | 250 | 43 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Appendix E: Descriptive Statistics by Demographic Group

**Table E.1. Scale Score Descriptive Statistics by Demographic Group—Gender, Summer 2015**

| Test Period | Content Area | Gender | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Summer 2015 | English II | Female | 166 | 152 | 236 | 193.40 | 15.65 |
| | | Male | 264 | 164 | 236 | 194.86 | 15.57 |
| | Algebra I | Female | 410 | 153 | 250 | 202.30 | 17.95 |
| | | Male | 467 | 153 | 250 | 200.06 | 17.58 |
| | Biology | Female | 144 | 111 | 241 | 192.98 | 20.77 |
| | | Male | 161 | 153 | 250 | 194.60 | 18.27 |
| | English I | Female | 22 | 162 | 232 | 197.23 | 18.22 |
| | | Male | 30 | 162 | 232 | 196.27 | 14.71 |
| | Algebra II | Female | 24 | 163 | 250 | 202.33 | 20.49 |
| | | Male | 15 | 159 | 250 | 203.67 | 26.82 |
| | Geometry | Female | 18 | 154 | 216 | 188.39 | 16.81 |
| | | Male | 19 | 132 | 243 | 195.11 | 23.36 |
| | Government | Female | 432 | 145 | 250 | 201.77 | 23.86 |
| | | Male | 356 | 150 | 250 | 203.02 | 24.32 |
| | Am. History | Female | 51 | 146 | 250 | 197.65 | 25.90 |
| | | Male | 26 | 173 | 250 | 206.69 | 20.31 |

**Table E.2. Scale Score Descriptive Statistics by Demographic Group—Gender, Fall 2015**

| Test Period | Content Area | Gender | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Fall 2015 | English II | Female | 1,269 | 105 | 250 | 198.72 | 18.35 |
| | | Male | 1,496 | 146 | 250 | 194.08 | 18.97 |
| | Algebra I | Female | 2,181 | 100 | 250 | 199.10 | 21.61 |
| | | Male | 2,441 | 124 | 250 | 196.01 | 22.20 |
| | Biology | Female | 1,274 | 100 | 250 | 198.14 | 23.69 |
| | | Male | 1,488 | 100 | 250 | 194.85 | 24.70 |
| | English I | Female | 313 | 150 | 250 | 208.13 | 17.19 |
| | | Male | 343 | 157 | 248 | 204.07 | 16.55 |
| | Algebra II | Female | 366 | 156 | 250 | 211.83 | 21.76 |
| | | Male | 326 | 146 | 250 | 214.95 | 22.63 |
| | Geometry | Female | 325 | 166 | 250 | 205.86 | 20.03 |
| | | Male | 349 | 158 | 250 | 207.27 | 18.26 |
| | Government | Female | 6,857 | 100 | 250 | 202.77 | 21.34 |
| | | Male | 6,987 | 100 | 250 | 204.60 | 22.44 |
| | Am. History | Female | 207 | 146 | 250 | 199.29 | 23.77 |
| | | Male | 258 | 142 | 250 | 207.10 | 24.88 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.3. Scale Score Descriptive Statistics by Demographic Group—Gender, Spring 2016**

| Test Period | Content Area | Gender | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Spring 2016 | English II | Female | 31,033 | 111 | 250 | 212.64 | 13.67 |
| | | Male | 31,756 | 111 | 250 | 208.07 | 14.61 |
| | Algebra I | Female | 30,487 | 100 | 250 | 207.77 | 18.23 |
| | | Male | 30,484 | 100 | 250 | 206.80 | 19.32 |
| | Biology | Female | 30,640 | 100 | 250 | 208.09 | 19.09 |
| | | Male | 30,846 | 100 | 250 | 207.71 | 19.88 |
| | English I | Female | 8,003 | 154 | 250 | 206.39 | 15.20 |
| | | Male | 7,862 | 117 | 250 | 202.11 | 15.82 |
| | Algebra II | Female | 10,516 | 104 | 250 | 208.85 | 22.21 |
| | | Male | 9,275 | 131 | 250 | 212.77 | 23.36 |
| | Geometry | Female | 4,515 | 141 | 250 | 203.11 | 19.90 |
| | | Male | 4,178 | 148 | 250 | 205.92 | 20.14 |
| | Government | Female | 21,988 | 143 | 250 | 205.03 | 20.15 |
| | | Male | 22,492 | 100 | 250 | 207.80 | 21.67 |
| | Am. History | Female | 4,570 | 123 | 250 | 195.12 | 23.32 |
| | | Male | 4,585 | 114 | 250 | 202.01 | 24.18 |
| | Physical Science | Female | 2,293 | 145 | 250 | 188.67 | 16.48 |
| | | Male | 2,435 | 150 | 250 | 191.72 | 18.28 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.4. Scale Score Descriptive Statistics by Demographic Group—Ethnicity, Summer 2015**

| Test Period | Content Area | Ethnicity | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Summer 2015 | English II | American Indian/ Alaskan Native | 3 | -- | -- | -- | -- |
| | | Asian | 3 | -- | -- | -- | -- |
| | | Pacific Islander | 2 | -- | -- | -- | -- |
| | | Black (not Hispanic) | 172 | 152 | 236 | 191.37 | 14.21 |
| | | Hispanic | 40 | 162 | 225 | 199.88 | 12.92 |
| | | White (not Hispanic) | 210 | 162 | 236 | 195.25 | 16.69 |
| | | Multi-racial | -- | -- | -- | -- | -- |
| | Algebra I | American Indian/ Alaskan Native | -- | -- | -- | -- | -- |
| | | Asian | 7 | -- | -- | -- | -- |
| | | Pacific Islander | -- | -- | -- | -- | -- |
| | | Black (not Hispanic) | 268 | 153 | 250 | 193.90 | 16.81 |
| | | Hispanic | 49 | 168 | 244 | 204.06 | 16.50 |
| | | White (not Hispanic) | 546 | 153 | 250 | 204.49 | 17.32 |
| | | Multi-racial | 7 | -- | -- | -- | -- |
| | Biology | American Indian/ Alaskan Native | -- | -- | -- | -- | -- |
| | | Asian | -- | -- | -- | -- | -- |
| | | Pacific Islander | 1 | -- | -- | -- | -- |
| | | Black (not Hispanic) | 130 | 149 | 250 | 189.67 | 19.57 |
| | | Hispanic | 20 | 162 | 228 | 197.10 | 16.87 |
| | | White (not Hispanic) | 150 | 111 | 250 | 196.77 | 19.26 |
| | | Multi-racial | 4 | -- | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.4 (continued). Scale Score Descriptive Statistics by Demographic Group—Ethnicity, Summer 2015**

| Test Period | Content Area | Ethnicity | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Summer 2015 | English I | American Indian/ Alaskan Native | 1 | -- | -- | -- | -- |
| | | Asian | -- | -- | -- | -- | -- |
| | | Pacific Islander | -- | -- | -- | -- | -- |
| | | Black (not Hispanic) | 9 | -- | -- | -- | -- |
| | | Hispanic | 12 | 162 | 216 | 190.58 | 14.59 |
| | | White (not Hispanic) | 30 | 162 | 232 | 198.77 | 17.31 |
| | | Multi-racial | -- | -- | -- | -- | -- |
| | Algebra II | American Indian/ Alaskan Native | -- | -- | -- | -- | -- |
| | | Asian | -- | -- | -- | -- | -- |
| | | Pacific Islander | -- | -- | -- | -- | -- |
| | | Black (not Hispanic) | 3 | -- | -- | -- | -- |
| | | Hispanic | 17 | 163 | 250 | 201.59 | 22.84 |
| | | White (not Hispanic) | 19 | 179 | 250 | 207.26 | 22.23 |
| | | Multi-racial | -- | -- | -- | -- | -- |
| | Geometry | American Indian/ Alaskan Native | -- | -- | -- | -- | -- |
| | | Asian | -- | -- | -- | -- | -- |
| | | Pacific Islander | 1 | -- | -- | -- | -- |
| | | Black (not Hispanic) | 14 | 166 | 216 | 194.29 | 16.72 |
| | | Hispanic | 3 | -- | -- | -- | -- |
| | | White (not Hispanic) | 17 | 132 | 243 | 193.59 | 24.36 |
| | | Multi-racial | 2 | -- | -- | -- | -- |
| | Government | American Indian/ Alaskan Native | 2 | -- | -- | -- | -- |
| | | Asian | 22 | 150 | 250 | 212.64 | 30.06 |
| | | Pacific Islander | 4 | -- | -- | -- | -- |
| | | Black (not Hispanic) | 137 | 145 | 250 | 192.00 | 23.33 |
| | | Hispanic | 62 | 150 | 233 | 195.45 | 19.18 |
| | | White (not Hispanic) | 544 | 154 | 250 | 204.80 | 23.62 |
| | | Multi-racial | 17 | 183 | 250 | 221.06 | 19.80 |
| | Am. History | American Indian/ Alaskan Native | 1 | -- | -- | -- | -- |
| | | Asian | 3 | -- | -- | -- | -- |
| | | Pacific Islander | -- | -- | -- | -- | -- |
| | | Black (not Hispanic) | 6 | -- | -- | -- | -- |
| | | Hispanic | 4 | -- | -- | -- | -- |
| | | White (not Hispanic) | 60 | 151 | 250 | 202.48 | 24.46 |
| | | Multi-racial | 3 | -- | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.5. Scale Score Descriptive Statistics by Demographic Group—Ethnicity, Fall 2015**

| Test Period | Content Area | Ethnicity | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Fall 2015 | English II | American Indian/ Alaskan Native | 11 | 153 | 227 | 193.45 | 23.24 |
| | | Asian | 47 | 165 | 250 | 202.28 | 21.85 |
| | | Pacific Islander | 8 | -- | -- | -- | -- |
| | | Black (not Hispanic) | 1,114 | 105 | 250 | 193.51 | 17.25 |
| | | Hispanic | 200 | 156 | 232 | 192.12 | 17.22 |
| | | White (not Hispanic) | 1,320 | 146 | 250 | 198.83 | 19.62 |
| | | Multi-racial | 65 | 142 | 242 | 198.35 | 21.80 |
| | Algebra I | American Indian/ Alaskan Native | 20 | 100 | 223 | 183.45 | 24.76 |
| | | Asian | 83 | 166 | 250 | 218.19 | 25.70 |
| | | Pacific Islander | 4 | -- | -- | -- | -- |
| | | Black (not Hispanic) | 911 | 100 | 250 | 186.85 | 17.60 |
| | | Hispanic | 341 | 148 | 250 | 194.50 | 18.52 |
| | | White (not Hispanic) | 3,161 | 124 | 250 | 200.45 | 22.04 |
| | | Multi-racial | 102 | 142 | 249 | 196.22 | 23.96 |
| | Biology | American Indian/ Alaskan Native | 18 | 164 | 250 | 204.56 | 24.62 |
| | | Asian | 74 | 153 | 250 | 218.09 | 24.24 |
| | | Pacific Islander | 7 | -- | -- | -- | -- |
| | | Black (not Hispanic) | 641 | 100 | 248 | 181.39 | 18.03 |
| | | Hispanic | 199 | 146 | 243 | 189.72 | 20.39 |
| | | White (not Hispanic) | 1,750 | 100 | 250 | 201.56 | 23.93 |
| | | Multi-racial | 73 | 146 | 250 | 198.44 | 24.86 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.5 (continued). Scale Score Descriptive Statistics by Demographic Group—Ethnicity, Fall 2015**

| Test Period | Content Area | Ethnicity | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Fall 2015 | English I | American Indian/ Alaskan Native | 6 | -- | -- | -- | -- |
| | | Asian | 9 | -- | -- | -- | -- |
| | | Pacific Islander | 3 | -- | -- | -- | -- |
| | | Black (not Hispanic) | 49 | 150 | 232 | 196.12 | 19.56 |
| | | Hispanic | 51 | 164 | 248 | 198.69 | 18.09 |
| | | White (not Hispanic) | 523 | 157 | 250 | 207.52 | 16.28 |
| | | Multi-racial | 15 | 176 | 228 | 206.80 | 14.59 |
| | Algebra II | American Indian/ Alaskan Native | 4 | -- | -- | -- | -- |
| | | Asian | 27 | 180 | 249 | 218.37 | 19.00 |
| | | Pacific Islander | 4 | -- | -- | -- | -- |
| | | Black (not Hispanic) | 76 | 156 | 250 | 195.07 | 24.12 |
| | | Hispanic | 32 | 180 | 250 | 212.38 | 18.69 |
| | | White (not Hispanic) | 526 | 146 | 250 | 215.96 | 21.00 |
| | | Multi-racial | 23 | 164 | 249 | 212.83 | 22.97 |
| | Geometry | American Indian/ Alaskan Native | 3 | -- | -- | -- | -- |
| | | Asian | 26 | 169 | 243 | 216.65 | 17.41 |
| | | Pacific Islander | 4 | -- | -- | -- | -- |
| | | Black (not Hispanic) | 73 | 158 | 235 | 196.07 | 16.21 |
| | | Hispanic | 50 | 162 | 239 | 201.44 | 18.45 |
| | | White (not Hispanic) | 492 | 166 | 250 | 208.25 | 19.12 |
| | | Multi-racial | 26 | 162 | 250 | 206.38 | 18.58 |
| | Government | American Indian/ Alaskan Native | 60 | 161 | 250 | 201.82 | 22.31 |
| | | Asian | 384 | 154 | 250 | 215.32 | 23.20 |
| | | Pacific Islander | 35 | 164 | 249 | 194.60 | 20.99 |
| | | Black (not Hispanic) | 2,628 | 130 | 250 | 193.71 | 19.35 |
| | | Hispanic | 720 | 116 | 250 | 198.06 | 20.54 |
| | | White (not Hispanic) | 9,709 | 100 | 250 | 206.32 | 21.66 |
| | | Multi-racial | 308 | 154 | 250 | 206.20 | 22.16 |
| | Am. History | American Indian/ Alaskan Native | 2 | -- | -- | -- | -- |
| | | Asian | 8 | -- | -- | -- | -- |
| | | Pacific Islander | 4 | -- | -- | -- | -- |
| | | Black (not Hispanic) | 41 | 146 | 234 | 193.27 | 23.45 |
| | | Hispanic | 30 | 151 | 245 | 200.13 | 22.31 |
| | | White (not Hispanic) | 370 | 142 | 250 | 204.99 | 24.60 |
| | | Multi-racial | 10 | 182 | 250 | 217.80 | 20.86 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.6. Scale Score Descriptive Statistics by Demographic Group—Ethnicity, Spring 2016**

| Test Period | Content Area | Ethnicity | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Spring 2016 | English II | American Indian/ Alaskan Native | 250 | 162 | 242 | 209.28 | 14.42 |
| | | Asian | 1,257 | 164 | 250 | 214.19 | 15.87 |
| | | Pacific Islander | 134 | 167 | 249 | 205.01 | 15.04 |
| | | Black (not Hispanic) | 9,268 | 111 | 250 | 202.25 | 14.66 |
| | | Hispanic | 2,994 | 147 | 250 | 207.28 | 14.00 |
| | | White (not Hispanic) | 47,489 | 111 | 250 | 212.02 | 13.66 |
| | | Multi-racial | 1,397 | 162 | 250 | 210.23 | 14.12 |
| | Algebra I | American Indian/ Alaskan Native | 282 | 100 | 250 | 202.55 | 18.29 |
| | | Asian | 1,269 | 146 | 250 | 221.53 | 20.16 |
| | | Pacific Islander | 130 | 168 | 250 | 202.33 | 17.47 |
| | | Black (not Hispanic) | 9,129 | 100 | 250 | 197.47 | 16.45 |
| | | Hispanic | 3,179 | 100 | 250 | 204.32 | 17.71 |
| | | White (not Hispanic) | 45,577 | 100 | 250 | 209.08 | 18.51 |
| | | Multi-racial | 1,405 | 159 | 250 | 208.23 | 18.39 |
| | Biology | American Indian/ Alaskan Native | 238 | 138 | 248 | 204.08 | 18.15 |
| | | Asian | 1,224 | 148 | 250 | 216.59 | 21.51 |
| | | Pacific Islander | 137 | 152 | 248 | 199.69 | 18.61 |
| | | Black (not Hispanic) | 9,094 | 100 | 250 | 195.01 | 18.33 |
| | | Hispanic | 2,965 | 138 | 250 | 202.88 | 18.19 |
| | | White (not Hispanic) | 46,504 | 100 | 250 | 210.54 | 18.64 |
| | | Multi-racial | 1,324 | 138 | 250 | 208.28 | 18.57 |
| | English I | American Indian/ Alaskan Native | 98 | 117 | 242 | 203.57 | 17.92 |
| | | Asian | 173 | 154 | 242 | 206.23 | 18.34 |
| | | Pacific Islander | 28 | 167 | 225 | 196.21 | 15.18 |
| | | Black (not Hispanic) | 1,217 | 157 | 242 | 196.96 | 15.54 |
| | | Hispanic | 722 | 154 | 248 | 199.77 | 16.07 |
| | | White (not Hispanic) | 13,288 | 150 | 250 | 205.23 | 15.34 |
| | | Multi-racial | 339 | 154 | 250 | 202.24 | 16.68 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.6 (continued). Scale Score Descriptive Statistics by Demographic Group—Ethnicity, Spring 2016**

| Test Period | Content Area | Ethnicity | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Spring 2016 | Algebra II | American Indian/ Alaskan Native | 78 | 151 | 250 | 205.33 | 23.43 |
| | | Asian | 634 | 155 | 250 | 226.57 | 21.42 |
| | | Pacific Islander | 33 | 167 | 250 | 210.52 | 20.51 |
| | | Black (not Hispanic) | 1,278 | 131 | 250 | 198.23 | 21.06 |
| | | Hispanic | 827 | 139 | 250 | 204.20 | 22.41 |
| | | White (not Hispanic) | 16,510 | 104 | 250 | 211.44 | 22.50 |
| | | Multi-racial | 431 | 151 | 250 | 209.08 | 23.23 |
| | Geometry | American Indian/ Alaskan Native | 51 | 162 | 243 | 201.80 | 17.40 |
| | | Asian | 184 | 158 | 250 | 230.05 | 20.50 |
| | | Pacific Islander | 11 | 158 | 210 | 185.55 | 15.22 |
| | | Black (not Hispanic) | 489 | 148 | 250 | 196.48 | 19.77 |
| | | Hispanic | 393 | 141 | 250 | 199.82 | 19.89 |
| | | White (not Hispanic) | 7,389 | 141 | 250 | 204.73 | 19.57 |
| | | Multi-racial | 176 | 166 | 250 | 200.55 | 19.01 |
| | Government | American Indian/ Alaskan Native | 179 | 159 | 250 | 205.51 | 21.19 |
| | | Asian | 755 | 156 | 250 | 210.92 | 22.68 |
| | | Pacific Islander | 88 | 128 | 247 | 195.66 | 18.74 |
| | | Black (not Hispanic) | 6,354 | 143 | 250 | 194.66 | 18.74 |
| | | Hispanic | 2,162 | 100 | 250 | 201.08 | 20.05 |
| | | White (not Hispanic) | 34,078 | 137 | 250 | 208.91 | 20.57 |
| | | Multi-racial | 864 | 152 | 250 | 206.09 | 20.89 |
| | Am. History | American Indian/ Alaskan Native | 62 | 151 | 250 | 203.97 | 24.78 |
| | | Asian | 97 | 130 | 250 | 206.27 | 23.48 |
| | | Pacific Islander | 14 | 130 | 250 | 196.07 | 35.03 |
| | | Black (not Hispanic) | 387 | 114 | 250 | 190.07 | 25.31 |
| | | Hispanic | 265 | 142 | 250 | 196.80 | 23.51 |
| | | White (not Hispanic) | 8,161 | 123 | 250 | 198.93 | 23.87 |
| | | Multi-racial | 169 | 142 | 250 | 196.84 | 22.72 |
| | Physical Science | American Indian/ Alaskan Native | 25 | 161 | 249 | 187.08 | 20.01 |
| | | Asian | 31 | 161 | 232 | 192.42 | 18.32 |
| | | Pacific Islander | 3 | -- | -- | -- | -- |
| | | Black (not Hispanic) | 187 | 145 | 239 | 181.00 | 15.05 |
| | | Hispanic | 139 | 150 | 239 | 187.23 | 16.02 |
| | | White (not Hispanic) | 4,235 | 150 | 250 | 190.78 | 17.51 |
| | | Multi-racial | 108 | 150 | 235 | 189.03 | 17.16 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.7. Scale Score Descriptive Statistics by Demographic Group—Migrant Status, Summer 2015**

| Test Period | Content Area | Migrant | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Summer 2015 | English II | No | 424 | 152 | 236 | 194.22 | 15.61 |
| | | Yes | -- | -- | -- | -- | -- |
| | Algebra I | No | 870 | 153 | 250 | 201.21 | 17.76 |
| | | Yes | -- | -- | -- | -- | -- |
| | Biology | No | 298 | 111 | 250 | 193.96 | 19.62 |
| | | Yes | -- | -- | -- | -- | -- |
| | English I | No | 52 | 162 | 232 | 196.67 | 16.12 |
| | | Yes | -- | -- | -- | -- | -- |
| | Algebra II | No | 39 | 159 | 250 | 202.85 | 22.80 |
| | | Yes | -- | -- | -- | -- | -- |
| | Geometry | No | 37 | 132 | 243 | 191.84 | 20.44 |
| | | Yes | -- | -- | -- | -- | -- |
| | Government | No | 775 | 145 | 250 | 202.49 | 24.14 |
| | | Yes | -- | -- | -- | -- | -- |
| | Am. History | No | 76 | 146 | 250 | 200.75 | 24.56 |
| | | Yes | -- | -- | -- | -- | -- |

**Table E.8. Scale Score Descriptive Statistics by Demographic Group—Migrant Status, Fall 2015**

| Test Period | Content Area | Migrant | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Fall 2015 | English II | No | 2,762 | 105 | 250 | 196.20 | 18.83 |
| | | Yes | 1 | -- | -- | -- | -- |
| | Algebra I | No | 4,589 | 100 | 250 | 197.49 | 22.00 |
| | | Yes | -- | -- | -- | -- | -- |
| | Biology | No | 2,756 | 100 | 250 | 196.38 | 24.31 |
| | | Yes | 1 | -- | -- | -- | -- |
| | English I | No | 656 | 150 | 250 | 206.01 | 16.97 |
| | | Yes | -- | -- | -- | -- | -- |
| | Algebra II | No | 692 | 146 | 250 | 213.30 | 22.21 |
| | | Yes | -- | -- | -- | -- | -- |
| | Geometry | No | 674 | 158 | 250 | 206.59 | 19.13 |
| | | Yes | -- | -- | -- | -- | -- |
| | Government | No | 13,827 | 100 | 250 | 203.70 | 21.93 |
| | | Yes | 1 | -- | -- | -- | -- |
| | Am. History | No | 465 | 142 | 250 | 203.62 | 24.67 |
| | | Yes | -- | -- | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.9. Scale Score Descriptive Statistics by Demographic Group—Migrant Status, Spring 2016**

| Test Period | Content Area | Migrant | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Spring 2016 | English II | No | 62,731 | 111 | 250 | 210.34 | 14.33 |
| | | Yes | 14 | 178 | 221 | 199.21 | 14.83 |
| | Algebra I | No | 60,888 | 100 | 250 | 207.30 | 18.79 |
| | | Yes | 13 | 185 | 218 | 199.85 | 8.74 |
| | Biology | No | 61,439 | 100 | 250 | 207.91 | 19.48 |
| | | Yes | 9 | -- | -- | -- | -- |
| | English I | No | 15,840 | 117 | 250 | 204.29 | 15.65 |
| | | Yes | 10 | 154 | 201 | 181.40 | 14.38 |
| | Algebra II | No | 19,782 | 104 | 250 | 210.69 | 22.84 |
| | | Yes | 1 | -- | -- | -- | -- |
| | Geometry | No | 8,689 | 141 | 250 | 204.47 | 20.07 |
| | | Yes | -- | -- | -- | -- | -- |
| | Government | No | 44,449 | 100 | 250 | 206.44 | 20.98 |
| | | Yes | 6 | -- | -- | -- | -- |
| | Am. History | No | 9,148 | 114 | 250 | 198.57 | 24.00 |
| | | Yes | -- | -- | -- | -- | -- |
| | Physical Science | No | 4,724 | 145 | 250 | 190.26 | 17.49 |
| | | Yes | 1 | -- | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.10. Scale Score Descriptive Statistics by Demographic Group—Free and Reduced Lunch, Summer 2015**

| Test Period | Content Area | FRL | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Summer 2015 | English II | No | 156 | 162 | 236 | 194.99 | 17.28 |
| | | Yes | 268 | 152 | 232 | 193.77 | 14.57 |
| | Algebra I | No | 423 | 153 | 250 | 205.03 | 18.05 |
| | | Yes | 447 | 153 | 250 | 197.60 | 16.72 |
| | Biology | No | 110 | 111 | 250 | 195.37 | 20.41 |
| | | Yes | 188 | 149 | 250 | 193.13 | 19.15 |
| | English I | No | 12 | 178 | 232 | 202.25 | 16.81 |
| | | Yes | 40 | 162 | 232 | 195.00 | 15.74 |
| | Algebra II | No | 18 | 179 | 250 | 207.72 | 21.23 |
| | | Yes | 21 | 159 | 250 | 198.67 | 23.76 |
| | Geometry | No | 19 | 132 | 243 | 192.74 | 23.52 |
| | | Yes | 18 | 154 | 216 | 190.89 | 17.24 |
| | Government | No | 460 | 154 | 250 | 208.65 | 23.91 |
| | | Yes | 315 | 145 | 250 | 193.50 | 21.54 |
| | Am. History | No | 54 | 151 | 250 | 206.41 | 22.78 |
| | | Yes | 22 | 146 | 239 | 186.86 | 23.68 |

