

**Technical Report**  
**Proficiency Assessments for Wyoming Students (PAWS)**

Reading and Mathematics: Grades 3–8

Science: Grades 4 and 8

2014-2015 Administration

Submitted to Wyoming Department of Education

Prepared by  
Educational Testing Service  
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## Executive Summary

This report presents the technical results for the 2015 Proficiency Assessments for Wyoming Students (PAWS). The document covers the grades 3 to 8 Reading and Mathematics administration and the grades 4 and 8 Science administration. There were approximately 6,766 to 7,547 students in the total Wyoming student population at grades 3 to 8.

### Structure of This Report

The initial chapter provides relevant policy decisions regarding the PAWS program, followed by brief descriptions of the PAWS as it was administered in 2015. The reliability and validity chapters present the evidence gathered to support the intended uses and interpretations of scores for the PAWS assessment program. In short, the validity process began with test design and continued through the entire assessment process, including item development and field testing, analyses of item and test data, test scaling, scoring, and score reporting. Each of these processes is described in detail starting with the Test Design and Development chapter, and concluded in the Historical Comparisons chapter. Operational aspects of the program are discussed in the remaining chapters.

### Elimination of SAWS Assessments

Student Assessment of Writing Skills (SAWS) at grades 3, 5, and 7 has been eliminated from administration due to Enrolled Act 50 (EA50) of the 2015 General Session of the Wyoming Legislature.

**Section 2.** *W.S. 21-2-204(c)(ii)(A)(III) is repealed.*

**Section 3.** *Notwithstanding any other provision of law, the state board, the state superintendent and the department of education shall cease any development or administration of a separate writing assessment as a part of the statewide assessment system required under W.S. 21-2-304.*

### Conclusion

The technical efforts conducted in 2014–2015, described later in this report, demonstrated the fidelity of the program to its long-standing levels of validity and reliability. This quality was retained through diligent compliance to procedures and high caliber judgment and evaluation of numerous national professionals from the field of test measurement.

# Table of Contents

Executive Summary .....	v
Structure of This Report.....	v
Elimination of SAWS Assessments.....	v
Conclusion .....	v
LIST OF TABLES .....	xiii
LIST OF FIGURES .....	xix
1. OVERVIEW OF THE 2015 PAWS .....	1
1.1 Introduction.....	1
1.2 Background of PAWS.....	1
1.3 Overview of PAWS Test Components .....	3
1.4 Overview of the PAWS Design .....	4
1.5 State Policy on Student Participation.....	4
1.5.1 Students with Disabilities, 504 Plans, and English Language Learners .....	5
2. VALIDITY .....	9
2.1 Overview.....	9
2.1.1. Purpose of the PAWS .....	10
2.1.2. The Constructs to Be Measured.....	10
2.1.3. The Interpretations and Uses of the Scores Generated .....	10
2.1.4. Intended Test Population(s) .....	11
2.2 Evidence Based on Content-related Validity .....	11
2.2.1. Description of the state standards .....	12
2.2.2. Specifications and Blueprints .....	12
2.2.3. Item development process.....	12
2.2.4. Item review process .....	12
2.2.5. Form construction process .....	12
2.2.6. Alignment study.....	12
2.3 Evidence Based on Relations to Other Variables .....	13
2.3.1. Correlations between Content Areas .....	13

2.3.2. Differential Item Functioning Analyses.....	13
2.4 Evidence Based on Response Processes .....	14
2.5 Evidence Based on Internal Structure.....	15
2.5.1. Classical Statistics.....	15
2.5.2. Reliability.....	16
2.5.3. Dimensionality.....	16
2.6 Evidence Based on Consequences of Testing.....	16
3. PAWS TEST DESIGN AND DEVELOPMENT .....	18
3.1 Overview.....	18
3.2 Test Design and Blueprints .....	18
3.2.1. Purpose.....	18
3.2.2. Plan .....	19
3.3 Types of Items Used in PAWS .....	20
3.3.1. PAWS Reading Tests.....	20
3.3.2. PAWS Mathematics Tests .....	27
3.3.3. PAWS Science Tests.....	34
3.4 PAWS Test Development Process.....	38
3.5 Item and Test Form Development .....	39
3.5.1. Item Specifications.....	40
3.5.2. Item Difficulty Requirements .....	40
3.5.3. Item Graphics Requirements.....	40
3.6 Item Review .....	40
3.7 Field Testing .....	42
3.7.1. Classical Item Statistics .....	43
3.7.1.1. Item Difficulty .....	43
3.7.1.2. Item Discrimination .....	43
3.7.2. Differential Item Functioning .....	44
3.7.3. Item Response Theory (IRT) Analysis .....	46
3.7.4. Data Review Procedures .....	46
3.8 Test Form Construction .....	48

3.8.1. Construction of the Reading and Mathematics Forms.....	48
3.8.2. Construction of the Science Forms .....	49
3.8.3. Final Review of Assembled Operational Tests.....	50
4. TEST ADMINISTRATION .....	52
4.1 Test Materials.....	52
4.2 Materials Return.....	52
4.3 Directions for Administration.....	52
4.3.1. Allowed Student Manipulatives.....	53
4.3.2. Test Security .....	53
4.4 Student Participation.....	54
4.5 PAWS Standard Accommodations .....	54
4.5.1. Students Eligible for Test Accommodations .....	56
4.5.2. Requirements for Use of Test Accommodations .....	56
4.5.3. Description of Standard Accommodations for Students with Disabilities .....	57
4.5.3.1. Presentation Accommodations.....	58
4.5.3.2. Response Accommodations .....	58
4.5.3.3. Setting Accommodations .....	59
4.5.3.4. Timing and Scheduling Accommodations.....	59
4.5.4. Description of Standard Accommodations for English Language Learners (ELL) ...	60
4.5.4.1. Presentation Accommodations.....	60
4.5.4.2. Setting Accommodations .....	60
4.5.4.3. Timing and Scheduling Accommodations.....	60
4.5.5. PAWS 2015 Monitoring of Appropriate Accommodations .....	61
4.5.5.1. Empirical Analysis of Accommodations .....	61
4.5.6. Selection and Administration of Accommodations .....	61
5. PROCESSING AND SCORING OF PAWS ITEMS.....	63
5.1 Overview.....	63
5.2 Receipt Control, Processing, Scanning, Editing.....	63
5.2.1 Receipt Control .....	63
5.2.2 Processing .....	64



5.2.3 Scanning.....	64
5.2.4 Resolutions.....	65
6. EQUATING AND SCALING PROCEDURES.....	66
6.1 Overview.....	66
6.2 Item and Forms Development.....	66
6.3 IRT Models and Calibrations.....	66
6.4 Fit Statistics for the Rasch Model.....	68
6.5 Reading and Mathematics Vertical Scales.....	69
6.6 Reading, Mathematics, and Science Equating Analyses .....	70
6.6.1. Calibration and Equating Process for the 2015 Administration .....	71
6.7 Translating Raw Scores to Scaled Scores and Performance Levels .....	73
7. PAWS REPORTING .....	75
7.1 Overview.....	75
7.2 Scaled Scores .....	75
7.3 Performance Levels .....	76
7.4 Content Standard-Level Raw and Scale Scores.....	77
7.5 Production of Printed Score Reports for PAWS.....	77
7.6 Assessment Score Reports: Supplement Guide for Districts and Schools for PAWS.....	78
8. RELIABILITY .....	79
8.1 Overview.....	79
8.2 Internal Consistency Reliability.....	79
8.3 Classical and Conditional Standard Errors of Measurement .....	84
8.4 Accuracy and Consistency of Classifications .....	85
9. QUALITY CONTROL PROCEDURES.....	90
9.1 Quality Control of Item Development .....	90
9.1.1. Item and Prompt Specifications .....	90
9.1.2. Item Writers .....	90
9.1.3. Internal Contractor Reviews .....	90
9.1.4. Content Review.....	91
9.1.5. Editorial Review .....	91

9.1.6. Fairness Review .....	91
9.1.7. Assessment Director Review .....	91
9.1.8. Data Review of Field Tested Items.....	91
9.1.9. Quality Control of the Item Bank .....	91
9.2 Quality Control of Test Materials .....	92
9.2.1. Collecting Test Materials .....	92
9.2.2. Processing Test Materials .....	93
9.3 Quality Control of Scanning .....	93
9.4 Quality Control of Psychometric Analyses.....	93
9.5 Quality Control of Reporting .....	93
9.5.1. Excluding Student Scores from Summary Reports .....	94
10. HISTORICAL COMPARISONS .....	95
11. REFERENCES .....	109
12. GLOSSARY OF TERMS .....	112
Appendix A: PAWS 2015 Reading, Math, and Science Blueprints .....	118
Reading .....	118
Mathematics .....	136
Science .....	142
Appendix B: Sample PAWS/SAWS Student Reports: Grade 4 Reading, Mathematics, and Science (exemplar for Grade 8) .....	146
Appendix C: Sample PAWS/SAWS Student Reports: Grade 6 Reading, Mathematics (exemplar for Grade 3, 5, and 7) .....	149
Appendix D: PAWS Operational Subscale Correlations.....	152
Appendix E: DIF Results for Field Test 2015 Items .....	158
Reading .....	158
Mathematics .....	161
Science .....	164
Appendix F: Classical Item Statistics for 2015 Field Test Items.....	165
Reading .....	165
Mathematics .....	189

Science .....	207
Appendix G: Classical Item Statistics for 2015 Operational Items .....	213
Reading .....	213
Mathematics .....	225
Science .....	237
Appendix H: Rasch Difficulty, Standard Error, Fit Statistics, and <i>N</i> -counts for 2015 Field Test Items.....	241
Reading .....	241
Mathematics .....	265
Science .....	283
Appendix I: Rasch Difficulty, Standard Error, and Fit Statistics for 2015 Operational Items ...	291
Reading .....	291
Mathematics .....	303
Science .....	315
Appendix J: Frequency of Individual Accommodations for 2015 PAWS Tests .....	319
Reading .....	319
Mathematics .....	322
Science .....	325
Appendix K: Mean Scale Scores, Counts, and Scale Score Standard Deviations for IEP Students by Accommodation Status .....	328
Reading .....	328
Mathematics .....	328
Science .....	329
Appendix L: Scaled Score Descriptive Statistics by Demographic Subgroup .....	330
Reading .....	331
Mathematics .....	334
Science .....	337
Appendix M: Raw Score to Scaled Score Tables .....	338
Reading .....	338
Mathematics .....	350

Science .....	367
Appendix N: Performance Level Percentages by Demographic Subgroup.....	371
Reading .....	372
Mathematics .....	375
Science .....	378

## LIST OF TABLES

Table 1. Statewide Participation in Reading PAWS.....	6
Table 2. Statewide Participation in Mathematics PAWS .....	7
Table 3. Statewide Participation in Science PAWS.....	8
Table 4. Reporting Strands Design for Grade 3 Reading .....	22
Table 5. Reporting Strands Design for Grade 4 Reading .....	23
Table 6. Reporting Strands Design for Grade 5 Reading .....	24
Table 7. Reporting Strands Design for Grade 6 Reading .....	25
Table 8. Reporting Strands Design for Grade 7 Reading .....	26
Table 9. Reporting Strands Design for Grade 8 Reading .....	27
Table 10. Reporting Strands Design for Grade 3 Mathematics .....	29
Table 11. Reporting Strands Design for Grade 4 Mathematics .....	30
Table 12. Reporting Strands Design for Grade 5 Mathematics .....	31
Table 13. Reporting Strands Design for Grade 6 Mathematics .....	32
Table 14. Reporting Strands Design for Grade 7 Mathematics .....	33
Table 15. Reporting Strands Design for Grade 8 Mathematics .....	34
Table 16. Reporting Strands Design for Grade 4 Science .....	37
Table 17. Reporting Strands Design for Grade 8 Science .....	38
Table 18. DIF Categories for Multiple-Choice Items .....	46
Table 19. Criteria to Evaluate Mean-Square Fit Statistics.....	69
Table 20. PAWS Reading, Mathematics, and Science Scaling Constants, Lowest Obtainable Scale Scores, and Highest Obtainable Scale Scores .....	74
Table 21. Proficiency Level Ranges for Grades 3–8 Reading.....	76
Table 22. Proficiency Level Ranges for Grades 3–8 Mathematics .....	76
Table 23. Proficiency Level Ranges for Grades 4 and 8 Science .....	76
Table 24. Summary Reliabilities, Standard Errors of Measurement, and Descriptive Statistics by Grade.....	80
Table 25. Summary Reliabilities, Standard Errors of Measurement, and Descriptive Statistics by Grade and Reading Domain.....	81
Table 26. Summary Reliabilities, Standard Errors of Measurement, and Descriptive Statistics by Grade and Mathematics Domain .....	83
Table 27. Summary Reliabilities, Standard Errors of Measurement, and Descriptive Statistics by Grade and Science Domain.....	84
Table 28. PAWS 2015 Decision Accuracy and Consistency Indices – Grade 3 .....	88
Table 29. PAWS 2015 Decision Accuracy and Consistency Indices – Grade 4 .....	88
Table 30. PAWS 2015 Decision Accuracy and Consistency Indices – Grade 5 .....	88
Table 31. PAWS 2015 Decision Accuracy and Consistency Indices – Grade 6 .....	88
Table 32. PAWS 2015 Decision Accuracy and Consistency Indices – Grade 7 .....	89

Table 33. PAWS 2015 Decision Accuracy and Consistency Indices – Grade 8 .....	89
Table 34. Scaled Scores Descriptive Statistics for the PAWS Reading Tests.....	96
Table 35. Percentage Proficient and Advanced for the PAWS Reading Tests.....	96
Table 36. Scaled Scores Descriptive Statistics for the Mathematics Tests.....	97
Table 37. Percentage of Proficient + Advanced Students for the Mathematics Tests.....	97
Table 38. Scaled Scores Descriptive Statistics for the Science Tests.....	98
Table 39. Percentage of Proficient + Advanced Students for the Science Tests .....	98
Table A1. PAWS 2015 Grade 3 Reading Blueprint .....	118
Table A2. PAWS 2015 Grade 4 Reading Blueprint .....	121
Table A3. PAWS 2015 Grade 5 Reading Blueprint .....	124
Table A4. PAWS 2015 Grade 6 Reading Blueprint .....	127
Table A5. PAWS 2015 Grade 7 Reading Blueprint .....	130
Table A6. PAWS 2015 Grade 8 Reading Blueprint .....	133
Table A7. PAWS 2015 Grade 3 Math Blueprint .....	136
Table A8. PAWS 2015 Grade 4 Math Blueprint .....	137
Table A9. PAWS 2015 Grade 5 Math Blueprint .....	138
Table A10. PAWS 2015 Grade 6 Math Blueprint .....	139
Table A11. PAWS 2015 Grade 7 Math Blueprint .....	140
Table A12. PAWS 2015 Grade 8 Math Blueprint .....	141
Table A13. PAWS 2015 Science Grade 4 Blueprint .....	142
Table A14. PAWS 2015 Science Grade 8 Blueprint .....	144
Table D1. Grade 3 PAWS Total Test and Subscale Correlations.....	152
Table D2. Grade 4 PAWS Total Test and Subscale Correlations.....	153
Table D3. Grade 5 PAWS Total Test and Subscale Correlations.....	154
Table D4. Grade 6 PAWS Total Test and Subscale Correlations.....	155
Table D5. Grade 7 PAWS Total Test and Subscale Correlations.....	156
Table D6. Grade 8 PAWS Total Test and Subscale Correlations.....	157
Table E1. Grade 3 Reading DIF Summary Statistics for Embedded Field Test Items.....	158
Table E2. Grade 4 Reading DIF Summary Statistics for Embedded Field Test Items.....	158
Table E3. Grade 5 Reading DIF Summary Statistics for Embedded Field Test Items.....	159
Table E4. Grade 6 Reading DIF Summary Statistics for Embedded Field Test Items.....	159
Table E5. Grade 7 Reading DIF Summary Statistics for Embedded Field Test Items.....	160
Table E6. Grade 8 Reading DIF Summary Statistics for Embedded Field Test Items.....	160
Table E7. Grade 3 Mathematics DIF Summary Statistics for Embedded Field Test Items .....	161
Table E8. Grade 4 Mathematics DIF Summary Statistics for Embedded Field Test Items .....	161
Table E9. Grade 5 Mathematics DIF Summary Statistics for Embedded Field Test Items .....	162
Table E10. Grade 6 Mathematics DIF Summary Statistics for Embedded Field Test Items .....	162
Table E11. Grade 7 Mathematics DIF Summary Statistics for Embedded Field Test Items .....	163
Table E12. Grade 8 Mathematics DIF Summary Statistics for Embedded Field Test Items .....	163

Table E13. Grade 4 Science DIF Summary Statistics for Embedded Field Test Items.....	164
Table E14. Grade 8 Science DIF Summary Statistics for Embedded Field Test Items.....	164
Table F1. Reading Grade 3 Classical Statistics for Field Test Items.....	165
Table F2. Reading Grade 4 Classical Statistics for Field Test Items.....	169
Table F3. Reading Grade 5 Classical Statistics for Field Test Items.....	173
Table F4. Reading Grade 6 Classical Statistics for Field Test Items.....	177
Table F5. Reading Grade 7 Classical Statistics for Field Test Items.....	181
Table F6. Reading Grade 8 Classical Statistics for Field Test Items.....	185
Table F7. Mathematics Grade 3 Classical Statistics for Field Test Items .....	189
Table F8. Mathematics Grade 4 Classical Statistics for Field Test Items .....	192
Table F9. Mathematics Grade 5 Classical Statistics for Field Test Items .....	195
Table F10. Mathematics Grade 6 Classical Statistics for Field Test Items .....	198
Table F11. Mathematics Grade 7 Classical Statistics for Field Test Items .....	201
Table F12. Mathematics Grade 8 Classical Statistics for Field Test Items .....	204
Table F13. Science Grade 4 Classical Statistics for Field Test Items .....	207
Table F14. Science Grade 8 Classical Statistics for Field Test Items .....	210
Table G1. Reading Grade 3 Classical Statistics for Operational Items .....	213
Table G2. Reading Grade 4 Classical Statistics for Operational Items .....	215
Table G3. Reading Grade 5 Classical Statistics for Operational Items .....	217
Table G4. Reading Grade 6 Classical Statistics for Operational Items .....	219
Table G5. Reading Grade 7 Classical Statistics for Operational Items .....	221
Table G6. Reading Grade 8 Classical Statistics for Operational Items .....	223
Table G7. Mathematics Grade 3 Classical Statistics for Operational Items.....	225
Table G8. Mathematics Grade 4 Classical Statistics for Operational Items.....	227
Table G9. Mathematics Grade 5 Classical Statistics for Operational Items.....	229
Table G10. Mathematics Grade 6 Classical Statistics for Operational Items.....	231
Table G11. Mathematics Grade 7 Classical Statistics for Operational Items.....	233
Table G12. Mathematics Grade 8 Classical Statistics for Operational Items.....	235
Table G13. Science Grade 4 Classical Statistics for Operational Items .....	237
Table G14. Science Grade 8 Classical Statistics for Operational Items .....	239
Table H1. Reading Grade 3 IRT Statistics for Field Test Items .....	241
Table H2. Reading Grade 4 IRT Statistics for Field Test Items .....	245
Table H3. Reading Grade 5 IRT Statistics for Field Test Items .....	249
Table H4. Reading Grade 6 IRT Statistics for Field Test Items .....	253
Table H5. Reading Grade 7 IRT Statistics for Field Test Items .....	257
Table H6. Reading Grade 8 IRT Statistics for Field Test Items .....	261
Table H7. Mathematics Grade 3 IRT Statistics for Field Test Items.....	265
Table H8. Mathematics Grade 4 IRT Statistics for Field Test Items.....	268
Table H9. Mathematics Grade 5 IRT Statistics for Field Test Items.....	271

Table H10. Mathematics Grade 6 IRT Statistics for Field Test Items.....	274
Table H11. Mathematics Grade 7 IRT Statistics for Field Test Items.....	277
Table H12. Mathematics Grade 8 IRT Statistics for Field Test Items.....	280
Table H13. Science Grade 4 IRT Statistics for Field Test Items.....	283
Table H14. Science Grade 8 IRT Statistics for Field Test Items.....	287
Table I1. Reading Grade 3 IRT Statistics for Operational Items.....	291
Table I2. Reading Grade 4 IRT Statistics for Operational Items.....	293
Table I3. Reading Grade 5 IRT Statistics for Operational Items.....	295
Table I4. Reading Grade 6 IRT Statistics for Operational Items.....	297
Table I5. Reading Grade 7 IRT Statistics for Operational Items.....	299
Table I6. Reading Grade 8 IRT Statistics for Operational Items.....	301
Table I7. Mathematics Grade 3 IRT Statistics for Operational Items .....	303
Table I8. Mathematics Grade 4 IRT Statistics for Operational Items .....	305
Table I9. Mathematics Grade 5 IRT Statistics for Operational Items .....	307
Table I10. Mathematics Grade 6 IRT Statistics for Operational Items .....	309
Table I11. Mathematics Grade 7 IRT Statistics for Operational Items .....	311
Table I12. Mathematics Grade 8 IRT Statistics for Operational Items .....	313
Table I13. Science Grade 4 IRT Statistics for Operational Items.....	315
Table I14. Science Grade 8 IRT Statistics for Operational Items.....	317
Table J1. Frequency of IEP Student’s Standard Accommodations: Presentation Accommodations .....	319
Table J2. Frequency of IEP Student’s Standard Accommodations: Response Accommodations .....	320
Table J3. Frequency of IEP Student’s Standard Accommodations: Setting Accommodations ..	320
Table J4. Frequency of IEP Student’s Standard Accommodations: Timing and Scheduling Accommodations .....	321
Table J5. Frequency of English Language Learners Standard Accommodations: Presentation Accommodations .....	321
Table J6. Frequency of English Language Learners Standard Accommodations: Setting Accommodations .....	321
Table J7. Frequency of English Language Learners Standard Accommodations: Timing and Scheduling Accommodations .....	321
Table J8. Frequency of IEP Student’s Standard Accommodations: Presentation Accommodations .....	322
Table J9. Frequency of IEP Student’s Standard Accommodations: Response Accommodations .....	323
Table J10. Frequency of IEP Student’s Standard Accommodations: Setting Accommodations	324
Table J11. Frequency of IEP Student’s Standard Accommodations: Timing and Scheduling Accommodations .....	324



Table J12. Frequency of English Language Learners Standard Accommodations: Presentation Accommodations .....	324
Table J13. Frequency of English Language Learners Standard Accommodations: Setting Accommodations .....	324
Table J14. Frequency of English Language Learners Standard Accommodations: Timing and Scheduling Accommodations .....	325
Table J15. Frequency of IEP Student’s Standard Accommodations: Presentation Accommodations .....	325
Table J16. Frequency of IEP Student’s Standard Accommodations: Response Accommodations .....	326
Table J17. Frequency of IEP Student’s Standard Accommodations: Setting Accommodations	326
Table J18. Frequency of IEP Student’s Standard Accommodations: Timing and Scheduling Accommodations .....	327
Table J19. Frequency of English Language Learners Standard Accommodations: Presentation Accommodations .....	327
Table J20. Frequency of English Language Learners Standard Accommodations: Setting Accommodations .....	327
Table J21. Frequency of English Language Learners Standard Accommodations: Timing and Scheduling Accommodations .....	327
Table K1. Reading Mean Scale Scores, Counts, and Scale Score Standard Deviations for IEP Students by Accommodation Status .....	328
Table K2. Mathematics Mean Scale Scores, Counts, and Scale Score Standard Deviations for IEP Students by Accommodation Status .....	328
Table K3. Science Mean Scale Scores, Counts, and Scale Score Standard Deviations for IEP Students by Accommodation Status .....	329
Table L1. Summary Statistics of Reading, Mathematics, and Science Scale Score by Grade...	330
Table L2. Summary Statistics of Reading Grade 3 Scale Score.....	331
Table L3. Summary Statistics of Reading Grade 4 Scale Score.....	331
Table L4. Summary Statistics of Reading Grade 5 Scale Score.....	332
Table L5. Summary Statistics of Reading Grade 6 Scale Score.....	332
Table L6. Summary Statistics of Reading Grade 7 Scale Score.....	333
Table L7. Summary Statistics of Reading Grade 8 Scale Score.....	333
Table L8. Summary Statistics of Mathematics Grade 3 Scale Score .....	334
Table L9. Summary Statistics of Mathematics Grade 4 Scale Score .....	334
Table L10. Summary Statistics of Mathematics Grade 5 Scale Score .....	335
Table L11. Summary Statistics of Mathematics Grade 6 Scale Score .....	335
Table L12. Summary Statistics of Mathematics Grade 7 Scale Score .....	336
Table L13. Summary Statistics of Mathematics Grade 8 Scale Score .....	336
Table L14. Summary Statistics of Science Grade 4 Scale Score.....	337

Table L15. Summary Statistics of Science Grade 8 Scale Score.....	337
Table M1. Reading Grade 3 Raw Score to Scaled Score .....	338
Table M2. Reading Grade 4 Raw Score to Scaled Score .....	340
Table M3. Reading Grade 5 Raw Score to Scaled Score .....	342
Table M4. Reading Grade 6 Raw Score to Scaled Score .....	344
Table M5. Reading Grade 7 Raw Score to Scaled Score .....	346
Table M6. Reading Grade 8 Raw Score to Scaled Score .....	348
Table M7. Mathematics Grade 3 Raw Score to Scaled Score .....	350
Table M8. Mathematics Grade 4 Raw Score to Scaled Score .....	352
Table M9. Mathematics Grade 5 Raw Score to Scaled Score .....	355
Table M10. Mathematics Grade 6 Raw Score to Scaled Score .....	358
Table M11. Mathematics Grade 7 Raw Score to Scaled Score .....	361
Table M12. Mathematics Grade 8 Raw Score to Scaled Score .....	364
Table M13. Science Grade 4 Raw Score to Scaled Score .....	367
Table M14. Science Grade 8 Raw Score to Scaled Score .....	369
Table N1. Performance Levels of Reading, Mathematics, and Science by Grade Revised .....	371
Table N2. Performance Levels of Reading by Grade 3 Demographic Subgroup.....	372
Table N3. Performance Levels of Reading by Grade 4 Demographic Subgroup.....	372
Table N4. Performance Levels of Reading by Grade 5 Demographic Subgroup.....	373
Table N5. Performance Levels of Reading by Grade 6 Demographic Subgroup.....	373
Table N6. Performance Levels of Reading by Grade 7 Demographic Subgroup.....	374
Table N7. Performance Levels of Reading by Grade 8 Demographic Subgroup.....	374
Table N8. Performance Levels of Mathematics by Grade 3 Demographic Subgroup .....	375
Table N9. Performance Levels of Mathematics by Grade 4 Demographic Subgroup .....	375
Table N10. Performance Levels of Mathematics by Grade 5 Demographic Subgroup .....	376
Table N11. Performance Levels of Mathematics by Grade 6 Demographic Subgroup .....	376
Table N12. Performance Levels of Mathematics by Grade 7 Demographic Subgroup .....	377
Table N13. Performance Levels of Mathematics by Grade 8 Demographic Subgroup .....	377
Table N14. Performance Levels of Science by Grade 4 Demographic Subgroup.....	378
Table N15. Performance Levels of Science by Grade 8 Demographic Subgroup.....	378

## LIST OF FIGURES

Figure 1. Sample item characteristic curve.....	68
Figure 2. Accuracy or Consistency around Critical Cut Point.....	86
Figure 3. Percentage of Proficient and Advanced Students for Grade 3 Reading.....	99
Figure 4. Percentage of Proficient and Advanced Students for Grade 4 Reading.....	100
Figure 5. Percentage of Proficient and Advanced Students for Grade 5 Reading.....	100
Figure 6. Percentage of Proficient and Advanced Students for Grade 6 Reading.....	101
Figure 7. Percentage of Proficient and Advanced Students for Grade 7 Reading.....	101
Figure 8. Percentage of Proficient and Advanced Students for Grade 8 Reading.....	102
Figure 9. Percentage of Proficient and Advanced Students for Grade 3 Mathematics.....	103
Figure 10. Percentage of Proficient and Advanced Students for Grade 4 Mathematics.....	104
Figure 11. Percentage of Proficient and Advanced Students for Grade 5 Mathematics.....	104
Figure 12. Percentage of Proficient and Advanced Students for Grade 6 Mathematics.....	105
Figure 13. Percentage of Proficient and Advanced Students for Grade 7 Mathematics.....	105
Figure 14. Percentage of Proficient and Advanced Students for Grade 8 Mathematics.....	106
Figure 15. Percentage of Proficient and Advanced Students for Grade 4 Science.....	107
Figure 16. Percentage of Proficient and Advanced Students for Grade 8 Science.....	108

# 1. OVERVIEW OF THE 2015 PAWS

## 1.1 Introduction

This report describes the technical characteristics of the 2015 Proficiency Assessments for Wyoming Students (PAWS). Primary purposes of the PAWS include improving teaching and learning, fostering school and program improvement, and measuring student performance indicators under the Wyoming Accountability in Education Act.

Beginning with the spring 2006 administration, PAWS became the official statewide assessment used to measure individual student achievement against the Wyoming Content and Performance Standards in English Language Arts and Mathematics at grades 3–8 and 11. The PAWS Reading and Mathematics tests meet all requirements of the No Child Left Behind Act of 2001 (NCLB). In 2008, a Science assessment was implemented at grades 4, 8, and 11.

The PAWS Writing test was discontinued beginning with the 2012 administration and was administered separately from the PAWS in 2013. The newly renamed SAWS program received further revision through the Select Committee on Education during 2011–2012. Current legislation (version C3 of EA90) required the state board to “establish a separate writing and language assessment to be implemented and administered statewide in school year 2014–2015 and each school year thereafter” (Section 3(a)).

Further legislative action, 2013 Wyoming State Enrolled Act 65, removed grade 11 from the 2013 PAWS and SAWS future administrations.

In 2012, the Wyoming State Board adopted the 2012 Wyoming Content Performance Standards (2012 WyCPS) in English Language Arts and Mathematics. ETS developed and field tested items in 2013 aligned to the 2012 WyCPS. The 2014 PAWS assessments utilize the 2012 WyCPS as reporting categories and have become the new scale measuring students’ academic performance.

Further legislative action in 2015, Wyoming State Enrolled Act 50, removed SAWS from the 2015 and future administrations.

## 1.2 Background of PAWS

In the spring of 2006, the Proficiency Assessments for Wyoming Students (PAWS) in reading, writing, and mathematics were administered for the first time to Wyoming students in grades 3–8 and 11. Wyoming statutes require that a statewide assessment system shall be substantially aligned with the uniform education program and student content and performance standards imposed by law and by board rule and regulation (§21-2-304 (a)(v)(A)).

In early 2003, the Wyoming State Legislature established the *Wyoming Statewide Task Force on Student Assessment and Education Accountability* and provided two central charges to this group. The legislature asked that the Task Force:

1. Recommend modifications, if necessary, to Wyoming's statewide assessment system to improve teaching and learning and foster school improvement; and
2. Recommend an accountability system with consequences assisting in meeting NCLB's accountability requirements while maintaining uniformity and quality of state standards.

Staff of the Wyoming Department of Education (WDE) served in an advisory capacity to this group. The 13-member Task Force included one district superintendent; five administrators; two members of the Wyoming legislature; two teachers; a parent; and the editor of the *Casper Star Tribune* newspaper. In October 2003, *The Wyoming Statewide Task Force on Student Assessment and Education Accountability Report and Recommendations* set forth various suggestions to the WDE for consideration as the new assessment system was designed.

The task force recommended a statewide assessment system that would include, among other things, the following:

- A summative assessment that would maintain some, but not all, of the features of the Wyoming Comprehensive Assessment System (WyCAS) and that would satisfy the core requirements of the NCLB related to standards, assessments, and accountability;
- Comparability of scores *across* grades to allow for meaningful evaluation of individual student performance and progress as that student moves from grade to grade while also allowing for meaningful within-grade comparisons from year to year;
- Embedded tools and assessments in Reading, Writing, and Mathematics (and possibly Science) that would: be developed and implemented over time; be based on ongoing research and evaluation; fit within existing district assessment systems; be administered periodically during the school year preceding the summative assessment; inform instructional strategies; assist in improving student learning during the year; and supplement summative assessment results;
- Use of the *National Assessment of Educational Progress* (NAEP) results for the state to provide national comparison data; and

- Timely and meaningful feedback to educators, parents, and students regarding student, school, district, and state performance, which could improve teaching and learning over the course of the school year.

As a result, PAWS replaced WyCAS as the statewide accountability assessment. The WyCAS was initially designed to comply with the provisions of the 1994 reauthorization of the ESEA, the *Improving America's Schools Act (IASA)*. With the introduction of the PAWS, the WDE has not only implemented an assessment system that meets the accountability requirements of NCLB, but one that also provides the data necessary to inform instructional decision-making by Wyoming classroom teachers to address the specific academic needs of students.

In 2012, Wyoming adopted the Common Core standards for English Language Arts and Mathematics, henceforth called 2012 WyCPS. The statutes read:

“W.S. 21-2-304(a)(iii) - By rule and regulation and in consultation with local school districts, prescribe uniform student content and performance standards for the common core of knowledge and the common core of skills specified under W.S. 21-9-101(b), and promulgate uniform standards . . .

W.S.21-2-304(c) - The state board shall perform an ongoing review of state board duties prescribed by law and may make recommendations to the legislature on board duties. In addition and not less than once every five (5) years, the board shall evaluate and review the uniformity and quality of the content and performance standards imposed under W.S. 21-9-101 and 21-9-102 and the student content and performance standards promulgated under paragraph (a)(iii) of this section . . .”

To comply with this legislative action, the WDE piloted 2012 WyCPS-aligned items in spring 2013. These embedded field test items were administered across the state in grades 3 through 8 for reading and mathematics. New vertical scales for Reading and Math were established and approved by the WDE in May 2014. A standard setting for 2014 PAWS Reading and Mathematics assessments was conducted in July 2014, establishing the performance standards.

### *1.3 Overview of PAWS Test Components*

The entire assessment program administered in 2015 consisted of the following components:

- PAWS Reading, Mathematics, and Science assessments

The test design for the spring 2015 administration of the PAWS included content area assessments in reading, mathematics, and science. For reading, mathematics and science, each

test had two to three sessions. Multiple choice items were administered via pencil and paper in a consumable test booklet for students in grades 3-5 and via a separate answer document for students in grades 6-8.

#### 1.4 Overview of the PAWS Design

As stated above, the intent of the PAWS assessment is not only to meet the accountability requirements of NCLB and the Wyoming Accountability in Education Act, but also to inform teaching, learning, and school improvement activities.

Therefore, PAWS was conceptually constructed around an instructionally supportive design to include clear targets for instruction and informative reporting categories.

The PAWS assessment was used to measure individual student achievement against the newly adopted 2012 WyCPS in English language arts (ELA) and mathematics. The Wyoming Content and Performance Standards outline knowledge and skills students are expected to acquire at each grade in order to succeed in school and at work.

The PAWS Science provides additional skill-level reporting categories aligned to the Wyoming Content and Performance Standards as organized by the Wyoming Assessment Descriptions to assist teachers in interpreting and addressing specific academic needs of students.

Assessment results provide important information to all facets of the school community. Policymakers, administrators, teachers, students, and parents all use assessment information for a variety of purposes. Collectively, these users make decisions about how well students are achieving, whether schools are functioning effectively for each child, and whether they are functioning well for all children collectively.

PAWS results are particularly intended to help educators make informed decisions about curriculum and instruction. Since PAWS is aligned to academic content and student performance standards, its results can reveal weaknesses and strengths in curricula or instructional methodology. Thus, they can also help educators target specific areas necessary for school and district improvement.

#### 1.5 State Policy on Student Participation

With two exceptions, all public school students in grades 3 through 8 must participate in the regular PAWS if they receive any instruction on Wyoming state academic standards. The only exceptions are for students with significant cognitive disabilities who meet Wyoming Alternate Assessment participation guidelines and ELL students who have been in the United States for less than a full year. The exemption for ELL students is only for the reading component of PAWS. They are required to take the mathematics and science portions of PAWS, but may take

the Wyoming English proficiency assessment as a substitution for the ELA/Reading portions of PAWS. Additionally, students who are expelled during the test window and students who are educated in residential institutions outside of Wyoming do not participate in statewide assessments.

Students with significant cognitive disabilities were required to take the Wyoming Alternate Assessment for Students with Significant Cognitive Disabilities (Wy-ALT). All students will participate in the state accountability assessment program in one of three ways:

- Participation in PAWS regular assessment without accommodation
- Participation in PAWS regular assessment with accommodation
- Participation in Wy-ALT

#### *1.5.1 Students with Disabilities, 504 Plans, and English Language Learners*

Following are procedures and practices related to the participation in the statewide assessments of students with disabilities, students who have 504 Plans, and students with limited English proficiency in the statewide assessments:

Students with disabilities participate with appropriate accommodations based on each student's Individualized Education Program (IEP) team's recommendation. Students with 504 Plans and English Language Learners (ELL) also take the PAWS.

Some students with disabilities, for whom even the PAWS with accommodations is inappropriate, participate in the WY-ALT as provided for by a student's IEP. The PAWS are intended to include all of the public school students in Wyoming. However, students with the most significant cognitive disabilities are assessed using the Wy-ALT under the provisions of Individuals with Disabilities Education Act or Section 504 of the Rehabilitation Act. The decision for participation in the Wy-ALT is made on an individual basis according to professional judgments of the IEP team. Corresponding documentation for is required.

School districts may not exempt ELL students from the assessment, except for students who are in their first year of school in the United States. Only students who are in their first year may take the Wyoming ELL assessment (ACCESS for ELLs) instead of the reading component of PAWS, but they are not exempt from the mathematics and science tests. The Wyoming ELL assessment measures English language academic proficiency.

Tables 1 through 3 provide data on the numbers of students tested in 2015. Additional information can be found on the WDE website: <http://edu.wyoming.gov/default.aspx>.



Table 1. Statewide Participation in Reading PAWS

	Grade 3		Grade 4		Grade 5		Grade 6		Grade 7		Grade 8	
	N	%	N	%	N	%	N	%	N	%	N	%
Total	7541	100	7316	100	6966	100	7102	100	6766	100	6788	100
Male	3913	51.9	3661	50.0	3625	52.0	3683	51.9	3517	52.0	3507	51.7
Female	3624	48.1	3649	49.9	3334	47.9	3419	48.1	3249	48.0	3281	48.3
Unknown	4	0.1	6	0.1	7	0.1						
American Indian/Alaska Native	272	3.6	293	4.0	257	3.7	267	3.8	269	4.0	226	3.3
Asian	57	0.8	56	0.8	65	0.9	69	1.0	56	0.8	53	0.8
African American	74	1.0	74	1.0	89	1.3	72	1.0	71	1.0	78	1.1
Native Hawaiian or other/Pacific Islander	10	0.1	11	0.2	8	0.1	8	0.1	12	0.2	16	0.2
Hispanic/Latino	1029	13.6	1090	14.9	960	13.8	956	13.5	926	13.7	920	13.6
White	5943	78.8	5613	76.7	5429	77.9	5575	78.5	5295	78.3	5352	78.8
Multiracial	145	1.9	159	2.2	148	2.1	145	2.0	134	2.0	135	2.0
Unknown	11	0.1	20	0.3	10	0.1	10	0.1	3	0.0	8	0.1
Free/Reduced Lunch	2773	36.8	2615	35.7	2505	36.0	2446	34.4	2293	33.9	2317	34.1
Not Free/Reduced Lunch	4768	63.2	4701	64.3	4461	64.0	4656	65.6	4473	66.1	4471	65.9
Special Education	996	13.2	967	13.2	964	13.8	907	12.8	808	11.9	774	11.4
Not Special Education	6545	86.8	6349	86.8	6002	86.2	6195	87.2	5958	88.1	6014	88.6
English Language Learner	304	4.0	205	2.8	130	1.9	104	1.5	139	2.1	138	2.0
Not English Language Learner	7237	96.0	7111	97.2	6836	98.1	6998	98.5	6627	97.9	6650	98.0

Table 2. Statewide Participation in Mathematics PAWS

	Grade 3		Grade 4		Grade 5		Grade 6		Grade 7		Grade 8	
	N	%	N	%	N	%	N	%	N	%	N	%
Total	7547	100	7319	100	6975	100	7107	100	6767	100	6802	100
Male	3915	51.9	3663	50.0	3630	52.0	3687	51.9	3519	52.0	3519	51.7
Female	3627	48.1	3648	49.8	3338	47.9	3420	48.1	3248	48.0	3283	48.3
Unknown	5	0.1	8	0.1	7	0.1						
American Indian/Alaska Native	274	3.6	292	4.0	256	3.7	268	3.8	268	4.0	225	3.3
Asian	57	0.8	56	0.8	68	1.0	70	1.0	57	0.8	54	0.8
African American	76	1.0	75	1.0	90	1.3	71	1.0	71	1.0	78	1.1
Native Hawaiian or other/Pacific Islander	11	0.1	10	0.1	8	0.1	9	0.1	12	0.2	17	0.2
Hispanic/Latino	1033	13.7	1097	15.0	967	13.9	965	13.6	928	13.7	933	13.7
White	5933	78.6	5611	76.7	5427	77.8	5570	78.4	5293	78.2	5352	78.7
Multiracial	146	1.9	160	2.2	148	2.1	145	2.0	135	2.0	135	2.0
Unknown	17	0.2	18	0.2	11	0.2	9	0.1	3	0.0	8	0.1
Free/Reduced Lunch	2772	36.7	2609	35.6	2513	36.0	2452	34.5	2292	33.9	2323	34.2
Not Free/Reduced Lunch	4775	63.3	4710	64.4	4462	64.0	4655	65.5	4475	66.1	4479	65.8
Special Education	998	13.2	950	13.0	962	13.8	907	12.8	808	11.9	773	11.4
Not Special Education	6549	86.8	6369	87.0	6013	86.2	6200	87.2	5959	88.1	6029	88.6
English Language Learner	308	4.1	205	2.8	135	1.9	110	1.5	140	2.1	146	2.1
Not English Language Learner	7239	95.9	7114	97.2	6840	98.1	6997	98.5	6627	97.9	6656	97.9

Table 3. Statewide Participation in Science PAWS

	<u>Grade 4</u>		<u>Grade 8</u>	
	<i>N</i>	%	<i>N</i>	%
Total	7307	100	6790	100
Male	3655	50.0	3513	51.7
Female	3645	49.9	3277	48.3
Unknown	7	0.1		
American Indian/Alaska Native	290	4.0	222	3.3
Asian	56	0.8	54	0.8
African American	74	1.0	78	1.1
Native Hawaiian or other/Pacific Islander	10	0.1	17	0.3
Hispanic/Latino	1096	15.0	927	13.7
White	5609	76.8	5349	78.8
Multiracial	159	2.2	135	2.0
Unknown	13	0.2	8	0.1
Free/Reduced Lunch	2605	35.7	2322	34.2
Not Free/Reduced Lunch	4702	64.3	4468	65.8
Special Education	952	13.0	771	11.4
Not Special Education	6355	87.0	6019	88.6
English Language Learner	204	2.8	144	2.1
Not English Language Learner	7103	97.2	6646	97.9

## 2. VALIDITY

### 2.1 Overview

Validity refers to the degree to which each interpretation or use of a test score is supported by evidence that is gathered (American Educational Research Association [AERA], American Psychological Association [APA], and National Council on Measurement in Education [NCME], 2014; ETS, 2015). It is a central concern underlying the development, administration, and scoring of a test and the uses and interpretations of test scores.

Validation is the process of accumulating evidence to support each proposed score interpretation or use. It does not involve a single study or gathering one particular kind of evidence. Validation involves multiple investigations and various kinds of evidence (AERA, APA, and NCME, 2014; Cronbach, 1971; ETS, 2015; Kane, 2006). The process begins with test design and continues through the entire assessment process including item development and field testing, analyses of item and test data, test scaling, scoring, and score reporting.

In this section, the evidence gathered is presented to support the intended uses and interpretations of scores for the PAWS assessment program. The description is organized in the manner prescribed by *The Standards for Educational and Psychological Testing* (AERA, APA, and NCME, 2014). These standards require a clear definition of the purpose of the test, which includes a description of the qualities called constructs that are to be assessed by a test, the population to be assessed, as well as how the scores are to be interpreted and used.

In addition, the *Standards* identify five kinds of evidence that can provide support for score interpretations and uses, which are as follows:

- Evidence based on test content;
- Evidence based on relations to other variables;
- Evidence based on response processes;
- Evidence based on internal structure; and
- Evidence based on the consequences of testing.

These kinds of evidence are also defined as important elements of validity information in documents developed by the U.S. Department of Education for the peer review of testing programs administered by states in response to the Elementary and Secondary Education Act (USDOE, 2001).

The next section defines the purpose of the PAWS assessments, followed by a description and discussion of the kinds of validity evidence that have been gathered.

### *2.1.1. Purpose of the PAWS*

The purposes of the PAWS are multifold, as outlined in Chapters 1 and 3. The assessment is intended to comply with federal and state mandates, to inform ongoing instruction, and to help teachers plan instruction for the following year. Additionally, the PAWS in grades 3 through 8 is used in determining Adequate Yearly Progress (AYP) that applies toward meeting the requirement of the federal No Child Left Behind (NCLB) Act of 2001.

### *2.1.2. The Constructs to Be Measured*

The PAWS is designed to show how well students perform relative to the Wyoming content standards. These content standards describe what students should know and be able to do at each grade level.

Test blueprints and specifications define the procedures used to measure the content standards. These documents also provide an operational definition of the construct to which each set of standards refers. That is, they define, for each subject area the content to be assessed, the tasks to be presented, the administration instructions to be given, and the rules used to score examinee responses. They control as many aspects of the measurement procedure as possible so that the testing conditions will remain the same over test administrations (Cronbach, 1971; Cronbach, Gleser, Nanda, and Rajaratnam, 1972) in order to minimize construct irrelevant score variance (Messick, 1989). The content blueprints for the PAWS can be found in Chapter 3, Appendix A, and on the WDE Web page at <http://edu.wyoming.gov/educators/assessment/paws/>. ETS has developed all PAWS test items to conform to the Wyoming content standards and test blueprints.

### *2.1.3. The Interpretations and Uses of the Scores Generated*

Total scores expressed as scale scores, student performance levels, and subscores for each reporting cluster are generated for each subject area test. Based on a student's total score, an inference is drawn about how much knowledge and skill in the subject area the student has. The total score is also used to classify students in terms of their level of knowledge and skill in the subject area. These levels are called performance levels and are as follows: advanced, proficient, basic, and below basic.

Subscore results compare an individual student's scale score to the average scale score for the state as a whole. Subscores should be cautiously used to draw inferences about a student's achievement in each of several specific knowledge or skill areas covered by each test. There are limitations to the inferences drawn from the subscores by domain, given that there are relatively few items addressing each domain. A detailed description of the uses and applications of PAWS scores is presented in Chapter 7. Examples of individual student reports are provided in Appendix B showing the report for reading and mathematics for grades 3, 5, 6, and 7 and Appendix C demonstrating the reading, mathematics, and science for grades 4 and 8.

The tests that make up the PAWS assessments provide results or score summaries that are used for different purposes. The four major purposes are:

1. Communicating with parents and guardians;
2. Informing decisions needed to support student achievement;
3. Evaluating school programs; and
4. Providing data for state and federal accountability programs for schools.

These are the only uses and interpretations of scores for which validity evidence has been gathered. If the user wishes to interpret or use the scores in other ways, the user is cautioned that the validity of doing so has not been established. The user is advised to gather evidence to support these additional interpretations or uses (AERA, APA, and NCME, 2014, Standard 1.4).

#### *2.1.4. Intended Test Population(s)*

Wyoming public school students are the intended test population for the PAWS. Students in grades 3–8 are tested in reading and mathematics. In addition, students in grades 4 and 8 take a grade-level science test. Section 1.5 provides details regarding state policy for student participation. Further details regarding student participation and accommodations can be found in Chapter 4.

### *2.2 Evidence Based on Content-related Validity*

According to the AERA, APA, and NCME's *Standards for Educational and Psychological Testing* (2014), analyses that demonstrate a strong relationship between a test's content and the construct that the test was designed to measure can provide important evidence of validity. In current K–12 testing, the construct of interest usually is operationally defined by state content standards and the test blueprints that specify the content, format, and scoring of items that are admissible measures of the knowledge and skills described in the content standards. Evidence that the items meet these specifications and represent the domain of knowledge and skills referenced by the standards supports the inference that students' scores on these items can be appropriately regarded as measures of the intended construct.

As noted in the AERA, APA, and NCME's *Standards for Educational and Psychological Testing* (2014), evidence based on test content may involve logical analyses of test content in which experts judge the adequacy with which the test content conforms to the test specifications and represents the intended domain of content. Such reviews can also be used to determine whether the test content contains material that is not relevant to the construct of interest. Analyses of test content may also involve the use of empirical evidence of item quality.

The procedures used for test administration and test scoring are also to be considered in evaluating test content. As Kane (2006, p. 29) has noted, although evidence that appropriate administration and scoring procedures have been used does not provide compelling evidence to

support a particular score interpretation or use, such evidence may prove useful in refuting rival explanations of test results. Evidence based on content includes the following:

#### *2.2.1. Description of the state standards*

As was noted in Chapter 1, Wyoming adopted rigorous content standards in 2008 for science. In 2012, the Wyoming State Legislature adopted the 2012 WyCPS for the PAWS assessment program for reading and mathematics. These standards, which are the Common Core State Standards, were designed to guide instruction and learning for all students in the state and to bring Wyoming students to world-class levels of achievement.

#### *2.2.2. Specifications and Blueprints*

ETS maintains item development specifications for each PAWS assessment. The item specifications describe the characteristics of the items that should be written to measure each content standard. A thorough description of the specifications can be found in Chapter 3. Once the items are developed, ETS selects all PAWS items to conform to the Wyoming content standards and test blueprints. Test blueprints for the components of the PAWS assessments were proposed by ETS and reviewed and approved by the WDE. There has been only one change in the blueprints for the PAWS with the removal of constructed response items. The content blueprints for the PAWS can be found in Chapter 3, Appendix A, and on the WDE Web page at <http://edu.wyoming.gov/educators/assessment/paws/>.

#### *2.2.3. Item development process*

A detailed description of the content and psychometric criteria applicable to the construction of the 2015 PAWS is presented in Chapter 3.

#### *2.2.4. Item review process*

Chapter 3 explains in detail the extensive item review process applied to items written for use in the PAWS. In brief, items written for the PAWS go through multiple review cycles and involve multiple groups of reviewers, including Wyoming teachers.

#### *2.2.5. Form construction process*

For each test, the content standards, blueprints, and test specifications are used as the basis for choosing items. Additional targets for item difficulty that are used for test construction were defined in light of what are desirable statistical characteristics in test items and statistical evaluations of the PAWS items. Guidelines for test construction were established with the goal of maintaining parallel forms to the greatest extent possible from year to year. Details can be found in Chapter 3.

#### *2.2.6. Alignment study*

Strong alignment between standards and assessments is fundamental to meaningful measurement of student achievement and instructional effectiveness. Alignment results should demonstrate

that the assessments represent the full range of the content standards and that these assessments measure student knowledge in the same manner and at the same level of complexity as expected in the content standards. The alignment study for the PAWS Science assessment was completed in previous years to the present administration and recommendations from those studies incorporated into current item and test development processes (for details please refer to past years' editions of the PAWS technical reports). Alignment studies for PAWS reading and mathematics are expected to be completed in the next two years.

### 2.3 Evidence Based on Relations to Other Variables

Empirical results concerning the relationships between scores on a test and measures of other variables external to the test can also provide evidence of validity when these relationships are found to be consistent with the definition of the construct that the test is intended to measure. As indicated in the *Test Standards* (AERA, APA, and NCME, 2014), the variables investigated can include other tests that measure the same construct and different constructs, criterion measures that scores on the test are expected to predict, as well as demographic characteristics of examinees that are expected to be related and unrelated to test performance.

#### *2.3.1. Correlations between Content Areas*

To the degree that students' content area scores correlate as expected, evidence of the validity in regarding those scores as measures of the intended constructs is provided. PAWS Reading, Mathematics, and Science tests and subscale inter-correlations are presented in Appendix D. There are strong relationships between the PAWS Reading, Mathematics, and Science scores. In the grades where science was tested, it tended to be more strongly related to both reading and mathematics than reading was to mathematics, though the average difference was small. For reading, this was probably because the science items were tied to common passages rather than being discrete and independent items, thus requiring more reading ability. For mathematics, science items often involve mathematical functions or terms, thus giving students with higher levels of mathematical ability an advantage in answering them. The strong relationships between the scaled scores for reading, mathematics, and science support the validity of the PAWS assessments. Taken together, they can be seen as measuring scholarship or academic achievement, and they tend to co-vary together as would be expected. All can be seen to have strong relationships with the other subscales within each of the subjects, indicating that the subscales are measuring different yet related areas of knowledge.

#### *2.3.2. Differential Item Functioning Analyses*

Analyses of DIF can provide evidence of the degree to which a score interpretation or use is valid for individuals who differ in particular demographic characteristics. For PAWS assessments, DIF analyses were performed on all field-test items for which sufficient student samples were available.



The results of the DIF analyses are presented in Appendix E. The vast majority of the items exhibited little or no significant DIF, suggesting that, in general, scores based on the PAWS items would have the same meaning for individuals who differed in their demographic characteristics. Due to small case counts, DIF analyses for ethnicities were not performed.

#### 2.4 Evidence Based on Response Processes

As noted in the AERA, APA, and NCME's *Standards for Educational and Psychological Testing* (2014) additional support for a particular score interpretation or use can be provided by theoretical and empirical evidence indicating that examinees are using the intended response processes when responding to the items in a test. This evidence may be gathered from interacting with examinees in order to understand what processes underlie their item responses. Finally, evidence may also be derived from feedback provided by observers or judges involved in the scoring of examinee responses.

Prior to the transition to the 2012 WyCPS, the WDE and ETS determined the need for new items and new item types in order to align the test blueprint with the new curriculum standards. Aligning the new PAWS Grades 3-8 Reading and Mathematics assessment blueprints to the 2012 WyCPS is part of the chain of validity evidence supporting assessment of standards to measure student progress. To assess the appropriateness of the new items and item types for Wyoming students, ETS conducted a series of cognitive labs to learn how students in grades 3, 5 and 8 responded to a sample of the items under development. Results from the cognitive labs study provide diagnostic feedback and support for subsequent item development. The cognitive labs were conducted in two phases, the first in December 2012 and the second in March 2013. A full report is under review and will be submitted to the WDE in September 2015.

The main findings from the cognitive lab were as follows.

- The items seemed to differentiate student math performance well. Item elicited a range of student responses with some students having difficulty and others answering with little difficulty.
- Student mistakes in math were most often due to being unfamiliar with the math concepts.
- For reading, on the whole, the students had no problems reading the passages and understanding what the questions were asking.
- Students appeared to understand the need to refer to the text to support their answers, but did not always do so successfully (i.e., they misremembered or misinterpreted the text).
- Students in Grade 3 were more successful reading and answering questions on the narrative passage compared to informational passage.

The results of the study, including all completed summary templates, were shared with the assessment development team for review. The assessment development experts found the results mostly confirmed their expectations of how students would respond to the new items. Furthermore, the cognitive labs did not identify specific problems with the items that needed to be corrected.

### 2.5 Evidence Based on Internal Structure

As suggested by the *Standards* (AERA, APA, and NCME, 2014), evidence of validity can also be obtained from studies of the properties of the scores and the relationship between these scores and scores on components of the test. To the extent that the score properties and relationships found are consistent with the definition of the construct measured by test, support is gained for interpreting these scores as measures of the construct.

For the PAWS, it is assumed that a single construct underlies the total scores obtained on each test. Evidence to support this assumption can be gathered from the results of item analyses, evaluations of internal consistency, and studies of model-data fit, dimensionality, and reliability.

With respect to the subscores that are reported, these scores are intended to reflect examinees' knowledge and/or skill in an area that is part of the construct underlying the total test. Analyses of the intercorrelations among the subscores themselves and between the subscores and total test score can be used for this purpose. Information about the internal consistency of the items on which each subscore is based is also useful and is provided in Section 8.2.

#### *2.5.1. Classical Statistics*

Point biserial correlations calculated for the items in a test show the degree to which the items discriminate between students with low and high scores on a test. To the degree that the correlations are high, evidence that the items assess the same construct is provided. The point biserials for the items in the PAWS are presented in Appendices J (field test) and K (operational).

Also germane to the validity of a score interpretation are the ranges of item difficulty for the items on which a test score will be based. The finding that items have difficulties spanning the range of examinee ability provides evidence that the items adequately measures examinees at all levels of ability. Information on average item score (i.e.,  $p$ -values) is given in Appendices J (field test) and K (operational); the distributions of item  $b$ -values are given in Appendices L (field test) and M (operational). A description of  $p$ -values and item means can be found in Section 3.7.1.1. Item Difficulty. Section 3.7.3. Item Response Theory (IRT) Analysis and Chapter 6 provide details about  $b$ -values.

### 2.5.2. Reliability

Reliability is a prerequisite for *validity*. The finding of reliability in student scores supports the validity of the inference that the scores reflect a stable construct. This section will describe briefly findings concerning the total test reliability, as well as reliability results for the reporting clusters.

**Overall reliability**—The reliability analyses on each of the PAWS assessments are presented in Chapter 8. The results indicate that the reliabilities for all PAWS were medium-high to high, ranging from 0.88 to 0.93.

**Reliability of performance classifications**—The methodology used for estimating the reliability of classification decisions is described in section 8.6, Accuracy and Consistency of Classifications. These levels of accuracy and consistency are high, and they are consistent with levels seen in previous years.

### 2.5.3. Dimensionality

Measurement using IRT implies order and magnitude on a single dimension (Andrich, 1989). However, unidimensionality cannot be strictly met in a real testing situation because students' cognitive, personality, and test-taking factors usually have a unique influence on their test performance to some level (Andrich, 1988; Hambleton, Swaminathan, and Rogers, 1991). Consequently, what is required for unidimensionality to be met is an investigation of the presence of a dominant factor that influences test performance. If present, this dominant factor can be considered to be the ability measured by the test (Andrich, 1988; Hambleton et al., 1991; Ryan, 1983). The results of science dimensionality studies were provided in the 2012 PAWS Technical Report. The PAWS Reading and Mathematics dimensionality study is planned for 2015–2016 administration.

## 2.6 Evidence Based on Consequences of Testing

As observed in the AERA, APA, and NCME's *Standards for Educational and Psychological Testing* (2014), tests are usually administered "with the expectation that some benefit will be realized from the intended use of the scores" (p. 18). When this is the case, expected benefits evidence will provide support for intended use of the scores. The WDE and ETS are in the process of determining what kinds of information can be gathered to assess the consequences of administration of the PAWS. One source of information for this purpose is the recently completed *Instructional Impact Study* (Baron, 2015).

During the transition to the 2012 WyCPS; hereafter referred to as the *new standards* and the 2006 standards-aligned PAWS, the WDE commissioned the *Instructional Impact Study*. The purpose of the study was to investigate the experience of Wyoming teachers, principals and curriculum directors (hereafter referred to as *educators*) during transition and implementation of

the new standards. Development of the survey was informed by teacher focus groups, the Wyoming Technical Advisory Committee and staff from the Assessment and Standards teams of the WDE. The survey included selected-response and open-ended questions and focused on educators' perspectives with respect to the timing of the implementation, professional support and resource availability, materials alignment, and student struggles during the transition. Results include comments collected from survey respondents and focus group participants.

Educators indicated that they understand that the PAWS is aligned to the new standards, and teachers described some frustration during the transition period due to a need for aligned curriculum, materials and classroom assessments. Principals and curriculum directors are experiencing a process of transition versus teachers who are experiencing a more immediate impact when standards are adopted. The evidence indicates that leadership has been working on re-writing curriculum, trying to better understand the standards, align curriculum within and across grades. Meanwhile the teachers in the classrooms are aware that the transition to the new standards will get easier over time; they are experiencing some struggles in the process. Students at the higher grades have not had the scope and sequence that is expected at the grade level; teachers' experiences across districts differ from each other, and this adds to the frustration during the transition period. Some teachers remarked that finding materials during the multi-year transition is getting easier, but many noted that they need more time and better materials to successfully implement the new standards. The results of the impact study may provide some indication of district-level differences in progress toward full implementation, and alignment of PAWS to the 2012 WyCPS will allow some measurement of student progress during the transition period.

## 3. PAWS TEST DESIGN AND DEVELOPMENT

### 3.1 Overview

The Wyoming PAWS statewide assessments adhere to the principles of sound and ethical test construction set forth in the *Standards for Educational and Psychological Testing* (AERA, 2014). These assessments comply with the requirements of NCLB (P.L. 107–110) and were designed to provide teachers with information to improve instruction based on the Wyoming Content and Performance Standards.

### 3.2 Test Design and Blueprints

#### *3.2.1. Purpose*

Standards-based educational reform began in Wyoming in 1997–98, with adoption of rigorous academic content standards in language arts,<sup>1</sup> mathematics, science, and social studies.<sup>2</sup> Wyoming educators have continued the other earlier efforts to implement standards-based curriculum and assessment to meet the goals of improving teaching and the academic achievement of all of our students.

In 2004, the Wyoming Legislature passed a law describing the purpose and implementation of a statewide assessment system (§21-2-304) in order to meet the requirements of NCLB.<sup>3</sup> As a result, PAWS became the official instrument for measuring individual student achievement. Results of student achievement are reported at the student level and aggregated at the grade, school, district, and state levels. As previously noted, the primary purpose of the PAWS is to foster program improvement at the school, district, and state levels that supports the teaching and learning that takes place in Wyoming public classrooms. The construction of PAWS also ensures that it meets NCLB requirements. Improvement of teaching and learning in schools and fostering school program improvement are the primary purposes of statewide assessment of student performance in Wyoming.

To achieve these goals, the first step taken by the WDE in early 2004 was to contract Dr. Robert Marzano to evaluate the Wyoming Content and Performance Standards with the intent of developing an organizing framework for reading, writing, and mathematics content. The second step was to empanel content experts from around the state to review and revise Dr. Marzano's

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<sup>1</sup> As previously noted, Wyoming tests only the Reading Language Arts Standards.

<sup>2</sup> Social studies is not presently tested in the PAWS assessments.

<sup>3</sup> The decision was made based on the recommendations of the Wyoming Statewide Task Force on Student Assessment and Education Accountability.

work. The major purpose of this exercise was the support of an assessment design that measured integrated concepts and skills. The WDE undertook this challenging task in order to better promote student learning of clear and rigorous content.

The documents were open to public comment during the fall of 2004 and again in 2012 for the 2012 WyCPS. From these documents arose the guiding principle of the design of PAWS as an assessment focused on powerful, content-subsuming cognitive skills and not on isolated collections of information. Thus, the knowledge, skills, and the expectation of Wyoming student performance as envisioned by Wyoming teachers and the Wyoming Content and Performance Standards led to the development of the PAWS blueprints and specifications.

### *3.2.2. Plan*

The first step in test development is to create item and test specifications. WDE's test specifications reflect skill expectations that are outlined in Wyoming's Content and Performance Standards. These item specifications established guidelines for selecting test content and writing test items. For PAWS, the specifications determined both the composition of the item pool and the rules for item development and selection.

The academic content and skills measured by a test and distributions of emphasis are set forth in the test blueprints and test specifications along with the number of points possible in each category. The test blueprints and test specifications were developed by content specialists of the Wyoming Department of Education and staff at ETS, based on the Wyoming Content and Performance Standards.

Wyoming considers a test blueprint to be a detailed plan for building test forms. The blueprint and specifications include:

- Knowledge and skills as specified in the reading, mathematics, science, and writing standards to be tested
- Number of items and points per test form
- Percentage and/or number of items and points per content standard
- Distribution of multiple item types (multiple choice and constructed response)
- Proposed distribution of items by cognitive complexity, i.e., percentage of items with low, moderate, or high levels of cognitive complexity
- Approximate time requirements for each assessment

### 3.3 Types of Items Used in PAWS

Consistent with Wyoming state law, legislation passed in 2013 [Enrolled Act 90, The Wyoming Accountability in Education Act] modified this requirement; beginning with the 2014 administration, the PAWS assessments were composed solely of multiple choice items for the PAWS assessments. Each item measures a single skill-reporting category within a content standard. Multiple-choice items have four response options and do not use “none of the above” or “all of the above” as response options. Reading and science items are grouped together into item sets that refer to a common passage.

The PAWS assessment is used to measure individual student achievement against the 2012 WyCPS in Reading and Mathematics. For Science, the Wyoming Content and Performance Standards adopted in 2008 remain in place. From 2012 to 2014, PAWS Reading and Mathematics blueprints were revised and test items developed to better align these assessments with the 2012 WyCPS. The newly developed blueprints are detailed in Appendix A.

The Wyoming Content and Performance Standards identify knowledge and skills students are expected to acquire at each grade in order to succeed in school and at work. It is important to develop items that elicit the complexity of knowledge required to meet these objectives. The degree of challenge on PAWS items is categorized based on Dr. Norman Webb’s work with Depth of Knowledge levels (Webb, 2005). The categories *low complexity*, *moderate complexity*, and *high complexity* form an ordered description of the cognitive load involved in responding to the item.

#### *3.3.1. PAWS Reading Tests*

The Wyoming Language Arts Content and Performance Standards include an expectation that all students will become effective readers, writers, listeners, and speakers. However, due to the limitations of large-scale testing and the desire to minimize student time spent on testing, the Wyoming Legislature determined that only reading will be assessed by PAWS (Beginning in 2014, the reconfigured writing test was removed from the PAWS assessment. In 2015, Enrolled Act 50 removed the writing test from the statewide assessment system altogether). The 2012 WyCPS requires schools and districts to include instruction and monitoring of student achievement in the areas of listening, speaking, and writing, but these measures are not included in the state’s determinations of school quality as measured by federal or state accountability.

The PAWS reading assessment is designed to measure the reading content standard requiring that students use the reading process to apply a variety of comprehension strategies and demonstrate an understanding of literary and informational text. Testing of Wyoming students’ reading comprehension skills relative to the reading proficiency goals required to meet the standards is one component of the PAWS. Students were tested in reading at grades 3 through 8.

Reading concepts were measured by requiring students to examine texts with accuracy, to make relevant connections, and to support their inferences.

The structure of the operational 2015 PAWS Reading test was based on the 2014 PAWS Reading Blueprint (see Appendix A). The content of the test is aligned to the reading content standards of the Wyoming Language Arts Content and Performance Standards. The PAWS assessment is designed to assess overall literacy skills in the following skill-reporting categories:

- Determine information's relevance and importance, and select and apply information for a task within a functional text;
- Understand main points and supporting details, recognize expository organization and its use, and see relationship of text's content to broader issues/topics within an expository text; and
- Identify the development of basic story elements, understand a story's plot development, and identify a story's theme(s) and its (their) development within a narrative text.

Four content standards are assessed for each grade for grades 3–8:

- Reading Literature
- Reading Informational Text
- Integration of Knowledge and Ideas
- Language

Within the Content Standards of *Reading Literature* and *Reading Informational Text*, there are four benchmarks for each grade for grades 3–8: Key Ideas and Details, Craft and Structure, Integration of Knowledge and Ideas, and Range of Reading and Level of Text Complexity. There are no additional benchmarks for the Content Standard of *Language*.

The 2014–2015 PAWS Reading blueprints and reporting categories for each of the grade levels are provided in Appendix A. As noted in the blueprints, the percentage of assessment coverage of text type reflects the emphasis of instruction in Wyoming classrooms across grades. Tables 4–9 provide the number of items for each reading assessment by reporting strand, for the assessment overall and for the vertical scale set. Integration of Knowledge and Ideas reporting category items were still being field tested in 2014 and therefore not reported.



Table 4. Reporting Strands Design for Grade 3 Reading

Strand	<u>Number of Items</u>			
	<u>2014<sup>4</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Lit: Key Ideas and Details	20	-	12	8
Lit: Craft and Structure	6	-	6	2
Inf.: Key Ideas and Details	10	-	9	4
Inf.: Craft and Structure	7	-	7	3
Integration of Knowledge and Ideas*	-	-	8	-
Language	7	-	8	3
Totals	50	-	50	20

Strand	<u>Percentages of Items</u>			
	<u>2014<sup>4</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Lit: Key Ideas and Details	40	-	24	40
Lit: Craft and Structure	12	-	12	10
Inf.: Key Ideas and Details	20	-	18	20
Inf.: Craft and Structure	14	-	14	15
Integration of Knowledge and Ideas*	-	-	16	-
Language	14	-	16	15

<sup>4</sup> 2014 is the base year for PAWS Reading scale. No anchor items were utilized in 2014 for year-to-year equating.

Table 5. Reporting Strands Design for Grade 4 Reading

Strand	<u>Number of Items</u>			
	<u>2014<sup>5</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Lit: Key Ideas and Details	15	-	10	6
Lit: Craft and Structure	6	-	7	3
Inf.: Key Ideas and Details	15	-	11	6
Inf.: Craft and Structure	8	-	6	3
Integration of Knowledge and Ideas*	-	-	7	-
Language	6	-	9	3
Totals	50	-	50	20

Strand	<u>Percentages of Items</u>			
	<u>2014<sup>5</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Lit: Key Ideas and Details	30	-	20	25
Lit: Craft and Structure	12	-	14	15
Inf.: Key Ideas and Details	30	-	22	30
Inf.: Craft and Structure	16	-	12	15
Integration of Knowledge and Ideas*	-	-	14	-
Language	12	-	18	15

<sup>5</sup> 2014 is the base year for PAWS Reading scale. No anchor items were utilized in 2014 for year-to-year equating.

Table 6. Reporting Strands Design for Grade 5 Reading

Strand	<u>Number of Items</u>			
	<u>2014<sup>6</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Lit: Key Ideas and Details	14	-	12	6
Lit: Craft and Structure	7	-	6	3
Inf.: Key Ideas and Details	17	-	12	7
Inf.: Craft and Structure	8	-	8	3
Integration of Knowledge and Ideas*	-	-	7	-
Language	8	-	9	3
Totals	54	-	54	22

Strand	<u>Percentages of Items</u>			
	<u>2014<sup>6</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Lit: Key Ideas and Details	26	-	22	27
Lit: Craft and Structure	13	-	11	14
Inf.: Key Ideas and Details	31	-	22	32
Inf.: Craft and Structure	15	-	15	14
Integration of Knowledge and Ideas*	-	-	13	-
Language	15	-	17	14

<sup>6</sup> 2014 is the base year for PAWS Reading scale. No anchor items were utilized in 2014 for year-to-year equating.

Table 7. Reporting Strands Design for Grade 6 Reading

Strand	<u>Number of Items</u>			
	<u>2014<sup>7</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Lit: Key Ideas and Details	15	-	12	6
Lit: Craft and Structure	9	-	7	4
Inf.: Key Ideas and Details	15	-	13	6
Inf.: Craft and Structure	9	-	7	4
Integration of Knowledge and Ideas*	-	-	8	-
Language	8	-	9	3
Totals	56	-	56	23

Strand	<u>Percentages of Items</u>			
	<u>2014<sup>7</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Lit: Key Ideas and Details	27	-	21	26
Lit: Craft and Structure	16	-	13	17
Inf.: Key Ideas and Details	27	-	23	26
Inf.: Craft and Structure	16	-	13	17
Integration of Knowledge and Ideas*	-	-	14	-
Language	14	-	16	13

<sup>7</sup> 2014 is the base year for PAWS Reading scale. No anchor items were utilized in 2014 for year-to-year equating.

Table 8. Reporting Strands Design for Grade 7 Reading

Strand	<u>Number of Items</u>			
	<u>2014<sup>8</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Lit: Key Ideas and Details	13	-	10	5
Lit: Craft and Structure	9	-	7	4
Inf.: Key Ideas and Details	19	-	16	8
Inf.: Craft and Structure	8	-	8	3
Integration of Knowledge and Ideas*	-	-	6	-
Language	7	-	9	3
Totals	56	-	56	23

Strand	<u>Percentages of Items</u>			
	<u>2014<sup>8</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Lit: Key Ideas and Details	23	-	18	20
Lit: Craft and Structure	16	-	13	12
Inf.: Key Ideas and Details	34	-	29	40
Inf.: Craft and Structure	14	-	14	12
Integration of Knowledge and Ideas*	-	-	11	-
Language	13	-	16	16

<sup>8</sup> 2014 is the base year for PAWS Reading scale. No anchor items were utilized in 2014 for year-to-year equating.

Table 9. Reporting Strands Design for Grade 8 Reading

Strand	<u>Number of Items</u>			
	<u>2014<sup>9</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Lit: Key Ideas and Details	12	-	11	5
Lit: Craft and Structure	7	-	7	3
Inf.: Key Ideas and Details	20	-	12	8
Inf.: Craft and Structure	9	-	10	4
Integration of Knowledge and Ideas*	-	-	6	-
Language	8	-	10	3
Totals	56	-	56	23

Strand	<u>Percentages of Items</u>			
	<u>2014<sup>9</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Lit: Key Ideas and Details	21	-	20	26
Lit: Craft and Structure	13	-	13	9
Inf.: Key Ideas and Details	36	-	21	35
Inf.: Craft and Structure	16	-	18	13
Integration of Knowledge and Ideas*	-	-	11	-
Language	14	-	18	17

### 3.3.2. PAWS Mathematics Tests

In the area of mathematics, the focus is on the ability of students to demonstrate basic computational skills along with the higher-level thinking skills of reasoning and problem solving. To achieve this end, the PAWS Mathematics assessment is designed to measure whether students have acquired the skills to analyze, reason, and communicate ideas effectively as they pose, formulate, solve, and interpret mathematical problems in a variety of real-world situations. Because of this, Wyoming’s framework for assessing mathematics is based upon mathematical problem solving.

The structure of the operational 2015 PAWS Mathematics test is detailed in the 2015 PAWS Mathematics Blueprints (see Appendix A). The content of the test is aligned to the five content

<sup>9</sup> 2014 is the base year for PAWS Reading scale. No anchor items were utilized in 2014 for year-to-year equating.

standards within the Wyoming Content and Performance Standards in Mathematics for grades 3–5:

- Operations and Algebraic Thinking
- Number and Operations – Base Ten
- Number and Operations – Fractions
- Measurement and Data
- Geometry

Five content standards within the Wyoming Content and Performance Standards in Mathematics for grades 6 and 7:

- Ratios and Proportional Relationships
- The Number System
- Expressions and Equations
- Geometry
- Statistics and Probability

Five content standards within the Wyoming Content and Performance Standards in Mathematics for grade 8:

- The Number System
- Expressions and Equations
- Functions
- Geometry
- Statistics and Probability

The 2014 PAWS Mathematics blueprints and reporting categories for each of the grade levels are provided in Appendix A. As noted in the tables below, the percentage of assessment coverage of each content standard reflects the emphasis of instruction in Wyoming classrooms across grades. For example, at grade 8 the emphasis is placed upon Expressions and Equations. Calculator use is not permitted for the grades 3–5 assessments. Tables 10–15 provide the number of items for each mathematics assessment by reporting strand and for the assessment overall.

Table 10. Reporting Strands Design for Grade 3 Mathematics

Strand	<u>Number of Items</u>			
	<u>2014<sup>10</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Operations and Algebraic Thinking	20	-	20	8
Number Operations–Base Ten	6	-	6	3
Number Operations–Fractions	6	-	6	2
Measurement and Data	12	-	12	5
Geometry	6	-	6	2
Total	50	-	50	20

Strand	<u>Percentages of Items</u>			
	<u>2014<sup>10</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Operations and Algebraic Thinking	40	-	40	40
Number Operations–Base Ten	12	-	12	15
Number Operations–Fractions	12	-	12	10
Measurement and Data	24	-	24	25
Geometry	12	-	12	10

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<sup>10</sup> 2014 is the base year for PAWS Mathematics scale. No anchor items were utilized in 2014 for year-to-year equating.



Table 11. Reporting Strands Design for Grade 4 Mathematics

Strand	<u>Number of Items</u>			
	<u>2014<sup>11</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Operations and Algebraic Thinking	13	-	13	5
Number Operations–Base Ten	10	-	10	4
Number Operations–Fractions	20	-	20	8
Measurement and Data	10	-	10	4
Geometry	6	-	6	3
Total	59	-	59	24

Strand	<u>Percentages of Items</u>			
	<u>2014<sup>11</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Operations and Algebraic Thinking	22	-	22	21
Number Operations–Base Ten	17	-	17	17
Number Operations–Fractions	34	-	34	33
Measurement and Data	17	-	17	17
Geometry	10	-	10	13

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<sup>11</sup> 2014 is the base year for PAWS Mathematics scale. No anchor items were utilized in 2014 for year-to-year equating.

Table 12. Reporting Strands Design for Grade 5 Mathematics

Strand	<u>Number of Items</u>			
	<u>2014<sup>12</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Operations and Algebraic Thinking	6	-	6	3
Number Operations–Base Ten	16	-	16	6
Number Operations–Fractions	19	-	19	8
Measurement and Data	12	-	12	5
Geometry	6	-	6	2
Total	59	-	59	24

Strand	<u>Percentages of Items</u>			
	<u>2014<sup>12</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Operations and Algebraic Thinking	10	-	10	13
Number Operations–Base Ten	27	-	27	25
Number Operations–Fractions	32	-	32	33
Measurement and Data	20	-	20	21
Geometry	10	-	10	8

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<sup>12</sup> 2014 is the base year for PAWS Mathematics scale. No anchor items were utilized in 2014 for year-to-year equating.