**Table E.11. Scale Score Descriptive Statistics by Demographic Group—Free and Reduced Lunch, Fall 2015**

| Test Period | Content Area | FRL | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Fall 2015 | English II | No | 760 | 146 | 250 | 202.35 | 19.06 |
| | | Yes | 2,003 | 105 | 250 | 193.86 | 18.21 |
| | Algebra I | No | 2,281 | 124 | 250 | 205.08 | 22.46 |
| | | Yes | 2,308 | 100 | 250 | 189.99 | 18.73 |
| | Biology | No | 1,271 | 100 | 250 | 209.94 | 22.16 |
| | | Yes | 1,486 | 100 | 250 | 184.76 | 19.60 |
| | English I | No | 437 | 162 | 250 | 210.51 | 15.34 |
| | | Yes | 219 | 150 | 248 | 197.04 | 16.53 |
| | Algebra II | No | 536 | 146 | 250 | 215.58 | 21.85 |
| | | Yes | 156 | 160 | 250 | 205.49 | 21.71 |
| | Geometry | No | 497 | 158 | 250 | 209.36 | 19.13 |
| | | Yes | 177 | 162 | 250 | 198.82 | 16.91 |
| | Government | No | 7,955 | 100 | 250 | 210.20 | 21.26 |
| | | Yes | 5,873 | 100 | 250 | 194.90 | 19.62 |
| | Am. History | No | 317 | 142 | 250 | 208.51 | 23.79 |
| | | Yes | 148 | 146 | 250 | 193.16 | 23.30 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.12. Scale Score Descriptive Statistics by Demographic Group—Free and Reduced Lunch, Spring 2016**

| Test Period | Content Area | FRL | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Spring 2016 | English II | No | 35,210 | 111 | 250 | 214.32 | 12.93 |
| | | Yes | 27,535 | 111 | 250 | 205.25 | 14.43 |
| | Algebra I | No | 32,395 | 100 | 250 | 212.93 | 18.36 |
| | | Yes | 28,506 | 100 | 250 | 200.91 | 17.15 |
| | Biology | No | 34,522 | 100 | 250 | 213.71 | 18.06 |
| | | Yes | 26,926 | 100 | 250 | 200.48 | 18.70 |
| | English I | No | 7,965 | 154 | 250 | 208.70 | 14.61 |
| | | Yes | 7,885 | 117 | 250 | 199.81 | 15.40 |
| | Algebra II | No | 14,401 | 104 | 250 | 214.01 | 22.40 |
| | | Yes | 5,382 | 131 | 250 | 201.81 | 21.61 |
| | Geometry | No | 5,222 | 141 | 250 | 208.12 | 20.40 |
| | | Yes | 3,467 | 141 | 250 | 198.97 | 18.22 |
| | Government | No | 25,345 | 128 | 250 | 212.36 | 19.93 |
| | | Yes | 19,110 | 100 | 250 | 198.59 | 19.72 |
| | Am. History | No | 5,265 | 130 | 250 | 203.61 | 23.53 |
| | | Yes | 3,883 | 114 | 250 | 191.74 | 22.91 |
| | Physical Science | No | 2,436 | 150 | 250 | 194.32 | 17.91 |
| | | Yes | 2,289 | 145 | 250 | 185.92 | 15.93 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.13. Scale Score Descriptive Statistics by Demographic Group—Limited English Proficient, Summer 2015**

| Test Period | Content Area | LEP | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Summer 2015 | English II | No | 407 | 152 | 236 | 194.22 | 15.81 |
| | | Yes | 17 | 178 | 209 | 194.29 | 9.90 |
| | Algebra I | No | 858 | 153 | 250 | 201.18 | 17.70 |
| | | Yes | 12 | 172 | 236 | 203.50 | 22.75 |
| | Biology | No | 286 | 111 | 250 | 194.23 | 19.72 |
| | | Yes | 12 | 153 | 209 | 187.50 | 16.31 |
| | English I | No | 45 | 162 | 232 | 198.58 | 15.64 |
| | | Yes | 7 | -- | -- | -- | -- |
| | Algebra II | No | 33 | 159 | 250 | 203.70 | 24.21 |
| | | Yes | 6 | -- | -- | -- | -- |
| | Geometry | No | 35 | 132 | 243 | 193.09 | 19.94 |
| | | Yes | 2 | -- | -- | -- | -- |
| | Government | No | 744 | 145 | 250 | 203.08 | 24.16 |
| | | Yes | 31 | 150 | 248 | 188.26 | 18.77 |
| | Am. History | No | 74 | 151 | 250 | 202.01 | 23.59 |
| | | Yes | 2 | -- | -- | -- | -- |

**Table E.14. Scale Score Descriptive Statistics by Demographic Group—Limited English Proficient, Fall 2015**

| Test Period | Content Area | LEP | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Fall 2015 | English II | No | 2,623 | 142 | 250 | 196.91 | 18.75 |
| | | Yes | 140 | 105 | 227 | 182.80 | 14.79 |
| | Algebra I | No | 4,417 | 100 | 250 | 197.74 | 22.08 |
| | | Yes | 172 | 148 | 250 | 191.05 | 18.65 |
| | Biology | No | 2,669 | 100 | 250 | 196.99 | 24.30 |
| | | Yes | 88 | 146 | 225 | 177.45 | 15.12 |
| | English I | No | 640 | 150 | 250 | 206.49 | 16.74 |
| | | Yes | 16 | 164 | 216 | 186.63 | 15.07 |
| | Algebra II | No | 681 | 146 | 250 | 213.50 | 22.03 |
| | | Yes | 11 | 171 | 250 | 201.00 | 30.36 |
| | Geometry | No | 661 | 158 | 250 | 206.77 | 19.11 |
| | | Yes | 13 | 176 | 235 | 197.38 | 18.58 |
| | Government | No | 13,580 | 100 | 250 | 204.05 | 21.83 |
| | | Yes | 248 | 116 | 250 | 184.67 | 18.29 |
| | Am. History | No | 457 | 142 | 250 | 204.05 | 24.60 |
| | | Yes | 8 | -- | -- | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.15. Scale Score Descriptive Statistics by Demographic Group—Limited English Proficient, Spring 2016**

| Test Period | Content Area | LEP | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Spring 2016 | English II | No | 61,465 | 111 | 250 | 210.61 | 14.23 |
| | | Yes | 1,280 | 147 | 242 | 197.31 | 13.28 |
| | Algebra I | No | 59,476 | 100 | 250 | 207.49 | 18.78 |
| | | Yes | 1,425 | 100 | 250 | 199.34 | 17.35 |
| | Biology | No | 60,125 | 100 | 250 | 208.27 | 19.37 |
| | | Yes | 1,323 | 144 | 250 | 191.48 | 17.22 |
| | English I | No | 15,555 | 117 | 250 | 204.57 | 15.52 |
| | | Yes | 295 | 154 | 232 | 188.98 | 15.03 |
| | Algebra II | No | 19,561 | 104 | 250 | 210.81 | 22.81 |
| | | Yes | 222 | 155 | 250 | 199.63 | 22.51 |
| | Geometry | No | 8,524 | 141 | 250 | 204.61 | 20.05 |
| | | Yes | 165 | 154 | 250 | 196.99 | 19.26 |
| | Government | No | 43,564 | 100 | 250 | 206.77 | 20.92 |
| | | Yes | 891 | 148 | 250 | 190.18 | 16.65 |
| | Am. History | No | 9,059 | 114 | 250 | 198.68 | 24.00 |
| | | Yes | 89 | 130 | 245 | 186.97 | 20.74 |
| | Physical Science | No | 4,686 | 145 | 250 | 190.33 | 17.49 |
| | | Yes | 39 | 150 | 228 | 181.23 | 15.16 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.16. Scale Score Descriptive Statistics by Demographic Group—Title I, Summer 2015**

| Test Period | Content Area | Title I | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Summer 2015 | English II | No | 399 | 152 | 236 | 193.65 | 15.62 |
| | | Yes | 25 | 175 | 228 | 203.32 | 12.46 |
| | Algebra I | No | 783 | 153 | 250 | 199.73 | 17.08 |
| | | Yes | 87 | 153 | 250 | 214.57 | 18.32 |
| | Biology | No | 258 | 111 | 250 | 191.90 | 19.07 |
| | | Yes | 40 | 153 | 245 | 207.23 | 18.09 |
| | English I | No | 38 | 162 | 232 | 197.71 | 18.02 |
| | | Yes | 14 | 180 | 216 | 193.86 | 9.14 |
| | Algebra II | No | 25 | 159 | 250 | 202.44 | 22.88 |
| | | Yes | 14 | 163 | 250 | 203.57 | 23.48 |
| | Geometry | No | 24 | 132 | 243 | 188.92 | 22.85 |
| | | Yes | 13 | 178 | 216 | 197.23 | 14.31 |
| | Government | No | 756 | 145 | 250 | 202.46 | 24.22 |
| | | Yes | 19 | 164 | 248 | 203.79 | 21.07 |
| | Am. History | No | 76 | 146 | 250 | 200.75 | 24.56 |
| | | Yes | -- | -- | -- | -- | -- |

**Table E.17. Scale Score Descriptive Statistics by Demographic Group—Title I, Fall 2015**

| Test Period | Content Area | Title I | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Fall 2015 | English II | No | 2,440 | 142 | 250 | 197.19 | 18.93 |
| | | Yes | 323 | 105 | 250 | 188.69 | 16.20 |
| | Algebra I | No | 4,016 | 100 | 250 | 198.72 | 22.33 |
| | | Yes | 573 | 100 | 250 | 188.85 | 17.19 |
| | Biology | No | 2,378 | 100 | 250 | 198.77 | 24.49 |
| | | Yes | 379 | 142 | 231 | 181.29 | 16.47 |
| | English I | No | 635 | 150 | 250 | 206.52 | 16.77 |
| | | Yes | 21 | 164 | 216 | 190.43 | 15.90 |
| | Algebra II | No | 679 | 146 | 250 | 213.36 | 22.12 |
| | | Yes | 13 | 164 | 250 | 210.15 | 27.18 |
| | Geometry | No | 673 | 158 | 250 | 206.61 | 19.14 |
| | | Yes | 1 | -- | -- | -- | -- |
| | Government | No | 13,018 | 100 | 250 | 204.19 | 21.94 |
| | | Yes | 810 | 116 | 250 | 195.92 | 20.11 |
| | Am. History | No | 450 | 142 | 250 | 203.96 | 24.63 |
| | | Yes | 15 | 155 | 245 | 193.67 | 24.76 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.18. Scale Score Descriptive Statistics by Demographic Group—Title I, Spring 2016**

| Test Period | Content Area | Title I | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Spring 2016 | English II | No | 58,775 | 111 | 250 | 210.87 | 14.17 |
| | | Yes | 3,970 | 147 | 249 | 202.37 | 14.38 |
| | Algebra I | No | 55,551 | 100 | 250 | 208.04 | 18.71 |
| | | Yes | 5,350 | 100 | 250 | 199.61 | 17.84 |
| | Biology | No | 57,423 | 100 | 250 | 208.81 | 19.22 |
| | | Yes | 4,025 | 138 | 250 | 195.13 | 18.74 |
| | English I | No | 14,774 | 117 | 250 | 204.37 | 15.70 |
| | | Yes | 1,076 | 162 | 248 | 202.97 | 15.02 |
| | Algebra II | No | 19,191 | 104 | 250 | 211.10 | 22.79 |
| | | Yes | 592 | 131 | 250 | 197.41 | 20.46 |
| | Geometry | No | 8,271 | 141 | 250 | 204.63 | 20.19 |
| | | Yes | 418 | 158 | 250 | 201.16 | 17.12 |
| | Government | No | 41,370 | 100 | 250 | 207.39 | 20.86 |
| | | Yes | 3,085 | 143 | 250 | 193.72 | 18.21 |
| | Am. History | No | 8,776 | 114 | 250 | 198.82 | 23.99 |
| | | Yes | 372 | 142 | 250 | 192.61 | 23.48 |
| | Physical Science | No | 4,446 | 145 | 250 | 190.53 | 17.65 |
| | | Yes | 279 | 158 | 235 | 185.89 | 13.99 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.19. Scale Score Descriptive Statistics by Demographic Group—Students with IEPs, Summer 2015**

| Test Period | Content Area | IEP | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Summer 2015 | English II | No | 382 | 152 | 236 | 194.82 | 15.68 |
| | | Yes | 42 | 164 | 219 | 188.79 | 14.03 |
| | Algebra I | No | 806 | 153 | 250 | 202.05 | 17.75 |
| | | Yes | 64 | 164 | 229 | 190.70 | 14.25 |
| | Biology | No | 267 | 111 | 250 | 194.52 | 20.01 |
| | | Yes | 31 | 156 | 221 | 189.06 | 15.29 |
| | English I | No | 50 | 162 | 232 | 197.52 | 15.62 |
| | | Yes | 2 | -- | -- | -- | -- |
| | Algebra II | No | 38 | 159 | 250 | 203.39 | 22.84 |
| | | Yes | 1 | -- | -- | -- | -- |
| | Geometry | No | 35 | 154 | 243 | 193.63 | 18.27 |
| | | Yes | 2 | -- | -- | -- | -- |
| | Government | No | 729 | 145 | 250 | 203.98 | 23.88 |
| | | Yes | 46 | 161 | 228 | 178.87 | 13.71 |
| | Am. History | No | 67 | 146 | 250 | 203.49 | 23.80 |
| | | Yes | 9 | -- | -- | -- | -- |

**Table E.20. Scale Score Descriptive Statistics by Demographic Group—Students with IEPs, Fall 2015**

| Test Period | Content Area | IEP | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Fall 2015 | English II | No | 2,378 | 105 | 250 | 197.94 | 18.84 |
| | | Yes | 385 | 159 | 236 | 185.45 | 14.79 |
| | Algebra I | No | 3,996 | 100 | 250 | 199.57 | 21.93 |
| | | Yes | 593 | 124 | 250 | 183.44 | 16.66 |
| | Biology | No | 2,417 | 100 | 250 | 198.41 | 24.09 |
| | | Yes | 340 | 100 | 248 | 181.83 | 20.61 |
| | English I | No | 602 | 157 | 250 | 207.30 | 16.47 |
| | | Yes | 54 | 150 | 228 | 191.59 | 15.90 |
| | Algebra II | No | 678 | 146 | 250 | 213.55 | 22.05 |
| | | Yes | 14 | 164 | 250 | 201.43 | 27.30 |
| | Geometry | No | 621 | 158 | 250 | 207.82 | 18.75 |
| | | Yes | 53 | 162 | 243 | 192.13 | 17.79 |
| | Government | No | 12,510 | 100 | 250 | 205.36 | 21.52 |
| | | Yes | 1,318 | 145 | 250 | 187.93 | 19.33 |
| | Am. History | No | 412 | 142 | 250 | 205.70 | 23.74 |
| | | Yes | 53 | 151 | 250 | 187.47 | 26.03 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.21. Scale Score Descriptive Statistics by Demographic Group—Students with IEPs, Spring 2016**

| Test Period | Content Area | IEP | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Spring 2016 | English II | No | 56,727 | 111 | 250 | 211.98 | 13.36 |
| | | Yes | 6,018 | 111 | 249 | 194.88 | 13.95 |
| | Algebra I | No | 55,076 | 100 | 250 | 209.07 | 18.16 |
| | | Yes | 5,825 | 100 | 250 | 190.55 | 16.20 |
| | Biology | No | 55,364 | 100 | 250 | 210.06 | 18.42 |
| | | Yes | 6,084 | 100 | 250 | 188.37 | 17.96 |
| | English I | No | 14,550 | 117 | 250 | 205.66 | 14.94 |
| | | Yes | 1,300 | 150 | 237 | 188.74 | 15.05 |
| | Algebra II | No | 19,490 | 104 | 250 | 210.89 | 22.79 |
| | | Yes | 293 | 151 | 250 | 197.58 | 22.55 |
| | Geometry | No | 8,297 | 141 | 250 | 205.22 | 19.78 |
| | | Yes | 392 | 141 | 250 | 188.56 | 19.38 |
| | Government | No | 40,149 | 100 | 250 | 208.43 | 20.25 |
| | | Yes | 4,306 | 128 | 250 | 187.88 | 18.35 |
| | Am. History | No | 8,380 | 123 | 250 | 200.27 | 23.45 |
| | | Yes | 768 | 114 | 250 | 180.06 | 21.97 |
| | Physical Science | No | 4,295 | 145 | 250 | 191.41 | 17.38 |
| | | Yes | 430 | 150 | 244 | 178.72 | 14.04 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.22. Scale Score Descriptive Statistics by Demographic Group—Students with Accommodations, Summer 2015**

| Test Period | Content Area | Accom. | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Summer 2015 | English II | No | 416 | 152 | 236 | 194.56 | 15.66 |
| | | Yes | 14 | 164 | 207 | 186.57 | 11.70 |
| | Algebra I | No | 857 | 153 | 250 | 201.36 | 17.83 |
| | | Yes | 20 | 172 | 210 | 190.35 | 11.55 |
| | Biology | No | 290 | 111 | 250 | 194.24 | 19.68 |
| | | Yes | 15 | 170 | 216 | 186.00 | 13.07 |
| | English I | No | 51 | 162 | 232 | 196.82 | 16.24 |
| | | Yes | 1 | -- | -- | -- | -- |
| | Algebra II | No | 39 | 159 | 250 | 202.85 | 22.80 |
| | | Yes | -- | -- | -- | -- | -- |
| | Geometry | No | 36 | 132 | 243 | 191.92 | 20.73 |
| | | Yes | 1 | -- | -- | -- | -- |
| | Government | No | 782 | 145 | 250 | 202.53 | 24.04 |
| | | Yes | 6 | -- | -- | -- | -- |
| | Am. History | No | 71 | 146 | 250 | 203.07 | 23.69 |
| | | Yes | 6 | -- | -- | -- | -- |

**Table E.23. Scale Score Descriptive Statistics by Demographic Group—Students with Accommodations, Fall 2015**

| Test Period | Content Area | Accom. | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Fall 2015 | English II | No | 2,643 | 105 | 250 | 196.70 | 18.85 |
| | | Yes | 122 | 159 | 225 | 185.64 | 14.90 |
| | Algebra I | No | 4,391 | 100 | 250 | 198.13 | 22.04 |
| | | Yes | 231 | 134 | 249 | 184.88 | 16.29 |
| | Biology | No | 2,642 | 100 | 250 | 196.95 | 24.29 |
| | | Yes | 120 | 146 | 238 | 183.59 | 20.58 |
| | English I | No | 626 | 150 | 250 | 206.72 | 16.78 |
| | | Yes | 30 | 162 | 213 | 191.13 | 13.97 |
| | Algebra II | No | 683 | 146 | 250 | 213.62 | 22.11 |
| | | Yes | 9 | -- | -- | -- | -- |
| | Geometry | No | 630 | 162 | 250 | 207.64 | 18.88 |
| | | Yes | 44 | 158 | 218 | 191.61 | 16.39 |
| | Government | No | 13,305 | 100 | 250 | 204.42 | 21.78 |
| | | Yes | 539 | 145 | 250 | 185.70 | 17.22 |
| | Am. History | No | 431 | 142 | 250 | 205.09 | 23.95 |
| | | Yes | 34 | 146 | 245 | 185.06 | 26.47 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table E.24. Scale Score Descriptive Statistics by Demographic Group—Students with Accommodations, Spring 2016**

| Test Period | Content Area | Accom. | N-Count | Min. | Max. | Mean | SD |
|---|---|---|---|---|---|---|---|
| Spring 2016 | English II | No | 58,952 | 111 | 250 | 211.35 | 13.79 |
| | | Yes | 3,837 | 147 | 249 | 194.69 | 13.37 |
| | Algebra I | No | 57,439 | 100 | 250 | 208.36 | 18.48 |
| | | Yes | 3,532 | 100 | 250 | 189.89 | 14.85 |
| | Biology | No | 57,785 | 100 | 250 | 209.19 | 18.92 |
| | | Yes | 3,701 | 138 | 250 | 187.80 | 17.10 |
| | English I | No | 14,849 | 117 | 250 | 205.35 | 15.13 |
| | | Yes | 1,016 | 150 | 248 | 188.44 | 14.73 |
| | Algebra II | No | 19,639 | 104 | 250 | 210.82 | 22.81 |
| | | Yes | 152 | 159 | 250 | 194.12 | 21.03 |
| | Geometry | No | 8,408 | 141 | 250 | 205.11 | 19.83 |
| | | Yes | 285 | 141 | 250 | 185.19 | 17.33 |
| | Government | No | 41,793 | 100 | 250 | 207.65 | 20.61 |
| | | Yes | 2,687 | 128 | 250 | 187.49 | 17.31 |
| | Am. History | No | 8,596 | 123 | 250 | 199.90 | 23.63 |
| | | Yes | 559 | 114 | 250 | 178.06 | 20.02 |
| | Physical Science | No | 4,454 | 145 | 250 | 191.04 | 17.42 |
| | | Yes | 274 | 150 | 219 | 177.14 | 12.90 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Appendix F: Achievement-Level Distributions by Demographic Group

**Table F.1. Achievement-Level Distributions—Gender, Summer 2015**

| Test Period | Content Area | Gender | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English II | Female | Below Basic | 38 | 22.89 |
| | | | Basic | 67 | 40.36 |
| | | | Proficient | 57 | 34.34 |
| | | | Advanced | -- | -- |
| | | | Total | 166 | 100.00 |
| | | Male | Below Basic | 53 | 20.08 |
| | | | Basic | 99 | 37.50 |
| | | | Proficient | 102 | 38.64 |
| | | | Advanced | 10 | 3.79 |
| | | | Total | 264 | 100.00 |
| | Algebra I | Female | Below Basic | 90 | 21.95 |
| | | | Basic | 79 | 19.27 |
| | | | Proficient | 191 | 46.59 |
| | | | Advanced | 50 | 12.20 |
| | | | Total | 410 | 100.00 |
| | | Male | Below Basic | 98 | 20.99 |
| | | | Basic | 127 | 27.19 |
| | | | Proficient | 199 | 42.61 |
| | | | Advanced | 43 | 9.21 |
| | | | Total | 467 | 100.00 |
| | Biology | Female | Below Basic | 25 | 17.36 |
| | | | Basic | 64 | 44.44 |
| | | | Proficient | 44 | 30.56 |
| | | | Advanced | 11 | 7.64 |
| | | | Total | 144 | 100.00 |
| | | Male | Below Basic | 21 | 13.04 |
| | | | Basic | 73 | 45.34 |
| | | | Proficient | 61 | 37.89 |
| | | | Advanced | -- | -- |
| | | | Total | 161 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.1 (continued). Achievement-Level Distributions—Gender, Summer 2015**

| Test Period | Content Area | Gender | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English I | Female | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 22 | 100.00 |
| | | Male | Below Basic | -- | -- |
| | | | Basic | 16 | 53.33 |
| | | | Proficient | 11 | 36.67 |
| | | | Advanced | -- | -- |
| | | | Total | 30 | 100.00 |
| | Algebra II | Female | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 24 | 100.00 |
| | | Male | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 15 | 100.00 |
| | Geometry | Female | Below Basic | 10 | 55.56 |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 18 | 100.00 |
| | | Male | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 19 | 100.00 |
| | Government | Female | Below Basic | 78 | 18.06 |
| | | | Basic | 121 | 28.01 |
| | | | Proficient | 150 | 34.72 |
| | | | Advanced | 83 | 19.21 |
| | | | Total | 432 | 100.00 |
| | | Male | Below Basic | 69 | 19.38 |
| | | | Basic | 94 | 26.40 |
| | | | Proficient | 102 | 28.65 |
| | | | Advanced | 91 | 25.56 |
| | | | Total | 356 | 100.00 |
| | Am. History | Female | Below Basic | 14 | 27.45 |
| | | | Basic | 13 | 25.49 |
| | | | Proficient | 15 | 29.41 |
| | | | Advanced | -- | -- |
| | | | Total | 51 | 100.00 |
| | | Male | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | 11 | 42.31 |
| | | | Advanced | -- | -- |
| | | | Total | 26 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.2. Achievement-Level Distributions—Gender, Fall 2015**

| Test Period | Content Area | Gender | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English II | Female | Below Basic | 221 | 17.42 |
| | | | Basic | 381 | 30.02 |
| | | | Proficient | 549 | 43.26 |
| | | | Advanced | 118 | 9.30 |
| | | | Total | 1,269 | 100.00 |
| | | Male | Below Basic | 404 | 27.01 |
| | | | Basic | 440 | 29.41 |
| | | | Proficient | 549 | 36.70 |
| | | | Advanced | 103 | 6.89 |
| | | | Total | 1,496 | 100.00 |
| | Algebra I | Female | Below Basic | 712 | 32.65 |
| | | | Basic | 430 | 19.72 |
| | | | Proficient | 734 | 33.65 |
| | | | Advanced | 305 | 13.98 |
| | | | Total | 2,181 | 100.00 |
| | | Male | Below Basic | 941 | 38.55 |
| | | | Basic | 505 | 20.69 |
| | | | Proficient | 683 | 27.98 |
| | | | Advanced | 312 | 12.78 |
| | | | Total | 2,441 | 100.00 |
| | Biology | Female | Below Basic | 239 | 18.76 |
| | | | Basic | 422 | 33.12 |
| | | | Proficient | 392 | 30.77 |
| | | | Advanced | 221 | 17.35 |
| | | | Total | 1,274 | 100.00 |
| | | Male | Below Basic | 376 | 25.27 |
| | | | Basic | 465 | 31.25 |
| | | | Proficient | 417 | 28.02 |
| | | | Advanced | 230 | 15.46 |
| | | | Total | 1,488 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.2 (continued). Achievement-Level Distributions—Gender, Fall 2015**

| Test Period | Content Area | Gender | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English I | Female | Below Basic | 14 | 4.47 |
| | | | Basic | 64 | 20.45 |
| | | | Proficient | 177 | 56.55 |
| | | | Advanced | 58 | 18.53 |
| | | | Total | 313 | 100.00 |
| | | Male | Below Basic | 27 | 7.87 |
| | | | Basic | 92 | 26.82 |
| | | | Proficient | 186 | 54.23 |
| | | | Advanced | 38 | 11.08 |
| | | | Total | 343 | 100.00 |
| | Algebra II | Female | Below Basic | 38 | 10.38 |
| | | | Basic | 63 | 17.21 |
| | | | Proficient | 148 | 40.44 |
| | | | Advanced | 117 | 31.97 |
| | | | Total | 366 | 100.00 |
| | | Male | Below Basic | 34 | 10.43 |
| | | | Basic | 42 | 12.88 |
| | | | Proficient | 119 | 36.50 |
| | | | Advanced | 131 | 40.18 |
| | | | Total | 326 | 100.00 |
| | Geometry | Female | Below Basic | 68 | 20.92 |
| | | | Basic | 48 | 14.77 |
| | | | Proficient | 143 | 44.00 |
| | | | Advanced | 66 | 20.31 |
| | | | Total | 325 | 100.00 |
| | | Male | Below Basic | 47 | 13.47 |
| | | | Basic | 61 | 17.48 |
| | | | Proficient | 170 | 48.71 |
| | | | Advanced | 71 | 20.34 |
| | | | Total | 349 | 100.00 |
| | Government | Female | Below Basic | 820 | 11.96 |
| | | | Basic | 2,226 | 32.46 |
| | | | Proficient | 2,465 | 35.95 |
| | | | Advanced | 1,346 | 19.63 |
| | | | Total | 6,857 | 100.00 |
| | | Male | Below Basic | 857 | 12.27 |
| | | | Basic | 1,986 | 28.42 |
| | | | Proficient | 2,525 | 36.14 |
| | | | Advanced | 1,619 | 23.17 |
| | | | Total | 6,987 | 100.00 |
| | Am. History | Female | Below Basic | 52 | 25.12 |
| | | | Basic | 57 | 27.54 |
| | | | Proficient | 61 | 29.47 |
| | | | Advanced | 37 | 17.87 |
| | | | Total | 207 | 100.00 |
| | | Male | Below Basic | 35 | 13.57 |
| | | | Basic | 53 | 20.54 |
| | | | Proficient | 98 | 37.98 |
| | | | Advanced | 72 | 27.91 |
| | | | Total | 258 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.3. Achievement-Level Distributions—Gender, Spring 2016**

| Test Period | Content Area | Gender | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | English II | Female | Below Basic | 586 | 1.89 |
| | | | Basic | 3,966 | 12.78 |
| | | | Proficient | 19,705 | 63.50 |
| | | | Advanced | 6,776 | 21.83 |
| | | | Total | 31,033 | 100.00 |
| | | Male | Below Basic | 1,441 | 4.54 |
| | | | Basic | 6,108 | 19.23 |
| | | | Proficient | 19,833 | 62.45 |
| | | | Advanced | 4,374 | 13.77 |
| | | | Total | 31,756 | 100.00 |
| | Algebra I | Female | Below Basic | 3,508 | 11.51 |
| | | | Basic | 5,839 | 19.15 |
| | | | Proficient | 15,558 | 51.03 |
| | | | Advanced | 5,582 | 18.31 |
| | | | Total | 30,487 | 100.00 |
| | | Male | Below Basic | 4,430 | 14.53 |
| | | | Basic | 6,110 | 20.04 |
| | | | Proficient | 14,133 | 46.36 |
| | | | Advanced | 5,811 | 19.06 |
| | | | Total | 30,484 | 100.00 |
| | Biology | Female | Below Basic | 1,540 | 5.03 |
| | | | Basic | 8,291 | 27.06 |
| | | | Proficient | 14,363 | 46.88 |
| | | | Advanced | 6,446 | 21.04 |
| | | | Total | 30,640 | 100.00 |
| | | Male | Below Basic | 1,997 | 6.47 |
| | | | Basic | 7,991 | 25.91 |
| | | | Proficient | 14,271 | 46.27 |
| | | | Advanced | 6,587 | 21.35 |
| | | | Total | 30,846 | 100.00 |
| | English I | Female | Below Basic | 342 | 4.27 |
| | | | Basic | 2,004 | 25.04 |
| | | | Proficient | 4,645 | 58.04 |
| | | | Advanced | 1,012 | 12.65 |
| | | | Total | 8,003 | 100.00 |
| | | Male | Below Basic | 664 | 8.45 |
| | | | Basic | 2,339 | 29.75 |
| | | | Proficient | 4,244 | 53.98 |
| | | | Advanced | 615 | 7.82 |
| | | | Total | 7,862 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.3 (continued). Achievement-Level Distributions—Gender, Spring 2016**

| Test Period | Content Area | Gender | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Algebra II | Female | Below Basic | 1,421 | 13.51 |
| | | | Basic | 1,954 | 18.58 |
| | | | Proficient | 4,387 | 41.72 |
| | | | Advanced | 2,754 | 26.19 |
| | | | Total | 10,516 | 100.00 |
| | | Male | Below Basic | 1,078 | 11.62 |
| | | | Basic | 1,480 | 15.96 |
| | | | Proficient | 3,601 | 38.82 |
| | | | Advanced | 3,116 | 33.60 |
| | | | Total | 9,275 | 100.00 |
| | Geometry | Female | Below Basic | 998 | 22.10 |
| | | | Basic | 913 | 20.22 |
| | | | Proficient | 1,849 | 40.95 |
| | | | Advanced | 755 | 16.72 |
| | | | Total | 4,515 | 100.00 |
| | | Male | Below Basic | 782 | 18.72 |
| | | | Basic | 720 | 17.23 |
| | | | Proficient | 1,846 | 44.18 |
| | | | Advanced | 830 | 19.87 |
| | | | Total | 4,178 | 100.00 |
| | Government | Female | Below Basic | 1,964 | 8.93 |
| | | | Basic | 6,234 | 28.35 |
| | | | Proficient | 9,263 | 42.13 |
| | | | Advanced | 4,527 | 20.59 |
| | | | Total | 21,988 | 100.00 |
| | | Male | Below Basic | 2,078 | 9.24 |
| | | | Basic | 5,282 | 23.48 |
| | | | Proficient | 9,081 | 40.37 |
| | | | Advanced | 6,051 | 26.90 |
| | | | Total | 22,492 | 100.00 |
| | Am. History | Female | Below Basic | 1,287 | 28.16 |
| | | | Basic | 1,348 | 29.50 |
| | | | Proficient | 1,348 | 29.50 |
| | | | Advanced | 587 | 12.84 |
| | | | Total | 4,570 | 100.00 |
| | | Male | Below Basic | 914 | 19.93 |
| | | | Basic | 1,121 | 24.45 |
| | | | Proficient | 1,618 | 35.29 |
| | | | Advanced | 932 | 20.33 |
| | | | Total | 4,585 | 100.00 |
| | Physical Science | Female | Below Basic | 161 | 7.02 |
| | | | Basic | 1,569 | 68.43 |
| | | | Proficient | 488 | 21.28 |
| | | | Advanced | 75 | 3.27 |
| | | | Total | 2,293 | 100.00 |
| | | Male | Below Basic | 138 | 5.67 |
| | | | Basic | 1,534 | 63.00 |
| | | | Proficient | 618 | 25.38 |
| | | | Advanced | 145 | 5.95 |
| | | | Total | 2,435 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.4. Achievement-Level Distribution—Ethnicity, Summer 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English II | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 3 | 100.00 |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 3 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 2 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 42 | 24.42 |
| | | | Basic | 75 | 43.60 |
| | | | Proficient | 52 | 30.23 |
| | | | Advanced | -- | -- |
| | | | Total | 172 | 100.00 |
| | | Hispanic | Below Basic | -- | -- |
| | | | Basic | 13 | 32.50 |
| | | | Proficient | 24 | 60.00 |
| | | | Advanced | -- | -- |
| | | | Total | 40 | 100.00 |
| | | White (not Hispanic) | Below Basic | 47 | 22.38 |
| | | | Basic | 76 | 36.19 |
| | | | Proficient | 78 | 37.14 |
| | | | Advanced | -- | -- |
| | | | Total | 210 | 100.00 |
| | | Multi-racial | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.4 (continued). Achievement-Level Distributions—Ethnicity, Summer 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | Algebra I | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 7 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | | Black (not Hispanic) | Below Basic | 92 | 34.33 |
| | | | Basic | 87 | 32.46 |
| | | | Proficient | 71 | 26.49 |
| | | | Advanced | 18 | 6.72 |
| | | | Total | 268 | 100.00 |
| | | Hispanic | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | 28 | 57.14 |
| | | | Advanced | -- | -- |
| | | | Total | 49 | 100.00 |
| | | White (not Hispanic) | Below Basic | 83 | 15.20 |
| | | | Basic | 109 | 19.96 |
| | | | Proficient | 285 | 52.20 |
| | | | Advanced | 69 | 12.64 |
| | | | Total | 546 | 100.00 |
| | | Multi-racial | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 7 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.4 (continued). Achievement-Level Distributions—Ethnicity, Summer 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | Biology | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 28 | 21.54 |
| | | | Basic | 62 | 47.69 |
| | | | Proficient | 35 | 26.92 |
| | | | Advanced | -- | -- |
| | | | Total | 130 | 100.00 |
| | | Hispanic | Below Basic | -- | -- |
| | | | Basic | 10 | 50.00 |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 20 | 100.00 |
| | | White (not Hispanic) | Below Basic | 16 | 10.67 |
| | | | Basic | 62 | 41.33 |
| | | | Proficient | 62 | 41.33 |
| | | | Advanced | 10 | 6.67 |
| | | | Total | 150 | 100.00 |
| | | Multi-racial | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 4 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.4 (continued). Achievement-Level Distributions—Ethnicity, Summer 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English I | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | | Black (not Hispanic) | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 9 | 100.00 |
| | | Hispanic | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 12 | 100.00 |
| | | White (not Hispanic) | Below Basic | -- | -- |
| | | | Basic | 11 | 36.67 |
| | | | Proficient | 14 | 46.67 |
| | | | Advanced | -- | -- |
| | | | Total | 30 | 100.00 |
| | | Multi-racial | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.4 (continued). Achievement-Level Distributions—Ethnicity, Summer 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | Algebra II | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | | Black (not Hispanic) | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 3 | 100.00 |
| | | Hispanic | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 17 | 100.00 |
| | | White (not Hispanic) | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 19 | 100.00 |
| | | Multi-racial | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.4 (continued). Achievement-Level Distributions—Ethnicity, Summer 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | Geometry | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |
| | | Black (not Hispanic) | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 14 | 100.00 |
| | | Hispanic | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 3 | 100.00 |
| | | White (not Hispanic) | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 17 | 100.00 |
| | | Multi-racial | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 2 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.4 (continued). Achievement-Level Distributions—Ethnicity, Summer 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | Government | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 2 | 100.00 |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | 11 | 50.00 |
| | | | Total | 22 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 4 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 49 | 35.77 |
| | | | Basic | 37 | 27.01 |
| | | | Proficient | 36 | 26.28 |
| | | | Advanced | 15 | 10.95 |
| | | | Total | 137 | 100.00 |
| | | Hispanic | Below Basic | 13 | 20.97 |
| | | | Basic | 22 | 35.48 |
| | | | Proficient | 20 | 32.26 |
| | | | Advanced | -- | -- |
| | | | Total | 62 | 100.00 |
| | | White (not Hispanic) | Below Basic | 80 | 14.71 |
| | | | Basic | 148 | 27.21 |
| | | | Proficient | 185 | 34.01 |
| | | | Advanced | 131 | 24.08 |
| | | | Total | 544 | 100.00 |
| | | Multi-racial | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | 10 | 58.82 |
| | | | Total | 17 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.4 (continued). Achievement-Level Distributions—Ethnicity, Summer 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | Am. History | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 3 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | | Black (not Hispanic) | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 6 | 100.00 |
| | | Hispanic | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 4 | 100.00 |
| | | White (not Hispanic) | Below Basic | 14 | 23.33 |
| | | | Basic | 14 | 23.33 |
| | | | Proficient | 20 | 33.33 |
| | | | Advanced | 12 | 20.00 |
| | | | Total | 60 | 100.00 |
| | | Multi-racial | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 3 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.5. Achievement-Level Distributions—Ethnicity, Fall 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English II | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 11 | 100.00 |
| | | Asian | Below Basic | 10 | 21.28 |
| | | | Basic | 10 | 21.28 |
| | | | Proficient | 18 | 38.30 |
| | | | Advanced | -- | -- |
| | | | Total | 47 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 8 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 258 | 23.16 |
| | | | Basic | 400 | 35.91 |
| | | | Proficient | 409 | 36.71 |
| | | | Advanced | 47 | 4.22 |
| | | | Total | 1,114 | 100.00 |
| | | Hispanic | Below Basic | 55 | 27.50 |
| | | | Basic | 69 | 34.50 |
| | | | Proficient | 69 | 34.50 |
| | | | Advanced | -- | -- |
| | | | Total | 200 | 100.00 |
| | | White (not Hispanic) | Below Basic | 281 | 21.29 |
| | | | Basic | 325 | 24.62 |
| | | | Proficient | 563 | 42.65 |
| | | | Advanced | 151 | 11.44 |
| | | | Total | 1,320 | 100.00 |
| | | Multi-racial | Below Basic | 17 | 26.15 |
| | | | Basic | 11 | 16.92 |
| | | | Proficient | 31 | 47.69 |
| | | | Advanced | -- | -- |
| | | | Total | 65 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.5 (continued). Achievement-Level Distributions—Ethnicity, Fall 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | Algebra I | American Indian/ Alaskan Native | Below Basic | 10 | 50.00 |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 20 | 100.00 |
| | | Asian | Below Basic | 12 | 14.46 |
| | | | Basic | -- | -- |
| | | | Proficient | 23 | 27.71 |
| | | | Advanced | 39 | 46.99 |
| | | | Total | 83 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 4 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 508 | 55.76 |
| | | | Basic | 195 | 21.41 |
| | | | Proficient | 182 | 19.98 |
| | | | Advanced | 26 | 2.85 |
| | | | Total | 911 | 100.00 |
| | | Hispanic | Below Basic | 124 | 36.36 |
| | | | Basic | 80 | 23.46 |
| | | | Proficient | 115 | 33.72 |
| | | | Advanced | 22 | 6.45 |
| | | | Total | 341 | 100.00 |
| | | White (not Hispanic) | Below Basic | 958 | 30.31 |
| | | | Basic | 627 | 19.84 |
| | | | Proficient | 1,061 | 33.57 |
| | | | Advanced | 515 | 16.29 |
| | | | Total | 3,161 | 100.00 |
| | | Multi-racial | Below Basic | 39 | 38.24 |
| | | | Basic | 16 | 15.69 |
| | | | Proficient | 32 | 31.37 |
| | | | Advanced | 15 | 14.71 |
| | | | Total | 102 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.5 (continued). Achievement-Level Distributions—Ethnicity, Fall 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | Biology | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 18 | 100.00 |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | 10 | 13.51 |
| | | | Proficient | 20 | 27.03 |
| | | | Advanced | 39 | 52.70 |
| | | | Total | 74 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 7 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 259 | 40.41 |
| | | | Basic | 271 | 42.28 |
| | | | Proficient | 100 | 15.60 |
| | | | Advanced | 11 | 1.72 |
| | | | Total | 641 | 100.00 |
| | | Hispanic | Below Basic | 52 | 26.13 |
| | | | Basic | 83 | 41.71 |
| | | | Proficient | 53 | 26.63 |
| | | | Advanced | 11 | 5.53 |
| | | | Total | 199 | 100.00 |
| | | White (not Hispanic) | Below Basic | 275 | 15.71 |
| | | | Basic | 500 | 28.57 |
| | | | Proficient | 603 | 34.46 |
| | | | Advanced | 372 | 21.26 |
| | | | Total | 1,750 | 100.00 |
| | | Multi-racial | Below Basic | 18 | 24.66 |
| | | | Basic | 16 | 21.92 |
| | | | Proficient | 27 | 36.99 |
| | | | Advanced | 12 | 16.44 |
| | | | Total | 73 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.5 (continued). Achievement-Level Distributions—Ethnicity, Fall 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English I | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 6 | 100.00 |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 9 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 3 | 100.00 |
| | | Black (not Hispanic) | Below Basic | -- | -- |
| | | | Basic | 18 | 36.73 |
| | | | Proficient | 18 | 36.73 |
| | | | Advanced | -- | -- |
| | | | Total | 49 | 100.00 |
| | | Hispanic | Below Basic | -- | -- |
| | | | Basic | 21 | 41.18 |
| | | | Proficient | 19 | 37.25 |
| | | | Advanced | -- | -- |
| | | | Total | 51 | 100.00 |
| | | White (not Hispanic) | Below Basic | 25 | 4.78 |
| | | | Basic | 112 | 21.41 |
| | | | Proficient | 304 | 58.13 |
| | | | Advanced | 82 | 15.68 |
| | | | Total | 523 | 100.00 |
| | | Multi-racial | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 15 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.5 (continued). Achievement-Level Distributions—Ethnicity, Fall 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | Algebra II | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 4 | 100.00 |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | 10 | 37.04 |
| | | | Advanced | 12 | 44.44 |
| | | | Total | 27 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 4 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 27 | 35.53 |
| | | | Basic | 21 | 27.63 |
| | | | Proficient | 17 | 22.37 |
| | | | Advanced | 11 | 14.47 |
| | | | Total | 76 | 100.00 |
| | | Hispanic | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | 16 | 50.00 |
| | | | Advanced | -- | -- |
| | | | Total | 32 | 100.00 |
| | | White (not Hispanic) | Below Basic | 38 | 7.22 |
| | | | Basic | 70 | 13.31 |
| | | | Proficient | 211 | 40.11 |
| | | | Advanced | 207 | 39.35 |
| | | | Total | 526 | 100.00 |
| | | Multi-racial | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 23 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.5 (continued). Achievement-Level Distributions—Ethnicity, Fall 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | Geometry | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 3 | 100.00 |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | 14 | 53.85 |
| | | | Advanced | -- | -- |
| | | | Total | 26 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 4 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 23 | 31.51 |
| | | | Basic | 16 | 21.92 |
| | | | Proficient | 31 | 42.47 |
| | | | Advanced | -- | -- |
| | | | Total | 73 | 100.00 |
| | | Hispanic | Below Basic | 14 | 28.00 |
| | | | Basic | -- | -- |
| | | | Proficient | 23 | 46.00 |
| | | | Advanced | -- | -- |
| | | | Total | 50 | 100.00 |
| | | White (not Hispanic) | Below Basic | 72 | 14.63 |
| | | | Basic | 78 | 15.85 |
| | | | Proficient | 230 | 46.75 |
| | | | Advanced | 112 | 22.76 |
| | | | Total | 492 | 100.00 |
| | | Multi-racial | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | 12 | 46.15 |
| | | | Advanced | -- | -- |
| | | | Total | 26 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.5 (continued). Achievement-Level Distributions—Ethnicity, Fall 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | Government | American Indian/ Alaskan Native | Below Basic | 11 | 18.33 |
| | | | Basic | 14 | 23.33 |
| | | | Proficient | 27 | 45.00 |
| | | | Advanced | -- | -- |
| | | | Total | 60 | 100.00 |
| | | Asian | Below Basic | 32 | 8.33 |
| | | | Basic | 59 | 15.36 |
| | | | Proficient | 114 | 29.69 |
| | | | Advanced | 179 | 46.61 |
| | | | Total | 384 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | 12 | 34.29 |
| | | | Proficient | 11 | 31.43 |
| | | | Advanced | -- | -- |
| | | | Total | 35 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 564 | 21.46 |
| | | | Basic | 1,046 | 39.80 |
| | | | Proficient | 805 | 30.63 |
| | | | Advanced | 213 | 8.11 |
| | | | Total | 2,628 | 100.00 |
| | | Hispanic | Below Basic | 104 | 14.44 |
| | | | Basic | 278 | 38.61 |
| | | | Proficient | 245 | 34.03 |
| | | | Advanced | 93 | 12.92 |
| | | | Total | 720 | 100.00 |
| | | White (not Hispanic) | Below Basic | 923 | 9.51 |
| | | | Basic | 2,714 | 27.95 |
| | | | Proficient | 3,674 | 37.84 |
| | | | Advanced | 2,398 | 24.70 |
| | | | Total | 9,709 | 100.00 |
| | | Multi-racial | Below Basic | 34 | 11.04 |
| | | | Basic | 89 | 28.90 |
| | | | Proficient | 114 | 37.01 |
| | | | Advanced | 71 | 23.05 |
| | | | Total | 308 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.5 (continued). Achievement-Level Distributions—Ethnicity, Fall 2015**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | Am. History | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 2 | 100.00 |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 8 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 4 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 13 | 31.71 |
| | | | Basic | 12 | 29.27 |
| | | | Proficient | 11 | 26.83 |
| | | | Advanced | -- | -- |
| | | | Total | 41 | 100.00 |
| | | Hispanic | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | 13 | 43.33 |
| | | | Advanced | -- | -- |
| | | | Total | 30 | 100.00 |
| | | White (not Hispanic) | Below Basic | 64 | 17.30 |
| | | | Basic | 87 | 23.51 |
| | | | Proficient | 127 | 34.32 |
| | | | Advanced | 92 | 24.86 |
| | | | Total | 370 | 100.00 |
| | | Multi-racial | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 10 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.6. Achievement-Level Distributions—Ethnicity, Spring 2016**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | English II | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | 52 | 20.80 |
| | | | Proficient | 151 | 60.40 |
| | | | Advanced | 39 | 15.60 |
| | | | Total | 250 | 100.00 |
| | | Asian | Below Basic | 42 | 3.34 |
| | | | Basic | 179 | 14.24 |
| | | | Proficient | 649 | 51.63 |
| | | | Advanced | 387 | 30.79 |
| | | | Total | 1,257 | 100.00 |
| | | Pacific Islander | Below Basic | 10 | 7.46 |
| | | | Basic | 32 | 23.88 |
| | | | Proficient | 80 | 59.70 |
| | | | Advanced | 12 | 8.96 |
| | | | Total | 134 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 739 | 7.97 |
| | | | Basic | 2,790 | 30.10 |
| | | | Proficient | 5,121 | 55.25 |
| | | | Advanced | 618 | 6.67 |
| | | | Total | 9,268 | 100.00 |
| | | Hispanic | Below Basic | 117 | 3.91 |
| | | | Basic | 627 | 20.94 |
| | | | Proficient | 1,883 | 62.89 |
| | | | Advanced | 367 | 12.26 |
| | | | Total | 2,994 | 100.00 |
| | | White (not Hispanic) | Below Basic | 1,066 | 2.24 |
| | | | Basic | 6,151 | 12.95 |
| | | | Proficient | 30,788 | 64.83 |
| | | | Advanced | 9,484 | 19.97 |
| | | | Total | 47,489 | 100.00 |
| | | Multi-racial | Below Basic | 45 | 3.22 |
| | | | Basic | 243 | 17.39 |
| | | | Proficient | 866 | 61.99 |
| | | | Advanced | 243 | 17.39 |
| | | | Total | 1,397 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.6 (continued). Achievement-Level Distributions—Ethnicity, Spring 2016**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Algebra I | American Indian/ Alaskan Native | Below Basic | 57 | 20.21 |
| | | | Basic | 59 | 20.92 |
| | | | Proficient | 131 | 46.45 |
| | | | Advanced | 35 | 12.41 |
| | | | Total | 282 | 100.00 |
| | | Asian | Below Basic | 58 | 4.57 |
| | | | Basic | 116 | 9.14 |
| | | | Proficient | 488 | 38.46 |
| | | | Advanced | 607 | 47.83 |
| | | | Total | 1,269 | 100.00 |
| | | Pacific Islander | Below Basic | 23 | 17.69 |
| | | | Basic | 37 | 28.46 |
| | | | Proficient | 54 | 41.54 |
| | | | Advanced | 16 | 12.31 |
| | | | Total | 130 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 2,323 | 25.45 |
| | | | Basic | 2,571 | 28.16 |
| | | | Proficient | 3,727 | 40.83 |
| | | | Advanced | 508 | 5.56 |
| | | | Total | 9,129 | 100.00 |
| | | Hispanic | Below Basic | 469 | 14.75 |
| | | | Basic | 699 | 21.99 |
| | | | Proficient | 1,582 | 49.76 |
| | | | Advanced | 429 | 13.49 |
| | | | Total | 3,179 | 100.00 |
| | | White (not Hispanic) | Below Basic | 4,850 | 10.64 |
| | | | Basic | 8,202 | 18.00 |
| | | | Proficient | 22,997 | 50.46 |
| | | | Advanced | 9,528 | 20.91 |
| | | | Total | 45,577 | 100.00 |
| | | Multi-racial | Below Basic | 158 | 11.25 |
| | | | Basic | 265 | 18.86 |
| | | | Proficient | 712 | 50.68 |
| | | | Advanced | 270 | 19.22 |
| | | | Total | 1,405 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.6 (continued). Achievement-Level Distributions—Ethnicity, Spring 2016**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Biology | American Indian/ Alaskan Native | Below Basic | 14 | 5.88 |
| | | | Basic | 79 | 33.19 |
| | | | Proficient | 107 | 44.96 |
| | | | Advanced | 38 | 15.97 |
| | | | Total | 238 | 100.00 |
| | | Asian | Below Basic | 55 | 4.49 |
| | | | Basic | 208 | 16.99 |
| | | | Proficient | 460 | 37.58 |
| | | | Advanced | 501 | 40.93 |
| | | | Total | 1,224 | 100.00 |
| | | Pacific Islander | Below Basic | 11 | 8.03 |
| | | | Basic | 57 | 41.61 |
| | | | Proficient | 52 | 37.96 |
| | | | Advanced | 17 | 12.41 |
| | | | Total | 137 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 1,446 | 15.90 |
| | | | Basic | 3,956 | 43.50 |
| | | | Proficient | 3,130 | 34.42 |
| | | | Advanced | 562 | 6.18 |
| | | | Total | 9,094 | 100.00 |
| | | Hispanic | Below Basic | 206 | 6.95 |
| | | | Basic | 1,041 | 35.11 |
| | | | Proficient | 1,351 | 45.56 |
| | | | Advanced | 367 | 12.38 |
| | | | Total | 2,965 | 100.00 |
| | | White (not Hispanic) | Below Basic | 1,752 | 3.77 |
| | | | Basic | 10,577 | 22.74 |
| | | | Proficient | 22,895 | 49.23 |
| | | | Advanced | 11,280 | 24.26 |
| | | | Total | 46,504 | 100.00 |
| | | Multi-racial | Below Basic | 53 | 4.00 |
| | | | Basic | 364 | 27.49 |
| | | | Proficient | 639 | 48.26 |
| | | | Advanced | 268 | 20.24 |
| | | | Total | 1,324 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.6 (continued). Achievement-Level Distributions—Ethnicity, Spring 2016**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | English I | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | 28 | 28.57 |
| | | | Proficient | 54 | 55.10 |
| | | | Advanced | 10 | 10.20 |
| | | | Total | 98 | 100.00 |
| | | Asian | Below Basic | 16 | 9.25 |
| | | | Basic | 33 | 19.08 |
| | | | Proficient | 92 | 53.18 |
| | | | Advanced | 32 | 18.50 |
| | | | Total | 173 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | 12 | 42.86 |
| | | | Proficient | 11 | 39.29 |
| | | | Advanced | -- | -- |
| | | | Total | 28 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 162 | 13.31 |
| | | | Basic | 486 | 39.93 |
| | | | Proficient | 517 | 42.48 |
| | | | Advanced | 52 | 4.27 |
| | | | Total | 1,217 | 100.00 |
| | | Hispanic | Below Basic | 77 | 10.66 |
| | | | Basic | 256 | 35.46 |
| | | | Proficient | 344 | 47.65 |
| | | | Advanced | 45 | 6.23 |
| | | | Total | 722 | 100.00 |
| | | White (not Hispanic) | Below Basic | 706 | 5.31 |
| | | | Basic | 3,428 | 25.80 |
| | | | Proficient | 7,694 | 57.90 |
| | | | Advanced | 1,460 | 10.99 |
| | | | Total | 13,288 | 100.00 |
| | | Multi-racial | Below Basic | 35 | 10.32 |
| | | | Basic | 100 | 29.50 |
| | | | Proficient | 177 | 52.21 |
| | | | Advanced | 27 | 7.96 |
| | | | Total | 339 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.6 (continued). Achievement-Level Distributions—Ethnicity, Spring 2016**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Algebra II | American Indian/ Alaskan Native | Below Basic | 15 | 19.23 |
| | | | Basic | 13 | 16.67 |
| | | | Proficient | 33 | 42.31 |
| | | | Advanced | 17 | 21.79 |
| | | | Total | 78 | 100.00 |
| | | Asian | Below Basic | 19 | 3.00 |
| | | | Basic | 52 | 8.20 |
| | | | Proficient | 198 | 31.23 |
| | | | Advanced | 365 | 57.57 |
| | | | Total | 634 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | 14 | 42.42 |
| | | | Advanced | 10 | 30.30 |
| | | | Total | 33 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 344 | 26.92 |
| | | | Basic | 298 | 23.32 |
| | | | Proficient | 486 | 38.03 |
| | | | Advanced | 150 | 11.74 |
| | | | Total | 1,278 | 100.00 |
| | | Hispanic | Below Basic | 164 | 19.83 |
| | | | Basic | 174 | 21.04 |
| | | | Proficient | 325 | 39.30 |
| | | | Advanced | 164 | 19.83 |
| | | | Total | 827 | 100.00 |
| | | White (not Hispanic) | Below Basic | 1,896 | 11.48 |
| | | | Basic | 2,807 | 17.00 |
| | | | Proficient | 6,768 | 40.99 |
| | | | Advanced | 5,039 | 30.52 |
| | | | Total | 16,510 | 100.00 |
| | | Multi-racial | Below Basic | 57 | 13.23 |
| | | | Basic | 85 | 19.72 |
| | | | Proficient | 164 | 38.05 |
| | | | Advanced | 125 | 29.00 |
| | | | Total | 431 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.6 (continued). Achievement-Level Distributions—Ethnicity, Spring 2016**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Geometry | American Indian/ Alaskan Native | Below Basic | 10 | 19.61 |
| | | | Basic | -- | -- |
| | | | Proficient | 26 | 50.98 |
| | | | Advanced | -- | -- |
| | | | Total | 51 | 100.00 |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | 53 | 28.80 |
| | | | Advanced | 117 | 63.59 |
| | | | Total | 184 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 11 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 178 | 36.40 |
| | | | Basic | 92 | 18.81 |
| | | | Proficient | 166 | 33.95 |
| | | | Advanced | 53 | 10.84 |
| | | | Total | 489 | 100.00 |
| | | Hispanic | Below Basic | 110 | 27.99 |
| | | | Basic | 87 | 22.14 |
| | | | Proficient | 135 | 34.35 |
| | | | Advanced | 61 | 15.52 |
| | | | Total | 393 | 100.00 |
| | | White (not Hispanic) | Below Basic | 1,424 | 19.27 |
| | | | Basic | 1,392 | 18.84 |
| | | | Proficient | 3,251 | 44.00 |
| | | | Advanced | 1,322 | 17.89 |
| | | | Total | 7,389 | 100.00 |
| | | Multi-racial | Below Basic | 48 | 27.27 |
| | | | Basic | 40 | 22.73 |
| | | | Proficient | 62 | 35.23 |
| | | | Advanced | 26 | 14.77 |
| | | | Total | 176 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.6 (continued). Achievement-Level Distributions—Ethnicity, Spring 2016**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Government | American Indian/ Alaskan Native | Below Basic | 14 | 7.82 |
| | | | Basic | 48 | 26.82 |
| | | | Proficient | 79 | 44.13 |
| | | | Advanced | 38 | 21.23 |
| | | | Total | 179 | 100.00 |
| | | Asian | Below Basic | 58 | 7.68 |
| | | | Basic | 172 | 22.78 |
| | | | Proficient | 278 | 36.82 |
| | | | Advanced | 247 | 32.72 |
| | | | Total | 755 | 100.00 |
| | | Pacific Islander | Below Basic | 11 | 12.50 |
| | | | Basic | 41 | 46.59 |
| | | | Proficient | 29 | 32.95 |
| | | | Advanced | -- | -- |
| | | | Total | 88 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 1,260 | 19.83 |
| | | | Basic | 2,468 | 38.84 |
| | | | Proficient | 2,098 | 33.02 |
| | | | Advanced | 528 | 8.31 |
| | | | Total | 6,354 | 100.00 |
| | | Hispanic | Below Basic | 277 | 12.81 |
| | | | Basic | 692 | 32.01 |
| | | | Proficient | 850 | 39.32 |
| | | | Advanced | 343 | 15.86 |
| | | | Total | 2,162 | 100.00 |
| | | White (not Hispanic) | Below Basic | 2,339 | 6.86 |
| | | | Basic | 7,870 | 23.09 |
| | | | Proficient | 14,653 | 43.00 |
| | | | Advanced | 9,216 | 27.04 |
| | | | Total | 34,078 | 100.00 |
| | | Multi-racial | Below Basic | 83 | 9.61 |
| | | | Basic | 225 | 26.04 |
| | | | Proficient | 357 | 41.32 |
| | | | Advanced | 199 | 23.03 |
| | | | Total | 864 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.6 (continued). Achievement-Level Distributions—Ethnicity, Spring 2016**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Am. History | American Indian/ Alaskan Native | Below Basic | 10 | 16.13 |
| | | | Basic | 16 | 25.81 |
| | | | Proficient | 20 | 32.26 |
| | | | Advanced | 16 | 25.81 |
| | | | Total | 62 | 100.00 |
| | | Asian | Below Basic | 11 | 11.34 |
| | | | Basic | 25 | 25.77 |
| | | | Proficient | 35 | 36.08 |
| | | | Advanced | 26 | 26.80 |
| | | | Total | 97 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 14 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 144 | 37.21 |
| | | | Basic | 99 | 25.58 |
| | | | Proficient | 102 | 26.36 |
| | | | Advanced | 42 | 10.85 |
| | | | Total | 387 | 100.00 |
| | | Hispanic | Below Basic | 72 | 27.17 |
| | | | Basic | 74 | 27.92 |
| | | | Proficient | 84 | 31.70 |
| | | | Advanced | 35 | 13.21 |
| | | | Total | 265 | 100.00 |
| | | White (not Hispanic) | Below Basic | 1,920 | 23.53 |
| | | | Basic | 2,209 | 27.07 |
| | | | Proficient | 2,656 | 32.55 |
| | | | Advanced | 1,376 | 16.86 |
| | | | Total | 8,161 | 100.00 |
| | | Multi-racial | Below Basic | 40 | 23.67 |
| | | | Basic | 42 | 24.85 |
| | | | Proficient | 66 | 39.05 |
| | | | Advanced | 21 | 12.43 |
| | | | Total | 169 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.6 (continued). Achievement-Level Distributions—Ethnicity, Spring 2016**