Table 13. Reporting Strands Design for Grade 6 Mathematics

Strand	<u>Number of Items</u>			
	<u>2014<sup>13</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Geometry	6	-	6	3
Ratios and Proportional Relationships	10	-	10	4
The Number System	15	-	15	6
Expressions and Equations	20	-	20	8
Statistics and Probability	8	-	8	3
Total	59	-	59	24

Strand	<u>Percentages of Items</u>			
	<u>2014<sup>13</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Geometry	10	-	10	13
Ratios and Proportional Relationships	17	-	17	17
The Number System	25	-	25	25
Expressions and Equations	34	-	34	33
Statistics and Probability	14	-	14	13

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<sup>13</sup> 2014 is the base year for PAWS Mathematics scale. No anchor items were utilized in 2014 for year-to-year equating.

Table 14. Reporting Strands Design for Grade 7 Mathematics

Strand	<u>Number of Items</u>			
	<u>2014<sup>14</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Geometry	9	-	9	4
Ratios and Proportional Relationships	13	-	13	5
The Number System	10	-	10	4
Expressions and Equations	18	-	18	7
Statistics and Probability	9	-	9	4
Total	59	-	59	24

Strand	<u>Percentages of Items</u>			
	<u>2014<sup>14</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Geometry	15	-	15	17
Ratios and Proportional Relationships	22	-	22	21
The Number System	17	-	17	17
Expressions and Equations	31	-	31	29
Statistics and Probability	15	-	15	17

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<sup>14</sup> 2014 is the base year for PAWS Mathematics scale. No anchor items were utilized in 2014 for year-to-year equating.

Table 15. Reporting Strands Design for Grade 8 Mathematics

Strand	<u>Number of Items</u>			
	<u>2014<sup>15</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Geometry	16	-	16	6
The Number System	6	-	6	3
Expressions and Equations	23	-	23	9
Statistics and Probability	6	-	6	2
Functions	14	-	14	6
Total	65	-	65	26

Strand	<u>Percentages of Items</u>			
	<u>2014<sup>14</sup></u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
Geometry	25	-	25	23
The Number System	9	-	9	12
Expressions and Equations	35	-	35	35
Statistics and Probability	9	-	9	8
Functions	22	-	22	23

### 3.3.3. PAWS Science Tests

The Wyoming Science Content and Performance Standards specify that all students should understand science concepts and processes, scientific inquiry, and the history and nature of science. Because of the constraints of space available on the assessment and the desire to limit testing time, the WDE determined that only the skills of science concepts and processes and scientific inquiry would be assessed by PAWS, as these skills allow students to process, apply, and effectively communicate scientific knowledge. The 2012 WyCPS requires schools and districts to include instruction and monitoring of student achievement in the areas of the history and nature of science at the local level, but these measures are not assessed by the PAWS at present.

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<sup>15</sup> 2014 is the base year for PAWS Mathematics scale. No anchor items were utilized in 2014 for year-to-year equating.

In order to accurately reflect the expectations of the Wyoming Science Content and Performance Standards, the PAWS Science assessments for grades 4 and 8 are designed to measure students' abilities to connect science knowledge with science process. The Wyoming Content and Performance Standards establish the expectations that teachers will judge where students are performing in relation to the benchmarks, and ultimately, the standards. To evaluate students' mastery against the Wyoming Performance Level Descriptors, teachers are expected to measure each student's ability to make connections among concepts and processes and apply scientific information as the criteria for determining performance levels (advanced, proficient, basic, and below basic). As stated in the Wyoming Science Content and Performance Standards, students develop an understanding of scientific content through inquiry. Therefore, when considering the appropriateness of the PAWS Science tests, careful consideration was given to the relevant criterion intended to be measured and the alignment to the intent of the Wyoming Content and Performance Standards in Science, notably, the science performance inferences to be drawn from the results.

Based on this design, the PAWS Science assessment items are written to measure students' mastery of science inquiry skills within the context of the benchmarks from Standard I: Concepts and Processes. The items are distributed equally among the physical science, life science, and earth/space science benchmarks. Over the course of a two-year cycle, each of the inquiry skills is assessed within the context of each benchmark in Standard I Concepts and Processes. All too often, students' understanding of core concepts and scientific theories is measured without careful attention to how students internalize core assumptions, apply important ideas, or make connections to relevant everyday experiences. Without measurement of such epistemological standards, teachers will not know whether students have a firm foundation on which to base scientific arguments.

The design of both the Wyoming Science Content and Performance Standards and the PAWS Science assessments is based on a view of proficiency in science that values students' understanding of science concepts and their ability to think critically and apply scientific logic and reasoning, rather than simply memorizing and recalling science facts. Students were tested in science at grades 4 and 8. Science concepts and inquiry skills were measured by requiring students to examine scientific investigations accurately, to make relevant connections, and to support their inferences.

The structure of the operational 2015 PAWS Science test was based on the 2008 PAWS Science Blueprint. The content of the test is aligned to the Science as Inquiry content standard of the Wyoming Science Content and Performance Standards. Because scientific inquiry involves many processes, the PAWS assessment is designed to assess inquiry skills overall in the following skill reporting categories:

- Use observation to pose questions that can be addressed through a scientific investigation;
- Design and conduct a scientific investigation;
- Organize and represent data; and
- Draw conclusions and make connections with concepts and knowledge.

The content of the test is aligned to the three content areas within the Wyoming Science Content and Performance Standard I: Concepts and Processes, and a score analysis is reported in each of the following areas:

- Life science;
- Physical science; and
- Earth/Space science.

The number of items assessing each skill-reporting category and content standard is constant across all grade levels; they are provided in Appendix A. Tables 16 and 17 provide the number of items (and points) for each Science assessment, by reporting strand for the assessment overall, and for the anchor item set. The anchor item set is utilized for year-to-year equating. These tables include similar information for 2014 and 2015 for comparison purposes. There is some fluctuation between the percentage of the total raw score represented by the reporting strand and the percentage of anchor item points for the strand. Across all grades, the representation of the anchor sets remained stable although the number of anchor items was reduced to ensure equal representation.

Table 16. Reporting Strands Design for Grade 4 Science

Strand	<u>Number of Items</u>			
	<u>2014</u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
LIFE	16	6	16	7
PHYS	18	7	18	7
ESCI	16	6	16	6
Totals	50	19	50	20

Strand	<u>Percentages of Items</u>			
	<u>2014</u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
LIFE	32	32	32	35
PHYS	36	37	36	35
ESCI	32	32	32	30



Table 17. Reporting Strands Design for Grade 8 Science

Strand	<u>Number of Items</u>			
	<u>2014</u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
LIFE	16	7	16	7
PHYS	18	8	18	7
ESCI	12	4	16	6
Totals	46 <sup>16</sup>	19	50	20

Strand	<u>Percentages of Items</u>			
	<u>2014</u>		<u>2015</u>	
	Total Test Items	Anchor Items	Total Test Items	Anchor Items
LIFE	35	37	32	35
PHYS	39	42	36	35
ESCI	26	21	32	30

### 3.4 PAWS Test Development Process

A state committee consisting of regional representatives utilized national and regional documents to establish that the rigor of the Wyoming language arts standards are consistent with these documents, and adjustments were made as deemed appropriate by the state committees.<sup>17</sup> The Wyoming Content and Performance Standards in English Language Arts address three content standards: (1) Reading, (2) Writing, and (3) Speaking and Listening. Content standard 2 (Writing) and 3, (Speaking and Listening), are not currently assessed by PAWS.

<sup>16</sup> A passage in Grade 8 Science Test Booklet also appeared in the Released Test Questions posted on the WDE website before 2014 test administration. After reviewing the consequences, ETS decided to remove the four questions altogether from the scorable bank of operational items and treat them as a “Do Not Score.” This reduced the number of maximum raw points for Science in Grade 8, but did not bear any negative consequences to content or statistical reliability.

<sup>17</sup> These documents included the following publications:

- National Council of Teachers of English and International Reading Program
- Standards for the English Language Arts;
- National Center on Education and the Economy,
- New Standards Performance Standards; Speech Communication Association, Speaking, Listening, and Media Literacy Standards for K through 12 Education, and
- Guidelines for Assessing Communication in Primary and Secondary Education; the Colorado Model Content Standards for Reading and Writing; and the Standards of Learning for Virginia Public Schools.

As noted elsewhere in this report, multiple choice items (only) were used on the PAWS Reading, Mathematics, and Science portions.

The 2012 WyCPS in Mathematics are consistent with those of the National Council of Teachers of Mathematics (NCTM) as they are written in *Principles and Standards for School Mathematics* (April 2000). The Wyoming mathematics standards address five content standards: (1) Number Operations and Concepts, (2) Geometry, (3) Measurement, (4) Algebraic Concepts and Relationships, and (5) Data Analysis and Probability.

The 2008 WyCPS in Science address three content standards: (1) Concepts and Processes, (2) Science as Inquiry, and (3) History and Nature of Science in Personal and Social Decisions. Content standard 3, History and Nature of Science in Personal and Social Decisions is not assessed by PAWS.

Initial creation of blueprints, item and passage specifications, and assessment descriptions took place in the fall of 2012. Development of these documents has been an ongoing process, and they guided the development, review, and field testing of items for use on the PAWS assessments.

Item development was a cooperative effort involving WDE and ETS content staff as well as Wyoming teachers. All items were authored by ETS content staff and reviewed by and revised at the direction of WDE content staff. After items were approved by WDE, they were then reviewed by committees of Wyoming educators (see Section 3.6 Item Review). Items approved at item review then became eligible for field testing, after which they were evaluated in light of their statistics from field testing (see Section 3.7.4, Data Review). Items approved at data review then were eligible for use as operational items.

The PAWS tests were constructed to produce assessments that are psychometrically sound, measure the academic content outlined in Wyoming's grade-level content standards and described in the test specifications, and to interest and engage students. WDE content staff and ETS content specialists and psychometricians collaborated to choose items for use on the 2015 forms considering both the content and psychometric properties of each item selected.

### 3.5 Item and Test Form Development

In this section, the general process for item development is described. Using the 2012 and 2008 WyCPS as a foundation, test blueprints were developed by the WDE setting forth the number of items for each Reading, Mathematics, or Science content standard. These blueprints were initially developed in the fall of 2012 for Reading and Mathematics and 2006 for Science. They have been refined during the course of the program, balancing the need to provide a high level of information about student ability to inform instruction against the desire to impinge upon instructional time as little as possible.

Wyoming’s item development procedures are consistent with industry practice and take approximately two years, including writing, review, and field-testing before an item is eligible for inclusion in the item pool.

### *3.5.1. Item Specifications*

Test items were created by ETS item writers (Wyoming educators are involved in the item review process) who are selected for their academic content and grade-level experience and who are experienced in the development of statewide assessments. Item writers selected to write items for the PAWS were then trained on PAWS specific requirements, including the WyCPS for their specific grade and subject and style guidelines for the PAWS. These PAWS specific requirements were collected in an Item Specifications document. All items were written to measure specific content standards at a variety of specified levels of cognitive complexity as developed from Webb’s Depth of Knowledge levels.

For example, the Mathematics Item Specifications were intended to accomplish two purposes: (1) to provide both general and specific guidelines for development of all test items at the grade levels assessed by PAWS Mathematics, and (2) to describe the test items and prompt types to be developed for the PAWS Mathematics assessments. Within the specifications document are sections dedicated to information about item contexts, cognitive task levels, use of graphics, item style and format, and general content limits by grade. Comparable information was provided for PAWS Reading and Science items in Reading and Science Item Specifications.

### *3.5.2. Item Difficulty Requirements*

The Rasch measurement model was used to develop the scale for each of the PAWS Reading, Science, and Mathematics assessments. The Rasch model is robust and is used for many large-scale, high stakes assessment programs. In general, the Rasch model assumes that the probability that a student will answer an item correctly is a function of the latent trait that underlies performance on the assessment and the difficulty of the item. This underlying trait, usually referred to as ability, is nothing more than what the assessment is designed to measure (e.g., Mathematics, Reading, or Science). See chapter 5 for further detail on the Rasch model.

### *3.5.3. Item Graphics Requirements*

Many items contain graphics. For example, mathematics items frequently contain charts, spinners, box-and-whisker plots, line graphics, clocks, and geometric shapes. WDE reviewed all test items and forms to ensure an appropriate use and balance of these types of graphics.

## 3.6 Item Review

Items accepted from ETS item writers for consideration by the PAWS program are reviewed against WDE-established criteria (i.e., alignment with Wyoming content standards, grade-level appropriateness, cognitive demand, appropriate item type, and bias) by ETS assessment

specialists and content specialists at the WDE. ETS and the WDE collaborate to consider and implement WDE-proposed revisions to the items. Items passing this review phase become eligible for external review by Wyoming teachers.

Annually, an external review of items is completed by a panel of experienced teachers at each grade level selected by the WDE. Each panel has approximately 10–15 members. Panel members commit up to two weeks of service during the summer and are compensated for their service.

Most members of these panels are classroom teachers. University of Wyoming and district curriculum personnel have also participated. Criteria for the panel selection include the following:

- Knowledge of the Wyoming Content and Performance Standards and expertise in the subject area
- Teaching experience at the grade level to which the individual will be assigned
- Geographical location to ensure all regions of Wyoming are represented

All reviewers first receive training in how to effectively evaluate items, including strategies for examining the overall technical qualities of all items, such as language clarity, readability, plausibility of options, parallel structure of response options, significance and suitability of subject content, lack of bias, veracity of the correct answer, proper level of difficulty, and alignment to Wyoming Content and Performance Standards.

The evaluations and recommendations of the educators for each item are evaluated by ETS and WDE. All of the feedback generated by the reviewers is utilized to make final decisions on which items to accept and what revisions to include in the version of the item that is field tested. Only the items that measure grade-level expectations are carried forward to the field-test stage. The criteria used for item review are listed below.

#### 1. Conceptual criteria:

- Grade-level appropriateness
- Thinking skill match
- Lack of bias
- Clear statement
- One best answer
- Each distractor credible
- Meets all technical criteria for item parameters

## 2. Language criteria:

- Appropriate for age
- Correct punctuation
- Spelling and grammar
- Lack of excess words
- No stem/foil clues

## 3. Format criteria:

- Logical order of distractors
- Familiar presentation style, print size, and type
- Correct mechanics and appearance
- Equal-length distractors

## 4. Graphic stimuli criteria:

- Necessary
- Clean
- Relevant
- Unbiased

The item review panel also provides input on potential bias and/or sensitivity in the test content. With regard to fairness and content, panelists suggest revision or deletion of items as they deem necessary. Any items surviving this rigorous examination becomes part of the pool of items eligible for field testing.

### 3.7 Field Testing

During the 2015 PAWS administration, field-test items were embedded within each operational exam for Reading, Mathematics, and Science. For each subject and grade, there were ten different forms, each containing a different set of field-test items. (Some field-test items were used in more than one form.) Each form within a subject/grade contained the same number of field-test items, administered in the same positions across forms. Forms were spiraled within classroom and school in order that randomly equivalent samples of students would receive each of the forms; each form was responded to by approximately 700-800 students, more if the item appeared on more than one form. The WDE reviewed the assembled field-test forms for clarity, correctness, potential bias, and curricular appropriateness. Field-test items were indistinguishable

from operational items so that the students' motivation in responding to them would be at the same level as their motivation in responding to operational items.

Students' responses to the field test items did not affect their operational test scores. Data on the field test items were used only in data review as an aid in determining whether the item was suitable for future use.

All field test items underwent comprehensive statistical analysis to provide the WDE with the information necessary to make informed decisions about the likelihood of each item providing reliable information that could be used in drawing valid inferences concerning student performance. The following analyses were conducted on the field test items (processes and findings are discussed below):

- Classical item analyses
- Differential Item Functioning (DIF) analyses
- Rasch Item Response Theory (IRT) analyses

### *3.7.1. Classical Item Statistics*

Classical item statistics were computed for all field test items in Mathematics, Reading, and Science. The field test classical analysis results appear in Appendix F. For each item, the following statistics were computed:

- *N*-counts for each statistic;
- Item difficulty (or average item score);
- Item discrimination (or point biserial correlation);
- Multiple choice item distractor discrimination for PAWS only;
- Multiple choice item response; and
- DIF statistics (Mantel and Haenszel, 1959) and standardized mean difference (SMD) by gender and ethnicity.

#### *3.7.1.1. Item Difficulty*

Item difficulty is typically defined as the average of scores for a given item. For multiple choice items, this value (commonly referred to as a *p*-value) ranged from 0 to 1.

#### *3.7.1.2. Item Discrimination*

Item discrimination is defined here as the correlation between a score on a given test question and the overall operational raw test score. For multiple-choice items, it is also known as the point biserial correlation. The discrimination for multiple choice distractors (incorrect answer options)

was also computed. The operational test score used in calculating this coefficient did not include field test item scores.

### 3.7.2. Differential Item Functioning

In addition to classical item analyses, Differential Item Functioning (DIF) analyses are conducted on the field test items. DIF statistics are not computed on operational items. DIF analyses are used to identify those items that identifiable groups of students (e.g., males, females) with the same underlying level of ability have different probabilities of answering correctly. Examinees are separated into relevant subgroups based on ethnicity or gender for analysis. Then examinees in each subgroup are ranked relative to their total test score (conditioning on ability). Examinees in the focal group (e.g., females) are compared to examinees in the reference group (e.g., males) relative to their performance on individual items.

If the item is differentially more difficult for an identifiable subgroup when conditioned on ability, it may be measuring something different from the intended construct. However, it is important to recognize that DIF-flagged items might be related to actual differences in relevant knowledge or skills (item impact) or statistical Type I error. As a result, DIF statistics are used to identify items that are potentially functioning differentially. Subsequent review by content experts and bias/sensitivity committees are required to determine the source and meaning of performance differences. For the spring 2015 PAWS Reading, Mathematics, and Science tests, DIF analyses were conducted for gender groups (Male/Female) and ethnicity groups (White/American Indian (Native American), White/Asian, White/Black (African American), and White/Hispanic (Latino)) where sample size was sufficient.

Statistics from two DIF detection methods were computed: the Mantel-Haenszel procedure (Mantel and Haenszel, 1959) for multiple choice items and the standardization procedure (Dorans and Kulick, 1983, 1986) for writing prompts. As part of the Mantel-Haenszel procedure, the statistic described by Holland and Thayer (1988), known as MH D-DIF, was used.

The formula for the estimate of constant odds ratio is:

$$\alpha_{MH} = \frac{\left( \sum_m \frac{R_{rm} W_{fm}}{N_m} \right)}{\left( \sum_m \frac{R_{fm} W_{rm}}{N_m} \right)},$$

where

$R_{rm}$  = number in reference group at ability level  $m$  answering the item right,

$W_{fm}$  = number in focal group at ability level  $m$  answering the item wrong,

$R_{fm}$  = number in focal group at ability level  $m$  answering the item right,

$W_{rm}$  = number in reference group at ability level  $m$  answering the item wrong,

$N_m$  = total group at ability level  $m$ .

This statistic is expressed as the differences between members of the “focal group” (female, Asian, African American, Hispanic/Latino, and Native American) and members of the “reference group” (male and White) after conditioning on total operational test score. This statistic is reported on the ETS delta scale, which is a normalized transformation of item difficulty ( $p$ -value) with a mean of 13 and a standard deviation of 4. Negative MH D-DIF statistics favor the reference group and positive values favor the focal group. The classification logic used for flagging items is based on a combination of absolute differences and significance testing. Items that are not statistically significantly different based on the MH D-DIF ( $p > 0.05$ ) are considered to have similar performance between the two studied groups; these items are considered to be functioning appropriately. For items where the statistical test indicates significant differences ( $p < 0.05$ ), the effect size is used to determine the direction and severity of the DIF.

SMD is the Standardized Mean Difference index, and  $SD$  is the total group standard deviation of the item scores (in its original metric). A negative SMD value shows that the question is more difficult for the focal group, whereas a positive value indicates that it is more difficult for the reference group.

DIF analyses were not conducted if the sample size for either the reference group or focal group was less than 100 and the sample size for the two groups combined was less than 400. Items are classified into one of three categories and assigned values of A, B, or C based on these DIF statistics. Category A items contain negligible DIF. Category B items exhibit slight or moderate DIF. Category C items have moderate to large values of DIF. Negative values imply that, conditional on the matching variable, the focal group has a lower mean item score than the reference group. In contrast, a positive value implies that, conditional on total test score, the reference group has lower mean item score than the focal group. The flagging criteria for multiple-choice items are provided in Table 18.



Table 18. DIF Categories for Multiple-Choice Items

DIF Category	Definition
A (negligible)	Absolute value of the MH D-DIF is not significantly different from zero, or is less than one.
B (slight to moderate)	1. Absolute value of the MH D-DIF is significantly different from zero but not from one, and is at least one; OR 2. Absolute value of the MH D-DIF is significantly different from one, but is less than 1.5. Positive values are classified as “B+” and negative values as “B-”.
C (moderate to large)	Absolute value of the MH D-DIF is significantly different from one, and is at least 1.5. Positive values are classified as “C+” and negative values as “C-.”

DIF statistics are computed for all field test items and reviewed at Data Review as part of the evaluation process for inclusion into the active item pool. Appendix E summarizes the number and percentage of items by DIF category from the 2015 field test items for each grade and content area. The 2015 operational tests are composed of items that were piloted in years prior to 2015, which were reviewed and approved by Content Review, Bias and Fairness Review, and Data Review Committees.

### 3.7.3. Item Response Theory (IRT) Analysis

Rasch IRT was used to scale the PAWS. IRT is widely used because it allows for invariant estimation of item and ability parameters. Regardless of the distribution of the sample, the parameter estimates will be linearly related to the parameters estimated from another sample drawn from the same population apart from random measurement error. IRT allows the comparison of two students’ levels of ability even though they may have taken different sets of items. An important characteristic of IRT is its item-level orientation. IRT expresses the probability of a student answering a particular item correctly in terms of the student’s ability (i.e., the student’s level of achievement) and the item difficulty (*b*-value). The probability of a correct response to an item increases as the student’s ability increases. See Chapter 6 for further details on the Rasch model. The results of the Rasch IRT analyses of the field test items can be found in Appendix H.

### 3.7.4. Data Review Procedures

Following the spring 2015 PAWS administration the statistics discussed above were computed for each item field tested. These statistics will be compiled into books along with images of the items for use in data review meetings. Each item will appear on one page of the data review book with its statistics on the opposite page. An item with any statistics outside pre-established limits will have an appropriate annotation.

Field test items are evaluated by panels of Wyoming state educators selected by the WDE. Each data review panel consists of 8–12 educators with experience in the target grade and subject.

Items field tested during the 2015 administration were reviewed in July 2015 by a panel in Cody, Wyoming.

In addition to judgments of content relevance, panelists evaluate the technical quality of items, checking each field test item (including those with appropriate statistics) for such flaws as:

1. inappropriate readability level
2. ambiguities in the questions or answer options
3. clueing within the body of the item
4. keyed answers that were partially or wholly incorrect
5. distractors that were partially or wholly correct
6. unclear instructions
7. factual inaccuracy
8. any other concrete and material flaws

All items, statistics, and comments were reviewed by the WDE determining the final disposition of all field test items. Items found by the WDE to be inappropriate for curricular or psychometric reasons were removed from the pool of items eligible for use in future PAWS assessments.

The data review meetings begin with a training session led by an ETS assessment lead and psychometrician. This session covers the statistics that the panelists will be using as they evaluate each item, the meaning of each in the context of evaluating item quality and suitability for use on future operational exam forms, and the role of the panelists' expertise in the data review process.

Panelists were provided with measures of item difficulty (item mean score) and discrimination (item score-test score correlation). They were also given response or score distributions for all examinees. In addition, for multiple choice items they received distractor discrimination values. This information was presented in tabular format. Items with low or negative discrimination and/or with distractors with positive discriminations were culled out, along with items flagged for possible DIF.

Panelists were instructed that the statistics and notes were supplemental to their experience as Wyoming educators in recommending acceptance or rejection of the items being reviewed. That is, they could indicate possible locations of flaws in the item (for example, a distractor with a positive discrimination could indicate that an item actually has two correct options). However, panelists were asked to use their professional experience in educating and working with Wyoming students when deciding to recommend that an item should be rejected.

Items that appear to be bad based on their statistics may actually address areas about which students had misconceptions or in which they had not received effective or sufficient instruction. Such items could be helpful in highlighting areas where instruction can be improved. Similarly, items with good statistics might contain flaws and might need to be rejected. Panelists were asked not to blindly recommend acceptance or rejection based solely on an item's statistics, but rather to carefully consider each item in light of their expertise, using the statistical information to supplement their professional judgment. Only items with concrete and identifiable flaws should be recommended for rejection. Panelists were reminded in particular that items should not be rejected simply because they are deemed to be too hard or too easy, and that items of all difficulty levels are needed to effectively assess the entire range of student abilities within Wyoming.

The results of the Rasch IRT analyses of the field test items can be found in Appendix H, the PAWS classical analysis results appear in Appendix F, and PAWS DIF in Appendix E. Items accepted at data review from the 2015 administration are eligible for use as operational items beginning with the 2016 administration.

### *3.8 Test Form Construction*

After each administration, analyses were conducted by the ETS psychometrician to determine the statistical properties of all items that were present on any of the forms (both operational items and field test items). This includes estimation of Rasch difficulty parameters on the current scale for all items. Thus, all items that have been field tested or used operationally were equated to the original scales and have known Rasch difficulty. Therefore, when forms were constructed for the 2015 administration it was possible to create test forms that were targeted to not only meet content and blueprint specifications, but also to match statistical characteristics of the base PAWS tests, as test characteristic curves (TCCs), information, and standard error curves could be evaluated to help ensure statistical comparability.

#### *3.8.1. Construction of the Reading and Mathematics Forms*

ETS utilized proprietary test construction software for the construction of the 2015 forms for the new base scale for reading and mathematics. The ETS psychometrician utilized the test content blueprint and the preliminary statistical targets in a configuration file for each grade and subject test being constructed. The 2015 blueprints can be found in Appendix A.

In addition, the targets for key balance (for multiple choice items, approximately 25% for each of options A–D) were used.

The assessment development leads assembled a draft form conforming to the blueprint and tentative statistical targets were then reviewed by the psychometrician. The test construction software provided real-time feedback on the psychometric properties of the form, allowing the

psychometrician and content staff to immediately see the results of a proposed change in the items on the form.

Assessment development leads focused on the content of the form, including checking that the items conformed to the blueprint, that there was balance across the items and passages (for example, there should be a balance in gender and ethnic representation across items and passages. A reading test where all passages were about females playing sports would lack balance, as would a mathematics test where all the items referenced Cartesian graphs), that the items did not provide clues to the correct answers of other items, and other similar content-based issues.

The psychometrician and the assessment development leads checked the conformance of the test to its statistical targets and blueprint, key balance (i.e., that approximately the same number of multiple choice items were keyed to each of the possible answer options [A, B, C, and D]). Other checks were to determine that the same key occurred no more than three times in a row) and that the other statistical properties of the items and forms were within desired limits.

Changes in the composition of the forms (either in the items themselves or the ordering of the items) by either the assessment development leads or psychometrician had to be approved by the opposite party. Once a form had been approved by both the assessment development leads and the psychometrician it was sent to the WDE for their review and approval.

### *3.8.2. Construction of the Science Forms*

ETS utilized proprietary test construction software for the construction of the 2015 forms. The ETS psychometrician utilized the test content blueprint and the statistical targets in a configuration file for each grade and subject test being constructed. The blueprints were unchanged from 2013 and can be found in Appendix A. The TCCs, information, and standard error curves from the 2013 administration constituted the statistical targets for the 2015 science forms.

Additional check of forms includes the targets for key balance (for multiple choice items, approximately 25% for each of options A–D), proportion of items from the 2013 operational forms (approximately 30% of the test), and proportion of items that had previously been used operationally versus those that had only been field tested (between 40% and 60% of each) were used. Moreover, limits were set on the year an item had been field tested to maximize the use of newer items as much as possible.

The assessment development leads assembled a draft form conforming to the blueprint and statistical targets; then it was reviewed and edited by the psychometrician. The test construction software provided real-time feedback on the psychometric properties of the form, allowing the psychometrician and content staff to immediately see the results of a proposed change in the

items on the form. Finally, the software noted the items' positions, used to minimize the difference between the items' position on the 2015 form and its position on the form from its most recent use.

Assessment development leads focused on the content of the form, including checking that the items conformed to the blueprint, that there was balance across the items and passages (for example, there should be a balance in gender and ethnic representation across items and scenarios), that the items did not provide clues to the correct answers of other items, and other similar content-based issues.

The psychometrician and the assessment development leads checked the conformance of the test against its statistical targets and blueprint, key balance (i.e., that approximately the same number of multiple choice items were keyed to each of the possible answer options [A, B, C, and D] and that the same key occurred no more than three times in a row), and that the other statistical properties of the items and forms were within desired limits.

Changes in the composition of the forms (either in the items themselves or the ordering of the items) by either the assessment development leads or psychometrician had to be approved by the opposite party. Once a form had been approved by both the assessment development leads and the psychometrician it was sent to the WDE for their review and approval.

### *3.8.3. Final Review of Assembled Operational Tests*

Once the forms were assembled to meet test specifications and statistical targets, WDE content specialists reviewed the assembled forms. The criteria for evaluating each group of forms included the following:

- The content of the test forms should reflect the goals and objectives of the Wyoming Content and Performance Standards (curricular validity);
- The content of test forms should reflect the knowledge and skills as taught in Wyoming Schools (instructional validity);
- Items should be clearly and concisely written and the vocabulary appropriate to the target age level (item quality); and
- Content of the test forms should be balanced in relation to ethnicity, gender, socioeconomic status, and geographic district of the state (free from test/item bias).

After any changes from the WDE review had been completed, ETS staff (test development staff members, content specialists and editors) conducted a final review including a content and

grammar check. The WDE then completed their final review and provided approval and sign-off for each PAWS operational test form.

## 4. TEST ADMINISTRATION

### 4.1 Test Materials

Test materials were sent to each Wyoming PAWS Building Coordinator in shrink-wrapped packages within boxes that included school inventories. All students in grades 3–5 received scorable test and answer booklets. Students in grades 6–8 received answer documents to record responses to questions from the test booklets.

Building Coordinators were responsible for distributing the materials to test administrators. Materials were color-coded by grade. Coordinators applied Pre-ID labels with student identification and demographic information to test books or answer documents. Materials distributed each day were limited to those needed for testing on that particular day. When not in use, schools were directed that materials were to be locked in secure storage.

### 4.2 Materials Return

Once test administrations were completed, materials were collected and tabulated by Building Coordinators. In addition, the demographic information was hand gridded on the Test and Answer books or answer documents if the student did not have a Pre-ID label. The documents were then packaged together and locked in secure storage until their shipment to ETS. Each box was labeled with a unique traceable tracking number by the shipping carrier.

### 4.3 Directions for Administration

The *PAWS Directions for Administration* provided the guidelines for planning and managing the PAWS administration for district and school administrators. The *PAWS Directions for Administration* provided specific directions for test administrators, from scheduling and timing for sessions and preparing students to testing students from special populations. Two half-day comprehensive Building Coordinator training sessions conducted jointly by the WDE and ETS were held in January 2015 prior to the 2015 testing window. All test administrators around the state were expected to view the Building Coordinator Training Video before the test window opened. Building principals required test administrators as well as anyone handling test materials to sign off assuring they had been trained on test security and how to administer the test. These certification documents were retained in the school and were available to the WDE upon request.

The PAWS tests were administered under untimed testing conditions. Grades 3–6 Reading were administered in four untimed sessions. Grades 7 and 8 Reading were administered in three untimed sessions. Grade 3–5 Mathematics was administered in three untimed sessions (these were the only grades which did not have separate calculator and non-calculator sessions). Grades 6–8 of Mathematics were administered in three untimed sessions, one non-calculator and two calculator sessions.

All grades of Science (4 and 8) were administered in two untimed sessions. The expected time for testing was provided by grade and content area in the *PAWS Directions for Administration Manual*, but students could take more time if needed.

#### *4.3.1. Allowed Student Manipulatives*

Calculators were not allowed on the PAWS Mathematics test in grades 3–5. Calculators were permitted for students in grades 6–8 on two sections of the assessment. In addition, a *PAWS Allowable Resources* document was posted to the WDE webpage to assist test administrators in administering PAWS in a standardized manner.

#### *4.3.2. Test Security*

PAWS test security guidelines strictly prohibit the photocopying of all or any part of a test booklet, and require that all violations of the Wyoming Department of Education’s guidelines be reported to the WDE immediately. The reporting of violations to the WDE ensured that test scores could be invalidated if necessary. All test booklets were considered secure materials. The PAWS Building Coordinators were required to document the receipt of secure materials, check the lists of students, and return all test materials to ETS for scoring.

The specific procedures that were to be followed during any test administration and used in the handling of documentation were outlined in the *2015 PAWS Directions for Administration*.

Persons designated to administer the PAWS tests were expected to:

- Keep all test materials in locked storage.
- Not reproduce any test materials in any manner.
- Not disclose any actual test items to students prior to and after testing.
- Not provide answers to any test items to any students.
- Not change or otherwise alter a student’s answer.
- Follow the suggested time periods as closely as possible in order to maintain uniformity in the test administration. (Note: PAWS is an untimed test.)
- Follow the *Directions for Administration* manual explicitly.
- Follow all Ethics and Security Requirements as outlined in the *2015 PAWS Directions for Administration*. If there is a violation, the students’ materials *will not be scored* and the school will not be able to count the student(s) for participation.

PAWS test administrators (teachers) were instructed to immediately report any loss of test materials or other testing irregularities to the school principal or Building Coordinator. The



PAWS District Coordinator subsequently reported all irregularities to the WDE Assessment team.

#### 4.4 Student Participation

As noted previously, all Wyoming students in grades 3 through 8 were required to participate in the regular PAWS tests, the PAWS with appropriate accommodations, or the Wy-ALT (for students with the most significant cognitive disabilities). Federal and state law (i.e., the Individuals with Disabilities Act of 1997 and W.S. 21-9-101 (c)(i)) did not exempt any student from participating in the statewide assessments (except English learners in their first year of education in the U.S., students who were expelled, and students educated in out-of-state residential institutions). Students with disabilities, who were on a 504 Plan, or who were English Language Learners (ELL) were allowed to be provided with standard accommodations during the administration of PAWS consistent with guidance provided by the Wyoming Department of Education. Students with significant cognitive disabilities were required to take the Wyoming Alternate Assessment(Wy-ALT) as determined by their IEP teams.

All students participated in the state accountability assessment program in one of three ways:

- Participation in PAWS regular assessment without accommodation
- Participation in PAWS regular assessment with standard accommodation
- Participation in Wy-ALT

#### 4.5 PAWS Standard Accommodations

Accommodations are practices and procedures in the areas of presentation, response, setting, and timing/scheduling that provide equitable access for students during instruction and assessment. Accommodations changed the way a test was administered or the way a student responded to test questions to reduce or eliminate the effects of a student's disability or lack of proficiency in English, but did not reduce learning expectations. Allowable accommodations on PAWS did not change the construct being tested nor did they affect the psychometric characteristics of the assessment.

Standard accommodations were allowed on the PAWS for students with disabilities, for students on a 504 Plan, and English Language Learners (ELL). The WDE recognizes that the proper administration of standard accommodations allows these students access to the test, resulting in the students' ability to demonstrate their knowledge and skills consistent with the measured test constructs in each content area. Often the conditions under which the test was standardized differ from those present when accommodations were used. These differences, in some cases like reading the reading passages, reached a level sufficient to jeopardize the validity of

interpretations. However, based on available evidence, the standard accommodations allowed for PAWS were considered incidental to the construct intended to be measured by the test (Standards for Educational and Psychological Testing, 1999, p.101) by the WDE. Thus, students using accommodations received scores on PAWS that are considered valid and were aggregated with those of other students. WDE and ETS staff paid careful attention to the potential effects of testing conditions on test score interpretations and adhered to the Standards for Educational and Psychological Testing (2014).

The administration of standard accommodations during PAWS has potential implications for the validity of resulting scores. Therefore, it was necessary for test administrators and access assistants to be trained annually and to be familiar with updated standard accommodations documents related to the selection, administration, and evaluation of standard accommodations.

In January 2006, the *Wyoming Accommodations Manual for Instruction and Assessment: How to Select, Administer, and Evaluate Use of Accommodations for Instruction and Assessment of Students with Disabilities* was developed by the Wyoming Department of Education in conjunction with the CCSSO State Collaborative on Assessment and Student Standards Assessing Special Education Students (SCASS-ASES). Information in the manual guides the selection, administration, and evaluation of accommodations to ensure that the validity and comparability of resulting scores are preserved. It is available along with other documents related to PAWS standard accommodations on the WDE website.

In November 2006, the Standards, Assessment, and Accountability and Special Programs Units provided state-wide training for school district personnel representing every school district in the state on the selection, administration, and evaluation of accommodations to further standardize the use of accommodations in the PAWS administration. Training materials provided by CCSSO/SCASS-ASES were adapted, utilized, and distributed. Training materials were made available on CD and were sent to all districts that were not able to attend the training. Additionally, a presentation was made by the Wyoming Institute for Disabilities (WIND) of the University of Wyoming on assistive technology and augmentative devices. Based on feedback provided during the 2005–2006 administration and the November 2006 training and recommendations made by the Wyoming Technical Advisory Committee, revisions were made and are reflected in the approved list of PAWS Standard Accommodations (see 2015 *PAWS Directions for Administration*) to improve clarity and ensure the standard use of accommodations.

Two addendums related to the administration of standard accommodations were distributed through postings on the WDE website including the *Wyoming Statewide Assessment System 2015 PAWS Standard Accommodations* and the *2015 PAWS Standard Accommodations Frequently Asked Questions (FAQ)*. The *Wyoming Statewide Assessment System 2015 PAWS Standard Accommodations* document provides information about the administration of standard

accommodations and also identifies the allowable standard accommodations, divided into four categories (presentation, response, setting, and timing and scheduling). The FAQ document provides information about the administration and documentation of standard accommodations as well as detailed information regarding specific accommodations including the administration of standard accommodations for ELL students, best practices associated with the selection and administration of accommodations, and a specific list of standard accommodations for ELL students.

#### *4.5.1. Students Eligible for Test Accommodations*

The right to receive accommodations on state assessment is guaranteed by law to a student with a disability. The process of making decisions about accommodations is one in which members of the IEP team facilitate the participation of students with disabilities in general state assessments. Students eligible for accommodations also include those students with a 504 Plan and English Language Learners (ELL).

#### *4.5.2. Requirements for Use of Test Accommodations*

For students with disabilities, the selection of accommodations for the general assessment was the responsibility of a student's IEP team or 504 Plan committee. Guidance was provided in the *Wyoming Accommodations Manual for Instruction and Assessment: How to Select, Administer, and Evaluate Use of Accommodations for Instruction and Assessment of Students with Disabilities* (January 2006). Currently permitted are standard accommodations for students with disabilities, 504 Plans, or who were ELLs and were listed in the 2015 *Directions for Administration* (DFA). Accommodations were matched to an individual student's needs and were only provided when all of the following conditions were met:

1. The accommodations were documented on the student's IEP or 504 Plan.
2. The accommodations for ELL were determined at the local level.
3. The selection and administration of accommodations were consistent with the 2015 PAWS standard accommodations.
4. Standard accommodations were administered as described in the *Wyoming Statewide Assessment System 2015 PAWS Standard Accommodations* and the *Wyoming Accommodations Manual for Instruction and Assessment*.
5. The accommodations provided were effective in providing access to the test and had been regularly used by the student during instruction and classroom assessment.
6. The accommodations were administered by a trained Test Administrator or access assistant who was familiar to the student.

Accommodations could not:

1. result in adverse consequences;
2. alter the construct being tested; or
3. provide additional information, prompting, or clueing to suggest or support the selection of correct answers.

Standard accommodations must have been used consistently for instruction and assessment prior to the test administration. Accommodations were not allowed for non-ELL students or for any students without an IEP or 504 Plan. Accommodations were administered by a trained certified teacher, certified staff member, or access assistant. A certified teacher, certified staff member, or access assistant was qualified to administer accommodations if that teacher:

1. Understood the procedures for administering standard accommodations; and
2. Has effectively administered the accommodation(s) to the student during instruction and/or assessment; and
3. Has attended a 2015 PAWS Training or has viewed the 2015 PAWS Training online and submitted record of the training to the building principal; and
4. Has completed the 2015 PAWS Accommodations Training online and a submitted record of the training to the building principal.

PAWS administrations were untimed for all students. Large print, English/Spanish audio (Math and Science only), and braille versions of PAWS were available for all grade levels and content areas.

#### *4.5.3. Description of Standard Accommodations for Students with Disabilities*

As mentioned above, the types of standard and allowable accommodations used with PAWS were grouped into four categories:

- Presentation (visual, tactile, auditory, and multisensory)
- Response
- Setting
- Timing/scheduling

Appropriate documentation and monitoring of the standardized use of accommodations was required of test administrators, test coordinators, and/or principals. Monitoring of the selection, administration, and evaluation of accommodations by school personnel was provided by the Wyoming Department of Education and occurred during the administration of the tests as well as following the administration of the PAWS. Additionally, the Special Programs Unit reviewed

documentation of accommodations during on-site monitoring visits. The following assessment accommodations were allowable for students with an IEP or 504 Plan.

#### *4.5.3.1. Presentation Accommodations*

1. Student uses a Braille Special Test Form.
2. Student uses a Large Print Special Test Form.
3. Student uses an Audio Special Test Form.
4. Student uses magnification devices.
5. Student uses color overlays to reduce glare or enhance text.
6. Student uses templates to reduce the amount of visible print.
7. Student uses tactile graphics.
8. Sign language interpreter signs directions in all content areas and/or signs test questions as written in all content areas EXCEPT reading. The interpreter may not clarify, interpret, define word meanings, elaborate, or provide assistance to students. Interpreters need to be familiar with the terminology and symbols specific to the content. It is recommended that one interpreter be provided for each individual student.
9. A certified staff member or access assistant provides visual cues to students who are deaf or hard of hearing.
10. A certified staff member or access assistant reads directions word-for-word as written in all content areas and/or reads or re-reads test questions word-for-word as written in all content areas EXCEPT reading. Raters may not clarify, interpret, define word meanings, elaborate, or provide assistance to students. It is recommended that one reader be provided for each individual student.
11. Student asks for clarification of directions (not test questions or answer choices).
12. Student uses audio amplification devices, including and/or in addition to hearing aids to increase clarity.
13. Student uses text-to-speech software in all content areas EXCEPT reading.

#### *4.5.3.2. Response Accommodations*

14. A certified staff member or access assistant scribes what a student dictates through alternate augmentative communications (AAC), pointing, sign language, or speech. The scribe may not edit or alter the student's work in any way and must record, word for word, exactly what the student has dictated. A scribe must allow the student to review and edit what that student has written. The student's final response must be transcribed by a

- certified staff member or access assistant into the Student Test and Answer Book on the pages in which the student's response is to be written.
15. A student types responses using a word processor. Dictionary and synonym/thesaurus devices **MUST** be disabled. The margins for word-processed documents should match the same space as is allowed in the Student Test and Answer Book. A certified staff member or access assistant transcribes verbatim the student's work into the Student Test and Answer Book on the pages in which the student's response is to be written.
  16. Student uses speech-to-text conversion or voice recognition in all content areas. The margins for this document should match as closely as possible the same space as is allowed in the Student Test and Answer Book. A certified staff member or access assistant transcribes verbatim the student's work into the Student Test and Answer Book on the pages in which the student's response is to be written.
  17. Student uses a Braille. A certified staff member or access assistant transcribes verbatim the student's work into the Student Test and Answer Book or answer document on the pages in which the student's response is to be written.
  18. Student uses a tape recorder to record test responses rather than writing on a paper. A certified staff member or access assistant transcribes verbatim the student's work into the Student Test and Answer Book or answer document on the pages in which the student's response is to be written.
  19. A certified staff member or access assistant monitors the placement of student responses on the Student Test and Answer Book or answer document.
  20. Student uses visual organizers including graph paper, place markers, and templates. Student uses a pencil to underline text. Highlighters **CANNOT** be used in the Student Test and Answer Book or answer document.

#### *4.5.3.3. Setting Accommodations*

21. Student takes the test in a different building location, in a small group, or individually. Changes can also be made to a student's location within a room to reduce distractions to the student or to other students, to increase physical access, or enable the use of special equipment. Students must be monitored by a certified staff member.

#### *4.5.3.4. Timing and Scheduling Accommodations*

22. Student is provided with extended time to complete the assessment.
23. Student is provided with multiple, individual breaks as needed, monitored by a teacher or access assistant.

24. Student takes the tests at the time of day when that student is most likely to demonstrate peak performance.

#### *4.5.4. Description of Standard Accommodations for English Language Learners (ELL)*

Schools could not exempt ELL students from the PAWS content assessments. The only exception to this policy was that students who were enrolled in U.S. schools for less than one year as of March 31, 2015, could be waived from taking the PAWS Reading content assessments with an exemption approved by the Wyoming Department of Education. Students who received this exemption took the ACCESS for ELLs assessment instead of the Reading portion of PAWS, but were not exempted from the mathematics and science portions of PAWS.

ELL students could be provided with accommodations during PAWS as long as they met eligibility criteria. In addition, students who no longer meet the eligibility criteria as ELL and were identified as proficient or transitional could also receive standard accommodations for a period of up to two academic years when appropriate. These accommodations have been demonstrated to be effective in providing access to the test and should have been used regularly by the student during instruction and assessment prior to the 2015 administration.

##### *4.5.4.1. Presentation Accommodations*

25. A certified staff member or access assistant translates written directions to the student.
26. A certified staff member or access assistant re-reads, simplifies, or clarifies directions in English or in the student's primary language (NOT test questions or answer choices) without clueing correct responses.
27. A certified staff member or access assistant reads and/or re-reads test questions in English, word-for-word, exactly as written in all content areas EXCEPT reading. Readers may not clarify, interpret, define word meanings, elaborate, or provide assistance to students. Readers need to be familiar with the terminology and symbols specific to the content. It is recommended that one reader be provided for each individual student.
28. Student uses a bilingual dictionary provided by the school.

##### *4.5.4.2. Setting Accommodations*

29. Student takes the test in a different building location, in a small group, or individually. Changes can also be made to a student's location within a room to reduce distractions to the student or to other students, to increase physical access, or enable the use of special equipment. Students must be monitored by a certified staff member.

##### *4.5.4.3. Timing and Scheduling Accommodations*

30. Student is provided with multiple, individual breaks as needed.

31. Student is allowed to complete the test over multiple days.

#### *4.5.5. PAWS 2015 Monitoring of Appropriate Accommodations*

Through its Continuous Improvement Focused Monitoring process, the WDE Special Programs Division monitors the appropriate selection and use of accommodations for both instruction and assessment. Each school year, Special Programs staff members visit at least 16% of Wyoming districts to investigate potential noncompliance within the priority areas of Free and Appropriate Public Education in the Least Restrictive Environment (FAPE in the LRE), Postsecondary Transition, Child Find, Disproportionality, and other procedural areas.

While on-site in school districts, WDE staff members review Individual Education Program (IEP) files looking for evidence that IEP teams have made sound accommodations decisions to enable students with disabilities to gain access to instructional content and assessment measures. In addition, general and special education teachers, administrators, and service providers are interviewed to provide further information about school and district practices regarding accommodations. Failure to provide accommodations listed in a student's IEP or failure to thoughtfully consider accommodations for a student or students may contribute to a finding of noncompliance, thus requiring the district to address the issue through the creation and implementations of a Corrective Action Plan (CAP). Monitoring of standard accommodations for ELL's was provided by the Local Education Agency.

##### *4.5.5.1. Empirical Analysis of Accommodations*

IEP and 504 Plan students comprised approximately 11%–14% of students at each grade level, with between 60%–80% of those IEP and 504 students receiving testing accommodations (depending on grade and subject). While Wyoming allows 31 specific accommodations on PAWS as described herein, the overwhelming majority across all content areas were provided as auditory presentations (e.g., reading directions, reading questions, clarifying directions, or the audio form), setting accommodations (i.e., testing in a separate location), or an accommodation in timing/scheduling (e.g., extended time, multiple breaks, test over multiple days). This breakdown by specific accommodation also provides a baseline for monitoring accommodations in future years. Frequency tables for accommodations provided during the 2015 PAWS for Mathematics, Reading, and Science for all grades are presented in Appendix J. In general, IEP students who did not receive accommodations had higher mean scale scores. Mean scale scores for IEP and 504 Plan students broken down by accommodation status are presented in Appendix K.

#### *4.5.6. Selection and Administration of Accommodations*

An important question regarding the use of accommodations in large-scale assessment is whether the resultant student scores mean the same thing as scores resulting from non-accommodated assessment (Kim, Wang, Zhao, and Li, 2006). In other words, do the accommodations yield meaningful, valid scores of the level of a student's subject mastery? It is also imperative to know



the effect of including scores of accommodated students in test calibration<sup>18</sup>, specifically in terms of item parameters and resulting test scores (Karkee, Lewis, and Barton, 2005). Wyoming recognizes the need to examine the data associated with the administration of standard accommodations for students with disabilities, students with 504 Plans, and English Language Learners, and for the continued evaluation of the standard accommodations with regard to current research.

Standard accommodations were implemented for students with disabilities, students with 504 Plans, and the English Language Learners (ELLs) participating in the PAWS testing. In providing for the use of accommodations, the state recognized that it is important to ensure that accommodated testing conditions did not change the construct being tested nor affect the psychometric characteristics of the assessments. ETS and WDE will continue to monitor the appropriate use of accommodations for students that require them. Special attention will be given to ensure that the use of accommodations does not negatively affect the validity of the test results for such students or for students who did not require accommodations.

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<sup>18</sup> Note that responses to Braille, audio, and large print forms were excluded from calibration, scaling, and equating analyses, but are included in all descriptive statistics reported in this technical report except those that come directly from the calibration, scaling, and equating analyses (such as Rasch item difficulties). Responses to the regular forms from students who received accommodations were included in the calibration, scaling, and equating analyses.

## 5. PROCESSING AND SCORING OF PAWS ITEMS

### 5.1 Overview

This chapter describes the receipt control, scanning, and scoring procedures used at ETS for the 2015 PAWS.

At the close of testing, the PAWS Student Test and Answer Books and answer documents (grades 6–8) were returned to ETS. Upon receipt, they were scanned into ETS’s electronic imaging system. Subsequent processing of student responses necessary to score those responses and to produce reports used these images rather than the paper documents. After scanning, the physical documents were put into archival storage. Student responses to PAWS multiple-choice test items were machine-scored. Correct answers were assigned a score of one point and incorrect answers were assigned a score of zero points.

### 5.2 Receipt Control, Processing, Scanning, Editing

ETS’s Operations Center was responsible for the processing of documents received from Wyoming for each individual student’s work. The team consisted of software and process engineers, management professionals, systems and requirements analysts, and customer service specialists. The receiving staff accepted and counted PAWS cartons that were returned to ETS, confirming shipments from schools. The editing staff captured and verified customer information via the Header Sheet to compare number of documents scanned to number indicated as being returned on the Header Sheet. The Document Staging department ensured that box contents matched the information provided on the Header Sheet. This step linked every document to the proper scannable scoring order number (batch number) that was utilized throughout the remaining steps of the scanning and scoring process. The scanning process captured data from student test and answer books, answer documents, and school headers.

Within each functional area, specific tasks were accomplished and quality checks were performed both within and across functional areas. The quality checks performed were documented in the custom program specifications.

#### *5.2.1 Receipt Control*

Receipt control began when the receiving staff accepted and counted cartons as they were delivered, sorting them by district into scorable and non-scorable queues. The first quality checkpoint was a comparison of what was received against what was expected to be received. This check was performed utilizing the tracking system to flag any anomalies in the shipment and to begin immediate investigation of any such. The process was utilized to produce a daily report listing districts for which materials had not arrived.

ETS and WDE have established rules for handling issues encountered while processing the answer documents. These are located in the program specifications.

### *5.2.2 Processing*

ETS used Header Sheets to capture and verify customer information to ensure that complete results were delivered to the proper location. The information that was verified included the returned scorable document *N*-count, grade, and subject for each returned scorable document, building name and number, and district name.

To minimize or eliminate student coding errors on the student demographic page, ETS provided a pre-identification service to the WDE. This service was utilized to provide student demographic data that were printed on pre-ID labels that were scanned during processing.

During the staging process, ETS staff removed the documents from the boxes and arranged them on carts. A preprinted scannable scoring order number (batch number) was matched to each cart. Each Header Sheet was matched to a specific batch number that was placed with the documents so that when it was scanned the batch number was associated with those documents. This step is important because it linked every individual document to the proper order number throughout the remaining steps in the scoring and reporting process.

### *5.2.3 Scanning*

In the scanning stage, ETS captured all the data from the student response forms and school headers created during the staging process. All scannable documents were processed in a temperature-controlled environment. This allowed the paper to normalize and eliminated paper distortion caused by the environment. Properly stabilized paper improved scan reliability and quality. Prior to scanning, the spines of multiple-page documents were cut to create single sheets that were then scanned.

ETS utilized image-scanning technology to capture information from all scannable documents. A scanner diagnostic test was executed prior to scanning the documents on each cart, and a calibration check was performed to validate that the scanner was imaging properly. The calibration check ensured that the scanner was accurately capturing the range of darkness of the written and gridded responses. This was critical to the post-processing that occurred in editing and scoring.

The images produced by the scanner included document identification and all information gridded by the test-taker and were stored as 8-bit (256 level) grayscale images. The scanning program checked the validity of the document identification using optical mark recognition (OMR), skunk codes, and optical character recognition (OCR) module codes to ensure that the booklet that was being scanned was the correct booklet. The scanning program also compared the actual number of pages scanned to the number of pages expected for the document according

to its identification. These two checks ensured that the correct document was being imaged and that the entire document was imaged. Finally, the skunk and module codes acted as reference points indicating the orientation of the document as it moved through the scanner.

Scanned documents were sent to databases where images were distributed to editors and/or raters based upon rules established for the program. The data collected from the image scanners were stored in a scan file, which was used to generate an edit report. When this was completed, the cart containing the scanned documents was logged out of the scanning workstation.

#### *5.2.4 Resolutions*

The first step in the resolution process was to electronically compare each student's scanned data to the business rules established by WDE for processing the student's information. The results of this comparison were used to generate an edit report listing documents requiring correction or validation. This report included all documents with a data field that did not match program specifications. A scoring editor reviewed every flag by referencing the source document and validating or correcting the field. Data items edited included the student id, name, and date of birth. The edits that were applied to the student's scanned data were also applied when registering the student online. In the online system, edits were applied immediately and data were not accepted into the system if invalid.

Another step in the paper resolution process is *N*-count verification. The number of documents scanned was compared to the number of documents recorded on the Header Sheet and collected in the structure definition. When the *N*-counts did not match, the paper documents for that batch were manually counted, and based on the business rule variance, an alert was issued for document *N*-count discrepancies.

When all resolution edits were resolved any corrections were incorporated into the file containing student records. Once all corrections were made, the edit routine was rerun to ensure data validity. When no fields were flagged as suspect, all the records for that order were considered clean and the tracking system moved the order to job submission. The physical documents were no longer needed in the scoring process and were moved to the archiving workstation.

## 6. EQUATING AND SCALING PROCEDURES

### 6.1 Overview

This chapter covers:

- The equating of the 2015 PAWS Reading, Mathematics, and Science assessments; and
- Translation of raw scores to scale scores along with descriptive statistics for all of the 2015 PAWS scales.

ETS Statistical Analysis team for Wyoming program conducted and quality checked all analyses for the WY PAWS assessment, and documented the primary analyses results in this chapter. After all analyses were concluded and documented, preliminary results were calculated over the student data sample used for equating (all grades and subjects had responses from greater than 95% of the population of Wyoming students in the sample). Documentation of the analyses and the preliminary statewide results were presented to the WDE assessment leadership team for their review and approval by ETS's lead psychometrician via conference call and WebEx prior to the release of the scoring tables for production of reports. Scoring tables were released and production activities commenced after ETS received written approval of the results by the WDE assessment leadership.

### 6.2 Item and Forms Development

Kolen and Brennan (2014) state that equating adjusts for differences in test form difficulty, not for differences in content. Reading and mathematics have a new 2012 style guide based on the 2012 WyCPS. Science items have been developed to the same style guide since 2005 (with minor updates throughout), and tests have used comparable blueprints since the first operational administration in 2008. Science test blueprints did change between the 2013 and 2014 administrations with the removal of constructed response items from the assessments. There were no changes in 2015.

### 6.3 IRT Models and Calibrations

One parameter Item Response Theory (IRT) model (i.e., *Rasch model*, 1980) was used to calibrate the 2015 Wyoming PAWS assessments for dichotomous items. This measurement model is used regularly to construct test forms, for scaling and equating, and to develop and maintain large item banks. All test analyses, including item model fit analysis, equating, and performance prediction were accomplished within this framework. The statistical software used to calibrate the PAWS operational and field test items that were used in the spring 2015 administration was *WINSTEPS Version 3.68.1* (Linacre, 2007).

The most basic expression of the Rasch model is in the Item Characteristic Curve (ICC). It conceptualizes the probability of a correct response to an item as a function of the student's ability level and the difficulty of the item. The probability of a correct response is bounded by 1 (certainty of a correct response) and 0 (certainty of an incorrect response). The ability scale is theoretically unbounded. In practice, the ability scale ranges from approximately  $-4$  to  $+4$  logits for heterogeneous ability groups. The probability of an examinee with ability  $\hat{\theta}$  answering item  $i$  with difficulty  $D_i$  correctly is shown in the equation below:

$$P_i(\hat{\theta}) = \frac{\exp(\hat{\theta} - D_i)}{1 + \exp(\hat{\theta} - D_i)}$$

As an example, consider Figure 5.1, in which the response probability curve for a dichotomous item is depicted with a Rasch difficulty ( $D_i$ ) of 0.85. When a person answers a dichotomous item with a difficulty that is at the same level as their ability (ability is represented by  $\theta$  in the equation above), then that person has a 50% chance of answering the item correctly. Another way of expressing this is that if we have a group of 100 people, all of whom have an ability of 0.85, we would expect about 50% of them to answer the item correctly. A person whose ability was above 0.85 would have a higher probability of a correct answer, while a person whose ability is below 0.85 would have a lower probability. This makes intuitive sense and is the basic formulation of Rasch measurement for test items having only two possible scores (i.e., wrong or right).

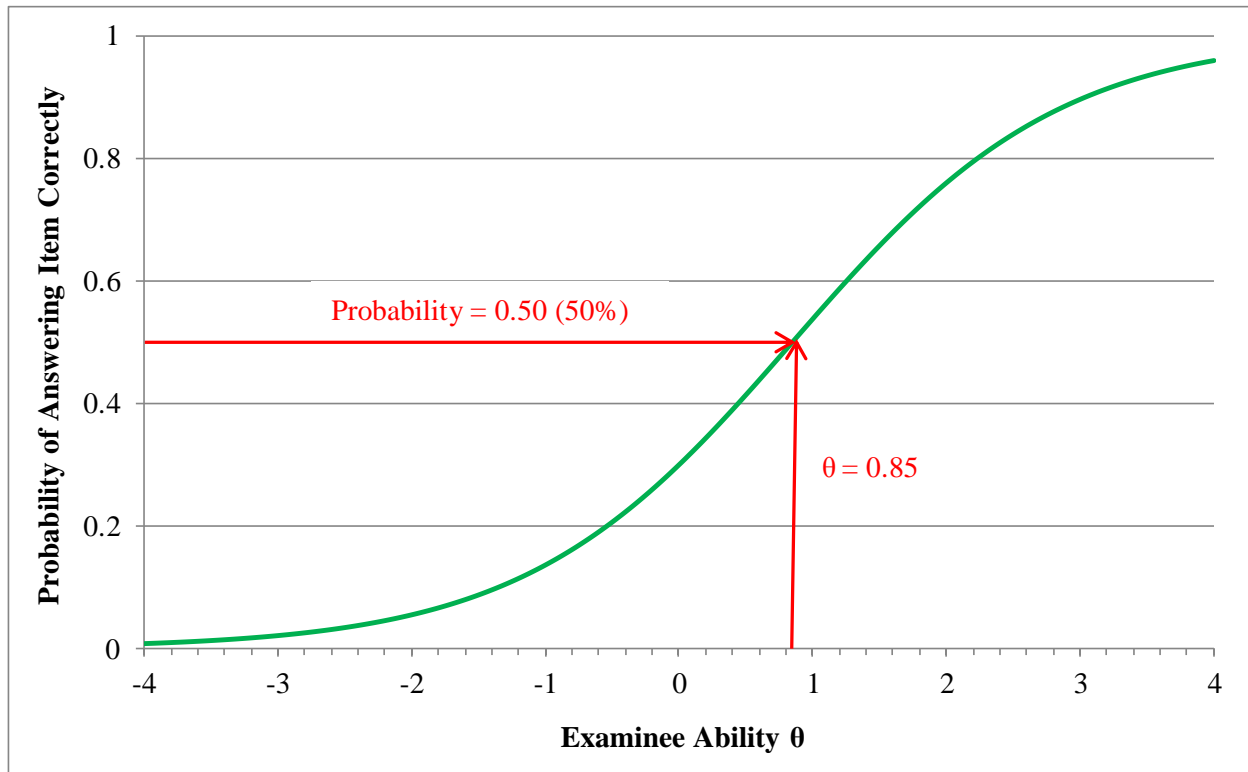


Figure 1. Sample item characteristic curve.

One important property of the Rasch model is its ability to separate the estimation of item/task parameters from the person parameters. With the Rasch model the total raw score is a sufficient statistic for estimating the person's ability (i.e., no additional information is necessary to derive an estimate of the person's level of ability). The total number of responses across examinees in a particular category is a sufficient statistic for estimating the difficulty for that category. Thus with the Rasch model, the same total score will yield the same ability estimate for different examinees, regardless of which *particular* items within the form they answered correctly.

#### 6.4 Fit Statistics for the Rasch Model

Fit statistics are used for evaluating the goodness-of-fit of a model to the data. Fit statistics are calculated by comparing the observed and expected trace lines obtained for an item after parameter estimates are obtained using a particular model. *WINSTEPS* provides two kinds of fit statistics called outfit and infit mean-squares that show to what degree the observed data follows the pattern of responses that would be predicted by the model. This indicates how appropriately the model is describing the statistical behavior of the item responses.

Outfit mean-squares are influenced by outliers and are usually easy to diagnose. Infit mean-squares, on the other hand, are influenced by response patterns and are harder to diagnose and remedy. Table 19 presents guidelines for evaluating mean-square fit statistics (Linacre, 2007).

Table 19. Criteria to Evaluate Mean-Square Fit Statistics

Mean-Square	Interpretation
> 2.0	Distorts or degrades the measurement system
1.5 – 2.0	Unproductive for construction of measurement, but not degrading
0.5 – 1.5	Productive for measurement
< 0.5	Unproductive for measurement, but not degrading. May produce misleadingly good reliabilities and separations

In general, mean-squares near 1.0 indicate little distortion of the measurement system, while values less than 1.0 indicate observations that are too predictable (redundancy, model overfit). Values greater than 1.0 indicate unpredictability (unmodeled noise, model underfit).

Appendix I provides Rasch difficulty estimates, standard errors, and infit and outfit statistics for 2015 PAWS operational items. The majority of fit statistics were within the range of 0.5 to 1.5. No operational items exceeded the 2.0 threshold. These results confirm that the Rasch model was appropriate for equating the 2015 PAWS operational Reading, Mathematics and Science tests. Operational classical item statistics are presented in Appendix G.

Appendix H provides IRT statistics and *N*-counts for items field-tested in 2015. Item fit is a factor that is considered during test construction, and items with less than optimal fit statistics that survive data review are not likely to be used on future PAWS forms.

### 6.5 Reading and Mathematics Vertical Scales

According to Young (2006), vertical scales have several important aspects. These include:

- The monitoring of student progress over time within a content area;
- Analyzing the growth patterns for individual students or groups of students in terms of changes in performance and variability from grade to grade; and
- Checking on the consistency of achievement-level expectations across grade levels.

It is important to note that vertical scaling produces scales that are *linked* across adjacent grades as opposed to scales that are *equated*. Linked scales are comparable, but have a weaker relationship than equated scales. This relationship is strongest across adjacent grades and weakens as the gap between the grades being compared widens. This is due to the fact that the



tests from adjacent grades cover different subject matter that is specific to their targeted grades. For an equating relationship to exist, the test forms that are being equated should cover the same subject matter. Thus, test forms from the same grade and subject are equated from year to year while test forms from adjacent grades (within grades 3 to 8) and the same subject are linked via the vertical scale.

New scales measuring students' academic performance on Wyoming Content and Performance Standards were established in 2014 for PAWS Reading and Mathematics assessments. The vertical scales for reading and mathematics were developed in 2014 using an operational and embedded vertical anchor test design. The vertical linking items were embedded within the PAWS 2014 assessment test booklets in the field test positions. The vertical linking items did not count toward a student's scale score.

The reading scale allows for direct comparison of student test scores across grade levels within a content area. The mathematics vertical span scale, performing the same function, was designed to address the mathematics blueprint having three content continuums across grades. This scale divides grades 3–8 mathematics tests into 3 spans (Span I: grades 3–5; Span II: grades 6–7; and Span III: grade 8).

A Rasch model was used for calibration and vertical scaling of 2014 PAWS Reading and Mathematics tests. A common-item nonequivalent groups design in which students in adjacent grade levels respond to the same items was used to collect data to build a vertical scale for PAWS Reading and Mathematics assessments. The linkages between adjacent grades were established by fixing the item difficulty parameters of the vertical anchor sets in the upper grade to the values obtained from the calibration of these items in the lower grade. Following the decision from Technical Advisory Committee (TAC) meeting, the grade 3 reading scale was chosen to be the base scale for Reading assessments. The grade 4 scale was linked to the grade 3, the grade 5 to the grade 4, etc. As a result, reading and mathematics test scores in grades 3–8 are directly comparable across adjacent grades. More information regarding the reading and mathematics vertical scales can be found in the PAWS 2014 Calibration and Scaling Reports for Reading and Mathematics.

### 6.6 Reading, Mathematics, and Science Equating Analyses

As was previously mentioned, the PAWS Reading, Mathematics, and Science assessments for 2015 were post-equated, meaning that the item and test statistics used to generate the scoring tables (i.e., tables displaying the relationship between specific raw scores and scale scores for a particular grade level and subject) came from the present (spring 2015) administration. All tests were equated to the existing scale, and so scale scores on the 2015 administration use the same metric as scale scores for the same grade level and subject from previous administrations of the

PAWS. The Science tests are only given at grades 4 and 8 and therefore were not vertically scaled.

#### *6.6.1. Calibration and Equating Process for the 2015 Administration*

The procedures for equating the 2015 forms of the Reading, Mathematics and Science forms to the preexisting scales were similar to those used in previous years. To establish a strong relationship between the 2014 and 2015 forms, each 2015 form had approximately 30% of its items drawn from the set of 2014 operational items. Other items were drawn from the item bank, which was composed of all items used operationally (with the exception of those items released publicly as sample PAWS items), and items field tested and accepted at data review.

The tests were equated via common item equating to a calibrated item pool (Kolen and Brennan, 2014). All items were drawn from previous years' administrations and can potentially function as anchor items with their parameters being drawn from their most recent operational use<sup>19</sup>. Only core items that had been operationally used in a previous form and deemed to have reliable bank parameter values were selected for the anchor set. Other items that were only field tested in previous administrations were excluded from the anchor set.

There were some items that were identified as possibly having unreliable statistics from their most recent use and such items were removed from being anchor items. Some items had been modified since their most recent use (primarily older items modified to bring them in line with current PAWS item style guidelines). Their previous statistics in the item bank might not be comparable to the statistics of the new modified version of the item. These items were removed from the anchor set. All items that were not used as linking items had their parameters freely estimated while holding the parameters of the remaining anchor items fixed.

Though Rasch (and, in general, IRT) parameters are theoretically invariant across different samples of students, in practice it could be possible for the occurrence of parameter drift. Such drift can be the result of shifting emphases in instruction over time, changes in item position from the previous use of the item, contextual effects, or simply random measurement error. Therefore anchor stability was checked carefully prior to the final calibration analysis to identify any items whose parameters had drifted (i.e., items whose Rasch difficulties estimated from the 2015 administration data differed significantly from their known values used for equating).

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<sup>19</sup> ETS used only operationally administered items as anchors. Pearson previously used both field test and operational items as anchors. The change was approved by the WDE.

Anchor stability analysis was conducted to identify items that were not suitable for use as anchor items. The Robust-Z statistic (Huynh and Meyer, 2010) was utilized to identify items that exhibited instability in their difficulty parameter estimates (multiple choice items) for the 2015 calibration as compared to their difficulty estimates from their most recent previous use.

The first step in computing Robust-Z is to run a WINSTEPS calibration with all items (including those in the anchor set) unanchored (freely calibrated). The Rasch parameter estimates of anchor items in this run and their previous estimates in the item bank were used to calculate the Robust-Z statistics.

Robust-Z is defined as

$$Z = \frac{d - MDN(d)}{0.74 \times IQR(d)}$$

where  $d$  is the difference between the Rasch parameter estimate of an anchor item estimated from the free calibration and its bank parameter estimate,  $MDN(d)$  is the median of  $d$ , and  $IQR(d)$  is the interquartile range of  $d$ . Huynh and Meyer (2010) describe the use of the median and interquartile range as a robustification of the traditional  $z$ -statistic and  $z$ -test. In the above formula, Rasch parameter estimates are Rasch difficulties for multiple choice items (one parameter per item).

Items with a Robust-Z that exceeded 1.645 were deemed to have drifted in difficulty and were considered for being eliminated from the anchor set in the previous protocol. However, ETS retained all flagged item(s) in the anchor set if the items were not identified to be flawed by content experts. This departure from previous protocol was accepted by the WDE based on Yen's (2007) white paper. In the second round of anchor stability checks, anchored items' displacement values were also examined. Linacre (2007, p. 362) describes displacement statistic as:

*... the size of the change in the parameter estimate that would be observed in the next estimation iteration if this parameter was free (unanchored) and all other parameter estimates were anchored at their current values. For a parameter (item or person) that is anchored in the main estimation, (the displacement value) indicates the size of disagreement between an estimate based on the current data and the anchor value.*

If the absolute value of displacement was greater than or equal to 0.5, the item was flagged as having difficulty drift across administrations. The third round of analyses involved examining groups of items for displacements in the same direction, even if those displacements did not individually exceed the threshold value of 0.5 in the second round. This mainly applied to the Reading and Science tests that had sets of items tied to passages, but Mathematics tests were

examined as well. If a group of items with something in common (such as a common passage or content area) were all influenced in some way that affected their overall group difficulty in the same way, the cumulative effect of that group on the overall test (specifically, the relationship between raw and scale scores) can be large enough to introduce a significant amount of systematic error into the equating.

The second calibration run of the WINSTEPS software fixed parameters of items in the anchor set to their bank values and freely estimated the parameters of the rest of the items. This procedure enables equating operational test scores from year to year to the baseline scale. The output files that showed the correspondence between raw scores on the test and theta scores (a measure of student ability; see section 5.2) were later used to develop the raw score to scaled score conversion tables (see section 5.6). The theta equivalents for each raw score point were determined iteratively by solving the following equation.

$$TrueScore = \sum_{i=1}^I \sum_{j=0}^{m_i} j \cdot P_{ij}(\hat{\theta})$$

And *True Score* is set to each achievable raw score point to find its theta equivalent.

These theta score estimates were then scaled via constants to the reporting metric. According to Lord and Wingersky (1984), the procedure applied to true scores can be transferred to observed raw scores without any major anomalies in the resulting outcomes.

### 6.7 Translating Raw Scores to Scaled Scores and Performance Levels

Scaled scores on the PAWS Reading, Mathematics, and Science tests ranged generally from 300 to 975 for grades 3–8; the specific minimum and maximum possible scale scores varied by grade and subject. Appendix L provides scale score descriptive statistics for the 2015 PAWS Reading, Mathematics, and Science tests.

The following formulae were used to convert the underlying PAWS IRT Reading, Mathematics, and Science scales to the PAWS reporting scale:

$$PAWS \text{ Scaled Score} = \hat{\theta} \times Slope + Intercept$$

$$PAWS \text{ Scaled SEM} = SEM(\hat{\theta}) \times Slope$$

where  $\hat{\theta}$  was the *IRT* ability estimate, and  $SEM(\hat{\theta})$  was the estimated conditional standard error of measurement (*SEM*) of the ability estimate  $\hat{\theta}$ . Table 20 also contains the slope, intercept, and LOSS (lowest obtainable scale score) and HOSS (highest obtainable scale score) for the PAWS Reading, Mathematics, and Science scales.

The raw score to scale score conversion tables for the 2015 PAWS Reading, Mathematics, and Science tests can be found in Appendix M. Conditional standard error estimates and performance levels for the scale scores are also included in these tables.

Table 20. PAWS Reading, Mathematics, and Science Scaling Constants, Lowest Obtainable Scale Scores, and Highest Obtainable Scale Scores

Grade	Scaling constant	LOSS	HOSS
<u>Reading</u>			
Grade 3	Scaled = $\hat{\theta} * 43.89281 + 553.1639$	375	800
Grade 4	Scaled = $\hat{\theta} * 43.89281 + 553.1639$	400	825
Grade 5	Scaled = $\hat{\theta} * 43.89281 + 553.1639$	425	850
Grade 6	Scaled = $\hat{\theta} * 43.89281 + 553.1639$	450	875
Grade 7	Scaled = $\hat{\theta} * 43.89281 + 553.1639$	475	900
Grade 8	Scaled = $\hat{\theta} * 43.89281 + 553.1639$	500	925
<u>Mathematics</u>			
Grade 3	Scaled = $\hat{\theta} * 43.4074 + 570.41$	375	850
Grade 4	Scaled = $\hat{\theta} * 43.4074 + 570.41$	400	875
Grade 5	Scaled = $\hat{\theta} * 43.4074 + 570.41$	425	900
Grade 6	Scaled = $\hat{\theta} * 43.4074 + 570.41$	450	925
Grade 7	Scaled = $\hat{\theta} * 43.4074 + 570.41$	475	950
Grade 8	Scaled = $\hat{\theta} * 43.4074 + 570.41$	500	975
<u>Science</u>			
Grades 4 and 8	Scaled Score = $\hat{\theta} * 48.21 + 637.5$	300	975

## 7. PAWS REPORTING

### 7.1 Overview

A thorough understanding of the results of the PAWS assessments is essential for all members of the school community (parents, teachers, administrators, and students) to be able to hold students accountable for individual learning progress and delivering targeted intervention as needed to help all students to meet grade level expectations. This level of assessment literacy is only possible if professional educators are well versed in assessment practice and assessment results are presented clearly. Sample student reports are located in Appendices B and C for PAWS. Appendix B shows the report for PAWS Reading and Mathematics for grades 3, 5, 6, and 7. Appendix C demonstrates the PAWS Reading, Mathematics, and Science reports for grades 4 and 8.

The following reporting information is provided:

- Performance Levels
- Raw and Scaled Scores by Domain
- Skill-Reporting Categories
- Production of PAWS Individual Student Score Reports

### 7.2 Scaled Scores

The PAWS Reading and Mathematics tests were designed to be comparable across grade levels (vertically) for grades 3–8. The vertical scale scores generally range from 375 to 975 for Reading and Mathematics. Care was taken in crafting the assessment system so that the skills and abilities captured by each grade level assessment (within subject) reflected the same fundamental set of skills. This is the intent of a vertical scaling system. In essence, each PAWS vertical scale reflects a single general underlying construct (e.g., mathematics ability).

While this is common practice in educational assessment, there are limits to the interpretations based on such scales (Kolen and Brennan, 2014). Where each grade level test is based on a common blueprint design, the grade-level specifics as reflected in the test questions differ from grade to grade. These differences are naturally greater as one compares over wider grade spans. It is thus important to take these underlying factors into consideration when interpreting student performance across grade levels, remembering that the scales for adjacent grades are linked rather than equated. Comparisons across adjacent grades are the most valid.

### 7.3 Performance Levels

Performance classifications are determined by applying the appropriate scale score cuts established from the PAWS standard setting activities described in the 2014 Standard Setting Summary Proficiency Assessments for Wyoming Students (PAWS for Reading, Mathematics) (Baron, 2014) and 2008 (Science) PAWS standard setting reports (Pearson, 2008). Tables 21–23 provide the scaled score ranges for the PAWS Reading, Mathematics, and Science tests.

Table 21. Proficiency Level Ranges for Grades 3–8 Reading

Grade	Below Basic	Basic	Proficient	Advanced
3	375–552	553–589	590–640	641–800
4	400–565	566–605	606–659	660–825
5	425–577	578–619	620–667	668–850
6	450–588	589–629	630–680	681–875
7	475–605	606–641	642–692	693–900
8	500–615	616–655	656–710	711–925

Table 22. Proficiency Level Ranges for Grades 3–8 Mathematics

Grade	Below Basic	Basic	Proficient	Advanced
3	375–549	550–598	599–659	660–850
4	400–583	584–636	637–696	697–875
5	425–608	609–651	652–726	727–900
6	450–628	629–676	677–742	743–925
7	475–652	653–696	697–752	753–950
8	500–663	664–706	707–762	763–975

Table 23. Proficiency Level Ranges for Grades 4 and 8 Science

Grade	Below Basic	Basic	Proficient	Advanced
4	300–611	612–665	666–725	726–975
8	300–605	606–653	654–713	714–975

Descriptions of each performance level provide specific information about the skills and abilities that students at that performance level are typically capable of demonstrating. The performance-level descriptions for reading, mathematics, and science are included on the Student Score Report.

Percentages for all Wyoming students as well as for selected demographic subgroups in each of the four performance levels can be found in Appendix N.

#### 7.4 Content Standard-Level Raw and Scale Scores

Content standard-level scores (by text type for Reading and skill for Science) are provided in the form of scaled and raw scores. The content standard-level scores were produced in the same way as the overall test scaled scores—a raw score to scaled score table for each content standard within a particular form/grade/content area combination was derived using the Rasch IRT parameters of the items that mapped to that standard.

The standard-level scaled scores and associated error ranges (student scaled score  $\pm$  one CSEM) are graphically presented on the Student Score Report. Assuming a normal distribution of scaled scores, the probability that a student's true score will be in the range indicated by the error bar is approximately 68%. For Mathematics, scaled scores are provided for grade 3-5: Operations & Algebraic Thinking, Number Operations – Base Ten, Number Operations – Fractions, Measurement & Data, and Geometry, grades 6-7: Ratios & Proportional Relationships, The Number System, Expressions & Equation, Geometry, and Statistics & Probability and grade 8: Functions, The Number System, Expressions & Equation, Geometry, and Statistics & Probability. For Reading, scale scores are provided for Literature: Key Ideas and Details, Literature: Craft and Structure, Informational: Key Ideas and Details, Informational: Craft and Structure, Integration of Knowledge and Ideas, Language. For Science, scaled scores are given for Life Science, Physical Science, and Earth and Space Science. Since measurement error is related to the number of reliable items making up the measure, the error ranges for the standard level scores (i.e., subscale scores) will generally be larger than those for the overall subject-level scale score.

When comparing subscale scores, users should remember that the comparison is affected by measurement error present in both subscales. Generally, the difference between any two subscale scores has a lower level of reliability and a larger SEM than those of the subscales that are being compared. Any decisions based on the comparison between two or more subscale scores should be made with an appropriate degree of caution.

Raw score points earned for each skill-reporting category are also provided relative to total points possible. Domain reporting categories for mathematics, reading, and science can be found in the blueprints in Appendix A.

#### 7.5 Production of Printed Score Reports for PAWS

In final preparation for the production and printing of the PAWS score reports, the following steps took place at ETS. In the job submission workstation, district orders were submitted in batches for reporting. Upon completion of these jobs, the next step in the process was the production of QC reports.



The QC reports allowed the testing and verification of all reporting processes against program reporting requirements. These QC reports were carefully reviewed by representatives from the following ETS departments: Scoring Operations, Quality Assurance, IT Requirements, IT Scoring Programming, and Contract Testing Program Management. Extensive data checks were performed to verify the validity of reported scores. After verification and sign off by all concerned parties, production reporting commenced.

Individual student reports in paper format were generated for distribution to WDE districts. In addition, a student data file containing student demographic information, item response data, and domain scores was provided to the WDE for Adequate Yearly Progress (AYP) reporting via a secure FTP site. For security purposes, ETS posts to a secure Tumbleweed site. ETS provided secure user IDs and passwords to access the site.

Printed student reports were assembled and packed. Packers visually checked print and form quality during assembly. The reports then moved to pre-ship quality control, where the order received a final quality check prior to shipping. Results were compared against the reporting requirements to verify correct application of the scoring tables and to ensure that all deliverables were present. Each order was then released to shipping. An example of the PAWS individual student report is provided in each of Appendices B and C.

#### *7.6 Assessment Score Reports: Supplement Guide for Districts and Schools for PAWS*

The 2015 Wyoming State Assessment Program Score Reports: Interpretation Guide for Teachers was an online-only version that could be printed by users if desired. It contained explanations of the features and data contained in the PAWS reports. It was available on the WDE websites, and was intended for use by all users of the data from the PAWS assessment.

## 8. RELIABILITY

### 8.1 Overview

Reliability is the degree to which scores remain consistent over an assessment procedure (Nitko, 2004). Further defined, reliability is the degree to which students' assessment results are consistent when:

- They complete the same task on one, two, or more occasions;
- Two or more raters evaluate their performance on the same task; or
- They complete two or more parallel tasks on one or more occasions.

Consistency of scores over repeated assessment and/or with different raters is the underlying concern of reliability.

This chapter describes the reliability analyses of the 2015 PAWS operational assessments. Internal consistency and interrater reliabilities, classical and conditional standard errors of measurement, and accuracy and consistency results are included.

### 8.2 Internal Consistency Reliability

As a means of gauging score stability, internal consistency reliabilities were computed. Several methods can be used to estimate the internal consistency of a test.

The internal consistency of a test estimates the stability of scores from one sample of content to another. One approach is to split all test questions into two groups and then correlate student scores on the two half-tests. This is known as a split-half estimate of reliability. This method avoids the implications of any changes in the individual by administering only a single test. If scores have a high rate of correlation on the two half-tests, it can be concluded that the test questions complement one another, function well as a group, and measure similar concepts. This also suggests that measurement error is minimal. The split-half method's decision about which questions contribute to each half-test's score can have an impact on the resulting correlation.

As one index of internal consistency, ETS uses Cronbach's coefficient alpha statistic (Cronbach, 1951). The coefficient alpha is the average split-half correlation based on all possible divisions of a test into two parts. Coefficient Alpha is computed using the following formula:

$$r_{xx'} = \left( \frac{N}{N-1} \right) \left( 1 - \frac{\sum s_i^2}{s_x^2} \right)$$

where  $\sum s_i^2$  = sum of all of the item variances,  $s_x^2$  = observed score variance, and

$N$  = the number of items on the test.

Based on the total test, overall alpha statistics suggest reasonable internal consistency reliability for PAWS assessments at all grades and subjects. Alphas were mostly above 0.91 and never lower than 0.88 for any grade/subject combination. These observed reliabilities meet generally accepted industry levels and benchmarks for large-scale assessments. Complete results for PAWS are given in Table 24, including coefficient alpha and the standard error of measurement for each grade and content area. Tables 25–27 provide coefficient alpha and the standard error of measurement for each domain within a grade and content area.

Table 24. Summary Reliabilities, Standard Errors of Measurement, and Descriptive Statistics by Grade

Grade	<i>N</i> Counts	Possible Points	Cronbach's Alpha	SEM
Reading				
3	7538	50	0.90	2.97
4	7315	50	0.91	2.79
5	6894	54	0.91	2.85
6	7103	56	0.91	3.15
7	6766	56	0.91	3.12
8	6787	56	0.91	3.03
Mathematics				
3	7514	50	0.91	2.94
4	7285	59	0.91	3.24
5	6853	59	0.93	3.28
6	7107	59	0.92	3.37
7	6767	59	0.92	3.25
8	6801	65	0.92	3.54
Science				
4	7259	50	0.88	3.05
8	6789	50	0.89	3.18

Table 25. Summary Reliabilities, Standard Errors of Measurement, and Descriptive Statistics by Grade and Reading Domain

Grade	Domain	N Counts	Possible Points	Cronbach's Alpha	SEM
3	LTKY	7538	12	0.68	1.41
	LTCR	7538	6	0.48	0.94
	INKY	7538	9	0.64	1.32
	INCR	7538	7	0.51	1.19
	INTG	7538	8	0.66	1.17
	LANG	7538	8	0.66	1.05
4	LTKY	7315	10	0.68	1.24
	LTCR	7315	7	0.59	1.02
	INKY	7315	11	0.74	1.33
	INCR	7315	6	0.47	1.02
	INTG	7315	7	0.55	1.14
	LANG	7315	9	0.66	1.17
5	LTKY	6894	12	0.68	1.30
	LTCR	6894	6	0.53	0.82
	INKY	6894	12	0.72	1.43
	INCR	6894	8	0.63	1.09
	INTG	6894	7	0.44	1.12
	LANG	6894	9	0.69	1.11
6	LTKY	7103	12	0.70	1.42
	LTCR	7103	7	0.58	0.97
	INKY	7103	13	0.72	1.53
	INTG	7103	7	0.57	1.11
	INCR	7103	8	0.58	1.17
	LANG	7103	9	0.62	1.29
7	LTKY	6766	10	0.64	1.20
	LTCR	6766	7	0.61	1.00
	INKY	6766	16	0.75	1.70
	INCR	6766	8	0.58	1.23
	INTG	6766	6	0.49	1.14
	LANG	6766	9	0.63	1.28

Grade	Domain	N Counts	Possible Points	Cronbach's Alpha	SEM
8	LTKY	6787	11	0.69	1.22
	LTCR	6787	7	0.57	1.11
	INKY	6787	12	0.66	1.46
	INCR	6787	10	0.67	1.26
	INTG	6787	6	0.46	1.03
	LANG	6787	10	0.68	1.19

Table 26. Summary Reliabilities, Standard Errors of Measurement, and Descriptive Statistics by Grade and Mathematics Domain

Grade	Domain	N Counts	Possible Points	Cronbach's Alpha	SEM
3	GEOM	7514	6	0.41	1.00
	MEAS	7514	12	0.73	1.51
	ALGE	7514	20	0.82	1.78
	BTEN	7514	6	0.64	0.96
	FRCT	7514	6	0.61	1.06
4	GEOM	7285	6	0.46	1.03
	MEAS	7285	10	0.66	1.34
	ALGE	7285	13	0.74	1.38
	BTEN	7285	10	0.66	1.17
	FRCT	7285	20	0.83	1.90
5	GEOM	6853	6	0.53	1.03
	MEAS	6853	12	0.74	1.48
	ALGE	6853	6	0.61	1.00
	BTEN	6853	16	0.78	1.69
	FRCT	6853	19	0.84	1.88
6	GEOM	7107	6	0.62	1.05
	RELT	7107	10	0.70	1.26
	NMBR	7107	15	0.74	1.68
	EQTN	7107	20	0.82	1.91
	STPR	7107	8	0.58	1.30
7	GEOM	6767	9	0.55	1.34
	RELT	6767	13	0.74	1.53
	NMBR	6767	10	0.68	1.36
	EQTN	6767	18	0.79	1.83
	STPR	6767	9	0.61	1.31
8	GEOM	6801	16	0.72	1.80
	FNCT	6801	14	0.72	1.69
	NMBR	6801	6	0.58	1.10
	EQTN	6801	23	0.81	2.14
	STPR	6801	6	0.49	1.07

Table 27. Summary Reliabilities, Standard Errors of Measurement, and Descriptive Statistics by Grade and Science Domain

Grade	Domain	N Counts	Possible Points	Cronbach's Alpha	SEM
4	LIFE	7259	16	0.72	1.64
	PHYS	7259	18	0.74	1.89
	ESCI	7259	16	0.68	1.75
8	LIFE	6789	16	0.70	1.81
	PHYS	6789	18	0.76	1.91
	ESCI	6789	16	0.74	1.78

### 8.3 Classical and Conditional Standard Errors of Measurement

Because no assessment measures ability with perfect consistency, it is useful to take into account the likely size of measurement errors. One way to describe the inconsistency of assessment results is to administer the same assessment to a student on multiple occasions and note how much the resulting scores vary. If a student could be assessed on multiple occasions without practice effects, a collection of the student's obtained scores could be compiled. These scores would cluster around an average value. The standard deviation, or spread, of these scores is an estimate of the standard error of measurement (SEM).

The SEM is another index of reliability and provides an estimate of the amount of error in an individual's observed test score. The individual's observed total score is considered an estimate of that individual's true score. Because the standard error of measurement is inversely related to the reliability of a test, the higher the reliability, the lower the standard error of measurement and the more confidence one may have in the accuracy, or precision, of the observed test score. The measurement error is commonly expressed in terms of standard deviation units; that is, the standard error of measurement is the standard deviation of the measurement error distribution. Under Classical Test Theory and traditional item analysis, we estimate the SEM from:

$$SEM = s_x \sqrt{1 - r_{xx}}$$

where:  $s_x$  is the observed score standard deviation, and  $r_{xx}$  is the reliability estimate (coefficient alpha).

In the item response theory (IRT) framework, SEM is estimated as a function of measured ability, and thus is often referred to as a conditional standard error of measurement (CSEM). CSEMs typically are smaller in scaled score units towards the center of the scale where there are more items and more test information and larger at the extremes where there are fewer items and less test information.

Note that the standard error for item difficulty is smallest when the probability of passing is close to the probability of failing. That is, when an item is near the difficulty level for many persons in the sample, the standard error is small (Embretson and Reise, 2000).

Overall Coefficient Alpha and SEM results for PAWS assessments are presented in Table 24. Conditional SEMs for all achievable scores on the assessment are included with the raw score to scaled score tables in Appendix M for PAWS.

#### 8.4 Accuracy and Consistency of Classifications

Analyses were performed using the computer program RelClass (ETS proprietary software) to estimate the accuracy and consistency of decisions about meeting standards on the PAWS assessments. The methods described by Livingston and Lewis (1995) and Young and Yoon (1998) were applied to complete these analyses.

Every discrete test administration will result in some error in the classification of examinees. When an assessment uses performance classifications as the primary method to report test results, accuracy and consistency of decisions become important indicators about the quality of the assessment. This section includes the estimates of decision consistency and accuracy for the 2015 PAWS assessments administered in March 2015.

The *accuracy* of decisions is represented by the agreement between the classifications based on students' observed scores on the actual test form and the classifications that would have been made based on students' true scores. True scores are assumed to be errorless but are unknown. They can, however, be estimated based on the expected values of test scores over all possible forms of the test. A false positive decision results when a true score corresponds to a classification below a critical cut score (e.g., "does not meet standard"), but the observed score corresponds to a "meets standard" classification. A false negative decision results when a true score "meets standard," but the observed score corresponds to a "does not meet standard" classification. Decision *consistency* is the agreement between two non-overlapping and equally difficult forms of the test. This index is estimated using response data from the actual test form and a hypothetical alternate form, based on the actual test form's estimated reliability.

For each PAWS assessment, the decision consistency and accuracy table includes the proportion of:

- Overall accurate classifications;
- False positives for accurate classifications;
- False negatives for accurate classifications;
- Overall consistent classifications;



- False positives for consistent classifications;
- False negatives for consistent classifications;
- Accuracy around critical cut point (“meets standard” vs. “does not meet standard”); and
- Consistency around critical cut point (“meets standard” vs. “does not meet standard”).

A classification accuracy table is a cross-tabulation of the true score vs. observed score classifications. A classification consistency table is a cross-tabulation of the observed score vs. hypothetical alternate form score classifications.

The proportion of overall accuracy and consistency classifications is computed as the sum of the diagonal cell entries (agreement between observed and true score decisions for accuracy; agreement between observed and hypothetical alternate form score decisions for consistency).

Accuracy and consistency classifications around a critical cut point (e.g., “meets standard” versus “does not meet standard”) are similarly computed by collapsing all classification decisions into a dichotomized distribution around the critical cut point. For each PAWS test, “below basic” and “basic” performance levels result in a “does not meet standard” classification denoted as A in Figure 2; “proficient” and “advanced” performance levels result in the “meets standard” classification indicated as B.

Figure 2. Accuracy or Consistency around Critical Cut Point

		Accuracy or Consistency = A + B				
		Below Basic	Basic	Proficient	Advanced	Total
Below Basic	A					
Basic						
Proficient	B					
Advanced						
Total						

Decision accuracy, based on errorless true score classification, is typically higher than decision consistency, which is based on two types of test scores that both contain measurement error. Tables 28–33 present the results of the decision accuracy and consistency of the PAWS cut scores for Reading, Mathematics, and Science. The following information is presented:

- Accuracy classifications
- False Positives
- False Negatives
- Consistency classifications

It should be noted that the sum of values of Accuracy, False Positive, and False Negative is equal to 1, but due to rounding errors the sum of the table values may not be equal to 1. False Positive and False Negative classifications refer to the mismatch between student true scores and observed scores. The False Positive value is the proportion of student scores misclassified to the category “*Achieves Proficiency*” when student scores do not meet proficiency. The False Negative value is the proportion of student scores misclassified to the category “*Does Not Achieve Proficiency*” when student scores actually do meet proficiency.

Overall accuracy and consistency ratings range from 0.89 to 0.92, with most results above 0.90. All false negative and false positive results are at or below 0.17. These results suggest acceptable levels of reliability at the cut points for all PAWS assessments.

Table 28. PAWS 2015 Decision Accuracy and Consistency Indices – Grade 3

Subject	N	Accuracy			Consistency			Cut Point Accuracy	Cut Point Consistency
		Overall	False Positive	False Negative	Overall	False Positive	False Negative		
<b>Reading</b>	7541	0.76	0.12	0.12	0.67	0.16	0.17	0.91	0.87
<b>Mathematics</b>	7547	0.80	0.10	0.10	0.72	0.14	0.14	0.91	0.88

Table 29. PAWS 2015 Decision Accuracy and Consistency Indices – Grade 4

Subject	N	Accuracy			Consistency			Cut Point Accuracy	Cut Point Consistency
		Overall	False Positive	False Negative	Overall	False Positive	False Negative		
<b>Reading</b>	7316	0.77	0.12	0.12	0.68	0.16	0.16	0.91	0.87
<b>Mathematics</b>	7319	0.81	0.10	0.09	0.73	0.13	0.13	0.91	0.88
<b>Science</b>	7307	0.78	0.11	0.11	0.70	0.15	0.16	0.89	0.85

Table 30. PAWS 2015 Decision Accuracy and Consistency Indices – Grade 5

Subject	N	Accuracy			Consistency			Cut Point Accuracy	Cut Point Consistency
		Overall	False Positive	False Negative	Overall	False Positive	False Negative		
<b>Reading</b>	6966	0.77	0.12	0.11	0.69	0.16	0.15	0.90	0.86
<b>Mathematics</b>	6975	0.82	0.10	0.08	0.75	0.13	0.12	0.92	0.89

Table 31. PAWS 2015 Decision Accuracy and Consistency Indices – Grade 6

Subject	N	Accuracy			Consistency			Cut Point Accuracy	Cut Point Consistency
		Overall	False Positive	False Negative	Overall	False Positive	False Negative		
<b>Reading</b>	7102	0.78	0.11	0.11	0.69	0.15	0.15	0.91	0.87
<b>Mathematics</b>	7107	0.81	0.09	0.09	0.74	0.13	0.13	0.92	0.89

Table 32. PAWS 2015 Decision Accuracy and Consistency Indices – Grade 7

Subject	N	Accuracy			Consistency			Cut Point Accuracy	Cut Point Consistency
		Overall	False Positive	False Negative	Overall	False Positive	False Negative		
<b>Reading</b>	6766	0.78	0.11	0.11	0.70	0.15	0.15	0.90	0.87
<b>Mathematics</b>	6767	0.80	0.10	0.09	0.73	0.14	0.14	0.92	0.89

Table 33. PAWS 2015 Decision Accuracy and Consistency Indices – Grade 8

Subject	N	Accuracy			Consistency			Cut Point Accuracy	Cut Point Consistency
		Overall	False Positive	False Negative	Overall	False Positive	False Negative		
<b>Reading</b>	6788	0.77	0.12	0.11	0.68	0.16	0.16	0.90	0.86
<b>Mathematics</b>	6802	0.81	0.09	0.10	0.73	0.13	0.13	0.92	0.89
<b>Science</b>	6790	0.78	0.12	0.11	0.69	0.16	0.16	0.91	0.87

## 9. QUALITY CONTROL PROCEDURES

ETS implemented rigorous quality control procedures throughout the test development, administration, scoring, and analyses processes. As part of this effort, ETS program staff consulted with the Office of Professional Standards residing in the legal department. The office publishes and maintains the *ETS Standards for Quality and Fairness*, with the purposes of helping design, develop, and deliver technically sound, fair, and useful products and services, and to help the public and auditors evaluate those products and services.

In addition, every department involved in the program designed and implemented an independent set of procedures to ensure the quality of its products. In the next sections, these quality control procedures are outlined.

### 9.1 Quality Control of Item Development

The item development process for the PAWS was described in detail in Chapter 2 of this report. This section highlights the elements of the process devoted specifically to the quality control of item development.

#### *9.1.1. Item and Prompt Specifications*

ETS maintains item specifications for the PAWS and has developed an item utilization plan to guide the development of the items for each content area. Item writing emphasis was determined in consultation with the WDE. Adherence to the specifications ensured the maintenance of quality and consistency of the item development process.

#### *9.1.2. Item Writers*

The items for the PAWS were written by item writers having a thorough understanding of the Wyoming Content and Performance Standards. The item writers were carefully screened and selected by senior ETS content staff. Only those with strong content and teaching backgrounds who have experience with students who have severe cognitive disabilities were invited to participate in an extensive training program for item writers.

#### *9.1.3. Internal Contractor Reviews*

Once items were written, ETS assessment specialists ensured each item underwent an intensive internal review process. Every step of this process was designed to produce items exceeding industry standards for quality. It included three rounds of content reviews, two rounds of editorial reviews, an internal fairness review, and a high-level review and approval by a content area director. A carefully designed and monitored workflow and detailed checklists help to ensure that all items meet the specifications for the process.

#### *9.1.4. Content Review*

ETS assessment specialists ensured the items and related materials complied with ETS's written guidelines for clarity, style, accuracy, and appropriateness and with approved item specifications. The artwork and graphics for the items were created during the internal content review period so assessment specialists could evaluate the correctness and appropriateness of the art early in the item development process. ETS selected visuals relevant to the item content and that were easily understood so students do not struggle to determine the purpose or meaning of the questions.

#### *9.1.5. Editorial Review*

Another step in the ETS internal review process involved a team of specially trained editors who check questions for clarity, correctness of language, grade-level appropriateness of language, adherence to style guidelines, and conformity to acceptable item-writing practices. The editorial review also included rounds of copyediting and proofreading. ETS takes pride in the typographical integrity of the items presented to our clients and strives for error-free items beginning with the initial rounds of review.

#### *9.1.6. Fairness Review*

One of the final steps in the ETS internal review process was to have all items and stimuli reviewed for fairness. Only ETS staff members who have participated in the ETS Fairness Training, a rigorous internal training course, conducted this bias and sensitivity review. These staff members were trained to identify and eliminate test questions that contain content that could be construed as offensive to, or biased against, members of specific ethnic, racial, or gender groups.

#### *9.1.7. Assessment Director Review*

As a final quality control step, the content area's assessment director or another senior-level content reviewer read each item before it is presented to the WDE.

#### *9.1.8. Data Review of Field Tested Items*

ETS field tested newly developed items to obtain statistical information about item performance. This information was used to evaluate items that are candidates for use in operational test forms. The item statistics were examined carefully at data review meetings, where content experts discussed items that have poor statistics and do not meet the psychometric criteria for item quality. The WDE defined the criteria for acceptable or unacceptable item statistics. This ensured that the item had an appropriate level of difficulty for the target population. The content experts made recommendations about whether to accept or reject each item for inclusion in the PAWS item banks.

#### *9.1.9. Quality Control of the Item Bank*

After completion of the pilot analyses, the items were placed in the item bank with their statistics. ETS delivered the prompts to the WDE through an electronic item bank. The item bank database was maintained by a staff of application systems programmers, led by the Item Bank Manager. All

processes were logged; all change requests, including item bank updates for prompt availability status, were tracked. All output and Wyoming item bank deliveries underwent quality control for accuracy.

The quality of the item bank and secure transfer of the Wyoming item bank to the WDE was crucial. The ETS internal item bank database resided on a server within the ETS firewall. Access to the SQL, the server database, was strictly controlled by means of system administration. The electronic item banking application included a login/password system to authorize access to the database or designated portions of the database. In addition, only users authorized to access the specific database are able to use the item bank. Users were authorized by a designated administrator at the WDE and ETS.

### 9.2 Quality Control of Test Materials

ETS followed a meticulous set of internal quality standards to ensure high-quality printed products for all testing related materials.

- **Publishing and Editing Review**—A three-way review of all project materials was performed internally. After this internal review, assessment materials were forwarded to WDE for review and approval.
- **Printing**—All external printing companies hired to print scannable and nonscannable forms guaranteed the highest level of quality and security.
- **Multiple Checks**—ETS Program Managers conducted quality checks during the printing process to confirm all requirements for printed materials were met.

Accurate packing, shipping, and collection of test materials were critical for districts and schools to successfully administer the tests. Shipping carriers had online, traceable distribution systems to track all materials.

#### *9.2.1. Collecting Test Materials*

After administration, schools returned scorable and nonscorable materials within five working days after the last testing day of each test administration period. Schools were provided UPS return labels with bar-coded information identifying the school. Schools applied the appropriate labels and numbered the cartons prior to returning the materials. All scorable materials were returned via two-day UPS shipment; nonscorable materials were return via UPS ground shipment.

ETS closely monitored the return of materials through the “SeNT” system, tracking each package of materials shipped out to sites and shipped back to ETS. The Wyoming Customer Support Center at ETS contacted schools not returning materials in a timely manner and worked with them to facilitate the return of the test materials.

### *9.2.2. Processing Test Materials*

Upon receipt of the test materials, ETS used precise inventory and test processing systems, in addition to quality assurance procedures, to maintain an up-to-date accounting of all the testing materials within their facilities. The materials were removed carefully from the shipping cartons and examined for a number of conditions, including physical damage, shipping errors, and omissions. A visual inspection to compare the number of students recorded on the Header sheets with the number of test and answer books or answer documents in the stack was also conducted.

ETS's image scanning process captured security information electronically and compared scorable material quantities reported on the Headers to actual documents scanned. Schools were contacted by phone if there were any missing shipments or if the quantity of materials returned appeared to be more or less than expected.

### *9.3 Quality Control of Scanning*

ETS ensured all student test booklets had been accounted for and processed through scanning, pre-editing, and post-editing processes. All student test and answer books or answer documents returned to ETS were scanned and scored.

The intensity levels of each scanner were constantly monitored throughout each administration for quality control purposes. Intensity diagnostic sheets were run before and during each batch to verify the scanner was working properly. In the event a scanner failed to properly pick up data on the diagnostic sheets, the scanner was recalibrated before it resumed processing student documents.

Documents received in poor condition (torn, folded, or water-stained) that could not be fed through the high-speed scanners were keyed into the system manually.

### *9.4 Quality Control of Psychometric Analyses*

The psychometric analyses conducted at ETS underwent comprehensive quality checks by a team of psychometricians and data analysts. Detailed checklists were consulted by members of the team for each of the statistical procedures performed.

Any items flagged for questionable statistical attributes were sent to Assessment Development staff for their review; PAWS psychometricians reviewed their comments before prompts were approved to be included in operational forms. Additionally, the statistics imported into the item banking system were thoroughly checked by data analysts and psychometricians before and after the import.

### *9.5 Quality Control of Reporting*

For the quality control of Wyoming student reports, three general areas are evaluated, including the following:



- Comparing report formats to input sources from the WDE-approved samples
- Validating and verifying the report data by querying the appropriate student data
- Proofreading individual student reports at the WDE and ETS prior to any school district mailings

The student report was required to include a single, accurate WISER ID, a school district name, and a school name. After the draft version of the report was validated against the WDE's requirements, a set of student reports were provided to the WDE for review and approval. ETS posted a PDF of the sample reports via a secure site. The WDE and ETS reviewed and signed off on the reports after a thorough review. Upon the WDE's approval of the reports, ETS proceeded with production.

#### *9.5.1. Excluding Student Scores from Summary Reports*

ETS provided specifications to the WDE documenting when to exclude student scores from summary reports. This specification included the logic for handling answer documents, for example, "*was absent,*" "*was not tested due to parent/guardian request,*" or "*did not complete the test due to illness.*"

## 10. HISTORICAL COMPARISONS

Historical comparisons of the PAWS test results are routinely performed to identify trends in examinee performance, in terms of percentage of students meeting standards. As this is the second administration of the PAWS Reading and Mathematics under the new standards 2012 WyCPS, only the two years of performance is included in Tables 34–37.

The percentages of reading students in the equating sample classified as Proficient + Advanced decreased for all grades except grade 5 from 2014. For grade 8, the percentages of students Proficient + Advanced decreased from 58.9% in 2014 to 51.2% in 2015, a decrease of 7.7%. Grade 4 had a decrease of 3.6% from 63.7% to 60.1%. Grade 7 had similar decrease of 3.4% from 59.7% to 56.3%. For all grades, the percentage of Proficient + Advanced students is within previously observed values for the specific grade.

The percentages of mathematics students in the equating sample classified as Proficient + Advanced varied for all grades from 2014. For grade 4, the percentage of students Proficient + Advanced increased from 46.6% in 2014 to 50.1% in 2015 for an increase of 3.5%. Grade 8 had the largest drop of 3.1% from 50.2% to 47.1%. For all grades, the percentage of Proficient + Advanced students is within previously observed values for the specific grade.

Tables 38–39 provide a comparison of percentages of the students classified as “Proficient + Advanced” from 2008 to 2015 for PAWS Science. The percentage of science students in the equating population classified as Proficient + Advanced decreased for grade 4 and grade 8 from 2014. Grade 4 had a modest decrease of 1.2% from 52.5% to 51.3%. Grade 8 had the larger decrease in the percentage of students classified as Proficient + Advanced, from 47.5% to 41.2%, a decrease of 6.3%.

Figures 3 through 14 display the PAWS percentages of students in the equating populations classified as “Proficient + Advanced” from 2014 through 2015 for each Reading and Mathematics grade level. Figures 15 through 16 display the PAWS percentages of students in the equating populations classified as “Proficient + Advanced” from 2008 through 2015 for each Science grade level. The results for 2010 were not provided due to federal exemption for reporting scores.

Table 34. Scaled Scores Descriptive Statistics for the PAWS Reading Tests

Year	Grade 3			Grade 4			Grade 5			Grade 6			Grade 7			Grade 8		
	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>
2014	7365	600.0	50.0	7022	616.0	46.8	7075	626.5	47.4	6758	636.3	48.8	6796	649.3	44.6	6781	661.1	47.7
2015	7541	599.3	48.0	7316	616.3	50.5	6966	628.8	49.9	7102	637.4	47.5	6766	648.8	46.0	6788	654.7	47.9

Table 35. Percentage Proficient and Advanced for the PAWS Reading Tests

Grade	2014	2015	Min	Max	Median	2015 Difference from Median	2015 Difference from 2014
3	61.8	60.5	60.5	61.8	53.0	7.5	-1.3
4	63.7	60.1	60.1	63.7	61.9	-1.8	-3.6
5	58.1	58.3	58.1	58.3	58.2	0.1	0.2
6	56.9	56.5	56.5	56.9	56.7	-0.2	-0.4
7	58.8	56.3	56.3	58.8	57.6	-1.3	-2.5
8	57.7	51.2	51.2	57.7	54.5	-3.3	-6.5

Table 36. Scaled Scores Descriptive Statistics for the Mathematics Tests

	<u>Grade 3</u>			<u>Grade 4</u>			<u>Grade 5</u>			<u>Grade 6</u>			<u>Grade 7</u>			<u>Grade 8</u>		
	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>
2014	7369	600.0	50.0	7026	634.7	45.1	7077	659.7	50.6	6760	678.1	48.2	6799	691.8	45.5	6784	707.5	45.0
2015	7547	602.4	51.2	7319	639.6	50.6	6975	662.3	54.1	7107	679.4	48.9	6767	693.9	45.4	6802	706.7	44.2

Table 37. Percentage of Proficient + Advanced Students for the Mathematics Tests

Grade	2014	2015	Min	Max	Median	2015 Difference from Median	2015 Difference from 2014
3	50.4	49.3	49.3	50.4	49.9	-0.5	-1.1
4	46.6	50.2	46.6	50.2	48.4	1.8	3.6
5	54.0	52.4	52.4	54.0	53.2	-0.8	-1.6
6	48.5	49.3	48.5	49.3	48.9	0.4	0.8
7	42.8	43.1	42.8	43.1	43.0	0.1	0.3
8	49.2	47.0	47.0	49.2	48.1	-1.1	-2.2

Table 38. Scaled Scores Descriptive Statistics for the Science Tests

Year	N	Grade 4			Grade 8		
		Mean	SD	N	Mean	SD	
2008	6508	665.9	46.5	6588	649.8	44.6	
2009	6631	668.1	44.3	6339	647.2	41.2	
2010	-	-	-	-	-	-	
2011	6680	672.4	42.9	6554	656.5	42.9	
2012	6771	677.2	41.1	6752	655.9	44.6	
2013	7157	673.1	44.6	6754	651.6	45.6	
2014	7022	669.7	46.4	6770	650.9	45.5	
2015	7307	668.9	47.0	6790	648.0	46.7	

Table 39. Percentage of Proficient + Advanced Students for the Science Tests

Grade	2008	2009	2010	2011	2012	2013	2014	2015	Min	Max	Median	2015 Difference from Median	2015 Difference from 2014
4	50.9	50.5		54.5	63.3	57.5	52.5	51.3	50.5	63.3	52.5	-1.2	-1.2
8	46.4	42.9		50.7	51.2	43.7	46.8	41.2	41.2	51.2	46.4	-5.2	-5.6

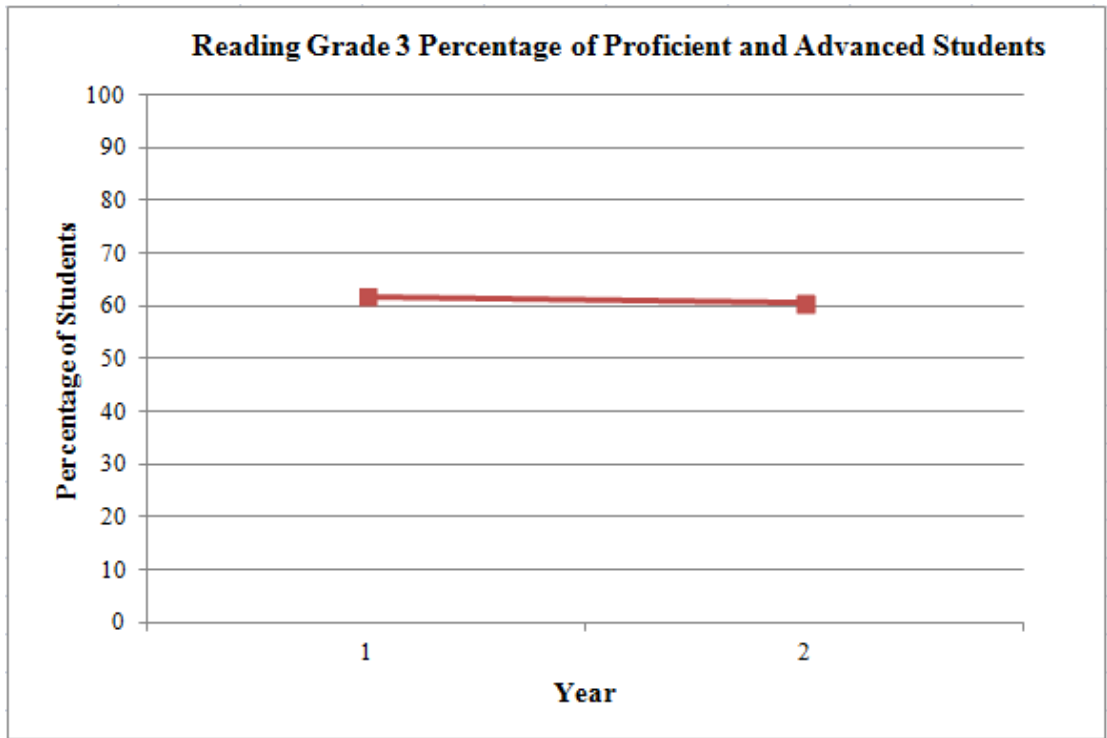


Figure 3. Percentage of Proficient and Advanced Students for Grade 3 Reading

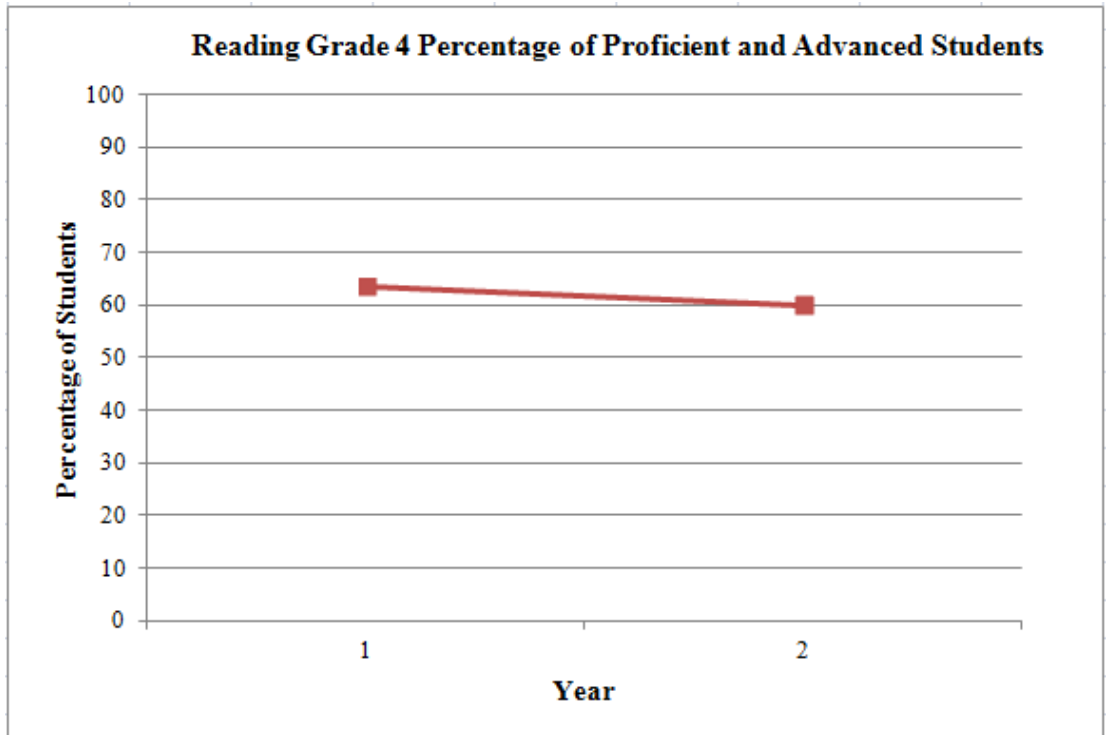


Figure 4. Percentage of Proficient and Advanced Students for Grade 4 Reading

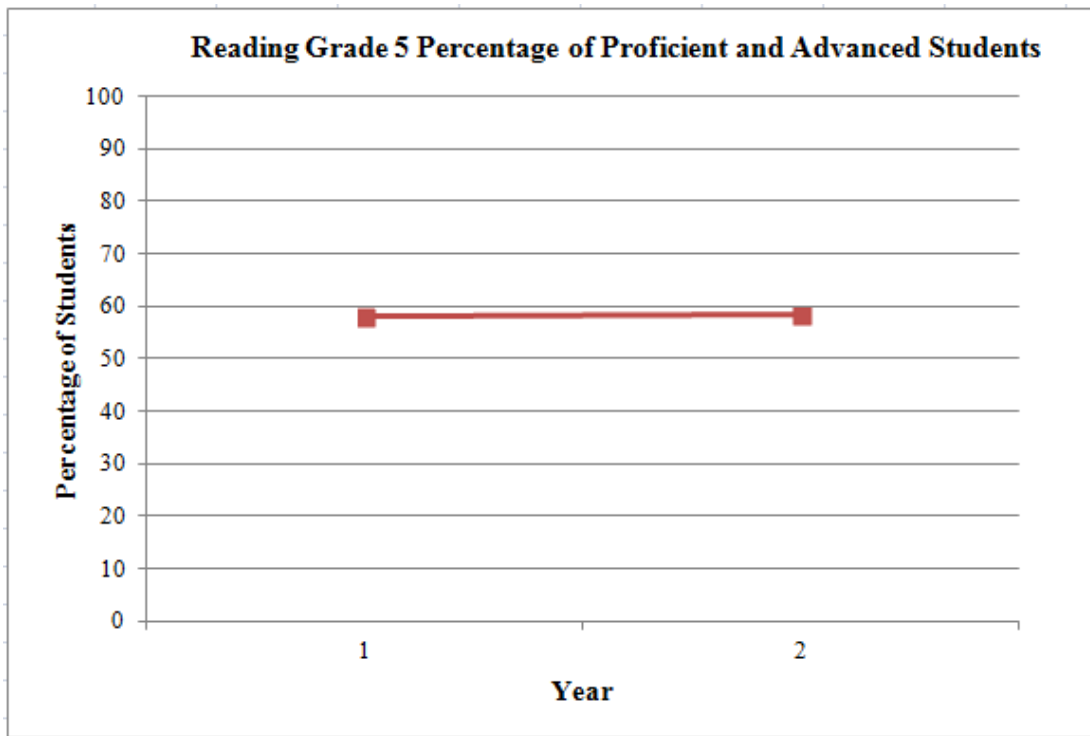


Figure 5. Percentage of Proficient and Advanced Students for Grade 5 Reading

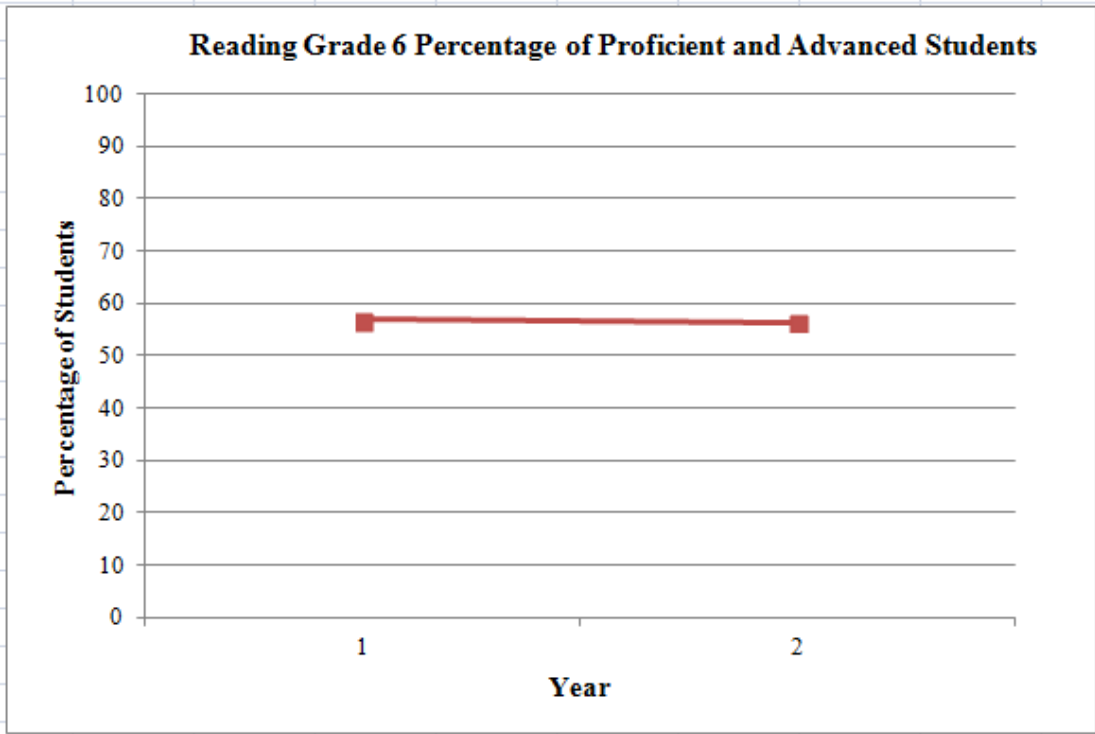


Figure 6. Percentage of Proficient and Advanced Students for Grade 6 Reading

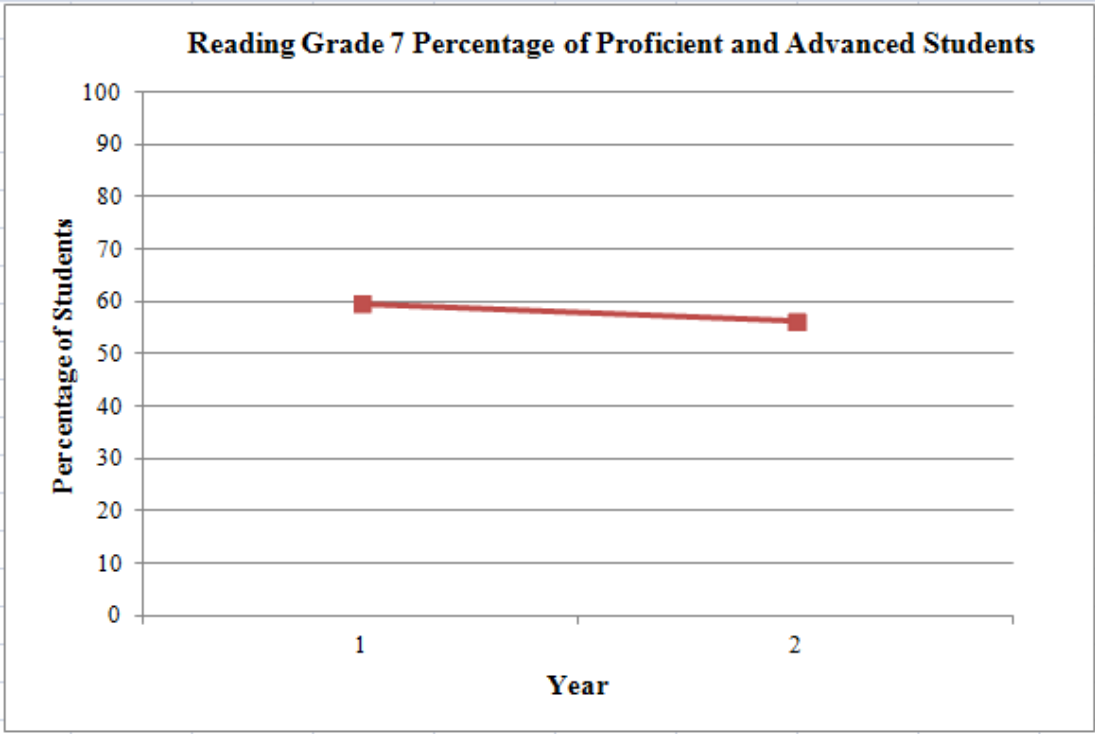


Figure 7. Percentage of Proficient and Advanced Students for Grade 7 Reading



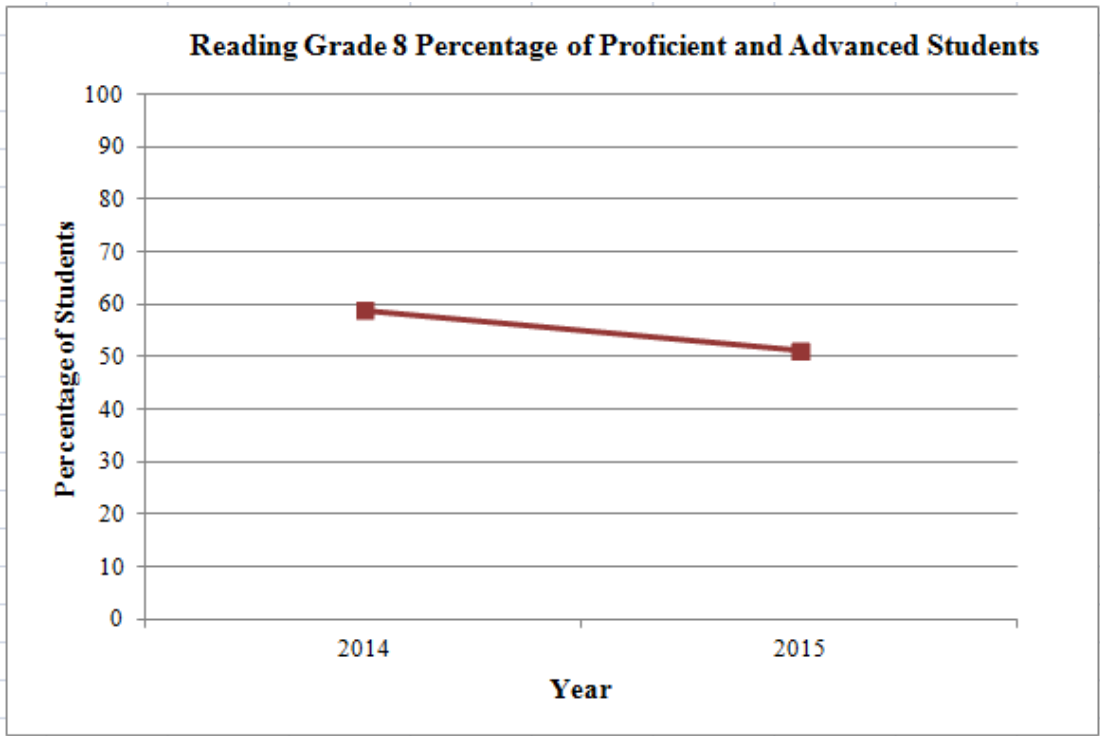


Figure 8. Percentage of Proficient and Advanced Students for Grade 8 Reading

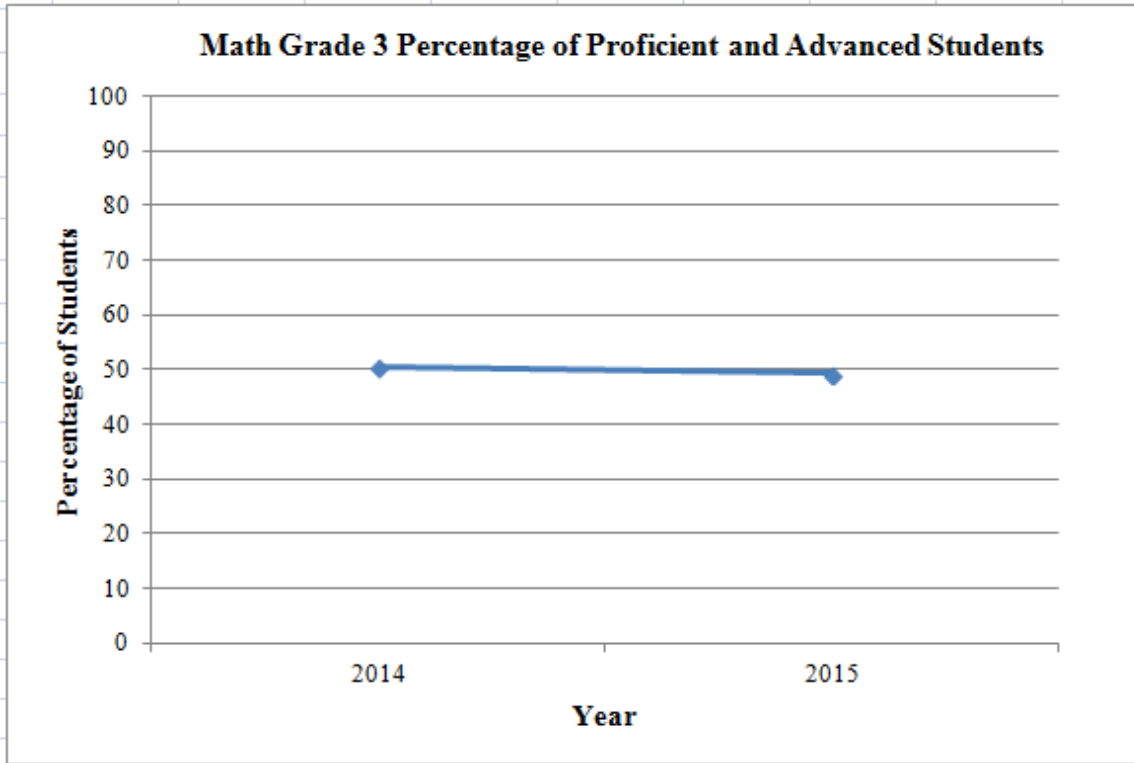


Figure 9. Percentage of Proficient and Advanced Students for Grade 3 Mathematics

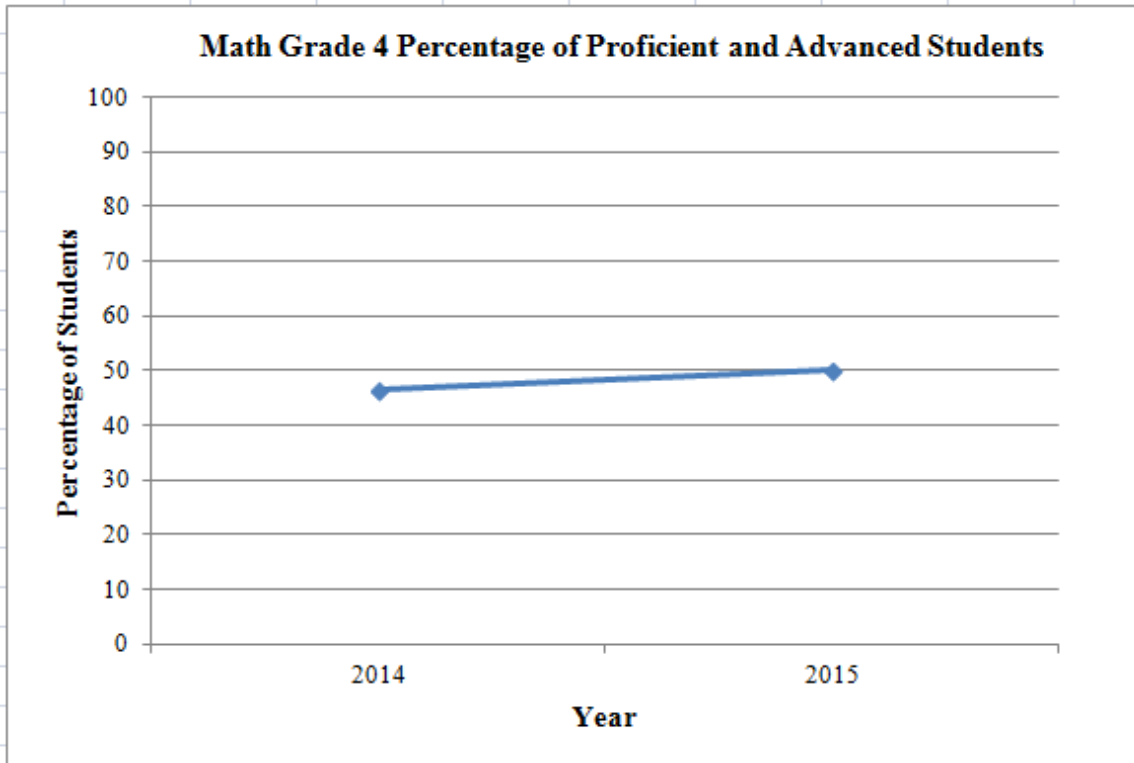


Figure 10. Percentage of Proficient and Advanced Students for Grade 4 Mathematics

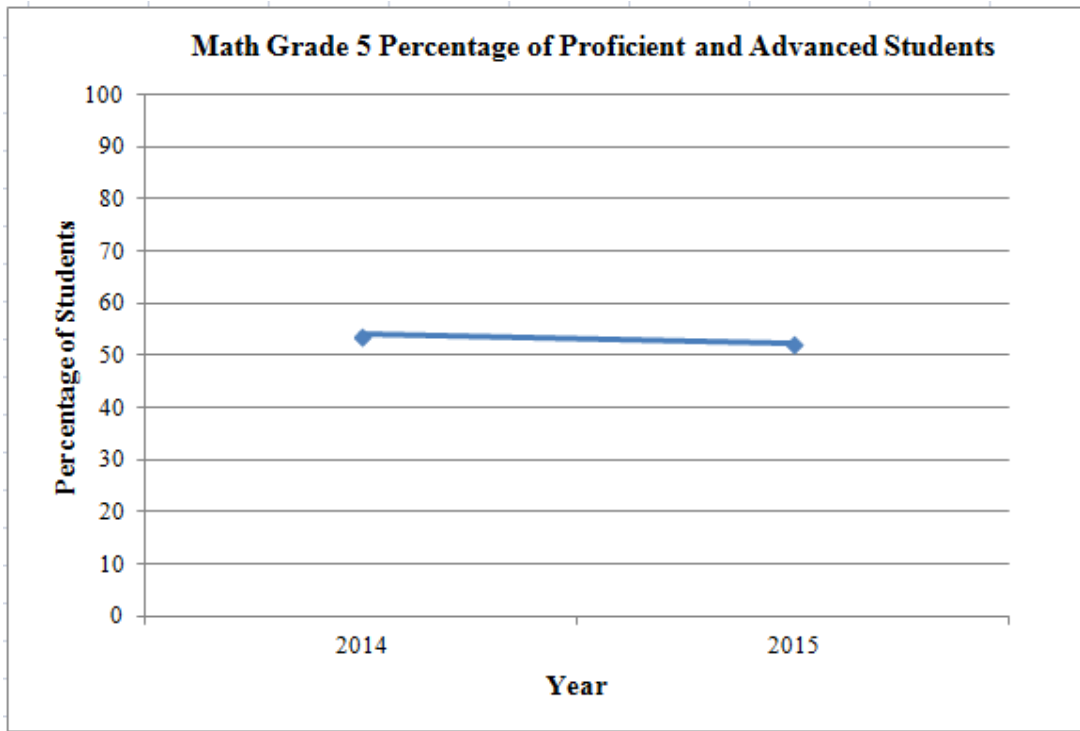


Figure 11. Percentage of Proficient and Advanced Students for Grade 5 Mathematics

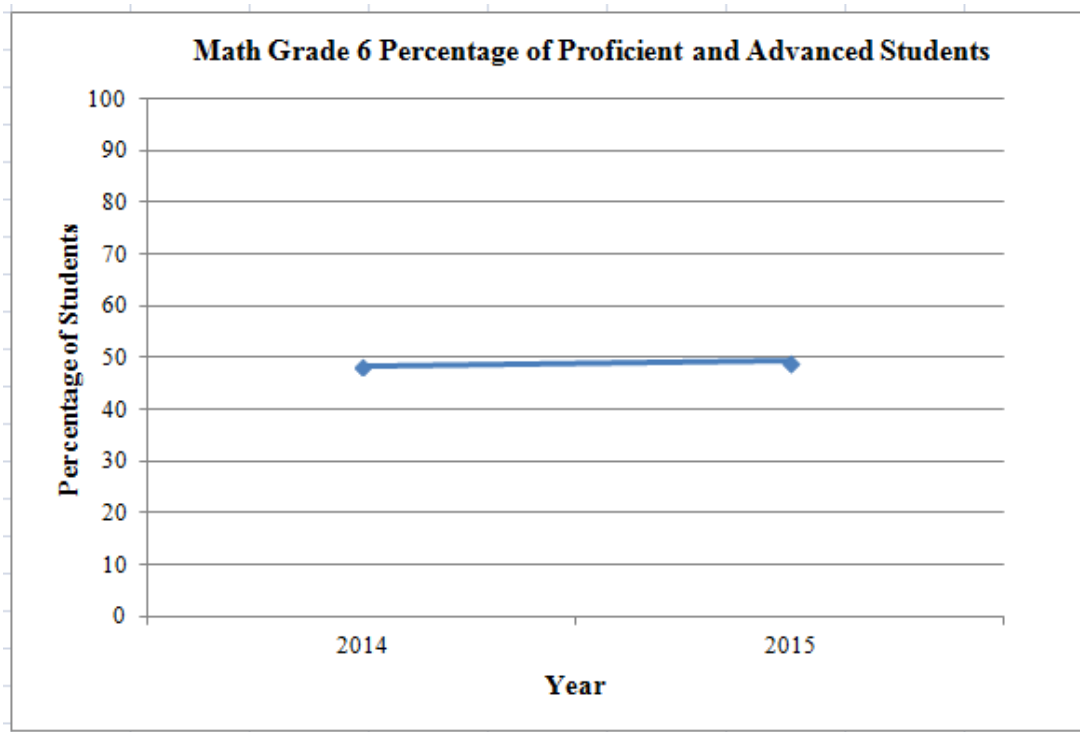


Figure 12. Percentage of Proficient and Advanced Students for Grade 6 Mathematics

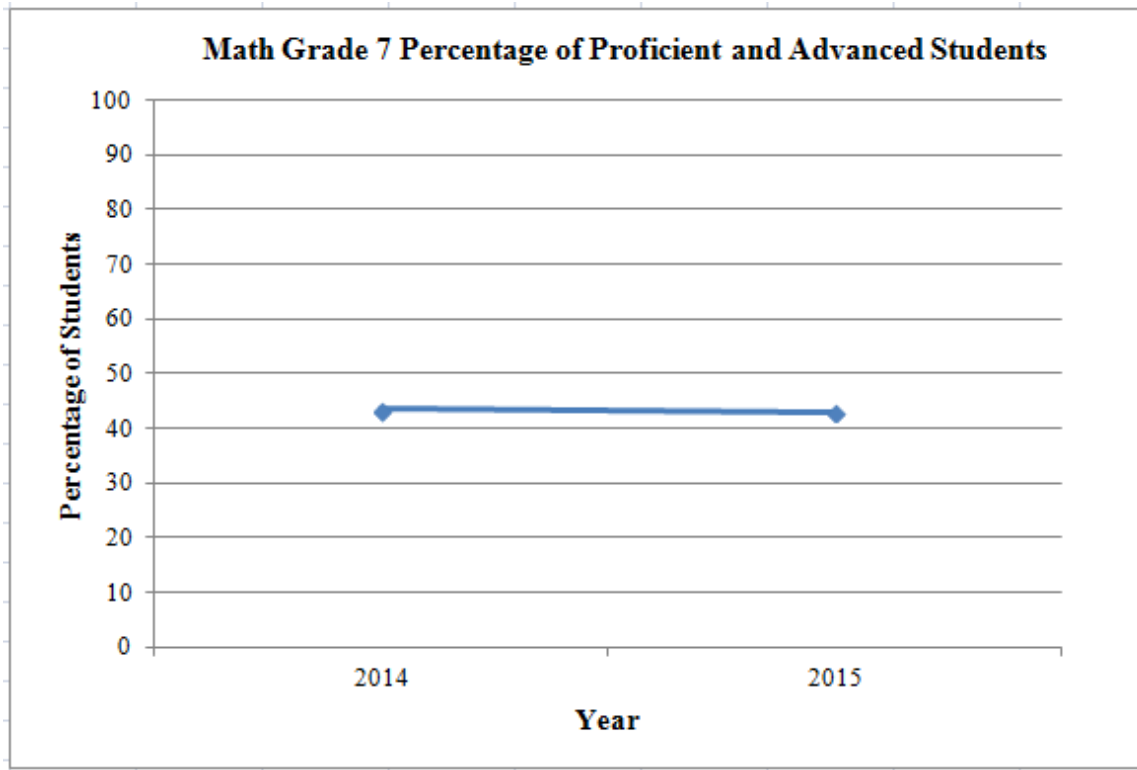


Figure 13. Percentage of Proficient and Advanced Students for Grade 7 Mathematics

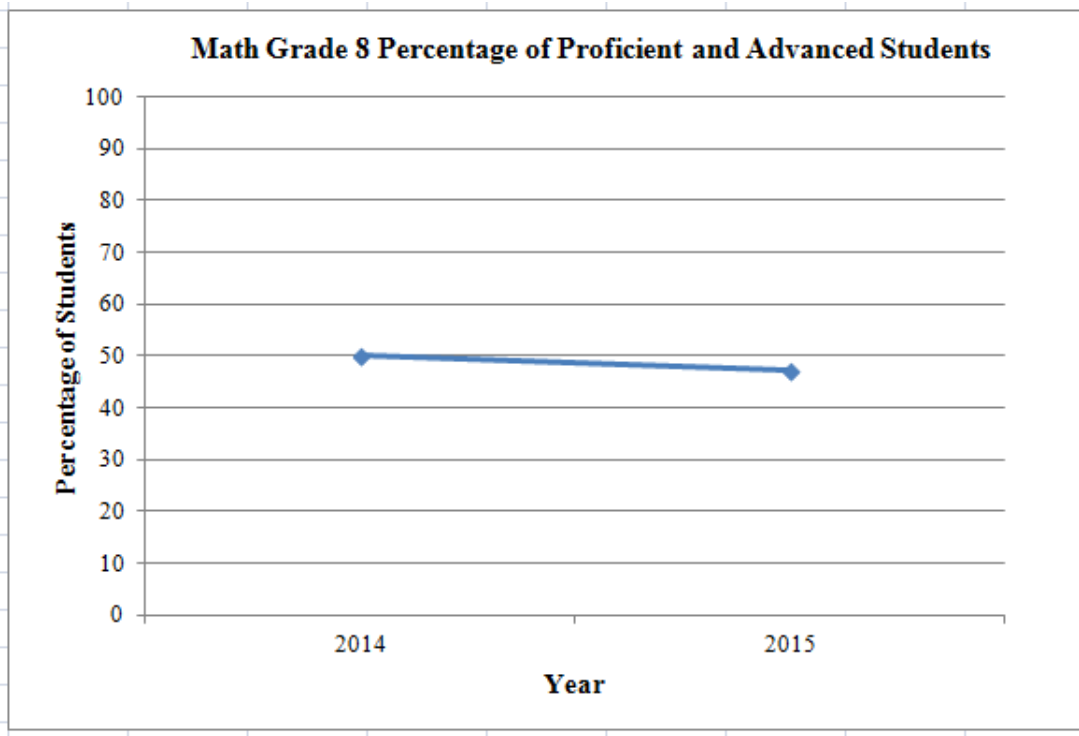


Figure 14. Percentage of Proficient and Advanced Students for Grade 8 Mathematics

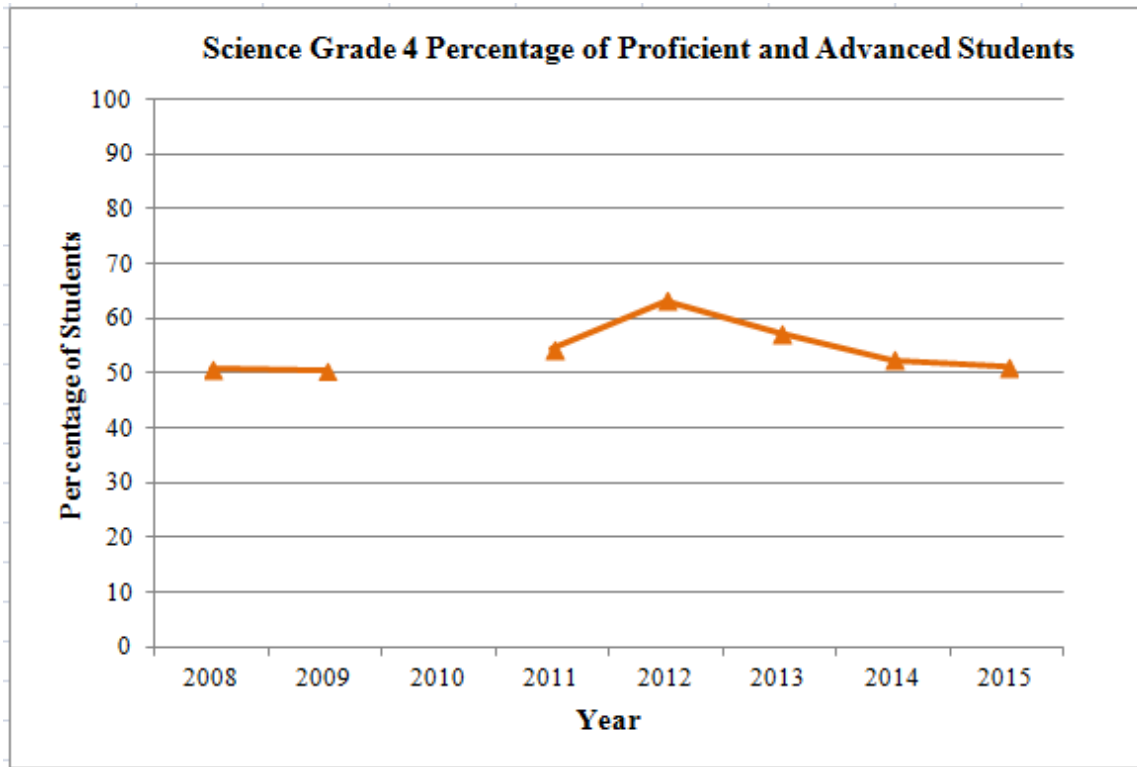


Figure 15. Percentage of Proficient and Advanced Students for Grade 4 Science

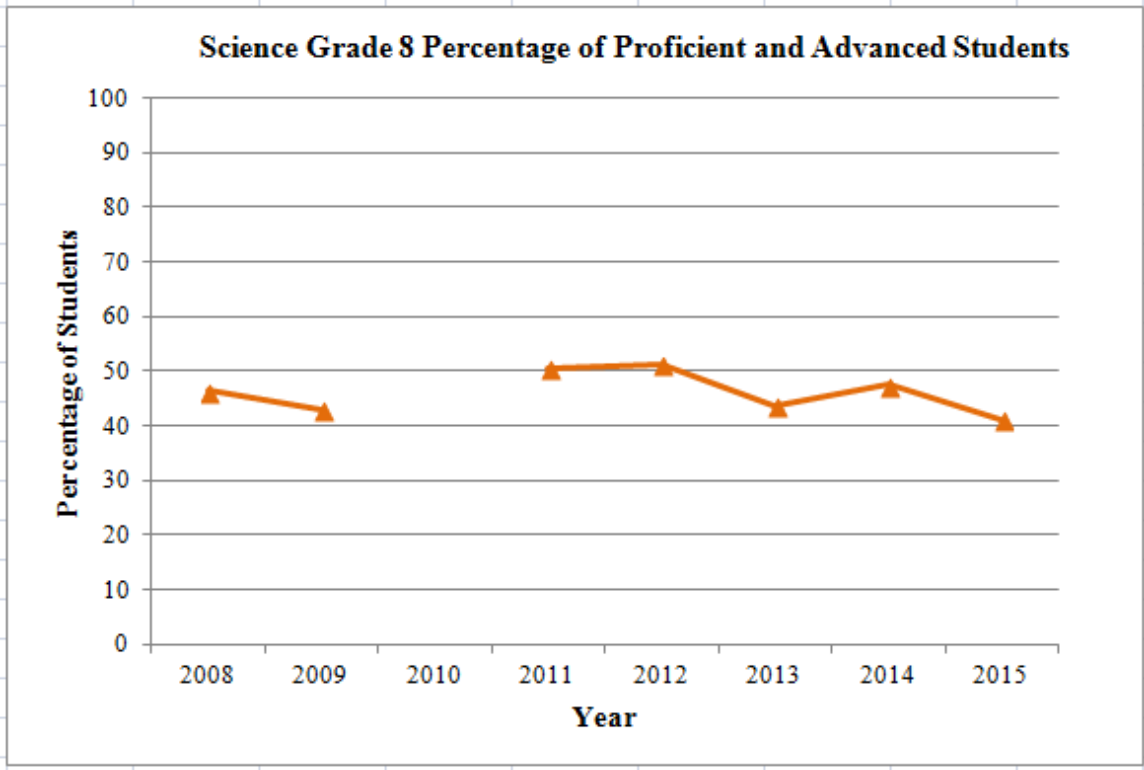


Figure 16. Percentage of Proficient and Advanced Students for Grade 8 Science

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## 12. GLOSSARY OF TERMS

The terms below are defined by their application in this document and their common uses in the Wyoming PAWS technical report. Some of the terms refer to complex statistical procedures used in the process of test development. In an effort to avoid the use of excessive technical jargon, definitions have been simplified; however, they should not be considered exhaustive.

**2008 WyCPS** - 2008 Wyoming Content Performance Standards for science

**2012 WyCPS** - 2012 Wyoming Content Performance Standards for reading and mathematics

**504 Plan** - An official educational document that may specify a special testing condition (e.g., accommodation) for a student taking an NCLB-related test. In some cases, an IEP may specify an alternate assessment or other sources of data related to a student's achievement.

**Accommodations** - Changes made in the format or administration of the test to provide options to test takers who are unable to take the original test under standard test conditions.

**Achievement Levels** - Descriptions of a test taker's competency in a particular area of knowledge or skill, usually defined as ordered categories on a continuum classified by broad ranges of performance.

**Assessment Descriptions** - These provide skill level descriptions or topics which rely on the structure of the discipline in order to organize instruction. A skill can be defined as somewhere between the breadth of a content standard and the specificity of a benchmark.

**Alternate Assessment** - An assessment that is administered to students for whom the regular assessment with or without an accommodation is inappropriate. It is only used with students who have an individualized education program (IEP) and are unable to respond to accommodated versions of the standard test materials. Wyoming's alternate assessments include Reading, Mathematics, and Science administered by the teacher.

**Alignment** - Alignment procedures examine the agreement or match between educational components such as test items and academic standards. To the extent that test items are aligned with academic standards, they are considered to be valid measures of those standards.

**Answer Document** - The document on which a student records answers to assessment questions (grades 6–8). These are scannable and have grids for recording student name and demographic information.

**Benchmarks** - These statements specify what students are expected to know and should be able to do at the end of each of the benchmark grade levels in this document, grades 3 through 8.

These benchmarks specify the skills and content students must master along the way in order to reach the content standards by the time they graduate.

**Blueprint (Test Blueprint)** - Tests are built to specifications, sometimes called blueprints, in the same way that a house is built to a blueprint. The blueprint specifies such things as reporting categories, number of items for each category, and the number of operational and field test items on the test.

**Common Items** - Test questions that are contained on all test forms and administered to all students in the assessment group.

**Content Area** - Subject area; for example, Reading, Mathematics, or Science.

**Content Standards** - These statements define what students are expected to know and should be able to do by the time they graduate. They do not dictate what methodology or instructional materials should be used, nor how the material is delivered.

**Criterion Referenced Test (CRT)** - A customized achievement test that describes student performance in terms of a specific standard. Typically, criterion-referenced testing has been associated with classroom testing where instructional objectives are used. In recent years, standardized testing has moved towards customized criterion-referenced testing in order to provide testing instruments that better align with state and local educational objectives.

**Cut Scores** - A specific point on a score scale, such that scores at or above that point are interpreted or acted upon differently from scores below that point.

**Differential Item Functioning (DIF)** - A statistical procedure for helping detect if an item is differentially difficult for particular groups of test takers with the same ability level. DIF helps determine if members of a particular group have difficulty with an item, not because they know less but because they have different cultural experiences or assumptions. Members of the Item Review panel look at items marked by the DIF procedure and judge whether there was something about the item that was unfair to the group identified.

**Dimensionality** - The extent to which a test item measures more than one ability.

**Embedded Test Model** - Using an operational test to field-test new items or sections. The new items or sections are embedded into the new test and appear to examinees as being indistinguishable from the operational test.

**Equating** - A psychometric process that ensures comparability of scores from one test form to another (e.g., from year to year or from form to form).

**Equivalent Forms** - Statistically insignificant differences between forms (i.e., one form is not harder than another).

**ETS** – Educational Testing Service, current vendor for the PAWS.

**Field Test** - A field test is a practice run of the items ensuring that test questions are accurate and fair for all students. Statistics produced from field testing will be used in interpreting item behavior/performance and allow for the calibration of item parameters used in equating tests.

**Form** - Operational items and embedded field test items that uniquely define a (test) booklet.

**IEP** - Each public school child who receives special education and related services must have an Individualized Education Program (IEP). Each IEP must be designed for one student and must be a truly individualized document. The IEP creates an opportunity for teachers, parents, school administrators, related services personnel, and students (when appropriate) to work together to improve educational results for children with disabilities. (IEP definition, 2015).

**Instructionally Supportive Assessment** - Assessment intended to promote more effective classroom instruction.

**Item** - A test question. Examples of formats are multiple-choice, open-ended (constructed response), and extended response. For PAWS, only multiple-choice items are used.

**Item Analysis** - Statistical analysis that provides measurement and bias information about items. This information is used for item reviews, test construction, technical reports, and other psychometric documentation. Item analysis may also refer to a quality control step to verify/check answer keys. The item or foil analysis report shows the number and percentage of students responding to each answer choice as well as difficulty values, item-test correlations, for the items.

**Item Bank** - An item bank is a collection of test items, along with associated material (e.g., Reading passages, reviewer's comments) and item statistics. Test items that have passed all reviews are eligible to be put on an operational test.

**Item Calibration** - A process of evaluating item functioning using an Item Response Theory (IRT) model (see description below). The results of item calibration are various item parameter estimates.

**Item Difficulty** - A number that indicates how easy or hard an item is with regard to its intended use. Item difficulty is typically displayed as a  $p$ -value, the proportion of examinees choosing the correct answer. It can also be displayed as a value obtained from an Item Response Theory procedure such as the Rasch logit difficulty or the 3PL theta.

**Item Discrimination** - A number that indicates how well an item differentiates students who know the content measured by the item from those who do not know the content. It is used for indicating how well an item differentiates the more able students from the less able students. Item discrimination is typically displayed as a correlation coefficient with larger positive numbers indicating better discrimination (e.g., 0.42).

**Item Response Theory** - A method of test item analysis that takes into account the ability of the examinee and determines characteristics of the item relative to other items in the test.

**Item Specifications** - Item specifications specify the language and format item writers must follow when constructing items.

**Mantel-Haenszel** - A statistical procedure that examines the differential item functioning (DIF) or the relationship between a score on an item and the different groups answering the item (e.g., gender, race), controlling for ability level. This procedure is used to identify individual items for bias review.

**MC-** Multiple-choice item (worth 1-point)

**Operational Test** - Test is administered statewide with standardized procedures and full reporting of scores and stakes for examinees and schools.