| Test Period | Content Area | Ethnicity | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Physical Science | American Indian/ Alaskan Native | Below Basic | -- | -- |
| | | | Basic | 16 | 64.00 |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 25 | 100.00 |
| | | Asian | Below Basic | -- | -- |
| | | | Basic | 20 | 64.52 |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 31 | 100.00 |
| | | Pacific Islander | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 3 | 100.00 |
| | | Black (not Hispanic) | Below Basic | 28 | 14.97 |
| | | | Basic | 137 | 73.26 |
| | | | Proficient | 19 | 10.16 |
| | | | Advanced | -- | -- |
| | | | Total | 187 | 100.00 |
| | | Hispanic | Below Basic | 13 | 9.35 |
| | | | Basic | 101 | 72.66 |
| | | | Proficient | 20 | 14.39 |
| | | | Advanced | -- | -- |
| | | | Total | 139 | 100.00 |
| | | White (not Hispanic) | Below Basic | 242 | 5.71 |
| | | | Basic | 2,763 | 65.24 |
| | | | Proficient | 1,025 | 24.20 |
| | | | Advanced | 205 | 4.84 |
| | | | Total | 4,235 | 100.00 |
| | | Multi-racial | Below Basic | 12 | 11.11 |
| | | | Basic | 64 | 59.26 |
| | | | Proficient | 30 | 27.78 |
| | | | Advanced | -- | -- |
| | | | Total | 108 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.7. Achievement-Level Distributions—Migrant, Summer 2015**

| Test Period | Content Area | Migrant | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English II | No | Below Basic | 90 | 21.23 |
| | | | Basic | 164 | 38.68 |
| | | | Proficient | 157 | 37.03 |
| | | | Advanced | 13 | 3.07 |
| | | | Total | 424 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Algebra I | No | Below Basic | 185 | 21.26 |
| | | | Basic | 204 | 23.45 |
| | | | Proficient | 388 | 44.60 |
| | | | Advanced | 93 | 10.69 |
| | | | Total | 870 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Biology | No | Below Basic | 46 | 15.44 |
| | | | Basic | 132 | 44.30 |
| | | | Proficient | 103 | 34.56 |
| | | | Advanced | 17 | 5.70 |
| | | | Total | 298 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.7 (continued). Achievement-Level Distributions—Migrant, Summer 2015**

| Test Period | Content Area | Migrant | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English I | No | Below Basic | -- | -- |
| | | | Basic | 24 | 46.15 |
| | | | Proficient | 20 | 38.46 |
| | | | Advanced | -- | -- |
| | | | Total | 52 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Algebra II | No | Below Basic | -- | -- |
| | | | Basic | 12 | 30.77 |
| | | | Proficient | 12 | 30.77 |
| | | | Advanced | -- | -- |
| | | | Total | 39 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Geometry | No | Below Basic | 18 | 48.65 |
| | | | Basic | -- | -- |
| | | | Proficient | 13 | 35.14 |
| | | | Advanced | -- | -- |
| | | | Total | 37 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Government | No | Below Basic | 145 | 18.71 |
| | | | Basic | 208 | 26.84 |
| | | | Proficient | 248 | 32.00 |
| | | | Advanced | 174 | 22.45 |
| | | | Total | 775 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Am. History | No | Below Basic | 18 | 23.68 |
| | | | Basic | 18 | 23.68 |
| | | | Proficient | 26 | 34.21 |
| | | | Advanced | 14 | 18.42 |
| | | | Total | 76 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.8. Achievement-Level Distributions—Migrant, Fall 2015**

| Test Period | Content Area | Migrant | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English II | No | Below Basic | 625 | 22.63 |
| | | | Basic | 820 | 29.69 |
| | | | Proficient | 1,096 | 39.68 |
| | | | Advanced | 221 | 8.00 |
| | | | Total | 2,762 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |
| | Algebra I | No | Below Basic | 1,643 | 35.80 |
| | | | Basic | 923 | 20.11 |
| | | | Proficient | 1,407 | 30.66 |
| | | | Advanced | 616 | 13.42 |
| | | | Total | 4,589 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Biology | No | Below Basic | 614 | 22.28 |
| | | | Basic | 885 | 32.11 |
| | | | Proficient | 806 | 29.25 |
| | | | Advanced | 451 | 16.36 |
| | | | Total | 2,756 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.8 (continued). Achievement-Level Distributions—Migrant, Fall 2015**

| Test Period | Content Area | Migrant | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English I | No | Below Basic | 41 | 6.25 |
| | | | Basic | 156 | 23.78 |
| | | | Proficient | 363 | 55.34 |
| | | | Advanced | 96 | 14.63 |
| | | | Total | 656 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Algebra II | No | Below Basic | 72 | 10.40 |
| | | | Basic | 105 | 15.17 |
| | | | Proficient | 267 | 38.58 |
| | | | Advanced | 248 | 35.84 |
| | | | Total | 692 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Geometry | No | Below Basic | 115 | 17.06 |
| | | | Basic | 109 | 16.17 |
| | | | Proficient | 313 | 46.44 |
| | | | Advanced | 137 | 20.33 |
| | | | Total | 674 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Government | No | Below Basic | 1,676 | 12.12 |
| | | | Basic | 4,204 | 30.40 |
| | | | Proficient | 4,983 | 36.04 |
| | | | Advanced | 2,964 | 21.44 |
| | | | Total | 13,827 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |
| | Am. History | No | Below Basic | 87 | 18.71 |
| | | | Basic | 110 | 23.66 |
| | | | Proficient | 159 | 34.19 |
| | | | Advanced | 109 | 23.44 |
| | | | Total | 465 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.9. Achievement-Level Distributions—Migrant, Spring 2016**

| Test Period | Content Area | Migrant | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | English II | No | Below Basic | 2,021 | 3.22 |
| | | | Basic | 10,057 | 16.03 |
| | | | Proficient | 39,504 | 62.97 |
| | | | Advanced | 11,149 | 17.77 |
| | | | Total | 62,731 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 14 | 100.00 |
| | Algebra I | No | Below Basic | 7,911 | 12.99 |
| | | | Basic | 11,926 | 19.59 |
| | | | Proficient | 29,660 | 48.71 |
| | | | Advanced | 11,391 | 18.71 |
| | | | Total | 60,888 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 13 | 100.00 |
| | Biology | No | Below Basic | 3,525 | 5.74 |
| | | | Basic | 16,270 | 26.48 |
| | | | Proficient | 28,615 | 46.57 |
| | | | Advanced | 13,029 | 21.21 |
| | | | Total | 61,439 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 9 | 100.00 |
| | English I | No | Below Basic | 1,001 | 6.32 |
| | | | Basic | 4,329 | 27.33 |
| | | | Proficient | 8,884 | 56.09 |
| | | | Advanced | 1,626 | 10.27 |
| | | | Total | 15,840 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 10 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.9 (continued). Achievement-Level Distributions—Migrant, Spring 2016**

| Test Period | Content Area | Migrant | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Algebra II | No | Below Basic | 2,498 | 12.63 |
| | | | Basic | 3,432 | 17.35 |
| | | | Proficient | 7,985 | 40.36 |
| | | | Advanced | 5,867 | 29.66 |
| | | | Total | 19,782 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |
| | Geometry | No | Below Basic | 1,777 | 20.45 |
| | | | Basic | 1,633 | 18.79 |
| | | | Proficient | 3,694 | 42.51 |
| | | | Advanced | 1,585 | 18.24 |
| | | | Total | 8,689 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Government | No | Below Basic | 4,035 | 9.08 |
| | | | Basic | 11,505 | 25.88 |
| | | | Proficient | 18,333 | 41.25 |
| | | | Advanced | 10,576 | 23.79 |
| | | | Total | 44,449 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 6 | 100.00 |
| | Am. History | No | Below Basic | 2,198 | 24.03 |
| | | | Basic | 2,468 | 26.98 |
| | | | Proficient | 2,964 | 32.40 |
| | | | Advanced | 1,518 | 16.59 |
| | | | Total | 9,148 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Physical Science | No | Below Basic | 297 | 6.29 |
| | | | Basic | 3,101 | 65.64 |
| | | | Proficient | 1,106 | 23.41 |
| | | | Advanced | 220 | 4.66 |
| | | | Total | 4,724 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.10. Achievement-Level Distributions—Free and Reduced Lunch, Summer 2015**

| Test Period | Content Area | FRL | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English II | No | Below Basic | 38 | 24.36 |
| | | | Basic | 51 | 32.69 |
| | | | Proficient | 57 | 36.54 |
| | | | Advanced | 10 | 6.41 |
| | | | Total | 156 | 100.00 |
| | | Yes | Below Basic | 52 | 19.40 |
| | | | Basic | 113 | 42.16 |
| | | | Proficient | 100 | 37.31 |
| | | | Advanced | -- | -- |
| | | | Total | 268 | 100.00 |
| | Algebra I | No | Below Basic | 62 | 14.66 |
| | | | Basic | 87 | 20.57 |
| | | | Proficient | 215 | 50.83 |
| | | | Advanced | 59 | 13.95 |
| | | | Total | 423 | 100.00 |
| | | Yes | Below Basic | 123 | 27.52 |
| | | | Basic | 117 | 26.17 |
| | | | Proficient | 173 | 38.70 |
| | | | Advanced | 34 | 7.61 |
| | | | Total | 447 | 100.00 |
| | Biology | No | Below Basic | 14 | 12.73 |
| | | | Basic | 49 | 44.55 |
| | | | Proficient | 38 | 34.55 |
| | | | Advanced | -- | -- |
| | | | Total | 110 | 100.00 |
| | | Yes | Below Basic | 32 | 17.02 |
| | | | Basic | 83 | 44.15 |
| | | | Proficient | 65 | 34.57 |
| | | | Advanced | -- | -- |
| | | | Total | 188 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.10 (continued). Achievement-Level Distributions—Free and Reduced Lunch, Summer 2015**

| Test Period | Content Area | FRL | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English I | No | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 12 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | 20 | 50.00 |
| | | | Proficient | 15 | 37.50 |
| | | | Advanced | -- | -- |
| | | | Total | 40 | 100.00 |
| | Algebra II | No | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 18 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 21 | 100.00 |
| | Geometry | No | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 19 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 18 | 100.00 |
| | Government | No | Below Basic | 55 | 11.96 |
| | | | Basic | 111 | 24.13 |
| | | | Proficient | 151 | 32.83 |
| | | | Advanced | 143 | 31.09 |
| | | | Total | 460 | 100.00 |
| | | Yes | Below Basic | 90 | 28.57 |
| | | | Basic | 97 | 30.79 |
| | | | Proficient | 97 | 30.79 |
| | | | Advanced | 31 | 9.84 |
| | | | Total | 315 | 100.00 |
| | Am. History | No | Below Basic | -- | -- |
| | | | Basic | 14 | 25.93 |
| | | | Proficient | 21 | 38.89 |
| | | | Advanced | 12 | 22.22 |
| | | | Total | 54 | 100.00 |
| | | Yes | Below Basic | 11 | 50.00 |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 22 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.11. Achievement-Level Distributions—Free and Reduced Lunch, Fall 2015**

| Test Period | Content Area | FRL | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English II | No | Below Basic | 120 | 15.79 |
| | | | Basic | 165 | 21.71 |
| | | | Proficient | 362 | 47.63 |
| | | | Advanced | 113 | 14.87 |
| | | | Total | 760 | 100.00 |
| | | Yes | Below Basic | 505 | 25.21 |
| | | | Basic | 656 | 32.75 |
| | | | Proficient | 734 | 36.65 |
| | | | Advanced | 108 | 5.39 |
| | | | Total | 2,003 | 100.00 |
| | Algebra I | No | Below Basic | 535 | 23.45 |
| | | | Basic | 398 | 17.45 |
| | | | Proficient | 850 | 37.26 |
| | | | Advanced | 498 | 21.83 |
| | | | Total | 2,281 | 100.00 |
| | | Yes | Below Basic | 1,108 | 48.01 |
| | | | Basic | 525 | 22.75 |
| | | | Proficient | 557 | 24.13 |
| | | | Advanced | 118 | 5.11 |
| | | | Total | 2,308 | 100.00 |
| | Biology | No | Below Basic | 102 | 8.03 |
| | | | Basic | 270 | 21.24 |
| | | | Proficient | 495 | 38.95 |
| | | | Advanced | 404 | 31.79 |
| | | | Total | 1,271 | 100.00 |
| | | Yes | Below Basic | 513 | 34.52 |
| | | | Basic | 615 | 41.39 |
| | | | Proficient | 311 | 20.93 |
| | | | Advanced | 47 | 3.16 |
| | | | Total | 1,486 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.11 (continued). Achievement-Level Distributions—Free and Reduced Lunch, Fall 2015**

| Test Period | Content Area | FRL | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English I | No | Below Basic | 13 | 2.97 |
| | | | Basic | 72 | 16.48 |
| | | | Proficient | 265 | 60.64 |
| | | | Advanced | 87 | 19.91 |
| | | | Total | 437 | 100.00 |
| | | Yes | Below Basic | 28 | 12.79 |
| | | | Basic | 84 | 38.36 |
| | | | Proficient | 98 | 44.75 |
| | | | Advanced | -- | -- |
| | | | Total | 219 | 100.00 |
| | Algebra II | No | Below Basic | 45 | 8.40 |
| | | | Basic | 69 | 12.87 |
| | | | Proficient | 212 | 39.55 |
| | | | Advanced | 210 | 39.18 |
| | | | Total | 536 | 100.00 |
| | | Yes | Below Basic | 27 | 17.31 |
| | | | Basic | 36 | 23.08 |
| | | | Proficient | 55 | 35.26 |
| | | | Advanced | 38 | 24.36 |
| | | | Total | 156 | 100.00 |
| | Geometry | No | Below Basic | 64 | 12.88 |
| | | | Basic | 74 | 14.89 |
| | | | Proficient | 243 | 48.89 |
| | | | Advanced | 116 | 23.34 |
| | | | Total | 497 | 100.00 |
| | | Yes | Below Basic | 51 | 28.81 |
| | | | Basic | 35 | 19.77 |
| | | | Proficient | 70 | 39.55 |
| | | | Advanced | 21 | 11.86 |
| | | | Total | 177 | 100.00 |
| | Government | No | Below Basic | 507 | 6.37 |
| | | | Basic | 1,886 | 23.71 |
| | | | Proficient | 3,153 | 39.64 |
| | | | Advanced | 2,409 | 30.28 |
| | | | Total | 7,955 | 100.00 |
| | | Yes | Below Basic | 1,169 | 19.90 |
| | | | Basic | 2,319 | 39.49 |
| | | | Proficient | 1,830 | 31.16 |
| | | | Advanced | 555 | 9.45 |
| | | | Total | 5,873 | 100.00 |
| | Am. History | No | Below Basic | 40 | 12.62 |
| | | | Basic | 63 | 19.87 |
| | | | Proficient | 121 | 38.17 |
| | | | Advanced | 93 | 29.34 |
| | | | Total | 317 | 100.00 |
| | | Yes | Below Basic | 47 | 31.76 |
| | | | Basic | 47 | 31.76 |
| | | | Proficient | 38 | 25.68 |
| | | | Advanced | 16 | 10.81 |
| | | | Total | 148 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.12. Achievement-Level Distributions—Free and Reduced Lunch, Spring 2016**

| Test Period | Content Area | FRL | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | English II | No | Below Basic | 465 | 1.32 |
| | | | Basic | 3,288 | 9.34 |
| | | | Proficient | 22,881 | 64.98 |
| | | | Advanced | 8,576 | 24.36 |
| | | | Total | 35,210 | 100.00 |
| | | Yes | Below Basic | 1,558 | 5.66 |
| | | | Basic | 6,773 | 24.60 |
| | | | Proficient | 16,631 | 60.40 |
| | | | Advanced | 2,573 | 9.34 |
| | | | Total | 27,535 | 100.00 |
| | Algebra I | No | Below Basic | 2,353 | 7.26 |
| | | | Basic | 4,557 | 14.07 |
| | | | Proficient | 16,747 | 51.70 |
| | | | Advanced | 8,738 | 26.97 |
| | | | Total | 32,395 | 100.00 |
| | | Yes | Below Basic | 5,559 | 19.50 |
| | | | Basic | 7,373 | 25.86 |
| | | | Proficient | 12,921 | 45.33 |
| | | | Advanced | 2,653 | 9.31 |
| | | | Total | 28,506 | 100.00 |
| | Biology | No | Below Basic | 821 | 2.38 |
| | | | Basic | 6,262 | 18.14 |
| | | | Proficient | 17,334 | 50.21 |
| | | | Advanced | 10,105 | 29.27 |
| | | | Total | 34,522 | 100.00 |
| | | Yes | Below Basic | 2,706 | 10.05 |
| | | | Basic | 10,010 | 37.18 |
| | | | Proficient | 11,286 | 41.91 |
| | | | Advanced | 2,924 | 10.86 |
| | | | Total | 26,926 | 100.00 |
| | English I | No | Below Basic | 238 | 2.99 |
| | | | Basic | 1,523 | 19.12 |
| | | | Proficient | 5,023 | 63.06 |
| | | | Advanced | 1,181 | 14.83 |
| | | | Total | 7,965 | 100.00 |
| | | Yes | Below Basic | 766 | 9.71 |
| | | | Basic | 2,812 | 35.66 |
| | | | Proficient | 3,862 | 48.98 |
| | | | Advanced | 445 | 5.64 |
| | | | Total | 7,885 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.12 (continued). Achievement-Level Distributions—Free and Reduced Lunch, Spring 2016**

| Test Period | Content Area | FRL | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Algebra II | No | Below Basic | 1,337 | 9.28 |
| | | | Basic | 2,230 | 15.49 |
| | | | Proficient | 5,834 | 40.51 |
| | | | Advanced | 5,000 | 34.72 |
| | | | Total | 14,401 | 100.00 |
| | | Yes | Below Basic | 1,161 | 21.57 |
| | | | Basic | 1,202 | 22.33 |
| | | | Proficient | 2,152 | 39.99 |
| | | | Advanced | 867 | 16.11 |
| | | | Total | 5,382 | 100.00 |
| | Geometry | No | Below Basic | 811 | 15.53 |
| | | | Basic | 878 | 16.81 |
| | | | Proficient | 2,314 | 44.31 |
| | | | Advanced | 1,219 | 23.34 |
| | | | Total | 5,222 | 100.00 |
| | | Yes | Below Basic | 966 | 27.86 |
| | | | Basic | 755 | 21.78 |
| | | | Proficient | 1,380 | 39.80 |
| | | | Advanced | 366 | 10.56 |
| | | | Total | 3,467 | 100.00 |
| | Government | No | Below Basic | 1,052 | 4.15 |
| | | | Basic | 4,904 | 19.35 |
| | | | Proficient | 11,245 | 44.37 |
| | | | Advanced | 8,144 | 32.13 |
| | | | Total | 25,345 | 100.00 |
| | | Yes | Below Basic | 2,984 | 15.61 |
| | | | Basic | 6,604 | 34.56 |
| | | | Proficient | 7,090 | 37.10 |
| | | | Advanced | 2,432 | 12.73 |
| | | | Total | 19,110 | 100.00 |
| | Am. History | No | Below Basic | 894 | 16.98 |
| | | | Basic | 1,347 | 25.58 |
| | | | Proficient | 1,888 | 35.86 |
| | | | Advanced | 1,136 | 21.58 |
| | | | Total | 5,265 | 100.00 |
| | | Yes | Below Basic | 1,304 | 33.58 |
| | | | Basic | 1,121 | 28.87 |
| | | | Proficient | 1,076 | 27.71 |
| | | | Advanced | 382 | 9.84 |
| | | | Total | 3,883 | 100.00 |
| | Physical Science | No | Below Basic | 85 | 3.49 |
| | | | Basic | 1,478 | 60.67 |
| | | | Proficient | 707 | 29.02 |
| | | | Advanced | 166 | 6.81 |
| | | | Total | 2,436 | 100.00 |
| | | Yes | Below Basic | 212 | 9.26 |
| | | | Basic | 1,624 | 70.95 |
| | | | Proficient | 399 | 17.43 |
| | | | Advanced | 54 | 2.36 |
| | | | Total | 2,289 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.13. Achievement-Level Distributions—Limited English Proficient, Summer 2015**

| Test Period | Content Area | LEP | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English II | No | Below Basic | 89 | 21.87 |
| | | | Basic | 155 | 38.08 |
| | | | Proficient | 150 | 36.86 |
| | | | Advanced | 13 | 3.19 |
| | | | Total | 407 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 17 | 100.00 |
| | Algebra I | No | Below Basic | 180 | 20.98 |
| | | | Basic | 204 | 23.78 |
| | | | Proficient | 384 | 44.76 |
| | | | Advanced | 90 | 10.49 |
| | | | Total | 858 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 12 | 100.00 |
| | Biology | No | Below Basic | 44 | 15.38 |
| | | | Basic | 124 | 43.36 |
| | | | Proficient | 101 | 35.31 |
| | | | Advanced | 17 | 5.94 |
| | | | Total | 286 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 12 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.13 (continued). Achievement-Level Distributions—Limited English Proficient, Summer 2015**