**p-value** - Difficulty of an item defined by using the proportion of examinees who answered an item correctly.

**Parallel Forms** - Two or more test forms that are developed for a given exam program, according to the same test blueprint and statistical criteria. The forms should be assembled in such a way that they are as similar to one another as possible.

**PAWS-** Proficiency Assessments for Wyoming Students

**Percentile** - The score on a test below which a given percentage of scores fall.

**Performance Level Descriptors** - These statements describe how well students must perform the benchmark standards in order to meet each performance level. The proficient level is required to meet the standards. These descriptors help teachers judge how students are performing in relation to meeting the standards.

**Rasch Model** - A psychometric model from the IRT family of models that permits objective comparisons of individuals, items, etc. Rasch provides both estimates of item difficulty (logit difficulty) and person ability (logit ability) on the same scale. It is used for scaling and equating test forms as well as producing item analyses.

**Raw Score** - The unadjusted score on a test determined by counting the number of correct answers.

**Reliability** - The extent to which test scores are reproducible. If a class of students theoretically took the same test twice in one day and each student's score was the same on the second administration of the test as on the first, the test would be perfectly reliable (1.00). Of course, perfection is not possible and reliabilities in the 0.90s are considered good. In handscoring, reliability (interrater reliability) refers to agreement between raters when assigning scores. Handscoring quality control reports help monitor reader reliability.

**Rollup** - a compilation of individual scores for students into class, school, district, region and/or state level summary reports.

**Scaled Score** - A score to which raw scores are converted by numerical transformation. Scale scores allow for comparison of different forms of the test using the same scale.

**Standard Deviation** - A measure of variability, expressed in the same metric as the score. It indicates the spread of test scores around the mean. Assuming a normal distribution, if you know the mean and standard deviation of a distribution, you can determine what proportion of scores falls within one standard deviation of the mean.

**Standard Error of Measurement** - The standard deviation of an individual's observed scores, usually estimated from group data.

**Test and Answer Book** - The document on which a student records answers to assessment questions (grades 3–5). These are scannable and have grids for recording student name and demographic information.

**Test Development** - The process of constructing a test. It includes writing the items or test questions and selecting the good items and organizing them into test forms.

**Test Map** - A master document containing a detailed breakdown of a test's specifications by item, objective, cluster, subtest, and all rollups involved with each level of reporting category on each testing program. It is considered the master source for information about a test.

**Test Specifications** - Test specifications are the specific rules and characteristics that guide the development of a test. Adherence to test specifications ensures that equivalent test forms are developed annually. Test specifications refer to the overall characteristics of the test content and format that must be followed when constructing tests.

**Validity** - The appropriateness or correctness of inferences, decisions, or descriptions made about individuals, groups, or institutions from test results. There is no such thing as a generically valid

test. Validity must be considered in terms of the correctness of a particular inference made from test scores.

**WyCPS** - Used to denote either the 2012 Wyoming Content Performance Standards for reading and mathematics or the 2008 Wyoming Content Performance Standards for science.



# Appendix A: PAWS 2015 Reading, Math, and Science Blueprints

## Reading

Table A1. PAWS 2015 Grade 3 Reading Blueprint

### DRAFT Blueprint 2014 - 50 3R OP items aligned to CCSS

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Reading Literature</b>							
<b>Key Ideas and Details</b>							
RL3.1	Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for answers.	28	R.03.N skills: 62% (31 items)	18-20	Literary portion: approx. 53%	10-12	Literary portion: approx. 36%
RL3.2	Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through key details in the text.						
RL3.3	Describe characters in a story (e.g., their traits, motivations, or feelings) and explain how their actions contribute to the sequence of events.						
<b>Craft and Structure</b>							
RL3.4	Determine the meaning of words and phrases as they are used in a text, distinguishing literal from non-literal language.	3	N.1 = 15 items N.2 = 16 items N.3 = 0 items	6-8		6-8	
RL3.5	Refer to parts of stories, dramas, and poems when writing or speaking about a text, using terms such as chapter, scene, and stanza; describe how each successive part builds on earlier sections.						
RL3.6	Distinguish their own point of view from that of the narrator or those of the characters.						
<b>Integration of Knowledge and Ideas (see below)</b>							
<b>Range of Reading and Level of Text Complexity</b>							
RL3.10	By the end of the year, read and comprehend literature, including stories, dramas, and poetry, at the high end of the grades 2–3 text complexity band independently and proficiently.						

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Reading Informational Text</b>							
<b>Key Ideas and Details</b>							
RI.3.1	Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.	15	R.03.E skills: 18% (9 items)	8-10	Informational portion: approx. 32%	7-9	Informational portion: approx. 32%
RI.3.2	Determine the main idea of a text; recount the key details and explain how they support the main idea.						
RI.3.3	Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.						
<b>Craft and Structure</b>							
RI.3.4	Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.	2	R.03.F skills: 20% (10 items)	6-8	Informational portion: approx. 32%	7-9	Informational portion: approx. 32%
RI.3.5	Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.						
RI.3.6	Distinguish their own point of view from that of the author of a text.						
<b>Integration of Knowledge and Ideas (see below)</b>							
<b>Range of Reading and Level of Text Complexity</b>							
RI.3.10	By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 2–3 text complexity band independently and proficiently.						

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Integration of Knowledge and Ideas*</b>							
RL.3.7	Explain how specific aspects of a text's illustrations contribute to what is conveyed by the words in a story (e.g., create mood, emphasize aspects of a character or setting).	2	Captured in totals above	0-2†	*Integration portion: approx. 2%	7-9	*Integration portion: approx. 16%
RL.3.8	(Not applicable to literature)						
RL.3.9	Compare and contrast the themes, settings, and plots of stories written by the same author about the same or similar characters (e.g., in books from a series).						
RI.3.7	Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).						
RI.3.8	Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).						
RI.3.9	Compare and contrast the most important points and key details presented in two texts on the same topic.						

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
Language*							
L3.4	Determine or clarify the meaning of unknown and multiple-meaning word and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.	0	no direct alignment to Wyoming skills: 0%	6-8	*Language portion: approx. 13%	7-9	*Language portion: approx. 16%
L3.4.a	Use sentence-level context as a clue to the meaning of a word or phrase.						
L3.4.b	Determine the meaning of the new word formed when a known affix is added to a known word (e.g., agreeable/disagreeable, comfortable/uncomfortable, care/careless, heat/preheat).						
L3.4.c	Use a known root word as a clue to the meaning of an unknown word with the same root (e.g., company, companion).						
L3.4.d	Use glossaries or beginning dictionaries, both print and digital, to determine or clarify the precise meaning of key words and phrases.						
L3.5	Demonstrate understanding of word relationships and nuances in word meanings.						
L3.5.a	Distinguish the literal and nonliteral meanings of words and phrases in context (e.g., take steps).						
L3.5.b	Identify real-life connections between words and their use (e.g., describe people who are friendly or helpful).						
L3.5.c	Distinguish shades of meaning among related words that describe states of mind or degrees of certainty (e.g., knew, believed, suspected, heard, wondered).						
L3.6	Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships (e.g., After dinner that night we went looking for them).						
suggested total OP items on form:		50		50		50	

\*Integration and Language reporting categories have items associated with both literary and informational passages. The goal will be to strike an overall balance of approx. 50% per genre on the test form.

†Integration of Knowledge and Ideas will not report out in 2014.

Table A2. PAWS 2015 Grade 4 Reading Blueprint

**DRAFT Blueprint 2014 - 50 4R OP items aligned to CCSS**

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Reading Literature</b>							
<b>Key Ideas and Details</b>							
RL.1	Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.	16		13-15		10-12	
RL.2	Determine a theme of a story, drama, or poem from details in the text; summarize the text.						
RL.3	Describe in depth a character, setting, or event in a story or drama, drawing on specific details in the text (e.g., a character's thoughts, words, or actions).						
<b>Craft and Structure</b>							
RL.4.4	Determine the meaning of words and phrases as they are used in a text, including those that allude to significant characters found in mythology (e.g., Herculean).	0	R.04.N skills: 32% (16 items)  N.1 = 7 items N.2 = 9 items N.3 = 0 items	6-8	Literary portion: approx. 42%	6-8	Literary portion: approx. 35%
RL.4.5	Explain major differences between poems, drama, and prose, and refer to the structural elements of poems (e.g., verse, rhythm, meter) and drama (e.g., casts of characters, settings, descriptions, dialogue, stage directions) when writing or speaking about a text.						
RL.4.6	Compare and contrast the point of view from which different stories are narrated, including the difference between first- and third-person narrations.						
<b>Integration of Knowledge and Ideas (see below)</b>							
<b>Range of Reading and Level of Text Complexity</b>							
RL.10	By the end of the year, read and comprehend literature, including stories, dramas, and poetry, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range.						

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Reading Informational Text</b>							
<b>Key Ideas and Details</b>							
RI.4.1	Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.	34	R.04.E skills: 40% (20 items)	13-15	Informational portion: approx. 42%	10-12	Informational portion: approx. 35%
RI.4.2	Determine the main idea of a text and explain how it is supported by key details; summarize the text.						
RI.4.3	Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.						
<b>Craft and Structure</b>							
RI.4.4	Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.	0	E.1 = 11 items E.2 = 0 items E.3 = 9 items  R.04.F skills: 28% (14 items)  F.1 = 14 items F.2 = 0 items	6-8	Informational portion: approx. 42%	6-8	Informational portion: approx. 35%
RI.4.5	Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.						
RI.4.6	Compare and contrast a firsthand and secondhand account of the same event or topic; describe the differences in focus and the information provided.						
<b>Integration of Knowledge and Ideas (see below)</b>							
<b>Range of Reading and Level of Text Complexity</b>							
RI.4.10	By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range.						

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Integration of Knowledge and Ideas*</b>							
RI.4.7	Make connections between the text of a story or drama and a visual or oral presentation of the text, identifying where each version reflects specific descriptions and directions in the text.	0	Captured in totals above	0-2†	*Integration portion: approx. 2%	6-8	*Integration portion: approx. 14%
RI.4.8	(Not applicable to literature)						
RI.4.9	Compare and contrast the treatment of similar themes and topics (e.g., opposition of good and evil) and patterns of events (e.g., the quest) in stories, myths, and traditional literature from different cultures.						
RI.4.7	Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.						
RI.4.8	Explain how an author uses reasons and evidence to support particular points in a text.						
RI.4.9	Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.						

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
Language*							
L4.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.	0	no direct alignment to Wyoming skills: 0%	6-8	*Language portion: approx. 14%	7-9	*Language portion: approx. 16%
L4.4.a	Use context (e.g., definitions, examples, or restatements in text) as a clue to the meaning of a word or phrase.						
L4.4.b	Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., telegraph, photograph, autograph).						
L4.4.c	Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.						
L4.5	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.						
L4.5.a	Explain the meaning of simple similes and metaphors (e.g., as pretty as a picture) in context.						
L4.5.b	Recognize and explain the meaning of common idioms, adages, and proverbs.						
L4.5.c	Demonstrate understanding of words by relating them to their opposites (antonyms) and to words with similar but not identical meanings (synonyms).						
L4.6	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and that are basic to a particular topic (e.g., wildlife, conservation, and endangered when discussing animal preservation).						
suggested total OP items on form:							

\*Integration and Language reporting categories have items associated with both literary and informational passages. The goal will be to strike an overall balance of approx. 50% per genre on the test form.

†Integration of Knowledge and Ideas will not report out in 2014.

Table A3. PAWS 2015 Grade 5 Reading Blueprint

**DRAFT Blueprint 2014 - 54 5R OP items aligned to CCSS**

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Reading Literature</b>							
<b>Key Ideas 0</b>							
RL5.1	Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.		R.05.N skills: 45% (24 items)	12-14	Literary portion: approx. 38%	11-13	Literary portion: approx. 35%
RL5.2	Determine a theme of a story, drama, or poem from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text.						
RL5.3	Compare and contrast two or more characters, settings, or events in a story or drama, drawing on specific details in the text (e.g., how characters interact).	19					
<b>Craft and Structure</b>							
RL 5.4	Determine the meaning of words and phrases as they are used in a text, including figurative language such as metaphors and similes.		N.1 = 14 items N.2 = 10 items N.3 = 0 items	6-8		6-8	
RL5.5	Explain how a series of chapters, scenes, or stanzas fits together to provide the overall structure of a particular story, drama, or poem.						
RL 5.6	Describe how a narrator's or speaker's point of view influences how events are described.	5					
<b>Integration of Knowledge and Ideas (see below)</b>							
<b>Range of Reading and Level of Text Complexity</b>							
RL5.10	By the end of the year, read and comprehend literature, including stories, dramas, and poetry, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range.						

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage			
		2013		2014		2015				
<b>Reading Informational Text</b>										
<b>Key Ideas and Details</b>										
RIS.1	Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.	30	R.05.E skills: 22% (12 items)  E.1 = 7 items E.2 = 0 items E.3 = 5 items  R.05.F skills: 33% (18 items)  F.1 = 10 items F.2 = 8 item	15-17	Informational portion: approx. 47%	12-14	Informational portion: approx. 36%			
RIS.2	Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.									
RIS.3	Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.									
<b>Craft and Structure</b>										
RIS.4	Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.	0		R.05.F skills: 33% (18 items)  F.1 = 10 items F.2 = 8 item		7-9		Informational portion: approx. 47%	6-8	Informational portion: approx. 36%
RIS.5	Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts.									
RIS.6	Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent.									
<b>Integration of Knowledge and Ideas (see below)</b>										
<b>Range of Reading and Level of Text Complexity</b>										
RIS.10	By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range.									

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Integration of Knowledge and Ideas*</b>							
RL5.7	Analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text (e.g., graphic novel; multimedia presentation of fiction, folktale, myth, poem).	0	Captured in totals above	0-2†	*Integration portion: approx. 2%	6-8	*Integration portion: approx. 13%
RL5.8	(Not applicable to literature)						
RL5.9	Compare and contrast stories in the same genre (e.g., mysteries and adventure stories) on their approaches to similar themes and topics.						
RIS.7	Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.						
RIS.8	Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).						
RIS.9	Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.						



CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
Language*							
L5.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.	0	no direct alignment to Wyoming skills: 0%	6-8	*Language portion: approx. 13%	8-10	*Language portion: approx. 16%
L5.4.a	Use context (e.g., cause/effect relationships and comparisons in text) as a clue to the meaning of a word or phrase.						
L5.4.b	Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., photograph, photosynthesis).						
L5.4.c	Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.						
L5.5	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.						
L5.5.a	Interpret figurative language, including similes and metaphors, in context.						
L5.5.b	Recognize and explain the meaning of common idioms, adages, and proverbs.						
L5.5.c	Use the relationship between particular words (e.g., synonyms, antonyms, homographs) to better understand each of the words.						
L5.6	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).						
suggested total OP items on form:							

\*Integration and Language reporting categories have items associated with both literary and informational passages. The goal will be to strike an overall balance of approx. 50% per genre on the test form.

†Integration of Knowledge and Ideas will not report out in 2014.

Table A4. PAWS 2015 Grade 6 Reading Blueprint

**DRAFT Blueprint 2014 - 56 6R OP items aligned to CCSS**

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Reading Literature</b>							
<b>Key Ideas and Details</b>							
RL.6.1	Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	8	R.06.N skills: 41% (23 items)	13-15	Literary portion: approx. 43%	12-14	Literary portion: approx. 36%
RL.6.2	Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.						
RL.6.3	Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves toward a resolution.						
<b>Craft and Structure</b>							
RL.6.4	Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of a specific word choice on meaning and tone.	13		8-10		6-8	
RL.6.5	Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot.						
RL.6.6	Explain how an author develops the point of view of the narrator or speaker in a text.						
<b>Integration of Knowledge and Ideas (see below)</b>							
<b>Range of Reading and Level of Text Complexity</b>							
RL.6.10	By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.						

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage			
		2013		2014		2015				
<b>Reading Informational Text</b>										
<b>Key Ideas and Details</b>										
RI.6.1	Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	11	R.06.E skills: 25% (14 items)  E.1 = 6 items E.2 = 0 items E.3 = 8 items  R.06.F skills: 34% (19 items)  F.1 = 8 items F.2 = 11 items	14-16	Informational portion: approx. 43%	12-14	Informational portion: approx. 36%			
RI.6.2	Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.									
RI.6.3	Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).									
<b>Craft and Structure</b>										
RI.6.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.	2				7-9			6-8	
RI.6.5	Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas.									
RI.6.6	Determine an author's point of view or purpose in a text and explain how it is conveyed in the text.									
<b>Integration of Knowledge and Ideas (see below)</b>										
<b>Range of Reading and Level of Text Complexity</b>										
RI.6.10	By the end of the year, read and comprehend literary nonfiction in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.									

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage		
		2013		2014		2015			
<b>Integration of Knowledge and Ideas*</b>									
RI.6.7	Compare and contrast the experience of reading a story, drama, or poem to listening to or viewing an audio, video, or live version of the text, including contrasting what they "see" and "hear" when reading the text to what they perceive when they listen or watch.	22	Captured in totals above	0-2†	*Integration portion: approx. 2%	7-9	*Integration portion: approx. 14%		
RI.6.8	(Not applicable to literature)								
RI.6.9	Compare and contrast texts in different forms or genres (e.g., stories and poems; historical novels and fantasy stories) in terms of their approaches to similar themes and topics.								
RI.6.7	Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.								
RI.6.8	Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.								
RI.6.9	Compare and contrast one author's presentation of events with that of another (e.g., a memoir written by and a biography on the same person).								

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
Language*							
L6.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, choosing flexibly from a range of strategies.	0	no direct alignment to Wyoming skills: 0%	6-8	*Language portion: approx. 13%	7-9	*Language portion: approx. 14%
L6.4.a	Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.						
L6.4.b	Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., audience, auditory, audible).						
L6.4.c	Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.						
L6.4.d	Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).						
L6.5	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.						
L6.5.a	Interpret figures of speech (e.g., personification) in context.						
L6.5.b	Use the relationship between particular words (e.g., cause/effect, part/whole, item/category) to better understand each of the words.						
L6.5.c	Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., stingy, scrimping, economical, unwasteful, thrifty).						
L6.6	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.						
suggested total OP items on form:		56		56		56	

\*Integration and Language reporting categories have items associated with both literary and informational passages. The goal will be to strike an overall balance of approx. 50% per genre on the test form.  
†Integration of Knowledge and Ideas will not report out in 2014.

Table A5. PAWS 2015 Grade 7 Reading Blueprint

**DRAFT Blueprint 2014 - 56 7R OP items aligned to CCSS**

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Reading Literature</b>							
<b>Key Ideas and Details</b>							
RL7.1	Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	13		11-13		9-11	
RL7.2	Determine a theme or central idea of a text and analyze its development over the course of the text; provide an objective summary of the text.						
RL7.3	Analyze how particular elements of a story or drama interact (e.g., how setting shapes the characters or plot).						
<b>Craft and Structure</b>							
RL7.4	Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of rhymes and other repetitions of sounds (e.g., alliteration) on a specific verse or stanza of a poem or section of a story or drama.	7	R.07.N skills: 36% (20 items) N.1 = 7 items N.2 = 8 items N.3 = 5 items	7-9	Literary portion: approx. 37%	7-9	Literary portion: approx. 32%
RL7.5	Analyze how a drama's or poem's form or structure (e.g., soliloquy, sonnet) contributes to its meaning.						
RL7.6	Analyze how an author develops and contrasts the points of view of different characters or narrators in a text.						
<b>Integration of Knowledge and Ideas (see below)</b>							
<b>Range of Reading and Level of Text Complexity</b>							
RL7.10	By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.						

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Reading Informational Text</b>							
<b>Key Ideas and Details</b>							
RI.7.1	Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	9	R.07.E skills: 39% (22 items)	17-19	Informational portion: approx. 49%	14-16	Informational portion: approx. 39%
RI.7.2	Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.						
RI.7.3	Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events).						
<b>Craft and Structure</b>							
RI.7.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.	18	R.07.F skills: 25% (14 items)	7-9	Informational portion: approx. 49%	6-8	Informational portion: approx. 39%
RI.7.5	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.						
RI.7.6	Determine an author's point of view or purpose in a text and analyze how the author distinguishes his or her position from that of others.						
<b>Integration of Knowledge and Ideas (see below)</b>							
<b>Range of Reading and Level of Text Complexity</b>							
RI.7.10	By the end of the year, read and comprehend literary nonfiction in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.						

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Integration of Knowledge and Ideas*</b>							
RL.7.7	Compare and contrast a written story, drama, or poem to its audio, filmed, staged, or multimedia version, analyzing the effects of techniques unique to each medium (e.g., lighting, sound, color, or camera focus and angles in a film).	9	Captured in totals above	0-2†	*Integration portion: approx. 2%	6-8	*Integration portion: approx. 13%
RL.7.8	(Not applicable to literature)						
RL.7.9	Compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same period as a means of understanding how authors of fiction use or alter history.						
RI.7.7	Compare and contrast a text to an audio, video, or multimedia version of the text, analyzing each medium's portrayal of the subject (e.g., how the delivery of a speech affects the impact of the words).						
RI.7.8	Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.						
RI.7.9	Analyze how two or more authors writing about the same topic shape their presentations of key information by emphasizing different evidence or advancing different interpretations of facts.						

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
Language*							
L7.4.a	Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.	0	no direct alignment to Wyoming skills: 0%	6-8	*Language portion: approx. 12%	8-10	*Language portion: approx. 16%
L7.4.b	Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., belligerent, bellicose, rebel).						
L7.4.c	Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.						
L7.4.d	Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).						
L7.5	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.						
L7.5.a	Interpret figures of speech (e.g., literary, biblical, and mythological allusions) in context.						
L7.5.b	Use the relationship between particular words (e.g., synonym/antonym, analogy) to better understand each of the words.						
L7.5.c	Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., refined, respectful, polite, diplomatic, condescending).						
L7.6	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.						
suggested total OP items on form:							

\*Integration and Language reporting categories have items associated with both literary and informational passages. The goal will be to strike an overall balance of approx. 50% per genre on the test form.  
†Integration of Knowledge and Ideas will not report out in 2014.

Table A6. PAWS 2015 Grade 8 Reading Blueprint

**DRAFT Blueprint 2014 - 56 8R OP items aligned to CCSS**

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
<b>Reading Literature</b>							
<b>Key Ideas and Details</b>							
RL.1	Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.	10		10-12		9-11	
RL.2	Determine a theme or central idea of a text and analyze its development over the course of the text, including its relationship to the characters, setting, and plot; provide an objective summary of the text.						
RL.3	Analyze how particular lines of dialogue or incidents in a story or drama propel the action, reveal aspects of a character, or provoke a decision.						
<b>Craft and Structure</b>							
RL.4	Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.	6	R.08.N skills: 29% (16 items)  N.1 = 4 items N.2 = 6 items N.3 = 6 items	7-9	Literary portion: approx. 35%	7-9	Literary portion: approx. 32%
RL.5	Compare and contrast the structure of two or more texts and analyze how the differing structure of each text contributes to its meaning and style.						
RL.6	Analyze how differences in the points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) create such effects as suspense or humor.						
<b>Integration of Knowledge and Ideas (see below)</b>							
<b>Range of Reading and Level of Text Complexity</b>							
RL.10	By the end of the year, read and comprehend literature, including stories, dramas, and poems, at the high end of grades 6–8 text complexity band independently and proficiently.						



CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage			
		2013		2014		2015				
<b>Reading Informational Text</b>										
<b>Key Ideas and Details</b>										
RI.8.1	Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.	29	R.04.E skills: 46% (26 items)  E.1 = 12 items E.2 = 9 items E.3 = 5 items  R.04.F skills: 25% (14 items)  F.1 = 7 items F.2 = 7 items	18-20	Informational portion: approx. 50%	12-14	Informational portion: approx. 39%			
RI.8.2	Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.									
RI.8.3	Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).									
<b>Craft and Structure</b>										
RI.8.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.	5		R.04.F skills: 25% (14 items)  F.1 = 7 items F.2 = 7 items		7-9		Informational portion: approx. 50%	8-10	Informational portion: approx. 39%
RI.8.5	Analyze in detail the structure of a specific paragraph in a text, including the role of particular sentences in developing and refining a key concept.									
RI.8.6	Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.									
<b>Integration of Knowledge and Ideas (see below)</b>										
<b>Range of Reading and Level of Text Complexity</b>										
RI.8.10	By the end of the year, read and comprehend literary nonfiction at the high end of the grades 6–8 text complexity band independently and proficiently.									

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage			
		2013		2014		2015				
<b>Integration of Knowledge and Ideas*</b>										
RL.8.7	Analyze the extent to which a filmed or live production of a story or drama stays faithful to or departs from the text or script, evaluating the choices made by the director or actors.	6	Captured in totals above	0-2†	*Integration portion: approx. 2%	6-8	*Integration portion: approx. 13%			
RL.8.8	(Not applicable to literature)									
RL.8.9	Analyze how a modern work of fiction draws on themes, patterns of events, or character types from myths, traditional stories, or religious works such as the Bible, including describing how the material is rendered new.									
RI.8.7	Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.	6		Captured in totals above		0-2†		*Integration portion: approx. 2%	6-8	*Integration portion: approx. 13%
RI.8.8	Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.									
RI.8.9	Analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation.									

CCSS code	CCSS text	Current CCSS alignment	Current WY skills alignment	Ideal blueprint	Content coverage	Ideal blueprint	Content coverage
		2013		2014		2015	
Language*							
L8.4.a	Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.	0	no direct alignment to Wyoming skills: 0%	6-8	*Language portion: approx. 13%	8-10	*Language portion: approx. 16%
L8.4.b	Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., precede, recede, secede).						
L8.4.c	Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.						
L8.4.d	Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).						
L8.5	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.						
L8.5.a	Interpret figures of speech (e.g. verbal irony, puns) in context.						
L8.5.b	Use the relationship between particular words to better understand each of the words.						
L8.5.c	Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., bullheaded, willful, firm, persistent, resolute).						
L8.6	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.						
suggested total OP items on form:		56		56		56	

\*Integration and Language reporting categories have items associated with both literary and informational passages. The goal will be to strike an overall balance of approx. 50% per genre on the test form.  
†Integration of Knowledge and Ideas will not report out in 2014.

Mathematics

Table A7. PAWS 2015 Grade 3 Math Blueprint

Domain / Standard	2014 PAWS - 3rd Grade Mathematics Cluster Heading	Focus m = major s = supporting a = additional	Items Per Domain	# of Items / Cluster Heading	PAWS Emphasis
<b>Operations and Algebraic Thinking</b>			<b>20</b>		
3.OA.1	Represent and solve problems involving multiplication and division.	m		6-8	40%
3.OA.2					
3.OA.3					
3.OA.4					
3.OA.5	Understand properties of multiplication and the relationship between multiplication and division.	m		3-5	
3.OA.6					
3.OA.7	Multiply and divide within 100.	m		3-5	
3.OA.8	Solve problems involving the four operations, and identify and explain patterns in arithmetic.	m		4-6	
3.OA.9					
<b>Number and Operations - Base Ten</b>			<b>6</b>		
3.NBT.1	Use place value understanding and properties of operations to perform multi-digit arithmetic.	a		6	12%
3.NBT.2					
3.NBT.3					
<b>Number and Operations - Fractions</b>			<b>6</b>		
3.NF.1	Develop understanding of fractions as numbers.	m		6	12%
3.NF.2					
3.NF.3					
<b>Measurement and Data</b>			<b>12</b>		
3.MD.1	Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.	m		3-5	24%
3.MD.2					
3.MD.3	Represent and interpret data.	s		1-3	
3.MD.4					
3.MD.5	Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	m		3-5	
3.MD.6					
3.MD.7					
3.MD.8	Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	a		1-3	
<b>Geometry</b>			<b>6</b>		
3.G.1	Reason with shapes and their attributes.	s		6	12%
3.G.2					
			<b>50</b>	<b>50</b>	<b>100%</b>

Released May 2013 PAWS Mathematics Blueprint Wyoming Department of Education

Table A8. PAWS 2015 Grade 4 Math Blueprint

Domain / Standard	2014 PAWS - 4th Grade Mathematics Cluster Heading	Focus m = major s = supporting a = additional	Items Per Domain	# of Items / Cluster Heading	PAWS Emphasis
<b>Operations and Algebraic Thinking</b>			<b>13</b>		
4.OA.1	Use the four operations with whole numbers to solve problems.	m		6-8	22%
4.OA.2					
4.OA.3					
4.OA.4	Gain familiarity with factors and multiples.	s		2-4	
4.OA.5	Generate and analyze patterns.	a		2-4	
<b>Number and Operations - Base Ten</b>			<b>10</b>		
4.NBT.1	Generalize place value understanding for multi-digit whole numbers.	m		3-5	17%
4.NBT.2					
4.NBT.3					
4.NBT.4	Use place value understanding and properties of operations to perform multi-digit arithmetic.	m		5-7	
4.NBT.5					
4.NBT.6					
<b>Number and Operations - Fractions</b>			<b>20</b>		
4.NF.1	Extend understanding of fraction equivalence and ordering.	m		3-5	34%
4.NF.2					
4.NF.3	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	m		9-11	
4.NF.4					
4.NF.5	Understand decimal notation for fractions, and compare decimal fractions.	m		5-7	
4.NF.6					
4.NF.7					
<b>Measurement and Data</b>			<b>10</b>		
4.MD.1	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	s		5-7	17%
4.MD.2					
4.MD.3					
4.MD.4	Represent and interpret data.	s		1-3	
4.MD.5	Geometric measurement; understand concepts of angle and measure angles.	a		1-3	
4.MD.6					
4.MD.7					
<b>Geometry</b>			<b>6</b>		
4.G.1	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	a		6	10%
4.G.2					
4.G.3					
			<b>59</b>	<b>59</b>	<b>100%</b>

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PAWS Mathematics Blueprint







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Table A9. PAWS 2015 Grade 5 Math Blueprint

Domain / Standard	2014 PAWS - 5th Grade Mathematics Cluster Heading	Focus m = major s = supporting a = additional	Items Per Domain	# of Items / Cluster Heading	PAWS Emphasis
<b>Operations and Algebraic Thinking</b>			6		
S.OA.1	Write and interpret numerical expressions.	a		2-4	10%
S.OA.2					
S.OA.3	Analyze patterns and relationships.	a		2-4	
<b>Number and Operations - Base Ten</b>			16		
S.NBT.1	Understand the place value system.	m		5-7	27%
S.NBT.2					
S.NBT.3					
S.NBT.4					
S.NBT.5	Perform operations with multi-digit whole numbers and with decimals to hundredths.	m		9-11	
S.NBT.6					
S.NBT.7					
<b>Number and Operations - Fractions</b>			19		
S.NF.1	Use equivalent fractions as a strategy to add and subtract fractions.	m		7-9	32%
S.NF.2					
S.NF.3	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	m		10-12	
S.NF.4					
S.NF.5					
S.NF.6					
S.NF.7					
<b>Measurement and Data</b>			12		
S.MD.1	Convert like measurement units within a given measurement system.	s		2-4	20%
S.MD.2	Represent and interpret data.	s		1-3	
S.MD.3	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	m		6-8	
S.MD.4					
S.MD.5					
<b>Geometry</b>			6		
S.G.1	Graph points on the coordinate plane to solve real-world and mathematical problems.	a		2-4	10%
S.G.2					
S.G.3	Classify two-dimensional figures into categories based on their properties.	a		2-4	
S.G.4					
			59	59	100%







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Table A10. PAWS 2015 Grade 6 Math Blueprint

Domain / Standard	2014 PAWS - 6th Grade Mathematics Cluster Heading	Focus	Items Per Domain	# of Items / Cluster Heading	PAWS Emphasis
<b>Ratios and Proportional Relationships</b>			10		
6.RP.1	Understand ratio concepts and use ratio reasoning to solve problems.	major		10	17%
6.RP.2					
6.RP.3					
<b>The Number System</b>			15		
6.NS.1	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	major		4-6	25%
6.NS.2	Compute fluently with multi-digit numbers and find common factors.	additional		3-5	
6.NS.3					
6.NS.4					
6.NS.5	Apply and extend previous understandings of numbers to the system of rational numbers.	major		5-7	
6.NS.6					
6.NS.7					
6.NS.8					
<b>Expressions and Equations</b>			20		
6.EE.1	Apply and extend previous understandings of arithmetic to algebraic expressions.	major		7-9	34%
6.EE.2					
6.EE.3					
6.EE.4					
6.EE.5	Reason about and solve one-variable equations and inequalities.	major		6-8	
6.EE.6					
6.EE.7					
6.EE.8					
6.EE.9	Represent and analyze quantitative relationships between dependent and independent variables.	major		4-6	
<b>Geometry</b>			6		
6.G.1	Solve real-world and mathematical problems involving area, surface area, and volume.	supporting		6	10%
6.G.2					
6.G.3					
6.G.4					
<b>Statistics and Probability</b>			8		
6.SP.1	Develop understanding of statistical variability.	additional		2-4	14%
6.SP.2					
6.SP.3					
6.SP.4	Summarize and describe distributions.	additional		4-6	
6.SP.5					
			59	59	100%

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Table A11. PAWS 2015 Grade 7 Math Blueprint

Domain / Standard	2014 PAWS - 7th Grade Mathematics Cluster Heading	Focus m = major s = supporting a = additional	Items Per Domain	# of Items / Cluster Heading	PAWS Emphasis
<b>Ratios and Proportional Relationships</b>					
7.RP.1	Analyze proportional relationships and use them to solve real-world and mathematical problems.	m		13	22%
7.RP.2					
7.RP.3					
<b>The Number System</b>					
7.NS.1	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	m		10	17%
7.NS.2					
7.NS.3					
<b>Expressions and Equations</b>					
7.EE.1	Use properties of operations to generate equivalent expressions.	m		5-7	31%
7.EE.2					
7.EE.3				11-13	
7.EE.4					
<b>Geometry</b>					
7.G.1	Draw, construct, and describe geometrical figures and describe the relationships between them.	a		1-3	15%
7.G.2					
7.G.3					
7.G.4	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	a		6-8	
7.G.5					
7.G.6					
<b>Statistics and Probability</b>					
7.SP.1	Use random sampling to draw inferences about a population.	s		2-4	15%
7.SP.2					
7.SP.3	Draw informal comparative inferences about two populations.	a		1-3	
7.SP.4					
7.SP.5					
7.SP.6	Investigate chance processes and develop, use, and evaluate probability models.	s		3-5	
7.SP.7					
7.SP.8					
			<b>59</b>	<b>59</b>	<b>100.00%</b>

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Table A12. PAWS 2015 Grade 8 Math Blueprint

Domain / Standard	2014 PAWS - 8th Grade Mathematics Cluster Heading	Focus m = major s = supporting a = additional	Items Per Domain	# of Items / Cluster Heading	PAWS Emphasis
<b>The Number System</b>			<b>6</b>		
8.NS.1	Know that there are numbers that are not rational, and approximate them by rational numbers.	supporting		6	9%
8.NS.2					
<b>Expressions and Equations</b>			<b>23</b>		
8.EE.1	Work with radicals and integer exponents.	major		6-8	35%
8.EE.2					
8.EE.3					
8.EE.4					
8.EE.5	Understand the connections between proportional relationships, lines, and linear equations.	major		5-7	
8.EE.6					
8.EE.7	Analyze and solve linear equations and pairs of simultaneous linear equations.	major		9-11	
8.EE.8					
<b>Functions</b>			<b>14</b>		
8.F.1	Define, evaluate, and compare functions.	major		7-9	22%
8.F.2					
8.F.3					
8.F.4	Use functions to model relationships between quantities.	supporting		5-7	
8.F.5					
<b>Geometry</b>			<b>16</b>		
8.G.1	Understand congruence and similarity using physical models, transparencies, or geometry software.	major		6-8	25%
8.G.2					
8.G.3					
8.G.4					
8.G.5					
8.G.6	Understand and apply the Pythagorean Theorem.	major		5-7	
8.G.7					
8.G.8	Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.	additional		2-4	
8.G.9					
<b>Statistics and Probability</b>			<b>6</b>		
8.SP.1	Investigate patterns of association in bivariate data.	supporting		6	9%
8.SP.2					
8.SP.3					
8.SP.4					
			<b>65</b>	<b>65</b>	<b>100.00%</b>

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Science

Table A13. PAWS 2015 Science Grade 4 Blueprint

Standards	Total Points per Standard	Skills	Branches	Benchmarks	Total # of Items per Benchmark (MC = 1pt. each)	Items Aligning Skill & Benchmark	of Items per Branches (MC Items = 1)	Age of Test Items per Branch
Concepts & Processes	50	I.1 Observe and Question  I.2 Design and Conduct a Scientific Investigation	Life Science	4.1.1 Characteristics of Organisms: Students describe observable characteristics of living things, including structures that serve specific functions and everyday behaviors.	5-6	I.1 - 0-1	16	32.00%
						I.2 - 1-2		
						I.3 - 0-1		
						I.4 - 0-1		
				4.1.2 Life Cycles of Organisms: Students sequence life cycles of living things, and recognize that plants and animals resemble their parents.	5-6	I.1 - 0-1		
						I.2 - 1-2		
			I.3 - 0-1					
			I.4 - 1-2					
		4.1.3 Organisms and Their Environments: Students show connections between living things, their basic needs, and the environments.	4-5	I.1 - 0-1				
				I.2 - 1-2				
				I.3 - 0-1				
				I.4 - 0-1				
I.3 Organize and Represent Data  I.4 Draw Conclusions and Make Connections	Earth and Space Science	4.1.4 Properties of Earth Materials: Students investigate water, air, rocks, and soils to compare basic properties of earth materials.	4-5	I.1 - 0-1				
				I.2 - 0-1				
				I.3 - 0-1				
				I.4 - 1-2				
		4.1.5 Objects in the Sky: Students describe observable objects in the sky and their patterns of movement.	5-6	I.1 - 0-1				
				I.2 - 0-1				
	I.3 - 0-1							
	I.4 - 1-2							
	5-6	I.1 - 0-1						
		I.2 - 1-2						
		I.3 - 1-2						
		I.4 - 1-2						
I.1 Observe and Question  I.2 Design and Conduct a Scientific Investigation  I.3 Organize and Represent Data  I.4 Draw Conclusions and Make Connections	Physical Science	4.1.7 Properties of Objects: Students classify objects by properties that can be observed, measured, and recorded, including color, shape, size, weight, volume, texture, and temperature.	4-5	I.1 - 0-1	18	36.00%		
				I.2 - 1-2				
				I.3 - 0-1				
				I.4 - 0-1				
		4.1.8 Changes in States of Matter: Students demonstrate that the processes of heating and cooling can change matter from one state to another.	4-5	I.1 - 1-2				
				I.2 - 0-1				
				I.3 - 0-1				
				I.4 - 1-2				
		4.1.9 Physical Phenomena: Students investigate physical phenomena commonly encountered in daily life, including light, heat, electricity, sound, and magnetism.	4-5	I.1 - 0-1				
				I.2 - 1-2				
				I.3 - 0-1				
				I.4 - 1-2				
4.1.10 Position and Motion of Objects: Students demonstrate that pushing and pulling can change the position and motion of objects.	4-5	I.1 - 0-1						
		I.2 - 0-1						
		I.3 - 0-1						
		I.4 - 0-1						

<b>Science as Inquiry</b>			4.2.1 Students research answers to science questions and present findings through appropriate means.	<b>Not Assessed</b>
			4.2.2 Students use the inquiry process to conduct simple scientific investigations: 1) Collect and organize data; 2) Use data to construct simple graphs, charts, diagrams, and/or model; 3) Draw conclusions and accurately communicate results, making connections to daily life; 4) Pose or identify questions and make predictions; and 5) Conduct investigations to answer questions and check predictions	<b>Assessed with Concepts &amp; Processes</b>
			4.2.3 Students identify and use appropriate scientific equipment.	
			4.2.4 Students properly use safety equipment and recognize hazards and safety symbols while practicing standard safety procedures.	

Table A14. PAWS 2015 Science Grade 8 Blueprint

Standards	Total Points per Standard	Skills	Branches	Benchmarks	Total # of Items per Benchmark (MC = 1pt. each)	# of Items Aligning Skill & Benchmark	Total # of Items per Branch (MC Items = 1 pt. each)	Percentage of Test Items per Branch (%)
Concepts and Processes	50	I.1 Observe and Question I.2 Design and Conduct a Scientific Investigation I.3 Organize and Represent Data I.4 Draw Conclusions and Make Connections	Life Science	<u>8.1.1 Levels of Organization in Living Systems:</u> Students model the cell as the basic unit of a living system. They realize that all functions that sustain life act within a single cell and cells differentiate into specialized cells, tissues, organs, and organ systems.	2-3	1.1 - 0-1	16	32%
						1.2 - 0-1		
						1.3 - 0-1		
						1.4 - 0-1		
				<u>8.1.2 Reproduction and Heredity:</u> Students describe reproduction as a characteristic of all living systems, which is essential to the continuation of species, and identify and interpret traits, patterns of inheritance, and the interaction between genetics and environment.	2-3	1.1 - 0-1		
						1.2 - 0-1		
						1.3 - 0-1		
						1.4 - 0-1		
				<u>8.1.3 Evolution as a Theory:</u> Students explain evolution as a theory and apply the theory to the diversity of species, which results from natural selection and the acquisition of unique characteristics through biological adaptation.	2-3	1.1 - 0-1		
						1.2 - 0-1		
						1.3 - 0-1		
						1.4 - 0-1		
				<u>8.1.4 Diversity of Organisms:</u> Students investigate the interconnectedness of organisms, identifying similarity and diversity of organisms through a classification system of hierarchical relationships and structural homologies.	2-3	1.1 - 0-1		
						1.2 - 0-1		
						1.3 - 0-1		
	1.4 - 0-1							
<u>8.1.5 Behavior and Adaptation:</u> Students recognize behavior as a response of an organism to an internal or environmental stimulus and connect the characteristics and behaviors of an organism to biological adaptation.	2-3	1.1 - 0-1						
		1.2 - 0-1						
		1.3 - 0-1						
		1.4 - 0-1						
				<u>8.1.6 Interrelationships of Populations and Ecosystems:</u> Students illustrate populations of organisms and their interconnection within an ecosystem, identifying relationships among producers, consumers, and	2-3	1.1 - 0-1		
			1.2 - 0-1					
			1.3 - 0-1					
			1.4 - 0-1					
				<u>8.1.7 The Earth in the Solar System:</u> Students describe Earth as the third planet in the Solar System and understand the effects of the sun as a major source of energy, gravitational forces, and motions of objects in the Solar System.	5-6	1.1 - 0-1		
			1.2 - 1-2					
			1.3 - 0-1					
			1.4 - 1-2					
				<u>8.1.8 The Structure of the Earth System:</u> Students examine the structure of the Earth, identifying layers of the Earth, considering plate movement and its effect, and recognizing landforms resulting from constructive and destructive forces.	5-6	1.1 - 1-2		
			1.2 - 1-2					
			1.3 - 0-1					
			1.4 - 1-2					
				<u>8.1.9 The Earth's History:</u> Students systematize the Earth's history in terms of geologic evidence, comparing past and present Earth processes and identifying catastrophic events and fossil evidence.	5-6	1.1 - 0-1		
			1.2 - 0-1					
			1.3 - 1-2					
			1.4 - 1-2					

		<b>I.1 Observe and Question</b>  <b>I.2 Design and Conduct a Scientific Investigation</b>  <b>I.3 Organize and Represent Data</b>  <b>I.4 Draw Conclusions and Make Connections</b>	<b>PHYSICAL SCIENCE</b>	<b>8.1.10 The Structure and Properties of Matter:</b> Students identify characteristic properties of matter such as density, solubility, and boiling point and understand that elements are the basic components of matter.	<b>3-4</b>	<b>I.1 - 0-1</b>	<b>18</b>	<b>36.00%</b>
						<b>I.2 - 0-1</b>		
						<b>I.3 - 0-1</b>		
						<b>I.4 - 0-1</b>		
				<b>8.1.11 Physical and Chemical Changes in Matter:</b> Students evaluate chemical and physical changes, recognizing that chemical change forms compounds with different properties and that physical change alters the appearance but not the composition of a substance.	<b>3-4</b>	<b>I.1 - 0-1</b>		
	<b>I.2 - 0-1</b>							
	<b>I.3 - 0-1</b>							
	<b>I.4 - 0-1</b>							
<b>8.1.12 Forms and Uses of Energy:</b> Students investigate energy as a property of substances in a variety of forms with a range of uses.	<b>3-4</b>	<b>I.1 - 0-1</b>						
		<b>I.2 - 0-1</b>						
		<b>I.3 - 0-1</b>						
		<b>I.4 - 0-1</b>						
<b>8.1.13 The Conservation of Matter and Energy:</b> Students identify supporting evidence to explain conservation of matter and energy, indicating that matter or energy cannot be created or destroyed but is transferred from one object to another.	<b>3-4</b>	<b>I.1 - 0-1</b>						
		<b>I.2 - 0-1</b>						
		<b>I.3 - 0-1</b>						
		<b>I.4 - 0-1</b>						
<b>8.1.14 Effects of Motions and Forces:</b> Students describe motion of an object by position, direction, and speed, and identify the effects of force and inertia on an object.	<b>3-4</b>	<b>I.1 - 0-1</b>						
		<b>I.2 - 0-1</b>						
		<b>I.3 - 0-1</b>						
		<b>I.4 - 0-1</b>						

<b>Science as Inquiry</b>				<b>8.2.1</b> Students research answers to science questions and present findings through appropriate means.	<b>4</b>	<b>Assessed with Concepts &amp; Processes</b>
				<b>8.2.2</b> Students use the inquiry to conduct scientific investigations: 1) Ask questions that lead to conducting an investigation; 2) Collect, organize, and analyze and appropriately represent data; 3) Draw conclusions based on evidence and make connections to applied scientific concepts; 4) Clearly and accurately communicate the result of the investigations.		
				<b>8.2.3</b> Students clearly and accurately communicate the result of their own work, as well as information obtained from other sources.		
				<b>8.2.4</b> Students recognize the relationship between science and technology in meeting human needs.		
				<b>8.2.5</b> Students properly use appropriate scientific and safety equipment, recognize hazards and safety symbols, and observe standard safety procedures.		

Appendix B: Sample PAWS/SAWS Student Reports: Grade 4 Reading,  
Mathematics, and Science (exemplar for Grade 8)



# Student Report

First Name: EMILIE  
Middle Initial: G  
Last Name: AUSTIN

Grade: 4  
Birthdate: 05/27/2005  
Student ID: 23931011

Test Window: 10/24/14 - 05/29/15  
School: Laura Irwin Elementary

District: Big Horn CSD # 4

### Purpose of Report

This report provides information about your child's achievement on the Proficiency Assessment for Wyoming Students (PAWS) and the Student Assessment of Writing Skills (SAWS). This report will help you understand your child's performance in reading and math (grades 3-8), science (grades 4 and 8), and writing (grades 3, 5, and 7) for the 2014-2015 school year.

### Glossary of Terms

**Scale Score:** Your child's raw score (total number of points earned) transformed into a score on a scale.

**Student Performance by Domain:** Describes your child's performance in sub-categories (domains) of each content area. The Scale Score column indicates your child's performance in domains relative to the overall scale (see above). The Domain Performance column shows the number of items your child got correct out of the total number of items in that domain. Please note that the number of items in each domain and their level of difficulty varies from grade to grade and year to year.

**State Percentile Rank:** State Percentile Rank indicates your child's performance in relation to other Wyoming students in the same grade. The ranking number shows the number of Wyoming students in the same grade who obtained scores equal to or less than your child's score.

**Lexile Measure:** Helps readers select materials at their reading level. This can serve as a guide in selecting books for your child.

**Quantile Measure:** Similar to the Lexile and can help you identify math activities to do at home. These activities will help your child practice mathematical skills leading to increased mathematical understanding.

**Not Scored (NS):** Your child did not complete enough of the test to calculate a score.

**Not Tested (NT):** Your child did not take this part of the assessment.

**Not Applicable (NA):** This content area is not tested at this grade level.

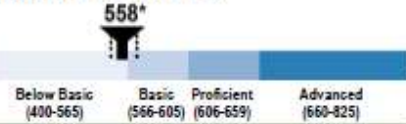
For Additional Resources and Information- Visit the Wyoming Department of Education online

Go to the Wyoming Department of Education's website at [edu.wyoming.gov](http://edu.wyoming.gov) for more information about the PAWS and SAWS Assessments.

## YOUR CHILD'S RESULTS:

### READING

Your child's score: 558  
Performance Level: Below Basic  
State Percentile Rank: 12



### MATHEMATICS

Your child's score: 600  
Performance Level: Basic  
State Percentile Rank: 22



### SCIENCE

Your child's score: 644  
Performance Level: Basic  
State Percentile Rank: 31



### WRITING

Your child's score: NA



\* The dotted lines indicate the range of likely scores your child would receive if your child took many versions of the test.

## STUDENT PERFORMANCE BY DOMAIN

PAWS		Scale Score	Domain Performance
Reading	Literature: Craft and Structure	556	3 of 7
	Literature: Key Ideas and Details	406	0 of 10
	Informational Text: Craft and Structure	583	4 of 6
	Informational Text: Key Ideas and Details	636	8 of 11
	Integration of Knowledge and Ideas	654	6 of 7
Language		502	2 of 9
Math	Operations & Algebraic Thinking	616	9 of 13
	Number Operations - Base 10	539	4 of 10
	Number Operations - Fractions	610	9 of 20
	Measurement & Data	636	5 of 10
	Geometry	564	2 of 6
Science	Life Science	637	8 of 16
	Physical Science	654	10 of 18
	Earth & Space Science	640	8 of 16
SAWS		Total Possible	Student Score
Writing	NA		
	NA		

Lexile<sup>®</sup> Measure

675L

Quantile<sup>®</sup> Measure

550Q

For more information, and to search for books by Lexile measure, visit [www.Lexile.com](http://www.Lexile.com). For more information about Quantile measures, visit the Math @ Home section at [www.Quantiles.com](http://www.Quantiles.com).

## A Guide to the Score Report

Several types of information are provided in this report. One is a description of your child's performance level (advanced, proficient, basic, or below basic) in each content area. Another is the scale score your child earned for those content areas. You can also see your child's performance in each of the content area domains. These results provide your child's school with information about how well your child is learning the Wyoming Content Standards.

The charts at the top right of the first page indicates the ranges of the scale scores depicting your child's scale score in each of the content areas. Different scales are used for each content area, so the numerical scores from each content area are not comparable numbers. The placement of the score in each proficiency band is important information for you and your child's teacher. The Student Performance by Domain box on the lower right side of the front page contains more detailed information about your child's performance. This information helps you and your child's teacher identify specific areas of strength and areas in need of improvement. The SAWS writing information (bottom right) shows the raw score (total earned and total possible) for your child on the writing test. At the bottom you will see the Lexile and Quantile scores for your child. Entering your child's scores will provide you access to valuable tools and resources which can support your child's academic growth.

### Performance Level Descriptors

	Reading	Mathematics	Science	Writing
Advanced	Students demonstrate thorough ability to comprehend implied main ideas, answer questions, and explain structural comparisons between one or more texts. They understand complex words and phrases.	Students demonstrate an in-depth understanding of whole numbers and measurements to solve problems using the four operations; whole number place value; equivalent fractions or decimals; fraction operations; classifying and analyzing geometric shapes.	Students demonstrate in-depth science knowledge in complex situations to analyze, construct, and use information and ideas. They evaluate conclusions based on evidence to explain phenomena and generalize cause and effect relationships.	Not Applicable.
Proficient	Students demonstrate adequate ability to comprehend main ideas, answer questions about text, and explain structural comparisons between one or more texts. They understand grade-appropriate words and phrases.	Students demonstrate a solid understanding of whole numbers and measurements to solve problems using the four operations; whole number place value; equivalent fractions or decimals; fraction operations; identifying or classifying geometric shapes.	Students demonstrate solid understanding of concepts and skills to analyze information and use ideas. They can describe and recall facts, perform investigations, record results, predict outcomes and provide solutions based on evidence.	Not Applicable.
Basic	Students demonstrate partial ability to comprehend main ideas, answer questions, and explain structural comparisons between one or more texts. They understand simple words and phrases.	Students demonstrate a partial understanding of whole numbers and measurements to solve problems using the four operations; whole number place value; equivalent fractions or decimals; fraction operations; identifying or classifying geometric shapes.	Students demonstrate partial understanding or require assistance to use concepts and skills to analyze facts and ideas. They demonstrate or explain basic scientific principles and observations with support.	Not Applicable.
Below Basic	Students require extensive support or provide little or no evidence in meeting the standard.	Students require extensive support or provide little or no evidence in meeting the standard.	Students require extensive support or provide little or no evidence in meeting the standard.	Not Applicable.

### What Can You Do at Home?

Reading	Mathematics	Science	Writing
<ul style="list-style-type: none"> <li>Read for at least thirty minutes per night.</li> <li>Read aloud to your child.</li> <li>Model being a reader.</li> <li>Ask who, what, where, when, why and how, questions about the book your child is reading.</li> <li>Ask your child to jot notes about his or her reading.</li> </ul>	<ul style="list-style-type: none"> <li>Be familiar with what your child is learning at school and work on those concepts in different contexts.</li> <li>Have a specific place for homework at home where you can check your child's progress and concepts being taught at any time.</li> <li>Practice fluency facts.</li> </ul>	<ul style="list-style-type: none"> <li>Promote investigative activities that happen outside.</li> <li>Turn everyday household activities into experiments (baking, cleaning, etc.).</li> <li>Form hypotheses when trying to work out everyday problems.</li> </ul>	<ul style="list-style-type: none"> <li>Keep a journal or diary at home.</li> <li>Find a pen-pal and write often.</li> <li>Find creative writing topics and work on stories together with your child.</li> <li>Ask your child's teacher for a writing rubric to know what exactly to work on at home.</li> <li>Model your own writing.</li> </ul>

Appendix C: Sample PAWS/SAWS Student Reports: Grade 6 Reading,  
Mathematics (exemplar for Grade 3, 5, and 7)





# Student Report

**First Name:** ALYSSA  
**Middle Initial:** K  
**Last Name:** AUSTIN  
  
**Grade:** 6  
**Birthdate:** 01/06/2003  
**Student ID:** 23930017  
**Test Window:** 10/24/14 - 05/29/15  
**School:** Laura Irwin Elementary  
  
**District:** Big Horn CSD # 4

### Purpose of Report

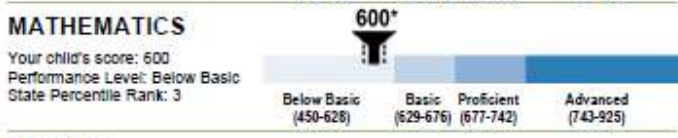
This report provides information about your child's achievement on the Proficiency Assessment for Wyoming Students (PAWS) and the Student Assessment of Writing Skills (SAWS). This report will help you understand your child's performance in reading and math (grades 3-8), science (grades 4 and 8), and writing (grades 3, 5, and 7) for the 2014-2015 school year.

### Glossary of Terms

- Scale Score:** Your child's raw score (total number of points earned) transformed into a score on a scale.
- Student Performance by Domain:** Describes your child's performance in sub-categories (domains) of each content area. The Scale Score column indicates your child's performance in domains relative to the overall scale (see above). The Domain Performance column shows the number of items your child got correct out of the total number of items in that domain. Please note that the number of items in each domain and their level of difficulty varies from grade to grade and year to year.
- State Percentile Rank:** State Percentile Rank indicates your child's performance in relation to other Wyoming students in the same grade. The ranking number shows the number of Wyoming students in the same grade who obtained scores equal to or less than your child's score.
- Lexile Measure:** Helps readers select materials at their reading level. This can serve as a guide in selecting books for your child.
- Quantile Measure:** Similar to the Lexile and can help you identify math activities to do at home. These activities will help your child practice mathematical skills leading to increased mathematical understanding.
- Not Scored (NS):** Your child did not complete enough of the test to calculate a score.
- Not Tested (NT):** Your child did not take this part of the assessment.
- Not Applicable (NA):** This content area is not tested at this grade level.

For Additional Resources and Information- Visit the Wyoming Department of Education online  
 Go to the Wyoming Department of Education's website at [edu.wyoming.gov](http://edu.wyoming.gov) for more information about the PAWS and SAWS Assessments.

## YOUR CHILD'S RESULTS:



\* The dotted lines indicate the range of likely scores your child would receive if your child took many versions of the test.

### STUDENT PERFORMANCE BY DOMAIN

PAWS		Scale Score	Domain Performance
Reading	Literature: Key Ideas and Details	537	3 of 12
	Literature: Craft and Structure	547	2 of 7
	Informational Text: Key Ideas and Details	584	4 of 13
	Informational Text: Craft and Structure	582	2 of 7
	Integration of Knowledge and Ideas - Language	479	1 of 8
Math	Ratio & Proportional Relationships	528	1 of 10
	The Number System	613	4 of 15
	Expressions & Equations	578	3 of 20
	Geometry	719	4 of 6
	Statistics & Probability	578	1 of 8
Science	NA		
SAWS		Total Possible	Student Score
Writing	NA		
	NA		

Lexile<sup>®</sup> Measure **665L**      Quantile<sup>®</sup> Measure **540Q**

For more information, and to search for books by Lexile measure, visit [www.Lexile.com](http://www.Lexile.com).  
 For more information about Quantile measures, visit the Math @ Home section at [www.Quantile.com](http://www.Quantile.com).

## A Guide to the Score Report

Several types of information are provided in this report. One is a description of your child's performance level (advanced, proficient, basic, or below basic) in each content area. Another is the scale score your child earned for those content areas. You can also see your child's performance in each of the content area domains. These results provide your child's school with information about how well your child is learning the Wyoming Content Standards.

The charts at the top right of the first page indicates the ranges of the scale scores depicting your child's scale score in each of the content areas. Different scales are used for each content area, so the numerical scores from each content area are not comparable numbers. The placement of the score in each proficiency band is important information for you and your child's teacher. The Student Performance by Domain box on the lower right side of the front page contains more detailed information about your child's performance. This information helps you and your child's teacher identify specific areas of strength and areas in need of improvement. The SAWS writing information (bottom right) shows the raw score (total earned and total possible) for your child on the writing test. At the bottom you will see the Lexile and Quantile scores for your child. Entering your child's scores will provide you access to valuable tools and resources which can support your child's academic growth.

### Performance Level Descriptors

	Reading	Mathematics	Science	Writing
Advanced	Students demonstrate thorough comprehension by supporting inferences, analyzing points of view, and making comparisons between themes, topics, and text structures within/across texts. They understand complex words and phrases.	Students demonstrate an in-depth understanding of ratios, positive rational numbers, and geometric properties to solve problems; negative numbers; writing, interpreting, and using expressions, equations, and inequalities; summarizing data.	Not Applicable.	Not Applicable.
Proficient	Students demonstrate adequate comprehension by supporting inferences, explaining points of view, and making comparisons between themes, topics, and text structures within/across texts. They understand grade-appropriate words and phrases.	Students demonstrate a solid understanding of ratios, positive rational numbers, and geometric properties to solve problems; negative numbers; writing, interpreting, and using expressions, equations, and inequalities; summarizing data.	Not Applicable.	Not Applicable.
Basic	Students demonstrate partial comprehension by supporting inferences, identifying points of view, and making comparisons between themes, topics, and text structures within/across texts. They understand simple words and phrases.	Students demonstrate a partial understanding of ratios, positive rational numbers, and geometric properties to solve problems; negative numbers; writing, interpreting, and using expressions, equations, and inequalities; summarizing data.	Not Applicable.	Not Applicable.
Below Basic	Students require extensive support or provide little or no evidence in meeting the standard.	Students require extensive support or provide little or no evidence in meeting the standard.	Not Applicable.	Not Applicable.

### What Can You Do at Home?

Reading	Mathematics	Science	Writing
<ul style="list-style-type: none"> <li>• Read for at least thirty minutes per night.</li> <li>• Read aloud to your child.</li> <li>• Model being a reader.</li> <li>• Ask who, what, where, when, why and how, questions about the book your child is reading.</li> <li>• Ask your child to jot notes about his or her reading.</li> </ul>	<ul style="list-style-type: none"> <li>• Be familiar with what your child is learning at school and work on those concepts in different contexts.</li> <li>• Have a specific place for homework at home where you can check your child's progress and concepts being taught at any time.</li> <li>• Practice fluency facts.</li> </ul>	<ul style="list-style-type: none"> <li>• Promote investigative activities that happen outside.</li> <li>• Turn everyday household activities into experiments (baking, cleaning, etc.).</li> <li>• Form hypotheses when trying to work out everyday problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Keep a journal or diary at home.</li> <li>• Find a pen-pal and write often.</li> <li>• Find creative writing topics and work on stories together with your child.</li> <li>• Ask your child's teacher for a writing rubric to know what exactly to work on at home.</li> <li>• Model your own writing.</li> </ul>

## Appendix D: PAWS Operational Subscale Correlations

Table D1. Grade 3 PAWS Total Test and Subscale Correlations

	Reading Total	LitKey	LitCrft	InfKey	InfCrft	Integ Knowl	Language	Math Total	Geometry	Measure	Algebra	Base Ten	Fraction
Reading Total	1.00												
LitKey	0.85	1.00											
LitCrft	0.73	0.58	1.00										
InfKey	0.84	0.62	0.55	1.00									
InfCrft	0.77	0.56	0.49	0.58	1.00								
IntegKnowl	0.84	0.64	0.55	0.64	0.58	1.00							
Language	0.82	0.62	0.55	0.62	0.56	0.63	1.00						
Math Total	0.73	0.58	0.52	0.62	0.56	0.64	0.59	1.00					
Geometry	0.45	0.37	0.33	0.39	0.35	0.39	0.37	0.62	1.00				
Measure	0.63	0.50	0.44	0.55	0.50	0.56	0.52	0.88	0.46	1.00			
Algebra	0.69	0.56	0.49	0.59	0.53	0.61	0.56	0.93	0.49	0.73	1.00		
Base Ten	0.58	0.47	0.42	0.50	0.43	0.51	0.48	0.80	0.41	0.64	0.71	1.00	
Fraction	0.49	0.38	0.33	0.42	0.39	0.44	0.40	0.71	0.38	0.55	0.57	0.47	1.00

Table D2. Grade 4 PAWS Total Test and Subscale Correlations

	Reading Total	LitKey	LitCrft	InfKey	InfCrft	Integ Knowl	Language	Math Total	Geometry	Measure	Algebra	Base Ten	Fraction	Science Total	LifeSci	PhysSci	EarthSci
Reading Total	1.00																
LitKey	0.84	1.00															
LitCrft	0.80	0.61	1.00														
InfKey	0.88	0.66	0.63	1.00													
InfCrft	0.75	0.57	0.54	0.61	1.00												
IntegKnowl	0.77	0.55	0.55	0.61	0.51	1.00											
Language	0.83	0.63	0.62	0.65	0.56	0.55	1.00										
Math Total	0.70	0.55	0.56	0.63	0.53	0.56	0.57	1.00									
Geometry	0.35	0.27	0.29	0.31	0.26	0.28	0.27	0.56	1.00								
Measure	0.57	0.44	0.45	0.52	0.44	0.47	0.46	0.84	0.42	1.00							
Algebra	0.66	0.52	0.52	0.60	0.50	0.51	0.54	0.86	0.38	0.66	1.00						
Base Ten	0.57	0.45	0.45	0.51	0.44	0.45	0.48	0.79	0.36	0.58	0.67	1.00					
Fraction	0.62	0.49	0.50	0.56	0.47	0.51	0.51	0.92	0.42	0.70	0.71	0.64	1.00				
Science Total	0.77	0.62	0.62	0.71	0.57	0.59	0.62	0.74	0.37	0.62	0.68	0.58	0.66	1.00			
LifeSci	0.72	0.59	0.58	0.66	0.53	0.55	0.58	0.67	0.34	0.56	0.63	0.55	0.60	0.88	1.00		
PhysSci	0.69	0.56	0.55	0.64	0.51	0.52	0.56	0.66	0.34	0.57	0.60	0.51	0.59	0.91	0.71	1.00	
EarthSci	0.66	0.52	0.53	0.61	0.49	0.51	0.53	0.64	0.33	0.54	0.58	0.49	0.58	0.88	0.68	0.70	1.00

Table D3. Grade 5 PAWS Total Test and Subscale Correlations

	Reading Total	LitKey	LitCrft	InfKey	InfCrft	Integ Knowl	Language	Math Total	Geometry	Measure	Algebra	Base Ten	Fraction
Reading Total	1.00												
LitKey	0.85	1.00											
LitCrft	0.74	0.60	1.00										
InfKey	0.88	0.66	0.57	1.00									
InfCrft	0.82	0.61	0.56	0.67	1.00								
IntegKnowl	0.72	0.54	0.45	0.57	0.52	1.00							
Language	0.84	0.65	0.59	0.67	0.63	0.52	1.00						
Math Total	0.71	0.56	0.48	0.65	0.61	0.53	0.57	1.00					
Geometry	0.50	0.39	0.34	0.47	0.44	0.37	0.40	0.70	1.00				
Measure	0.61	0.48	0.43	0.57	0.54	0.45	0.49	0.87	0.55	1.00			
Algebra	0.60	0.49	0.42	0.54	0.51	0.44	0.50	0.77	0.48	0.61	1.00		
Base Ten	0.64	0.51	0.44	0.59	0.56	0.49	0.52	0.90	0.56	0.71	0.67	1.00	
Fraction	0.63	0.50	0.42	0.59	0.54	0.49	0.50	0.93	0.58	0.74	0.66	0.76	1.00

Table D4. Grade 6 PAWS Total Test and Subscale Correlations

	Reading Total	LitKey	LitCrft	InfKey	InfCrft	Integ Knowl	Language	Math Total	Geometry	Measure	Algebra	Base Ten	Fraction
Reading Total	1.00												
LitKey	0.86	1.00											
LitCrft	0.80	0.64	1.00										
InfKey	0.88	0.68	0.65	1.00									
InfCrft	0.79	0.60	0.58	0.64	1.00								
IntegKnowl	0.80	0.61	0.58	0.65	0.57	1.00							
Language	0.83	0.64	0.61	0.67	0.60	0.60	1.00						
Math Total	0.75	0.60	0.59	0.68	0.58	0.61	0.63	1.00					
Geometry	0.52	0.41	0.41	0.48	0.41	0.43	0.45	0.75	1.00				
Measure	0.66	0.54	0.52	0.59	0.53	0.53	0.56	0.83	0.56	1.00			
Algebra	0.64	0.51	0.51	0.59	0.49	0.53	0.53	0.88	0.59	0.67	1.00		
Base Ten	0.69	0.55	0.54	0.62	0.54	0.57	0.58	0.93	0.65	0.71	0.76	1.00	
Fraction	0.61	0.50	0.48	0.55	0.48	0.50	0.51	0.78	0.54	0.62	0.61	0.65	1.00

Table D5. Grade 7 PAWS Total Test and Subscale Correlations

	Reading Total	LitKey	LitCrft	InfKey	InfCrft	Integ Knowl	Language	Math Total	Geometry	Measure	Algebra	Base Ten	Fraction
Reading Total	1.00												
LitKey	0.80	1.00											
LitCrft	0.79	0.61	1.00										
InfKey	0.90	0.64	0.65	1.00									
InfCrft	0.80	0.57	0.57	0.65	1.00								
IntegKnowl	0.74	0.50	0.52	0.60	0.54	1.00							
Language	0.82	0.57	0.59	0.67	0.61	0.55	1.00						
Math Total	0.73	0.53	0.56	0.66	0.59	0.58	0.63	1.00					
Geometry	0.49	0.35	0.37	0.44	0.40	0.39	0.44	0.73	1.00				
Measure	0.66	0.48	0.49	0.59	0.53	0.52	0.56	0.89	0.57	1.00			
Algebra	0.62	0.46	0.49	0.55	0.50	0.49	0.53	0.84	0.54	0.70	1.00		
Base Ten	0.65	0.48	0.49	0.58	0.52	0.51	0.55	0.91	0.59	0.75	0.71	1.00	
Fraction	0.64	0.47	0.49	0.58	0.52	0.51	0.55	0.80	0.52	0.66	0.61	0.65	1.00

Table D6. Grade 8 PAWS Total Test and Subscale Correlations

	Reading Total	LitKey	LitCrft	InfKey	InfCrft	Integ Knowl	Language	Math Total	Geometry	Measure	Algebra	Base Ten	Fraction	Science Total	LifeSci	PhysSci	EarthSci
Reading Total	1.00																
LitKey	0.83	1.00															
LitCrft	0.78	0.61	1.00														
InfKey	0.86	0.63	0.59	1.00													
InfCrft	0.85	0.63	0.60	0.66	1.00												
IntegKnowl	0.75	0.56	0.50	0.59	0.59	1.00											
Language	0.84	0.63	0.58	0.64	0.67	0.57	1.00										
Math Total	0.71	0.56	0.52	0.64	0.61	0.53	0.59	1.00									
Geometry	0.58	0.46	0.43	0.52	0.49	0.44	0.48	0.85	1.00								
Measure	0.63	0.50	0.47	0.57	0.54	0.48	0.52	0.88	0.66	1.00							
Algebra	0.49	0.39	0.37	0.46	0.42	0.38	0.40	0.74	0.57	0.59	1.00						
Base Ten	0.65	0.52	0.48	0.58	0.56	0.49	0.54	0.93	0.70	0.77	0.64	1.00					
Fraction	0.58	0.47	0.43	0.51	0.49	0.42	0.49	0.67	0.49	0.55	0.42	0.57	1.00				
Science Total	0.77	0.62	0.60	0.70	0.66	0.58	0.64	0.78	0.66	0.69	0.56	0.72	0.58	1.00			
LifeSci	0.67	0.53	0.52	0.61	0.57	0.50	0.54	0.69	0.59	0.62	0.50	0.64	0.50	0.89	1.00		
PhysSci	0.69	0.55	0.53	0.64	0.59	0.52	0.56	0.71	0.61	0.63	0.52	0.65	0.53	0.91	0.72	1.00	
EarthSci	0.72	0.58	0.55	0.64	0.61	0.53	0.61	0.69	0.58	0.60	0.49	0.63	0.53	0.89	0.68	0.71	1.00



Appendix E: DIF Results for Field Test 2015 Items<sup>20</sup>

*Reading*

Table E1. Grade 3 Reading DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs. Female</u>		<u>White vs. Asian</u>		<u>White vs. African American</u>		<u>White vs. Hispanic/Latino</u>		<u>White vs. Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	0	0	0	0	0	0	2	1.4	0	0
B-	1	0.7	0	0	0	0	4	2.9	0	0
A	137	97.9	0	0	0	0	92	65.7	0	0
B+	1	0.7	0	0	0	0	0	0	0	0
C+	1	0.7	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	140	100	140	100	42	30.0	140	100
TOTAL	140	100	140	100	140	100	140	100	140	100

Table E2. Grade 4 Reading DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs. Female</u>		<u>White vs. Asian</u>		<u>White vs. African American</u>		<u>White vs. Hispanic/Latino</u>		<u>White vs. Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	1	0.7	0	0	0	0	1	0.7	0	0
B-	4	2.9	0	0	0	0	7	5.1	0	0
A	128	94.1	0	0	0	0	115	84.6	0	0
B+	3	2.2	0	0	0	0	0	0	0	0
C+	0	0	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	136	100	136	100	13	9.6	136	100
TOTAL	136	100	136	100	136	100	136	100	136	100

<sup>20</sup> Not all percentages will sum to a total of 100 due to rounding.

Table E3. Grade 5 Reading DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs. Female</u>		<u>White vs. Asian</u>		<u>White vs. African American</u>		<u>White vs. Hispanic/Latino</u>		<u>White vs. Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	2	1.4	0	0	0	0	0	0	0	0
B-	7	5.1	0	0	0	0	1	0.7	0	0
A	124	89.9	0	0	0	0	54	39.1	0	0
B+	5	3.6	0	0	0	0	0	0	0	0
C+	0	0	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	138	100	138	100	83	60.1	138	100
TOTAL	138	100	138	100	138	100	138	100	138	100

Table E4. Grade 6 Reading DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs. Female</u>		<u>White vs. Asian</u>		<u>White vs. African American</u>		<u>White vs. Hispanic/Latino</u>		<u>White vs. Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	0	0	0	0	0	0	0	0	0	0
B-	6	4.3	0	0	0	0	0	0	0	0
A	118	85.5	0	0	0	0	14	10.1	0	0
B+	14	10.1	0	0	0	0	0	0	0	0
C+	0	0	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	138	100	138	100	124	89.9	138	100
TOTAL	138	100	138	100	138	100	138	100	138	100

Table E5. Grade 7 Reading DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs.</u> <u>Female</u>		<u>White vs.</u> <u>Asian</u>		<u>White vs.</u> <u>African American</u>		<u>White vs.</u> <u>Hispanic/Latino</u>		<u>White vs.</u> <u>Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	0	0	0	0	0	0	0	0	0	0
B-	2	1.5	0	0	0	0	0	0	0	0
A	125	91.2	0	0	0	0	31	22.6	0	0
B+	10	7.3	0	0	0	0	0	0	0	0
C+	0	0	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	137	100	137	100	106	77.4	137	100
TOTAL	137	100	137	100	137	100	137	100	137	100

Table E6. Grade 8 Reading DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs.</u> <u>Female</u>		<u>White vs.</u> <u>Asian</u>		<u>White vs.</u> <u>African American</u>		<u>White vs.</u> <u>Hispanic/Latino</u>		<u>White vs.</u> <u>Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	4	2.9	0	0	0	0	0	0	0	0
B-	8	5.7	0	0	0	0	1	0.7	0	0
A	109	77.9	0	0	0	0	13	9.3	0	0
B+	16	11.4	0	0	0	0	0	0	0	0
C+	3	2.1	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	140	100	140	100	126	90.0	140	100
TOTAL	140	100	140	100	140	100	140	100	140	100

Mathematics

Table E7. Grade 3 Mathematics DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs. Female</u>		<u>White vs. Asian</u>		<u>White vs. African American</u>		<u>White vs. Hispanic/Latino</u>		<u>White vs. Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	0	0	0	0	0	0	0	0	0	0
B-	2	1.7	0	0	0	0	5	4.3	0	0
A	112	95.7	0	0	0	0	65	55.6	0	0
B+	2	1.7	0	0	0	0	1	0.9	0	0
C+	1	0.9	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	117	100	117	100	46	39.3	117	100
TOTAL	117	100	117	100	117	100	117	100	117	100

Table E8. Grade 4 Mathematics DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs. Female</u>		<u>White vs. Asian</u>		<u>White vs. African American</u>		<u>White vs. Hispanic/Latino</u>		<u>White vs. Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	1	0.9	0	0	0	0	0	0	0	0
B-	6	5.2	0	0	0	0	7	6.0	0	0
A	105	90.5	0	0	0	0	83	71.6	0	0
B+	4	3.4	0	0	0	0	2	1.7	0	0
C+	0	0	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	116	100	116	100	24	20.7	116	100
TOTAL	116	100	116	100	116	100	116	100	116	100

Table E9. Grade 5 Mathematics DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs. Female</u>		<u>White vs. Asian</u>		<u>White vs. African American</u>		<u>White vs. Hispanic/Latino</u>		<u>White vs. Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	1	0.9	0	0	0	0	0	0	0	0
B-	6	5.2	0	0	0	0	1	0.9	0	0
A	103	89.6	0	0	0	0	43	37.4	0	0
B+	5	4.3	0	0	0	0	2	1.7	0	0
C+	0	0	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	115	100	115	100	69	60.0	115	100
TOTAL	115	100	115	100	115	100	115	100	115	100

Table E10. Grade 6 Mathematics DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs. Female</u>		<u>White vs. Asian</u>		<u>White vs. African American</u>		<u>White vs. Hispanic/Latino</u>		<u>White vs. Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	0	0	0	0	0	0	0	0	0	0
B-	6	5.5	0	0	0	0	1	0.9	0	0
A	96	88.1	0	0	0	0	11	10.1	0	0
B+	7	6.4	0	0	0	0	0	0	0	0
C+	0	0	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	109	100	109	100	97	89.0	109	100
TOTAL	109	100	109	100	109	100	109	100	109	100

Table E11. Grade 7 Mathematics DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs.</u>		<u>White vs.</u>		<u>White vs.</u>		<u>White vs.</u>		<u>White vs.</u>	
	<u>Female</u>		<u>Asian</u>		<u>African American</u>		<u>Hispanic/Latino</u>		<u>Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	0	0	0	0	0	0	1	0.8	0	0
B-	10	8.5	0	0	0	0	3	2.5	0	0
A	105	89.0	0	0	0	0	20	16.9	0	0
B+	3	2.5	0	0	0	0	0	0	0	0
C+	0	0	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	118	100	118	100	94	79.7	118	100
TOTAL	118	100	118	100	118	100	118	100	118	100

Table E12. Grade 8 Mathematics DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs.</u>		<u>White vs.</u>		<u>White vs.</u>		<u>White vs.</u>		<u>White vs.</u>	
	<u>Female</u>		<u>Asian</u>		<u>African American</u>		<u>Hispanic/Latino</u>		<u>Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	1	0.8	0	0	0	0	0	0	0	0
B-	5	4.2	0	0	0	0	0	0	0	0
A	107	90.7	0	0	0	0	10	8.5	0	0
B+	5	4.2	0	0	0	0	1	0.8	0	0
C+	0	0	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	118	100	118	100	107	90.7	118	100
TOTAL	118	100	118	100	118	100	118	100	118	100

*Science*

Table E13. Grade 4 Science DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs. Female</u>		<u>White vs. Asian</u>		<u>White vs. African American</u>		<u>White vs. Hispanic/Latino</u>		<u>White vs. Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	0	0	0	0	0	0	1	0.8	0	0
B-	9	7.5	0	0	0	0	1	0.8	0	0
A	108	90.0	0	0	0	0	94	78.3	0	0
B+	3	2.5	0	0	0	0	0	0	0	0
C+	0	0	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	120	100	120	100	24	20.0	120	100
TOTAL	120	100	120	100	120	100	120	100	120	100

Table E14. Grade 8 Science DIF Summary Statistics for Embedded Field Test Items

DIF Category	<u>Male vs. Female</u>		<u>White vs. Asian</u>		<u>White vs. African American</u>		<u>White vs. Hispanic/Latino</u>		<u>White vs. Native American</u>	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
C-	0	0	0	0	0	0	0	0	0	0
B-	10	8.4	0	0	0	0	0	0	0	0
A	105	88.2	0	0	0	0	23	19.3	0	0
B+	4	3.4	0	0	0	0	1	0.8	0	0
C+	0	0	0	0	0	0	0	0	0	0
SMALL <i>N</i>	0	0	119	100	119	100	95	79.8	119	100
TOTAL	119	100	119	100	119	100	119	100	119	100

## Appendix F: Classical Item Statistics for 2015 Field Test Items

### Reading

Table F1. Reading Grade 3 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VF821781	778	0.77	0.52
	VF821789	778	0.20	0.07
	VF821793	778	0.76	0.25
	VF821783	778	0.82	0.43
	VF821758	778	0.54	0.17
	VF821776	778	0.82	0.39
	VH121729	778	0.78	0.54
	VH121731	778	0.81	0.53
	VH121738	778	0.91	0.45
	VH121740	778	0.67	0.56
	VH121744	778	0.57	0.41
	VH121727	778	0.87	0.43
	VH153039	778	0.75	0.46
	VH152965	778	0.57	0.39
2	VF821778	757	0.77	0.34
	VF821797	757	0.59	0.35
	VF821791	757	0.78	0.31
	VF821802	757	0.46	0.34
	VF821787	757	0.88	0.42
	VF821765	757	0.93	0.47
	VH121733	757	0.81	0.39
	VH121742	757	0.84	0.52
	VH121735	757	0.75	0.46
	VH121737	757	0.49	0.22
	VH121743	757	0.90	0.42
	VH121741	757	0.69	0.54
	VH152985	757	0.72	0.48
	VH152980	757	0.78	0.43
3	VH121707	750	0.87	0.40
	VH121705	750	0.21	0.15
	VH121710	750	0.82	0.53
	VH121709	750	0.88	0.42
	VH121721	750	0.88	0.50
	VH121716	750	0.71	0.49
	VH151330	750	0.73	0.39
	VH151332	750	0.59	0.40
	VH151365	750	0.45	0.34
	VH151363	750	0.39	0.30
	VH151336	750	0.53	0.28
	VH151322	750	0.68	0.38
	VH153000	750	0.62	0.40
	VH153045	750	0.18	0.07



Form	Accession Number	N	Average Item Score	Point Biserial Corr.
4	VH121704	752	0.96	0.35
	VH121703	752	0.87	0.42
	VH121712	752	0.67	0.37
	VH121713	752	0.89	0.44
	VH121717	752	0.68	0.35
	VH121719	752	0.41	0.23
	VH151327	752	0.60	0.34
	VH151358	752	0.61	0.42
	VH151362	752	0.79	0.47
	VH151335	752	0.69	0.40
	VH151355	752	0.79	0.50
	VH151356	752	0.57	0.34
	VH152941	752	0.88	0.43
	VH153032	752	0.73	0.41
5	VH134284	753	0.86	0.44
	VH134285	753	0.69	0.35
	VH134302	753	0.59	0.42
	VH134309	753	0.39	0.23
	VH134325	753	0.68	0.54
	VH134321	753	0.57	0.27
	VH142471	753	0.39	0.39
	VH142478	753	0.59	0.35
	VH142531	753	0.67	0.35
	VH142491	753	0.33	0.24
	VH142488	753	0.43	0.35
	VH142507	753	0.84	0.44
	VH153016	753	0.54	0.37
	VH152988	753	0.77	0.51
6	VH134273	746	0.74	0.50
	VH134279	746	0.69	0.37
	VH134297	746	0.86	0.52
	VH134305	746	0.83	0.26
	VH134331	746	0.88	0.47
	VH134336	746	0.80	0.53
	VH142503	746	0.54	0.39
	VH142496	746	0.63	0.46
	VH142484	746	0.68	0.48
	VH142522	746	0.37	0.12
	VH142509	746	0.34	0.31
	VH142536	746	0.31	0.24
	VH152948	746	0.55	0.34
	VH152969	746	0.43	0.29

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
7	VH151154	746	0.66	0.32
	VH151174	746	0.55	0.23
	VH151199	746	0.65	0.10
	VH151197	746	0.69	0.44
	VH151201	746	0.54	0.35
	VH151205	746	0.45	0.27
	VH125894	746	0.76	0.43
	VH125863	746	0.28	0.19
	VH125902	746	0.30	0.24
	VH125877	746	0.40	0.11
	VH125816	746	0.89	0.37
	VH125828	746	0.86	0.51
	VH153005	746	0.90	0.51
	VH152959	746	0.73	0.20
8	VH151173	748	0.80	0.47
	VH151178	748	0.39	0.27
	VH151194	748	0.70	0.45
	VH151186	748	0.76	0.50
	VH151203	748	0.60	0.38
	VH151207	748	0.32	0.11
	VH125854	748	0.90	0.36
	VH125883	748	0.43	0.31
	VH125928	748	0.70	0.46
	VH125923	748	0.13	-0.01
	VH125836	748	0.89	0.52
	VH125918	748	0.84	0.57
	VH153024	748	0.72	0.56
	VH152936	748	0.43	0.31
9	VH145130	751	0.61	0.29
	VH145142	751	0.81	0.46
	VH145154	751	0.34	0.37
	VH145170	751	0.29	0.11
	VH145173	751	0.61	0.38
	VH145174	751	0.41	0.33
	VH143162	751	0.83	0.36
	VH143131	751	0.76	0.30
	VH143274	751	0.70	0.32
	VH143252	751	0.60	0.42
	VH143057	751	0.87	0.43
	VH143006	751	0.74	0.51
	VH152953	751	0.68	0.42
	VH153042	751	0.82	0.45

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
10	VH145145	757	0.61	0.44
	VH145151	757	0.69	0.39
	VH145167	757	0.64	0.46
	VH145162	757	0.67	0.45
	VH145177	757	0.49	0.31
	VH145179	757	0.56	0.42
	VH143172	757	0.58	0.43
	VH143092	757	0.61	0.17
	VH143254	757	0.23	0.20
	VH143261	757	0.52	0.03
	VH143181	757	0.46	0.12
	VH143197	757	0.52	0.27
	VH153021	757	0.79	0.32
	VH152992	757	0.70	0.39

Table F2. Reading Grade 4 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VH129443	782	0.74	0.26
	VH129412	782	0.66	0.34
	VH129493	782	0.82	0.46
	VH129508	782	0.67	0.48
	VH129521	782	0.80	0.36
	VH129530	782	0.37	0.29
	VH144891	782	0.86	0.44
	VH144916	782	0.53	0.36
	VH145039	782	0.54	0.38
	VH144881	782	0.83	0.52
	VH145036	782	0.45	0.30
	VH144851	782	0.35	0.20
	VH151660	782	0.64	0.37
	VH151945	782	0.63	0.37
2	VH129434	734	0.87	0.38
	VH129450	734	0.86	0.47
	VH129505	734	0.78	0.32
	VH129483	734	0.65	0.39
	VH129517	734	0.80	0.47
	VH129527	734	0.80	0.43
	VH145033	734	0.66	0.33
	VH145009	734	0.61	0.36
	VH145045	734	0.68	0.49
	VH145086	734	0.42	0.35
	VH144895	734	0.56	0.17
	VH144867	734	0.80	0.45
	VH151975	734	0.49	0.44
	VH152005	734	0.74	0.33
3	VH142665	734	0.64	0.31
	VH142671	734	0.80	0.51
	VH142741	734	0.47	0.32
	VH142716	734	0.66	0.40
	VH142761	734	0.69	0.19
	VH142748	734	0.45	0.26
	VF798658	734	0.75	0.40
	VF798598	734	0.71	0.42
	VF798607	734	0.86	0.52
	VF798738	734	0.24	0.15
	VF798587	734	0.85	0.46
	VF798540	734	0.68	0.36
	VH151958	734	0.81	0.44
	VH152000	734	0.72	0.44

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
4	VH142678	731	0.53	0.44
	VH142659	731	0.78	0.37
	VH142705	731	0.23	0.03
	VH142732	731	0.80	0.43
	VH142765	731	0.71	0.37
	VH142756	731	0.62	0.32
	VF798644	731	0.86	0.46
	VF798662	731	0.74	0.32
	VF798614	731	0.78	0.50
	VF798617	731	0.49	0.22
	VF798577	731	0.78	0.42
	VF798593	731	0.82	0.45
	VH151994	731	0.66	0.38
	VH152021	731	0.76	0.51
5	VH150614**	731	0.64	0.31
	VH150639	731	0.82	0.39
	VH150624	731	0.85	0.38
	VH150612	731	0.71	0.30
	VH150637	731	0.86	0.45
	VH150605	731	0.82	0.44
	VH150491	731	0.89	0.44
	VH150501	731	0.57	0.48
	VH150488	731	0.58	0.44
	VH150486	731	0.46	0.31
	VH150500	731	0.82	0.56
	VH150498	731	0.46	0.27
	VH151981	731	0.70	0.41
	VH152009	731	0.89	0.50
6	VH150643	722	0.88	0.46
	VH150628	722	0.70	0.33
	VH150617	722	0.75	0.45
	VH150646	722	0.67	0.31
	VH150620	722	0.54	0.36
	VH150592	722	0.73	0.37
	VH150493	722	0.54	0.47
	VH150483	722	0.84	0.51
	VH150482	722	0.71	0.31
	VH150492	722	0.85	0.52
	VH150489	722	0.68	0.50
	VH150496	722	0.84	0.47
	VH152012	722	0.86	0.55
	VH152031	722	0.50	0.26

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
7	VH145604	1426	0.48	0.24
	VH136570	714	0.34	0.10
	VH136551	714	0.79	0.43
	VH136564	714	0.46	0.18
	VH136573	714	0.41	0.32
	VH136557	714	0.68	0.35
	VH136512	714	0.55	0.23
	VH145672	714	0.61	0.27
	VH145677	714	0.40	0.29
	VH145653	714	0.51	0.31
	VH145684	714	0.31	0.24
	VH145595	714	0.65	0.43
	VH152029	714	0.64	0.41
	VH152060	714	0.83	0.43
8	VH136538*	712	0.39	0.02
	VH136543	712	0.76	0.45
	VH136554	712	0.47	0.41
	VH136567	712	0.39	0.27
	VH136548	712	0.23	0.04
	VH136533	712	0.69	0.39
	VH145643	712	0.29	0.16
	VH145638	712	0.70	0.44
	VH145660	712	0.57	0.28
	VH145702	712	0.51	0.27
	VH145604	1426	0.48	0.24
	VH145629	712	0.75	0.46
	VH152039	712	0.32	0.17
	VH152046	712	0.88	0.50
9	VF864063	1455	0.40	0.08
	VH134078	722	0.93	0.38
	VH134103	722	0.89	0.44
	VH134141	722	0.71	0.32
	VH134113	722	0.73	0.47
	VH134109	722	0.75	0.56
	VH134083	722	0.60	0.28
	VF864054	722	0.51	0.37
	VF864073	722	0.83	0.52
	VF864102	722	0.60	0.31
	VF864105	722	0.69	0.34
	VF864007	722	0.72	0.42
	VH152048	722	0.57	0.32
	VH152049	722	0.88	0.53

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
10	VH134090	733	0.79	0.39
	VH134148	733	0.84	0.35
	VH134131	733	0.68	0.25
	VH134133	733	0.84	0.52
	VH134126	733	0.68	0.39
	VH134105	733	0.65	0.29
	VF864063	1455	0.40	0.08
	VF864119	733	0.28	0.03
	VF864086	733	0.84	0.48
	VF864068	733	0.66	0.47
	VF864109	733	0.58	0.29
	VF863980	733	0.85	0.46
	VH152025	733	0.55	0.44
	VH152058	733	0.28	0.13

Table F3. Reading Grade 5 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VF821994	734	0.70	0.39
	VF822015	734	0.69	0.41
	VF822000	734	0.54	0.34
	VF821961	734	0.73	0.29
	VF822020	734	0.85	0.36
	VF821971	734	0.73	0.31
	VH144162	734	0.38	0.32
	VH144153	734	0.83	0.46
	VH144227	734	0.54	0.44
	VH144245	734	0.36	0.16
	VH144315*	734	0.34	-0.11
	VH144430	734	0.32	0.25
	VH150246	734	0.51	0.29
	VH150273	734	0.41	0.08
2	VF821985	674	0.82	0.40
	VF822011	674	0.69	0.27
	VF822002	674	0.74	0.43
	VF822027	674	0.54	0.24
	VF821981	674	0.94	0.33
	VF821975	674	0.93	0.45
	VH144174	674	0.70	0.30
	VH144181	674	0.45	0.36
	VH144200	674	0.48	0.30
	VH144195	674	0.79	0.42
	VH144278	674	0.44	0.33
	VH144283	674	0.72	0.50
	VH150370	674	0.62	0.28
	VH150300	674	0.65	0.35
3	VH125681	674	0.85	0.47
	VH125715	674	0.53	0.42
	VH125708	674	0.66	0.41
	VH125686	674	0.49	0.20
	VH125709	674	0.69	0.31
	VH125694	674	0.31	0.18
	VH144479	674	0.39	0.04
	VH144474	674	0.69	0.46
	VH144514	674	0.27	0.14
	VH144509	674	0.64	0.29
	VH144571	674	0.63	0.34
	VH144594	674	0.62	0.23
	VH150289	674	0.91	0.38
	VH150408	674	0.68	0.42



Form	Accession Number	N	Average Item Score	Point Biserial Corr.
4	VH125712	681	0.20	-0.12
	VH125680	681	0.64	0.35
	VH125690	681	0.60	0.27
	VH125707	681	0.60	0.25
	VH125717	681	0.50	0.26
	VH125674	681	0.53	0.27
	VH144472	681	0.86	0.21
	VH144483	681	0.73	0.37
	VH144562	681	0.42	0.12
	VH144512	681	0.82	0.50
	VH144575	681	0.72	0.55
	VH144593	681	0.88	0.52
	VH150269	681	0.60	0.34
	VH150326	681	0.87	0.50
5	VH151526	1366	0.65	0.51
	VH143307	688	0.67	0.39
	VH143337	688	0.60	0.42
	VH143304	688	0.53	0.38
	VH143324	688	0.31	0.15
	VH143321	688	0.80	0.37
	VH143288	688	0.57	0.15
	VH151456	688	0.73	0.44
	VH151432	688	0.70	0.20
	VH151476	688	0.67	0.40
	VH151464	688	0.56	0.27
	VH151542	688	0.27	0.12
	VH150307	688	0.56	0.49
	VH150405	688	0.82	0.52
6	VH143299	678	0.49	0.30
	VH143328	678	0.50	0.31
	VH143339	678	0.27	0.15
	VH143318	678	0.87	0.39
	VH143332	678	0.39	0.21
	VH143331	678	0.80	0.42
	VH151444	678	0.84	0.44
	VH151453	678	0.84	0.37
	VH151465	678	0.72	0.38
	VH151482	678	0.84	0.53
	VH151538	678	0.64	0.37
	VH151526	1366	0.65	0.51
	VH150398	678	0.42	0.36
	VH150284	678	0.55	0.43

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
7	VH136617	691	0.47	0.34
	VH136631	691	0.81	0.42
	VH136637	691	0.74	0.37
	VH136630	691	0.54	0.12
	VH136636	691	0.49	0.13
	VH136607	691	0.88	0.37
	VH136905	691	0.75	0.36
	VH136913	691	0.18	0.14
	VH136903	691	0.84	0.32
	VH136918	691	0.68	0.16
	VH136916	691	0.73	0.33
	VH136747	691	0.58	0.24
	VH150319	691	0.88	0.40
	VH150240	691	0.66	0.37
8	VH136635	692	0.32	0.02
	VH136634	692	0.65	0.44
	VH136633	692	0.68	0.43
	VH136626	692	0.55	0.19
	VH136623	692	0.69	0.37
	VH136614	692	0.47	0.34
	VH136922	692	0.31	0.17
	VH136896	692	0.50	0.36
	VH136909	692	0.70	0.31
	VH136899	692	0.77	0.16
	VH136892	692	0.48	0.23
	VH136882	692	0.80	0.39
	VH150341	692	0.90	0.50
	VH150317	692	0.89	0.42
9	VH134412	687	0.58	0.31
	VH134512	687	0.83	0.44
	VH134567	687	0.40	0.27
	VH134427	687	0.42	0.33
	VH134407	687	0.62	0.23
	VH134544	687	0.51	0.49
	VH151873	687	0.48	0.30
	VH151849	687	0.55	0.33
	VH151835	687	0.58	0.13
	VH151852	687	0.53	0.23
	VH151866	687	0.50	0.26
	VH151834	687	0.59	0.19
	VH150312	687	0.70	0.51
	VH150336	687	0.89	0.40

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
10	VH134574	695	0.38	0.26
	VH134422	695	0.76	0.53
	VH134526	695	0.38	0.30
	VH134539	695	0.16	-0.02
	VH134521	695	0.78	0.31
	VH134580	695	0.66	0.38
	VH151858	695	0.76	0.42
	VH151830	695	0.57	0.20
	VH151851	695	0.73	0.44
	VH151862	695	0.60	0.38
	VH151871	695	0.61	0.41
	VH151825	695	0.60	0.40
	VH150267	695	0.56	0.30
	VH150331	695	0.76	0.48

Table F4. Reading Grade 6 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VH153061	817	0.26	0.18
	VH153072	817	0.53	0.30
	VH153091	817	0.49	0.27
	VH153161	817	0.41	0.25
	VH153196	817	0.67	0.44
	VH153197	817	0.54	0.34
	VH134919	817	0.49	0.22
	VH134916	817	0.42	0.24
	VH135694	817	0.51	0.27
	VH134922	817	0.43	0.25
	VH134946	817	0.44	0.04
	VH134909	817	0.52	0.35
	VH152257	817	0.48	0.40
	VH152269	817	0.58	0.32
	2	VH153064	693	0.55
VH153068		693	0.55	0.35
VH153076		693	0.55	0.23
VH153081		693	0.51	0.39
VH153209		693	0.82	0.45
VH153204		693	0.50	0.22
VH134939		693	0.52	0.32
VH134930		693	0.33	0.26
VH134974		693	0.87	0.47
VH134959		693	0.57	0.45
VH134918		693	0.68	0.43
VH134913		693	0.63	0.49
VH152272		693	0.55	0.40
VH152280		693	0.63	0.43
3		VH134786	704	0.83
	VH134805	704	0.50	0.20
	VH134870	704	0.57	0.43
	VH134823	704	0.74	0.48
	VH134799	704	0.50	0.26
	VH134867	704	0.52	0.16
	VH143947	704	0.63	0.36
	VH144101	704	0.26	-0.01
	VH143977	704	0.58	0.25
	VH144131	704	0.44	0.36
	VH143983	704	0.29	-0.11
	VH143937	704	0.27	0.03
	VH152247	704	0.76	0.35
	VH152250	704	0.64	0.29

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
4	VH134875	704	0.41	0.36
	VH134792	704	0.60	0.32
	VH134830	704	0.73	0.27
	VH134845	704	0.63	0.32
	VH134796	704	0.62	0.26
	VH134859	704	0.58	0.34
	VH143969	704	0.45	0.28
	VH144124	704	0.45	0.33
	VH143964	704	0.40	0.36
	VH143967	704	0.47	0.33
	VH143972	704	0.49	0.33
	VH143933	704	0.54	0.33
	VH152277	704	0.55	0.37
	VH152275	704	0.68	0.31
5	VH147125	702	0.54	0.29
	VH147121	702	0.50	0.34
	VH147089	702	0.65	0.27
	VH147081	702	0.56	0.30
	VH147167	702	0.70	0.39
	VH147003	702	0.62	0.36
	VF806592	702	0.64	0.52
	VF806593	702	0.50	0.43
	VF806590	702	0.63	0.52
	VF806597	702	0.48	0.35
	VF806596	702	0.48	0.38
	VF806601	702	0.57	0.36
	VH152255	702	0.79	0.48
	VH152285	702	0.56	0.44
6	VH147023	688	0.56	0.32
	VH147109	688	0.23	0.09
	VH147072	688	0.79	0.40
	VH147102	688	0.86	0.44
	VH147084	688	0.76	0.46
	VH146991	688	0.56	0.37
	VF806599	688	0.77	0.53
	VF806610	688	0.76	0.51
	VF806591	688	0.66	0.55
	VF806608	688	0.48	0.36
	VF806588	688	0.62	0.29
	VF806587	688	0.58	0.29
	VH152260	688	0.78	0.39
	VH152233*	688	0.31	0.16

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
7	VF814575*	683	0.63	0.13
	VF814592	683	0.77	0.25
	VF814585	683	0.57	0.24
	VF814581	683	0.51	0.33
	VF814528	683	0.62	0.29
	VF814488	683	0.85	0.50
	VH151414	683	0.62	0.48
	VH151376	683	0.61	0.32
	VH151420	683	0.67	0.63
	VH151381	683	0.44	0.14
	VH151416	683	0.86	0.43
	VH151405	683	0.53	0.20
	VH152237	683	0.52	0.34
	VH152239	683	0.83	0.51
8	VF814607	699	0.65	0.43
	VF814588	699	0.73	0.24
	VF814593	699	0.52	0.15
	VF814614	699	0.63	0.47
	VF814463	699	0.65	0.33
	VF814599	699	0.64	0.33
	VH151401	699	0.71	0.37
	VH151373	699	0.60	0.34
	VH151417	699	0.56	0.34
	VH151386	699	0.59	0.44
	VH151418	699	0.43	0.09
	VH151408	699	0.62	0.37
	VH152264	699	0.67	0.25
	VH152234	699	0.37	0.22
9	VH129551	703	0.78	0.41
	VH129577	703	0.72	0.38
	VH129569	703	0.86	0.50
	VH129565	703	0.55	0.48
	VH129579	703	0.56	0.41
	VH129572	703	0.82	0.45
	VF883355	703	0.38	0.19
	VF883366	703	0.75	0.35
	VF883362	703	0.73	0.35
	VF883370	703	0.59	0.47
	VF883369	703	0.32	0.07
	VF883343	703	0.42	0.16
	VH152244	703	0.50	0.36
	VH152232	703	0.46	0.38

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
10	VH129554	710	0.58	0.28
	VH129574	710	0.77	0.22
	VH129567	710	0.80	0.35
	VH129555	710	0.70	0.45
	VH129558	710	0.57	0.36
	VH129543	710	0.94	0.19
	VF883349	710	0.74	0.31
	VF883373	710	0.58	0.40
	VF883358	710	0.87	0.35
	VF883375	710	0.39	0.16
	VF883368	710	0.66	0.25
	VF883346	710	0.50	0.22
	VH152242	710	0.89	0.45
	VH152228	710	0.87	0.36

Table F5. Reading Grade 7 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VH134620	795	0.72	0.36
	VH134634	795	0.66	0.45
	VH134610	795	0.38	0.28
	VH134643	795	0.21	0.01
	VH134592	795	0.71	0.44
	VH134632	795	0.71	0.44
	VH145764	795	0.68	0.47
	VH145732	795	0.26	0.37
	VH145788	795	0.48	0.14
	VH145792	795	0.56	0.24
	VH145798	795	0.48	0.19
	VH145805	795	0.48	0.31
	VH150781	795	0.59	0.45
	VH150789	795	0.61	0.43
2	VH134606	658	0.45	0.23
	VH134608	658	0.36	0.07
	VH134648	658	0.74	0.51
	VH134636	658	0.45	0.23
	VH134640	658	0.46	0.31
	VH134625	658	0.78	0.28
	VH145751	658	0.48	0.18
	VH145744	658	0.64	0.27
	VH145783	658	0.49	0.08
	VH145785	658	0.66	0.38
	VH145801	658	0.67	0.45
	VH145795	658	0.34	0.09
	VH150720	658	0.70	0.37
	VH150832	658	0.50	0.34
3	VF864440	659	0.78	0.31
	VF864366	659	0.88	0.43
	VF864340	659	0.63	0.29
	VF864403	659	0.69	0.51
	VF864377	659	0.75	0.43
	VF864311	659	0.90	0.36
	VH145458	659	0.54	0.33
	VH145413	659	0.28	-0.02
	VH145478	659	0.71	0.44
	VH145473	659	0.61	0.38
	VH145530	659	0.52	0.41
	VH145535	659	0.68	0.27
	VH150659	659	0.80	0.51
	VH150695	659	0.35	0.17



Form	Accession Number	N	Average Item Score	Point Biserial Corr.
4	VF864412	672	0.49	0.25
	VF864437	672	0.88	0.37
	VF864425	672	0.76	0.50
	VF864363	672	0.67	0.26
	VF864443	672	0.74	0.45
	VF864304	672	0.89	0.35
	VH145438	672	0.27	0.08
	VH145444	672	0.57	0.29
	VH145485	672	0.48	0.43
	VH145489	672	0.53	0.24
	VH145507	672	0.77	0.45
	VH145500	672	0.53	0.16
	VH150806	672	0.54	0.34
	VH150834	672	0.38	0.14
5	VF820216	671	0.94	0.37
	VF820269	671	0.86	0.39
	VF820301	671	0.78	0.50
	VF820251	671	0.62	0.31
	VF820315	671	0.64	0.41
	VF820071	671	0.25	0.23
	VH143751	671	0.68	0.29
	VH143733	671	0.38	0.32
	VH143746	671	0.40	0.22
	VH143741	671	0.83	0.36
	VH143646	671	0.50	0.40
	VH143655	671	0.51	0.19
	VH150809	671	0.90	0.45
	VH150842	671	0.76	0.44
6	VF820282	639	0.51	0.24
	VF820333	639	0.57	0.32
	VF820224	639	0.71	0.19
	VF820260	639	0.46	0.40
	VF820210	639	0.63	0.37
	VF820351	639	0.53	0.35
	VH143754	639	0.52	0.23
	VH143660	639	0.75	0.42
	VH143663	639	0.41	0.31
	VH143760	639	0.85	0.41
	VH143648	639	0.62	0.43
	VH143599	639	0.87	0.33
	VH150820	639	0.64	0.41
	VH150844	639	0.86	0.36

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
7	VH134705	682	0.36	0.06
	VH134721	682	0.75	0.31
	VH134716	682	0.31	0.16
	VH134710	682	0.63	0.35
	VH134693	682	0.76	0.40
	VH134667	682	0.59	0.34
	VH152519	682	0.47	0.26
	VH152557	682	0.71	0.42
	VH152489	682	0.65	0.39
	VH152528	682	0.71	0.32
	VH152483	682	0.63	0.30
	VH152550	682	0.58	0.37
	VH150841	682	0.66	0.50
	VH150845	682	0.83	0.39
8	VH150837	1320	0.46	0.05
	VH150792	1324	0.83	0.43
	VH134700	654	0.92	0.42
	VH134664	654	0.55	0.42
	VH134676	654	0.81	0.41
	VH134720	654	0.53	0.35
	VH134715	654	0.69	0.25
	VH134718	654	0.86	0.43
	VH152532	654	0.33	0.10
	VH152510	654	0.57	0.24
	VH152524	654	0.59	0.32
	VH152542	654	0.58	0.42
	VH152462	654	0.83	0.33
	VH152535	654	0.50	0.28
9	VH150839	1336	0.54	0.27
	VH151023	670	0.34	0.25
	VH151026	670	0.40	0.29
	VH151036	670	0.61	0.31
	VH151014	670	0.55	0.47
	VH150992	670	0.21	0.15
	VH150970	670	0.85	0.44
	VH145334	670	0.73	0.33
	VH145365	670	0.54	0.40
	VH145322	670	0.59	0.20
	VH145305	670	0.73	0.38
	VH145288	670	0.55	0.19
	VH145344	670	0.59	0.41
	VH150792	1324	0.83	0.43

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
10	VH151038	666	0.66	0.27
	VH151034	666	0.35	0.31
	VH151031	666	0.80	0.35
	VH150987	666	0.45	0.33
	VH151028	666	0.68	0.25
	VH150980	666	0.58	0.27
	VH145328	666	0.38	0.40
	VH145347	666	0.60	0.30
	VH145309	666	0.58	0.36
	VH145359	666	0.58	0.40
	VH145320	666	0.88	0.43
	VH145352	666	0.78	0.39
	VH150837	1320	0.46	0.05
	VH150839	1336	0.54	0.27

Table F6. Reading Grade 8 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VH146556	745	0.63	0.44
	VH146544	745	0.39	0.33
	VH146563	745	0.12	-0.04
	VH146564	745	0.41	0.28
	VH146586	745	0.44	0.39
	VH146582	745	0.60	0.50
	VH152383	745	0.34	0.12
	VH152400	745	0.68	0.31
	VH152391	745	0.73	0.57
	VH152370	745	0.34	0.24
	VH152415	745	0.61	0.25
	VH152422	745	0.75	0.49
	VH151091	745	0.56	0.27
	VH151050	745	0.54	0.22
2	VH146553	669	0.66	0.17
	VH146548	669	0.59	0.37
	VH146567	669	0.58	0.47
	VH146571	669	0.61	0.37
	VH146591	669	0.39	0.04
	VH146577	669	0.32	0.12
	VH152367	669	0.56	0.44
	VH152406	669	0.37	0.07
	VH152394	669	0.49	0.35
	VH152362	669	0.80	0.49
	VH152434	669	0.71	0.44
	VH152351	669	0.38	0.23
	VH151048	669	0.86	0.45
	VH151054	669	0.78	0.43
3	VF820698	675	0.69	0.46
	VF820719	675	0.47	0.28
	VF820722	675	0.35	0.15
	VF820762	675	0.53	0.27
	VF820799	675	0.70	0.39
	VF820820	675	0.70	0.41
	VH130185	675	0.48	0.25
	VH130117	675	0.79	0.32
	VH130206	675	0.84	0.49
	VH130197	675	0.41	0.13
	VH130176	675	0.28	0.00
	VH130211	675	0.63	0.46
	VH151057	675	0.85	0.40
	VH151083	675	0.87	0.47

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
4	VF820705	678	0.46	0.30
	VF820751	678	0.88	0.53
	VF820713	678	0.58	0.24
	VF820728	678	0.83	0.41
	VF820776	678	0.55	0.24
	VF820816	678	0.90	0.50
	VH130133	678	0.79	0.42
	VH130137	678	0.84	0.46
	VH130237	678	0.77	0.49
	VH130248	678	0.46	0.25
	VH130180	678	0.73	0.46
	VH130223	678	0.85	0.48
	VH151059	678	0.50	0.39
	VH151078	678	0.86	0.53
5	VH138062	675	0.48	0.18
	VH138021	675	0.49	0.37
	VH138034	675	0.59	0.26
	VH138016	675	0.80	0.45
	VH138045	675	0.53	0.18
	VH138006	675	0.48	0.30
	VH146485	675	0.64	0.26
	VH146468	675	0.77	0.43
	VH146510	675	0.70	0.30
	VH146522	675	0.63	0.38
	VH146531	675	0.57	0.24
	VH146533	675	0.55	0.32
	VH151092	675	0.31	0.16
	VH151102	675	0.62	0.35
6	VH138025	646	0.79	0.43
	VH138029	646	0.89	0.31
	VH138048	646	0.55	0.32
	VH138067	646	0.30	-0.05
	VH138069	646	0.56	0.19
	VH138055	646	0.78	0.18
	VH146478	646	0.88	0.42
	VH146481	646	0.70	0.44
	VH146514	646	0.73	0.44
	VH146518	646	0.59	0.28
	VH146526	646	0.45	0.15
	VH146528	646	0.66	0.37
	VH151073	646	0.56	0.25
	VH151086	646	0.84	0.49

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
7	VH140471	656	0.34	0.02
	VH140451	656	0.61	0.28
	VH140466	656	0.57	0.16
	VH140473	656	0.65	0.39
	VH140441	656	0.50	0.35
	VH140457	656	0.33	0.12
	VH151610	656	0.71	0.30
	VH151646	656	0.83	0.36
	VH151651	656	0.46	0.23
	VH151631	656	0.76	0.37
	VH151604	656	0.93	0.40
	VH151649	656	0.79	0.34
	VH151112	656	0.26	0.18
	VH151117	656	0.89	0.47
8	VH140455	706	0.76	0.41
	VH140468	706	0.49	0.28
	VH140477	706	0.24	0.11
	VH140453	706	0.48	0.22
	VH140437	706	0.81	0.35
	VH140461	706	0.82	0.37
	VH151648	706	0.79	0.44
	VH151630	706	0.80	0.38
	VH151644	706	0.83	0.47
	VH151639	706	0.48	0.26
	VH151594	706	0.68	0.51
	VH151601	706	0.65	0.38
	VH151089	706	0.64	0.43
	VH151098	706	0.38	0.19
9	VH142369	661	0.44	0.16
	VH142376	661	0.68	0.33
	VH142414	661	0.41	0.20
	VH142420	661	0.72	0.33
	VH142401	661	0.56	0.22
	VH142352	661	0.78	0.22
	VH133897	661	0.74	0.30
	VH133954	661	0.61	0.29
	VH133924	661	0.81	0.28
	VH133887	661	0.68	0.40
	VH133948	661	0.30	0.09
	VH133936	661	0.70	0.35
	VH151104	661	0.80	0.39
	VH151119	661	0.29	0.09

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
10	VH142381	675	0.86	0.36
	VH142392	675	0.81	0.45
	VH142373	675	0.72	0.26
	VH142388	675	0.23	0.04
	VH142432	675	0.47	0.15
	VH142422	675	0.58	0.42
	VH133916	675	0.49	0.20
	VH133893	675	0.59	0.26
	VH133958	675	0.57	0.28
	VH133883	675	0.46	0.20
	VH129586	675	0.78	0.35
	VH133871	675	0.85	0.37
	VH151116	675	0.21	0.00
	VH151121	675	0.36	0.30

*Mathematics*

Table F7. Mathematics Grade 3 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VH095335	808	0.53	0.36
	VH103485	808	0.50	0.50
	VH095567	808	0.67	0.53
	VH103612	808	0.23	0.12
	VH122585	808	0.26	0.20
	VH095522	808	0.63	0.55
	VH098006	808	0.45	0.40
	VH098030*	808	0.23	0.07
	VH095532	808	0.77	0.37
	VH094859	808	0.63	0.45
	VH125344	808	0.55	0.40
	VH094974	808	0.26	0.13
2	VH095385	757	0.20	0.08
	VH095424	757	0.64	0.37
	VH122552	757	0.29	0.09
	VH103626	757	0.46	0.31
	VH103583	757	0.14	0.15
	VH125430	757	0.69	0.39
	VH095256	757	0.34	0.22
	VH103646	757	0.51	0.32
	VH094980	757	0.74	0.48
	VH122544	757	0.58	0.29
	VH103399	757	0.18	0.20
	VH095623	757	0.56	0.49
3	VH094883	753	0.25	0.31
	VH097969	753	0.51	0.25
	VH095365	753	0.48	0.37
	VH095451	753	0.65	0.37
	VH098043	753	0.65	0.26
	VH125333	753	0.91	0.29
	VH095276	753	0.52	0.32
	VH095493	753	0.61	0.45
	VH125380	753	0.70	0.31
	VH103456*	753	0.12	-0.05
	VH095407	753	0.68	0.36
VH098021	753	0.56	0.38	



Form	Accession Number	N	Average Item Score	Point Biserial Corr.
4	VH095585	743	0.66	0.53
	VH103475	743	0.55	0.37
	VH097990	743	0.32	0.17
	VH125347	743	0.31	0.31
	VH103547	743	0.79	0.38
	VH095298	743	0.47	0.40
	VH122582	743	0.76	0.53
	VH094851	743	0.54	0.33
	VH103449	743	0.84	0.22
	VH103560	743	0.37	0.32
	VH095446	743	0.78	0.49
	VH095395	743	0.56	0.37
5	VH095317	747	0.30	0.23
	VH095488	747	0.79	0.48
	VH122533	747	0.72	0.37
	VH095373	747	0.61	0.41
	VH125353	747	0.24	0.17
	VH122573	747	0.56	0.46
	VH103631	747	0.43	0.24
	VH095414	747	0.39	0.26
	VH103507	747	0.44	0.28
	VH094976	747	0.67	0.34
	VH103467	747	0.18	0.39
	VH095555	747	0.77	0.43
6	VH095347	759	0.67	0.52
	VH094953	759	0.55	0.41
	VH095289	759	0.42	0.40
	VH103654	759	0.77	0.41
	VH103587	759	0.77	0.14
	VH098028	759	0.38	0.44
	VH095501	759	0.65	0.60
	VH125375	759	0.10	0.08
	VH125412	759	0.86	0.23
	VH103620	759	0.64	0.52
	VH098047	759	0.50	0.14
	VH097983	759	0.45	0.43
7	VH103572	748	0.86	0.27
	VH094934	748	0.38	0.21
	VH103652	748	0.73	0.22
	VH098050	748	0.42	0.31
	VH125404	748	0.31	0.11
	VH094982	748	0.57	0.39
	VH122561	748	0.50	0.21
	VH098024	748	0.90	0.21
	VH095406	748	0.58	0.34
	VH103554	748	0.64	0.40
	VH103604	748	0.74	0.43
	VH095438	748	0.66	0.56

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
8	VH103497	745	0.52	0.56
	VH125300	745	0.77	0.46
	VH125445	745	0.18	0.11
	VH122597*	745	0.36	-0.02
	VH095359	745	0.61	0.51
	VH095279	745	0.35	0.20
	VH103637	745	0.74	0.24
	VH094920	745	0.78	0.44
	VH097967	745	0.55	0.55
	VH103598	745	0.49	0.42
	VH094957	745	0.55	0.39
	VH098018	745	0.56	0.19
9	VH103521	733	0.47	0.37
	VH095324	733	0.44	0.38
	VH094890	733	0.41	0.47
	VH098032	733	0.58	0.21
	VH098039	733	0.31	0.22
	VH122577	733	0.38	0.43
	VH095431	733	0.26	0.09
	VH095303	733	0.34	0.33
	VH095379	733	0.83	0.34
	VH095268	733	0.85	0.44
	VH103593	733	0.50	0.40
	VH094991	733	0.35	0.26
10	VH098035	721	0.92	0.21
	VH095413	721	0.34	0.33
	VH094960	721	0.81	0.42
	VH095290	721	0.66	0.47
	VH095606	721	0.49	0.48
	VH095306	721	0.44	0.29
	VH097973	721	0.22	0.41
	VH094971	721	0.47	0.51
	VH094989	721	0.52	0.13
	VH098042	721	0.37	0.37
	VH094951	721	0.44	0.54
	VH103650	721	0.30	0.34

Table F8. Mathematics Grade 4 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VH097287	838	0.42	0.54
	VH097576	838	0.49	0.44
	VH097347	838	0.45	0.44
	VH104648	838	0.58	0.23
	VH103600	838	0.39	0.36
	VH103401	838	0.52	0.45
	VH118094	838	0.42	0.39
	VH103492	838	0.38	0.28
	VH118312	838	0.89	0.40
	VH097141	838	0.54	0.40
	VH097368	838	0.40	0.52
	VH097185	838	0.58	0.32
2	VH097502	745	0.80	0.40
	VH103459*	745	0.08	-0.02
	VH097277	745	0.31	0.56
	VH124331	745	0.70	0.43
	VH118090	745	0.76	0.49
	VH097255	745	0.81	0.40
	VH118288	745	0.54	0.28
	VH104580	745	0.50	0.33
	VH124473	745	0.46	0.45
	VH103697	745	0.42	0.22
	VH104641	745	0.39	0.28
	VH097562	745	0.56	0.37
3	VH097534	724	0.81	0.34
	VH124439	724	0.53	0.12
	VH097202	724	0.32	0.29
	VH124426	724	0.72	0.33
	VH097528	724	0.90	0.28
	VH124450	724	0.52	0.40
	VH097401	724	0.13	0.25
	VH124386*	724	0.27	0.05
	VH097169	724	0.54	0.34
	VH097423	724	0.89	0.19
	VH097289	724	0.52	0.40
	VH104654*	724	0.17	0.01
4	VH097484	714	0.64	0.25
	VH128854	714	0.57	0.41
	VH124309	714	0.60	0.36
	VH097242	714	0.39	0.24
	VH118284	714	0.79	0.44
	VH097479	714	0.61	0.52
	VH103388	714	0.31	0.24
	VH097184	714	0.55	0.19
	VH097325	714	0.74	0.40
	VH104555	714	0.47	0.39
	VH097324	714	0.47	0.37
	VH097353	714	0.76	0.39

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
5	VH097553	713	0.36	0.38
	VH097190	713	0.48	0.48
	VH097139	713	0.69	0.54
	VH097535	713	0.27	0.24
	VH097338	713	0.58	0.43
	VH097516	713	0.75	0.44
	VH097435	713	0.53	0.47
	VH128825	713	0.32	0.25
	VH104561	713	0.48	0.39
	VH103564	713	0.60	0.43
	VH097438	713	0.68	0.33
	VH097464	713	0.41	0.48
6	VH124416	727	0.34	0.31
	VH118306	727	0.42	0.42
	VH097231	727	0.42	0.37
	VH124358	727	0.83	0.43
	VH124227	727	0.69	0.29
	VH103486	727	0.35	0.20
	VH104623	727	0.67	0.47
	VH104591	727	0.44	0.36
	VH097262	727	0.83	0.37
	VH097521	727	0.70	0.51
	VH097374	727	0.45	0.43
	VH097472	727	0.46	0.36
7	VH103422	713	0.23	0.30
	VH104545	713	0.33	0.39
	VH118316	713	0.74	0.37
	VH124349	713	0.50	0.38
	VH097512	713	0.53	0.19
	VH103471	713	0.27	0.16
	VH118315	713	0.50	0.33
	VH097308	713	0.40	0.41
	VH097315	713	0.33	0.45
	VH103376	713	0.58	0.48
	VH118322	713	0.50	0.50
	VH118279	713	0.29	0.28
8	VH103411	711	0.51	0.42
	VH097505	711	0.72	0.38
	VH097490	711	0.19	0.30
	VH104572	711	0.40	0.24
	VH118320	711	0.52	0.55
	VH097382	711	0.45	0.41
	VH124216	711	0.32	0.39
	VH103550	711	0.64	0.49
	VH103590	711	0.39	0.36
	VH124444	711	0.81	0.41
	VH097563	711	0.63	0.33
	VH097454*	711	0.67	0.05

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
9	VH097402	702	0.58	0.28
	VH097224	702	0.39	0.49
	VH097093	702	0.77	0.35
	VH128865	702	0.29	0.16
	VH124323	702	0.80	0.42
	VH118294	702	0.33	0.44
	VH103477	702	0.41	0.20
	VH124180	702	0.57	0.37
	VH103556	702	0.58	0.32
	VH097174	702	0.86	0.43
	VH097542	702	0.65	0.40
	VH097569	702	0.53	0.37
	10	VH103619	698	0.43
VH097558		698	0.85	0.33
VH103693		698	0.45	0.32
VH104657		698	0.34	0.29
VH097429		698	0.47	0.35
VH097547		698	0.39	0.08
VH097446		698	0.19	0.43
VH103443		698	0.59	0.48
VH097218		698	0.81	0.34
VH097334		698	0.87	0.42
VH118318		698	0.38	0.12
VH097497		698	0.78	0.33

Table F9. Mathematics Grade 5 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VH095137	773	0.36	0.46
	VH098064	773	0.23	0.26
	VH095140	773	0.50	0.41
	VH104510	773	0.49	0.33
	VH094999	773	0.25	0.12
	VH092895	773	0.48	0.30
	VH099708	773	0.35	0.17
	VH095099	773	0.61	0.33
	VH094418	773	0.40	0.55
	VF880726	773	0.68	0.49
	VH094466	773	0.46	0.36
VF491791	773	0.54	0.57	
2	VH099627	684	0.44	0.41
	VH094899	684	0.36	0.26
	VF491942	684	0.65	0.45
	VH103721	684	0.42	0.48
	VH095123	684	0.41	0.44
	VH098020	684	0.39	0.43
	VH094918	684	0.51	0.44
	VH094318	684	0.50	0.47
	VH094425	684	0.57	0.54
	VH094602	684	0.42	0.32
	VH094858	684	0.74	0.46
VH104411	684	0.65	0.42	
3	VH099900	673	0.31	0.35
	VH095125	673	0.32	0.27
	VH092750	673	0.40	0.26
	VH094943	673	0.45	0.13
	VF491933	673	0.54	0.69
	VH098046	673	0.39	0.16
	VH104447	673	0.73	0.30
	VH104384	673	0.29	0.36
	VH094333	673	0.27	0.27
	VH099875	673	0.37	0.35
	VH103760	673	0.62	0.51
VH098003	673	0.46	0.14	
4	VH095116	681	0.43	0.44
	VH094310	681	0.53	0.33
	VF491755	681	0.37	0.48
	VH104507	681	0.67	0.14
	VH094499	681	0.43	0.34
	VH092830	681	0.71	0.42
	VH095017	681	0.59	0.44
	VH099674	681	0.31	0.39
	VH095138	681	0.38	0.17
	VH094305	681	0.74	0.35
	VH103744	681	0.40	0.28
VH103708	681	0.72	0.34	

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
5	VH098060	684	0.32	0.32
	VH099860	684	0.33	0.25
	VF741551	684	0.47	0.30
	VH094808	684	0.39	0.22
	VH104438	684	0.43	0.31
	VH092998	684	0.39	0.24
	VF491989	684	0.57	0.38
	VH099667	684	0.32	0.45
	VH094365	684	0.64	0.35
	VH095040*	684	0.25	0.04
	VH103717	684	0.77	0.29
	VH104501	684	0.44	0.21
6	VH094413	692	0.49	0.33
	VH093943	692	0.58	0.35
	VH095090	692	0.36	0.12
	VH094485	692	0.41	0.23
	VH095128	692	0.40	0.38
	VH092936	692	0.41	0.08
	VH098054	692	0.43	0.40
	VF491982	692	0.52	0.57
	VH103548	692	0.55	0.52
	VF819940	692	0.37	0.22
	VH098011	692	0.64	0.37
	VH104342	692	0.37	0.54
7	VH099721	671	0.41	0.48
	VH103562	671	0.58	0.61
	VH093957	671	0.55	0.46
	VH097998	671	0.24	0.22
	VH103703	671	0.23	0.13
	VH103591	671	0.43	0.46
	VH092986	671	0.31	0.44
	VF492122	671	0.59	0.35
	VH095073*	671	0.22	0.04
	VH093987	671	0.28	0.23
	VH104394	671	0.61	0.53
	VH103731	671	0.42	0.18
8	VH099742	679	0.59	0.48
	VH095132	679	0.53	0.54
	VH095048	679	0.36	0.42
	VH098053	679	0.40	0.45
	VH094344	679	0.70	0.43
	VH103608*	679	0.16	-0.05
	VH099618	679	0.35	0.35
	VF740948	679	0.80	0.35
	VH103629	679	0.58	0.34
	VH104403	679	0.48	0.60
	VH103570	679	0.52	0.47
	VF492269	679	0.70	0.52

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
9	VF819983	660	0.35	0.35
	VH103644*	660	0.34	-0.10
	VH095095	660	0.48	0.51
	VH099648	660	0.35	0.30
	VH094878	660	0.31	0.34
	VH098013	660	0.44	0.31
	VH099771	660	0.28	0.31
	VH093804	660	0.66	0.37
	VH103584	660	0.71	0.52
	VF492271	660	0.70	0.53
	VH094250	660	0.42	0.27
	VF492275	660	0.80	0.39
10	VF736488	656	0.73	0.23
	VH094283	656	0.38	0.27
	VH103694*	656	0.21	0.02
	VF866042	656	0.74	0.11
	VH099804	656	0.44	0.35
	VH098017	656	0.54	0.42
	VH098037	656	0.39	0.15
	VH104363	656	0.46	0.53
	VH092967	656	0.63	0.42
	VH103532	656	0.27	0.25
	VF492218	656	0.67	0.35
	VH094296	656	0.59	0.18



Table F10. Mathematics Grade 6 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VH118600	870	0.34	0.33
	VH135088	870	0.57	0.38
	VH118609	870	0.36	0.36
	VH120376	870	0.37	0.20
	VH121630	870	0.69	0.31
	VH141145	870	0.44	0.34
	VH118541	870	0.29	0.07
	VH136341	870	0.48	0.01
	VH121591	870	0.63	0.40
	VH121046	870	0.74	0.36
	VF492746	870	0.46	0.31
VH121658	870	0.46	0.42	
2	VH135208	673	0.37	0.23
	VH118685	673	0.61	0.47
	VH135098	673	0.78	0.40
	VH120441	673	0.32	0.10
	VH136323	673	0.94	0.18
	VH121113	673	0.79	0.40
	VH118525	673	0.66	0.32
	VH141320*	673	0.14	-0.11
	VH141006	673	0.36	0.19
	VH141242	673	0.85	0.29
	VH140952	673	0.35	0.34
VH118579	673	0.51	0.43	
3	VH135116	671	0.62	0.42
	VH120455	671	0.51	0.34
	VH118671	671	0.56	0.42
	VH135313	671	0.68	0.37
	VH141014	671	0.50	0.43
	VH121101	671	0.58	0.42
	VH140956	671	0.35	0.25
	VH118560	671	0.66	0.42
	VH140947	671	0.51	0.31
	VH118531	671	0.49	0.36
	VH141199	671	0.46	0.25
VF822069	671	0.43	0.21	
4	VH118676	694	0.58	0.44
	VH135342	694	0.81	0.42
	VH120466	694	0.35	0.33
	VF741760	694	0.90	0.30
	VH136312	694	0.53	0.43
	VH121615	694	0.72	0.32
	VH136155	694	0.37	0.27
	VH136257	694	0.57	0.43
	VH141169*	694	0.18	-0.08
	VH118507	694	0.58	0.40
	VF822040	694	0.49	0.09
VH136222	694	0.39	0.51	

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
5	VH120767	696	0.67	0.48
	VH135857	696	0.73	0.34
	VH135351	696	0.56	0.44
	VH135867	696	0.59	0.45
	VH136290	696	0.60	0.48
	VH136168	696	0.66	0.49
	VH136234	696	0.31	0.22
	VH136282	696	0.68	0.48
	VF883058	696	0.52	0.50
	VH140958*	696	0.20	-0.05
	VH141288	696	0.19	0.07
	VH118546	696	0.26	0.20
6	VH118682	717	0.52	0.43
	VH135849	717	0.54	0.28
	VH135326	717	0.87	0.35
	VH135883	717	0.30	0.37
	VH140981*	717	0.29	0.03
	VH136179	717	0.54	0.42
	VH121032	717	0.62	0.60
	VH135060	717	0.34	0.31
	VF492764	717	0.46	0.23
	VH118552	717	0.71	0.30
	VH141152	717	0.80	0.45
	VH136315	717	0.41	0.21
7	VH135827	689	0.43	0.27
	VH118702*	689	0.26	-0.03
	VH140963	689	0.55	0.43
	VH135870	689	0.70	0.47
	VH141235	689	0.70	0.36
	VH136336*	689	0.19	0.06
	VH121038	689	0.78	0.29
	VH141128*	689	0.20	-0.17
	VH141315	689	0.37	0.37
	VH136245	689	0.31	0.13
	VH135077	689	0.37	0.44
	VH118556	689	0.35	0.38
8	VH120783	687	0.64	0.40
	VH135893	687	0.43	0.26
	VH118677	687	0.34	0.37
	VH135880	687	0.48	0.20
	VH140975	687	0.93	0.11
	VH136294	687	0.69	0.26
	VH141003	687	0.44	0.12
	VH118571	687	0.78	0.50
	VH121642	687	0.33	0.41
	VH118513	687	0.72	0.38
	VH121654	687	0.41	0.32
	VH120805	687	0.15	0.06

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
9	VH121067	697	0.48	0.33
	VH121098	697	0.64	0.13
	VH118666	697	0.26	0.34
	VH135897	697	0.38	0.22
	VH121646	697	0.24	0.11
	VH141316	697	0.32	0.15
	VH136204	697	0.27	0.07
	VH136332	697	0.47	0.10
	VH121012	697	0.80	0.45
	VH136297	697	0.57	0.40
	VH140970*	697	0.13	0.02
	VH121049	697	0.60	0.58
	10	VH118711*	713	0.19
VH121074		713	0.79	0.21
VH118628		713	0.51	0.30
VH121663		713	0.22	0.24
VH141123*		713	0.18	-0.06
VH136343		713	0.60	0.32
VH141331*		713	0.19	-0.05
VH121115		713	0.71	0.48
VH136302		713	0.32	0.35
VH118567		713	0.24	0.38
VH121636		713	0.70	0.30
VH121019		713	0.37	0.21

Table F11. Mathematics Grade 7 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VH095274	822	0.56	0.36
	VH129957	822	0.50	0.36
	VH095559	822	0.23	0.21
	VH095390	822	0.30	0.36
	VH147987	822	0.31	0.38
	VH148921	822	0.51	0.32
	VH124668	822	0.32	0.23
	VH100007	822	0.21	0.09
	VH141553	822	0.69	0.46
	VH129853	822	0.42	0.47
	VH148955	822	0.46	0.39
VH097743	822	0.39	0.25	
2	VH095281	647	0.62	0.44
	VH147507	647	0.53	0.35
	VH147514	647	0.22	0.40
	VH095441	647	0.31	0.34
	VH124820	647	0.63	0.32
	VH129910	647	0.33	0.32
	VH097777	647	0.25	0.17
	VH148156	647	0.36	0.33
	VH148986	647	0.66	0.25
	VH141606	647	0.42	0.32
	VH100040	647	0.34	0.35
VH148935	647	0.39	0.32	
3	VH095465	644	0.58	0.35
	VH129934	644	0.34	0.17
	VH147513	644	0.31	0.22
	VH147508	644	0.50	0.37
	VH147895	644	0.51	0.22
	VH141559	644	0.63	0.50
	VH124701	644	0.24	0.16
	VH129881	644	0.26	0.18
	VH148965	644	0.23	0.37
	VH097789	644	0.58	0.19
	VH124722	644	0.37	0.20
VH149582	644	0.32	0.24	
4	VH095405	660	0.50	0.09
	VH147509	660	0.60	0.45
	VH095550	660	0.18	0.14
	VH095287	660	0.50	0.47
	VH141524	660	0.57	0.42
	VH147911	660	0.38	0.18
	VH124790	660	0.71	0.41
	VH124624	660	0.39	0.55
	VH149508	660	0.34	0.47
	VH141610	660	0.38	0.36
	VH099956	660	0.23	0.24
VH100025	660	0.39	0.26	

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
5	VH147502	667	0.24	0.24
	VH095299	667	0.72	0.30
	VH095434	667	0.38	0.34
	VH129959	667	0.48	0.44
	VH099980	667	0.72	0.36
	VH141531	667	0.39	0.35
	VH124817	667	0.56	0.34
	VH097710	667	0.67	0.49
	VH124650	667	0.57	0.46
	VH148927	667	0.50	0.45
	VH129868	667	0.46	0.37
	VH149460	667	0.54	0.42
6	VH095416	656	0.38	0.16
	VH095308	656	0.52	0.39
	VH129947	656	0.28	0.23
	VH147505	656	0.33	0.42
	VH124661	656	0.74	0.54
	VH124771	656	0.60	0.45
	VH148997	656	0.22	0.23
	VH141605*	656	0.09	0.01
	VH148163	656	0.29	0.20
	VH149394	656	0.24	0.16
	VH097763	656	0.57	0.36
	VH100001	656	0.47	0.37
7	VH129941	689	0.18	0.16
	VH095597	689	0.23	0.06
	VH147510	689	0.35	0.37
	VH095474	689	0.38	0.40
	VH129889	689	0.27	0.15
	VH148947	689	0.53	0.17
	VH097695	689	0.35	0.31
	VH141570	689	0.51	0.23
	VH141620*	689	0.23	0.00
	VH100033	689	0.45	0.38
	VH124781	689	0.22	0.14
	VH147975	689	0.25	0.27
8	VH095342	637	0.81	0.31
	VH129956	637	0.22	0.22
	VH095590	637	0.13	0.27
	VH095428	637	0.53	0.38
	VH149435	637	0.22	0.11
	VH129916	637	0.49	0.51
	VH100028	637	0.30	0.20
	VH148251	637	0.36	0.29
	VH124606	637	0.46	0.40
	VH097784	637	0.25	0.26
	VH124776	637	0.53	0.47
	VH141596	637	0.36	0.24

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
9	VH129965	666	0.15	0.31
	VH147512	666	0.45	0.34
	VH095351	666	0.42	0.40
	VH095615	666	0.14	0.13
	VH149616	666	0.50	0.28
	VH097803	666	0.46	0.22
	VH141617	666	0.41	0.10
	VH141509	666	0.45	0.38
	VH124615	666	0.65	0.38
	VH124765	666	0.21	0.12
	VH129897	666	0.41	0.41
	VH148352	666	0.31	0.22
	10	VH095450	679	0.31
VH095364		679	0.81	0.35
VH095484		679	0.46	0.43
VH129922		679	0.29	0.22
VH141616		679	0.69	0.24
VH124712		679	0.58	0.28
VH097754		679	0.63	0.44
VH099940		679	0.32	0.26
VH148915		679	0.67	0.39
VH148173		679	0.43	0.31
VH141599		679	0.21	0.30
VH129876		679	0.40	0.35

Table F12. Mathematics Grade 8 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VH118755	781	0.52	0.30
	VH118752	781	0.27	0.42
	VH118739	781	0.19	0.26
	VH118026	781	0.28	0.26
	VH121907	781	0.25	0.33
	VH147232	781	0.40	0.31
	VH148441*	781	0.20	0.03
	VH145885	781	0.19	0.28
	VH138980	781	0.41	0.40
	VH139596	781	0.74	0.42
	VH146791	781	0.29	0.25
	VH121958	781	0.45	0.40
2	VH120141	663	0.49	0.22
	VH119949	663	0.33	0.24
	VH118748	663	0.37	0.31
	VH118056	663	0.40	0.23
	VH139254	663	0.49	0.23
	VH148445	663	0.28	0.25
	VH147393	663	0.53	0.39
	VH137854	663	0.49	0.41
	VH139591	663	0.49	0.33
	VH122050	663	0.55	0.26
	VH148458	663	0.75	0.41
	VH146599	663	0.15	0.12
3	VH118031	666	0.35	0.27
	VH121842	666	0.24	0.19
	VH121877	666	0.65	0.28
	VH118956	666	0.27	0.12
	VH145979	666	0.42	0.21
	VH148446	666	0.52	0.14
	VH137557	666	0.75	0.39
	VH139527	666	0.26	0.17
	VH139490	666	0.58	0.44
	VH122501	666	0.47	0.27
	VH147356	666	0.27	0.26
	VH146729	666	0.58	0.45
4	VH121891	669	0.28	0.28
	VH118943	669	0.31	0.41
	VH120081	669	0.59	0.22
	VH118079	669	0.48	0.53
	VH138993	669	0.52	0.40
	VH146673	669	0.39	0.41
	VH145949	669	0.57	0.47
	VH147435	669	0.44	0.15
	VH122473	669	0.54	0.15
	VH148457	669	0.43	0.41
	VH122029	669	0.66	0.40
	VH137876	669	0.41	0.32

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
5	VH118912	677	0.29	0.29
	VH120009	677	0.56	0.34
	VH118043	677	0.24	0.08
	VH118733	677	0.57	0.32
	VH146823	677	0.19	0.07
	VH137600	677	0.51	0.53
	VH139566	677	0.29	0.15
	VH139462	677	0.54	0.32
	VH148416	677	0.64	0.44
	VH121931	677	0.38	0.37
	VH122227	677	0.37	0.45
	VH146043	677	0.32	0.11
6	VH119976	655	0.45	0.33
	VH120133	655	0.50	0.38
	VH118746	655	0.63	0.36
	VH118053	655	0.45	0.37
	VH122299	655	0.25	0.14
	VH146033	655	0.15	0.16
	VH137736	655	0.35	0.43
	VH146829*	655	0.14	-0.02
	VH122468	655	0.41	0.42
	VH139013	655	0.52	0.39
	VH139576	655	0.54	0.39
	VH147488	655	0.43	0.39
7	VH120033	661	0.65	0.42
	VH118922	661	0.31	0.25
	VH118074	661	0.60	0.54
	VH118034	661	0.39	0.31
	VH145943	661	0.48	0.27
	VH137566	661	0.64	0.43
	VH122429	661	0.55	0.28
	VH139100	661	0.30	0.22
	VH147496	661	0.67	0.37
	VH146637	661	0.37	0.30
	VH148444	661	0.72	0.38
	VH145987	661	0.61	0.24
8	VH118897	703	0.44	0.21
	VH119991	703	0.47	0.40
	VH118067	703	0.17	0.25
	VH121865	703	0.58	0.43
	VH122253	703	0.32	0.26
	VH137625	703	0.35	0.38
	VH122435	703	0.29	0.29
	VH137761	703	0.40	0.44
	VH147239	703	0.27	0.23
	VH146740	703	0.54	0.40
	VH148452	703	0.32	0.24
	VH146719	703	0.45	0.49



Form	Accession Number	N	Average Item Score	Point Biserial Corr.
9	VH118906	659	0.36	0.30
	VH120028	659	0.35	0.23
	VH118039	659	0.23	0.20
	VH118742	659	0.36	0.27
	VH138964	659	0.40	0.46
	VH146073	659	0.37	0.16
	VH145956	659	0.29	0.44
	VH137656	659	0.43	0.40
	VH147375	659	0.32	0.19
	VH148459	659	0.80	0.42
	VH122508	659	0.35	0.16
	VH145932	659	0.36	0.27
10	VH118929	666	0.19	0.21
	VH120120	666	0.29	0.20
	VH118028	666	0.58	0.52
	VH119970	666	0.54	0.38
	VH147216	666	0.80	0.41
	VH148455	666	0.57	0.38
	VH148460	666	0.30	0.38
	VH121940	666	0.51	0.38
	VH139503	666	0.27	0.14
	VH145937	666	0.36	0.25
	VH137609	666	0.28	0.34
	VH146747	666	0.53	0.37

*Science*

Table F13. Science Grade 4 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VH096461	828	0.35	0.26
	VH096495	828	0.73	0.34
	VH172565	828	0.62	0.27
	VH096471	828	0.66	0.49
	VH096466	828	0.46	0.30
	VH146856	828	0.41	0.30
	VH146846	828	0.58	0.44
	VH149135	828	0.39	0.19
	VH149133	828	0.34	0.26
	VH149109	828	0.36	0.09
	VH149150	828	0.47	0.28
	VH149127	828	0.10	-0.12
2	VH123648	725	0.62	0.33
	VH123651	725	0.30	0.20
	VH123642	725	0.30	0.14
	VH123637	725	0.66	0.44
	VH123641	725	0.84	0.36
	VH126198	725	0.36	-0.07
	VH126131	725	0.82	0.22
	VH146863	725	0.59	0.27
	VH146855	725	0.27	0.27
	VH146868	725	0.63	0.48
	VH146869	725	0.32	0.06
	VH146865	725	0.34	0.23
3	VH118422	720	0.56	0.11
	VH118453	720	0.28	0.25
	VH118479	720	0.66	0.28
	VH118463	720	0.70	0.27
	VH118429	720	0.51	0.35
	VF801629	720	0.69	0.45
	VF801857	720	0.60	0.27
	VH102875	720	0.50	0.36
	VH102854	720	0.48	0.36
	VH102809	720	0.59	0.51
	VH102857	720	0.32	0.16
VH172640	720	0.45	0.30	

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
4	VH118459	715	0.59	0.39
	VH118404	715	0.77	0.31
	VH118414	715	0.76	0.18
	VH118474	715	0.79	0.39
	VH118470	715	0.13	-0.18
	VH126220	715	0.75	0.26
	VH126043	715	0.76	0.37
	VH123681	715	0.58	0.48
	VH123679	715	0.67	0.43
	VH123689	715	0.52	0.37
	VH123674	715	0.63	0.40
	VH123703	715	0.61	0.37
	5	VH123683	700	0.60
VH123685		700	0.89	0.25
VH123691		700	0.52	0.15
VH123692		700	0.21	0.18
VH123706		700	0.66	0.34
VH102841		700	0.60	0.46
VH102761		700	0.49	0.09
VH149116		700	0.41	0.38
VH149154		700	0.45	0.40
VH149118		700	0.52	0.25
VH149169		700	0.41	0.23
VH149131		700	0.54	0.35
6	VH123650	740	0.26	0.30
	VH123639	740	0.52	0.12
	VH123653	740	0.49	0.16
	VH123647	740	0.58	0.36
	VH123643	740	0.45	0.16
	VH149174	740	0.38	0.24
	VH149122	740	0.60	0.18
	VH129808	740	0.51	0.31
	VH129813	740	0.50	0.31
	VH129725	740	0.44	0.37
	VH129781	740	0.46	0.32
	VH129826	740	0.54	0.32
7	VF801633	717	0.68	0.39
	VF801858	717	0.69	0.33
	VF801864	717	0.60	0.30
	VF801861	717	0.58	0.27
	VF801632	717	0.97	0.23
	VH146172	717	0.71	0.38
	VH146226	717	0.56	0.27
	VH125970	717	0.87	0.39
	VH125967	717	0.43	0.26
	VH125987	717	0.72	0.40
	VH125979	717	0.39	0.17
	VH125964	717	0.77	0.11

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
8	VH126160	709	0.71	0.40
	VH126184	709	0.82	0.39
	VH126152	709	0.62	0.08
	VH126187	709	0.58	0.37
	VH126216	709	0.50	0.32
	VH129742	709	0.92	0.29
	VH129821	709	0.44	0.21
	VH146240	709	0.48	0.29
	VH146232	709	0.61	0.24
	VH146194	709	0.72	0.23
	VH146214	709	0.32	0.04
	VH146166	709	0.65	0.54
9	VF801859	702	0.73	0.33
	VH172654	702	0.50	0.05
	VF801794	702	0.48	0.23
	VF801860	702	0.51	0.39
	VF801863	702	0.55	0.35
	VH123644	702	0.18	0.04
	VH123652	702	0.38	0.29
	VH129772	702	0.78	0.39
	VH129733	702	0.58	0.50
	VH129728	702	0.61	0.41
	VH129797	702	0.63	0.42
	VH172644	702	0.52	0.28
10	VH096497	703	0.27	0.21
	VH096486	703	0.74	0.29
	VH096452	703	0.53	0.34
	VH096441	703	0.31	0.26
	VH096455	703	0.38	0.25
	VH123698	703	0.37	0.30
	VH123670	703	0.55	0.27
	VH102881	703	0.44	0.35
	VH102818	703	0.73	0.31
	VH102868	703	0.49	0.37
	VH102794	703	0.81	0.47
	VH102847	703	0.69	0.37

Table F14. Science Grade 8 Classical Statistics for Field Test Items

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
1	VH128915	773	0.76	0.33
	VH128928	773	0.30	0.11
	VH128934	773	0.29	0.14
	VH128955	773	0.51	0.30
	VH128980	773	0.37	-0.07
	VH125631	773	0.22	-0.11
	VH125613	773	0.30	0.09
	VH133779	773	0.55	0.39
	VH122088	773	0.47	0.28
	VH122108	773	0.20	0.09
	VH122099	773	0.66	0.41
	VH122102	773	0.62	0.27
2	VH122124	671	0.57	0.12
	VH122093	671	0.48	0.28
	VH122105	671	0.67	0.38
	VH122112	671	0.58	0.34
	VH122080	671	0.67	0.30
	VH125548	671	0.47	0.14
	VH125551	671	0.74	0.26
	VH128989	671	0.20	0.08
	VH128924	671	0.36	0.02
	VH128959	671	0.74	0.40
	VH128967	671	0.54	0.37
	VH128949*	671	0.34	0.15
3	VH140213	667	0.55	0.17
	VH140155	667	0.35	0.04
	VH140200	667	0.21	0.12
	VH140266	667	0.75	0.25
	VH140283	667	0.66	0.21
	VH125589	667	0.36	0.16
	VH125650	667	0.54	0.31
	VH102999	667	0.56	0.17
	VH103015	667	0.47	0.23
	VH103007	667	0.73	0.26
	VH103016	667	0.83	0.27
	VH103011	667	0.91	0.36
4	VH103014	674	0.45	0.24
	VH103013	674	0.71	0.28
	VH103017	674	0.41	0.30
	VH103010	674	0.43	0.34
	VH103003	674	0.68	0.49
	VH125571	674	0.44	0.28
	VH125607	674	0.26	0.21
	VH140167	674	0.66	0.32
	VH140162	674	0.48	0.30
	VH140239	674	0.62	0.35
	VH140207	674	0.17	0.09
	VH140253	674	0.21	0.04

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
5	VH139742	674	0.68	0.39
	VH139796	674	0.54	0.39
	VH139768	674	0.41	0.22
	VH140030	674	0.63	0.33
	VH140079	674	0.39	0.32
	VH125644	674	0.80	0.31
	VH125625	674	0.34	0.21
	VH090838	674	0.64	0.31
	VH090758	674	0.85	0.30
	VH090788	674	0.54	0.30
	VH090846	674	0.79	0.45
	VH090829	674	0.38	0.37
	6	VH090778	647	0.60
VH090752		647	0.80	0.37
VH090762		647	0.36	0.30
VH090859		647	0.80	0.30
VH090805		647	0.45	0.12
VH083112		647	0.44	0.16
VH083099		647	0.53	0.15
VH139804		647	0.68	0.33
VH139756		647	0.47	0.28
VH140057		647	0.55	0.15
VH139837		647	0.37	0.09
VH140086		647	0.81	0.40
7		VH103256	659	0.31
	VH103271	659	0.70	0.30
	VH103289	659	0.60	0.21
	VH122979	659	0.41	0.04
	VH103300	659	0.56	0.11
	VH083062	659	0.43	0.27
	VH083097	659	0.25	0.19
	VH096378	659	0.51	0.34
	VH096351	659	0.49	0.33
	VH096390	659	0.53	0.27
	VH096355	659	0.46	0.30
	VH155466	659	0.63	0.44
	8	VH096364	713	0.67
VH096374		713	0.37	0.22
VH096331		713	0.46	0.22
VH155456		713	0.31	0.17
VH096384		713	0.73	0.27
VH083054		713	0.47	0.16
VH083129		713	0.49	0.25
VH103277		713	0.63	0.36
VH103260		713	0.40	0.10
VH103297		713	0.74	0.19
VH103282		713	0.32	0.23
VH122545		713	0.50	0.20

Form	Accession Number	N	Average Item Score	Point Biserial Corr.
9	VH083715	649	0.33	0.12
	VH083722	649	0.53	0.17
	VH083729	649	0.69	0.18
	VH083725	649	0.30	0.15
	VH083700	649	0.43	-0.10
	VH083082	649	0.27	0.12
	VH083068	649	0.54	0.33
	VF671388	649	0.56	0.23
	VF671370	649	0.68	0.39
	VF671377	649	0.50	0.37
	VF684395	649	0.48	0.27
	VF684417	649	0.78	0.36
	10	VF671364	661	0.53
VF671372		661	0.85	0.33
VF671358		661	0.66	0.32
VF671382		661	0.68	0.33
VF671389		661	0.57	0.23
VH083116		661	0.22	0.19
VH083079		661	0.33	0.07
VH083726		661	0.56	0.23
VH083693		661	0.64	0.34
VH083685		661	0.62	0.33
VH083710		661	0.58	0.19
VH083718		661	0.88	0.34

## Appendix G: Classical Item Statistics for 2015 Operational Items

### Reading

Table G1. Reading Grade 3 Classical Statistics for Operational Items

Accession Number	N	Average Item Score	Point Biserial Corr.
VF394057	7538	0.72	0.28
VF394053	7538	0.78	0.46
VF394041	7538	0.72	0.30
VF394045	7538	0.64	0.38
VF394050	7538	0.83	0.35
VF394046	7538	0.87	0.48
VF394049	7538	0.80	0.36
VF394051	7538	0.77	0.25
VF389477	7538	0.65	0.51
VF389620	7538	0.67	0.42
VF389446	7538	0.55	0.29
VF389473	7538	0.58	0.41
VF389165	7538	0.72	0.51
VF821218	7538	0.79	0.46
VF821206	7538	0.31	0.30
VF821123	7538	0.75	0.38
VF821312	7538	0.62	0.38
VF821272	7538	0.90	0.51
VF821338	7538	0.68	0.46
VF821362	7538	0.63	0.45
VF497668	7538	0.74	0.49
VF497700	7538	0.60	0.41
VF497705	7538	0.43	0.32
VF497671	7538	0.64	0.45
VF497696	7538	0.73	0.43
VF497690	7538	0.65	0.48
VF497684	7538	0.54	0.41
VF497676	7538	0.76	0.50
VF883330	7538	0.50	0.47
VF882884	7538	0.49	0.42
VF883326	7538	0.67	0.34
VF883549	7538	0.79	0.53
VF883561	7538	0.55	0.29
VF883364	7538	0.89	0.47



Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF883614	7538	0.81	0.44
VF883619	7538	0.67	0.49
VF883622	7538	0.68	0.36
VF497716	7538	0.66	0.39
VF497751	7538	0.64	0.42
VF497761	7538	0.71	0.54
VF497725	7538	0.67	0.58
VF497758	7538	0.57	0.45
VF497767	7538	0.52	0.44
VF497766	7538	0.39	0.25
VF497718	7538	0.69	0.36
VF497731	7538	0.83	0.51
VF885214	7538	0.70	0.47
VF885379	7538	0.53	0.35
VF885192	7538	0.86	0.55
VF885434	7538	0.69	0.52

Table G2. Reading Grade 4 Classical Statistics for Operational Items

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF495028	7315	0.42	0.27
VF495644	7315	0.70	0.30
VF494993	7315	0.47	0.37
VF495021	7315	0.68	0.31
VF495015	7315	0.76	0.49
VF495003	7315	0.59	0.49
VF495010	7315	0.94	0.42
VF880215	7315	0.72	0.46
VF880210	7315	0.52	0.31
VF880326	7315	0.62	0.37
VF880321	7315	0.43	0.31
VF880343	7315	0.59	0.39
VF880345	7315	0.56	0.42
VF880350	7315	0.63	0.44
VF497359	7315	0.63	0.50
VF497361	7315	0.80	0.54
VF497384	7315	0.52	0.40
VF497390	7315	0.70	0.58
VF497378	7315	0.44	0.37
VF497354	7315	0.85	0.44
VF497147	7315	0.85	0.53
VF497155	7315	0.66	0.49
VF497220	7315	0.74	0.51
VF497215	7315	0.33	0.33
VF497188	7315	0.93	0.46
VF497212	7315	0.69	0.42
VF884843	7315	0.87	0.53
VF884830	7315	0.69	0.43
VF884836	7315	0.64	0.52
VF884910	7315	0.84	0.30
VF884900	7315	0.88	0.48
VF884918	7315	0.76	0.38
VF884913	7315	0.47	0.38
VF497338	7315	0.59	0.20
VF497314	7315	0.70	0.55
VF497322	7315	0.67	0.50
VF497303	7315	0.80	0.48
VF497330	7315	0.75	0.48
VF497327	7315	0.72	0.43
VF407243	7315	0.73	0.45
VF407287	7315	0.84	0.52
VF407232	7315	0.80	0.55
VF407295	7315	0.90	0.46
VF407297	7315	0.69	0.44
VF407298	7315	0.64	0.35
VF407282	7315	0.88	0.57

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF885226	7315	0.88	0.47
VF885195	7315	0.82	0.47
VF885205	7315	0.70	0.52
VF885228	7315	0.80	0.50

Table G3. Reading Grade 5 Classical Statistics for Operational Items

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF497182	6894	0.94	0.34
VF497170	6894	0.87	0.38
VF497060	6894	0.95	0.43
VF497172	6894	0.83	0.37
VF497056	6894	0.75	0.44
VF496032	6894	0.65	0.41
VF496085	6894	0.67	0.36
VF496185	6894	0.68	0.32
VF496188	6894	0.68	0.42
VF496024	6894	0.76	0.53
VF407319	6894	0.67	0.34
VF407388	6894	0.73	0.44
VF407329	6894	0.78	0.48
VF407332	6894	0.76	0.38
VF407360	6894	0.90	0.41
VF407322	6894	0.61	0.34
VF884489	6894	0.96	0.38
VF884524	6894	0.70	0.32
VF884517	6894	0.86	0.52
VF884520	6894	0.76	0.31
VF884556	6894	0.56	0.29
VF884567	6894	0.62	0.48
VF884535	6894	0.69	0.42
VF496865	6894	0.68	0.49
VF496879	6894	0.65	0.43
VF496213	6894	0.72	0.38
VF496206	6894	0.65	0.39
VF496209	6894	0.78	0.46
VF496212	6894	0.81	0.49
VF496221	6894	0.92	0.42
VF880864	6894	0.89	0.44
VF882769	6894	0.73	0.43
VF882762	6894	0.52	0.37
VF882790	6894	0.52	0.38
VF909893	6894	0.60	0.32
VF882786	6894	0.71	0.26
VF497284	6894	0.80	0.45
VF497278	6894	0.84	0.51
VF497273	6894	0.87	0.35
VF497285	6894	0.40	0.33
VF497287	6894	0.74	0.44
VF497274	6894	0.52	0.39
VF497288	6894	0.82	0.38
VF497039	6894	0.51	0.51
VF497030	6894	0.67	0.47
VF497028	6894	0.57	0.53