| Test Period | Content Area | LEP | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English I | No | Below Basic | -- | -- |
| | | | Basic | 20 | 44.44 |
| | | | Proficient | 19 | 42.22 |
| | | | Advanced | -- | -- |
| | | | Total | 45 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 7 | 100.00 |
| | Algebra II | No | Below Basic | -- | -- |
| | | | Basic | 11 | 33.33 |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 33 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 6 | 100.00 |
| | Geometry | No | Below Basic | 16 | 45.71 |
| | | | Basic | -- | -- |
| | | | Proficient | 13 | 37.14 |
| | | | Advanced | -- | -- |
| | | | Total | 35 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 2 | 100.00 |
| | Government | No | Below Basic | 134 | 18.01 |
| | | | Basic | 197 | 26.48 |
| | | | Proficient | 240 | 32.26 |
| | | | Advanced | 173 | 23.25 |
| | | | Total | 744 | 100.00 |
| | | Yes | Below Basic | 11 | 35.48 |
| | | | Basic | 11 | 35.48 |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 31 | 100.00 |
| | Am. History | No | Below Basic | 16 | 21.62 |
| | | | Basic | 18 | 24.32 |
| | | | Proficient | 26 | 35.14 |
| | | | Advanced | 14 | 18.92 |
| | | | Total | 74 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 2 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.14. Achievement-Level Distributions—Limited English Proficient, Fall 2015**

| Test Period | Content Area | LEP | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English II | No | Below Basic | 561 | 21.39 |
| | | | Basic | 763 | 29.09 |
| | | | Proficient | 1,079 | 41.14 |
| | | | Advanced | 220 | 8.39 |
| | | | Total | 2,623 | 100.00 |
| | | Yes | Below Basic | 64 | 45.71 |
| | | | Basic | 58 | 41.43 |
| | | | Proficient | 17 | 12.14 |
| | | | Advanced | -- | -- |
| | | | Total | 140 | 100.00 |
| | Algebra I | No | Below Basic | 1,568 | 35.50 |
| | | | Basic | 874 | 19.79 |
| | | | Proficient | 1,371 | 31.04 |
| | | | Advanced | 604 | 13.67 |
| | | | Total | 4,417 | 100.00 |
| | | Yes | Below Basic | 75 | 43.60 |
| | | | Basic | 49 | 28.49 |
| | | | Proficient | 36 | 20.93 |
| | | | Advanced | 12 | 6.98 |
| | | | Total | 172 | 100.00 |
| | Biology | No | Below Basic | 571 | 21.39 |
| | | | Basic | 849 | 31.81 |
| | | | Proficient | 799 | 29.94 |
| | | | Advanced | 450 | 16.86 |
| | | | Total | 2,669 | 100.00 |
| | | Yes | Below Basic | 44 | 50.00 |
| | | | Basic | 36 | 40.91 |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 88 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.14 (continued). Achievement-Level Distributions—Limited English Proficient, Fall 2015**

| Test Period | Content Area | LEP | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English I | No | Below Basic | 37 | 5.78 |
| | | | Basic | 147 | 22.97 |
| | | | Proficient | 360 | 56.25 |
| | | | Advanced | 96 | 15.00 |
| | | | Total | 640 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 16 | 100.00 |
| | Algebra II | No | Below Basic | 67 | 9.84 |
| | | | Basic | 104 | 15.27 |
| | | | Proficient | 265 | 38.91 |
| | | | Advanced | 245 | 35.98 |
| | | | Total | 681 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 11 | 100.00 |
| | Geometry | No | Below Basic | 110 | 16.64 |
| | | | Basic | 106 | 16.04 |
| | | | Proficient | 310 | 46.90 |
| | | | Advanced | 135 | 20.42 |
| | | | Total | 661 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 13 | 100.00 |
| | Government | No | Below Basic | 1,585 | 11.67 |
| | | | Basic | 4,091 | 30.13 |
| | | | Proficient | 4,951 | 36.46 |
| | | | Advanced | 2,953 | 21.75 |
| | | | Total | 13,580 | 100.00 |
| | | Yes | Below Basic | 91 | 36.69 |
| | | | Basic | 114 | 45.97 |
| | | | Proficient | 32 | 12.90 |
| | | | Advanced | 11 | 4.44 |
| | | | Total | 248 | 100.00 |
| | Am. History | No | Below Basic | 83 | 18.16 |
| | | | Basic | 107 | 23.41 |
| | | | Proficient | 158 | 34.57 |
| | | | Advanced | 109 | 23.85 |
| | | | Total | 457 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 8 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.15. Achievement-Level Distributions—Limited English Proficient, Spring 2016**

| Test Period | Content Area | LEP | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | English II | No | Below Basic | 1,876 | 3.05 |
| | | | Basic | 9,544 | 15.53 |
| | | | Proficient | 38,924 | 63.33 |
| | | | Advanced | 11,121 | 18.09 |
| | | | Total | 61,465 | 100.00 |
| | | Yes | Below Basic | 147 | 11.48 |
| | | | Basic | 517 | 40.39 |
| | | | Proficient | 588 | 45.94 |
| | | | Advanced | 28 | 2.19 |
| | | | Total | 1,280 | 100.00 |
| | Algebra I | No | Below Basic | 7,605 | 12.79 |
| | | | Basic | 11,533 | 19.39 |
| | | | Proficient | 29,066 | 48.87 |
| | | | Advanced | 11,272 | 18.95 |
| | | | Total | 59,476 | 100.00 |
| | | Yes | Below Basic | 307 | 21.54 |
| | | | Basic | 397 | 27.86 |
| | | | Proficient | 602 | 42.25 |
| | | | Advanced | 119 | 8.35 |
| | | | Total | 1,425 | 100.00 |
| | Biology | No | Below Basic | 3,284 | 5.46 |
| | | | Basic | 15,589 | 25.93 |
| | | | Proficient | 28,281 | 47.04 |
| | | | Advanced | 12,971 | 21.57 |
| | | | Total | 60,125 | 100.00 |
| | | Yes | Below Basic | 243 | 18.37 |
| | | | Basic | 683 | 51.63 |
| | | | Proficient | 339 | 25.62 |
| | | | Advanced | 58 | 4.38 |
| | | | Total | 1,323 | 100.00 |
| | English I | No | Below Basic | 924 | 5.94 |
| | | | Basic | 4,199 | 26.99 |
| | | | Proficient | 8,810 | 56.64 |
| | | | Advanced | 1,622 | 10.43 |
| | | | Total | 15,555 | 100.00 |
| | | Yes | Below Basic | 80 | 27.12 |
| | | | Basic | 136 | 46.10 |
| | | | Proficient | 75 | 25.42 |
| | | | Advanced | -- | -- |
| | | | Total | 295 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.15 (continued). Achievement-Level Distributions—Limited English Proficient, Spring 2016**

| Test Period | Content Area | LEP | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Algebra II | No | Below Basic | 2,440 | 12.47 |
| | | | Basic | 3,375 | 17.25 |
| | | | Proficient | 7,911 | 40.44 |
| | | | Advanced | 5,835 | 29.83 |
| | | | Total | 19,561 | 100.00 |
| | | Yes | Below Basic | 58 | 26.13 |
| | | | Basic | 57 | 25.68 |
| | | | Proficient | 75 | 33.78 |
| | | | Advanced | 32 | 14.41 |
| | | | Total | 222 | 100.00 |
| | Geometry | No | Below Basic | 1,719 | 20.17 |
| | | | Basic | 1,597 | 18.74 |
| | | | Proficient | 3,638 | 42.68 |
| | | | Advanced | 1,570 | 18.42 |
| | | | Total | 8,524 | 100.00 |
| | | Yes | Below Basic | 58 | 35.15 |
| | | | Basic | 36 | 21.82 |
| | | | Proficient | 56 | 33.94 |
| | | | Advanced | 15 | 9.09 |
| | | | Total | 165 | 100.00 |
| | Government | No | Below Basic | 3,804 | 8.73 |
| | | | Basic | 11,131 | 25.55 |
| | | | Proficient | 18,089 | 41.52 |
| | | | Advanced | 10,540 | 24.19 |
| | | | Total | 43,564 | 100.00 |
| | | Yes | Below Basic | 232 | 26.04 |
| | | | Basic | 377 | 42.31 |
| | | | Proficient | 246 | 27.61 |
| | | | Advanced | 36 | 4.04 |
| | | | Total | 891 | 100.00 |
| | Am. History | No | Below Basic | 2,163 | 23.88 |
| | | | Basic | 2,441 | 26.95 |
| | | | Proficient | 2,941 | 32.46 |
| | | | Advanced | 1,514 | 16.71 |
| | | | Total | 9,059 | 100.00 |
| | | Yes | Below Basic | 35 | 39.33 |
| | | | Basic | 27 | 30.34 |
| | | | Proficient | 23 | 25.84 |
| | | | Advanced | -- | -- |
| | | | Total | 89 | 100.00 |
| | Physical Science | No | Below Basic | 291 | 6.21 |
| | | | Basic | 3,071 | 65.54 |
| | | | Proficient | 1,105 | 23.58 |
| | | | Advanced | 219 | 4.67 |
| | | | Total | 4,686 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | 31 | 79.49 |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 39 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.15. Achievement-Level Distributions—Title I, Summer 2015**

| Test Period | Content Area | Title I | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English II | No | Below Basic | 88 | 22.06 |
| | | | Basic | 159 | 39.85 |
| | | | Proficient | 140 | 35.09 |
| | | | Advanced | 12 | 3.01 |
| | | | Total | 399 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | 17 | 68.00 |
| | | | Advanced | -- | -- |
| | | | Total | 25 | 100.00 |
| | Algebra I | No | Below Basic | 180 | 22.99 |
| | | | Basic | 194 | 24.78 |
| | | | Proficient | 346 | 44.19 |
| | | | Advanced | 63 | 8.05 |
| | | | Total | 783 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | 10 | 11.49 |
| | | | Proficient | 42 | 48.28 |
| | | | Advanced | 30 | 34.48 |
| | | | Total | 87 | 100.00 |
| | Biology | No | Below Basic | 44 | 17.05 |
| | | | Basic | 123 | 47.67 |
| | | | Proficient | 81 | 31.40 |
| | | | Advanced | 10 | 3.88 |
| | | | Total | 258 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | 22 | 55.00 |
| | | | Advanced | -- | -- |
| | | | Total | 40 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.15 (continued). Achievement-Level Distributions—Title I, Summer 2015**

| Test Period | Content Area | Title I | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English I | No | Below Basic | -- | -- |
| | | | Basic | 14 | 36.84 |
| | | | Proficient | 16 | 42.11 |
| | | | Advanced | -- | -- |
| | | | Total | 38 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | 10 | 71.43 |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 14 | 100.00 |
| | Algebra II | No | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 25 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 14 | 100.00 |
| | Geometry | No | Below Basic | 13 | 54.17 |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 24 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 13 | 100.00 |
| | Government | No | Below Basic | 142 | 18.78 |
| | | | Basic | 204 | 26.98 |
| | | | Proficient | 239 | 31.61 |
| | | | Advanced | 171 | 22.62 |
| | | | Total | 756 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 19 | 100.00 |
| | Am. History | No | Below Basic | 18 | 23.68 |
| | | | Basic | 18 | 23.68 |
| | | | Proficient | 26 | 34.21 |
| | | | Advanced | 14 | 18.42 |
| | | | Total | 76 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.16. Achievement-Level Distributions—Title I, Fall 2015**

| Test Period | Content Area | Title I | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English II | No | Below Basic | 522 | 21.39 |
| | | | Basic | 689 | 28.24 |
| | | | Proficient | 1,013 | 41.52 |
| | | | Advanced | 216 | 8.85 |
| | | | Total | 2,440 | 100.00 |
| | | Yes | Below Basic | 103 | 31.89 |
| | | | Basic | 132 | 40.87 |
| | | | Proficient | 83 | 25.70 |
| | | | Advanced | -- | -- |
| | | | Total | 323 | 100.00 |
| | Algebra I | No | Below Basic | 1,358 | 33.81 |
| | | | Basic | 784 | 19.52 |
| | | | Proficient | 1,282 | 31.92 |
| | | | Advanced | 592 | 14.74 |
| | | | Total | 4,016 | 100.00 |
| | | Yes | Below Basic | 285 | 49.74 |
| | | | Basic | 139 | 24.26 |
| | | | Proficient | 125 | 21.82 |
| | | | Advanced | 24 | 4.19 |
| | | | Total | 573 | 100.00 |
| | Biology | No | Below Basic | 471 | 19.81 |
| | | | Basic | 708 | 29.77 |
| | | | Proficient | 751 | 31.58 |
| | | | Advanced | 448 | 18.84 |
| | | | Total | 2,378 | 100.00 |
| | | Yes | Below Basic | 144 | 37.99 |
| | | | Basic | 177 | 46.70 |
| | | | Proficient | 55 | 14.51 |
| | | | Advanced | -- | -- |
| | | | Total | 379 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.16 (continued). Achievement-Level Distributions—Title I, Fall 2015**

| Test Period | Content Area | Title I | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English I | No | Below Basic | 36 | 5.67 |
| | | | Basic | 149 | 23.46 |
| | | | Proficient | 354 | 55.75 |
| | | | Advanced | 96 | 15.12 |
| | | | Total | 635 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 21 | 100.00 |
| | Algebra II | No | Below Basic | 70 | 10.31 |
| | | | Basic | 102 | 15.02 |
| | | | Proficient | 264 | 38.88 |
| | | | Advanced | 243 | 35.79 |
| | | | Total | 679 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 13 | 100.00 |
| | Geometry | No | Below Basic | 115 | 17.09 |
| | | | Basic | 108 | 16.05 |
| | | | Proficient | 313 | 46.51 |
| | | | Advanced | 137 | 20.36 |
| | | | Total | 673 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |
| | Government | No | Below Basic | 1,518 | 11.66 |
| | | | Basic | 3,904 | 29.99 |
| | | | Proficient | 4,715 | 36.22 |
| | | | Advanced | 2,881 | 22.13 |
| | | | Total | 13,018 | 100.00 |
| | | Yes | Below Basic | 158 | 19.51 |
| | | | Basic | 301 | 37.16 |
| | | | Proficient | 268 | 33.09 |
| | | | Advanced | 83 | 10.25 |
| | | | Total | 810 | 100.00 |
| | Am. History | No | Below Basic | 82 | 18.22 |
| | | | Basic | 105 | 23.33 |
| | | | Proficient | 156 | 34.67 |
| | | | Advanced | 107 | 23.78 |
| | | | Total | 450 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 15 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.17. Achievement-Level Distributions—Title I, Spring 2016**

| Test Period | Content Area | Title I | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | English II | No | Below Basic | 1,733 | 2.95 |
| | | | Basic | 8,826 | 15.02 |
| | | | Proficient | 37,324 | 63.50 |
| | | | Advanced | 10,892 | 18.53 |
| | | | Total | 58,775 | 100.00 |
| | | Yes | Below Basic | 290 | 7.30 |
| | | | Basic | 1,235 | 31.11 |
| | | | Proficient | 2,188 | 55.11 |
| | | | Advanced | 257 | 6.47 |
| | | | Total | 3,970 | 100.00 |
| | Algebra I | No | Below Basic | 6,679 | 12.02 |
| | | | Basic | 10,561 | 19.01 |
| | | | Proficient | 27,401 | 49.33 |
| | | | Advanced | 10,910 | 19.64 |
| | | | Total | 55,551 | 100.00 |
| | | Yes | Below Basic | 1,233 | 23.05 |
| | | | Basic | 1,369 | 25.59 |
| | | | Proficient | 2,267 | 42.37 |
| | | | Advanced | 481 | 8.99 |
| | | | Total | 5,350 | 100.00 |
| | Biology | No | Below Basic | 2,845 | 4.95 |
| | | | Basic | 14,544 | 25.33 |
| | | | Proficient | 27,286 | 47.52 |
| | | | Advanced | 12,748 | 22.20 |
| | | | Total | 57,423 | 100.00 |
| | | Yes | Below Basic | 682 | 16.94 |
| | | | Basic | 1,728 | 42.93 |
| | | | Proficient | 1,334 | 33.14 |
| | | | Advanced | 281 | 6.98 |
| | | | Total | 4,025 | 100.00 |
| | English I | No | Below Basic | 934 | 6.32 |
| | | | Basic | 3,999 | 27.07 |
| | | | Proficient | 8,306 | 56.22 |
| | | | Advanced | 1,535 | 10.39 |
| | | | Total | 14,774 | 100.00 |
| | | Yes | Below Basic | 70 | 6.51 |
| | | | Basic | 336 | 31.23 |
| | | | Proficient | 579 | 53.81 |
| | | | Advanced | 91 | 8.46 |
| | | | Total | 1,076 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.17 (continued). Achievement-Level Distributions—Title I, Spring 2016**

| Test Period | Content Area | Title I | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Algebra II | No | Below Basic | 2,339 | 12.19 |
| | | | Basic | 3,285 | 17.12 |
| | | | Proficient | 7,758 | 40.43 |
| | | | Advanced | 5,809 | 30.27 |
| | | | Total | 19,191 | 100.00 |
| | | Yes | Below Basic | 159 | 26.86 |
| | | | Basic | 147 | 24.83 |
| | | | Proficient | 228 | 38.51 |
| | | | Advanced | 58 | 9.80 |
| | | | Total | 592 | 100.00 |
| | Geometry | No | Below Basic | 1,687 | 20.40 |
| | | | Basic | 1,532 | 18.52 |
| | | | Proficient | 3,513 | 42.47 |
| | | | Advanced | 1,539 | 18.61 |
| | | | Total | 8,271 | 100.00 |
| | | Yes | Below Basic | 90 | 21.53 |
| | | | Basic | 101 | 24.16 |
| | | | Proficient | 181 | 43.30 |
| | | | Advanced | 46 | 11.00 |
| | | | Total | 418 | 100.00 |
| | Government | No | Below Basic | 3,392 | 8.20 |
| | | | Basic | 10,285 | 24.86 |
| | | | Proficient | 17,323 | 41.87 |
| | | | Advanced | 10,370 | 25.07 |
| | | | Total | 41,370 | 100.00 |
| | | Yes | Below Basic | 644 | 20.88 |
| | | | Basic | 1,223 | 39.64 |
| | | | Proficient | 1,012 | 32.80 |
| | | | Advanced | 206 | 6.68 |
| | | | Total | 3,085 | 100.00 |
| | Am. History | No | Below Basic | 2,077 | 23.67 |
| | | | Basic | 2,360 | 26.89 |
| | | | Proficient | 2,862 | 32.61 |
| | | | Advanced | 1,477 | 16.83 |
| | | | Total | 8,776 | 100.00 |
| | | Yes | Below Basic | 121 | 32.53 |
| | | | Basic | 108 | 29.03 |
| | | | Proficient | 102 | 27.42 |
| | | | Advanced | 41 | 11.02 |
| | | | Total | 372 | 100.00 |
| | Physical Science | No | Below Basic | 277 | 6.23 |
| | | | Basic | 2,893 | 65.07 |
| | | | Proficient | 1,059 | 23.82 |
| | | | Advanced | 217 | 4.88 |
| | | | Total | 4,446 | 100.00 |
| | | Yes | Below Basic | 20 | 7.17 |
| | | | Basic | 209 | 74.91 |
| | | | Proficient | 47 | 16.85 |
| | | | Advanced | -- | -- |
| | | | Total | 279 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.18. Achievement-Level Distributions—Individualized Education Program, Summer 2015**

| Test Period | Content Area | IEP | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English II | No | Below Basic | 77 | 20.16 |
| | | | Basic | 145 | 37.96 |
| | | | Proficient | 147 | 38.48 |
| | | | Advanced | 13 | 3.40 |
| | | | Total | 382 | 100.00 |
| | | Yes | Below Basic | 13 | 30.95 |
| | | | Basic | 19 | 45.24 |
| | | | Proficient | 10 | 23.81 |
| | | | Advanced | -- | -- |
| | | | Total | 42 | 100.00 |
| | Algebra I | No | Below Basic | 158 | 19.60 |
| | | | Basic | 185 | 22.95 |
| | | | Proficient | 371 | 46.03 |
| | | | Advanced | 92 | 11.41 |
| | | | Total | 806 | 100.00 |
| | | Yes | Below Basic | 27 | 42.19 |
| | | | Basic | 19 | 29.69 |
| | | | Proficient | 17 | 26.56 |
| | | | Advanced | -- | -- |
| | | | Total | 64 | 100.00 |
| | Biology | No | Below Basic | 39 | 14.61 |
| | | | Basic | 118 | 44.19 |
| | | | Proficient | 93 | 34.83 |
| | | | Advanced | 17 | 6.37 |
| | | | Total | 267 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | 14 | 45.16 |
| | | | Proficient | 10 | 32.26 |
| | | | Advanced | -- | -- |
| | | | Total | 31 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.18 (continued). Achievement-Level Distributions—Individualized Education Program, Summer 2015**

| Test Period | Content Area | IEP | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English I | No | Below Basic | -- | -- |
| | | | Basic | 23 | 46.00 |
| | | | Proficient | 20 | 40.00 |
| | | | Advanced | -- | -- |
| | | | Total | 50 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 2 | 100.00 |
| | Algebra II | No | Below Basic | -- | -- |
| | | | Basic | 12 | 31.58 |
| | | | Proficient | 12 | 31.58 |
| | | | Advanced | -- | -- |
| | | | Total | 38 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |
| | Geometry | No | Below Basic | 17 | 48.57 |
| | | | Basic | -- | -- |
| | | | Proficient | 13 | 37.14 |
| | | | Advanced | -- | -- |
| | | | Total | 35 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 2 | 100.00 |
| | Government | No | Below Basic | 121 | 16.60 |
| | | | Basic | 189 | 25.93 |
| | | | Proficient | 246 | 33.74 |
| | | | Advanced | 173 | 23.73 |
| | | | Total | 729 | 100.00 |
| | | Yes | Below Basic | 24 | 52.17 |
| | | | Basic | 19 | 41.30 |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 46 | 100.00 |
| | Am. History | No | Below Basic | 13 | 19.40 |
| | | | Basic | 15 | 22.39 |
| | | | Proficient | 26 | 38.81 |
| | | | Advanced | 13 | 19.40 |
| | | | Total | 67 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 9 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.19. Achievement-Level Distributions—Individualized Education Program, Fall 2015**

| Test Period | Content Area | IEP | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English II | No | Below Basic | 459 | 19.30 |
| | | | Basic | 681 | 28.64 |
| | | | Proficient | 1,021 | 42.94 |
| | | | Advanced | 217 | 9.13 |
| | | | Total | 2,378 | 100.00 |
| | | Yes | Below Basic | 166 | 43.12 |
| | | | Basic | 140 | 36.36 |
| | | | Proficient | 75 | 19.48 |
| | | | Advanced | -- | -- |
| | | | Total | 385 | 100.00 |
| | Algebra I | No | Below Basic | 1,259 | 31.51 |
| | | | Basic | 803 | 20.10 |
| | | | Proficient | 1,335 | 33.41 |
| | | | Advanced | 599 | 14.99 |
| | | | Total | 3,996 | 100.00 |
| | | Yes | Below Basic | 384 | 64.76 |
| | | | Basic | 120 | 20.24 |
| | | | Proficient | 72 | 12.14 |
| | | | Advanced | 17 | 2.87 |
| | | | Total | 593 | 100.00 |
| | Biology | No | Below Basic | 469 | 19.40 |
| | | | Basic | 754 | 31.20 |
| | | | Proficient | 758 | 31.36 |
| | | | Advanced | 436 | 18.04 |
| | | | Total | 2,417 | 100.00 |
| | | Yes | Below Basic | 146 | 42.94 |
| | | | Basic | 131 | 38.53 |
| | | | Proficient | 48 | 14.12 |
| | | | Advanced | 15 | 4.41 |
| | | | Total | 340 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.19 (continued). Achievement-Level Distributions—Individualized Education Program, Fall 2015**

| Test Period | Content Area | IEP | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English I | No | Below Basic | 31 | 5.15 |
| | | | Basic | 129 | 21.43 |
| | | | Proficient | 347 | 57.64 |
| | | | Advanced | 95 | 15.78 |
| | | | Total | 602 | 100.00 |
| | | Yes | Below Basic | 10 | 18.52 |
| | | | Basic | 27 | 50.00 |
| | | | Proficient | 16 | 29.63 |
| | | | Advanced | -- | -- |
| | | | Total | 54 | 100.00 |
| | Algebra II | No | Below Basic | 68 | 10.03 |
| | | | Basic | 102 | 15.04 |
| | | | Proficient | 264 | 38.94 |
| | | | Advanced | 244 | 35.99 |
| | | | Total | 678 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 14 | 100.00 |
| | Geometry | No | Below Basic | 91 | 14.65 |
| | | | Basic | 98 | 15.78 |
| | | | Proficient | 297 | 47.83 |
| | | | Advanced | 135 | 21.74 |
| | | | Total | 621 | 100.00 |
| | | Yes | Below Basic | 24 | 45.28 |
| | | | Basic | 11 | 20.75 |
| | | | Proficient | 16 | 30.19 |
| | | | Advanced | -- | -- |
| | | | Total | 53 | 100.00 |
| | Government | No | Below Basic | 1,233 | 9.86 |
| | | | Basic | 3,666 | 29.30 |
| | | | Proficient | 4,743 | 37.91 |
| | | | Advanced | 2,868 | 22.93 |
| | | | Total | 12,510 | 100.00 |
| | | Yes | Below Basic | 443 | 33.61 |
| | | | Basic | 539 | 40.90 |
| | | | Proficient | 240 | 18.21 |
| | | | Advanced | 96 | 7.28 |
| | | | Total | 1,318 | 100.00 |
| | Am. History | No | Below Basic | 63 | 15.29 |
| | | | Basic | 96 | 23.30 |
| | | | Proficient | 149 | 36.17 |
| | | | Advanced | 104 | 25.24 |
| | | | Total | 412 | 100.00 |
| | | Yes | Below Basic | 24 | 45.28 |
| | | | Basic | 14 | 26.42 |
| | | | Proficient | 10 | 18.87 |
| | | | Advanced | -- | -- |
| | | | Total | 53 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.20. Achievement-Level Distributions—Individualized Education Program, Spring 2016**