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF497012	6894	0.69	0.45
VF497016	6894	0.78	0.52
VF885191	6894	0.85	0.58
VF885197	6894	0.84	0.55
VF885212	6894	0.89	0.54
VF885217	6894	0.76	0.53
VF885221	6894	0.58	0.35
VF885314	6894	0.80	0.51

Table G4. Reading Grade 6 Classical Statistics for Operational Items

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF497042	7103	0.87	0.48
VF497046	7103	0.51	0.13
VF497035	7103	0.77	0.38
VF497034	7103	0.83	0.41
VF497041	7103	0.84	0.45
VF496873	7103	0.67	0.38
VF496204	7103	0.64	0.50
VF496208	7103	0.64	0.43
VF496863	7103	0.64	0.49
VF496191	7103	0.57	0.47
VF496867	7103	0.70	0.44
VF496415	7103	0.67	0.35
VF496172	7103	0.66	0.47
VF496055	7103	0.49	0.45
VF496083	7103	0.92	0.40
VF496036	7103	0.56	0.37
VF496065	7103	0.69	0.42
VF496071	7103	0.80	0.46
VF496100	7103	0.81	0.48
VF496087	7103	0.82	0.49
VF496029	7103	0.84	0.45
VF495908	7103	0.81	0.39
VF495961	7103	0.63	0.39
VF495968	7103	0.50	0.41
VF495990	7103	0.80	0.46
VF495918	7103	0.75	0.42
VF495945	7103	0.60	0.32
VF495925	7103	0.77	0.44
VF495938	7103	0.51	0.40
VF495954	7103	0.75	0.37
VF814311	7103	0.79	0.51
VF814382	7103	0.73	0.54
VF814391	7103	0.77	0.45
VF814392	7103	0.61	0.40
VF814393	7103	0.39	0.30
VF821664	7103	0.71	0.50
VF821580	7103	0.74	0.40
VF821704	7103	0.83	0.46
VF821673	7103	0.58	0.34
VF821619	7103	0.62	0.40
VF523861	7103	0.69	0.52
VF523801	7103	0.60	0.44
VF523825	7103	0.74	0.55
VF523818	7103	0.69	0.41
VF523813	7103	0.51	0.26
VF523804	7103	0.58	0.42

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF523786	7103	0.66	0.45
VF884733	7103	0.66	0.38
VF884772	7103	0.40	0.38
VF884844	7103	0.65	0.44
VF884880	7103	0.75	0.44
VF884857	7103	0.64	0.42
VF884630	7103	0.60	0.28
VF884988	7103	0.68	0.53
VF884628	7103	0.51	0.32
VF884658	7103	0.47	0.42

Table G5. Reading Grade 7 Classical Statistics for Operational Items

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF496937	6766	0.80	0.31
VF496932	6766	0.84	0.39
VF496901	6766	0.72	0.28
VF496913	6766	0.87	0.48
VF496906	6766	0.88	0.43
VF496895	6766	0.50	0.44
VF496900	6766	0.86	0.50
VF497972	6766	0.34	0.31
VF497969	6766	0.53	0.44
VF497958	6766	0.68	0.47
VF497951	6766	0.70	0.42
VF497955	6766	0.78	0.51
VF497961	6766	0.59	0.50
VF497978	6766	0.50	0.41
VF497974	6766	0.55	0.40
VF865426	6766	0.83	0.44
VF865388	6766	0.92	0.40
VF865473	6766	0.53	0.45
VF865494	6766	0.54	0.23
VF865624	6766	0.61	0.35
VF865614	6766	0.52	0.32
VF865627	6766	0.71	0.43
VF497881	6766	0.66	0.40
VF497882	6766	0.62	0.36
VF497879	6766	0.67	0.35
VF497893	6766	0.67	0.31
VF497890	6766	0.71	0.42
VF497876	6766	0.74	0.40
VF497873	6766	0.71	0.44
VF498058	6766	0.68	0.38
VF497995	6766	0.72	0.58
VF498030	6766	0.76	0.39
VF498018	6766	0.79	0.53
VF497980	6766	0.46	0.40
VF498062	6766	0.58	0.42
VF498051	6766	0.61	0.38
VF498054	6766	0.58	0.47
VF498057	6766	0.64	0.44
VF498063	6766	0.49	0.34
VF498032	6766	0.81	0.48
VF498052	6766	0.44	0.31
VF820422	6766	0.71	0.48
VF820412	6766	0.79	0.40
VF820449	6766	0.72	0.38
VF820435	6766	0.40	0.30
VF820464	6766	0.63	0.33



Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF820391	6766	0.65	0.37
VF864902	6766	0.70	0.53
VF864898	6766	0.84	0.42
VF865078	6766	0.52	0.31
VF865072	6766	0.74	0.54
VF865088	6766	0.54	0.42
VF865104	6766	0.53	0.53
VF885398	6766	0.64	0.45
VF885820	6766	0.50	0.53
VF885813	6766	0.59	0.32

Table G6. Reading Grade 8 Classical Statistics for Operational Items

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF497427	6787	0.94	0.38
VF497431	6787	0.86	0.43
VF497441	6787	0.86	0.37
VF497443	6787	0.88	0.38
VF497446	6787	0.74	0.40
VF497445	6787	0.76	0.43
VF497207	6787	0.87	0.42
VF497213	6787	0.81	0.44
VF497196	6787	0.79	0.39
VF497178	6787	0.55	0.28
VF497193	6787	0.59	0.36
VF497209	6787	0.68	0.38
VF497257	6787	0.76	0.31
VF497259	6787	0.52	0.34
VF497244	6787	0.76	0.44
VF497271	6787	0.77	0.54
VF497235	6787	0.87	0.53
VF497252	6787	0.83	0.44
VF867326	6787	0.74	0.49
VF867239	6787	0.65	0.43
VF867293	6787	0.64	0.44
VF867355	6787	0.36	0.33
VF867368	6787	0.60	0.34
VF497096	6787	0.65	0.44
VF497103	6787	0.77	0.46
VF497098	6787	0.50	0.29
VF497114	6787	0.74	0.41
VF497094	6787	0.75	0.48
VF497115	6787	0.78	0.43
VF820174	6787	0.77	0.49
VF820025	6787	0.76	0.45
VF820170	6787	0.45	0.35
VF820236	6787	0.44	0.29
VF820159	6787	0.76	0.34
VF820261	6787	0.65	0.39
VF497127	6787	0.81	0.53
VF497116	6787	0.59	0.35
VF497117	6787	0.62	0.50
VF497130	6787	0.70	0.44
VF497123	6787	0.71	0.39
VF497370	6787	0.68	0.30
VF497329	6787	0.78	0.50
VF497319	6787	0.71	0.54
VF497353	6787	0.64	0.48
VF497328	6787	0.57	0.40
VF497325	6787	0.66	0.47

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF497363	6787	0.55	0.38
VF820777	6787	0.79	0.52
VF820750	6787	0.76	0.45
VF820727	6787	0.57	0.51
VF820786	6787	0.67	0.28
VF820720	6787	0.55	0.36
VF820801	6787	0.88	0.51
VF883716	6787	0.81	0.40
VF883823	6787	0.77	0.46
VF883653	6787	0.87	0.46

Mathematics

Table G7. Mathematics Grade 3 Classical Statistics for Operational Items

Accession Number	N	Average Item Score	Point Biserial Corr.
VF493110	7514	0.85	0.27
VF387496	7514	0.91	0.37
VF803080	7514	0.79	0.42
VF494670	7514	0.44	0.46
VF494103	7514	0.52	0.45
VF803172	7514	0.52	0.43
VF406339	7514	0.81	0.46
VF406297	7514	0.53	0.31
VF821698	7514	0.51	0.44
VF493136	7514	0.75	0.44
VF492342	7514	0.79	0.52
VF406204	7514	0.63	0.34
VF394359	7514	0.73	0.49
VF394252	7514	0.56	0.32
VF866235	7514	0.64	0.47
VF737752	7514	0.53	0.57
VF740960	7514	0.52	0.42
VF866360	7514	0.89	0.47
VF866898	7514	0.78	0.39
VF740890	7514	0.49	0.41
VF394339	7514	0.56	0.38
VF493415	7514	0.52	0.49
VF394382	7514	0.91	0.32
VF394362	7514	0.44	0.46
VF819669	7514	0.48	0.31
VF866354	7514	0.78	0.52
VF493287	7514	0.55	0.49
VF394376	7514	0.61	0.49
VF393748	7514	0.61	0.60
VF865389	7514	0.64	0.52
VF819676	7514	0.87	0.28
VF494895	7514	0.45	0.47
VF394378	7514	0.40	0.25
VF867001	7514	0.66	0.54
VF803121	7514	0.56	0.38
VF822822	7514	0.79	0.47
VF867073	7514	0.49	0.39
VF493127	7514	0.57	0.46
VF393824	7514	0.45	0.36
VF821767	7514	0.43	0.35
VF394232	7514	0.83	0.45
VF494750	7514	0.67	0.40
VF493461	7514	0.43	0.33
VF393786	7514	0.78	0.46

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF394358	7514	0.59	0.57
VF394356	7514	0.61	0.53
VF394229	7514	0.54	0.40
VF493153	7514	0.81	0.44
VF494674	7514	0.59	0.43
VF493387	7514	0.80	0.42

Table G8. Mathematics Grade 4 Classical Statistics for Operational Items

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF492371	7285	0.90	0.23
VF866662	7285	0.62	0.49
VF393675	7285	0.54	0.47
VF867083	7285	0.67	0.40
VF866677	7285	0.75	0.41
VF822854	7285	0.91	0.38
VF493356	7285	0.89	0.28
VF492358	7285	0.90	0.33
VF493344	7285	0.84	0.39
VF493349	7285	0.45	0.49
VF492311	7285	0.93	0.35
VF867084	7285	0.44	0.49
VF801214	7285	0.45	0.51
VF493334	7285	0.27	0.38
VF823138	7285	0.66	0.52
VF497391	7285	0.70	0.52
VF493140	7285	0.62	0.52
VF864051	7285	0.76	0.43
VF492353	7285	0.57	0.44
VF867078	7285	0.39	0.45
VF492320	7285	0.91	0.45
VF492339	7285	0.88	0.41
VF493228	7285	0.58	0.60
VF492330	7285	0.59	0.33
VF866857	7285	0.58	0.42
VF741948	7285	0.37	0.29
VF497395	7285	0.62	0.53
VF493219	7285	0.75	0.38
VF816048	7285	0.68	0.45
VF863975	7285	0.85	0.35
VF493154	7285	0.90	0.33
VF741944	7285	0.78	0.30
VF801835	7285	0.66	0.30
VF493257	7285	0.50	0.48
VF493312	7285	0.35	0.26
VF492373	7285	0.72	0.42
VF493223	7285	0.50	0.53
VF493366	7285	0.36	0.30
VF801227	7285	0.39	0.40
VF880336	7285	0.35	0.40
VF493377	7285	0.60	0.38
VF492354	7285	0.78	0.44
VF493295	7285	0.38	0.49
VF492350	7285	0.91	0.30
VF493301	7285	0.48	0.34
VF393648	7285	0.33	0.35

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF493135	7285	0.63	0.51
VF823371	7285	0.69	0.37
VF864100	7285	0.73	0.43
VF492364	7285	0.77	0.47
VF492386	7285	0.66	0.45
VF866699	7285	0.60	0.56
VF866870	7285	0.39	0.36
VF493262	7285	0.64	0.38
VF497402	7285	0.50	0.47
VF493242	7285	0.60	0.42
VF492337	7285	0.59	0.41
VF815909	7285	0.84	0.45
VF493361	7285	0.49	0.21

Table G9. Mathematics Grade 5 Classical Statistics for Operational Items

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF819900	6853	0.83	0.27
VF491924	6853	0.69	0.46
VF491941	6853	0.51	0.37
VF741941	6853	0.65	0.38
VF492203	6853	0.85	0.46
VF864604	6853	0.56	0.47
VF741081	6853	0.62	0.42
VF815846	6853	0.51	0.39
VF816021	6853	0.62	0.53
VF797963	6853	0.60	0.51
VF491626	6853	0.73	0.45
VF740894	6853	0.83	0.44
VF492313	6853	0.65	0.57
VF864628	6853	0.64	0.21
VF823759	6853	0.37	0.42
VF823819	6853	0.52	0.28
VF736524	6853	0.78	0.43
VF492031	6853	0.53	0.46
VF801992	6853	0.71	0.49
VF492296	6853	0.43	0.28
VF740936	6853	0.81	0.43
VF491967	6853	0.53	0.45
VF492007	6853	0.66	0.41
VF492255	6853	0.66	0.50
VF492214	6853	0.37	0.53
VF802894	6853	0.57	0.41
VF491914	6853	0.62	0.34
VF491948	6853	0.48	0.52
VF492077	6853	0.63	0.56
VF491635	6853	0.50	0.55
VF492099	6853	0.58	0.55
VF491992	6853	0.65	0.39
VF492248	6853	0.69	0.50
VF492186	6853	0.47	0.34
VF491937	6853	0.53	0.39
VF492528	6853	0.65	0.36
VF491895	6853	0.73	0.47
VF492423	6853	0.70	0.40
VF491804	6853	0.58	0.63
VF491911	6853	0.90	0.31
VF823790	6853	0.69	0.30
VF491932	6853	0.58	0.53
VF491630	6853	0.48	0.43
VF492397	6853	0.44	0.48
VF492095	6853	0.60	0.55
VF491905	6853	0.69	0.49



Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF491783	6853	0.39	0.51
VF492304	6853	0.72	0.51
VF492435	6853	0.53	0.35
VF864609	6853	0.49	0.55
VF491794	6853	0.68	0.48
VF492001	6853	0.69	0.35
VF866103	6853	0.60	0.38
VF492010	6853	0.51	0.44
VF819989	6853	0.40	0.40
VF491761	6853	0.68	0.51
VF491727	6853	0.47	0.47
VF491821	6853	0.53	0.52
VF815982	6853	0.38	0.54

Table G10. Mathematics Grade 6 Classical Statistics for Operational Items

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF492233	7107	0.83	0.36
VF862699	7107	0.71	0.46
VF492542	7107	0.67	0.52
VF811515	7107	0.41	0.46
VF491930	7107	0.67	0.44
VF492260	7107	0.50	0.47
VF882963	7107	0.48	0.16
VF862786	7107	0.61	0.56
VF809839	7107	0.67	0.59
VF492192	7107	0.54	0.34
VF741578	7107	0.58	0.35
VF741723	7107	0.62	0.37
VF492383	7107	0.62	0.50
VF492773	7107	0.40	0.34
VF812185	7107	0.61	0.39
VF492660	7107	0.30	0.48
VF492053	7107	0.54	0.53
VF492709	7107	0.43	0.50
VF492562	7107	0.87	0.40
VF492388	7107	0.64	0.40
VF492533	7107	0.74	0.50
VF491996	7107	0.49	0.29
VF491960	7107	0.72	0.48
VF492078	7107	0.55	0.42
VF741572	7107	0.53	0.44
VF491935	7107	0.72	0.50
VF491879	7107	0.89	0.41
VF493058	7107	0.64	0.48
VF491874	7107	0.64	0.60
VF493013	7107	0.37	0.35
VF866278	7107	0.47	0.35
VF865635	7107	0.57	0.46
VF797964	7107	0.39	0.23
VF822007	7107	0.43	0.43
VF883067	7107	0.63	0.38
VF491931	7107	0.89	0.44
VF492280	7107	0.46	0.45
VF492879	7107	0.45	0.52
VF741533	7107	0.44	0.39
VF492716	7107	0.42	0.38
VF812407	7107	0.49	0.49
VF821920	7107	0.62	0.37
VF797977	7107	0.78	0.44
VF423146	7107	0.79	0.42
VF492284	7107	0.79	0.42
VF492996	7107	0.53	0.57

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF491787	7107	0.66	0.34
VF493003	7107	0.59	0.48
VF491966	7107	0.58	0.33
VF822023	7107	0.71	0.43
VF492941	7107	0.30	0.41
VF866290	7107	0.51	0.36
VF803293	7107	0.47	0.46
VF491940	7107	0.64	0.54
VF882800	7107	0.55	0.31
VF493092	7107	0.52	0.54
VF492415	7107	0.61	0.46
VF866230	7107	0.56	0.42
VF491976	7107	0.42	0.33

Table G11. Mathematics Grade 7 Classical Statistics for Operational Items

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF492966	6767	0.73	0.48
VF880308	6767	0.67	0.40
VF800136	6767	0.70	0.33
VF492307	6767	0.76	0.47
VF800144	6767	0.64	0.45
VF818181	6767	0.38	0.53
VF822884	6767	0.14	0.22
VF880331	6767	0.32	0.42
VF492888	6767	0.50	0.43
VF880250	6767	0.42	0.39
VF492708	6767	0.49	0.46
VF492640	6767	0.40	0.45
VF492578	6767	0.36	0.48
VF492835	6767	0.66	0.42
VF492666	6767	0.48	0.49
VF492760	6767	0.33	0.35
VF493038	6767	0.62	0.59
VF492357	6767	0.36	0.30
VF880897	6767	0.76	0.46
VF867307	6767	0.69	0.26
VF813096	6767	0.44	0.47
VF736963	6767	0.36	0.32
VF883138	6767	0.42	0.35
VF866491	6767	0.30	0.52
VF492665	6767	0.54	0.45
VF869623	6767	0.57	0.52
VF492973	6767	0.32	0.20
VF800078	6767	0.57	0.23
VF493061	6767	0.45	0.58
VF492864	6767	0.68	0.54
VF867256	6767	0.52	0.42
VF882715	6767	0.31	0.29
VF492425	6767	0.54	0.49
VF492951	6767	0.49	0.24
VF493067	6767	0.45	0.39
VF492538	6767	0.73	0.54
VF493019	6767	0.43	0.46
VF736938	6767	0.56	0.52
VF818347	6767	0.74	0.18
VF818184	6767	0.52	0.42
VF492830	6767	0.67	0.53
VF492915	6767	0.72	0.35
VF883156	6767	0.47	0.48
VF800055	6767	0.84	0.36
VF736940	6767	0.39	0.41
VF492780	6767	0.59	0.46

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF866386	6767	0.34	0.35
VF492567	6767	0.45	0.35
VF493077	6767	0.73	0.46
VF882691	6767	0.50	0.45
VF492589	6767	0.27	0.45
VF493052	6767	0.43	0.34
VF883150	6767	0.57	0.24
VF880171	6767	0.28	0.31
VF492259	6767	0.48	0.55
VF493043	6767	0.36	0.23
VF492901	6767	0.41	0.44
VF883244	6767	0.55	0.46
VF799837	6767	0.73	0.46

Table G12. Mathematics Grade 8 Classical Statistics for Operational Items

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF491923	6801	0.87	0.36
VF802924	6801	0.39	0.21
VF493115	6801	0.77	0.19
VF491907	6801	0.64	0.38
VF823432	6801	0.66	0.52
VF491824	6801	0.40	0.36
VF494699	6801	0.56	0.42
VF492863	6801	0.58	0.50
VF492712	6801	0.41	0.46
VF802938	6801	0.42	0.37
VF493112	6801	0.69	0.38
VF492726	6801	0.35	0.40
VF885510	6801	0.48	0.45
VF812743	6801	0.38	0.37
VF823444	6801	0.53	0.42
VF885577	6801	0.50	0.47
VF802937	6801	0.53	0.38
VF880849	6801	0.49	0.28
VF812762	6801	0.49	0.41
VF493159	6801	0.54	0.36
VF492438	6801	0.73	0.38
VF491991	6801	0.70	0.45
VF494928	6801	0.37	0.33
VF883648	6801	0.79	0.38
VF493034	6801	0.54	0.49
VF492410	6801	0.49	0.44
VF883641	6801	0.58	0.38
VF809838	6801	0.68	0.40
VF492278	6801	0.70	0.52
VF865996	6801	0.42	0.38
VF823784	6801	0.68	0.40
VF494751	6801	0.46	0.38
VF880646	6801	0.56	0.44
VF809061	6801	0.46	0.39
VF492907	6801	0.72	0.48
VF863280	6801	0.34	0.39
VF493107	6801	0.38	0.34
VF492563	6801	0.61	0.36
VF491975	6801	0.65	0.49
VF863290	6801	0.29	0.25
VF492272	6801	0.57	0.56
VF494801	6801	0.57	0.42
VF492420	6801	0.72	0.49
VF803474	6801	0.72	0.41
VF883670	6801	0.51	0.44
VF866064	6801	0.44	0.45

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Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF492586	6801	0.44	0.29
VF492212	6801	0.57	0.32
VF491949	6801	0.64	0.47
VF865675	6801	0.50	0.34
VF809001	6801	0.40	0.48
VF804267	6801	0.46	0.29
VF492414	6801	0.56	0.48
VF822412	6801	0.57	0.48
VF812997	6801	0.50	0.43
VF492008	6801	0.48	0.39
VF493011	6801	0.73	0.52
VF492178	6801	0.49	0.49
VF494819	6801	0.38	0.36
VF880680	6801	0.57	0.39
VF493097	6801	0.31	0.25
VF492231	6801	0.36	0.21
VF822465	6801	0.50	0.47
VF885555	6801	0.56	0.34
VF492436	6801	0.72	0.40

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Science

Table G13. Science Grade 4 Classical Statistics for Operational Items

Accession Number	N	Average Item Score	Point Biserial Corr.
VF287740	7259	0.49	0.33
VF287742	7259	0.52	0.37
VF311572	7259	0.72	0.43
VF430956	7259	0.59	0.38
VF430688	7259	0.60	0.37
VF430686	7259	0.48	0.37
VF294929	7259	0.69	0.44
VF296821	7259	0.65	0.41
VF387280	7259	0.30	0.34
VF387256	7259	0.59	0.43
VF431142	7259	0.65	0.48
VF283606	7259	0.86	0.37
VF431081	7259	0.83	0.33
VF385246	7259	0.76	0.44
VF388627	7259	0.46	0.41
VF269709	7259	0.88	0.35
VF430894	7259	0.43	0.32
VF431027	7259	0.67	0.44
VF431028	7259	0.84	0.41
VF287722	7259	0.49	0.40
VF287717	7259	0.33	0.33
VF430984	7259	0.67	0.37
VF430987	7259	0.41	0.36
VF431125	7259	0.58	0.31
VF431127	7259	0.76	0.42
VF431129	7259	0.63	0.39
VF431112	7259	0.62	0.43
VF431113	7259	0.68	0.29
VF269830	7259	0.47	0.23
VF269831	7259	0.50	0.36
VF407152	7259	0.42	0.30
VF406427	7259	0.51	0.44
VF393911	7259	0.93	0.33
VF393954	7259	0.75	0.40
VF393826	7259	0.73	0.43
VF311629	7259	0.47	0.28
VF311640	7259	0.74	0.30
VF393724	7259	0.77	0.54
VF393699	7259	0.56	0.45
VF393721	7259	0.58	0.38
VF386736	7259	0.83	0.48
VF386732	7259	0.32	0.26
VF386739	7259	0.71	0.41
VF269871	7259	0.47	0.42



Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF269873	7259	0.66	0.46
VF386811	7259	0.60	0.41
VF386826	7259	0.56	0.41
VF430695	7259	0.33	0.40
VF269769	7259	0.53	0.35
VF269779	7259	0.72	0.44

Table G14. Science Grade 8 Classical Statistics for Operational Items

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF309025	6789	0.54	0.39
VF431248	6789	0.57	0.37
VF388503	6789	0.32	0.27
VF388413	6789	0.56	0.36
VF394477	6789	0.53	0.50
VF394502	6789	0.47	0.38
VF431671	6789	0.66	0.38
VF431673	6789	0.77	0.50
VF431674	6789	0.64	0.47
VF823970	6789	0.53	0.33
VF394777	6789	0.51	0.39
VF394780	6789	0.52	0.35
VF394809	6789	0.55	0.36
VF394814	6789	0.44	0.30
VF308932	6789	0.48	0.33
VF308933	6789	0.32	0.35
VF431421	6789	0.55	0.36
VF431423	6789	0.34	0.34
VF308876	6789	0.69	0.42
VF308880	6789	0.73	0.32
VF308882	6789	0.71	0.34
VF813827	6789	0.72	0.35
VF313289	6789	0.47	0.37
VF313291	6789	0.65	0.42
VF313300	6789	0.57	0.38
VF431549	6789	0.65	0.50
VF308941	6789	0.52	0.43
VF308944	6789	0.34	0.48
VF431656	6789	0.69	0.37
VF308871	6789	0.59	0.45
VF308869	6789	0.58	0.30
VF431599	6789	0.45	0.38
VF431602	6789	0.40	0.50
VF431598	6789	0.48	0.48
VF407480	6789	0.51	0.41
VF407483	6789	0.56	0.26
VF431624	6789	0.49	0.41
VF431626	6789	0.74	0.55
VF431683	6789	0.72	0.40
VF431688	6789	0.49	0.39
VF431609	6789	0.53	0.29
VF431610	6789	0.67	0.43
VF431608	6789	0.56	0.46
VF431704	6789	0.58	0.45
VF431703	6789	0.48	0.47
VF313274	6789	0.36	0.27

Accession Number	<i>N</i>	Average Item Score	Point Biserial Corr.
VF313280	6789	0.48	0.48
VF313281	6789	0.53	0.47
VF486149	6789	0.44	0.43
VF486146	6789	0.52	0.37

Appendix H: Rasch Difficulty, Standard Error, Fit Statistics, and *N*-counts for  
2015 Field Test Items

*Reading*

Table H1. Reading Grade 3 IRT Statistics for Field Test Items

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
1	VF821781	778	-0.423	0.093	0.85	0.72
	VF821789	778	2.701	0.096	1.20	1.83
	VF821793	778	-0.388	0.092	1.14	1.14
	VF821783	778	-0.818	0.102	0.92	0.79
	VF821758	778	0.824	0.080	1.24	1.29
	VF821776	778	-0.839	0.102	0.95	0.92
	VH121729	778	-0.493	0.094	0.83	0.70
	VH121731	778	-0.708	0.099	0.82	0.65
	VH121738	778	-1.719	0.132	0.84	0.57
	VH121740	778	0.171	0.085	0.83	0.75
	VH121744	778	0.668	0.081	0.99	0.98
	VH121727	778	-1.282	0.115	0.89	0.79
	VH153039	778	-0.287	0.091	0.93	0.88
	VH152965	778	0.714	0.081	1.00	1.00
2	VF821778	757	-0.358	0.095	1.05	0.99
	VF821797	757	0.652	0.082	1.03	1.11
	VF821791	757	-0.449	0.096	1.07	1.12
	VF821802	757	1.317	0.081	1.03	1.07
	VF821787	757	-1.283	0.119	0.90	0.74
	VF821765	757	-1.992	0.151	0.82	0.46
	VH121733	757	-0.653	0.101	0.99	0.91
	VH121742	757	-0.879	0.107	0.83	0.56
	VH121735	757	-0.210	0.092	0.92	0.90
	VH121737	757	1.154	0.081	1.17	1.29
	VH121743	757	-1.545	0.129	0.86	0.74
	VH121741	757	0.102	0.087	0.85	0.77
	VH152985	757	-0.030	0.089	0.91	0.86
	VH152980	757	-0.431	0.096	0.94	0.86

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
3	VH121707	750	-1.302	0.117	0.92	0.80
	VH121705	750	2.617	0.096	1.10	1.56
	VH121710	750	-0.832	0.103	0.82	0.68
	VH121709	750	-1.416	0.121	0.86	0.87
	VH121721	750	-1.401	0.121	0.81	0.57
	VH121716	750	-0.064	0.089	0.89	0.87
	VH151330	750	-0.226	0.091	1.00	1.04
	VH151332	750	0.595	0.082	0.99	0.97
	VH151365	750	1.279	0.081	1.04	1.06
	VH151363	750	1.601	0.083	1.06	1.11
	VH151336	750	0.896	0.081	1.12	1.22
	VH151322	750	0.075	0.087	1.02	1.01
	VH153000	750	0.437	0.084	1.00	0.98
	VH153045	750	2.811	0.101	1.12	1.92
4	VH121704	752	-2.728	0.199	0.86	0.42
	VH121703	752	-1.235	0.116	0.91	0.69
	VH121712	752	0.160	0.086	1.02	1.01
	VH121713	752	-1.497	0.126	0.87	0.59
	VH121717	752	0.137	0.086	1.03	1.07
	VH121719	752	1.531	0.082	1.15	1.28
	VH151327	752	0.578	0.083	1.05	1.10
	VH151358	752	0.523	0.083	0.96	0.92
	VH151362	752	-0.544	0.097	0.88	0.77
	VH151335	752	0.077	0.087	0.99	0.96
	VH151355	752	-0.544	0.097	0.86	0.72
	VH151356	752	0.734	0.082	1.06	1.05
	VH152941	752	-1.332	0.119	0.89	0.77
	VH153032	752	-0.192	0.091	0.96	1.04
5	VH134284	753	-1.210	0.113	0.88	0.75
	VH134285	753	0.001	0.088	1.04	1.05
	VH134302	753	0.534	0.083	0.98	0.97
	VH134309	753	1.575	0.083	1.17	1.25
	VH134325	753	0.069	0.087	0.86	0.76
	VH134321	753	0.657	0.082	1.15	1.18
	VH142471	753	1.561	0.083	0.95	1.05
	VH142478	753	0.568	0.083	1.07	1.14
	VH142531	753	0.114	0.086	1.05	1.15
	VH142491	753	1.895	0.086	1.12	1.28
	VH142488	753	1.350	0.082	1.03	1.10
	VH142507	753	-1.051	0.108	0.89	0.83
	VH153016	753	0.798	0.082	1.03	1.05
	VH152988	753	-0.488	0.095	0.86	0.77

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
6	VH134273	746	-0.212	0.092	0.87	0.80
	VH134279	746	0.091	0.087	1.00	1.05
	VH134297	746	-1.131	0.114	0.80	0.55
	VH134305	746	-0.866	0.106	1.06	1.17
	VH134331	746	-1.309	0.120	0.87	0.57
	VH134336	746	-0.574	0.099	0.83	0.72
	VH142503	746	0.900	0.081	0.99	0.99
	VH142496	746	0.434	0.084	0.92	0.88
	VH142484	746	0.159	0.086	0.90	0.84
	VH142522	746	1.729	0.083	1.23	1.51
	VH142509	746	1.884	0.085	1.01	1.10
	VH142536	746	2.022	0.086	1.05	1.29
	VH152948	746	0.841	0.081	1.05	1.04
	VH152969	746	1.399	0.081	1.05	1.14
7	VH151154	746	0.311	0.085	1.07	1.05
	VH151174	746	0.835	0.082	1.17	1.22
	VH151199	746	0.354	0.085	1.30	1.40
	VH151197	746	0.110	0.087	0.95	0.88
	VH151201	746	0.894	0.081	1.03	1.11
	VH151205	746	1.367	0.081	1.08	1.24
	VH125894	746	-0.307	0.094	0.95	0.85
	VH125863	746	2.231	0.088	1.12	1.34
	VH125902	746	2.093	0.086	1.06	1.27
	VH125877	746	1.579	0.082	1.24	1.52
	VH125816	746	-1.356	0.123	0.90	1.02
	VH125828	746	-1.041	0.112	0.82	0.64
	VH153005	746	-1.582	0.132	0.79	0.51
	VH152959	746	-0.111	0.091	1.17	1.51
8	VH151173	748	-0.666	0.101	0.89	0.75
	VH151178	748	1.602	0.083	1.08	1.23
	VH151194	748	-0.013	0.089	0.94	0.86
	VH151186	748	-0.364	0.094	0.88	0.77
	VH151203	748	0.539	0.083	1.02	1.04
	VH151207	748	2.008	0.086	1.27	1.47
	VH125854	748	-1.530	0.127	0.94	0.86
	VH125883	748	1.432	0.082	1.06	1.16
	VH125928	748	0.019	0.088	0.92	0.86
	VH125923	748	3.369	0.117	1.14	2.61
	VH125836	748	-1.405	0.122	0.79	0.53
	VH125918	748	-0.924	0.107	0.77	0.64
	VH153024	748	-0.109	0.090	0.83	0.72
	VH152936	748	1.398	0.082	1.05	1.10

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
9	VH145130	751	0.449	0.083	1.11	1.13
	VH145142	751	-0.750	0.101	0.89	0.81
	VH145154	751	1.825	0.084	0.95	1.06
	VH145170	751	2.097	0.087	1.20	1.63
	VH145173	751	0.463	0.083	1.02	1.03
	VH145174	751	1.468	0.082	1.03	1.12
	VH143162	751	-0.920	0.106	0.97	1.00
	VH143131	751	-0.374	0.093	1.05	1.18
	VH143274	751	-0.030	0.088	1.06	1.13
	VH143252	751	0.504	0.083	0.97	0.96
	VH143057	751	-1.234	0.115	0.87	0.81
	VH143006	751	-0.238	0.091	0.87	0.80
	VH152953	751	0.076	0.087	0.97	0.97
	VH153042	751	-0.812	0.103	0.90	0.84
10	VH145145	757	0.453	0.082	0.94	0.90
	VH145151	757	0.064	0.086	0.99	0.95
	VH145167	757	0.329	0.083	0.92	0.88
	VH145162	757	0.152	0.085	0.93	0.88
	VH145177	757	1.074	0.080	1.07	1.09
	VH145179	757	0.739	0.081	0.96	0.94
	VH143172	757	0.634	0.081	0.95	0.95
	VH143092	757	0.494	0.082	1.22	1.26
	VH143254	757	2.452	0.093	1.10	1.22
	VH143261	757	0.920	0.080	1.38	1.50
	VH143181	757	1.235	0.080	1.23	1.37
	VH143197	757	0.901	0.080	1.12	1.21
	VH153021	757	-0.578	0.097	1.02	1.18
	VH152992	757	-0.003	0.087	0.99	1.02

Table H2. Reading Grade 4 IRT Statistics for Field Test Items

Form Number	Accession Number	N	Rasch Difficulty	Rasch SE	Infit	Outfit
1	VH129443	782	0.049	0.091	1.18	1.33
	VH129412	782	0.535	0.085	1.10	1.18
	VH129493	782	-0.575	0.103	0.92	0.81
	VH129508	782	0.484	0.086	0.93	0.85
	VH129521	782	-0.391	0.099	1.03	1.10
	VH129530	782	2.022	0.083	1.09	1.33
	VH144891	782	-0.886	0.112	0.92	0.70
	VH144916	782	1.198	0.081	1.06	1.10
	VH145039	782	1.145	0.081	1.05	1.04
	VH144881	782	-0.629	0.105	0.86	0.74
	VH145036	782	1.622	0.081	1.06	1.28
	VH144851	782	2.167	0.084	1.16	1.59
	VH151660	782	0.621	0.084	1.08	1.10
	VH151945	782	0.713	0.084	1.08	1.10
2	VH129434	734	-0.883	0.119	0.97	0.96
	VH129450	734	-0.734	0.114	0.87	0.69
	VH129505	734	-0.101	0.098	1.07	1.16
	VH129483	734	0.706	0.087	1.03	1.05
	VH129517	734	-0.261	0.102	0.92	0.78
	VH129527	734	-0.230	0.101	0.96	0.95
	VH145033	734	0.615	0.088	1.09	1.11
	VH145009	734	0.905	0.085	1.06	1.12
	VH145045	734	0.529	0.089	0.91	0.89
	VH145086	734	1.862	0.084	1.02	1.11
	VH144895	734	1.169	0.084	1.28	1.42
	VH144867	734	-0.251	0.101	0.94	0.81
	VH151975	734	1.515	0.083	0.93	0.92
	VH152005	734	0.157	0.094	1.08	1.08
3	VH142665	734	0.690	0.086	1.09	1.12
	VH142671	734	-0.268	0.101	0.85	0.71
	VH142741	734	1.572	0.082	1.03	1.11
	VH142716	734	0.577	0.087	0.99	0.97
	VH142761	734	0.438	0.089	1.22	1.39
	VH142748	734	1.680	0.082	1.12	1.23
	VF798658	734	0.037	0.095	0.98	0.93
	VF798598	734	0.294	0.091	0.97	0.93
	VF798607	734	-0.835	0.116	0.81	0.56
	VF798738	734	2.817	0.094	1.11	1.63
	VF798587	734	-0.756	0.113	0.88	0.66
	VF798540	734	0.462	0.088	1.04	1.05
	VH151958	734	-0.371	0.103	0.91	0.89
	VH152000	734	0.219	0.092	0.95	0.89



Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
4	VH142678	731	1.345	0.082	0.93	0.92
	VH142659	731	-0.068	0.098	1.00	0.94
	VH142705	731	2.917	0.094	1.22	1.85
	VH142732	731	-0.227	0.101	0.93	0.88
	VH142765	731	0.381	0.090	1.02	1.02
	VH142756	731	0.860	0.085	1.06	1.07
	VF798644	731	-0.765	0.116	0.87	0.79
	VF798662	731	0.205	0.093	1.06	1.12
	VF798614	731	-0.107	0.099	0.87	0.75
	VF798617	731	1.533	0.082	1.16	1.23
	VF798577	731	-0.068	0.098	0.96	0.91
	VF798593	731	-0.387	0.105	0.93	0.77
	VH151994	731	0.661	0.087	1.00	0.97
	VH152021	731	0.026	0.096	0.87	0.73
5	VH150614**	731	0.770	0.087	1.13	1.23
	VH150639	731	-0.366	0.105	1.00	0.87
	VH150624	731	-0.623	0.112	0.97	0.93
	VH150612	731	0.353	0.091	1.13	1.15
	VH150637	731	-0.792	0.117	0.89	0.69
	VH150605	731	-0.410	0.106	0.94	0.82
	VH150491	731	-1.073	0.127	0.88	0.77
	VH150501	731	1.141	0.084	0.91	0.90
	VH150488	731	1.070	0.084	0.97	0.96
	VH150486	731	1.705	0.083	1.08	1.20
	VH150500	731	-0.399	0.106	0.80	0.62
	VH150498	731	1.684	0.083	1.17	1.23
	VH151981	731	0.435	0.090	1.00	0.99
	VH152009	731	-1.122	0.129	0.82	0.51
6	VH150643	721	-1.061	0.125	0.88	0.62
	VH150628	721	0.372	0.091	1.08	1.06
	VH150617	721	0.048	0.096	0.95	0.85
	VH150646	721	0.543	0.089	1.13	1.17
	VH150620	721	1.256	0.084	1.06	1.07
	VH150592	721	0.166	0.094	1.05	1.02
	VH150493	721	1.234	0.084	0.91	0.90
	VH150483	721	-0.642	0.112	0.87	0.60
	VH150482	721	0.314	0.092	1.13	1.12
	VH150492	721	-0.680	0.113	0.84	0.64
	VH150489	721	0.519	0.089	0.91	0.89
	VH150496	721	-0.630	0.111	0.89	0.70
	VH152012	721	-0.785	0.116	0.80	0.52
	VH152031	721	1.439	0.084	1.16	1.21

Form Number	Accession Number	N	Rasch Difficulty	Rasch SE	Infit	Outfit
7	VH136570	714	2.255	0.086	1.28	1.43
	VH136551	714	-0.169	0.101	0.93	0.80
	VH136564	714	1.678	0.083	1.21	1.31
	VH136573	714	1.929	0.084	1.01	1.14
	VH136557	714	0.519	0.089	1.03	1.11
	VH136512	714	1.208	0.084	1.17	1.24
	VH145672	714	0.903	0.085	1.12	1.16
	VH145677	714	1.972	0.084	1.04	1.14
	VH145653	714	1.437	0.083	1.05	1.13
	VH145684	714	2.470	0.089	1.06	1.22
	VH145595	714	0.689	0.087	0.94	0.89
	VH145604	1426	1.538	0.059	1.12	1.24
	VH152029	714	0.756	0.086	0.97	0.92
	VH152060	714	-0.473	0.108	0.91	0.90
8	VH136543	712	-0.007	0.097	0.93	0.83
	VH136554	712	1.565	0.083	0.93	1.00
	VH136567	712	1.979	0.085	1.09	1.18
	VH136548	712	2.851	0.096	1.27	1.77
	VH136533	712	0.442	0.090	1.00	1.00
	VH145643	712	2.476	0.090	1.16	1.35
	VH145638	712	0.352	0.091	0.95	0.88
	VH145660	712	1.077	0.084	1.12	1.17
	VH145702	712	1.392	0.083	1.11	1.14
	VH145629	712	0.040	0.096	0.91	0.81
	VH152039	712	2.358	0.088	1.13	1.42
	VH152046	712	-0.935	0.121	0.82	0.59
9	VH134078	722	-1.632	0.152	0.92	0.60
	VH134103	722	-1.142	0.130	0.86	0.62
	VH134141	722	0.360	0.092	1.10	1.23
	VH134113	722	0.249	0.093	0.94	0.85
	VH134109	722	0.079	0.096	0.83	0.69
	VH134083	722	0.943	0.086	1.14	1.16
	VF864063	1455	1.941	0.059	1.28	1.59
	VF864054	722	1.427	0.084	1.02	1.06
	VF864073	722	-0.536	0.110	0.85	0.69
	VF864102	722	0.973	0.085	1.11	1.16
	VF864105	722	0.492	0.090	1.09	1.14
	VF864007	722	0.301	0.092	0.99	0.93
	VH152048	722	1.145	0.084	1.09	1.14
VH152049	722	-0.997	0.124	0.81	0.51	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
10	VH134090	733	-0.187	0.099	0.99	0.87
	VH134148	733	-0.621	0.110	0.98	0.93
	VH134131	733	0.500	0.088	1.16	1.19
	VH134133	733	-0.645	0.111	0.83	0.64
	VH134126	733	0.500	0.088	1.00	0.95
	VH134105	733	0.644	0.086	1.10	1.09
	VF864119	733	2.548	0.089	1.25	1.84
	VF864086	733	-0.585	0.109	0.87	0.70
	VF864068	733	0.584	0.087	0.91	0.87
	VF864109	733	1.009	0.083	1.11	1.18
	VF863980	733	-0.670	0.111	0.88	0.78
	VH152025	733	1.187	0.082	0.94	0.93
	VH152058	733	2.548	0.089	1.15	1.55

Table H3. Reading Grade 5 IRT Statistics for Field Test Items

Form Number	Accession Number	N	Rasch Difficulty	Rasch SE	Infit	Outfit
1	VF821994	734	0.495	0.089	1.00	0.95
	VF822015	734	0.535	0.089	0.98	0.96
	VF822000	734	1.379	0.083	1.05	1.07
	VF821961	734	0.297	0.092	1.10	1.24
	VF822020	734	-0.562	0.112	0.96	1.08
	VF821971	734	0.331	0.092	1.08	1.29
	VH144162	734	2.138	0.084	1.05	1.10
	VH144153	734	-0.406	0.107	0.91	0.73
	VH144227	734	1.345	0.083	0.95	0.96
	VH144245	734	2.259	0.085	1.20	1.39
	VH144430	734	2.472	0.087	1.05	1.29
	VH150246	734	1.488	0.082	1.11	1.14
	VH150273	734	2.026	0.083	1.31	1.58
2	VF821985	673	-0.099	0.110	0.96	0.82
	VF822011	673	0.776	0.092	1.13	1.26
	VF822002	673	0.509	0.096	0.96	0.88
	VF822027	673	1.588	0.086	1.15	1.22
	VF821981	673	-1.535	0.172	0.91	0.90
	VF821975	673	-1.368	0.162	0.87	0.52
	VH144174	673	0.733	0.093	1.08	1.06
	VH144181	673	2.015	0.086	0.99	1.04
	VH144200	673	1.890	0.086	1.08	1.16
	VH144195	673	0.162	0.103	0.95	0.82
	VH144278	673	2.052	0.086	1.02	1.09
	VH144283	673	0.601	0.095	0.89	0.78
	VH150370	673	1.181	0.088	1.12	1.20
	VH150300	673	0.991	0.090	1.06	1.11
3	VH125681	674	-0.368	0.117	0.88	0.75
	VH125715	674	1.608	0.086	0.96	0.93
	VH125708	674	0.947	0.090	0.97	0.94
	VH125686	674	1.790	0.085	1.15	1.28
	VH125709	674	0.757	0.092	1.07	1.07
	VH125694	674	2.706	0.091	1.10	1.44
	VH144479	674	2.283	0.087	1.32	1.58
	VH144474	674	0.782	0.092	0.93	0.89
	VH144514	674	2.927	0.094	1.14	1.55
	VH144509	674	1.027	0.089	1.12	1.16
	VH144571	674	1.074	0.089	1.05	1.10
	VH144594	674	1.121	0.088	1.18	1.36
	VH150289	674	-1.004	0.141	0.93	0.80
VH150408	674	0.815	0.091	0.96	0.93	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
4	VH125712	681	3.370	0.102	1.32	2.64
	VH125680	681	1.033	0.088	1.04	1.05
	VH125690	681	1.233	0.087	1.11	1.13
	VH125707	681	1.240	0.087	1.16	1.23
	VH125717	681	1.730	0.085	1.12	1.17
	VH125674	681	1.579	0.085	1.11	1.15
	VH144472	681	-0.460	0.119	1.08	1.43
	VH144483	681	0.551	0.095	1.01	0.96
	VH144562	681	2.156	0.086	1.26	1.39
	VH144512	681	-0.075	0.108	0.86	0.73
	VH144575	681	0.595	0.094	0.84	0.75
	VH144593	681	-0.688	0.128	0.81	0.52
	VH150269	681	1.248	0.087	1.04	1.02
	VH150326	681	-0.563	0.123	0.85	0.57
5	VH143307	688	0.804	0.090	1.00	1.00
	VH143337	688	1.147	0.087	0.97	0.97
	VH143304	688	1.494	0.085	1.00	1.02
	VH143324	688	2.638	0.090	1.14	1.46
	VH143321	688	-0.012	0.104	0.99	1.04
	VH143288	688	1.297	0.086	1.27	1.42
	VH151456	688	0.438	0.095	0.96	0.88
	VH151432	688	0.605	0.092	1.21	1.43
	VH151476	688	0.764	0.090	1.00	0.99
	VH151464	688	1.370	0.086	1.12	1.13
	VH151542	688	2.881	0.093	1.16	1.63
	VH151526	1366	0.908	0.063	0.88	0.82
	VH150307	688	1.370	0.086	0.89	0.87
	VH150405	688	-0.202	0.108	0.85	0.66
6	VH143299	678	1.740	0.086	1.08	1.19
	VH143328	678	1.704	0.086	1.07	1.10
	VH143339	678	2.903	0.095	1.12	1.71
	VH143318	678	-0.576	0.122	0.95	0.82
	VH143332	678	2.278	0.088	1.13	1.32
	VH143331	678	-0.028	0.106	0.93	0.91
	VH151444	678	-0.340	0.114	0.90	0.75
	VH151453	678	-0.340	0.114	0.97	0.90
	VH151465	678	0.509	0.095	1.00	0.93
	VH151482	678	-0.327	0.114	0.82	0.62
	VH151538	678	0.980	0.089	1.02	1.05
	VH150398	678	2.088	0.087	0.97	1.07
	VH150284	678	1.460	0.086	0.95	0.93

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
7	VH136617	691	1.847	0.084	1.02	1.07
	VH136631	691	-0.021	0.105	0.93	0.84
	VH136637	691	0.452	0.095	1.01	0.89
	VH136630	691	1.508	0.084	1.24	1.32
	VH136636	691	1.741	0.084	1.23	1.38
	VH136607	691	-0.711	0.126	0.93	0.96
	VH136905	691	0.388	0.096	1.01	0.95
	VH136913	691	3.511	0.106	1.08	1.53
	VH136903	691	-0.315	0.113	1.02	0.93
	VH136918	691	0.815	0.089	1.21	1.26
	VH136916	691	0.505	0.094	1.04	1.08
	VH136747	691	1.314	0.085	1.15	1.21
	VH150319	691	-0.695	0.126	0.90	0.91
	VH150240	691	0.894	0.089	1.01	1.07
8	VH136635	692	2.682	0.089	1.31	1.63
	VH136634	692	0.965	0.089	0.95	0.90
	VH136633	692	0.813	0.090	0.96	0.92
	VH136626	692	1.515	0.085	1.21	1.33
	VH136623	692	0.756	0.091	1.02	1.03
	VH136614	692	1.878	0.084	1.03	1.04
	VH136922	692	2.730	0.090	1.12	1.54
	VH136896	692	1.764	0.084	0.99	1.00
	VH136909	692	0.723	0.091	1.10	1.25
	VH136899	692	0.292	0.099	1.21	1.41
	VH136892	692	1.842	0.084	1.15	1.21
	VH136882	692	0.035	0.104	0.97	0.96
	VH150341	692	-0.880	0.134	0.83	0.51
	VH150317	692	-0.725	0.128	0.92	0.72
9	VH134412	687	1.382	0.085	1.07	1.11
	VH134512	687	-0.115	0.109	0.90	0.77
	VH134567	687	2.253	0.086	1.10	1.20
	VH134427	687	2.158	0.085	0.98	1.10
	VH134407	687	1.197	0.087	1.16	1.28
	VH134544	687	1.728	0.085	0.85	0.83
	VH151873	687	1.892	0.085	1.06	1.08
	VH151849	687	1.541	0.085	1.03	1.06
	VH151835	687	1.389	0.085	1.26	1.35
	VH151852	687	1.620	0.085	1.16	1.19
	VH151866	687	1.799	0.084	1.11	1.13
	VH151834	687	1.338	0.086	1.21	1.27
	VH150312	687	0.741	0.091	0.88	0.76
	VH150336	687	-0.730	0.130	0.90	0.83

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
10	VH134574	694	2.342	0.086	1.08	1.20
	VH134422	694	0.302	0.098	0.86	0.71
	VH134526	694	2.342	0.086	1.02	1.16
	VH134539	694	3.721	0.111	1.21	2.47
	VH134521	694	0.174	0.101	1.06	1.32
	VH134580	694	0.916	0.089	1.03	1.07
	VH151858	694	0.283	0.098	0.97	0.89
	VH151830	694	1.370	0.085	1.21	1.31
	VH151851	694	0.515	0.094	0.96	0.93
	VH151862	694	1.223	0.086	1.01	1.02
	VH151871	694	1.163	0.087	0.96	0.92
	VH151825	694	1.238	0.086	0.98	0.97
	VH150267	694	1.414	0.085	1.08	1.11
	VH150331	694	0.312	0.098	0.91	0.80

Table H4. Reading Grade 6 IRT Statistics for Field Test Items

Form Number	Accession Number	N	Rasch Difficulty	Rasch SE	Infit	Outfit
1	VH153061	817	3.048	0.087	1.13	1.37
	VH153072	817	1.655	0.077	1.07	1.09
	VH153091	817	1.834	0.077	1.09	1.12
	VH153161	817	2.252	0.079	1.09	1.19
	VH153196	817	0.940	0.081	0.92	0.84
	VH153197	817	1.577	0.078	1.03	1.04
	VH134919	817	1.846	0.077	1.14	1.16
	VH134916	817	2.160	0.078	1.10	1.16
	VH135694	817	1.715	0.077	1.11	1.17
	VH134922	817	2.141	0.078	1.10	1.16
	VH134946	817	2.099	0.078	1.36	1.50
	VH134909	817	1.703	0.077	1.02	1.03
	VH152257	817	1.864	0.077	0.96	0.94
	VH152269	817	1.401	0.078	1.05	1.14
2	VH153064	693	1.663	0.085	1.07	1.09
	VH153068	693	1.663	0.085	1.04	1.03
	VH153076	693	1.677	0.085	1.17	1.24
	VH153081	693	1.869	0.084	1.00	1.01
	VH153209	693	0.078	0.107	0.90	0.76
	VH153204	693	1.933	0.084	1.17	1.24
	VH134939	693	1.834	0.084	1.04	1.09
	VH134930	693	2.760	0.088	1.07	1.20
	VH134974	693	-0.371	0.121	0.84	0.64
	VH134959	693	1.591	0.085	0.93	0.93
	VH134918	693	1.027	0.089	0.95	0.93
	VH134913	693	1.290	0.087	0.90	0.87
	VH152272	693	1.699	0.085	0.99	0.97
	VH152280	693	1.290	0.087	0.96	0.89
3	VH134786	704	0.063	0.106	0.93	0.92
	VH134805	704	1.917	0.082	1.16	1.21
	VH134870	704	1.561	0.083	0.94	0.91
	VH134823	704	0.650	0.093	0.88	0.76
	VH134799	704	1.911	0.082	1.10	1.12
	VH134867	704	1.829	0.083	1.19	1.25
	VH143947	704	1.271	0.085	1.00	1.03
	VH144101	704	3.147	0.092	1.23	1.75
	VH143977	704	1.519	0.084	1.12	1.17
	VH144131	704	2.204	0.083	0.97	1.02
	VH143983	704	2.957	0.089	1.40	1.79
	VH143937	704	3.063	0.091	1.24	1.55
	VH152247	704	0.544	0.095	1.00	0.94
	VH152250	704	1.212	0.086	1.07	1.04



Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
4	VH134875	704	2.331	0.084	1.00	1.05
	VH134792	704	1.392	0.085	1.07	1.13
	VH134830	704	0.678	0.093	1.08	1.19
	VH134845	704	1.224	0.086	1.07	1.04
	VH134796	704	1.283	0.086	1.13	1.18
	VH134859	704	1.478	0.084	1.06	1.07
	VH143969	704	2.127	0.084	1.08	1.14
	VH144124	704	2.148	0.084	1.04	1.10
	VH143964	704	2.367	0.085	1.00	1.01
	VH143967	704	2.036	0.083	1.04	1.07
	VH143972	704	1.946	0.083	1.06	1.10
	VH143933	704	1.696	0.084	1.07	1.08
	VH152277	704	1.668	0.084	1.01	1.00
	VH152275	704	0.965	0.089	1.06	1.07
5	VH147125	702	1.618	0.084	1.12	1.17
	VH147121	702	1.836	0.084	1.05	1.06
	VH147089	702	1.077	0.087	1.13	1.22
	VH147081	702	1.518	0.085	1.10	1.09
	VH147167	702	0.776	0.091	0.99	1.04
	VH147003	702	1.220	0.086	1.03	1.03
	VF806592	702	1.138	0.087	0.86	0.79
	VF806593	702	1.843	0.084	0.95	0.94
	VF806590	702	1.190	0.086	0.86	0.77
	VF806597	702	1.935	0.084	1.03	1.09
	VF806596	702	1.914	0.084	1.02	1.03
	VF806601	702	1.475	0.085	1.03	1.03
	VH152255	702	0.185	0.101	0.87	0.75
	VH152285	702	1.554	0.084	0.95	0.93
6	VH147023	687	1.649	0.085	1.05	1.07
	VH147109	687	3.406	0.098	1.18	1.69
	VH147072	687	0.353	0.102	0.93	0.95
	VH147102	687	-0.253	0.118	0.86	0.71
	VH147084	687	0.531	0.098	0.90	0.79
	VH146991	687	1.664	0.085	1.01	1.00
	VF806599	687	0.473	0.099	0.82	0.66
	VF806610	687	0.522	0.098	0.85	0.75
	VF806591	687	1.120	0.089	0.82	0.74
	VF806608	687	2.045	0.085	1.01	1.07
	VF806588	687	1.338	0.087	1.10	1.24
	VF806587	687	1.569	0.086	1.11	1.12
	VH152260	687	0.383	0.101	0.97	0.92

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
7	VF814592	683	0.588	0.099	1.11	1.19
	VF814585	683	1.679	0.086	1.15	1.18
	VF814581	683	1.969	0.085	1.06	1.10
	VF814528	683	1.440	0.087	1.10	1.13
	VF814488	683	-0.062	0.115	0.83	0.68
	VH151414	683	1.417	0.087	0.91	0.86
	VH151376	683	1.471	0.087	1.06	1.07
	VH151420	683	1.135	0.090	0.76	0.66
	VH151381	683	2.313	0.085	1.25	1.38
	VH151416	683	-0.129	0.117	0.89	0.73
	VH151405	683	1.875	0.085	1.20	1.26
	VH152237	683	1.940	0.085	1.04	1.05
	VH152239	683	0.078	0.111	0.84	0.64
8	VF814607	699	1.187	0.087	0.95	0.93
	VF814588	699	0.762	0.092	1.11	1.20
	VF814593	699	1.841	0.083	1.23	1.30
	VF814614	699	1.292	0.086	0.91	0.91
	VF814463	699	1.202	0.087	1.05	1.03
	VF814599	699	1.225	0.087	1.04	1.06
	VH151401	699	0.888	0.091	1.00	0.95
	VH151373	699	1.474	0.085	1.03	1.06
	VH151417	699	1.673	0.084	1.03	1.04
	VH151386	699	1.496	0.085	0.94	0.91
	VH151418	699	2.286	0.084	1.26	1.42
	VH151408	699	1.358	0.086	0.99	1.00
	VH152264	699	1.072	0.088	1.12	1.18
VH152234	699	2.588	0.086	1.12	1.22	
9	VH129551	703	0.345	0.100	0.94	0.93
	VH129577	703	0.748	0.092	0.99	0.95
	VH129569	703	-0.285	0.116	0.83	0.59
	VH129565	703	1.673	0.084	0.92	0.89
	VH129579	703	1.616	0.085	1.00	0.99
	VH129572	703	0.060	0.106	0.89	0.75
	VF883355	703	2.510	0.086	1.20	1.37
	VF883366	703	0.554	0.096	1.01	0.98
	VF883362	703	0.679	0.093	1.03	1.10
	VF883370	703	1.479	0.085	0.92	0.89
	VF883369	703	2.854	0.089	1.32	1.62
	VF883343	703	2.341	0.085	1.23	1.38
	VH152244	703	1.921	0.084	1.03	1.04
VH152232	703	2.105	0.084	1.00	1.06	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
10	VH129554	710	1.505	0.084	1.10	1.12
	VH129574	710	0.452	0.097	1.08	1.38
	VH129567	710	0.277	0.100	0.96	1.04
	VH129555	710	0.914	0.089	0.92	0.83
	VH129558	710	1.582	0.083	1.01	1.03
	VH129543	710	-1.272	0.164	1.01	1.11
	VF883349	710	0.675	0.093	1.04	0.97
	VF883373	710	1.540	0.084	0.98	0.97
	VF883358	710	-0.305	0.117	0.95	0.82
	VF883375	710	2.467	0.085	1.20	1.32
	VF883368	710	1.114	0.087	1.12	1.22
	VF883346	710	1.898	0.083	1.16	1.18
	VH152242	710	-0.541	0.126	0.85	0.55
	VH152228	710	-0.375	0.120	0.92	0.82

Table H5. Reading Grade 7 IRT Statistics for Field Test Items

Form Number	Accession Number	N	Rasch Difficulty	Rasch SE	Infit	Outfit
1	VH134620	795	0.900	0.087	1.00	0.99
	VH134634	795	1.279	0.083	0.92	0.86
	VH134610	795	2.692	0.081	1.09	1.19
	VH134643	795	3.716	0.095	1.27	1.99
	VH134592	795	0.967	0.086	0.92	0.84
	VH134632	795	0.960	0.086	0.92	0.84
	VH145764	795	1.126	0.084	0.89	0.91
	VH145732	795	3.373	0.089	0.93	1.01
	VH145788	795	2.189	0.079	1.28	1.35
	VH145792	795	1.750	0.080	1.16	1.24
	VH145798	795	2.170	0.079	1.22	1.33
	VH145805	795	2.157	0.079	1.08	1.10
	VH150781	795	1.641	0.080	0.92	0.88
	VH150789	795	1.525	0.081	0.95	0.89
2	VH134606	658	2.408	0.086	1.11	1.16
	VH134608	658	2.897	0.088	1.22	1.41
	VH134648	658	0.946	0.096	0.86	0.79
	VH134636	658	2.445	0.086	1.10	1.16
	VH134640	658	2.364	0.085	1.05	1.08
	VH134625	658	0.664	0.102	1.03	1.01
	VH145751	658	2.284	0.085	1.19	1.25
	VH145744	658	1.518	0.088	1.08	1.08
	VH145783	658	2.219	0.085	1.27	1.39
	VH145785	658	1.400	0.090	0.97	0.93
	VH145801	658	1.359	0.090	0.92	0.89
	VH145795	658	2.983	0.089	1.21	1.45
	VH150720	658	1.177	0.092	0.98	0.95
	VH150832	658	2.168	0.085	1.00	1.01
3	VF864440	659	0.749	0.101	1.02	1.03
	VF864366	659	-0.092	0.127	0.87	0.69
	VF864340	659	1.611	0.089	1.07	1.06
	VF864403	659	1.311	0.092	0.87	0.76
	VF864377	659	0.917	0.098	0.93	0.89
	VF864311	659	-0.334	0.137	0.90	0.78
	VH145458	659	2.044	0.086	1.04	1.05
	VH145413	659	3.374	0.094	1.32	1.78
	VH145478	659	1.191	0.093	0.92	0.89
	VH145473	659	1.697	0.088	0.99	0.95
	VH145530	659	2.141	0.086	0.97	0.95
	VH145535	659	1.353	0.091	1.10	1.10
	VH150659	659	0.578	0.105	0.85	0.70
	VH150695	659	3.007	0.089	1.16	1.32

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
4	VF864412	672	2.222	0.085	1.12	1.14
	VF864437	672	-0.189	0.125	0.92	0.75
	VF864425	672	0.747	0.098	0.86	0.75
	VF864363	672	1.306	0.090	1.10	1.24
	VF864443	672	0.888	0.096	0.91	0.82
	VF864304	672	-0.237	0.127	0.91	0.94
	VH145438	672	3.361	0.094	1.19	1.53
	VH145444	672	1.796	0.086	1.08	1.07
	VH145485	672	2.273	0.085	0.95	0.94
	VH145489	672	1.999	0.085	1.14	1.16
	VH145507	672	0.717	0.099	0.90	0.82
	VH145500	672	2.007	0.085	1.22	1.27
	VH150806	672	1.970	0.085	1.03	1.05
	VH150834	672	2.748	0.087	1.20	1.32
5	VF820216	671	-1.003	0.165	0.86	0.60
	VF820269	671	-0.061	0.120	0.90	0.86
	VF820301	671	0.643	0.101	0.86	0.76
	VF820251	671	1.531	0.088	1.09	1.14
	VF820315	671	1.461	0.089	0.98	0.94
	VF820071	671	3.444	0.096	1.05	1.38
	VH143751	671	1.218	0.091	1.10	1.14
	VH143733	671	2.750	0.087	1.05	1.11
	VH143746	671	2.637	0.087	1.16	1.21
	VH143741	671	0.207	0.112	0.96	0.96
	VH143646	671	2.173	0.085	0.98	0.96
	VH143655	671	2.085	0.086	1.22	1.27
	VH150809	671	-0.487	0.137	0.86	0.51
	VH150842	671	0.762	0.098	0.92	0.95
6	VF820282	639	2.183	0.087	1.14	1.22
	VF820333	639	1.862	0.088	1.05	1.07
	VF820224	639	1.117	0.095	1.15	1.33
	VF820260	639	2.387	0.087	0.95	0.95
	VF820210	639	1.594	0.090	1.01	1.00
	VF820351	639	2.053	0.087	1.02	1.02
	VH143754	639	2.107	0.087	1.13	1.13
	VH143660	639	0.870	0.100	0.93	0.85
	VH143663	639	2.633	0.088	1.03	1.09
	VH143760	639	0.204	0.117	0.91	0.79
	VH143648	639	1.626	0.090	0.95	0.95
	VH143599	639	0.003	0.124	0.97	0.90
	VH150820	639	1.496	0.091	0.96	0.93
	VH150844	639	0.106	0.120	0.95	0.99

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
7	VH134705	682	2.803	0.087	1.28	1.45
	VH134721	682	0.793	0.096	1.00	1.15
	VH134716	682	3.078	0.090	1.18	1.34
	VH134710	682	1.474	0.087	1.01	1.05
	VH134693	682	0.756	0.096	0.93	0.90
	VH134667	682	1.653	0.086	1.02	1.02
	VH152519	682	2.233	0.084	1.09	1.13
	VH152557	682	1.055	0.092	0.93	0.87
	VH152489	682	1.352	0.088	0.96	0.92
	VH152528	682	1.030	0.092	1.00	0.98
	VH152483	682	1.482	0.087	1.07	1.09
	VH152550	682	1.697	0.085	0.99	0.97
	VH150841	682	1.297	0.089	0.87	0.78
	VH150845	682	0.202	0.109	0.91	0.85
8	VH134700	654	-0.584	0.148	0.87	0.57
	VH134664	654	1.959	0.086	0.95	0.94
	VH134676	654	0.461	0.108	0.92	0.91
	VH134720	654	2.078	0.086	1.04	1.05
	VH134715	654	1.248	0.093	1.12	1.25
	VH134718	654	0.076	0.119	0.88	0.82
	VH152532	654	3.036	0.090	1.17	1.55
	VH152510	654	1.884	0.087	1.14	1.15
	VH152524	654	1.763	0.087	1.06	1.09
	VH152542	654	1.808	0.087	0.96	0.93
	VH152462	654	0.329	0.112	0.98	1.03
	VH152535	654	2.218	0.086	1.09	1.12
	VH150792	1324	0.314	0.078	0.90	0.77
	VH150837	1320	2.367	0.061	1.33	1.50
9	VH151023	670	2.988	0.089	1.06	1.19
	VH151026	670	2.706	0.086	1.07	1.11
	VH151036	670	1.674	0.086	1.04	1.08
	VH151014	670	1.961	0.085	0.90	0.86
	VH150992	670	3.767	0.102	1.12	1.38
	VH150970	670	0.148	0.115	0.87	0.66
	VH145334	670	1.024	0.094	1.01	0.99
	VH145365	670	2.018	0.085	0.97	0.96
	VH145322	670	1.786	0.086	1.15	1.21
	VH145305	670	0.997	0.094	0.96	0.89
	VH145288	670	1.946	0.085	1.17	1.22
	VH145344	670	1.771	0.086	0.96	0.94
	VH150839	1336	1.996	0.060	1.10	1.11

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
10	VH151038	666	1.372	0.090	1.10	1.06
	VH151034	666	2.946	0.089	1.02	1.14
	VH151031	666	0.554	0.103	0.98	0.94
	VH150987	666	2.428	0.086	1.05	1.07
	VH151028	666	1.249	0.091	1.12	1.11
	VH150980	666	1.788	0.086	1.11	1.12
	VH145328	666	2.789	0.088	0.94	0.96
	VH145347	666	1.675	0.087	1.08	1.10
	VH145309	666	1.811	0.086	1.03	1.03
	VH145359	666	1.811	0.086	0.97	0.95
	VH145320	666	-0.128	0.124	0.87	0.64
	VH145352	666	0.668	0.101	0.96	0.84

Table H6. Reading Grade 8 IRT Statistics for Field Test Items

Form Number	Accession Number	N	Rasch Difficulty	Rasch SE	Infit	Outfit
1	VH146556	745	1.527	0.084	0.93	0.87
	VH146544	745	2.723	0.083	1.02	1.10
	VH146563	745	4.514	0.118	1.18	2.50
	VH146564	745	2.662	0.083	1.12	1.13
	VH146586	745	2.506	0.082	0.95	0.99
	VH146582	745	1.674	0.083	0.89	0.83
	VH152383	745	3.006	0.085	1.25	1.44
	VH152400	745	1.235	0.087	1.06	1.15
	VH152391	745	0.976	0.090	0.80	0.67
	VH152370	745	3.013	0.085	1.12	1.24
	VH152415	745	1.632	0.083	1.15	1.20
	VH152422	745	0.825	0.093	0.87	0.79
	VH151091	745	1.906	0.082	1.12	1.18
	VH151050	745	1.999	0.082	1.20	1.26
2	VH146553	669	1.548	0.090	1.21	1.31
	VH146548	669	1.882	0.087	1.01	1.00
	VH146567	669	1.920	0.087	0.90	0.88
	VH146571	669	1.776	0.088	1.00	0.95
	VH146591	669	2.872	0.087	1.33	1.54
	VH146577	669	3.224	0.090	1.22	1.42
	VH152367	669	2.025	0.086	0.93	0.93
	VH152406	669	2.979	0.088	1.28	1.49
	VH152394	669	2.370	0.085	1.03	1.05
	VH152362	669	0.631	0.106	0.86	0.73
	VH152434	669	1.273	0.093	0.93	0.84
	VH152351	669	2.933	0.087	1.14	1.20
	VH151048	669	0.126	0.121	0.87	0.74
	VH151054	669	0.771	0.102	0.94	0.93
3	VF820698	675	1.354	0.091	0.91	0.85
	VF820719	675	2.462	0.085	1.07	1.13
	VF820722	675	3.063	0.088	1.16	1.38
	VF820762	675	2.173	0.085	1.11	1.10
	VF820799	675	1.321	0.092	0.97	0.92
	VF820820	675	1.287	0.092	0.96	0.91
	VH130185	675	2.433	0.085	1.12	1.20
	VH130117	675	0.755	0.102	1.02	1.04
	VH130206	675	0.332	0.113	0.87	0.64
	VH130197	675	2.768	0.086	1.24	1.39
	VH130176	675	3.479	0.093	1.27	1.79
	VH130211	675	1.667	0.088	0.91	0.88
	VH151057	675	0.240	0.116	0.92	0.89
	VH151083	675	0.071	0.122	0.84	0.65



Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
4	VF820705	678	2.518	0.086	1.08	1.15
	VF820751	678	-0.081	0.126	0.80	0.53
	VF820713	678	1.922	0.087	1.17	1.24
	VF820728	678	0.400	0.110	0.92	1.04
	VF820776	678	2.049	0.086	1.18	1.22
	VF820816	678	-0.374	0.138	0.81	0.50
	VH130133	678	0.704	0.103	0.95	0.84
	VH130137	678	0.300	0.113	0.88	0.69
	VH130237	678	0.847	0.100	0.88	0.81
	VH130248	678	2.518	0.086	1.12	1.21
	VH130180	678	1.103	0.095	0.92	0.84
	VH130223	678	0.235	0.115	0.87	0.70
	VH151059	678	2.320	0.085	1.01	1.03
	VH151078	678	0.084	0.120	0.80	0.64
5	VH138062	675	2.389	0.085	1.20	1.26
	VH138021	675	2.338	0.085	1.00	1.01
	VH138034	675	1.834	0.086	1.14	1.24
	VH138016	675	0.619	0.104	0.92	0.85
	VH138045	675	2.165	0.085	1.18	1.24
	VH138006	675	2.381	0.085	1.07	1.16
	VH146485	675	1.606	0.088	1.12	1.11
	VH146468	675	0.816	0.100	0.93	0.86
	VH146510	675	1.248	0.092	1.07	1.04
	VH146522	675	1.629	0.088	1.00	0.95
	VH146531	675	1.968	0.086	1.14	1.14
	VH146533	675	2.048	0.085	1.06	1.09
	VH151092	675	3.233	0.090	1.15	1.39
	VH151102	675	1.698	0.087	1.03	1.04
6	VH138025	646	0.786	0.104	0.92	0.86
	VH138029	646	-0.065	0.131	0.97	0.94
	VH138048	646	2.092	0.087	1.04	1.06
	VH138067	646	3.328	0.092	1.37	1.79
	VH138069	646	2.047	0.087	1.19	1.21
	VH138055	646	0.861	0.102	1.15	1.35
	VH146478	646	-0.031	0.129	0.89	0.67
	VH146481	646	1.319	0.094	0.92	0.85
	VH146514	646	1.138	0.097	0.91	0.86
	VH146518	646	1.894	0.088	1.10	1.14
	VH146526	646	2.579	0.087	1.19	1.30
	VH146528	646	1.534	0.091	0.99	0.96
	VH151073	646	2.047	0.087	1.11	1.14
	VH151086	646	0.383	0.115	0.87	0.65

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
7	VH140471	656	3.131	0.090	1.29	1.53
	VH140451	656	1.796	0.088	1.08	1.06
	VH140466	656	1.992	0.086	1.21	1.28
	VH140473	656	1.592	0.089	0.98	0.97
	VH140441	656	2.339	0.086	0.99	1.02
	VH140457	656	3.156	0.090	1.18	1.39
	VH151610	656	1.250	0.094	1.06	1.06
	VH151646	656	0.406	0.112	0.95	0.88
	VH151651	656	2.515	0.086	1.12	1.14
	VH151631	656	0.964	0.099	0.98	0.97
	VH151604	656	-0.600	0.155	0.87	0.86
	VH151649	656	0.751	0.103	0.99	0.93
	VH151112	656	3.568	0.096	1.06	1.31
	VH151117	656	-0.101	0.130	0.86	0.59
8	VH140455	706	0.893	0.097	0.93	0.85
	VH140468	706	2.339	0.084	1.09	1.14
	VH140477	706	3.687	0.095	1.16	1.63
	VH140453	706	2.402	0.084	1.14	1.21
	VH140437	706	0.552	0.104	0.97	0.92
	VH140461	706	0.464	0.106	0.95	0.86
	VH151648	706	0.668	0.101	0.87	0.72
	VH151630	706	0.616	0.102	0.94	0.79
	VH151644	706	0.418	0.107	0.85	0.68
	VH151639	706	2.402	0.084	1.11	1.16
	VH151594	706	1.382	0.089	0.84	0.74
	VH151601	706	1.561	0.087	0.98	0.95
	VH151089	706	1.606	0.087	0.95	0.94
	VH151098	706	2.937	0.086	1.14	1.30
9	VH142369	661	2.569	0.086	1.15	1.29
	VH142376	661	1.389	0.091	1.04	1.06
	VH142414	661	2.731	0.086	1.13	1.20
	VH142420	661	1.158	0.094	1.03	0.99
	VH142401	661	2.015	0.086	1.16	1.21
	VH142352	661	0.767	0.102	1.10	1.34
	VH133897	661	1.021	0.097	1.05	1.06
	VH133954	661	1.723	0.088	1.06	1.07
	VH133924	661	0.561	0.107	1.04	1.10
	VH133887	661	1.373	0.091	0.96	0.94
	VH133948	661	3.269	0.091	1.19	1.41
	VH133936	661	1.246	0.093	1.00	1.01
	VH151104	661	0.661	0.104	0.95	0.86
	VH151119	661	3.337	0.092	1.18	1.47

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
10	VH142381	675	0.195	0.118	0.95	0.97
	VH142392	675	0.568	0.106	0.90	0.78
	VH142373	675	1.179	0.094	1.11	1.06
	VH142388	675	3.745	0.098	1.17	1.76
	VH142432	675	2.451	0.084	1.20	1.31
	VH142422	675	1.921	0.086	0.93	0.92
	VH133916	675	2.359	0.084	1.16	1.23
	VH133893	675	1.906	0.086	1.11	1.14
	VH133958	675	2.001	0.085	1.07	1.08
	VH133883	675	2.515	0.084	1.14	1.21
	VH129586	675	0.803	0.101	1.00	0.93
	VH133871	675	0.236	0.116	0.94	1.03
	VH151116	675	3.904	0.101	1.20	1.96
	VH151121	675	3.028	0.087	1.00	1.09

*Mathematics*

Table H7. Mathematics Grade 3 IRT Statistics for Field Test Items

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
1	VH095335	807	0.483	0.080	1.07	1.09
	VH103485	807	0.603	0.080	0.92	0.90
	VH095567	807	-0.277	0.083	0.86	0.79
	VH103612	807	2.163	0.093	1.22	2.04
	VH122585	807	1.970	0.090	1.17	1.67
	VH095522	807	-0.040	0.082	0.85	0.78
	VH098006	807	0.863	0.080	1.02	1.04
	VH095532	807	-0.882	0.091	1.00	0.99
	VH094859	807	-0.033	0.081	0.96	0.92
	VH125344	807	0.381	0.080	1.03	1.03
VH094974	807	1.921	0.089	1.28	1.68	
2	VH095385	757	2.445	0.099	1.22	1.91
	VH095424	757	0.034	0.084	1.03	1.03
	VH122552	757	1.842	0.089	1.28	1.63
	VH103626	757	0.953	0.082	1.08	1.14
	VH103583	757	2.935	0.113	1.10	1.65
	VH125430	757	-0.279	0.087	1.00	0.96
	VH095256	757	1.562	0.085	1.16	1.33
	VH103646	757	0.708	0.081	1.09	1.18
	VH094980	757	-0.554	0.091	0.89	0.88
	VH122544	757	0.349	0.082	1.10	1.16
	VH103399	757	2.620	0.104	1.10	1.51
VH095623	757	0.443	0.082	0.91	0.88	
3	VH094883	752	2.072	0.093	1.02	1.13
	VH097969	752	0.629	0.081	1.17	1.20
	VH095365	752	0.775	0.081	1.03	1.08
	VH095451	752	-0.083	0.084	1.01	0.97
	VH098043	752	-0.061	0.084	1.13	1.19
	VH125333	752	-2.055	0.134	0.95	0.85
	VH095276	752	0.576	0.081	1.08	1.14
	VH095493	752	0.155	0.083	0.93	0.89
	VH125380	752	-0.333	0.087	1.07	1.10
	VH095407	752	-0.257	0.086	1.02	1.02
VH098021	752	0.397	0.082	1.01	1.01	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
4	VH095585	742	-0.073	0.085	0.85	0.79
	VH103475	742	0.489	0.082	1.03	1.01
	VH097990	742	1.661	0.088	1.21	1.48
	VH125347	742	1.708	0.088	1.04	1.20
	VH103547	742	-0.865	0.097	0.95	0.87
	VH095298	742	0.893	0.082	1.00	0.99
	VH122582	742	-0.668	0.093	0.82	0.65
	VH094851	742	0.502	0.082	1.07	1.07
	VH103449	742	-1.230	0.105	1.08	1.20
	VH103560	742	1.408	0.085	1.08	1.14
	VH095446	742	-0.846	0.096	0.84	0.73
	VH095395	742	0.442	0.082	1.02	1.03
5	VH095317	746	1.733	0.089	1.13	1.49
	VH095488	746	-0.942	0.098	0.86	0.85
	VH122533	746	-0.469	0.090	1.03	1.03
	VH095373	746	0.149	0.084	1.00	1.00
	VH125353	746	2.135	0.095	1.19	1.51
	VH122573	746	0.363	0.083	0.94	0.92
	VH103631	746	1.070	0.083	1.17	1.25
	VH095414	746	1.251	0.084	1.15	1.29
	VH103507	746	0.974	0.083	1.14	1.20
	VH094976	746	-0.176	0.086	1.06	1.10
	VH103467	746	2.579	0.104	0.92	0.90
	VH095555	746	-0.775	0.095	0.93	0.89
6	VH095347	757	-0.123	0.086	0.87	0.79
	VH094953	757	0.545	0.082	1.01	0.98
	VH095289	757	1.206	0.083	1.02	1.00
	VH103654	757	-0.680	0.093	0.94	0.95
	VH103587	757	-0.715	0.094	1.19	1.80
	VH098028	757	1.431	0.085	0.96	1.00
	VH095501	757	0.008	0.085	0.79	0.69
	VH125375	757	3.571	0.134	1.12	2.62
	VH125412	757	-1.443	0.112	1.07	1.07
	VH103620	757	0.044	0.084	0.87	0.79
	VH098047	757	0.807	0.082	1.32	1.43
	VH097983	757	1.029	0.082	0.97	1.00