| Test Period | Content Area | IEP | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | English II | No | Below Basic | 1,052 | 1.85 |
| | | | Basic | 7,423 | 13.09 |
| | | | Proficient | 37,217 | 65.61 |
| | | | Advanced | 11,035 | 19.45 |
| | | | Total | 56,727 | 100.00 |
| | | Yes | Below Basic | 971 | 16.13 |
| | | | Basic | 2,638 | 43.84 |
| | | | Proficient | 2,295 | 38.14 |
| | | | Advanced | 114 | 1.89 |
| | | | Total | 6,018 | 100.00 |
| | Algebra I | No | Below Basic | 5,397 | 9.80 |
| | | | Basic | 10,197 | 18.51 |
| | | | Proficient | 28,309 | 51.40 |
| | | | Advanced | 11,173 | 20.29 |
| | | | Total | 55,076 | 100.00 |
| | | Yes | Below Basic | 2,515 | 43.18 |
| | | | Basic | 1,733 | 29.75 |
| | | | Proficient | 1,359 | 23.33 |
| | | | Advanced | 218 | 3.74 |
| | | | Total | 5,825 | 100.00 |
| | Biology | No | Below Basic | 1,934 | 3.49 |
| | | | Basic | 13,373 | 24.15 |
| | | | Proficient | 27,233 | 49.19 |
| | | | Advanced | 12,824 | 23.16 |
| | | | Total | 55,364 | 100.00 |
| | | Yes | Below Basic | 1,593 | 26.18 |
| | | | Basic | 2,899 | 47.65 |
| | | | Proficient | 1,387 | 22.80 |
| | | | Advanced | 205 | 3.37 |
| | | | Total | 6,084 | 100.00 |
| | English I | No | Below Basic | 645 | 4.43 |
| | | | Basic | 3,742 | 25.72 |
| | | | Proficient | 8,552 | 58.78 |
| | | | Advanced | 1,611 | 11.07 |
| | | | Total | 14,550 | 100.00 |
| | | Yes | Below Basic | 359 | 27.62 |
| | | | Basic | 593 | 45.62 |
| | | | Proficient | 333 | 25.62 |
| | | | Advanced | 15 | 1.15 |
| | | | Total | 1,300 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.20 (continued). Achievement-Level Distributions—Individualized Education Program, Spring 2016**

| Test Period | Content Area | IEP | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Algebra II | No | Below Basic | 2,407 | 12.35 |
| | | | Basic | 3,371 | 17.30 |
| | | | Proficient | 7,881 | 40.44 |
| | | | Advanced | 5,831 | 29.92 |
| | | | Total | 19,490 | 100.00 |
| | | Yes | Below Basic | 91 | 31.06 |
| | | | Basic | 61 | 20.82 |
| | | | Proficient | 105 | 35.84 |
| | | | Advanced | 36 | 12.29 |
| | | | Total | 293 | 100.00 |
| | Geometry | No | Below Basic | 1,567 | 18.89 |
| | | | Basic | 1,556 | 18.75 |
| | | | Proficient | 3,611 | 43.52 |
| | | | Advanced | 1,563 | 18.84 |
| | | | Total | 8,297 | 100.00 |
| | | Yes | Below Basic | 210 | 53.57 |
| | | | Basic | 77 | 19.64 |
| | | | Proficient | 83 | 21.17 |
| | | | Advanced | 22 | 5.61 |
| | | | Total | 392 | 100.00 |
| | Government | No | Below Basic | 2,583 | 6.43 |
| | | | Basic | 9,771 | 24.34 |
| | | | Proficient | 17,459 | 43.49 |
| | | | Advanced | 10,336 | 25.74 |
| | | | Total | 40,149 | 100.00 |
| | | Yes | Below Basic | 1,453 | 33.74 |
| | | | Basic | 1,737 | 40.34 |
| | | | Proficient | 876 | 20.34 |
| | | | Advanced | 240 | 5.57 |
| | | | Total | 4,306 | 100.00 |
| | Am. History | No | Below Basic | 1,760 | 21.00 |
| | | | Basic | 2,286 | 27.28 |
| | | | Proficient | 2,848 | 33.99 |
| | | | Advanced | 1,486 | 17.73 |
| | | | Total | 8,380 | 100.00 |
| | | Yes | Below Basic | 438 | 57.03 |
| | | | Basic | 182 | 23.70 |
| | | | Proficient | 116 | 15.10 |
| | | | Advanced | 32 | 4.17 |
| | | | Total | 768 | 100.00 |
| | Physical Science | No | Below Basic | 224 | 5.22 |
| | | | Basic | 2,782 | 64.77 |
| | | | Proficient | 1,074 | 25.01 |
| | | | Advanced | 215 | 5.01 |
| | | | Total | 4,295 | 100.00 |
| | | Yes | Below Basic | 73 | 16.98 |
| | | | Basic | 320 | 74.42 |
| | | | Proficient | 32 | 7.44 |
| | | | Advanced | -- | -- |
| | | | Total | 430 | 100.00 |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.21. Achievement-Level Distributions—Accommodations, Summer 2015**

| Test Period | Content Area | Accom. | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English II | No | Below Basic | 87 | 20.91 |
| | | | Basic | 159 | 38.22 |
| | | | Proficient | 156 | 37.50 |
| | | | Advanced | 14 | 3.37 |
| | | | Total | 416 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 14 | 100.00 |
| | Algebra I | No | Below Basic | 180 | 21.00 |
| | | | Basic | 200 | 23.34 |
| | | | Proficient | 384 | 44.81 |
| | | | Advanced | 93 | 10.85 |
| | | | Total | 857 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 20 | 100.00 |
| | Biology | No | Below Basic | 42 | 14.48 |
| | | | Basic | 129 | 44.48 |
| | | | Proficient | 102 | 35.17 |
| | | | Advanced | 17 | 5.86 |
| | | | Total | 290 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 15 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.21 (continued). Achievement-Level Distributions—Accommodations, Summer 2015**

| Test Period | Content Area | Accom. | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Summer 2015 | English I | No | Below Basic | -- | -- |
| | | | Basic | 23 | 45.10 |
| | | | Proficient | 20 | 39.22 |
| | | | Advanced | -- | -- |
| | | | Total | 51 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |
| | Algebra II | No | Below Basic | -- | -- |
| | | | Basic | 12 | 30.77 |
| | | | Proficient | 12 | 30.77 |
| | | | Advanced | -- | -- |
| | | | Total | 39 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | -- | -- |
| | Geometry | No | Below Basic | 18 | 50.00 |
| | | | Basic | -- | -- |
| | | | Proficient | 13 | 36.11 |
| | | | Advanced | -- | -- |
| | | | Total | 36 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 1 | 100.00 |
| | Government | No | Below Basic | 144 | 18.41 |
| | | | Basic | 212 | 27.11 |
| | | | Proficient | 252 | 32.23 |
| | | | Advanced | 174 | 22.25 |
| | | | Total | 782 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 6 | 100.00 |
| | Am. History | No | Below Basic | 14 | 19.72 |
| | | | Basic | 17 | 23.94 |
| | | | Proficient | 26 | 36.62 |
| | | | Advanced | 14 | 19.72 |
| | | | Total | 71 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 6 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.22. Achievement-Level Distributions—Accommodations, Fall 2015**

| Test Period | Content Area | Accom. | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English II | No | Below Basic | 577 | 21.83 |
| | | | Basic | 771 | 29.17 |
| | | | Proficient | 1,075 | 40.67 |
| | | | Advanced | 220 | 8.32 |
| | | | Total | 2,643 | 100.00 |
| | | Yes | Below Basic | 48 | 39.34 |
| | | | Basic | 50 | 40.98 |
| | | | Proficient | 23 | 18.85 |
| | | | Advanced | -- | -- |
| | | | Total | 122 | 100.00 |
| | Algebra I | No | Below Basic | 1,517 | 34.55 |
| | | | Basic | 885 | 20.15 |
| | | | Proficient | 1,376 | 31.34 |
| | | | Advanced | 613 | 13.96 |
| | | | Total | 4,391 | 100.00 |
| | | Yes | Below Basic | 136 | 58.87 |
| | | | Basic | 50 | 21.65 |
| | | | Proficient | 41 | 17.75 |
| | | | Advanced | -- | -- |
| | | | Total | 231 | 100.00 |
| | Biology | No | Below Basic | 573 | 21.69 |
| | | | Basic | 836 | 31.64 |
| | | | Proficient | 786 | 29.75 |
| | | | Advanced | 447 | 16.92 |
| | | | Total | 2,642 | 100.00 |
| | | Yes | Below Basic | 42 | 35.00 |
| | | | Basic | 51 | 42.50 |
| | | | Proficient | 23 | 19.17 |
| | | | Advanced | -- | -- |
| | | | Total | 120 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.22 (continued). Achievement-Level Distributions—Accommodations, Fall 2015**

| Test Period | Content Area | Accom. | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Fall 2015 | English I | No | Below Basic | 35 | 5.59 |
| | | | Basic | 142 | 22.68 |
| | | | Proficient | 353 | 56.39 |
| | | | Advanced | 96 | 15.34 |
| | | | Total | 626 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | 14 | 46.67 |
| | | | Proficient | 10 | 33.33 |
| | | | Advanced | -- | -- |
| | | | Total | 30 | 100.00 |
| | Algebra II | No | Below Basic | 68 | 9.96 |
| | | | Basic | 103 | 15.08 |
| | | | Proficient | 264 | 38.65 |
| | | | Advanced | 248 | 36.31 |
| | | | Total | 683 | 100.00 |
| | | Yes | Below Basic | -- | -- |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 9 | 100.00 |
| | Geometry | No | Below Basic | 96 | 15.24 |
| | | | Basic | 101 | 16.03 |
| | | | Proficient | 296 | 46.98 |
| | | | Advanced | 137 | 21.75 |
| | | | Total | 630 | 100.00 |
| | | Yes | Below Basic | 19 | 43.18 |
| | | | Basic | -- | -- |
| | | | Proficient | 17 | 38.64 |
| | | | Advanced | -- | -- |
| | | | Total | 44 | 100.00 |
| | Government | No | Below Basic | 1,485 | 11.16 |
| | | | Basic | 3,975 | 29.88 |
| | | | Proficient | 4,902 | 36.84 |
| | | | Advanced | 2,943 | 22.12 |
| | | | Total | 13,305 | 100.00 |
| | | Yes | Below Basic | 192 | 35.62 |
| | | | Basic | 237 | 43.97 |
| | | | Proficient | 88 | 16.33 |
| | | | Advanced | 22 | 4.08 |
| | | | Total | 539 | 100.00 |
| | Am. History | No | Below Basic | 71 | 16.47 |
| | | | Basic | 101 | 23.43 |
| | | | Proficient | 153 | 35.50 |
| | | | Advanced | 106 | 24.59 |
| | | | Total | 431 | 100.00 |
| | | Yes | Below Basic | 16 | 47.06 |
| | | | Basic | -- | -- |
| | | | Proficient | -- | -- |
| | | | Advanced | -- | -- |
| | | | Total | 34 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Table F.23. Achievement-Level Distributions—Accommodations, Spring 2016**

| Test Period | Content Area | Accom. | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | English II | No | Below Basic | 1,444 | 2.45 |
| | | | Basic | 8,314 | 14.10 |
| | | | Proficient | 38,108 | 64.64 |
| | | | Advanced | 11,086 | 18.81 |
| | | | Total | 58,952 | 100.00 |
| | | Yes | Below Basic | 583 | 15.19 |
| | | | Basic | 1,760 | 45.87 |
| | | | Proficient | 1,430 | 37.27 |
| | | | Advanced | 64 | 1.67 |
| | | | Total | 3,837 | 100.00 |
| | Algebra I | No | Below Basic | 6,412 | 11.16 |
| | | | Basic | 10,808 | 18.82 |
| | | | Proficient | 28,920 | 50.35 |
| | | | Advanced | 11,299 | 19.67 |
| | | | Total | 57,439 | 100.00 |
| | | Yes | Below Basic | 1,526 | 43.20 |
| | | | Basic | 1,141 | 32.30 |
| | | | Proficient | 771 | 21.83 |
| | | | Advanced | 94 | 2.66 |
| | | | Total | 3,532 | 100.00 |
| | Biology | No | Below Basic | 2,572 | 4.45 |
| | | | Basic | 14,427 | 24.97 |
| | | | Proficient | 27,850 | 48.20 |
| | | | Advanced | 12,936 | 22.39 |
| | | | Total | 57,785 | 100.00 |
| | | Yes | Below Basic | 965 | 26.07 |
| | | | Basic | 1,855 | 50.12 |
| | | | Proficient | 784 | 21.18 |
| | | | Advanced | 97 | 2.62 |
| | | | Total | 3,701 | 100.00 |
| | English I | No | Below Basic | 733 | 4.94 |
| | | | Basic | 3,854 | 25.95 |
| | | | Proficient | 8,643 | 58.21 |
| | | | Advanced | 1,619 | 10.90 |
| | | | Total | 14,849 | 100.00 |
| | | Yes | Below Basic | 273 | 26.87 |
| | | | Basic | 489 | 48.13 |
| | | | Proficient | 246 | 24.21 |
| | | | Advanced | -- | -- |
| | | | Total | 1,016 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

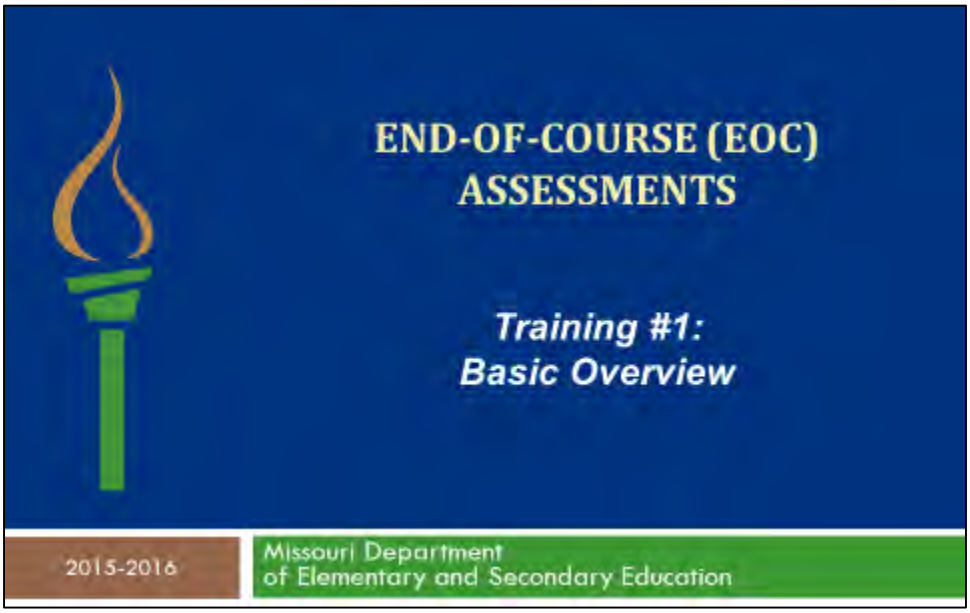
**Table F.23 (continued). Achievement-Level Distributions—Accommodations, Spring 2016**

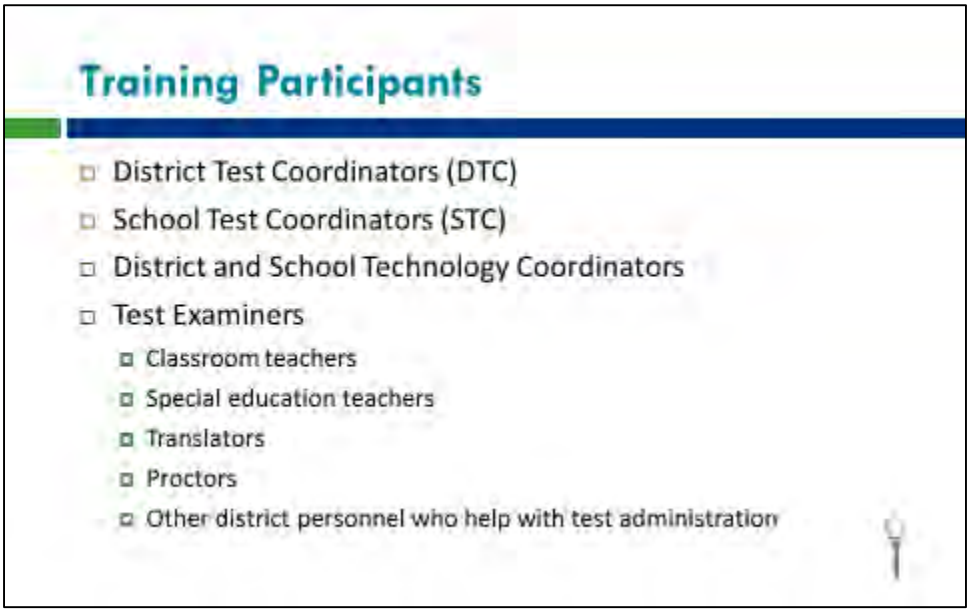
| Test Period | Content Area | Accom. | Achievement Level | Freq. | % |
|---|---|---|---|---|---|
| Spring 2016 | Algebra II | No | Below Basic | 2,446 | 12.45 |
| | | | Basic | 3,398 | 17.30 |
| | | | Proficient | 7,939 | 40.42 |
| | | | Advanced | 5,856 | 29.82 |
| | | | Total | 19,639 | 100.00 |
| | | Yes | Below Basic | 53 | 34.87 |
| | | | Basic | 36 | 23.68 |
| | | | Proficient | 49 | 32.24 |
| | | | Advanced | 14 | 9.21 |
| | | | Total | 152 | 100.00 |
| | Geometry | No | Below Basic | 1,611 | 19.16 |
| | | | Basic | 1,574 | 18.72 |
| | | | Proficient | 3,647 | 43.38 |
| | | | Advanced | 1,576 | 18.74 |
| | | | Total | 8,408 | 100.00 |
| | | Yes | Below Basic | 169 | 59.30 |
| | | | Basic | 59 | 20.70 |
| | | | Proficient | 48 | 16.84 |
| | | | Advanced | -- | -- |
| | | | Total | 285 | 100.00 |
| | Government | No | Below Basic | 3,150 | 7.54 |
| | | | Basic | 10,383 | 24.84 |
| | | | Proficient | 17,803 | 42.60 |
| | | | Advanced | 10,457 | 25.02 |
| | | | Total | 41,793 | 100.00 |
| | | Yes | Below Basic | 892 | 33.20 |
| | | | Basic | 1,133 | 42.17 |
| | | | Proficient | 541 | 20.13 |
| | | | Advanced | 121 | 4.50 |
| | | | Total | 2,687 | 100.00 |
| | Am. History | No | Below Basic | 1,861 | 21.65 |
| | | | Basic | 2,340 | 27.22 |
| | | | Proficient | 2,888 | 33.60 |
| | | | Advanced | 1,507 | 17.53 |
| | | | Total | 8,596 | 100.00 |
| | | Yes | Below Basic | 340 | 60.82 |
| | | | Basic | 129 | 23.08 |
| | | | Proficient | 78 | 13.95 |
| | | | Advanced | 12 | 2.15 |
| | | | Total | 559 | 100.00 |
| | Physical Science | No | Below Basic | 243 | 5.46 |
| | | | Basic | 2,910 | 65.33 |
| | | | Proficient | 1,081 | 24.27 |
| | | | Advanced | 220 | 4.94 |
| | | | Total | 4,454 | 100.00 |
| | | Yes | Below Basic | 56 | 20.44 |
| | | | Basic | 193 | 70.44 |
| | | | Proficient | 25 | 9.12 |
| | | | Advanced | -- | -- |
| | | | Total | 274 | 100.00 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Appendix G: Training PowerPoints

## Training #1: Basic Overview





Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Additional EOC Trainings

- EOC Trainings are also available for:
  - After Testing
  - Alternative Testing Formats
  - Blueprints and Timing Guidelines
  - EOC Process
  - Important Dates to Remember
  - Practice Tutorials & Pre-Tests
  - Test Tickets
  - Testing Day
  - Testing Issues
  - Universal Tools and Accommodations
  - Using iTester Admin
  - Who Is Tested

## Accessing the Trainings

- DESE Assessment webpage under EOC training
  - http://dese.mo.gov/college-career-readiness/assessment/end-course
- iTester Admin page under the Help tab
  - http://moeoc.questarai.com/Admin


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Subjects Tested

- Required
  - Algebra I
  - English II
  - Government
  - Biology
- Optional (For Local Use)
  - *Algebra II
  - Geometry
  - English I
  - American History
  - Physical Science

## Testing Timelines

| Administration | Pre-Code Due By | Students in iTester By | Students Can Test By |
|---|---|---|---|
| Fall 2015 | 9/18/15 | 9/28/15 | 10/5/15 |
| 10/5/15–1/22/16 | 11/6/15 | 11/15/15 | 11/23/15 |
| Spring 2015 | 1/29/16 | 2/15/16 | 2/22/16 |
| 2/22/16–5/27/16 | 3/4/16 | 3/14/16 | 3/21/16 |
| | 4/1/16 | 4/11/16 | 4/18/16 |

DTCs must specify the district assessment windows for each content area. Districts have 7 business days per content area to administer the assessments. Once the district testing window has ended, iTester will close and no further tests will be accessible without contacting Questar.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Costs for EOC Assessments

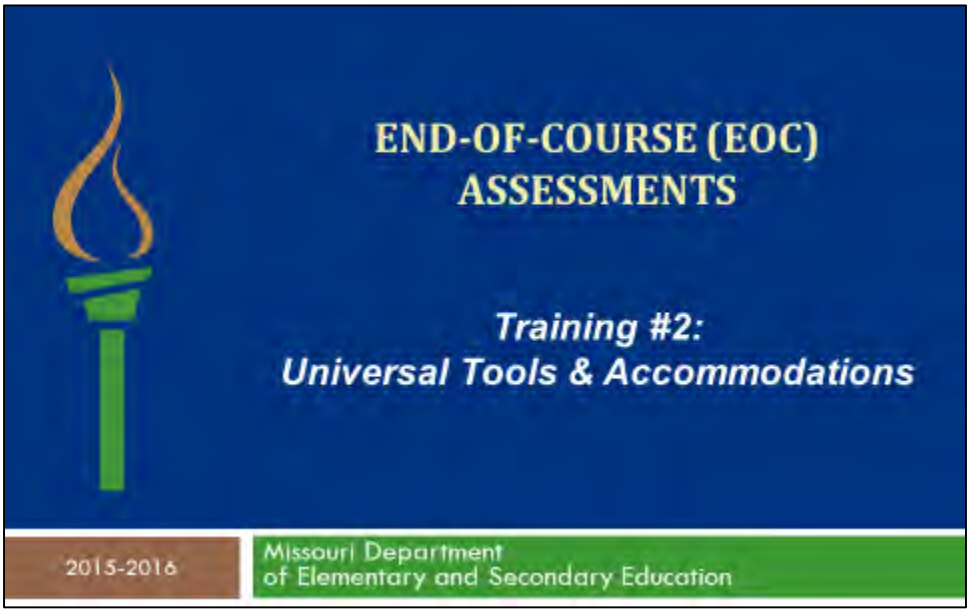
- Required:
  - Algebra I - $1.80
  - English II - $1.80
  - Biology - $1.80
  - Government – Free
- Optional:
  - English I - $4.03
  - Physical Science - $1.88
  - American History - $1.88
  - Algebra II - $1.88
  - Geometry - $1.88

## Reminders

- Resources to consult:
  - The Test Administration Manual (TAM)
  - 2015-2016 LEA Guide to the Missouri Assessment Program
  - DESE EOC Website
    - http://dese.mo.gov/college-career-readiness/assessment/end-course
  - Your District Testing Coordinator (DTC)


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Training #2: Universal Tools & Accommodations**





Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Universal Tools & Accommodations

- What we previously knew as accommodations has been split into two categories:
  - Universal Tools
  - Accommodations
- There are no accommodations for use on EOCs that cause an invalidation

## Universal Tools

- Universal Tools
  - Available to all students taking EOC assessments, unless otherwise noted
  - Some tools are only for use by English Language Learner (ELL) students (ELL students are those marked LEP-RCV or LEP-NRC in Core Data)
  - Some tools need to be marked in iTester prior to the assessment. Please read the description to determine if the tool must be marked in iTester.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Universal Tools

| Tool | Description | Code |
|---|---|---|
| **Bilingual Dictionary** | ELL students may have access to a physical Bilingual Dictionary for use ONLY on the Writing Prompt for the English I and English II assessments. If the Bilingual Dictionary is electronic, it may not connect to the internet.<br><br>This tool must be chosen in the iTester system under student accommodations prior to testing. | S431 |
| **Break (Pause)** | All students may take breaks of up to 20 minutes as needed. There is no limit to how many times a student may use this during an assessment.<br><br>If a student hits the pause button, they will be logged out. They can log back in anytime that same day. If the assessment needs to be reopened on a subsequent day, the district will need to call help desk.<br><br>If the need arises to move a student from one computer to another, pause the test to exit. The test will remain incomplete until the student logs back in and completes the test. | N/A |
| **Color Contrast – Paper** | All students taking the paper/pencil assessment may have the test printed in different colors based on student needs or preferences.<br><br>This tool must be chosen in the iTester system under student accommodations prior to testing. | S102 |

## Accommodations

- Accommodations
  - Must appear in an IEP or 504 plan
  - Some accommodations are only for use by English Language Learner (ELL) students (ELL students are those marked LEP-RCV or LEP-NRC in Core Data) with an IEP/504
  - All accommodations need to be marked in iTester prior to the assessment



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Accommodations

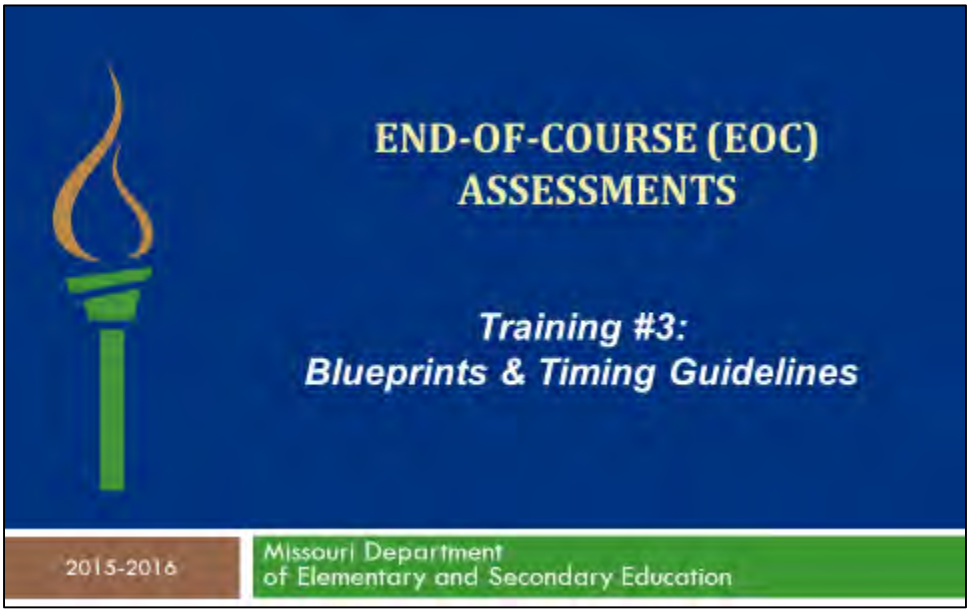
- Accommodations for Missouri EOCs aligned to new accommodations being used for the MAP Grade-Level assessments
- Greater flexibility in providing accessibility for all students

## EOC Read Aloud

- All directions and items in any subject, except ELA reading passages, may be read by a trained reader
- Read aloud of an ELA reading passage requires an IEP or 504 plan
- Decision to read aloud should be made by educators who work with the student on a regular basis
- DESE does not recommend the use of Read Aloud for students who do not use it as part of their everyday learning in the classroom. The use of Read Aloud for some students can prove distracting and become a hindrance to student performance
- Completed in a small group or individual setting


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Training #3: Blueprints & Timing Guidelines





Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Blueprints – Algebra I

**Blueprint for ALGEBRA I**

| Category | Code | Target | Point Range | Range Of Emphasis |
|---|---|---|---|---|
| Number & Quantity | HSN-RN.A | The Real Number System | 2-4 | 5-10% |
| | HSN-Q | Quantities | | |
| Algebra | HSA-SSE | Seeing Structure In Expressions | 14-21 | 35-53% |
| | HSA-APR | Arithmetic With Polynomials And Rational Expressions | | |
| | HSA-CED | Creating Equations | | |
| | HSA-REI | Reasoning With Equations And Inequalities | | |
| Functions | HSF-IF | Interpreting Functions | 11-20 | 28-50% |
| | HSF-BF | Building Functions | | |
| | HSF-LE | Linear, Quadratic And Exponential Models | | |
| Stats & Prob | HSS-ID | Interpreting Categorical And Quantitative Data | 3-6 | 8-15% |
| Total | | | 40 | 100% |

**Performance Event:** Each year the performance event may align to any specific conceptual category or to a group of them. The Performance Event is worth 10 points.

# Blueprints – Algebra II

**Blueprint for ALGEBRA II**

| Category | Code | Target | Point Range | Range Of Emphasis |
|---|---|---|---|---|
| Number & Quantity | HSN-CN | The Complex Number System | 0-4 | 0-10% |
| Algebra | HSA-SSE | Seeing Structure In Expressions | 16-22 | 40-55% |
| | HSA-APR | Arithmetic With Polynomials And Rational Expressions | | |
| | HSA-CED | Creating Equations | | |
| | HSA-REI | Reasoning With Equations And Inequalities | | |
| Functions | HSF-IF | Interpreting Functions | 18-24 | 45-60% |
| | HSF-BF | Building Functions | | |
| | HSF-LE | Linear, Quadratic And Exponential Models | | |
| Stats & Prob | HSS-ID | Interpreting Categorical And Quantitative Data | 0-6 | 0-15% |
| | HSS-MD | Using Probability To Make Decisions | | |
| Total | | | 40 | 100% |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Blueprints – Geometry

**Blueprint for GEOMETRY**

| Category | Code | Target | Point Range | Range Of Emphasis |
|---|---|---|---|---|
| Geometry | HSF-CO | Congruence | 34-40 | 85-100% |
| | HSG-SRT | Similarity, Right Triangles And Trigonometry | | |
| | HSG-C | Circles | | |
| | HSG-GPE | Expressing Geometric Properties With Equations | | |
| | HSG-GMD | Geometric Measurement And Dimension | | |
| | HSG-MG | Linear, Quadratic And Exponential Models | | |
| Stats & Prob | HSS-CP | Conditional Probability And The Rules Of Probability | 0-6 | 0-15% |
| | HSS-MD | Using Probability To Make Decisions | | |
| Total | | | 40 | 100% |

## Blueprints – English I

**Blueprint for ENGLISH I**

| Claim | Category | Big Idea | Point Range | Range Of Emphasis |
|---|---|---|---|---|
| Reading | Claim 1a | Apply reading skills to demonstrate the ability to integrate key ideas and details, interpret and analyze the craft and structure of texts, and evaluate the knowledge and ideas found in literary texts | 15 | 33% |
| Reading | Claim 1b | Apply reading skills to demonstrate the ability to integrate key ideas and details, interpret and analyze the craft and structure of texts, and evaluate the knowledge and ideas found in informational text | 15 | 33% |
| Writing | Claim 2a | Demonstrate the ability to produce a variety of text types and purposes | 10 | 22% |
| Writing | Claim 2b | Demonstrate a command of the conventions of standard English, appropriate grade-level acquisition of vocabulary | 5 | 11% |
| Total | | | 45 | 100% |



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Blueprints – English II

**Blueprint for ENGLISH II**

| Claim | Category | Big Idea | Point Range | Range Of Emphasis |
|---|---|---|---|---|
| Reading | Claim 1a | Apply reading skills to demonstrate the ability to integrate key ideas and details, interpret and analyze the craft and structure of texts, and evaluate the knowledge and ideas found in literary texts | 15 | 33% |
| Reading | Claim 1b | Apply reading skills to demonstrate the ability to integrate key ideas and details, interpret and analyze the craft and structure of texts, and evaluate the knowledge and ideas found in informational text | 15 | 33% |
| Writing | Claim 2a | Demonstrate the ability to produce a variety of text types and purposes | 10 | 22% |
| Writing | Claim 2b | Demonstrate a command of the conventions of standard English, appropriate grade-level acquisition of vocabulary | 5 | 11% |
| Total | | | 45 | 100% |

## Blueprints – Biology

**Blueprint for BIOLOGY**

| Content Strand | Point Range | Range Of Emphasis |
|---|---|---|
| Characteristics and Interactions of Living Organisms | 20-24 | 36%-44% |
| Changes in Ecosystems and Interactions of Organisms with their Environments | 12-14 | 22%-25% |
| Scientific Inquiry | 20 | 36% |
| **Total** | **55** | **100%** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Blueprints – Physical Science

**Blueprint for PHYSICAL SCIENCE**

| Content Strand | Point Range | Range Of Emphasis |
|---|---|---|
| Properties And Principles Of Matter And Energy | 25-30 | 55-66% |
| Properties And Principles Of Force And Motion | 15-20 | 33-44% |
| **Total** | **45** | **100%** |

## Blueprints – Government

**Blueprint for GOVERNMENT**

| Content Strand | Point Range | Range Of Emphasis |
|---|---|---|
| Principles of Constitutional Democracy | 18-22 | 45%-55% |
| Principles and Processes of Governance Systems | 18-22 | 45%-55% |
| **Total** | **40** | **100%** |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Blueprints – American History

**Blueprint for AMERICAN HISTORY**

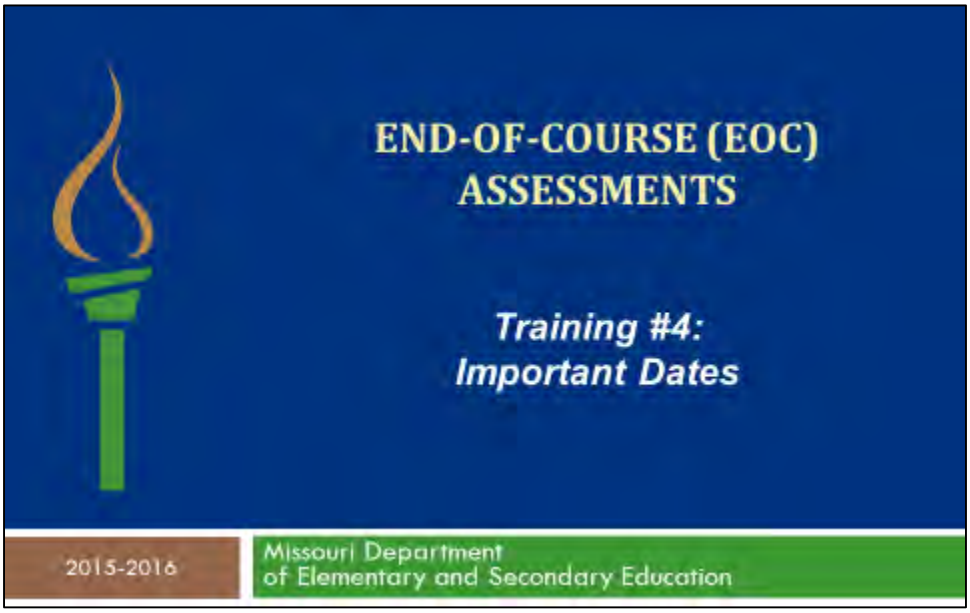
| Reporting Categories | Point Range | Range Of Emphasis |
|---|---|---|
| Government | 7-9 | 18%-23% |
| History | 14-18 | 35%-45% |
| Economics | 7-9 | 18%-23% |
| Geography | 7-9 | 18%-23% |
| Total | 40 | 100% |

## Timing Guidelines

| Content | Time Suggestions |
|---|---|
| English II | Session I: 90 – 110 min / Session II: 90 – 110 min |
| Algebra I | Session I: 90 – 110 min / Session II: 60 - 70 min |
| Biology | Session I: 55 – 60 min / Session II: 65 - 70 min |
| English I | Session I: 90 – 110 min / Session II: 90 – 110 min |
| Algebra II | 90 – 110 min |
| Geometry | 90 – 110 min |
| American History | 60 – 80 min |
| Government | 60 – 80 min |
| Physical Science | 60 – 80 min |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Training #4: Important Dates





Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Important Dates

- Please check the DESE website often for updates
  - dese.mo.gov → MAP → EOC → Important Dates

## Important Dates

| Administration | Dates | Event |
|---|---|---|
| Fall 2015 | **DUE** September 18, 2015 | Fall 2015 First Precode (students available in iTester 9/28/15 - students may begin testing 10/5/15) |
| | October 5, 2015 to January 22, 2016 | **Fall 2015 Window** |
| | **DUE** November 6, 2015 | Fall 2015 Second Precode (students available in iTester 11/16/15 - students may begin testing 11/23/15) |
| Spring 2015 | **DUE** January 29, 2016 | Spring 2016 First Precode (students available in iTester 2/15/16 - students may begin testing 2/22/16) |
| | February 22, 2016 to May 27, 2016 | **Spring 2016 Window** |
| | **DUE** March 4, 2016 | Spring 2016 Second Precode (students available in iTester 3/14/16 - students may begin testing 3/21/16) |
| | **DUE** April 1, 2016 | Spring 2016 Third Precode (students available in iTester 4/11/16 - students may begin testing 4/18/16) |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Important Dates

- Inform parents/ guardians of upcoming testing dates
- Minimize schedule conflicts
- Students participate when they complete associated course content

## Important Dates

- 7 business days for each content area
- Identify a window for each content area
- Tests with more than one session are not required to be completed in the same day


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Timing Guidelines

| Content | Time Suggestions |
|---|---|
| English II | Session I: 90 – 110 min / Session II: 90 – 110 min |
| Algebra I | Session I: 90 – 110 min / Session II: 60 - 70 min |
| Biology | Session I: 55 – 60 min / Session II: 65 - 70 min |
| English I | Session I: 90 – 110 min / Session II: 90 – 110 min |
| Algebra II | 90 – 110 min |
| Geometry | 90 – 110 min |
| American History | 60 – 80 min |
| Government | 60 – 80 min |
| Physical Science | 60 – 80 min |

Missouri DEPARTMENT OF ELEMENTARY & SECONDARY EDUCATION

## Contact Us

dese.mo.gov

(573) 751-3545

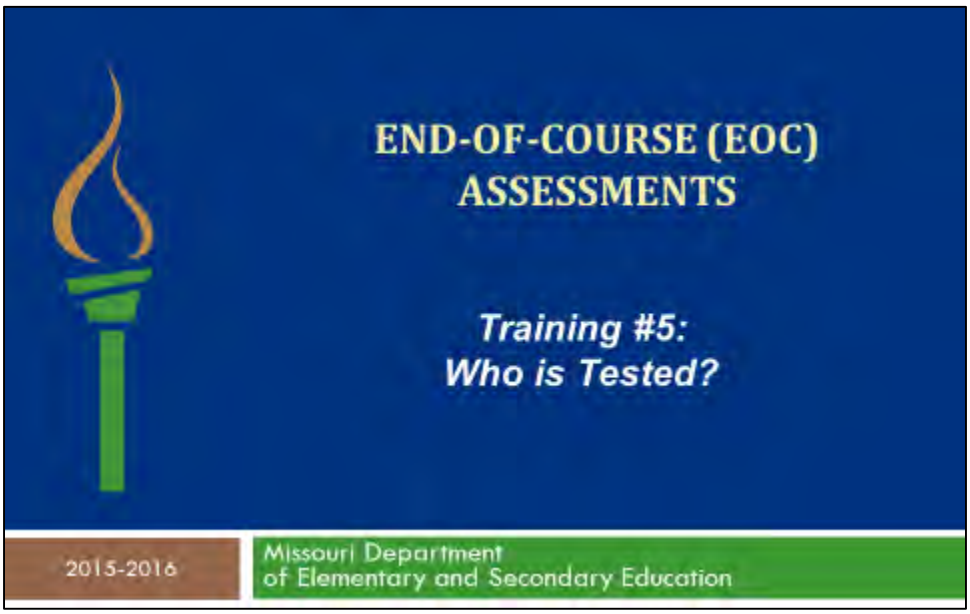
assessment@dese.mo.gov

The Department of Elementary and Secondary Education does not discriminate on the basis of race, color, religion, gender, national origin, age, or disability in its programs and activities. Inquiries related to Department programs and to the location of services, activities, and facilities that are accessible by persons with disabilities may be directed to the Jefferson State Office Building, Office of the General Counsel, Coordinator – Civil Rights Compliance (Title VI/Title IX/504/ADA/Age Act), 8th Floor, 205 Jefferson Street, P.O. Box 480, Jefferson City, MO 65102-0480; telephone number 573-526-4757 or TTY 800-735-2966; www.dese.mo.gov/civilrights@dese.mo.gov



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Training #5: Who is Tested?**




## Who is Tested?

- Students participate when they complete associated course content

| Required | Optional (For Local Use) |
|---|---|
| Algebra I | *Algebra II |
| Biology | American History |
| English II | English I |
| Government | Geometry |
| | Physical Science |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Who is Tested?

- Missouri Option students
- Homebound students
- MoVIP students

## Who is Exempt from Testing?

- Students eligible for MAP-A
- ELL students who have been in the United States for less than 12 cumulative months may be exempt from ELA assessments


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Questions about Exemptions?

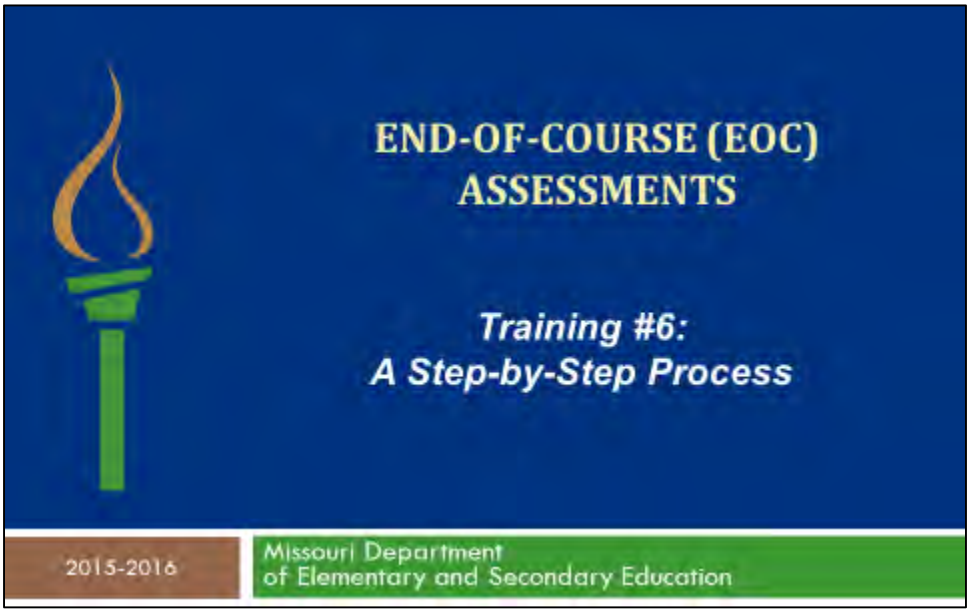
- Contact DESE's Accountability Data office at (573) 526-4886
- Keep track of each student's EOC completions
- See the EOC History Report on MCDS Portal

## Optional Populations

- Foreign Exchange Students
- Homeschooled Students
  - Homeschool Box


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

**Training #6: A Step-by-Step Process**





Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## A 13-Step Process

- 1. Training Participants
- 2. Setting Up iTester
- 3. Site Setup
- 4. Selecting Students
- 5. Determining Content Windows
- 6. Pre-Coding
- 7. Final Preparations
- 8. Special Considerations
- 9. Accessing the Tutorials
- 10. Printing Test Tickets
- 11. Testing
- 12. Closing a Window Early
- 13. Student Reports

## Step 1: Training Participants

- District Test Coordinator (DTC)
- School Test Coordinator (STC)
- Test Examiner (TE)
- Other district personnel involved in testing
  - View appropriate recorded trainings
  - Review the Test Administration Manual (TAM)


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Step 2: Setting up iTester

- iTester Administration site opens on:
  - 9/28/15 (Fall)
  - 1/15/16 (Spring)
- District IT staff should log in and download the latest version of the iTester student client and run workstation readiness tests

## Step 3: Site Setup

- IT staff confirms that the building is ready for testing
- STC or DTC confirms that within the iTester Admin


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Step 4: Selecting Students

- Students who have completed the Missouri Learning Standards for the appropriate course

## Step 5: Determining Content Windows

- 7 business days for each content
- Content windows can be separate or overlap
- Must fall within the state testing window


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Step 6: Pre-coding

- Populates students into iTester
- Determine which pre-code window works best for your district
- Pre-code during the window that accommodates first anticipated content window

## Step 7: Final Preparations

- Students are enrolled in the correct content area
- Students are enrolled with correct examiner
- Changes can be made to student information and groups
- Students can be manually added


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Step 8: Special Considerations

- Paper/Pencil, Braille or Large Print assessments must be marked prior to testing
  - Braille and Large Print need to be ordered at least one week prior to testing
  - Paper/Pencil must be downloaded by the DTC and printed prior to testing
- Other accommodations should be entered prior to testing

## Step 9: Accessing the Practice Tutorials

- Students should be given ample time to access the tutorials
- Become familiar with the way the system works
- Become familiar with the tools
- Can be accessed at any time


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Step 10: Printing Test Tickets

- iTester allows for batch printing of tickets
- Distribute prior to testing
- Will need session code if more than one session
- Collect and securely destroy tickets after testing

## Step 11: Testing

- Once all preparations are made it's time to assess
- Refer to the timing guidelines for each content
  - These are general timing estimates
    - For example, 60-80 minutes
  - Please plan accordingly
- Paper/Pencil, Large Print and Braille answers must be entered into the system prior to the close of the 7 day window


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Step 12: Closing a Window Early

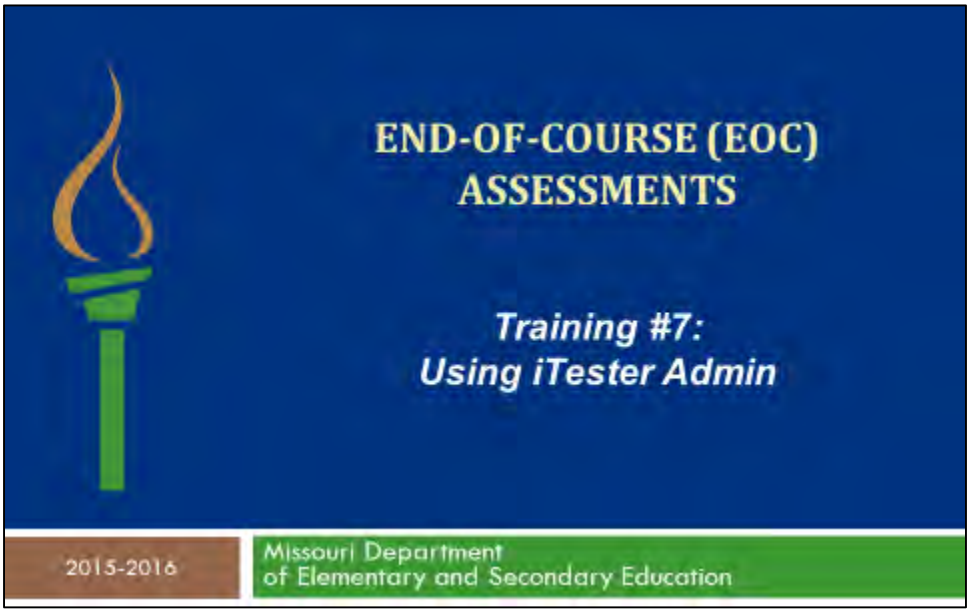
- 7 day window, if a district finishes early they may close the window
- 5 day turn around on results begins the business day after the window closes
- To close a window early contact Questar at:
  - (800) 571-2545

## Step 13: Student Reports

- Five business days after the close of the district content window
- DTCs can download student scores from the Reports tab
- Individual Student Reports (ISRs) are available to download and print at the district level.


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Training #7: Using iTester Admin





Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## iTester Administration vs. iTester Student

- iTester is the system used to manage and deliver the EOC Online Assessments. iTester consists of two main applications:
  - **iTester Admin**—An administrative web site used by test coordinators and Examiners to manage users and test sessions, student testing records, marking accommodations and other tasks before, during, and after testing
  - **iTester Student**—A test-delivery application used by students to take their tests. iTester Student is a Java-based application that must be installed on each student workstation before testing begins

## iTester Administration Login

- iTester Admin can be accessed at: http://moeoc.questarai.com/Admin/
- If you cannot remember your username/password, use the "Can't Login" button found at the bottom of the Sign In box
- If you do not have a login, please contact the EOC Help Desk at 800-571-2545

Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## iTester Admin – Materials Ordering

- Click on the Materials Ordering tab to order
  - Large print test
  - Braille test

## iTester Admin - Examiners

- Under the Examiners tab you can add examiners
- Examiners are divided by subject
- Examiners may be listed in more than one area
- Edit examiners name, email and content areas

Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

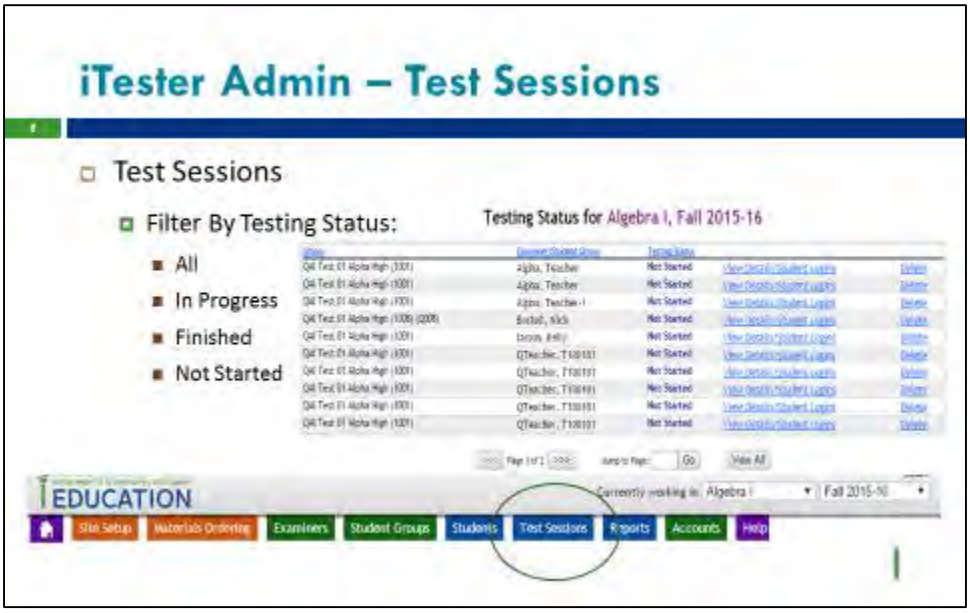
## iTester Admin – Student Groups

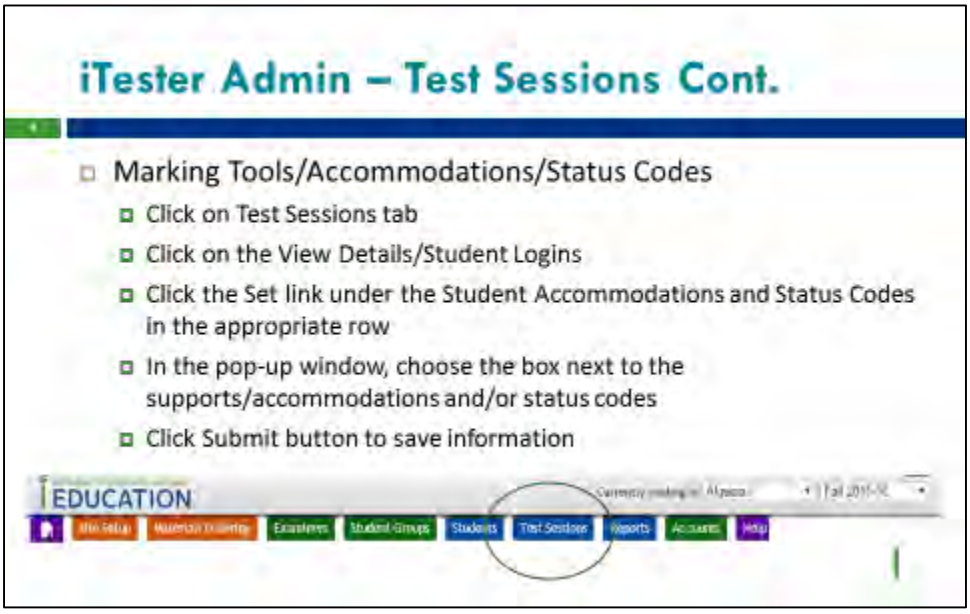
- In the Student Groups tab you can view groups scheduled to test in a subject
- Create a new student group
- Move a student to a new group

## iTester Admin - Students

- In the Students tab you can view students across all subjects and students not assigned to a student group
- View students who are assigned to test in a subject
- Add/Edit students
  - Any changes made to student demographics must also be made in DESE's MOSIS system.
  - Change or add content area to be tested

Copyright © 2016 by the Missouri Department of Elementary and Secondary Education






Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## iTester Admin – Test Sessions Cont.

- Printing Student Logins
  - Click on View Details/Student Logins link
  - Information sorts by last name
  - Click the Print Student test logins link above the table to view and/or print the student test logins.
  - Choose Print from the File menu to display the options dialog box for the printer.