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
7	VH103572	748	-1.495	0.112	1.02	1.01
	VH094934	748	1.269	0.084	1.18	1.24
	VH103652	748	-0.508	0.089	1.12	1.41
	VH098050	748	1.090	0.082	1.08	1.11
	VH125404	748	1.648	0.087	1.25	1.52
	VH094982	748	0.328	0.082	1.00	0.99
	VH122561	748	0.651	0.081	1.18	1.25
	VH098024	748	-1.940	0.129	1.03	1.00
	VH095406	748	0.288	0.082	1.05	1.08
	VH103554	748	-0.033	0.084	0.97	0.98
	VH103604	748	-0.564	0.090	0.93	0.85
VH095438	748	-0.154	0.085	0.82	0.73	
8	VH103497	744	0.615	0.083	0.85	0.80
	VH125300	744	-0.764	0.095	0.89	0.81
	VH125445	744	2.629	0.106	1.17	2.17
	VH095359	744	0.132	0.084	0.90	0.84
	VH095279	744	1.469	0.086	1.24	1.37
	VH103637	744	-0.616	0.092	1.13	1.36
	VH094920	744	-0.845	0.096	0.91	0.83
	VH097967	744	0.465	0.083	0.86	0.84
	VH103598	744	0.758	0.083	0.98	0.96
	VH094957	744	0.438	0.083	1.02	1.03
VH098018	744	0.410	0.083	1.27	1.46	
9	VH103521	732	0.874	0.083	1.03	1.04
	VH095324	732	1.047	0.084	1.03	1.06
	VH094890	732	1.195	0.084	0.90	0.95
	VH098032	732	0.332	0.083	1.20	1.27
	VH098039	732	1.733	0.089	1.19	1.36
	VH122577	732	1.331	0.085	0.97	0.98
	VH095431	732	2.014	0.093	1.30	1.70
	VH095303	732	1.569	0.087	1.06	1.14
	VH095379	732	-1.146	0.104	0.98	0.89
	VH095268	732	-1.304	0.109	0.87	0.61
	VH103593	732	0.744	0.083	1.00	1.00
VH094991	732	1.508	0.087	1.12	1.27	
10	VH098035	720	-2.148	0.140	1.03	0.99
	VH095413	720	1.504	0.089	1.05	1.13
	VH094960	720	-1.058	0.101	0.92	0.75
	VH095290	720	-0.147	0.087	0.92	0.85
	VH095606	720	0.734	0.084	0.92	0.89
	VH095306	720	0.989	0.085	1.14	1.18
	VH097973	720	2.306	0.101	0.94	0.92
	VH094971	720	0.839	0.084	0.88	0.87
	VH094989	720	0.565	0.084	1.32	1.72
	VH098042	720	1.372	0.087	1.05	1.09
	VH094951	720	0.960	0.085	0.86	0.83
VH103650	720	1.730	0.091	1.05	1.14	

Table H8. Mathematics Grade 4 IRT Statistics for Field Test Items

Form Number	Accession Number	N	Rasch Difficulty	Rasch SE	Infit	Outfit
1	VH097287	838	1.819	0.079	0.85	0.85
	VH097576	838	1.496	0.078	0.99	0.99
	VH097347	838	1.694	0.079	0.97	1.01
	VH104648	838	1.037	0.079	1.23	1.39
	VH103600	838	2.024	0.081	1.07	1.16
	VH103401	838	1.337	0.078	0.98	0.95
	VH118094	838	1.819	0.079	1.04	1.07
	VH103492	838	2.050	0.081	1.19	1.33
	VH118312	838	-1.042	0.115	0.88	0.69
	VH097141	838	1.227	0.078	1.04	1.06
	VH097368	838	1.940	0.080	0.88	0.89
VH097185	838	1.018	0.079	1.12	1.29	
2	VH097502	744	-0.155	0.099	0.93	0.91
	VH097277	744	2.531	0.089	0.80	0.74
	VH124331	744	0.495	0.088	0.96	0.88
	VH118090	744	0.103	0.094	0.86	0.75
	VH097255	744	-0.215	0.100	0.93	0.75
	VH118288	744	1.312	0.082	1.14	1.18
	VH104580	744	1.548	0.082	1.10	1.25
	VH124473	744	1.753	0.083	0.97	0.99
	VH103697	744	1.946	0.084	1.21	1.34
	VH104641	744	2.088	0.085	1.17	1.24
VH097562	744	1.223	0.083	1.06	1.11	
3	VH097534	724	-0.220	0.101	0.98	1.12
	VH124439	724	1.381	0.083	1.30	1.53
	VH097202	724	2.477	0.089	1.06	1.24
	VH124426	724	0.393	0.090	1.03	1.05
	VH097528	724	-1.037	0.129	0.96	0.88
	VH124450	724	1.415	0.083	1.00	0.96
	VH097401	724	3.875	0.121	1.02	1.33
	VH097169	724	1.312	0.083	1.07	1.14
	VH097423	724	-0.880	0.122	1.06	1.03
VH097289	724	1.409	0.083	1.00	1.00	
4	VH097484	712	0.832	0.086	1.12	1.18
	VH128854	712	1.203	0.084	0.97	0.93
	VH124309	712	1.048	0.084	1.04	1.01
	VH097242	712	2.112	0.085	1.16	1.27
	VH118284	712	-0.008	0.098	0.89	0.78
	VH097479	712	1.020	0.084	0.87	0.82
	VH103388	712	2.556	0.090	1.13	1.32
	VH097184	712	1.321	0.083	1.21	1.28
	VH097325	712	0.298	0.092	0.95	0.88
	VH104555	712	1.701	0.083	1.00	0.98
	VH097324	712	1.701	0.083	1.02	1.02
VH097353	712	0.194	0.094	0.95	0.97	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
	VH097190	708	1.707	0.084	0.93	0.91
	VH097139	708	0.588	0.089	0.84	0.73
	VH097535	708	2.828	0.095	1.15	1.38
	VH097338	708	1.206	0.084	0.98	1.06
	VH097516	708	0.229	0.094	0.92	0.82
	VH097435	708	1.439	0.084	0.94	0.92
	VH128825	708	2.530	0.090	1.14	1.33
	VH104561	708	1.665	0.084	1.02	1.07
	VH103564	708	1.091	0.085	0.98	0.94
	VH097438	708	0.628	0.089	1.06	1.06
	VH097464	708	2.046	0.086	0.93	0.91
	VH124416	725	2.412	0.088	1.09	1.18
	VH118306	725	1.993	0.084	0.98	1.03
	VH097231	725	2.007	0.084	1.04	1.06
	VH124358	725	-0.301	0.105	0.90	0.74
	VH124227	725	0.580	0.088	1.10	1.12
6	VH103486	725	2.351	0.087	1.23	1.46
	VH104623	725	0.725	0.087	0.91	0.88
	VH104591	725	1.908	0.084	1.06	1.09
	VH097262	725	-0.279	0.104	0.95	0.86
	VH097521	725	0.572	0.088	0.86	0.76
	VH097374	725	1.845	0.084	0.98	0.98
	VH097472	725	1.789	0.083	1.05	1.08
	VH103422	713	3.012	0.099	1.08	1.19
	VH104545	713	2.391	0.089	1.01	1.04
	VH118316	713	0.246	0.092	0.99	0.90
	VH124349	713	1.520	0.084	1.03	1.03
	VH097512	713	1.359	0.084	1.22	1.28
7	VH103471	713	2.733	0.094	1.27	1.46
	VH118315	713	1.492	0.084	1.09	1.12
	VH097308	713	2.040	0.086	1.01	1.01
	VH097315	713	2.391	0.089	0.94	0.95
	VH103376	713	1.121	0.084	0.92	0.88
	VH118322	713	1.499	0.084	0.89	0.88
	VH118279	713	2.646	0.093	1.14	1.23
	VH103411	710	1.517	0.084	0.98	1.00
	VH097505	710	0.401	0.091	0.98	0.94
	VH097490	710	3.320	0.105	1.03	1.19
	VH104572	710	2.073	0.086	1.18	1.32
	VH118320	710	1.461	0.084	0.85	0.81
8	VH097382	710	1.792	0.084	0.99	1.00
	VH124216	710	2.464	0.090	0.98	1.07
	VH103550	710	0.823	0.086	0.88	0.87
	VH103590	710	2.133	0.086	1.04	1.14
	VH124444	710	-0.220	0.103	0.92	0.87
	VH097563	710	0.890	0.086	1.06	1.10



Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
9	VH097402	701	1.274	0.085	1.14	1.17
	VH097224	701	2.226	0.087	0.90	0.92
	VH097093	701	0.205	0.097	1.00	0.94
	VH128865	701	2.783	0.093	1.22	1.58
	VH124323	701	-0.043	0.103	0.91	0.85
	VH118294	701	2.575	0.090	0.94	0.90
	VH103477	701	2.144	0.086	1.24	1.31
	VH124180	701	1.310	0.085	1.04	1.02
	VH103556	701	1.259	0.085	1.10	1.10
	VH097174	701	-0.543	0.117	0.86	0.66
	VH097542	701	0.918	0.087	1.00	0.97
	VH097569	701	1.532	0.084	1.05	1.05
10	VH103619	698	1.902	0.085	1.11	1.17
	VH097558	698	-0.476	0.112	0.96	0.86
	VH103693	698	1.800	0.085	1.07	1.08
	VH104657	698	2.362	0.089	1.13	1.18
	VH097429	698	1.693	0.084	1.06	1.11
	VH097547	698	2.123	0.087	1.35	1.59
	VH097446	698	3.377	0.107	0.89	0.90
	VH103443	698	1.117	0.085	0.91	0.86
	VH097218	698	-0.189	0.103	0.96	1.01
	VH097334	698	-0.646	0.117	0.87	0.65
	VH118318	698	2.168	0.087	1.29	1.51
	VH097497	698	0.015	0.099	1.01	0.90

Table H9. Mathematics Grade 5 IRT Statistics for Field Test Items

Form Number	Accession Number	N	Rasch Difficulty	Rasch SE	Infit	Outfit
1	VH095137	773	2.705	0.085	0.99	0.96
	VH098064	773	3.544	0.097	1.13	1.43
	VH095140	773	1.947	0.081	1.03	1.11
	VH104510	773	2.040	0.081	1.13	1.16
	VH094999	773	3.345	0.093	1.32	1.74
	VH092895	773	2.066	0.081	1.17	1.22
	VH099708	773	2.764	0.086	1.32	1.56
	VH095099	773	1.399	0.082	1.08	1.17
	VH094418	773	2.465	0.083	0.87	0.87
	VF880726	773	1.003	0.085	0.88	0.84
	VH094466	773	2.159	0.082	1.09	1.08
VF491791	773	1.783	0.081	0.85	0.79	
2	VH099627	682	2.350	0.089	1.06	1.07
	VH094899	682	2.789	0.092	1.25	1.45
	VF491942	682	1.246	0.089	0.97	1.03
	VH103721	682	2.437	0.089	0.98	0.94
	VH095123	682	2.516	0.090	1.02	1.05
	VH098020	682	2.630	0.091	1.05	1.07
	VH094918	682	1.956	0.087	1.03	1.05
	VH094318	682	2.055	0.087	0.98	0.97
	VH094425	682	1.644	0.087	0.88	0.84
	VH094602	682	2.484	0.089	1.18	1.30
	VH094858	682	0.722	0.095	0.91	0.92
VH104411	682	1.254	0.089	0.99	1.01	
3	VH099900	671	3.158	0.095	1.06	1.22
	VH095125	671	3.086	0.094	1.13	1.29
	VH092750	671	2.642	0.089	1.18	1.29
	VH094943	671	2.384	0.088	1.34	1.45
	VF491933	671	1.899	0.087	0.71	0.65
	VH098046	671	2.666	0.090	1.32	1.46
	VH104447	671	0.912	0.094	1.07	1.12
	VH104384	671	3.240	0.096	1.03	1.16
	VH094333	671	3.353	0.098	1.15	1.33
	VH099875	671	2.764	0.090	1.11	1.13
	VH103760	671	1.487	0.088	0.89	0.80
VH098003	671	2.322	0.087	1.35	1.48	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
4	VH095116	680	2.426	0.087	0.97	0.97
	VH094310	680	1.936	0.086	1.09	1.08
	VF491755	680	2.730	0.089	0.92	0.96
	VH104507	680	1.205	0.089	1.23	1.40
	VH094499	680	2.404	0.087	1.08	1.12
	VH092830	680	0.993	0.092	0.95	0.89
	VH095017	680	1.634	0.086	0.97	0.93
	VH099674	680	3.063	0.093	1.00	1.06
	VH095138	680	2.698	0.089	1.30	1.44
	VH094305	680	0.803	0.094	1.00	1.00
	VH103744	680	2.595	0.088	1.14	1.19
VH103708	680	0.934	0.092	1.03	0.98	
5	VH098060	683	2.888	0.091	1.10	1.09
	VH099860	683	2.871	0.091	1.13	1.25
	VF741551	683	2.143	0.085	1.12	1.21
	VH094808	683	2.530	0.088	1.18	1.23
	VH104438	683	2.312	0.086	1.11	1.12
	VH092998	683	2.545	0.088	1.17	1.26
	VF491989	683	1.644	0.085	1.02	1.04
	VH099667	683	2.913	0.091	0.93	0.95
	VH094365	683	1.288	0.087	1.03	1.00
	VH103717	683	0.500	0.098	1.03	1.05
VH104501	683	2.297	0.086	1.21	1.29	
6	VH094413	689	2.110	0.086	1.11	1.13
	VH093943	689	1.655	0.086	1.07	1.12
	VH095090	689	2.809	0.090	1.36	1.56
	VH094485	689	2.543	0.088	1.22	1.31
	VH095128	689	2.573	0.088	1.04	1.10
	VH092936	689	2.504	0.087	1.41	1.58
	VH098054	689	2.421	0.087	1.03	1.05
	VF491982	689	1.978	0.085	0.83	0.79
	VH103548	689	1.810	0.086	0.89	0.83
	VF819940	689	2.753	0.089	1.23	1.36
	VH098011	689	1.346	0.088	1.04	1.06
VH104342	689	2.769	0.089	0.85	0.81	
7	VH099721	671	2.499	0.089	0.93	0.89
	VH103562	671	1.573	0.088	0.80	0.73
	VH093957	671	1.749	0.087	0.96	0.94
	VH097998	671	3.463	0.102	1.24	1.49
	VH103703	671	3.601	0.105	1.30	1.72
	VH103591	671	2.380	0.089	0.98	1.04
	VH092986	671	3.021	0.095	0.97	0.98
	VF492122	671	1.542	0.088	1.07	1.13
	VH093987	671	3.244	0.098	1.15	1.59
	VH104394	671	1.448	0.088	0.87	0.80
VH103731	671	2.435	0.089	1.32	1.44	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
8	VH099742	677	1.650	0.088	0.96	0.89
	VH095132	677	1.976	0.088	0.89	0.83
	VH095048	677	2.906	0.093	1.01	1.09
	VH098053	677	2.687	0.091	1.02	1.02
	VH094344	677	1.056	0.093	0.96	0.96
	VH099618	677	2.923	0.093	1.10	1.27
	VF740948	677	0.378	0.104	0.99	0.96
	VH103629	677	1.720	0.088	1.13	1.10
	VH104403	677	2.248	0.088	0.82	0.76
	VH103570	677	2.022	0.088	0.99	0.97
	VF492269	677	1.073	0.093	0.87	0.82
9	VF819983	657	2.922	0.094	1.09	1.17
	VH095095	657	2.187	0.089	0.92	0.90
	VH099648	657	2.922	0.094	1.14	1.33
	VH094878	657	3.139	0.096	1.08	1.24
	VH098013	657	2.411	0.090	1.17	1.23
	VH099771	657	3.301	0.099	1.12	1.31
	VH093804	657	1.254	0.092	1.06	1.08
	VH103584	657	0.977	0.094	0.87	0.79
	VF492271	657	1.004	0.094	0.85	0.72
	VH094250	657	2.508	0.090	1.21	1.38
	VF492275	657	0.401	0.104	0.96	0.81
10	VF736488	655	0.802	0.096	1.11	1.18
	VH094283	655	2.630	0.090	1.16	1.25
	VF866042	655	0.755	0.096	1.19	1.74
	VH099804	655	2.352	0.088	1.06	1.10
	VH098017	655	1.862	0.087	0.98	0.98
	VH098037	655	2.598	0.090	1.29	1.46
	VH104363	655	2.220	0.088	0.88	0.84
	VH092967	655	1.376	0.089	0.96	0.98
	VH103532	655	3.312	0.099	1.12	1.35
	VF492218	655	1.165	0.091	1.03	0.97
	VH094296	655	1.602	0.088	1.23	1.37

Table H10. Mathematics Grade 6 IRT Statistics for Field Test Items

Form Number	Accession Number	N	Rasch Difficulty	Rasch SE	Infit	Outfit
1	VH118600	869	3.154	0.079	1.05	1.11
	VH135088	869	1.959	0.075	0.99	0.96
	VH118609	869	3.012	0.078	1.00	1.04
	VH120376	869	2.963	0.078	1.20	1.29
	VH121630	869	1.371	0.079	1.02	1.04
	VH141145	869	2.633	0.076	1.05	1.05
	VH118541	869	3.416	0.083	1.31	1.57
	VH136341	869	2.411	0.075	1.39	1.65
	VH121591	869	1.676	0.077	0.95	0.91
	VH121046	869	1.068	0.083	0.95	0.91
	VF492746	869	2.490	0.075	1.06	1.05
VH121658	869	2.490	0.075	0.96	0.95	
2	VH135208	673	3.203	0.089	1.18	1.24
	VH118685	673	2.002	0.087	0.92	0.87
	VH135098	673	1.051	0.099	0.94	0.79
	VH120441	673	3.489	0.092	1.30	1.49
	VH136323	673	-0.537	0.162	0.99	1.19
	VH121113	673	0.919	0.102	0.91	0.93
	VH118525	673	1.740	0.089	1.06	1.07
	VH141006	673	3.267	0.089	1.20	1.32
	VH141242	673	0.504	0.114	0.97	1.01
	VH140952	673	3.291	0.090	1.04	1.08
VH118579	673	2.468	0.086	0.96	0.97	
3	VH135116	668	1.887	0.088	0.98	1.03
	VH120455	668	2.493	0.087	1.08	1.13
	VH118671	668	2.231	0.087	1.01	1.02
	VH135313	668	1.565	0.091	1.01	1.04
	VH141014	668	2.523	0.087	0.99	0.98
	VH121101	668	2.140	0.087	0.98	0.97
	VH140956	668	3.299	0.091	1.17	1.32
	VH118560	668	1.720	0.090	0.99	0.98
	VH140947	668	2.478	0.087	1.12	1.12
	VH118531	668	2.591	0.087	1.06	1.15
	VH141199	668	2.719	0.087	1.18	1.23
VF822069	668	2.879	0.088	1.21	1.31	
4	VH118676	693	2.075	0.085	0.95	0.94
	VH135342	693	0.781	0.103	0.89	0.82
	VH120466	693	3.231	0.088	1.08	1.11
	VF741760	693	-0.030	0.130	0.93	0.96
	VH136312	693	2.326	0.084	0.97	0.94
	VH121615	693	1.325	0.092	1.03	1.05
	VH136155	693	3.123	0.087	1.13	1.19
	VH136257	693	2.162	0.085	0.96	0.94
	VH118507	693	2.090	0.085	0.99	0.98
	VF822040	693	2.525	0.084	1.34	1.49
VH136222	693	3.033	0.087	0.87	0.86	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
5	VH120767	696	1.594	0.089	0.90	0.82
	VH135857	696	1.283	0.093	0.99	1.07
	VH135351	696	2.205	0.085	0.97	1.01
	VH135867	696	2.031	0.085	0.95	0.96
	VH136290	696	1.987	0.086	0.91	0.83
	VH136168	696	1.680	0.088	0.90	0.82
	VH136234	696	3.506	0.092	1.16	1.32
	VH136282	696	1.547	0.089	0.90	0.82
	VF883058	696	2.405	0.085	0.91	0.86
	VH141288	696	4.306	0.107	1.33	1.79
	VH118546	696	3.805	0.096	1.15	1.44
6	VH118682	717	2.407	0.084	0.99	0.95
	VH135849	717	2.287	0.084	1.15	1.22
	VH135326	717	0.230	0.117	0.92	0.78
	VH135883	717	3.565	0.092	1.02	1.16
	VH136179	717	2.287	0.084	1.01	0.98
	VH121032	717	1.887	0.085	0.80	0.71
	VH135060	717	3.352	0.089	1.12	1.16
	VF492764	717	2.704	0.084	1.23	1.36
	VH118552	717	1.357	0.091	1.07	1.14
	VH141152	717	0.788	0.101	0.87	0.71
	VH136315	717	2.935	0.086	1.24	1.33
7	VH135827	689	2.870	0.086	1.15	1.24
	VH140963	689	2.272	0.085	0.96	1.06
	VH135870	689	1.467	0.091	0.90	0.81
	VH141235	689	1.483	0.090	1.00	0.98
	VH121038	689	1.007	0.098	1.02	1.12
	VH141315	689	3.186	0.088	1.04	1.04
	VH136245	689	3.508	0.092	1.25	1.50
	VH135077	689	3.178	0.088	0.95	0.95
	VH118556	689	3.280	0.089	1.00	1.14
8	VH120783	687	1.828	0.087	0.98	1.03
	VH135893	687	2.880	0.085	1.14	1.18
	VH118677	687	3.333	0.089	1.00	1.02
	VH135880	687	2.634	0.085	1.19	1.23
	VH140975	687	-0.352	0.150	1.04	2.03
	VH136294	687	1.570	0.090	1.10	1.15
	VH141003	687	2.851	0.085	1.29	1.40
	VH118571	687	1.023	0.099	0.84	0.68
	VH121642	687	3.429	0.090	0.94	1.00
	VH118513	687	1.387	0.092	0.97	0.96
	VH121654	687	2.990	0.086	1.06	1.11
	VH120805	687	4.608	0.114	1.21	1.77

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
9	VH121067	697	2.542	0.084	1.06	1.07
	VH121098	697	1.736	0.086	1.24	1.43
	VH118666	697	3.724	0.095	1.00	1.10
	VH135897	697	3.034	0.086	1.19	1.23
	VH121646	697	3.853	0.097	1.23	1.56
	VH141316	697	3.391	0.090	1.23	1.37
	VH136204	697	3.652	0.094	1.31	1.58
	VH136332	697	2.599	0.084	1.31	1.44
	VH121012	697	0.812	0.101	0.87	0.74
	VH136297	697	2.084	0.084	0.99	0.98
	VH121049	697	1.948	0.085	0.81	0.73
10	VH121074	713	0.843	0.099	1.09	1.46
	VH118628	713	2.411	0.083	1.11	1.13
	VH121663	713	4.019	0.099	1.09	1.25
	VH136343	713	1.949	0.085	1.07	1.10
	VH121115	713	1.384	0.090	0.89	0.84
	VH136302	713	3.409	0.089	1.00	1.07
	VH118567	713	3.895	0.096	0.94	1.03
	VH121636	713	1.440	0.089	1.06	1.10
	VH121019	713	3.111	0.086	1.17	1.32

Table H11. Mathematics Grade 7 IRT Statistics for Field Test Items

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
1	VH095274	822	2.359	0.077	1.01	1.01
	VH129957	822	2.613	0.077	1.02	1.04
	VH095559	822	4.107	0.091	1.14	1.36
	VH095390	822	3.679	0.084	1.03	1.03
	VH147987	822	3.623	0.084	0.99	1.01
	VH148921	822	2.566	0.077	1.06	1.08
	VH124668	822	3.540	0.083	1.16	1.24
	VH100007	822	4.227	0.093	1.28	1.67
	VH141553	822	1.683	0.081	0.86	0.78
	VH129853	822	3.021	0.078	0.91	0.89
	VH148955	822	2.833	0.077	0.99	0.99
VH097743	822	3.176	0.079	1.15	1.21	
2	VH095281	647	2.315	0.088	0.93	0.91
	VH147507	647	2.742	0.087	1.03	1.07
	VH147514	647	4.433	0.104	0.97	0.97
	VH095441	647	3.854	0.094	1.03	1.10
	VH124820	647	2.268	0.089	1.05	1.04
	VH129910	647	3.785	0.093	1.05	1.12
	VH097777	647	4.217	0.099	1.21	1.38
	VH148156	647	3.608	0.091	1.06	1.09
	VH148986	647	2.085	0.090	1.08	1.16
	VH141606	647	3.312	0.088	1.08	1.12
	VH100040	647	3.725	0.092	1.05	1.04
VH148935	647	3.446	0.089	1.08	1.11	
3	VH095465	644	2.537	0.087	1.01	1.03
	VH129934	644	3.699	0.091	1.17	1.28
	VH147513	644	3.868	0.093	1.14	1.18
	VH147508	644	2.885	0.086	1.00	0.98
	VH147895	644	2.855	0.086	1.14	1.17
	VH141559	644	2.263	0.088	0.87	0.82
	VH124701	644	4.298	0.101	1.17	1.36
	VH129881	644	4.122	0.097	1.16	1.30
	VH148965	644	4.359	0.102	0.94	1.03
	VH097789	644	2.537	0.087	1.15	1.23
	VH124722	644	3.529	0.089	1.16	1.22
VH149582	644	3.800	0.092	1.11	1.21	



Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
4	VH095405	660	2.840	0.086	1.30	1.41
	VH147509	660	2.336	0.087	0.93	0.88
	VH095550	660	4.704	0.111	1.14	1.61
	VH095287	660	2.863	0.086	0.92	0.89
	VH141524	660	2.508	0.086	0.96	0.92
	VH147911	660	3.423	0.089	1.22	1.26
	VH124790	660	1.789	0.092	0.92	0.88
	VH124624	660	3.376	0.088	0.84	0.82
	VH149508	660	3.641	0.091	0.91	0.90
	VH141610	660	3.455	0.089	1.03	1.05
	VH099956	660	4.362	0.103	1.11	1.27
VH100025	660	3.391	0.089	1.11	1.19	
5	VH147502	667	4.276	0.100	1.11	1.28
	VH095299	667	1.720	0.093	1.04	1.13
	VH095434	667	3.452	0.089	1.05	1.12
	VH129959	667	2.921	0.086	0.95	0.92
	VH099980	667	1.694	0.093	0.98	0.96
	VH141531	667	3.405	0.088	1.05	1.10
	VH124817	667	2.530	0.086	1.04	1.04
	VH097710	667	1.962	0.090	0.87	0.83
	VH124650	667	2.470	0.086	0.93	0.87
	VH148927	667	2.847	0.086	0.95	0.95
	VH129868	667	3.032	0.086	1.04	1.04
VH149460	667	2.648	0.086	0.97	0.93	
6	VH095416	656	3.367	0.088	1.22	1.29
	VH095308	656	2.693	0.086	0.98	0.98
	VH129947	656	3.938	0.096	1.13	1.28
	VH147505	656	3.608	0.091	0.95	0.97
	VH124661	656	1.570	0.095	0.80	0.64
	VH124771	656	2.288	0.087	0.92	0.86
	VH148997	656	4.280	0.102	1.13	1.20
	VH148163	656	3.857	0.094	1.16	1.29
	VH149394	656	4.148	0.100	1.18	1.36
	VH097763	656	2.459	0.086	1.01	1.00
VH100001	656	2.935	0.086	1.01	1.00	
7	VH129941	689	4.696	0.107	1.16	1.37
	VH095597	689	4.306	0.098	1.24	1.59
	VH147510	689	3.615	0.088	1.00	1.02
	VH095474	689	3.434	0.086	0.96	0.98
	VH129889	689	4.075	0.094	1.22	1.34
	VH148947	689	2.738	0.083	1.19	1.28
	VH097695	689	3.608	0.088	1.04	1.09
	VH141570	689	2.801	0.083	1.13	1.18
	VH100033	689	3.123	0.084	0.99	0.98
	VH124781	689	4.415	0.101	1.17	1.48
VH147975	689	4.202	0.096	1.07	1.17	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
8	VH095342	637	1.119	0.107	0.95	0.93
	VH129956	637	4.355	0.105	1.09	1.25
	VH095590	637	5.053	0.125	0.98	1.20
	VH095428	637	2.662	0.087	1.00	0.98
	VH149435	637	4.366	0.105	1.22	1.49
	VH129916	637	2.866	0.087	0.87	0.85
	VH100028	637	3.832	0.095	1.15	1.27
	VH148251	637	3.514	0.091	1.07	1.13
	VH124606	637	3.018	0.087	0.98	0.96
	VH097784	637	4.155	0.100	1.08	1.18
	VH124776	637	2.685	0.087	0.91	0.88
VH141596	637	3.506	0.091	1.14	1.20	
9	VH129965	666	4.891	0.117	0.99	0.98
	VH147512	666	3.032	0.085	1.02	1.04
	VH095351	666	3.222	0.086	0.99	0.98
	VH095615	666	5.019	0.121	1.09	1.58
	VH149616	666	2.816	0.085	1.08	1.08
	VH097803	666	3.003	0.085	1.14	1.15
	VH141617	666	3.237	0.086	1.26	1.33
	VH141509	666	3.046	0.085	1.00	0.99
	VH124615	666	2.093	0.087	0.95	0.94
	VH124765	666	4.420	0.104	1.18	1.46
	VH129897	666	3.245	0.086	0.96	0.95
VH148352	666	3.771	0.092	1.13	1.19	
10	VH095450	679	3.746	0.092	1.08	1.13
	VH095364	679	1.097	0.102	0.92	0.83
	VH095484	679	2.954	0.085	0.96	0.93
	VH129922	679	3.857	0.093	1.16	1.25
	VH141616	679	1.825	0.089	1.06	1.26
	VH124712	679	2.374	0.085	1.07	1.13
	VH097754	679	2.132	0.086	0.91	0.90
	VH099940	679	3.671	0.091	1.14	1.18
	VH148915	679	1.942	0.088	0.96	0.91
	VH148173	679	3.100	0.086	1.10	1.12
	VH141599	679	4.382	0.103	1.05	1.19
VH129876	679	3.256	0.087	1.03	1.05	

Table H12. Mathematics Grade 8 IRT Statistics for Field Test Items

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
1	VH118755	780	2.833	0.078	1.06	1.11
	VH118752	780	4.162	0.089	0.96	0.94
	VH118739	780	4.739	0.101	1.04	1.26
	VH118026	780	4.099	0.088	1.11	1.19
	VH121907	780	4.258	0.090	1.02	1.09
	VH147232	780	3.424	0.080	1.08	1.08
	VH145885	780	4.729	0.100	1.04	1.21
	VH138980	780	3.411	0.080	0.99	0.99
	VH139596	780	1.742	0.087	0.90	0.78
	VH146791	780	4.016	0.087	1.11	1.25
	VH121958	780	3.190	0.079	0.98	0.98
2	VH120141	663	3.178	0.084	1.13	1.19
	VH119949	663	3.948	0.090	1.09	1.15
	VH118748	663	3.736	0.088	1.03	1.08
	VH118056	663	3.577	0.086	1.13	1.15
	VH139254	663	3.164	0.084	1.11	1.12
	VH148445	663	4.252	0.094	1.06	1.16
	VH147393	663	2.986	0.084	0.97	0.97
	VH137854	663	3.185	0.084	0.95	0.94
	VH139591	663	3.164	0.084	1.03	1.04
	VH122050	663	2.879	0.085	1.08	1.09
	VH148458	663	1.834	0.095	0.91	0.81
VH146599	663	5.148	0.116	1.06	1.58	
3	VH118031	666	3.891	0.089	1.08	1.12
	VH121842	666	4.491	0.098	1.11	1.29
	VH121877	666	2.397	0.088	1.06	1.06
	VH118956	666	4.307	0.094	1.17	1.37
	VH145979	666	3.507	0.085	1.14	1.17
	VH148446	666	3.034	0.084	1.20	1.24
	VH137557	666	1.850	0.095	0.92	0.89
	VH139527	666	4.352	0.095	1.14	1.28
	VH139490	666	2.783	0.085	0.92	0.90
	VH122501	666	3.276	0.085	1.09	1.10
	VH147356	666	4.298	0.094	1.04	1.16
VH146729	666	2.769	0.085	0.92	0.88	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
4	VH121891	669	4.291	0.095	1.09	1.13
	VH118943	669	4.133	0.092	0.94	1.01
	VH120081	669	2.704	0.086	1.13	1.23
	VH118079	669	3.247	0.085	0.85	0.82
	VH138993	669	3.060	0.085	0.98	0.97
	VH146673	669	3.714	0.088	0.97	0.97
	VH145949	669	2.836	0.085	0.91	0.87
	VH147435	669	3.444	0.086	1.23	1.32
	VH122473	669	2.987	0.085	1.22	1.31
	VH148457	669	3.481	0.086	0.96	0.97
	VH122029	669	2.373	0.088	0.95	0.89
VH137876	669	3.585	0.087	1.07	1.09	
5	VH118912	677	4.245	0.093	1.06	1.16
	VH120009	677	2.875	0.085	1.03	1.05
	VH118043	677	4.595	0.099	1.27	1.59
	VH118733	677	2.854	0.085	1.06	1.07
	VH146823	677	4.911	0.107	1.30	1.60
	VH137600	677	3.104	0.084	0.85	0.81
	VH139566	677	4.245	0.093	1.24	1.36
	VH139462	677	2.975	0.084	1.05	1.02
	VH148416	677	2.480	0.087	0.91	0.85
	VH121931	677	3.745	0.087	1.01	0.99
	VH122227	677	3.837	0.088	0.90	0.93
VH146043	677	4.059	0.090	1.29	1.44	
6	VH119976	655	3.330	0.086	1.05	1.06
	VH120133	655	3.108	0.086	1.00	0.99
	VH118746	655	2.484	0.088	1.00	0.99
	VH118053	655	3.330	0.086	1.01	1.02
	VH122299	655	4.408	0.098	1.21	1.36
	VH146033	655	5.131	0.117	1.11	1.46
	VH137736	655	3.863	0.090	0.95	0.93
	VH122468	655	3.518	0.087	0.96	0.95
	VH139013	655	2.998	0.086	0.99	0.98
	VH139576	655	2.925	0.086	0.98	0.96
VH147488	655	3.442	0.087	0.99	0.97	
7	VH120033	661	2.344	0.088	0.94	0.87
	VH118922	661	4.056	0.092	1.09	1.20
	VH118074	661	2.625	0.086	0.83	0.78
	VH118034	661	3.624	0.087	1.05	1.08
	VH145943	661	3.194	0.085	1.10	1.13
	VH137566	661	2.406	0.088	0.93	0.91
	VH122429	661	2.861	0.085	1.08	1.09
	VH139100	661	4.090	0.092	1.12	1.26
	VH147496	661	2.282	0.089	0.98	0.97
	VH146637	661	3.756	0.088	1.05	1.10
	VH148444	661	1.959	0.093	0.94	0.90
VH145987	661	2.543	0.087	1.11	1.16	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
8	VH118897	703	3.456	0.084	1.18	1.23
	VH119991	703	3.296	0.083	0.98	0.97
	VH118067	703	5.094	0.111	1.07	1.30
	VH121865	703	2.760	0.083	0.94	0.92
	VH122253	703	4.064	0.089	1.12	1.15
	VH137625	703	3.885	0.087	0.99	0.99
	VH122435	703	4.220	0.092	1.07	1.16
	VH137761	703	3.612	0.085	0.94	0.92
	VH147239	703	4.348	0.094	1.12	1.26
	VH146740	703	2.953	0.083	0.97	0.95
	VH148452	703	4.056	0.089	1.11	1.24
	VH146719	703	3.386	0.083	0.89	0.84
9	VH118906	659	3.749	0.089	1.05	1.10
	VH120028	659	3.844	0.090	1.14	1.19
	VH118039	659	4.520	0.101	1.13	1.25
	VH118742	659	3.749	0.089	1.09	1.14
	VH138964	659	3.564	0.087	0.92	0.92
	VH146073	659	3.710	0.088	1.21	1.28
	VH145956	659	4.162	0.094	0.89	0.92
	VH137656	659	3.400	0.086	0.96	0.95
	VH147375	659	3.991	0.091	1.15	1.24
	VH148459	659	1.460	0.103	0.89	0.74
	VH122508	659	3.820	0.089	1.20	1.30
	VH145932	659	3.749	0.089	1.07	1.15
10	VH118929	666	4.869	0.108	1.11	1.35
	VH120120	666	4.188	0.094	1.14	1.37
	VH118028	666	2.739	0.086	0.86	0.81
	VH119970	666	2.907	0.085	1.00	0.99
	VH147216	666	1.469	0.103	0.90	0.79
	VH148455	666	2.783	0.086	0.99	0.95
	VH148460	666	4.145	0.093	0.99	0.99
	VH121940	666	3.037	0.085	1.01	0.99
	VH139503	666	4.324	0.096	1.23	1.38
	VH145937	666	3.798	0.089	1.13	1.18
	VH137609	666	4.251	0.095	1.02	1.15
	VH146747	666	2.958	0.085	1.01	0.99

*Science*

Table H13. Science Grade 4 IRT Statistics for Field Test Items

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
1	VH096461	828	1.280	0.079	1.06	1.10
	VH096495	828	-0.626	0.084	0.98	0.97
	VH172565	828	-0.014	0.077	1.06	1.12
	VH096471	828	-0.241	0.079	0.87	0.81
	VH096466	828	0.727	0.076	1.04	1.04
	VH146856	828	0.977	0.077	1.03	1.06
	VH146846	828	0.193	0.076	0.92	0.88
	VH149135	828	1.108	0.078	1.11	1.21
	VH149133	828	1.343	0.080	1.04	1.13
	VH149109	828	1.218	0.078	1.21	1.30
	VH149150	828	0.687	0.076	1.05	1.05
	VH149127	828	3.072	0.121	1.21	2.50
2	VH123648	725	0.036	0.083	1.01	1.00
	VH123651	725	1.596	0.087	1.10	1.18
	VH123642	725	1.596	0.087	1.14	1.29
	VH123637	725	-0.124	0.084	0.90	0.86
	VH123641	725	-1.285	0.107	0.92	0.82
	VH126198	725	1.305	0.084	1.36	1.51
	VH126131	725	-1.154	0.103	1.02	1.06
	VH146863	725	0.205	0.082	1.05	1.05
	VH146855	725	1.800	0.090	1.03	1.10
	VH146868	725	-0.005	0.083	0.88	0.83
	VH146869	725	1.507	0.086	1.25	1.35
	VH146865	725	1.383	0.085	1.07	1.14
3	VH118422	720	0.408	0.082	1.22	1.38
	VH118453	720	1.819	0.090	1.05	1.13
	VH118479	720	-0.090	0.085	1.05	1.09
	VH118463	720	-0.283	0.087	1.04	1.14
	VH118429	720	0.628	0.081	1.00	0.99
	VF801629	720	-0.267	0.087	0.89	0.86
	VF801857	720	0.233	0.083	1.07	1.06
	VH102875	720	0.714	0.081	0.99	0.99
	VH102854	720	0.807	0.081	0.99	0.99
	VH102809	720	0.281	0.082	0.86	0.81
	VH102857	720	1.608	0.087	1.14	1.29
	VH172640	720	0.920	0.082	1.03	1.05

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
4	VH118459	715	0.248	0.083	0.97	0.94
	VH118404	715	-0.729	0.095	1.00	1.06
	VH118414	715	-0.684	0.094	1.13	1.34
	VH118474	715	-0.878	0.098	0.93	0.82
	VH118470	715	2.942	0.119	1.31	2.83
	VH126220	715	-0.640	0.093	1.06	1.04
	VH126043	715	-0.693	0.094	0.95	0.93
	VH123681	715	0.296	0.083	0.88	0.83
	VH123679	715	-0.145	0.086	0.92	0.89
	VH123689	715	0.569	0.082	1.00	0.99
	VH123674	715	0.052	0.084	0.95	0.90
	VH123703	715	0.165	0.084	1.00	0.98
5	VH123683	700	0.103	0.084	0.90	0.86
	VH123685	700	-1.806	0.126	0.98	0.95
	VH123691	700	0.472	0.082	1.17	1.25
	VH123692	700	2.136	0.099	1.08	1.18
	VH123706	700	-0.168	0.086	0.99	0.99
	VH102841	700	0.103	0.084	0.90	0.86
	VH102761	700	0.620	0.082	1.22	1.26
	VH149116	700	1.022	0.083	0.95	0.96
	VH149154	700	0.809	0.082	0.94	0.92
	VH149118	700	0.479	0.082	1.08	1.09
	VH149169	700	1.001	0.083	1.09	1.12
VH149131	700	0.391	0.082	0.99	0.98	
6	VH123650	740	1.874	0.090	0.99	1.04
	VH123639	740	0.555	0.080	1.19	1.26
	VH123653	740	0.707	0.080	1.15	1.19
	VH123647	740	0.274	0.080	0.98	0.96
	VH123643	740	0.892	0.080	1.16	1.21
	VH149174	740	1.225	0.082	1.07	1.13
	VH149122	740	0.169	0.081	1.14	1.19
	VH129808	740	0.574	0.080	1.02	1.02
	VH129813	740	0.656	0.080	1.03	1.03
	VH129725	740	0.937	0.080	0.96	0.97
	VH129781	740	0.847	0.080	1.02	1.04
VH129826	740	0.479	0.080	1.01	1.02	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
7	VF801633	717	-0.291	0.087	0.93	0.92
	VF801858	717	-0.321	0.087	0.99	0.99
	VF801864	717	0.156	0.082	1.04	1.07
	VF801861	717	0.231	0.082	1.07	1.06
	VF801632	717	-3.259	0.225	0.94	0.54
	VH146172	717	-0.413	0.088	0.95	0.91
	VH146226	717	0.331	0.082	1.05	1.08
	VH125970	717	-1.539	0.116	0.90	0.70
	VH125967	717	0.931	0.082	1.06	1.13
	VH125987	717	-0.484	0.089	0.93	0.90
	VH125979	717	1.154	0.083	1.14	1.18
	VH125964	717	-0.779	0.095	1.15	1.39
8	VH126160	709	-0.423	0.089	0.94	0.87
	VH126184	709	-1.122	0.103	0.91	0.77
	VH126152	709	0.066	0.084	1.23	1.30
	VH126187	709	0.272	0.082	0.98	0.97
	VH126216	709	0.648	0.082	1.02	1.03
	VH129742	709	-2.057	0.139	0.93	0.88
	VH129821	709	0.916	0.082	1.14	1.16
	VH146240	709	0.742	0.082	1.05	1.09
	VH146232	709	0.128	0.083	1.09	1.11
	VH146194	709	-0.455	0.090	1.08	1.14
	VH146214	709	1.510	0.087	1.25	1.45
	VH146166	709	-0.091	0.085	0.82	0.76
9	VF801859	702	-0.473	0.091	0.99	0.96
	VH172654	702	0.701	0.082	1.29	1.39
	VF801794	702	0.762	0.082	1.10	1.12
	VF801860	702	0.620	0.082	0.95	0.94
	VF801863	702	0.437	0.083	0.99	1.00
	VH123644	702	2.430	0.104	1.19	1.67
	VH123652	702	1.265	0.084	1.04	1.05
	VH129772	702	-0.791	0.097	0.92	0.85
	VH129733	702	0.287	0.083	0.85	0.80
	VH129728	702	0.161	0.084	0.93	0.92
	VH129797	702	0.083	0.084	0.94	0.90
	VH172644	702	0.593	0.082	1.07	1.08



Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
10	VH096497	703	1.799	0.092	1.10	1.21
	VH096486	703	-0.577	0.091	1.00	1.20
	VH096452	703	0.489	0.082	1.01	1.05
	VH096441	703	1.540	0.088	1.06	1.13
	VH096455	703	1.199	0.084	1.08	1.12
	VH123698	703	1.228	0.085	1.03	1.04
	VH123670	703	0.367	0.082	1.07	1.10
	VH102881	703	0.886	0.083	0.99	1.00
	VH102818	703	-0.520	0.090	0.99	0.99
	VH102868	703	0.677	0.082	0.97	0.99
	VH102794	703	-1.055	0.101	0.84	0.68
	VH102847	703	-0.345	0.088	0.95	0.95

Table H14. Science Grade 8 IRT Statistics for Field Test Items

Form Number	Accession Number	N	Rasch Difficulty	Rasch SE	Infit	Outfit
1	VH128915	773	-1.285	0.090	0.97	0.94
	VH128928	773	1.046	0.084	1.19	1.32
	VH128934	773	1.111	0.085	1.16	1.27
	VH128955	773	0.002	0.078	1.04	1.04
	VH128980	773	0.706	0.081	1.39	1.48
	VH125631	773	1.552	0.093	1.35	1.66
	VH125613	773	1.074	0.085	1.20	1.38
	VH133779	773	-0.175	0.078	0.96	0.93
	VH122088	773	0.222	0.078	1.06	1.06
	VH122108	773	1.723	0.097	1.15	1.43
	VH122099	773	-0.727	0.082	0.91	0.88
VH122102	773	-0.480	0.080	1.05	1.07	
2	VH122124	671	-0.094	0.084	1.18	1.25
	VH122093	671	0.319	0.084	1.05	1.07
	VH122105	671	-0.601	0.088	0.93	0.94
	VH122112	671	-0.158	0.084	0.99	0.98
	VH122080	671	-0.601	0.088	1.01	1.03
	VH125548	671	0.348	0.084	1.18	1.22
	VH125551	671	-0.985	0.093	1.01	1.12
	VH128989	671	1.841	0.103	1.16	1.44
	VH128924	671	0.890	0.087	1.29	1.41
	VH128959	671	-0.985	0.093	0.92	0.81
VH128967	671	0.061	0.084	0.97	0.98	
3	VH140213	667	-0.040	0.084	1.14	1.18
	VH140155	667	0.962	0.088	1.23	1.41
	VH140200	667	1.794	0.103	1.12	1.39
	VH140266	667	-1.022	0.094	1.03	1.07
	VH140283	667	-0.568	0.088	1.09	1.23
	VH125589	667	0.901	0.087	1.15	1.25
	VH125650	667	0.017	0.084	1.03	1.07
	VH102999	667	-0.047	0.084	1.14	1.18
	VH103015	667	0.348	0.084	1.09	1.09
	VH103007	667	-0.960	0.093	1.02	1.13
	VH103016	667	-1.611	0.109	0.97	1.01
VH103011	667	-2.382	0.139	0.88	0.59	

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
4	VH103014	674	0.453	0.084	1.09	1.13
	VH103013	674	-0.821	0.090	1.02	1.07
	VH103017	674	0.632	0.085	1.04	1.04
	VH103010	674	0.567	0.085	1.00	1.00
	VH103003	674	-0.677	0.089	0.85	0.78
	VH125571	674	0.517	0.084	1.06	1.06
	VH125607	674	1.457	0.095	1.07	1.28
	VH140167	674	-0.576	0.087	1.00	1.02
	VH140162	674	0.298	0.084	1.03	1.05
	VH140239	674	-0.375	0.086	0.98	0.96
	VH140207	674	2.074	0.110	1.10	1.58
	VH140253	674	1.764	0.101	1.20	1.56
5	VH139742	674	-0.613	0.088	0.95	0.90
	VH139796	674	0.035	0.084	0.96	0.95
	VH139768	674	0.697	0.086	1.12	1.19
	VH140030	674	-0.385	0.086	1.01	1.01
	VH140079	674	0.786	0.086	1.02	1.07
	VH125644	674	-1.356	0.102	0.95	1.02
	VH125625	674	1.030	0.089	1.12	1.24
	VH090838	674	-0.437	0.087	1.03	1.04
	VH090758	674	-1.706	0.112	0.94	1.16
	VH090788	674	0.063	0.084	1.05	1.04
	VH090846	674	-1.285	0.100	0.87	0.74
	VH090829	674	0.846	0.087	0.99	1.02
6	VH090778	647	-0.230	0.086	1.07	1.11
	VH090752	647	-1.336	0.103	0.90	0.80
	VH090762	647	0.904	0.088	1.00	1.07
	VH090859	647	-1.368	0.104	0.97	0.94
	VH090805	647	0.462	0.085	1.19	1.23
	VH083112	647	0.527	0.086	1.15	1.22
	VH083099	647	0.092	0.085	1.15	1.19
	VH139804	647	-0.657	0.090	0.97	0.94
	VH139756	647	0.403	0.085	1.05	1.06
	VH140057	647	0.027	0.085	1.15	1.21
	VH139837	647	0.850	0.088	1.20	1.26
	VH140086	647	-1.401	0.105	0.88	0.76

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
7	VH103256	659	1.165	0.090	1.16	1.27
	VH103271	659	-0.711	0.090	1.00	1.03
	VH103289	659	-0.241	0.086	1.09	1.22
	VH122979	659	0.687	0.086	1.28	1.38
	VH103300	659	-0.030	0.085	1.20	1.21
	VH083062	659	0.599	0.085	1.05	1.08
	VH083097	659	1.511	0.096	1.11	1.20
	VH096378	659	0.205	0.084	1.00	0.99
	VH096351	659	0.291	0.084	1.01	1.01
	VH096390	659	0.127	0.084	1.06	1.07
	VH096355	659	0.455	0.085	1.04	1.05
	VH155466	659	-0.367	0.087	0.90	0.85
8	VH096364	713	-0.635	0.085	0.92	0.92
	VH096374	713	0.780	0.084	1.09	1.11
	VH096331	713	0.374	0.081	1.08	1.10
	VH155456	713	1.123	0.087	1.13	1.20
	VH096384	713	-0.961	0.089	1.00	1.05
	VH083054	713	0.295	0.081	1.14	1.17
	VH083129	713	0.216	0.081	1.06	1.09
	VH103277	713	-0.437	0.083	0.95	0.91
	VH103260	713	0.642	0.083	1.19	1.30
	VH103297	713	-1.017	0.090	1.05	1.23
	VH103282	713	1.062	0.087	1.07	1.13
	VH122545	713	0.170	0.081	1.10	1.13
9	VH083715	649	0.942	0.090	1.19	1.25
	VH083722	649	-0.003	0.085	1.14	1.17
	VH083729	649	-0.762	0.090	1.08	1.20
	VH083725	649	1.150	0.093	1.13	1.27
	VH083700	649	0.460	0.086	1.39	1.47
	VH083082	649	1.308	0.095	1.16	1.30
	VH083068	649	-0.068	0.085	1.01	1.02
	VF671388	649	-0.148	0.085	1.08	1.07
	VF671370	649	-0.714	0.089	0.92	0.88
	VF671377	649	0.126	0.085	0.97	0.95
	VF684395	649	0.220	0.085	1.07	1.06
	VF684417	649	-1.333	0.100	0.91	0.81

Form Number	Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
10	VF671364	661	0.013	0.085	1.14	1.18
	VF671372	661	-1.783	0.113	0.93	0.80
	VF671358	661	-0.600	0.088	1.00	0.98
	VF671382	661	-0.727	0.090	1.00	0.97
	VF671389	661	-0.145	0.085	1.10	1.18
	VH083116	661	1.638	0.100	1.06	1.32
	VH083079	661	1.032	0.090	1.24	1.37
	VH083726	661	-0.109	0.085	1.09	1.11
	VH083693	661	-0.523	0.087	0.98	0.98
	VH083685	661	-0.417	0.087	0.99	1.01
	VH083710	661	-0.196	0.085	1.13	1.21
	VH083718	661	-2.076	0.124	0.90	0.72

Appendix I: Rasch Difficulty, Standard Error, and Fit Statistics for 2015  
Operational Items

*Reading*

Table II. Reading Grade 3 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF394057	7529	-0.105	0.028	1.15	1.24
VF394053	7529	-0.479	0.030	0.94	0.90
VF394041	7529	-0.047	0.028	1.11	1.14
VF394045	7529	0.348	0.027	1.06	1.06
VF394050	7529	-0.934	0.034	1.02	1.11
VF394046	7529	-1.673	0.042	1.16	0.93
VF394049	7529	-0.614	0.031	1.04	1.09
VF394051	7529	-0.445	0.030	1.15	1.39
VF389477	7529	0.243	0.027	0.93	0.88
VF389620	7529	0.451	0.026	0.97	0.95
VF389446	7529	0.818	0.026	1.17	1.24
VF389473	7529	0.648	0.026	1.03	1.04
VF389165	7529	0.059	0.028	0.87	0.81
VF821218	7529	-0.545	0.031	0.94	0.86
VF821206	7529	2.037	0.027	1.07	1.29
VF821123	7529	-0.286	0.029	1.04	1.09
VF821312	7529	0.446	0.026	1.06	1.08
VF821272	7529	-1.603	0.041	0.82	0.52
VF821338	7529	0.108	0.027	0.97	0.95
VF821362	7529	0.372	0.027	0.99	1.00
VF497668	7529	-0.430	0.030	1.00	0.93
VF497700	7529	0.426	0.026	1.07	1.10
VF497705	7529	1.500	0.026	1.12	1.21
VF497671	7529	0.347	0.027	0.98	0.98
VF497696	7529	-0.270	0.029	1.02	1.02
VF497690	7529	0.354	0.027	0.95	0.93
VF497684	7529	0.980	0.026	1.02	1.06
VF497676	7529	-0.357	0.030	0.90	0.87
VF883330	7529	1.038	0.026	0.95	0.95
VF882884	7529	1.086	0.026	1.00	1.03
VF883326	7529	0.194	0.027	1.10	1.15
VF883549	7529	-0.582	0.031	0.87	0.72

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF883561	7529	0.825	0.026	1.15	1.20
VF883364	7529	-1.449	0.039	0.87	0.65
VF883614	7529	-0.744	0.032	0.94	0.92
VF883619	7529	0.185	0.027	0.94	0.90
VF883622	7529	0.097	0.027	1.07	1.19
VF497716	7529	0.109	0.027	1.09	1.14
VF497751	7529	0.307	0.027	1.04	1.04
VF497761	7529	-0.033	0.028	0.87	0.79
VF497725	7529	0.187	0.027	0.84	0.76
VF497758	7529	0.753	0.026	0.99	0.98
VF497767	7529	0.940	0.026	0.99	1.00
VF497766	7529	1.589	0.026	1.17	1.31
VF497718	7529	0.042	0.028	1.07	1.09
VF497731	7529	-0.944	0.034	0.88	0.84
VF885214	7529	-0.004	0.028	0.95	0.92
VF885379	7529	0.906	0.026	1.10	1.13
VF885192	7529	-1.120	0.035	0.82	0.58
VF885434	7529	0.078	0.028	0.91	0.85

Table I2. Reading Grade 4 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF495028	7311	1.854	0.027	1.17	1.36
VF495644	7311	0.470	0.028	1.16	1.21
VF494993	7311	1.593	0.026	1.08	1.13
VF495021	7311	0.513	0.028	1.17	1.23
VF495015	7311	-0.011	0.031	0.96	0.85
VF495003	7311	0.989	0.027	0.94	0.91
VF495010	7311	-1.928	0.053	0.87	0.50
VF880215	7311	0.271	0.029	0.99	0.95
VF880210	7311	1.347	0.026	1.16	1.25
VF880326	7311	0.810	0.027	1.11	1.14
VF880321	7311	1.809	0.026	1.14	1.27
VF880343	7311	0.996	0.027	1.08	1.11
VF880345	7311	1.134	0.027	1.04	1.06
VF880350	7311	0.794	0.027	1.03	1.04
VF497359	7311	1.011	0.027	0.93	0.91
VF497361	7311	-0.290	0.032	0.88	0.70
VF497384	7311	1.235	0.026	1.06	1.10
VF497390	7311	0.445	0.028	0.83	0.73
VF497378	7311	1.761	0.026	1.06	1.15
VF497354	7311	-0.566	0.035	0.87	0.85
VF497147	7311	-0.793	0.037	0.89	0.68
VF497155	7311	0.518	0.028	0.98	0.92
VF497220	7311	0.202	0.029	0.90	0.81
VF497215	7311	2.289	0.027	1.04	1.17
VF497188	7311	-1.642	0.048	0.76	0.48
VF497212	7311	0.383	0.029	1.06	1.05
VF884843	7311	-0.924	0.038	0.84	0.61
VF884830	7311	0.433	0.028	1.03	1.05
VF884836	7311	0.750	0.027	0.93	0.89
VF884910	7311	-0.606	0.035	1.10	1.25
VF884900	7311	-0.982	0.039	0.89	0.71
VF884918	7311	-0.026	0.031	1.06	1.09
VF884913	7311	1.631	0.026	1.05	1.11
VF497338	7311	1.011	0.027	1.31	1.51
VF497314	7311	0.378	0.029	0.89	0.80
VF497322	7311	0.560	0.028	0.95	0.90
VF497303	7311	-0.289	0.032	0.94	0.85



Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF497330	7311	0.039	0.030	0.95	0.87
VF497327	7311	0.278	0.029	1.03	1.01
VF407243	7311	0.079	0.030	1.05	1.10
VF407287	7311	-0.598	0.035	0.89	0.75
VF407232	7311	-0.760	0.036	1.17	1.02
VF407295	7311	-1.199	0.041	0.88	0.74
VF407297	7311	0.731	0.027	0.97	0.96
VF407298	7311	0.745	0.027	1.13	1.19
VF407282	7311	-0.962	0.038	0.79	0.52
VF885226	7311	-0.966	0.038	0.88	0.81
VF885195	7311	-0.453	0.034	0.94	0.88
VF885205	7311	0.367	0.029	0.92	0.84
VF885228	7311	-0.289	0.032	0.91	0.79

Table I3. Reading Grade 5 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF497182	6882	-1.546	0.053	0.95	0.80
VF497170	6882	-0.557	0.038	0.99	1.03
VF497060	6882	-1.714	0.056	0.85	0.49
VF497172	6882	-0.220	0.035	1.03	1.01
VF497056	6882	0.337	0.031	0.99	1.02
VF496032	6882	1.011	0.028	1.03	1.02
VF496085	6882	0.944	0.028	1.07	1.11
VF496185	6882	0.609	0.030	1.19	1.32
VF496188	6882	0.775	0.029	1.03	1.04
VF496024	6882	0.319	0.031	0.89	0.79
VF407319	6882	0.839	0.029	1.12	1.19
VF407388	6882	0.500	0.030	0.99	0.94
VF407329	6882	0.058	0.033	0.97	0.86
VF407332	6882	0.257	0.031	1.08	1.10
VF407360	6882	-0.984	0.043	0.93	0.74
VF407322	6882	1.049	0.028	1.15	1.24
VF884489	6882	-2.039	0.064	0.88	0.46
VF884524	6882	0.662	0.029	1.14	1.24
VF884517	6882	-0.477	0.037	0.87	0.65
VF884520	6882	0.265	0.031	1.13	1.22
VF884556	6882	1.422	0.027	1.17	1.23
VF884567	6882	1.130	0.028	0.95	0.91
VF884535	6882	0.700	0.029	1.03	0.99
VF496865	6882	0.765	0.029	0.95	0.93
VF496879	6882	0.953	0.028	1.02	1.00
VF496213	6882	0.564	0.030	1.07	1.11
VF496206	6882	0.943	0.028	1.07	1.06
VF496209	6882	0.126	0.032	0.96	0.86
VF496212	6882	-0.047	0.034	0.92	0.82
VF496221	6882	-1.225	0.047	0.90	0.70
VF880864	6882	-0.801	0.041	0.91	0.79
VF882769	6882	0.497	0.030	1.01	1.04
VF882762	6882	1.611	0.027	1.08	1.13
VF882790	6882	1.641	0.027	1.06	1.12
VF909893	6882	1.206	0.028	1.15	1.22
VF882786	6882	0.587	0.030	1.20	1.32
VF497284	6882	-0.038	0.033	0.97	0.92
VF497278	6882	-0.433	0.037	0.94	0.76
VF497273	6882	-0.661	0.039	1.02	1.36
VF497285	6882	2.422	0.028	1.12	1.32

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF497287	6882	0.346	0.031	1.02	1.01
VF497274	6882	1.762	0.027	1.04	1.10
VF497288	6882	-0.131	0.034	1.02	1.15
VF497039	6882	1.746	0.027	0.89	0.90
VF497030	6882	0.809	0.029	0.98	0.94
VF497028	6882	1.528	0.027	0.87	0.86
VF497012	6882	0.727	0.029	1.00	1.04
VF497016	6882	0.165	0.032	0.91	0.74
VF885191	6882	-0.388	0.036	0.81	0.57
VF885197	6882	-0.293	0.036	0.84	0.66
VF885212	6882	-0.781	0.041	0.82	0.57
VF885217	6882	0.296	0.031	0.90	0.78
VF885221	6882	1.333	0.027	1.12	1.20
VF885314	6882	0.029	0.033	0.90	0.80

Table I4. Reading Grade 6 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF497042	7097	-0.373	0.038	0.87	0.64
VF497046	7097	1.864	0.026	1.33	1.47
VF497035	7097	0.418	0.031	1.02	1.00
VF497034	7097	-0.012	0.034	0.95	0.88
VF497041	7097	-0.118	0.035	0.92	0.77
VF496873	7097	0.982	0.028	1.06	1.10
VF496204	7097	1.223	0.027	0.92	0.86
VF496208	7097	1.243	0.027	0.99	0.95
VF496863	7097	1.228	0.027	0.93	0.88
VF496191	7097	1.544	0.027	0.96	0.96
VF496867	7097	0.891	0.028	0.98	0.95
VF496415	7097	1.063	0.028	1.08	1.15
VF496172	7097	1.100	0.028	0.95	0.89
VF496055	7097	1.917	0.026	0.97	0.98
VF496083	7097	-0.933	0.045	0.88	0.78
VF496036	7097	1.635	0.027	1.07	1.06
VF496065	7097	0.907	0.028	1.00	1.01
VF496071	7097	0.040	0.034	1.03	0.99
VF496100	7097	-0.199	0.036	1.10	1.01
VF496087	7097	0.488	0.030	0.75	0.66
VF496029	7097	0.029	0.034	0.87	0.83
VF495908	7097	0.124	0.033	0.99	0.97
VF495961	7097	1.215	0.027	1.05	1.17
VF495968	7097	1.839	0.026	1.01	1.04
VF495990	7097	0.196	0.032	0.93	0.89
VF495918	7097	0.583	0.030	0.99	0.94
VF495945	7097	1.405	0.027	1.13	1.18
VF495925	7097	0.429	0.031	0.96	0.93
VF495938	7097	1.992	0.026	1.04	1.06
VF495954	7097	0.612	0.030	1.03	1.05
VF814311	7097	0.261	0.032	0.88	0.73
VF814382	7097	0.710	0.029	0.88	0.78
VF814391	7097	0.462	0.031	0.95	0.91
VF814392	7097	1.355	0.027	1.03	1.06
VF814393	7097	2.482	0.027	1.11	1.24
VF821664	7097	0.809	0.029	0.92	0.85
VF821580	7097	0.639	0.030	1.01	1.02
VF821704	7097	-0.028	0.034	0.90	0.80
VF821673	7097	1.492	0.027	1.11	1.14
VF821619	7097	1.322	0.027	1.04	1.07

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF523861	7097	1.085	0.028	0.87	0.80
VF523801	7097	1.458	0.027	0.99	1.01
VF523825	7097	0.629	0.030	0.86	0.77
VF523818	7097	0.949	0.028	1.01	1.03
VF523813	7097	1.676	0.027	1.20	1.27
VF523804	7097	1.448	0.027	1.04	1.08
VF523786	7097	1.143	0.028	0.97	0.94
VF884733	7097	1.115	0.028	1.05	1.07
VF884772	7097	2.398	0.027	1.03	1.08
VF884844	7097	1.142	0.028	1.00	0.99
VF884880	7097	0.589	0.030	0.97	0.90
VF884857	7097	1.224	0.027	1.02	0.98
VF884630	7097	1.439	0.027	1.17	1.25
VF884988	7097	1.011	0.028	0.90	0.83
VF884628	7097	1.866	0.026	1.13	1.19
VF884658	7097	2.055	0.026	1.00	1.03

Table I5. Reading Grade 7 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF496937	6764	0.475	0.033	1.05	1.24
VF496932	6764	0.158	0.036	0.96	0.90
VF496901	6764	0.845	0.031	1.20	1.41
VF496913	6764	-0.120	0.039	0.89	0.64
VF496906	6764	-0.248	0.040	0.90	0.74
VF496895	6764	2.197	0.027	0.98	0.99
VF496900	6764	0.061	0.037	0.83	0.62
VF497972	6764	2.991	0.028	1.08	1.17
VF497969	6764	2.017	0.027	0.99	0.98
VF497958	6764	1.216	0.029	0.96	0.95
VF497951	6764	1.224	0.029	0.97	0.94
VF497955	6764	0.595	0.032	0.91	0.77
VF497961	6764	1.837	0.027	0.91	0.88
VF497978	6764	2.265	0.027	1.02	1.03
VF497974	6764	2.088	0.027	1.02	1.02
VF865426	6764	0.301	0.034	0.93	0.82
VF865388	6764	-0.622	0.046	0.89	0.74
VF865473	6764	2.047	0.027	0.97	0.96
VF865494	6764	1.981	0.027	1.22	1.32
VF865624	6764	1.607	0.028	1.08	1.09
VF865614	6764	2.085	0.027	1.13	1.19
VF865627	6764	1.062	0.030	0.98	0.95
VF497881	6764	1.366	0.028	1.03	1.03
VF497882	6764	1.539	0.028	1.07	1.10
VF497879	6764	1.272	0.029	1.10	1.13
VF497893	6764	1.115	0.029	1.17	1.29
VF497890	6764	1.011	0.030	1.01	0.97
VF497876	6764	0.877	0.030	1.00	1.06
VF497873	6764	1.154	0.029	0.95	0.96
VF498058	6764	1.168	0.029	1.07	1.11
VF497995	6764	1.049	0.030	0.83	0.73
VF498030	6764	0.762	0.031	1.00	1.10
VF498018	6764	0.659	0.032	0.84	0.70
VF497980	6764	2.339	0.027	1.01	1.04
VF498062	6764	1.824	0.027	1.01	1.02
VF498051	6764	1.630	0.028	1.06	1.06
VF498054	6764	1.766	0.027	0.96	0.94
VF498057	6764	1.508	0.028	0.98	0.99
VF498063	6764	2.236	0.027	1.09	1.12
VF498032	6764	0.392	0.034	0.89	0.78

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF498052	6764	2.530	0.027	1.11	1.18
VF820422	6764	1.061	0.030	0.93	0.88
VF820412	6764	0.605	0.032	0.98	0.97
VF820449	6764	1.021	0.030	1.03	1.08
VF820435	6764	2.681	0.027	1.11	1.20
VF820464	6764	1.516	0.028	1.10	1.12
VF820391	6764	1.404	0.028	1.06	1.09
VF864902	6764	1.133	0.029	0.89	0.81
VF864898	6764	0.193	0.035	0.93	0.92
VF865078	6764	2.070	0.027	1.13	1.19
VF865072	6764	0.902	0.030	0.86	0.75
VF865088	6764	1.976	0.027	1.00	1.00
VF865104	6764	2.031	0.027	0.89	0.86
VF885398	6764	1.461	0.028	0.98	0.96
VF885820	6764	2.193	0.027	0.88	0.86
VF885813	6764	1.728	0.027	1.12	1.17

Table I6. Reading Grade 8 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF497427	6779	-0.941	0.053	0.91	0.55
VF497431	6779	0.109	0.038	0.93	0.78
VF497441	6779	0.351	0.035	0.89	0.85
VF497443	6779	-0.238	0.042	1.06	1.00
VF497446	6779	1.156	0.030	0.98	0.95
VF497445	6779	0.883	0.031	0.98	0.94
VF497207	6779	0.035	0.038	0.93	0.86
VF497213	6779	0.527	0.034	0.95	0.93
VF497196	6779	0.636	0.033	1.04	1.07
VF497178	6779	1.907	0.027	1.19	1.23
VF497193	6779	1.841	0.028	1.09	1.15
VF497209	6779	1.347	0.029	1.06	1.06
VF497257	6779	0.770	0.032	1.16	1.29
VF497259	6779	2.184	0.027	1.10	1.17
VF497244	6779	0.621	0.033	1.12	1.15
VF497271	6779	0.799	0.032	0.87	0.74
VF497235	6779	0.169	0.037	0.75	0.57
VF497252	6779	0.554	0.034	0.85	0.77
VF867326	6779	1.046	0.030	0.93	0.86
VF867239	6779	1.544	0.028	1.01	0.98
VF867293	6779	1.589	0.028	1.00	0.99
VF867355	6779	3.041	0.028	1.06	1.17
VF867368	6779	1.828	0.028	1.11	1.16
VF497096	6779	1.532	0.028	0.99	0.94
VF497103	6779	0.838	0.032	0.94	0.95
VF497098	6779	2.307	0.027	1.15	1.23
VF497114	6779	1.032	0.030	1.01	1.01
VF497094	6779	0.984	0.031	0.94	0.88
VF497115	6779	0.791	0.032	0.98	0.93
VF820174	6779	0.812	0.032	0.92	0.82
VF820025	6779	0.883	0.031	0.96	0.88
VF820170	6779	2.555	0.027	1.06	1.13
VF820236	6779	2.594	0.027	1.12	1.24
VF820159	6779	0.907	0.031	1.07	1.17
VF820261	6779	1.537	0.028	1.05	1.05
VF497127	6779	0.597	0.033	0.85	0.70
VF497116	6779	2.148	0.027	1.07	1.09
VF497117	6779	1.707	0.028	0.93	0.92
VF497130	6779	1.278	0.029	0.99	0.94
VF497123	6779	1.177	0.030	1.05	1.03



Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF497370	6779	1.378	0.029	1.15	1.23
VF497329	6779	0.770	0.032	0.91	0.82
VF497319	6779	1.182	0.030	0.89	0.82
VF497353	6779	1.804	0.028	0.92	0.89
VF497328	6779	1.578	0.028	1.14	1.24
VF497325	6779	1.635	0.028	0.94	0.91
VF497363	6779	2.126	0.027	1.05	1.09
VF820777	6779	0.695	0.033	0.88	0.75
VF820750	6779	0.880	0.031	0.96	0.92
VF820727	6779	1.962	0.027	0.90	0.87
VF820786	6779	1.430	0.029	1.16	1.29
VF820720	6779	2.051	0.027	1.08	1.10
VF820801	6779	-0.100	0.040	0.84	0.66
VF883716	6779	0.547	0.034	0.98	1.06
VF883823	6779	0.805	0.032	0.94	0.89
VF883653	6779	0.017	0.039	0.89	0.84

*Mathematics*

Table I7. Mathematics Grade 3 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF493110	7484	-1.447	0.035	1.06	1.16
VF387496	7484	-1.788	0.039	0.81	0.62
VF803080	7484	-0.899	0.031	0.97	0.95
VF494670	7484	0.996	0.026	0.99	1.00
VF494103	7484	0.755	0.026	1.01	1.02
VF803172	7484	0.597	0.026	1.03	1.04
VF406339	7484	-1.108	0.032	0.90	0.80
VF406297	7484	0.746	0.026	1.18	1.25
VF821698	7484	0.661	0.026	1.03	1.02
VF493136	7484	-0.641	0.029	0.96	0.93
VF492342	7484	-0.947	0.031	0.85	0.73
VF406204	7484	0.070	0.027	1.12	1.17
VF394359	7484	-0.526	0.029	0.91	0.89
VF394252	7484	-0.603	0.029	1.61	2.12
VF866235	7484	-0.044	0.027	0.97	0.92
VF737752	7484	0.535	0.026	0.86	0.84
VF740960	7484	0.602	0.026	1.04	1.08
VF866360	7484	-1.834	0.039	0.83	0.59
VF866898	7484	-0.864	0.030	1.00	0.98
VF740890	7484	0.765	0.026	1.05	1.07
VF394339	7484	-0.052	0.027	1.20	1.35
VF493415	7484	0.516	0.026	0.96	0.96
VF394382	7484	-2.000	0.041	0.92	0.78
VF394362	7484	1.154	0.027	1.01	1.04
VF819669	7484	0.803	0.026	1.18	1.26
VF866354	7484	-0.880	0.031	0.86	0.74
VF493287	7484	0.446	0.026	0.96	0.95
VF394376	7484	0.273	0.026	0.95	0.91
VF393748	7484	0.373	0.026	0.82	0.76
VF865389	7484	-0.020	0.027	0.91	0.88
VF819676	7484	-1.622	0.037	1.04	1.18
VF494895	7484	1.315	0.027	1.06	1.07
VF394378	7484	1.220	0.027	1.25	1.38
VF867001	7484	-0.130	0.027	0.89	0.83
VF803121	7484	0.428	0.026	1.10	1.15
VF822822	7484	-0.963	0.031	0.91	0.82
VF867073	7484	0.767	0.026	1.08	1.12
VF493127	7484	0.446	0.026	1.00	1.00

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF393824	7484	0.968	0.026	1.10	1.18
VF821767	7484	1.050	0.026	1.11	1.18
VF394232	7484	-1.203	0.033	0.91	0.77
VF494750	7484	-0.313	0.028	1.08	1.10
VF493461	7484	1.057	0.026	1.15	1.25
VF393786	7484	-0.535	0.029	0.84	0.74
VF394358	7484	0.233	0.026	0.87	0.81
VF394356	7484	0.046	0.027	0.93	0.86
VF394229	7484	0.491	0.026	1.07	1.10
VF493153	7484	-1.047	0.032	0.90	0.82
VF494674	7484	0.237	0.026	1.03	1.02
VF493387	7484	-1.025	0.031	0.97	0.88

Table I8. Mathematics Grade 4 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF492371	7254	-1.079	0.041	1.02	1.34
VF866662	7254	0.917	0.027	0.94	0.90
VF393675	7254	1.249	0.026	0.99	1.01
VF867083	7254	0.671	0.028	1.02	1.05
VF866677	7254	0.195	0.030	0.98	0.94
VF822854	7254	-1.209	0.043	0.89	0.64
VF493356	7254	-0.739	0.037	0.89	0.83
VF492358	7254	-0.948	0.040	0.89	0.88
VF493344	7254	-0.438	0.034	0.94	0.90
VF493349	7254	1.827	0.027	0.95	0.96
VF492311	7254	-1.259	0.044	0.79	0.56
VF867084	7254	1.869	0.027	0.95	0.94
VF801214	7254	1.825	0.027	0.93	0.92
VF493334	7254	2.389	0.028	0.95	1.01
VF823138	7254	0.718	0.027	0.89	0.84
VF497391	7254	0.507	0.028	0.88	0.86
VF493140	7254	0.978	0.027	0.90	0.84
VF864051	7254	0.150	0.030	0.96	0.91
VF492353	7254	1.505	0.026	1.02	1.02
VF867078	7254	2.120	0.027	0.98	1.01
VF492320	7254	-0.953	0.040	0.73	0.48
VF492339	7254	-0.822	0.038	0.90	0.69
VF493228	7254	1.144	0.027	0.82	0.76
VF492330	7254	1.068	0.027	1.13	1.19
VF866857	7254	1.132	0.027	1.02	1.00
VF741948	7254	2.209	0.027	1.18	1.28
VF497395	7254	1.026	0.027	0.89	0.83
VF493219	7254	0.184	0.030	1.00	1.09
VF816048	7254	0.610	0.028	0.96	0.99
VF863975	7254	-0.520	0.035	0.97	0.94
VF493154	7254	-0.783	0.038	0.76	0.72
VF741944	7254	0.010	0.031	1.06	1.25
VF801835	7254	0.715	0.027	1.15	1.15
VF493257	7254	1.280	0.026	0.98	0.96
VF493312	7254	2.312	0.028	1.21	1.38
VF492373	7254	0.303	0.029	1.01	1.09
VF493223	7254	1.601	0.026	0.90	0.88
VF493366	7254	2.245	0.027	1.15	1.27
VF801227	7254	2.106	0.027	1.06	1.11
VF880336	7254	2.348	0.028	1.02	1.13