## iTester Admin - Reports

- Reports
  - View Individual Student Reports
  - Print individual Student Reports
  - Download list (Excel CSV)
  - Order printed reports

Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## iTester Admin - Accounts

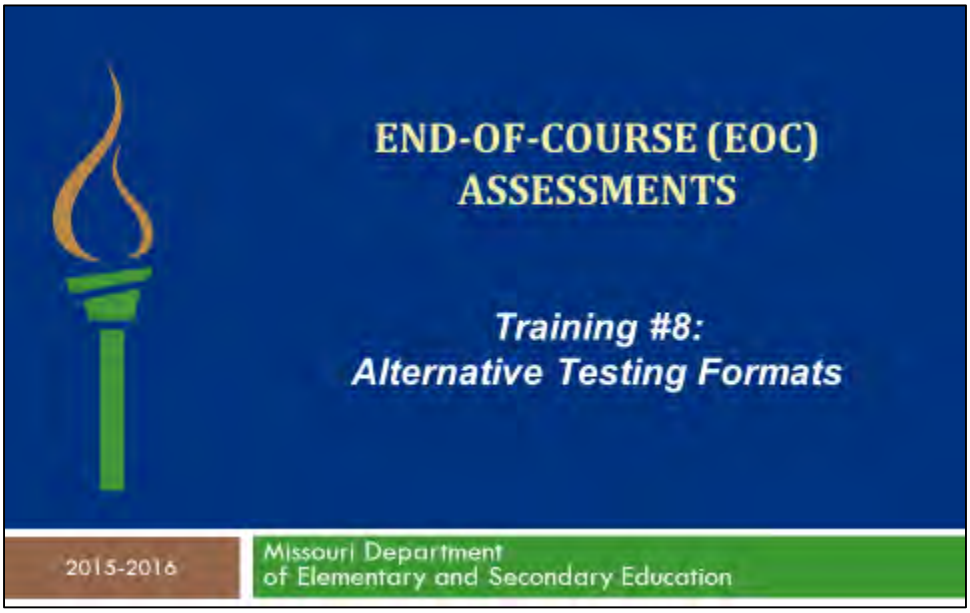
- Accounts tab
  - Create new accounts for test administrators
  - User Types
    - DTC- District Test Coordinator
    - DITC- District Information Technology Coordinator
    - STC- School Test Coordinator
    - SITC- School Information Technology Coordinator
    - Examiner- Examiner or Test Administrator

## iTester Admin – Help Tab

- Under the Help tab there you can find manuals, trainings and other resources for EOC Assessments

Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Training #8: Alternative Testing Formats





Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Large Print or Braille

- To order Large Print or Braille editions please contact Questar at:
  - (800) 571-2545
  - MOCustomerSupport@questarai.com
- Order at least one week prior to testing
- Accommodations codes
  - A012 for Braille
  - A021 for Large Print

## Paper/Pencil Editions

- Paper/Pencil edition of the test is available for:
  - Students with an IEP that says the student should take the Paper Based Assessment
  - Students who are out-of-district
  - Homebound students who cannot come to school to test
  - For ELL Translation when the translator needs to do translation prior to assessing the student due to technical language
- Use Accommodation code A102 for all scenarios


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Downloading Paper/Pencil Editions

- DTC downloads and prints Paper/Pencil Editions
- Individual test for each student
- Cannot be saved to a computer or downloaded multiple times and must not be copied for any reason

## After Testing

- Must immediately be transcribed into iTester
- Paper/Pencil assessments must be returned no later than 24 hours after the testing window closes
- Use shipping materials from Questar


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Returning Hard Copy Tests

- DTC is accountable for 100% of the returned shipment of each Paper/Pencil, Braille and Large Print test.
- Report all Braille, Large Print, and Paper/Pencil assessments on the Test Book Accountability form – Instructions at the back of the TAM

Missouri DEPARTMENT OF ELEMENTARY & SECONDARY EDUCATION

7

## Contact Us

dese.mo.gov

(573) 751-3545

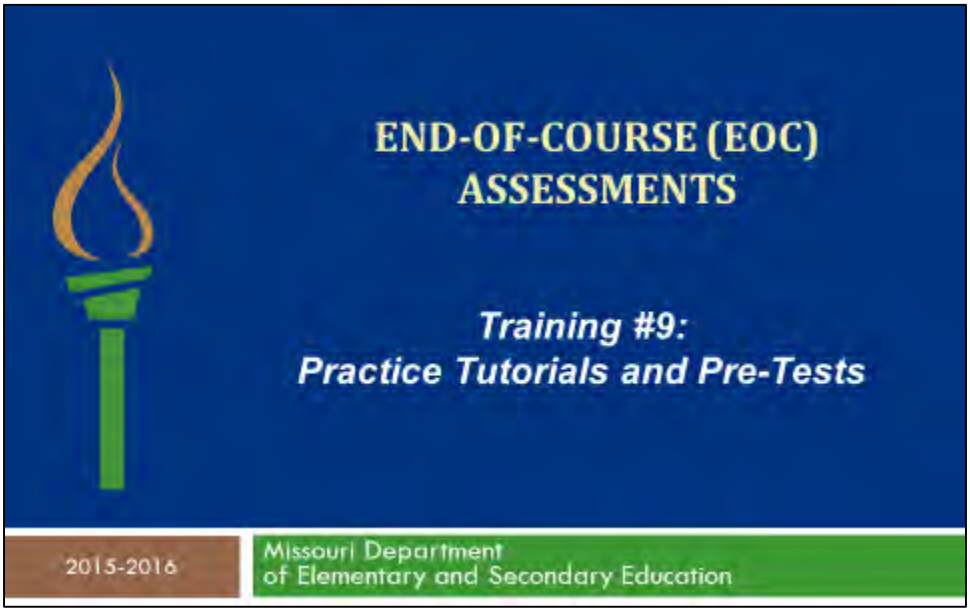
assessment@dese.mo.gov

The Department of Elementary and Secondary Education does not discriminate on the basis of race, color, religion, gender, national origin, age, or disability in its programs and activities. Inquiries related to Department programs and to the location of services, activities, and facilities that are accessible by persons with disabilities may be directed to the Jefferson State Office Building, Office of the General Counsel, Coordinator – Civil Rights Compliance (Title VI/Title IX/504/ADA/Age Act), 8th Floor, 205 Jefferson Street, P.O. Box 480, Jefferson City, MO 65102-0480; telephone number 573-526-4757 or TTY 800-735-2966; email civilrights@dese.mo.gov.



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Training #9: Practice Tutorials and Pre-Tests




### Practice Tutorials

- Tutorials are available in iTester Student for students to practice using the tools within the system
- Open year round
- Login information in the TAM and on DESE EOC Page
  - http://dese.mo.gov/college-career-readiness/assessment/end-course

| CONTENT | USERNAME | PASSWORD |
|---|---|---|
| Algebra I | MOALG1 | practice |
| Algebra II | MOALG2 | practice |
| Geometry | MOGEO | practice |
| Biology | MOBIO | practice |
| Physical Science | MOPHYSC | practice |
| English I | MOENG1 | practice |
| English II | MOENG2 | practice |
| American History | MOAMHIST | practice |
| Government | MOGOV | practice |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Pre-Tests - Online

- Online Pre-Tests
  - Released EOC Forms
  - No specific testing window
  - Districts enroll students directly through iTester
  - Automatically scores selected response
  - Scores returned to districts within 24 hours of test submission
- Pretests are available at no charge

## Pre-Tests - PDF

- PDF form
  - Located in iTester under the Help tab or on DESE EOC Page
  - Last page includes the answer key and alignment of each item
  - Allows students to be familiar with the types of questions they can expect to encounter


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Pre-Tests Enrollment

- Two ways that students are enrolled for the Pre-Tests:
  - **For students included in the operational precode**
    The operational enrollment file is also loaded into the pre-test administration. This means there will be a pre-test scheduled for each student included in the operational enrollment file, and nothing further needs to be done.
  - **For students NOT included in the operational precode**
    In order to enroll additional students in the pre-tests, meaning those excluded from the operational precode file, districts either must enter the student manually in the admin or create a pre-test enrollment file. The pre-test enrollment file must contain unique students who have yet to be created either in a previous precode file or manually.

## Accessing Pre-Tests

- Each student will be given a unique username and password
- Login information is generated and printed on test tickets
- Pre-Tests can be reset by the DTC


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Pre-Test Results

- CSV file with raw scores available 24 hours after student submission
- Data for pre-tests available for 20 business days
- Pre-Test ISRs (for multiple choice) also available
- Pretests with a writing prompt or performance event
  - Locally scored using provided rubrics and scoring materials
  - Supplement to the TAM and brief training webinar are posted to iTester under the Help tab

Missouri DEPARTMENT OF ELEMENTARY & SECONDARY EDUCATION

## Contact Us

dese.mo.gov

(573) 751-3545

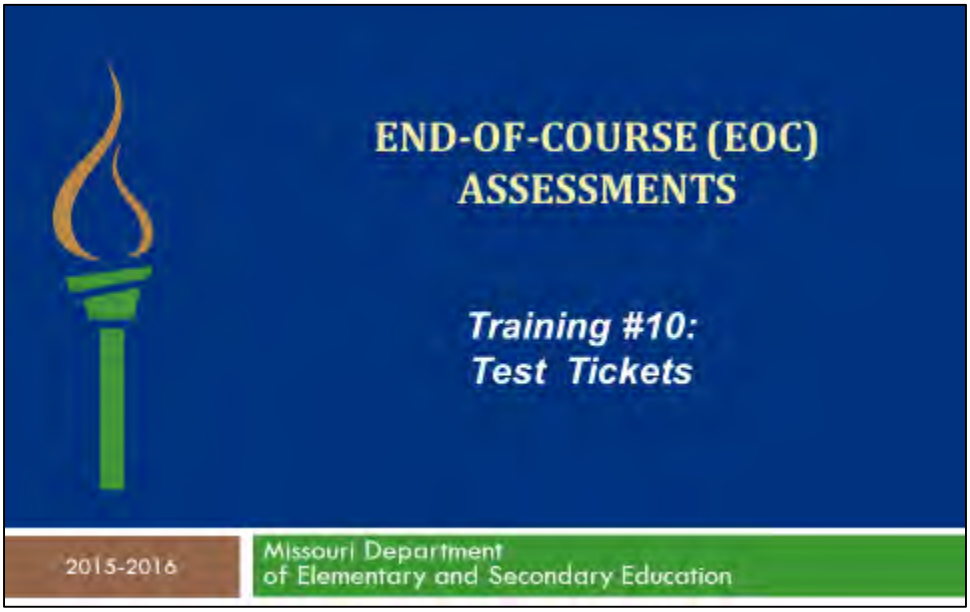
assessment@dese.mo.gov

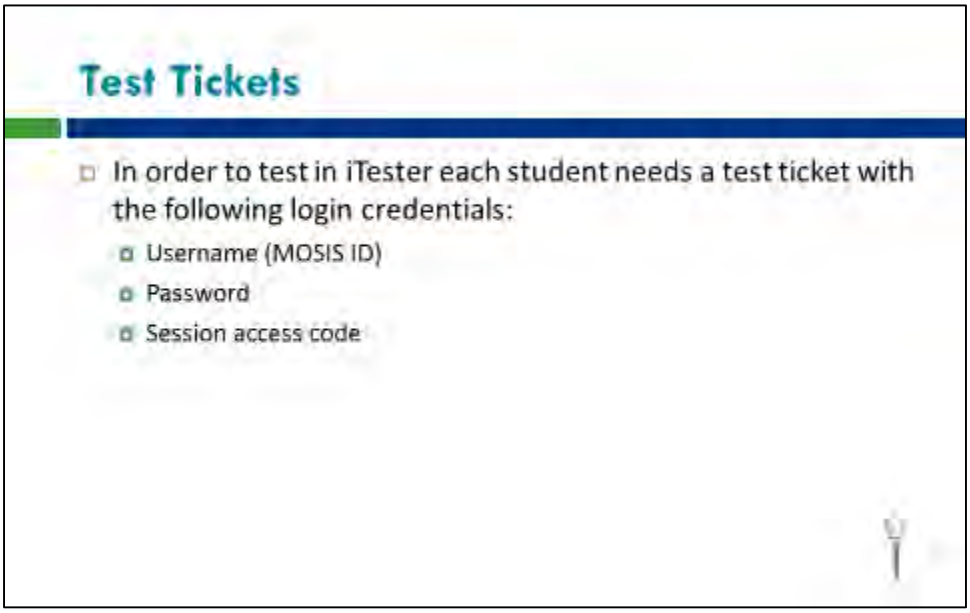
The Department of Elementary and Secondary Education does not discriminate on the basis of race, color, religion, gender, national origin, age, or disability in its programs and activities. Inquiries related to Department programs and to the location of services, activities, and facilities that are accessible by persons with disabilities may be directed to the Jefferson State Office Building, Office of the General Counsel, Coordinator – Civil Rights Compliance (Title VI/Title IX/504/ADA/Age Act), 8th Floor, 205 Jefferson Street, P.O. Box 480, Jefferson City, MO 65102-0480; telephone number 573-526-4757 or TTY 800-735-2966; www.dese.mo.gov/civilrights@dese.mo.gov



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Training #10: Test Tickets





Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Test Tickets

- May be printed on:
  - Plain paper
  - Avery labels (5160)
- In iTester, click on Test Sessions tab
  - View a list of registered students
  - Print tickets by student group

## Test Tickets

- If a student is not listed:
  - STC or DTC creates a profile
  - Register student in a student group
  - Login information will be generated


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Test Tickets

- When students log in have them check the ticket to ensure it is their MOSIS ID
- Have them verify the on screen information that includes:
  - Name
  - MOSIS ID
  - Date of Birth
  - Grade
  - Teacher Name
  - School Name

Missouri DEPARTMENT OF ELEMENTARY & SECONDARY EDUCATION

## Contact Us

dese.mo.gov

(573) 751-3545

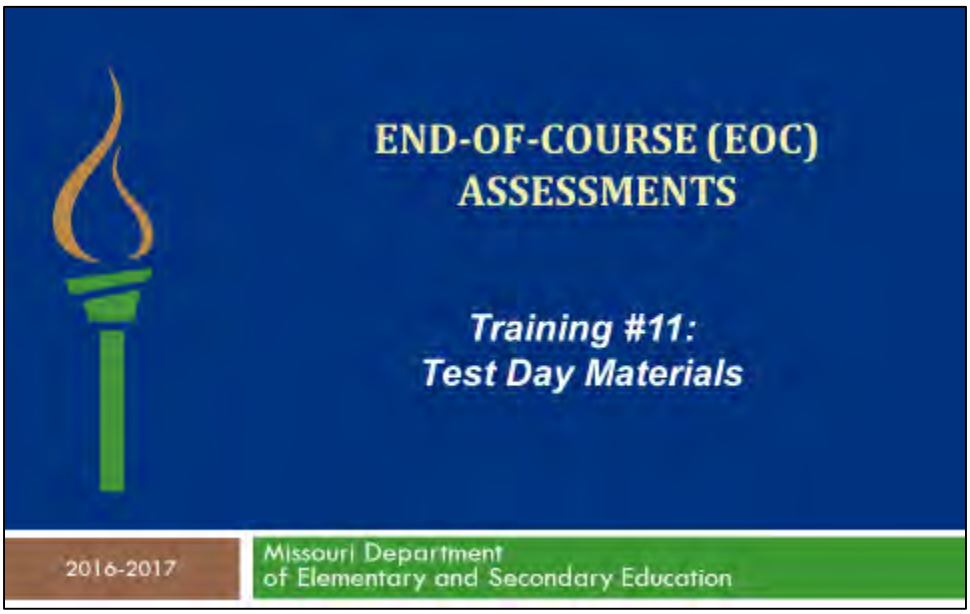
assessment@dese.mo.gov

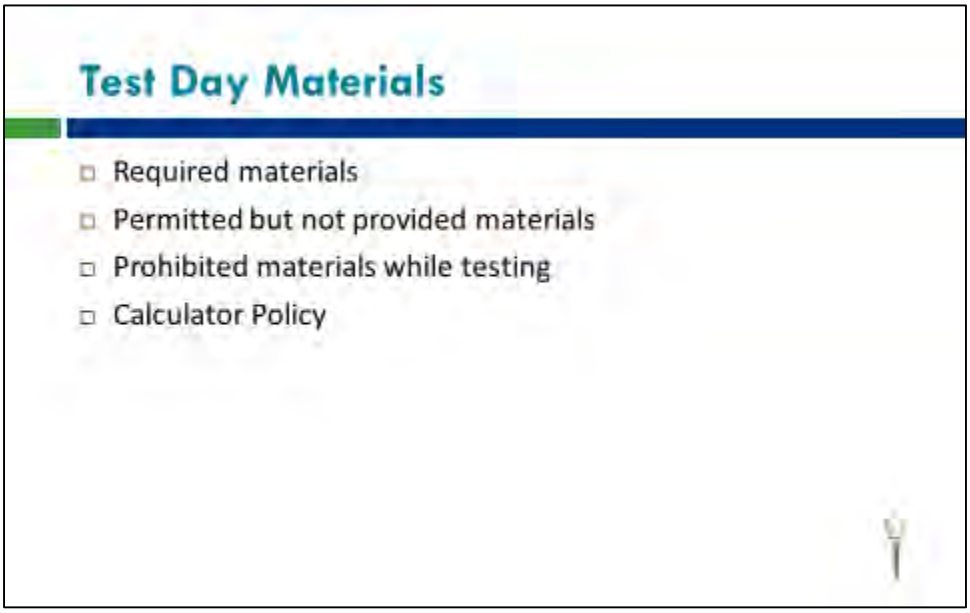
The Department of Elementary and Secondary Education does not discriminate on the basis of race, color, religion, gender, national origin, age, or disability in its programs and activities. Inquiries related to Department programs and to the location of services, activities, and facilities that are accessible by persons with disabilities may be directed to the Jefferson State Office Building, Office of the General Counsel, Coordinator – Civil Rights Compliance (Title VI/Title IX/504/ADA/Age Act), 8th Floor, 205 Jefferson Street, P.O. Box 480, Jefferson City, MO 65102-0480; telephone number 573-526-4757 or TTY 800-735-2966; www.dese.mo.gov/civilrights@dese.mo.gov



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Training #11: Test Day Materials





Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Test Day: Required Materials

- Workstation with internet access
- Student login information
- Scratch paper for ELA assessments
- Unlabeled grid or graph paper for Math and Biology assessments
- Writing utensil

## Test Day: Permitted Materials

- Hard copy of Mathematics Reference sheet
- Hard copy of the Periodic Table of Elements
- Calculators that meet TAM guidelines (Math only)
- ELA writing task only
  - Dictionary
  - Thesaurus
  - Grammar handbook
  - Bilingual dictionary for ELL students


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Test Day: Prohibited Materials

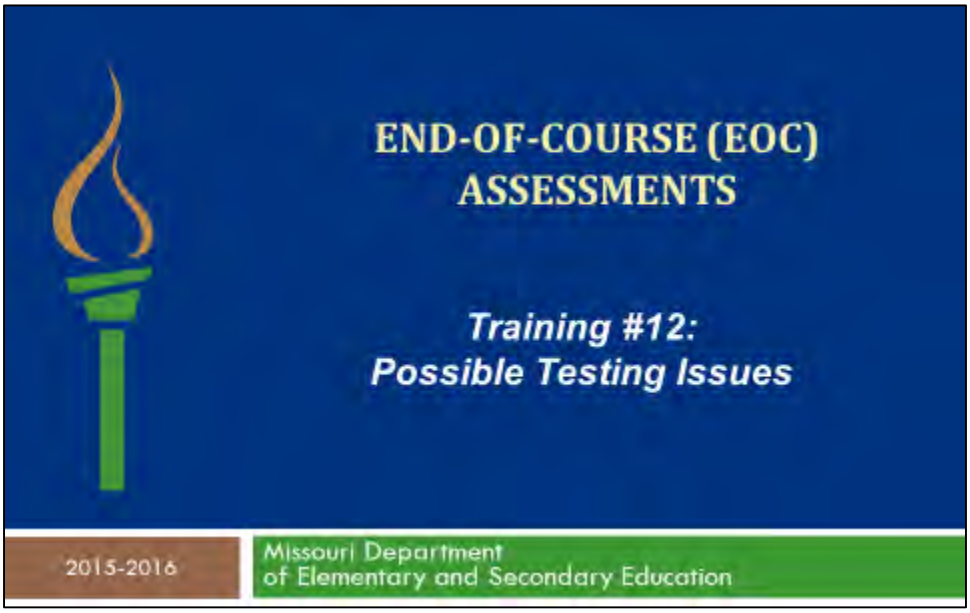
- Electronic devices that can connect to the internet or to anyone inside or outside the classroom
  - Cell Phones
  - Electronic Music Players
  - Digital Cameras
  - Handheld Scanners
  - Portable Gaming Devices
- Cell Phones
  - Collect and return

## Test Day: Calculator Policy

- DESE does not provide, endorse, or recommend a list of calculator brands or types
- Calculators cannot contain stored equations or functions at the time of the End-of-Course Mathematics Assessments.
- Test Examiners are responsible to ensure and verify that calculators that have the ability to store functions and equations, e.g., a graphing or a scientific calculator, have the memory cleared before and after each Mathematics Assessment.
- Calculators cannot have Internet connectivity


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Training #12: Possible Testing Issues





Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Moving Students: In, Out or Within the District

- If A Student Moves:
  - Into the district
    - Add them manually
    - If you can't add them, contact Questar Customer Service
  - Out of the district prior to testing
    - Remove student from student group
    - Do not log into test
    - Do not mark any status codes
  - From building to building
  - Keep documentation
  - See page 15 of the TAM

## Student Drops

- If a student was enrolled in an EOC, but later drops the course:
  - Remove from the student group in iTester
  - Do not:
    - Log into the test
    - Mark any status codes


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Absent Student or Incomplete Test

- All students should take the entire EOC assessment
  - However, is a student is:
    - absent
    - not ready to test
    - has an incomplete EOC
      - Follow the procedures on page 16 of the TAM

## Moving Students: Disruption or Illness

- Student may need to move during testing because of disruption or illness
  - Procedures are in the TAM
  - Pause the test
  - Escort the student to a new location
  - Login the student to a new workstation with the same operating system


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Loss of Internet Connection

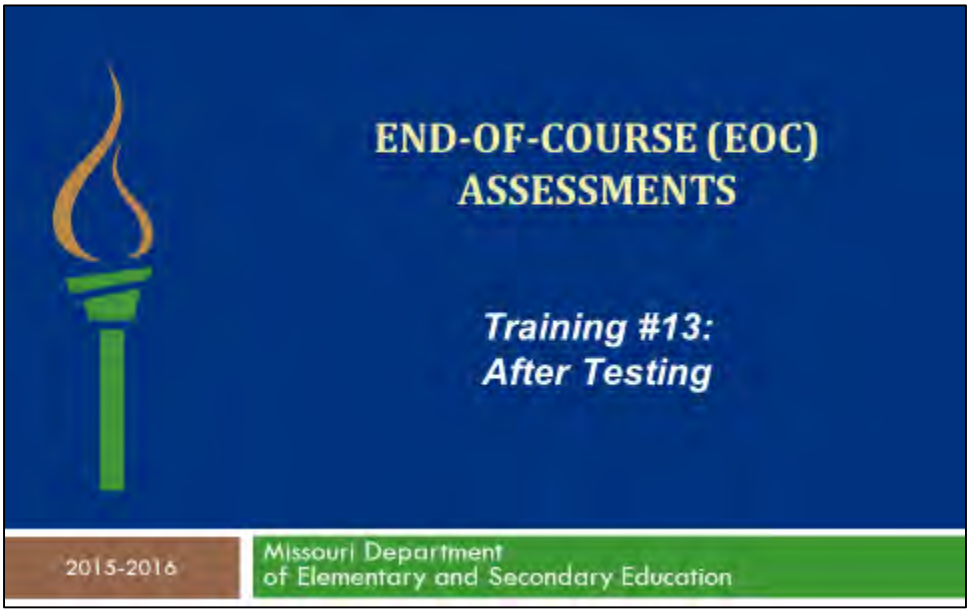
- Students test in iTester Student
- Tests download to a student's workstation
- In the event of a lost connection:
  - Do NOT turn off the student's device
  - Contact Questar at (800) 571-2545
  - Track student's status in iTester Admin and ensure they submit their tests for scoring following each test session

## Invalidation

- Tests are not invalidated because of:
  - Students behavior
  - Judgment of student effort
- Only Invalidated because of cheating
  - Only the DTC can invalidate a test
  - Has to be done before the 7 day window closes


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## Training #13: After Testing





Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## After Testing

- DTC responsibilities:
  - 100% return of all Paper/Pencil, Braille and Large Print
  - Questar will audit the returned shipments
  - Use the Test Book Accountability Form
- Securely Destroy Immediately
  - Test Tickets
  - Scratch paper

## After Testing

- Downloading results
  - Located in iTester Admin
    - Download, save and print the Individual Student Reports (ISRs)
- Questar will send student score labels after the statewide window has closed
- 15 days to notify parents or guardians that ISRs are available


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

## After Testing

- Guide to Interpreting Results is available on DESE's website
- The Guide to Interpreting Results contains information regarding:
  - Scale scores
  - Achievement level descriptors
  - Standard error of measurement
  - Sample reports
  - Examples of student labels

Missouri DEPARTMENT OF ELEMENTARY & SECONDARY EDUCATION

## Contact Us

dese.mo.gov

(573) 751-3545

assessment@dese.mo.gov

The Department of Elementary and Secondary Education does not discriminate on the basis of race, color, religion, gender, national origin, age, or disability in its programs and activities. Inquiries related to Department programs and to the location of services, activities, and facilities that are accessible by persons with disabilities may be directed to the Jefferson State Office Building, Office of the General Counsel, Coordinator – Civil Rights Compliance (Title VI/Title IX/504/ADA/Age Act), 8th Floor, 205 Jefferson Street, P.O. Box 480, Jefferson City, MO 65102-0480; telephone number 573-526-4757 or TTY 800-735-2966; www.dese.mo.gov/civilrights@dese.mo.gov



Copyright © 2016 by the Missouri Department of Elementary and Secondary Education

# Appendix H: Accommodation Codes

## Accommodations For Students With Disabilities

- The following is a list of accommodations for the End-of-Course assessments.
- The accommodation must appear in an IEP/504 plan to be allowed.
- ELL students include those receiving services (RCV) or not receiving services (NRC). ELL students do not include those students in monitored status (MY1 or MY2).

| Accommodation | Format | Description | Code |
|---|---|---|---|
| **Abacus** | Any | Students may have access to an abacus. | A391 |
| **Alternate Response Options** | Any | Students may respond to items using an alternate option, including but not limited to: Adapted Keyboards, StickyKeys, MouseKeys, FilterKeys, Adapted Mouse, Touch Screen, Head Wand, Switches. | A441 |
| **Braille** | Paper | Students with visual impairments may access the assessment via a Braille version. Tactile overlays and graphics tools may be used to assist the student in accessing the content. | A012 |
| **Large Print** | Paper | Students with visual impairments may access the assessment via a Large Print version. | A021 |
| **Multiplication Table** | Any | Students taking End-of-Course assessments may have access to a single digit multiplication table. | A395 |
| **Paper Based Assessment** | Paper | Students may have access to a paper based version of the assessment. | A102 |
| **Read-Aloud (ELA reading passages)** | Online - Not Embedded | Students may use assistive technology text-to-speech software to allow ELA reading passages to be read aloud. | A044 |
| | Any | Students may have English language arts reading passages to be read aloud to them by a trained reader. | A045 |
| | Any | ELL students may have English language arts reading passages read aloud to them in their native language by a trained translator. | A112 |
| **Read-Aloud (ELA reading passages)** | Paper | Blind students in any grade who do not yet have adequate Braille skills may have ELA reading passages read aloud. | A046 |
| **Specialized Calculator (For Calculator Allowed Items Only)** | Any | Students may have access, on items where calculator use is allowed, to a specialized calculator, including talking calculators or Braille calculators, when appropriate. | A396 |
| **Speech-To-Text** | Online - Not Embedded | The system allows students to use voice recognition software so the students may use their voices to dictate responses or give commands. | A352 |


Copyright © 2016 by the Missouri Department of Elementary and Secondary Education