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF493377	7254	0.630	0.028	1.18	1.29
VF492354	7254	-0.012	0.031	0.93	0.88
VF493295	7254	2.206	0.027	0.94	0.95
VF492350	7254	-1.200	0.043	0.95	0.98
VF493301	7254	1.493	0.026	1.13	1.18
VF393648	7254	2.429	0.028	1.11	1.18
VF493135	7254	1.404	0.026	0.93	0.88
VF823371	7254	0.562	0.028	1.04	1.09
VF864100	7254	0.357	0.029	0.97	0.99
VF492364	7254	0.102	0.030	0.91	0.84
VF492386	7254	0.694	0.027	0.98	1.00
VF866699	7254	1.038	0.027	0.86	0.82
VF866870	7254	2.120	0.027	1.08	1.17
VF493262	7254	0.822	0.027	1.06	1.11
VF497402	7254	1.531	0.026	0.98	0.98
VF493242	7254	1.024	0.027	1.02	1.03
VF492337	7254	0.924	0.027	1.07	1.06
VF815909	7254	-0.470	0.034	0.89	0.74
VF493361	7254	1.612	0.026	1.27	1.37

Table I9. Mathematics Grade 5 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF819900	6819	0.079	0.035	1.05	1.22
VF491924	6819	1.042	0.029	0.96	0.98
VF491941	6819	1.924	0.027	1.13	1.18
VF741941	6819	1.255	0.028	1.07	1.08
VF492203	6819	-0.047	0.036	0.85	0.61
VF864604	6819	1.732	0.028	0.99	1.01
VF741081	6819	1.423	0.028	1.04	1.04
VF815846	6819	2.019	0.027	1.11	1.18
VF816021	6819	1.440	0.028	0.91	0.83
VF797963	6819	1.550	0.028	0.94	0.93
VF491626	6819	0.814	0.030	0.95	0.88
VF740894	6819	0.118	0.034	0.89	0.81
VF492313	6819	1.328	0.028	0.84	0.75
VF864628	6819	1.304	0.028	1.26	1.56
VF823759	6819	2.768	0.029	1.05	1.12
VF823819	6819	1.944	0.027	1.23	1.33
VF736524	6819	0.503	0.031	0.94	0.92
VF492031	6819	1.879	0.027	1.01	1.01
VF801992	6819	0.920	0.029	0.93	0.83
VF492296	6819	2.442	0.028	1.24	1.34
VF740936	6819	0.290	0.033	0.91	1.01
VF491967	6819	1.980	0.027	1.02	1.02
VF492007	6819	1.132	0.029	1.05	1.13
VF492255	6819	1.197	0.028	0.92	0.83
VF492214	6819	2.745	0.029	0.91	0.91
VF802894	6819	1.710	0.028	1.06	1.08
VF491914	6819	1.417	0.028	1.12	1.19
VF491948	6819	2.075	0.028	0.94	0.90
VF492077	6819	1.357	0.028	0.87	0.79
VF491635	6819	2.072	0.028	0.90	0.88
VF492099	6819	1.552	0.028	0.90	0.87
VF491992	6819	1.267	0.028	1.05	1.10
VF492248	6819	1.191	0.028	0.89	0.79
VF492186	6819	2.304	0.028	1.18	1.25
VF491937	6819	2.173	0.028	1.13	1.21
VF492528	6819	1.270	0.028	1.09	1.17
VF491895	6819	0.837	0.030	0.92	0.90
VF492423	6819	0.916	0.029	1.03	1.15
VF491804	6819	1.621	0.028	0.80	0.71
VF491911	6819	-0.606	0.043	0.95	0.92

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF823790	6819	1.060	0.029	1.13	1.32
VF491932	6819	1.615	0.028	0.91	0.87
VF491630	6819	2.155	0.028	1.06	1.08
VF492397	6819	2.395	0.028	1.01	1.01
VF492095	6819	1.684	0.028	0.88	0.81
VF491905	6819	1.026	0.029	0.93	0.91
VF491783	6819	2.768	0.029	0.97	0.99
VF492304	6819	0.889	0.029	0.87	0.77
VF492435	6819	1.887	0.027	1.14	1.22
VF864609	6819	2.095	0.028	0.90	0.88
VF491794	6819	0.874	0.030	1.01	0.98
VF492001	6819	1.065	0.029	1.08	1.12
VF866103	6819	1.540	0.028	1.09	1.15
VF492010	6819	1.967	0.027	1.04	1.07
VF819989	6819	2.561	0.028	1.08	1.15
VF491761	6819	1.068	0.029	0.92	0.85
VF491727	6819	1.923	0.027	1.01	1.02
VF491821	6819	1.896	0.027	0.94	0.91
VF815982	6819	2.690	0.029	0.90	0.91

Table I10. Mathematics Grade 6 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF492233	7094	0.560	0.034	0.98	0.88
VF862699	7094	1.399	0.029	0.94	0.94
VF492542	7094	1.790	0.027	0.86	0.80
VF811515	7094	2.913	0.027	0.99	1.01
VF491930	7094	1.666	0.028	0.95	0.93
VF492260	7094	2.487	0.027	0.98	0.97
VF882963	7094	2.572	0.027	1.33	1.47
VF862786	7094	1.912	0.027	0.86	0.82
VF809839	7094	1.609	0.028	0.81	0.73
VF492192	7094	2.273	0.027	1.12	1.16
VF741578	7094	2.085	0.027	1.10	1.13
VF741723	7094	1.886	0.027	1.07	1.15
VF492383	7094	1.891	0.027	0.92	0.89
VF492773	7094	2.983	0.027	1.12	1.16
VF812185	7094	1.911	0.027	1.05	1.03
VF492660	7094	3.573	0.029	0.91	0.95
VF492053	7094	2.239	0.027	0.90	0.86
VF492709	7094	2.787	0.027	0.93	0.93
VF492562	7094	0.238	0.037	0.90	0.74
VF492388	7094	1.786	0.027	1.03	1.02
VF492533	7094	1.305	0.029	0.85	0.80
VF491996	7094	2.345	0.027	1.18	1.31
VF491960	7094	1.437	0.028	0.88	0.82
VF492078	7094	2.169	0.027	1.03	1.07
VF741572	7094	2.306	0.027	1.01	1.03
VF491935	7094	1.342	0.029	0.90	0.86
VF491879	7094	0.081	0.039	0.81	0.56
VF493058	7094	1.784	0.027	0.94	0.93
VF491874	7094	1.907	0.027	0.80	0.72
VF493013	7094	3.332	0.028	1.12	1.27
VF866278	7094	2.611	0.027	1.11	1.16
VF865635	7094	2.125	0.027	0.98	0.99
VF797964	7094	3.022	0.027	1.26	1.38
VF822007	7094	2.848	0.027	1.02	1.01
VF883067	7094	1.796	0.027	1.05	1.10
VF491931	7094	-0.006	0.040	0.86	0.56
VF492280	7094	2.705	0.027	0.99	0.99
VF492879	7094	2.595	0.027	0.91	0.90
VF741533	7094	2.806	0.027	1.05	1.09
VF492716	7094	2.804	0.027	1.06	1.11



Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF812407	7094	2.513	0.027	0.95	0.94
VF821920	7094	1.891	0.027	1.07	1.09
VF797977	7094	0.955	0.031	0.92	0.91
VF423146	7094	1.536	0.028	0.81	0.74
VF492284	7094	0.516	0.034	1.12	1.10
VF492996	7094	2.329	0.027	0.86	0.82
VF491787	7094	1.669	0.028	1.08	1.19
VF493003	7094	1.909	0.027	0.96	0.93
VF491966	7094	1.953	0.027	1.14	1.20
VF822023	7094	1.362	0.029	0.96	0.93
VF492941	7094	3.565	0.029	0.99	1.10
VF866290	7094	2.416	0.027	1.10	1.12
VF803293	7094	2.640	0.027	0.98	0.98
VF491940	7094	1.890	0.027	0.86	0.81
VF882800	7094	2.215	0.027	1.15	1.17
VF493092	7094	1.867	0.027	0.99	0.98
VF492415	7094	1.772	0.027	1.01	0.98
VF866230	7094	2.200	0.027	1.03	1.04
VF491976	7094	2.891	0.027	1.12	1.21

Table I11. Mathematics Grade 7 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF492966	6766	1.612	0.030	0.89	0.76
VF880308	6766	1.960	0.028	0.98	1.00
VF800136	6766	1.819	0.029	1.05	1.04
VF492307	6766	1.717	0.029	0.81	0.71
VF800144	6766	2.096	0.028	0.94	0.95
VF818181	6766	3.416	0.028	0.90	0.87
VF822884	6766	5.016	0.038	1.08	1.47
VF880331	6766	3.729	0.029	0.99	1.04
VF492888	6766	2.864	0.027	1.01	1.00
VF880250	6766	3.221	0.027	1.05	1.07
VF492708	6766	2.883	0.027	0.96	0.95
VF492640	6766	3.487	0.028	1.02	1.03
VF492578	6766	3.537	0.028	0.94	0.95
VF492835	6766	2.227	0.027	0.93	0.92
VF492666	6766	2.797	0.027	0.93	0.93
VF492760	6766	3.689	0.029	1.07	1.14
VF493038	6766	2.110	0.028	0.82	0.76
VF492357	6766	3.531	0.028	1.13	1.21
VF880897	6766	1.443	0.030	0.88	0.80
VF867307	6766	1.856	0.028	1.11	1.25
VF813096	6766	3.132	0.027	0.95	0.95
VF736963	6766	3.534	0.028	1.13	1.16
VF883138	6766	3.196	0.027	1.08	1.10
VF866491	6766	3.828	0.029	0.88	0.89
VF492665	6766	2.674	0.027	0.97	0.95
VF869623	6766	2.468	0.027	0.89	0.85
VF492973	6766	3.130	0.027	1.18	1.26
VF800078	6766	2.447	0.027	1.19	1.33
VF493061	6766	3.008	0.027	0.84	0.80
VF492864	6766	1.984	0.028	0.82	0.73
VF867256	6766	2.691	0.027	1.01	1.00
VF882715	6766	3.812	0.029	1.13	1.23
VF492425	6766	2.664	0.027	0.93	0.90
VF492951	6766	2.766	0.027	1.20	1.28
VF493067	6766	3.052	0.027	1.04	1.04
VF492538	6766	1.763	0.029	0.78	0.67
VF493019	6766	3.110	0.027	0.96	0.94
VF736938	6766	2.540	0.027	0.90	0.85
VF818347	6766	1.557	0.030	1.14	1.49
VF818184	6766	2.717	0.027	1.00	1.02

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF492830	6766	2.083	0.028	0.83	0.76
VF492915	6766	1.694	0.029	1.01	1.06
VF883156	6766	2.935	0.027	0.94	0.94
VF800055	6766	0.880	0.035	0.94	0.91
VF736940	6766	3.364	0.028	1.02	1.04
VF492780	6766	2.280	0.027	0.96	0.95
VF866386	6766	3.603	0.028	1.08	1.14
VF492567	6766	3.115	0.027	1.10	1.11
VF493077	6766	1.453	0.030	0.97	0.91
VF882691	6766	2.794	0.027	0.98	0.96
VF492589	6766	4.026	0.030	0.94	1.00
VF493052	6766	2.628	0.027	1.13	1.20
VF883150	6766	2.447	0.027	1.18	1.39
VF880171	6766	3.994	0.030	1.11	1.19
VF492259	6766	3.121	0.027	0.90	0.88
VF493043	6766	3.747	0.029	1.29	1.45
VF492901	6766	3.334	0.028	0.99	1.01
VF883244	6766	2.586	0.027	0.96	0.94
VF799837	6766	1.599	0.030	0.91	0.81

Table I12. Mathematics Grade 8 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF491923	6797	0.962	0.037	0.93	0.78
VF802924	6797	3.653	0.027	1.21	1.30
VF493115	6797	1.680	0.031	1.13	1.36
VF491907	6797	2.573	0.027	0.98	0.96
VF823432	6797	2.321	0.028	0.88	0.79
VF491824	6797	3.680	0.028	1.08	1.11
VF494699	6797	2.840	0.027	0.98	0.97
VF492863	6797	2.636	0.027	0.91	0.90
VF492712	6797	3.501	0.027	0.95	0.94
VF802938	6797	3.522	0.027	1.05	1.08
VF493112	6797	2.133	0.028	0.99	1.02
VF492726	6797	3.902	0.028	1.03	1.04
VF885510	6797	3.219	0.027	0.97	0.96
VF812743	6797	3.675	0.028	1.04	1.07
VF823444	6797	2.942	0.027	0.99	0.97
VF885577	6797	3.110	0.027	0.95	0.93
VF802937	6797	2.956	0.027	1.04	1.06
VF880849	6797	3.135	0.027	1.14	1.23
VF812762	6797	3.135	0.027	1.01	1.00
VF493159	6797	2.799	0.027	1.06	1.10
VF492438	6797	1.984	0.029	0.94	0.93
VF491991	6797	2.234	0.028	0.89	0.82
VF494928	6797	3.772	0.028	1.09	1.12
VF883648	6797	1.565	0.031	0.94	0.91
VF493034	6797	2.907	0.027	0.93	0.88
VF492410	6797	3.070	0.027	0.97	0.95
VF883641	6797	2.715	0.027	1.02	1.08
VF809838	6797	2.225	0.028	0.98	0.95
VF492278	6797	1.871	0.030	0.94	0.85
VF865996	6797	3.508	0.027	1.03	1.05
VF823784	6797	2.214	0.028	0.98	0.93
VF494751	6797	3.367	0.027	1.04	1.05
VF880646	6797	2.815	0.027	0.97	0.94
VF809061	6797	3.322	0.027	1.03	1.04
VF492907	6797	1.963	0.029	0.89	0.83
VF863280	6797	3.910	0.028	1.00	1.07
VF493107	6797	3.678	0.028	1.08	1.13
VF492563	6797	2.664	0.027	1.02	1.06
VF491975	6797	2.344	0.028	0.89	0.85
VF863290	6797	4.194	0.029	1.15	1.27

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF492272	6797	2.461	0.027	0.91	0.86
VF494801	6797	2.840	0.027	0.98	0.96
VF492420	6797	1.917	0.029	0.90	0.83
VF803474	6797	2.005	0.029	0.95	0.91
VF883670	6797	3.037	0.027	0.97	0.96
VF866064	6797	3.383	0.027	0.96	0.97
VF492586	6797	3.394	0.027	1.13	1.17
VF492212	6797	2.742	0.027	1.08	1.09
VF491949	6797	2.296	0.028	0.95	0.92
VF865675	6797	3.124	0.027	1.07	1.08
VF809001	6797	3.590	0.027	0.93	0.92
VF804267	6797	3.320	0.027	1.13	1.18
VF492414	6797	2.822	0.027	0.93	0.92
VF822412	6797	2.755	0.027	0.93	0.88
VF812997	6797	3.116	0.027	0.99	0.96
VF492008	6797	3.147	0.027	1.03	1.03
VF493011	6797	1.842	0.030	0.88	0.77
VF492178	6797	3.157	0.027	0.92	0.90
VF494819	6797	3.858	0.028	1.09	1.15
VF880680	6797	2.759	0.027	1.01	1.04
VF493097	6797	4.093	0.029	1.15	1.29
VF492231	6797	4.003	0.029	1.27	1.40
VF822465	6797	3.086	0.027	0.95	0.95
VF885555	6797	2.804	0.027	1.06	1.08
VF492436	6797	1.963	0.029	0.96	0.96

Science

Table I13. Science Grade 4 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF287740	7255	0.672	0.026	1.07	1.11
VF287742	7255	0.549	0.026	1.03	1.04
VF311572	7255	-0.470	0.028	0.95	0.92
VF430956	7255	0.217	0.026	1.02	1.01
VF430688	7255	0.072	0.026	1.05	1.05
VF430686	7255	0.703	0.026	1.03	1.06
VF294929	7255	-0.285	0.027	0.93	0.91
VF296821	7255	-0.219	0.027	1.01	1.02
VF387280	7255	1.648	0.028	1.02	1.06
VF387256	7255	0.219	0.026	0.97	0.98
VF431142	7255	-0.089	0.027	0.92	0.88
VF283606	7255	-1.498	0.036	0.98	0.88
VF431081	7255	-0.974	0.031	0.87	0.91
VF385246	7255	-0.721	0.029	0.93	0.85
VF388627	7255	0.848	0.026	0.99	1.00
VF269709	7255	-1.687	0.038	0.94	0.83
VF430894	7255	0.995	0.026	1.08	1.13
VF431027	7255	-0.278	0.027	0.98	0.99
VF431028	7255	-1.271	0.034	0.90	0.78
VF287722	7255	0.785	0.026	1.01	1.02
VF287717	7255	1.289	0.027	0.99	1.06
VF430984	7255	-0.201	0.027	1.01	1.03
VF430987	7255	1.088	0.026	1.03	1.05
VF431125	7255	0.371	0.026	1.08	1.10
VF431127	7255	-0.596	0.029	0.88	0.86
VF431129	7255	0.018	0.026	1.00	1.02
VF431112	7255	0.036	0.026	0.97	0.96
VF431113	7255	-0.249	0.027	1.08	1.16
VF269830	7255	0.775	0.026	1.18	1.23
VF269831	7255	0.623	0.026	1.05	1.06
VF407152	7255	1.097	0.026	1.10	1.15
VF406427	7255	0.586	0.026	0.96	0.95
VF393911	7255	-2.266	0.047	0.93	0.70
VF393954	7255	-0.648	0.029	0.97	0.94
VF393826	7255	-0.533	0.028	0.95	0.93
VF311629	7255	0.794	0.026	1.12	1.17
VF311640	7255	-0.624	0.029	1.06	1.09
VF393724	7255	-0.825	0.030	0.84	0.70

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF393699	7255	0.331	0.026	0.95	0.95
VF393721	7255	0.237	0.026	1.02	1.02
VF386736	7255	-1.177	0.033	0.87	0.71
VF386732	7255	1.542	0.027	1.11	1.23
VF386739	7255	-0.419	0.028	0.97	0.92
VF269871	7255	0.759	0.026	0.98	1.00
VF269873	7255	-0.159	0.027	0.93	0.89
VF386811	7255	0.241	0.026	0.98	0.98
VF386826	7255	0.235	0.026	1.01	0.99
VF430695	7255	1.478	0.027	0.96	1.01
VF269769	7255	0.493	0.026	1.05	1.07
VF269779	7255	-0.472	0.028	0.94	0.89

Table I14. Science Grade 8 IRT Statistics for Operational Items

Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF309025	6787	0.007	0.027	1.02	1.02
VF431248	6787	-0.133	0.027	1.03	1.05
VF388503	6787	1.097	0.028	1.11	1.20
VF388413	6787	-0.090	0.027	1.04	1.06
VF394477	6787	0.113	0.027	0.91	0.88
VF394502	6787	0.298	0.027	1.03	1.03
VF431671	6787	-0.608	0.028	0.99	1.02
VF431673	6787	-1.216	0.031	0.85	0.72
VF431674	6787	-0.496	0.027	0.92	0.88
VF823970	6787	0.032	0.027	1.07	1.10
VF394777	6787	-0.002	0.027	1.02	1.04
VF394780	6787	0.135	0.027	1.05	1.07
VF394809	6787	-0.011	0.027	1.04	1.06
VF394814	6787	0.325	0.027	1.10	1.13
VF308932	6787	0.312	0.027	1.08	1.10
VF308933	6787	1.126	0.029	1.03	1.10
VF431421	6787	-0.184	0.027	1.06	1.09
VF431423	6787	0.968	0.028	1.04	1.11
VF308876	6787	-0.733	0.028	0.95	0.91
VF308880	6787	-0.969	0.029	1.02	1.07
VF308882	6787	-0.875	0.029	1.02	1.04
VF813827	6787	-0.909	0.029	1.00	1.02
VF313289	6787	0.301	0.027	1.04	1.05
VF313291	6787	-0.425	0.027	0.94	0.92
VF313300	6787	-0.069	0.027	1.01	1.02
VF431549	6787	-0.560	0.028	0.89	0.83
VF308941	6787	0.078	0.027	0.98	0.98
VF308944	6787	0.991	0.028	0.90	0.91
VF431656	6787	-0.729	0.028	1.00	0.97
VF308871	6787	0.123	0.027	0.96	0.94
VF308869	6787	-0.201	0.027	1.10	1.17
VF431599	6787	0.432	0.027	1.03	1.05
VF431602	6787	0.667	0.027	0.91	0.90
VF431598	6787	0.298	0.027	0.92	0.91
VF407480	6787	0.044	0.027	1.00	1.02
VF407483	6787	-0.075	0.027	1.14	1.14
VF431624	6787	0.243	0.027	1.00	0.99
VF431626	6787	-1.023	0.030	0.82	0.68
VF431683	6787	-0.994	0.029	1.00	0.98
VF431688	6787	0.242	0.027	1.02	1.03



Accession Number	<i>N</i>	Rasch Difficulty	Rasch <i>SE</i>	Infit	Outfit
VF431609	6787	0.061	0.027	1.12	1.19
VF431610	6787	-0.667	0.028	0.94	0.96
VF431608	6787	-0.082	0.027	0.94	0.94
VF431704	6787	-0.204	0.027	0.95	0.93
VF431703	6787	0.312	0.027	0.94	0.94
VF313274	6787	1.083	0.028	1.17	1.28
VF313280	6787	0.366	0.027	0.94	0.92
VF313281	6787	-0.031	0.027	0.94	0.92
VF486149	6787	0.511	0.027	0.98	0.98
VF486146	6787	0.112	0.027	1.04	1.03

## Appendix J: Frequency of Individual Accommodations for 2015 PAWS Tests

Students received the same accommodations for all subjects (reading, mathematics, and science). The only exceptions are for those accommodations shaded in yellow that were not allowed for the Reading test.

### Reading

Table J1. Frequency of IEP Student's Standard Accommodations: Presentation Accommodations

Code	Accommodation	3	4	5	6	7	8
1	Student uses a Braille Special Test Form.	0	0	0	0	0	1
2	Student uses a Large Print Special Test Form.	3	4	5	3	3	2
3	Student uses an Audio Special Test Form.	0	0	0	0	0	0
4	Student uses magnification devices.	2	2	2	1	3	2
5	Student uses color overlays to reduce glare or enhance text.	9	10	5	6	3	3
6	Student uses templates to reduce the amount of visible print.	17	17	8	8	3	3
7	Student uses tactile graphics.	2	0	1	0	0	0
8	Sign language interpreter signs directions in all content areas and/or signs test questions as written in all content areas EXCEPT Reading. The interpreter may not clarify, interpret, define word meanings, elaborate, or provide assistance to students. Raters need to be familiar with the terminology and symbols specific to the content. It is recommended that one interpreter be provided for each individual student.	0	1	4	0	2	0
9	A certified staff member or access assistant provides visual cues to students who are deaf or hard of hearing.	2	2	1	1	1	3
10	A certified staff member or access assistant reads directions word-for-word as written in all content areas and/or reads or re-reads test questions word-for-word as written in all content areas EXCEPT Reading. Raters may not clarify, interpret, define word meanings, elaborate, or provide assistance to students. It is recommended that one reader be provided for each individual student.	134	142	134	73	39	47
11	Student asks for clarification of directions (NOT test questions or answer choices).	268	290	314	292	240	191
12	Student uses audio amplification devices, including and/or in addition to hearing aids to increase clarity.	4	5	9	2	1	3
13	Student uses text-to-speech software in all content areas EXCEPT Reading.	5	8	3	2	1	5

**Table J2. Frequency of IEP Student's Standard Accommodations: Response Accommodations**

Code	Accommodation	3	4	5	6	7	8
14	A certified staff member or access assistant scribes what a student dictates through alternate augmentative communications (AAC), pointing, sign language, or speech. The scribe may not edit or alter the student's work in any way and must record, word-for-word, exactly what the student has dictated. A scribe must allow the student to review and edit what he or she has written. The student's final response must be transcribed by a certified staff member or access assistant into the Student Test and Answer Book on the pages that the student's response is to be written.	18	17	14	10	3	11
15	A student types responses using a word processor. Dictionary and synonym/thesaurus devices MUST be disabled. The margins for word-processed documents should match the same space as is allowed in the Student Test and Answer Book. A certified staff member or access assistant transcribes verbatim the student's work into the Student Test and Answer Book on the pages that the student's response is to be written.	2	10	16	8	4	7
16	Student uses speech-to-text conversion or voice recognition in all content areas. The margins for this document should match as closely as possible the same space as is allowed in the Student Test and Answer Book. A certified staff member or access assistant transcribes verbatim the student's work into the Student Test and Answer Book on the pages that the student's response is to be written.	1	1	4	0	0	2
17	Student uses a Braille. A certified staff member or access assistant transcribes verbatim the student's work into the Student Test and Answer Book on the pages that the student's response is to be written.	0	0	0	0	0	0
18	Student uses a tape recorder to record test responses rather than writing on a paper. A certified staff member or access assistant transcribes verbatim the student's work into the Student Test and Answer Book on the pages that the student's response is to be written.	0	0	0	0	0	0
19	A certified staff member or access assistant monitors the placement of student responses on the Student Test and Answer Book.	77	60	61	61	35	48
20	Student uses visual organizers including graph paper, place markers, and templates. Student uses a pencil to underline text. Highlighters CANNOT be used in the Student Test and Answer Book.	48	44	87	71	50	37

**Table J3. Frequency of IEP Student's Standard Accommodations: Setting Accommodations**

Code	Accommodation	3	4	5	6	7	8
21	Student takes the test in a different building location in a small group or individually. Changes can also be made to a student's location within a room to reduce distractions to the student or to other students, to increase physical access, or enable the use of special equipment. Students must be monitored by a certified staff member.	517	599	642	635	560	532

Table J4. Frequency of IEP Student’s Standard Accommodations: Timing and Scheduling Accommodations

Code	Accommodation	3	4	5	6	7	8
22	Student is provided with extended time to complete the assessment.	382	447	465	447	396	317
23	Student is provided with multiple, individual breaks as needed, monitored by a teacher or access assistant.	371	416	433	391	288	212
24	Student takes the tests at the time of day when he or she is most likely to demonstrate peak performance.	99	87	67	56	30	21

Table J5. Frequency of English Language Learners Standard Accommodations: Presentation Accommodations

Code	Accommodation	3	4	5	6	7	8
25	A certified staff member or access assistant translates written directions to the student.	3	2	0	1	0	1
26	A certified staff member or access assistant re-reads, simplifies, or clarifies directions in English or in the student’s primary language (NOT test questions or answer choices) without clueing correct responses.	31	36	9	6	3	7
27	A certified staff member or access assistant reads and/or re-reads test questions in English, word-for-word, exactly as written in all content areas EXCEPT Reading. Raters may not clarify, interpret, define word meanings, elaborate, or provide assistance to students. Raters need to be familiar with the terminology and symbols specific to the content. It is recommended that one reader be provided for each individual student.	18	11	5	0	1	2
28	Student uses a bilingual dictionary provided by the school.	2	0	7	7	2	7

Table J6. Frequency of English Language Learners Standard Accommodations: Setting Accommodations

Code	Accommodation	3	4	5	6	7	8
29	Student takes test in a different or individual location, or in a small group.	96	52	36	16	12	25

Table J7. Frequency of English Language Learners Standard Accommodations: Timing and Scheduling Accommodations

Code	Accommodation	3	4	5	6	7	8
30	Student is provided with multiple, individual breaks as needed.	52	33	19	8	3	10
31	Student is allowed to complete the test over multiple days.	19	11	10	4	3	4

Mathematics

Table J8. Frequency of IEP Student’s Standard Accommodations: Presentation Accommodations

Code	Accommodation	3	4	5	6	7	8
1	Student uses a Braille Special Test Form.	0	0	0	0	0	1
2	Student uses a Large Print Special Test Form.	3	5	5	3	3	2
3	Student uses an Audio Special Test Form.	20	36	30	22	34	47
4	Student uses magnification devices.	0	2	2	1	3	2
5	Student uses color overlays to reduce glare or enhance text.	6	9	6	5	3	2
6	Student uses templates to reduce the amount of visible print.	13	5	4	6	2	2
7	Student uses tactile graphics.	0	0	1	0	0	1
8	Sign language interpreter signs directions in all content areas and/or signs test questions as written in all content areas EXCEPT Reading. The interpreter may not clarify, interpret, define word meanings, elaborate, or provide assistance to students. Raters need to be familiar with the terminology and symbols specific to the content. It is recommended that one interpreter be provided for each individual student.	1	1	2	0	1	0
9	A certified staff member or access assistant provides visual cues to students who are deaf or hard of hearing.	3	3	1	1	1	3
10	A certified staff member or access assistant reads directions word-for-word as written in all content areas and/or reads or re-reads test questions word-for-word as written in all content areas EXCEPT Reading. Raters may not clarify, interpret, define word meanings, elaborate, or provide assistance to students. It is recommended that one reader be provided for each individual student.	367	428	431	424	269	218
11	Student asks for clarification of directions (NOT test questions or answer choices).	245	287	334	310	267	200
12	Student uses audio amplification devices, including and/or in addition to hearing aids to increase clarity.	3	5	8	2	2	3
13	Student uses text-to-speech software in all content areas EXCEPT Reading.	5	7	21	6	15	10

Table J9. Frequency of IEP Student’s Standard Accommodations: Response Accommodations

Code	Accommodation	3	4	5	6	7	8
14	A certified staff member or access assistant scribes what a student dictates through alternate augmentative communications (AAC), pointing, sign language, or speech. The scribe may not edit or alter the student’s work in any way and must record, word-for-word, exactly what the student has dictated. A scribe must allow the student to review and edit what he or she has written. The student’s final response must be transcribed by a certified staff member or access assistant into the Student Test and Answer Book on the pages that the student’s response is to be written.	18	17	15	11	4	11
15	A student types responses using a word processor. Dictionary and synonym/thesaurus devices MUST be disabled. The margins for word-processed documents should match the same space as is allowed in the Student Test and Answer Book. A certified staff member or access assistant transcribes verbatim the student’s work into the Student Test and Answer Book on the pages that the student’s response is to be written. Student uses speech-to-text conversion or voice recognition in all content areas. The margins for this document should match as closely as possible the same space as is allowed in the Student Test and Answer Book. A certified staff member or access assistant transcribes verbatim the student’s work into the Student Test and Answer Book on the pages that the student’s response is to be written.	2	10	16	7	4	7
16	Student uses a Braille. A certified staff member or access assistant transcribes verbatim the student’s work into the Student Test and Answer Book on the pages that the student’s response is to be written.	1	2	4	0	0	2
17	Student uses a tape recorder to record test responses rather than writing on a paper. A certified staff member or access assistant transcribes verbatim the student’s work into the Student Test and Answer Book on the pages that the student’s response is to be written.	0	0	0	0	0	0
18	A certified staff member or access assistant monitors the placement of student responses on the Student Test and Answer Book.	0	0	0	0	1	0
19	Student uses visual organizers including graph paper, place markers, and templates. Student uses a pencil to underline text. Highlighters CANNOT be used in the Student Test and Answer Book.	78	52	55	63	41	47
20		102	98	164	136	87	73

Table J10. Frequency of IEP Student’s Standard Accommodations: Setting Accommodations

Code	Accommodation	3	4	5	6	7	8
21	Student takes the test in a different building location in a small group or individually. Changes can also be made to a student’s location within a room to reduce distractions to the student or to other students, to increase physical access, or enable the use of special equipment. Students must be monitored by a certified staff member.	509	596	657	662	571	530

Table J11. Frequency of IEP Student’s Standard Accommodations: Timing and Scheduling Accommodations

Code	Accommodation	3	4	5	6	7	8
22	Student is provided with extended time to complete the assessment.	352	431	453	456	397	312
23	Student is provided with multiple, individual breaks as needed, monitored by a teacher or access assistant.	338	407	437	395	292	213
24	Student takes the tests at the time of day when he or she is most likely to demonstrate peak performance.	89	87	73	55	26	12

Table J12. Frequency of English Language Learners Standard Accommodations: Presentation Accommodations

Code	Accommodation	3	4	5	6	7	8	
25	A certified staff member or access assistant translates written directions to the student.		4	4	8	8	3	9
26	A certified staff member or access assistant re-reads, simplifies, or clarifies directions in English or in the student’s primary language (NOT test questions or answer choices) without clueing correct responses.		48	34	12	7	6	12
27	A certified staff member or access assistant reads and/or re-reads test questions in English, word-for-word, exactly as written in all content areas EXCEPT Reading. Raters may not clarify, interpret, define word meanings, elaborate, or provide assistance to students. Raters need to be familiar with the terminology and symbols specific to the content. It is recommended that one reader be provided for each individual student.		128	76	47	14	7	26
28	Student uses a bilingual dictionary provided by the school.		6	27	14	5	2	5

Table J13. Frequency of English Language Learners Standard Accommodations: Setting Accommodations

Code	Accommodation	3	4	5	6	7	8
29	Student takes test in a different or individual location, or in a small group.	137	81	57	21	13	35

Table J14. Frequency of English Language Learners Standard Accommodations: Timing and Scheduling Accommodations

Code	Accommodation	3	4	5	6	7	8
30	Student is provided with multiple, individual breaks as needed.	90	60	33	8	3	14
31	Student is allowed to complete the test over multiple days.	18	10	13	3	3	4

Science

Table J15. Frequency of IEP Student's Standard Accommodations: Presentation Accommodations

Code	Accommodation	4	8
1	Student uses a Braille Special Test Form.	0	1
2	Student uses a Large Print Special Test Form.	3	2
3	Student uses an Audio Special Test Form.	36	44
4	Student uses magnification devices.	2	3
5	Student uses color overlays to reduce glare or enhance text.	9	3
6	Student uses templates to reduce the amount of visible print.	9	3
7	Student uses tactile graphics.	0	1
	Sign language interpreter signs directions in all content areas and/or signs test questions as written in all content areas EXCEPT Reading. The interpreter may not clarify, interpret, define word meanings, elaborate, or provide assistance to students. Raters need to be familiar with the terminology and symbols specific to the content.	1	0
8	It is recommended that one interpreter be provided for each individual student.		
9	A certified staff member or access assistant provides visual cues to students who are deaf or hard of hearing.	4	3
	A certified staff member or access assistant reads directions word-for-word as written in all content areas and/or reads or re-reads test questions word-for-word as written in all content areas EXCEPT Reading. Raters may not clarify, interpret, define word meanings, elaborate, or provide assistance to students. It is recommended that one reader be provided for each individual student.	434	216
10			
11	Student asks for clarification of directions (NOT test questions or answer choices).	305	208
12	Student uses audio amplification devices, including and/or in addition to hearing aids to increase clarity.	5	4
13	Student uses text-to-speech software in all content areas EXCEPT Reading.	10	11



**Table J16. Frequency of IEP Student’s Standard Accommodations: Response Accommodations**

Code	Accommodation	4	8
14	A certified staff member or access assistant scribes what a student dictates through alternate augmentative communications (AAC), pointing, sign language, or speech. The scribe may not edit or alter the student’s work in any way and must record, word-for-word, exactly what the student has dictated. A scribe must allow the student to review and edit what he or she has written. The student’s final response must be transcribed by a certified staff member or access assistant into the Student Test and Answer Book on the pages that the student’s response is to be written.	18	12
15	A student types responses using a word processor. Dictionary and synonym/thesaurus devices MUST be disabled. The margins for word-processed documents should match the same space as is allowed in the Student Test and Answer Book. A certified staff member or access assistant transcribes verbatim the student’s work into the Student Test and Answer Book on the pages that the student’s response is to be written.	9	7
16	Student uses speech-to-text conversion or voice recognition in all content areas. The margins for this document should match as closely as possible the same space as is allowed in the Student Test and Answer Book. A certified staff member or access assistant transcribes verbatim the student’s work into the Student Test and Answer Book on the pages that the student’s response is to be written.	1	2
17	Student uses a Braille. A certified staff member or access assistant transcribes verbatim the student’s work into the Student Test and Answer Book on the pages that the student’s response is to be written.	0	0
18	Student uses a tape recorder to record test responses rather than writing on a paper. A certified staff member or access assistant transcribes verbatim the student’s work into the Student Test and Answer Book on the pages that the student’s response is to be written.	0	0
19	A certified staff member or access assistant monitors the placement of student responses on the Student Test and Answer Book.	56	50
20	Student uses visual organizers including graph paper, place markers, and templates. Student uses a pencil to underline text. Highlighters CANNOT be used in the Student Test and Answer Book.	69	56

**Table J17. Frequency of IEP Student’s Standard Accommodations: Setting Accommodations**

Code	Accommodation	4	8
21	Student takes the test in a different building location in a small group or individually. Changes can also be made to a student’s location within a room to reduce distractions to the student or to other students, to increase physical access, or enable the use of special equipment. Students must be monitored by a certified staff member.	595	524

Table J18. Frequency of IEP Student’s Standard Accommodations: Timing and Scheduling Accommodations

Code	Accommodation	4	8
22	Student is provided with extended time to complete the assessment.	422	308
23	Student is provided with multiple, individual breaks as needed, monitored by a teacher or access assistant.	402	217
24	Student takes the tests at the time of day when he or she is most likely to demonstrate peak performance.	90	12

Table J19. Frequency of English Language Learners Standard Accommodations: Presentation Accommodations

Code	Accommodation	4	8
25	A certified staff member or access assistant translates written directions to the student.	6	7
26	A certified staff member or access assistant re-reads, simplifies, or clarifies directions in English or in the student’s primary language (NOT test questions or answer choices) without clueing correct responses.	43	9
27	A certified staff member or access assistant reads and/or re-reads test questions in English, word-for-word, exactly as written in all content areas EXCEPT Reading. Raters may not clarify, interpret, define word meanings, elaborate, or provide assistance to students. Raters need to be familiar with the terminology and symbols specific to the content. It is recommended that one reader be provided for each individual student.	78	18
28	Student uses a bilingual dictionary provided by the school.	14	6

Table J20. Frequency of English Language Learners Standard Accommodations: Setting Accommodations

Code	Accommodation	4	8
29	Student takes test in a different or individual location, or in a small group.	83	26

Table J21. Frequency of English Language Learners Standard Accommodations: Timing and Scheduling Accommodations

Code	Accommodation	4	8
30	Student is provided with multiple, individual breaks as needed.	65	11
31	Student is allowed to complete the test over multiple days.	12	2

Appendix K: Mean Scale Scores, Counts, and Scale Score Standard Deviations for IEP Students by Accommodation Status

Reading

Table K1. Reading Mean Scale Scores, Counts, and Scale Score Standard Deviations for IEP Students by Accommodation Status

Grade	Accommodated	<i>N</i>	Mean Scale Score	<i>SD</i> Scale Score
3	Yes	996	563.3	48.6
	No	6545	604.8	45.5
4	Yes	967	573.3	51.7
	No	6349	622.9	47.0
5	Yes	964	581.6	48.2
	No	6002	636.4	45.8
6	Yes	907	593.1	42.5
	No	6195	643.9	44.7
7	Yes	808	601.5	38.3
	No	5958	655.2	43.1
8	Yes	774	606.0	41.7
	No	6014	661.0	45.0

Mathematics

Table K2. Mathematics Mean Scale Scores, Counts, and Scale Score Standard Deviations for IEP Students by Accommodation Status

Grade	Accommodated	<i>N</i>	Mean Scale Score	<i>SD</i> Scale Score
3	Yes	998	573.4	49.7
	No	6549	606.9	50.0
4	Yes	950	607.9	45.7
	No	6369	644.3	49.6
5	Yes	962	624.6	43.8
	No	6013	668.3	53.1
6	Yes	907	641.4	40.7
	No	6200	684.9	47.5
7	Yes	808	655.5	32.4
	No	5959	699.1	44.4
8	Yes	773	668.2	31.2
	No	6029	711.6	43.2

Science

Table K3. Science Mean Scale Scores, Counts, and Scale Score Standard Deviations for IEP Students by Accommodation Status

Grade	Accommodated	<i>N</i>	Mean Scale Score	<i>SD</i> Scale Score
4	Yes	952	645.6	44.3
	No	6355	672.4	46.4
8	Yes	771	611.6	36.0
	No	6019	652.6	45.9

## Appendix L: Scaled Score Descriptive Statistics by Demographic Subgroup

Table L1. Summary Statistics of Reading, Mathematics, and Science Scale Score by Grade

Grade	<i>N</i>	Mean	<i>SD</i>
Reading			
3	7541	599.3	48.0
4	7316	616.3	50.5
5	6966	628.8	49.9
6	7102	637.4	47.5
7	6766	648.8	46.0
8	6788	654.7	47.9
Mathematics			
3	7547	602.4	51.2
4	7319	639.6	50.6
5	6975	662.3	54.1
6	7107	679.4	48.9
7	6767	693.9	45.4
8	6802	706.7	44.2
Science			
4	7307	668.9	47.0
8	6790	648.0	46.7

Reading

Table L2. Summary Statistics of Reading Grade 3 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	7541	599.3	48.0
Male	3913	596.0	48.7
Female	3624	602.9	47.0
Unknown	4	628.5	62.5
American Indian/Alaska Native	272	561.5	43.2
Asian	57	595.7	46.3
African American	74	584.7	42.3
Native Hawaiian or other/Pacific Islander	10	559.0	58.8
Hispanic/Latino	1029	580.4	44.9
White	5943	604.7	47.0
Multiracial	145	598.2	49.8
Unknown	11	588.8	63.9
Free/Reduced Lunch	2773	585.6	46.1
Not Free/Reduced Lunch	4768	607.3	47.3
Special Education	996	563.3	48.6
Not Special Education	6545	604.8	45.5
English Language Learner	304	553.7	36.6
Not English Language Learner	7237	601.3	47.5

Table L3. Summary Statistics of Reading Grade 4 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	7316	616.3	50.5
Male	3661	610.9	50.7
Female	3649	621.8	49.6
Unknown	6	557.2	57.2
American Indian/Alaska Native	293	578.6	51.5
Asian	56	617.0	49.7
African American	74	608.5	53.3
Native Hawaiian or other/Pacific Islander	11	600.8	47.9
Hispanic/Latino	1090	599.1	48.7
White	5613	622.0	49.1
Multiracial	159	612.2	51.3
Unknown	20	592.6	47.6
Free/Reduced Lunch	2615	603.2	49.5
Not Free/Reduced Lunch	4701	623.6	49.6
Special Education	967	573.3	51.7
Not Special Education	6349	622.9	47.0
English Language Learner	205	556.0	40.6
Not English Language Learner	7111	618.1	49.7

Table L4. Summary Statistics of Reading Grade 5 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	6966	628.8	49.9
Male	3625	624.8	50.7
Female	3334	633.2	48.7
Unknown	7	615.9	48.2
American Indian/Alaska Native	257	589.6	45.5
Asian	65	637.0	52.2
African American	89	612.8	43.6
Native Hawaiian or other/Pacific Islander	8	605.4	44.4
Hispanic/Latino	960	608.9	47.8
White	5429	634.3	48.8
Multiracial	148	633.1	48.4
Unknown	10	594.5	37.7
Free/Reduced Lunch	2505	614.5	47.2
Not Free/Reduced Lunch	4461	636.9	49.6
Special Education	964	581.6	48.2
Not Special Education	6002	636.4	45.8
English Language Learner	130	564.1	34.8
Not English Language Learner	6836	630.1	49.3

Table L5. Summary Statistics of Reading Grade 6 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	7102	637.4	47.5
Male	3683	634.1	48.6
Female	3419	641.0	46.1
Unknown	0	0.0	0.0
American Indian/Alaska Native	267	604.8	43.6
Asian	69	641.7	54.4
African American	72	629.9	47.0
Native Hawaiian or other/Pacific Islander	8	607.9	33.5
Hispanic/Latino	956	620.7	43.2
White	5575	642.1	47.0
Multiracial	145	634.8	50.0
Unknown	10	606.2	35.0
Free/Reduced Lunch	2446	623.8	45.2
Not Free/Reduced Lunch	4656	644.6	47.2
Special Education	907	593.1	42.5
Not Special Education	6195	643.9	44.7
English Language Learner	104	579.3	37.2
Not English Language Learner	6998	638.3	47.1

Table L6. Summary Statistics of Reading Grade 7 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	6766	648.8	46.0
Male	3517	645.2	46.2
Female	3249	652.7	45.4
Unknown	0	0.0	0.0
American Indian/Alaska Native	269	614.3	40.9
Asian	56	653.7	47.5
African American	71	631.3	47.7
Native Hawaiian or other/Pacific Islander	12	627.2	35.4
Hispanic/Latino	926	634.0	41.4
White	5295	653.3	45.6
Multiracial	134	653.6	48.8
Unknown	3	622.7	57.4
Free/Reduced Lunch	2293	635.5	44.1
Not Free/Reduced Lunch	4473	655.6	45.4
Special Education	808	601.5	38.3
Not Special Education	5958	655.2	43.1
English Language Learner	139	595.6	32.3
Not English Language Learner	6627	649.9	45.6

Table L7. Summary Statistics of Reading Grade 8 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	6788	654.7	47.9
Male	3507	647.1	48.0
Female	3281	662.8	46.5
Unknown	0	0.0	0.0
American Indian/Alaska Native	226	615.5	39.2
Asian	53	659.4	49.0
African American	78	639.0	42.0
Native Hawaiian or other/Pacific Islander	16	632.1	43.5
Hispanic/Latino	920	638.4	44.4
White	5352	659.6	47.5
Multiracial	135	650.4	49.6
Unknown	8	649.3	37.5
Free/Reduced Lunch	2317	639.9	45.5
Not Free/Reduced Lunch	4471	662.4	47.4
Special Education	774	606.0	41.7
Not Special Education	6014	661.0	45.0
English Language Learner	138	598.4	36.9
Not English Language Learner	6650	655.9	47.4



Mathematics

Table L8. Summary Statistics of Mathematics Grade 3 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	7547	602.4	51.2
Male	3915	605.2	52.3
Female	3627	599.6	49.9
Unknown	5	564.6	79.0
American Indian/Alaska Native	274	564.4	41.7
Asian	57	611.6	50.2
African American	76	584.9	48.4
Native Hawaiian or other/Pacific Islander	11	557.2	41.4
Hispanic/Latino	1033	583.5	46.2
White	5933	607.9	50.9
Multiracial	146	596.3	49.1
Unknown	17	590.4	60.6
Free/Reduced Lunch	2772	590.3	48.1
Not Free/Reduced Lunch	4775	609.5	51.6
Special Education	998	573.4	49.7
Not Special Education	6549	606.9	50.0
English Language Learner	308	563.4	35.7
Not English Language Learner	7239	604.1	51.1

Table L9. Summary Statistics of Mathematics Grade 4 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	7319	639.6	50.6
Male	3663	641.7	52.7
Female	3648	637.4	48.3
Unknown	8	646.4	74.1
American Indian/Alaska Native	292	609.6	49.4
Asian	56	650.5	55.0
African American	75	620.4	43.3
Native Hawaiian or other/Pacific Islander	10	624.7	43.0
Hispanic/Latino	1097	622.0	45.4
White	5611	645.0	50.2
Multiracial	160	632.5	52.9
Unknown	18	635.9	60.1
Free/Reduced Lunch	2609	629.0	47.5
Not Free/Reduced Lunch	4710	645.4	51.3
Special Education	950	607.9	45.7
Not Special Education	6369	644.3	49.6
English Language Learner	205	594.2	36.7
Not English Language Learner	7114	640.9	50.3

Table L10. Summary Statistics of Mathematics Grade 5 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	6975	662.3	54.1
Male	3630	662.5	55.4
Female	3338	662.1	52.6
Unknown	7	656.0	57.7
American Indian/Alaska Native	256	630.4	39.3
Asian	68	673.0	64.2
African American	90	643.7	44.7
Native Hawaiian or other/Pacific Islander	8	631.5	45.6
Hispanic/Latino	967	641.9	44.9
White	5427	667.7	54.8
Multiracial	148	662.1	51.7
Unknown	11	656.5	65.3
Free/Reduced Lunch	2513	647.9	48.3
Not Free/Reduced Lunch	4462	670.4	55.5
Special Education	962	624.6	43.8
Not Special Education	6013	668.3	53.1
English Language Learner	135	615.1	33.8
Not English Language Learner	6840	663.2	54.0

Table L11. Summary Statistics of Mathematics Grade 6 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	7107	679.4	48.9
Male	3687	678.6	49.6
Female	3420	680.2	48.2
Unknown	0	0.0	0.0
American Indian/Alaska Native	268	649.9	49.4
Asian	70	698.4	58.0
African American	71	670.0	46.8
Native Hawaiian or other/Pacific Islander	9	647.9	46.8
Hispanic/Latino	965	663.1	43.6
White	5570	683.8	48.4
Multiracial	145	671.3	49.4
Unknown	9	635.4	41.5
Free/Reduced Lunch	2452	666.0	43.9
Not Free/Reduced Lunch	4655	686.4	49.9
Special Education	907	641.4	40.7
Not Special Education	6200	684.9	47.5
English Language Learner	110	628.1	30.2
Not English Language Learner	6997	680.2	48.7

Table L12. Summary Statistics of Mathematics Grade 7 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	6767	693.9	45.4
Male	3519	694.3	46.4
Female	3248	693.4	44.2
Unknown	0	0.0	0.0
American Indian/Alaska Native	268	664.8	35.6
Asian	57	710.5	47.0
African American	71	676.5	40.6
Native Hawaiian or other/Pacific Islander	12	665.4	32.6
Hispanic/Latino	928	680.0	40.4
White	5293	698.0	45.7
Multiracial	135	689.4	40.2
Unknown	3	672.7	34.1
Free/Reduced Lunch	2292	681.0	40.7
Not Free/Reduced Lunch	4475	700.5	46.2
Special Education	808	655.5	32.4
Not Special Education	5959	699.1	44.4
English Language Learner	140	652.4	26.9
Not English Language Learner	6627	694.8	45.3

Table L13. Summary Statistics of Mathematics Grade 8 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	6802	706.7	44.2
Male	3519	704.5	44.5
Female	3283	709.0	43.7
Unknown	0	0.0	0.0
American Indian/Alaska Native	225	667.9	29.8
Asian	54	728.6	55.4
African American	78	687.2	32.0
Native Hawaiian or other/Pacific Islander	17	683.6	28.6
Hispanic/Latino	933	692.4	37.6
White	5352	711.1	44.3
Multiracial	135	702.7	45.2
Unknown	8	687.3	35.1
Free/Reduced Lunch	2323	693.2	38.4
Not Free/Reduced Lunch	4479	713.7	45.3
Special Education	773	668.2	31.2
Not Special Education	6029	711.6	43.2
English Language Learner	146	668.7	29.6
Not English Language Learner	6656	707.5	44.1

Science

Table L14. Summary Statistics of Science Grade 4 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	7307	668.9	47.0
Male	3655	668.3	47.1
Female	3645	669.4	46.9
Unknown	7	677.4	51.0
American Indian/Alaska Native	290	630.9	45.0
Asian	56	670.5	43.0
African American	74	654.3	41.5
Native Hawaiian or other/Pacific Islander	10	652.8	44.0
Hispanic/Latino	1096	649.6	41.0
White	5609	675.0	46.3
Multiracial	159	662.8	48.2
Unknown	13	648.1	46.9
Free/Reduced Lunch	2605	656.5	44.3
Not Free/Reduced Lunch	4702	675.8	47.1
Special Education	952	645.6	44.3
Not Special Education	6355	672.4	46.4
English Language Learner	204	619.5	32.0
Not English Language Learner	7103	670.3	46.6

Table L15. Summary Statistics of Science Grade 8 Scale Score

Group	<i>N</i>	Mean	<i>SD</i>
Total	6790	648.0	46.7
Male	3513	646.8	47.7
Female	3277	649.2	45.6
Unknown	0	0.0	0.0
American Indian/Alaska Native	222	608.5	34.5
Asian	54	657.6	46.8
African American	78	624.9	38.0
Native Hawaiian or other/Pacific Islander	17	630.7	31.8
Hispanic/Latino	927	629.9	40.9
White	5349	653.2	46.5
Multiracial	135	640.7	50.9
Unknown	8	646.8	37.6
Free/Reduced Lunch	2322	634.4	42.5
Not Free/Reduced Lunch	4468	655.0	47.3
Special Education	771	611.6	36.0
Not Special Education	6019	652.6	45.9
English Language Learner	144	599.8	29.4
Not English Language Learner	6646	649.0	46.5

## Appendix M: Raw Score to Scaled Score Tables

### Reading

Table M1. Reading Grade 3 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-4.798	375	63	1
1	-4.087	375	45	1
2	-3.357	406	32	1
3	-2.916	425	27	1
4	-2.592	439	23	1
5	-2.332	451	21	1
6	-2.114	460	20	1
7	-1.923	469	19	1
8	-1.753	476	18	1
9	-1.598	483	17	1
10	-1.455	489	16	1
11	-1.322	495	16	1
12	-1.197	501	15	1
13	-1.078	506	15	1
14	-0.965	511	15	1
15	-0.856	516	14	1
16	-0.751	520	14	1
17	-0.650	525	14	1
18	-0.551	529	14	1
19	-0.454	533	14	1
20	-0.359	537	13	1
21	-0.266	541	13	1
22	-0.173	546	13	1
23	-0.082	550	13	1
24	0.009	554	13	2
25	0.099	558	13	2
26	0.190	562	13	2
27	0.280	565	13	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
28	0.372	569	13	2
29	0.464	574	13	2
30	0.557	578	13	2
31	0.651	582	14	2
32	0.748	586	14	2
33	0.846	590	14	3
34	0.947	595	14	3
35	1.052	599	14	3
36	1.160	604	15	3
37	1.272	609	15	3
38	1.390	614	15	3
39	1.514	620	16	3
40	1.646	625	16	3
41	1.788	632	17	3
42	1.942	638	18	3
43	2.111	646	19	4
44	2.301	654	20	4
45	2.519	664	21	4
46	2.777	675	23	4
47	3.100	689	27	4
48	3.541	709	32	4
49	4.270	741	45	4
50	4.980	772	63	4

Table M2. Reading Grade 4 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-4.745	400	63	1
1	-4.031	400	45	1
2	-3.295	409	32	1
3	-2.846	428	27	1
4	-2.516	443	24	1
5	-2.251	454	22	1
6	-2.026	464	20	1
7	-1.829	473	19	1
8	-1.653	481	18	1
9	-1.493	488	17	1
10	-1.344	494	17	1
11	-1.206	500	16	1
12	-1.075	506	16	1
13	-0.951	511	15	1
14	-0.832	517	15	1
15	-0.718	522	15	1
16	-0.608	526	14	1
17	-0.500	531	14	1
18	-0.396	536	14	1
19	-0.294	540	14	1
20	-0.194	545	14	1
21	-0.095	549	14	1
22	0.002	553	14	1
23	0.099	558	14	1
24	0.195	562	14	1
25	0.291	566	14	2
26	0.386	570	14	2
27	0.482	574	14	2
28	0.578	579	14	2
29	0.675	583	14	2
30	0.773	587	14	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
31	0.873	591	14	2
32	0.974	596	14	2
33	1.077	600	14	2
34	1.183	605	14	2
35	1.292	610	15	3
36	1.405	615	15	3
37	1.522	620	15	3
38	1.644	625	16	3
39	1.773	631	16	3
40	1.909	637	16	3
41	2.055	643	17	3
42	2.214	650	18	3
43	2.387	658	19	3
44	2.581	666	20	4
45	2.802	676	21	4
46	3.064	688	24	4
47	3.391	702	27	4
48	3.835	721	32	4
49	4.567	754	45	4
50	5.279	785	63	4



Table M3. Reading Grade 5 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-4.778	425	63	1
1	-4.062	425	45	1
2	-3.324	425	32	1
3	-2.875	427	27	1
4	-2.543	442	24	1
5	-2.277	453	22	1
6	-2.053	463	20	1
7	-1.857	472	19	1
8	-1.681	479	18	1
9	-1.522	486	17	1
10	-1.376	493	17	1
11	-1.239	499	16	1
12	-1.111	504	15	1
13	-0.990	510	15	1
14	-0.875	515	15	1
15	-0.764	520	14	1
16	-0.658	524	14	1
17	-0.555	529	14	1
18	-0.455	533	14	1
19	-0.358	537	14	1
20	-0.264	542	13	1
21	-0.171	546	13	1
22	-0.079	550	13	1
23	0.011	554	13	1
24	0.100	558	13	1
25	0.188	561	13	1
26	0.276	565	13	1
27	0.363	569	13	1
28	0.450	573	13	1
29	0.537	577	13	1
30	0.625	581	13	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
31	0.713	584	13	2
32	0.802	588	13	2
33	0.892	592	13	2
34	0.983	596	13	2
35	1.076	600	13	2
36	1.171	605	14	2
37	1.268	609	14	2
38	1.368	613	14	2
39	1.471	618	14	2
40	1.578	622	14	3
41	1.689	627	15	3
42	1.806	632	15	3
43	1.929	638	16	3
44	2.060	644	16	3
45	2.201	650	17	3
46	2.354	656	18	3
47	2.523	664	18	3
48	2.711	672	20	4
49	2.928	682	21	4
50	3.185	693	23	4
51	3.507	707	27	4
52	3.947	726	32	4
53	4.674	758	45	4
54	5.385	790	63	4

Table M4. Reading Grade 6 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-4.001	450	63	1
1	-3.292	450	45	1
2	-2.569	450	32	1
3	-2.133	460	26	1
4	-1.815	473	23	1
5	-1.562	485	21	1
6	-1.349	494	19	1
7	-1.164	502	18	1
8	-1.000	509	17	1
9	-0.851	516	17	1
10	-0.714	522	16	1
11	-0.587	527	15	1
12	-0.468	533	15	1
13	-0.356	538	15	1
14	-0.249	542	14	1
15	-0.147	547	14	1
16	-0.048	551	14	1
17	0.047	555	13	1
18	0.139	559	13	1
19	0.228	563	13	1
20	0.316	567	13	1
21	0.401	571	13	1
22	0.485	574	13	1
23	0.568	578	13	1
24	0.650	582	13	1
25	0.731	585	12	1
26	0.811	589	12	2
27	0.891	592	12	2
28	0.971	596	12	2
29	1.050	599	12	2
30	1.130	603	12	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
31	1.210	606	12	2
32	1.291	610	13	2
33	1.373	613	13	2
34	1.455	617	13	2
35	1.538	621	13	2
36	1.624	624	13	2
37	1.710	628	13	2
38	1.799	632	13	3
39	1.890	636	13	3
40	1.984	640	14	3
41	2.082	645	14	3
42	2.183	649	14	3
43	2.289	654	14	3
44	2.400	659	15	3
45	2.518	664	15	3
46	2.643	669	16	3
47	2.778	675	16	3
48	2.925	682	17	4
49	3.088	689	18	4
50	3.271	697	19	4
51	3.482	706	21	4
52	3.733	717	23	4
53	4.048	731	26	4
54	4.481	750	32	4
55	5.202	781	44	4
56	5.908	812	63	4

Table M5. Reading Grade 7 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-3.692	475	63	1
1	-2.983	475	45	1
2	-2.257	475	32	1
3	-1.819	475	27	1
4	-1.498	487	23	1
5	-1.242	499	21	1
6	-1.027	508	20	1
7	-0.840	516	18	1
8	-0.674	524	17	1
9	-0.522	530	17	1
10	-0.384	536	16	1
11	-0.254	542	15	1
12	-0.133	547	15	1
13	-0.019	552	15	1
14	0.090	557	14	1
15	0.194	562	14	1
16	0.295	566	14	1
17	0.391	570	14	1
18	0.485	574	13	1
19	0.577	578	13	1
20	0.666	582	13	1
21	0.753	586	13	1
22	0.839	590	13	1
23	0.924	594	13	1
24	1.007	597	13	1
25	1.090	601	13	1
26	1.172	605	13	1
27	1.253	608	13	2
28	1.334	612	13	2
29	1.416	615	13	2
30	1.497	619	13	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
31	1.579	622	13	2
32	1.661	626	13	2
33	1.744	630	13	2
34	1.828	633	13	2
35	1.913	637	13	2
36	1.999	641	13	2
37	2.087	645	13	3
38	2.177	649	13	3
39	2.270	653	13	3
40	2.365	657	14	3
41	2.464	661	14	3
42	2.566	666	14	3
43	2.673	670	15	3
44	2.786	675	15	3
45	2.905	681	15	3
46	3.031	686	16	3
47	3.168	692	17	3
48	3.316	699	17	4
49	3.480	706	18	4
50	3.663	714	19	4
51	3.875	723	21	4
52	4.127	734	23	4
53	4.444	748	26	4
54	4.878	767	32	4
55	5.599	799	45	4
56	6.306	830	63	4

Table M6. Reading Grade 8 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-3.855	500	63	1
1	-3.146	500	45	1
2	-2.420	500	32	1
3	-1.983	500	27	1
4	-1.664	500	23	1
5	-1.409	500	21	1
6	-1.195	501	20	1
7	-1.009	509	18	1
8	-0.843	516	17	1
9	-0.694	523	17	1
10	-0.556	529	16	1
11	-0.428	534	15	1
12	-0.308	540	15	1
13	-0.195	545	15	1
14	-0.087	549	14	1
15	0.016	554	14	1
16	0.115	558	14	1
17	0.211	562	13	1
18	0.303	566	13	1
19	0.394	570	13	1
20	0.482	574	13	1
21	0.568	578	13	1
22	0.653	582	13	1
23	0.737	586	13	1
24	0.820	589	13	1
25	0.902	593	13	1
26	0.983	596	13	1
27	1.065	600	13	1
28	1.145	603	12	1
29	1.226	607	13	1
30	1.307	611	13	1

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
31	1.389	614	13	1
32	1.471	618	13	2
33	1.554	621	13	2
34	1.638	625	13	2
35	1.723	629	13	2
36	1.810	633	13	2
37	1.898	636	13	2
38	1.989	640	13	2
39	2.082	645	13	2
40	2.178	649	14	2
41	2.277	653	14	2
42	2.381	658	14	3
43	2.489	662	15	3
44	2.602	667	15	3
45	2.722	673	15	3
46	2.850	678	16	3
47	2.988	684	17	3
48	3.138	691	17	3
49	3.303	698	18	3
50	3.489	706	20	3
51	3.703	716	21	4
52	3.957	727	23	4
53	4.276	741	27	4
54	4.713	760	32	4
55	5.437	792	45	4
56	6.146	823	63	4



Mathematics

Table M7. Mathematics Grade 3 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-5.067	375	62	1
1	-4.354	381	44	1
2	-3.619	413	32	1
3	-3.173	433	27	1
4	-2.843	447	23	1
5	-2.578	459	21	1
6	-2.354	468	20	1
7	-2.158	477	19	1
8	-1.982	484	18	1
9	-1.821	491	17	1
10	-1.672	498	16	1
11	-1.533	504	16	1
12	-1.402	510	15	1
13	-1.278	515	15	1
14	-1.158	520	15	1
15	-1.044	525	15	1
16	-0.933	530	14	1
17	-0.826	535	14	1
18	-0.721	539	14	1
19	-0.619	544	14	1
20	-0.519	548	14	1
21	-0.420	552	14	2
22	-0.323	556	13	2
23	-0.226	561	13	2
24	-0.131	565	13	2
25	-0.036	569	13	2
26	0.059	573	13	2
27	0.154	577	13	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
28	0.249	581	13	2
29	0.345	585	13	2
30	0.442	590	14	2
31	0.539	594	14	2
32	0.639	598	14	2
33	0.740	603	14	3
34	0.843	607	14	3
35	0.950	612	14	3
36	1.060	616	14	3
37	1.174	621	15	3
38	1.293	627	15	3
39	1.418	632	16	3
40	1.550	638	16	3
41	1.692	644	17	3
42	1.846	651	17	3
43	2.014	658	18	3
44	2.202	666	19	4
45	2.418	675	21	4
46	2.674	686	23	4
47	2.994	700	26	4
48	3.432	719	32	4
49	4.156	751	44	4
50	4.864	782	62	4

Table M8. Mathematics Grade 4 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-4.542	400	62	1
1	-3.829	404	44	1
2	-3.097	436	32	1
3	-2.652	455	27	1
4	-2.324	470	23	1
5	-2.061	481	21	1
6	-1.838	491	20	1
7	-1.643	499	19	1
8	-1.468	507	18	1
9	-1.309	514	17	1
10	-1.163	520	16	1
11	-1.026	526	16	1
12	-0.897	531	15	1
13	-0.774	537	15	1
14	-0.658	542	15	1
15	-0.546	547	14	1
16	-0.439	551	14	1
17	-0.335	556	14	1
18	-0.234	560	14	1
19	-0.136	565	13	1
20	-0.040	569	13	1
21	0.054	573	13	1
22	0.145	577	13	1
23	0.236	581	13	1
24	0.325	585	13	2
25	0.413	588	13	2
26	0.499	592	13	2
27	0.586	596	13	2
28	0.671	600	13	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
29	0.756	603	13	2
30	0.841	607	13	2
31	0.926	611	13	2
32	1.011	614	13	2
33	1.096	618	13	2
34	1.181	622	13	2
35	1.268	625	13	2
36	1.355	629	13	2
37	1.443	633	13	2
38	1.532	637	13	3
39	1.622	641	13	3
40	1.715	645	13	3
41	1.809	649	13	3
42	1.906	653	14	3
43	2.006	657	14	3
44	2.109	662	14	3
45	2.215	667	14	3
46	2.327	671	15	3
47	2.443	676	15	3
48	2.566	682	15	3
49	2.697	687	16	3
50	2.838	694	17	3
51	2.990	700	17	4
52	3.158	707	18	4
53	3.345	716	19	4
54	3.561	725	21	4
55	3.817	736	23	4
56	4.137	750	26	4
57	4.574	769	32	4
58	5.298	800	44	4

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
59	6.007	831	62	4

Table M9. Mathematics Grade 5 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-3.549	425	62	1
1	-2.840	447	44	1
2	-2.115	479	32	1
3	-1.678	498	26	1
4	-1.359	511	23	1
5	-1.105	522	21	1
6	-0.892	532	19	1
7	-0.707	540	18	1
8	-0.542	547	17	1
9	-0.394	553	16	1
10	-0.257	559	16	1
11	-0.131	565	15	1
12	-0.013	570	15	1
13	0.098	575	14	1
14	0.204	579	14	1
15	0.305	584	14	1
16	0.402	588	13	1
17	0.495	592	13	1
18	0.585	596	13	1
19	0.673	600	13	1
20	0.758	603	13	1
21	0.842	607	12	1
22	0.923	610	12	2
23	1.003	614	12	2
24	1.082	617	12	2
25	1.160	621	12	2
26	1.237	624	12	2
27	1.314	627	12	2
28	1.390	631	12	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
29	1.466	634	12	2
30	1.541	637	12	2
31	1.617	641	12	2
32	1.693	644	12	2
33	1.769	647	12	2
34	1.845	650	12	2
35	1.923	654	12	3
36	2.001	657	12	3
37	2.081	661	12	3
38	2.161	664	12	3
39	2.243	668	13	3
40	2.328	671	13	3
41	2.414	675	13	3
42	2.503	679	13	3
43	2.594	683	13	3
44	2.689	687	13	3
45	2.788	691	14	3
46	2.892	696	14	3
47	3.001	701	15	3
48	3.116	706	15	3
49	3.240	711	16	3
50	3.373	717	16	3
51	3.518	723	17	3
52	3.678	730	18	4
53	3.859	738	19	4
54	4.068	747	21	4
55	4.317	758	23	4
56	4.630	771	26	4
57	5.061	790	31	4
58	5.780	821	44	4

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
59	6.485	852	62	4



Table M10. Mathematics Grade 6 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-3.064	450	62	1
1	-2.353	468	44	1
2	-1.624	500	32	1
3	-1.183	519	26	1
4	-0.860	533	23	1
5	-0.602	544	21	1
6	-0.386	554	19	1
7	-0.198	562	18	1
8	-0.030	569	17	1
9	0.121	576	16	1
10	0.260	582	16	1
11	0.389	587	15	1
12	0.510	593	15	1
13	0.623	597	14	1
14	0.731	602	14	1
15	0.834	607	14	1
16	0.933	611	13	1
17	1.028	615	13	1
18	1.119	619	13	1
19	1.208	623	13	1
20	1.295	627	13	1
21	1.380	630	13	2
22	1.463	634	12	2
23	1.544	637	12	2
24	1.624	641	12	2
25	1.703	644	12	2
26	1.781	648	12	2
27	1.858	651	12	2
28	1.935	654	12	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
29	2.012	658	12	2
30	2.088	661	12	2
31	2.164	664	12	2
32	2.241	668	12	2
33	2.318	671	12	2
34	2.395	674	12	2
35	2.473	678	12	3
36	2.552	681	12	3
37	2.632	685	12	3
38	2.713	688	12	3
39	2.796	692	13	3
40	2.881	695	13	3
41	2.968	699	13	3
42	3.057	703	13	3
43	3.149	707	13	3
44	3.245	711	14	3
45	3.345	716	14	3
46	3.449	720	14	3
47	3.558	725	15	3
48	3.675	730	15	3
49	3.799	735	16	3
50	3.933	741	16	3
51	4.079	747	17	4
52	4.240	754	18	4
53	4.422	762	19	4
54	4.631	771	21	4
55	4.881	782	23	4
56	5.196	796	26	4
57	5.628	815	32	4
58	6.347	846	44	4

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
59	7.054	877	62	4

Table M11. Mathematics Grade 7 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-2.312	475	62	1
1	-1.604	501	44	1
2	-0.882	532	32	1
3	-0.447	551	26	1
4	-0.129	565	23	1
5	0.124	576	21	1
6	0.336	585	19	1
7	0.521	593	18	1
8	0.685	600	17	1
9	0.833	607	16	1
10	0.970	613	16	1
11	1.097	618	15	1
12	1.215	623	15	1
13	1.328	628	14	1
14	1.434	633	14	1
15	1.536	637	14	1
16	1.634	641	13	1
17	1.729	645	13	1
18	1.821	649	13	1
19	1.910	653	13	2
20	1.996	657	13	2
21	2.081	661	13	2
22	2.165	664	12	2
23	2.247	668	12	2
24	2.328	671	12	2
25	2.407	675	12	2
26	2.486	678	12	2
27	2.565	682	12	2
28	2.643	685	12	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
29	2.721	689	12	2
30	2.798	692	12	2
31	2.876	695	12	2
32	2.954	699	12	3
33	3.032	702	12	3
34	3.111	705	12	3
35	3.191	709	12	3
36	3.272	712	12	3
37	3.353	716	12	3
38	3.436	720	13	3
39	3.521	723	13	3
40	3.607	727	13	3
41	3.696	731	13	3
42	3.787	735	13	3
43	3.882	739	13	3
44	3.979	743	14	3
45	4.081	748	14	3
46	4.187	752	14	3
47	4.299	757	15	4
48	4.418	762	15	4
49	4.545	768	16	4
50	4.681	774	16	4
51	4.830	780	17	4
52	4.995	787	18	4
53	5.180	795	19	4
54	5.393	805	21	4
55	5.647	816	23	4
56	5.966	829	26	4
57	6.403	848	32	4
58	7.129	880	44	4

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
59	7.838	911	62	4

Table M12. Mathematics Grade 8 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-2.210	500	62	1
1	-1.504	505	44	1
2	-0.785	536	31	1
3	-0.354	555	26	1
4	-0.040	569	23	1
5	0.209	579	21	1
6	0.417	589	19	1
7	0.597	596	18	1
8	0.757	603	17	1
9	0.901	610	16	1
10	1.033	615	15	1
11	1.155	621	15	1
12	1.268	625	14	1
13	1.376	630	14	1
14	1.477	635	14	1
15	1.574	639	13	1
16	1.666	643	13	1
17	1.755	647	13	1
18	1.841	650	13	1
19	1.924	654	12	1
20	2.004	657	12	1
21	2.083	661	12	1
22	2.160	664	12	2
23	2.235	667	12	2
24	2.309	671	12	2
25	2.381	674	12	2
26	2.453	677	12	2
27	2.524	680	12	2
28	2.594	683	11	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
29	2.663	686	11	2
30	2.732	689	11	2
31	2.801	692	11	2
32	2.869	695	11	2
33	2.937	698	11	2
34	3.005	701	11	2
35	3.074	704	11	2
36	3.143	707	11	3
37	3.212	710	11	3
38	3.281	713	11	3
39	3.352	716	12	3
40	3.423	719	12	3
41	3.495	722	12	3
42	3.568	725	12	3
43	3.642	728	12	3
44	3.718	732	12	3
45	3.796	735	12	3
46	3.875	739	12	3
47	3.957	742	13	3
48	4.042	746	13	3
49	4.129	750	13	3
50	4.221	754	13	3
51	4.316	758	14	3
52	4.415	762	14	3
53	4.521	767	14	4
54	4.633	772	15	4
55	4.753	777	15	4
56	4.883	782	16	4
57	5.024	788	17	4
58	5.181	795	18	4



Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
59	5.359	803	19	4
60	5.564	812	20	4
61	5.810	823	23	4
62	6.121	836	26	4
63	6.548	855	31	4
64	7.264	886	44	4
65	7.968	916	62	4

Science

Table M13. Science Grade 4 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-4.915	401	69	1
1	-4.200	435	49	1
2	-3.462	471	36	1
3	-3.014	492	30	1
4	-2.684	508	26	1
5	-2.419	521	24	1
6	-2.195	532	22	1
7	-1.999	541	21	1
8	-1.825	550	20	1
9	-1.666	557	19	1
10	-1.520	564	18	1
11	-1.383	571	18	1
12	-1.255	577	17	1
13	-1.133	583	17	1
14	-1.017	588	16	1
15	-0.905	594	16	1
16	-0.797	599	16	1
17	-0.693	604	15	1
18	-0.591	609	15	1
19	-0.492	614	15	2
20	-0.395	618	15	2
21	-0.299	623	15	2
22	-0.204	628	15	2
23	-0.111	632	15	2
24	-0.018	637	15	2
25	0.075	641	15	2
26	0.167	646	15	2
27	0.260	650	15	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
28	0.353	655	15	2
29	0.447	659	15	2
30	0.542	664	15	2
31	0.638	668	15	3
32	0.736	673	15	3
33	0.836	678	15	3
34	0.938	683	16	3
35	1.044	688	16	3
36	1.153	693	16	3
37	1.267	699	16	3
38	1.385	704	17	3
39	1.510	710	17	3
40	1.643	717	18	3
41	1.785	724	19	3
42	1.939	731	19	4
43	2.108	739	20	4
44	2.297	748	22	4
45	2.514	759	23	4
46	2.772	771	26	4
47	3.093	787	29	4
48	3.532	808	35	4
49	4.258	843	49	4
50	4.968	877	69	4

Table M14. Science Grade 8 Raw Score to Scaled Score

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
0	-4.773	407	69	1
1	-4.066	441	49	1
2	-3.345	476	35	1
3	-2.912	497	29	1
4	-2.596	512	25	1
5	-2.344	524	23	1
6	-2.132	535	21	1
7	-1.948	544	20	1
8	-1.785	551	19	1
9	-1.636	559	18	1
10	-1.500	565	18	1
11	-1.372	571	17	1
12	-1.253	577	16	1
13	-1.140	583	16	1
14	-1.032	588	16	1
15	-0.929	593	15	1
16	-0.829	598	15	1
17	-0.732	602	15	1
18	-0.638	607	15	2
19	-0.546	611	15	2
20	-0.456	616	14	2
21	-0.367	620	14	2
22	-0.279	624	14	2
23	-0.192	628	14	2
24	-0.106	632	14	2
25	-0.020	637	14	2
26	0.066	641	14	2
27	0.153	645	14	2
28	0.240	649	14	2

Raw Score	Theta	Rounded Scaled Score	Standard Error	Performance Level
29	0.327	653	14	2
30	0.416	658	14	3
31	0.506	662	15	3
32	0.598	666	15	3
33	0.692	671	15	3
34	0.789	676	15	3
35	0.889	680	15	3
36	0.992	685	16	3
37	1.100	691	16	3
38	1.213	696	16	3
39	1.332	702	17	3
40	1.459	708	17	3
41	1.595	714	18	4
42	1.744	722	19	4
43	1.907	729	20	4
44	2.091	738	21	4
45	2.302	748	23	4
46	2.554	761	25	4
47	2.870	776	29	4
48	3.304	797	35	4
49	4.024	831	49	4
50	4.731	866	69	4

## Appendix N: Performance Level Percentages by Demographic Subgroup

Table N1. Performance Levels of Reading, Mathematics, and Science by Grade Revised

Grade	Below Basic	Basic	Proficient	Advanced
<b>Reading</b>				
3	16.4	23.1	42.4	18.1
4	15.6	24.3	42.8	17.3
5	15.7	26.0	37.0	21.3
6	15.3	28.2	37.0	19.5
7	19.1	24.6	40.9	15.5
8	20.9	27.9	39.9	11.3
<b>Mathematics</b>				
3	15.4	35.3	37.0	12.3
4	11.9	37.9	37.4	12.8
5	15.2	32.4	39.9	12.4
6	15.0	35.7	39.6	9.8
7	17.9	39.0	32.9	10.2
8	16.4	36.5	36.8	10.2
<b>Science</b>				
4	11.4	37.3	41.0	10.3
8	18.7	40.1	31.1	10.1

Reading

Table N2. Performance Levels of Reading by Grade 3 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	16.4	23.1	42.4	18.1
Male	18.6	24.0	40.5	16.9
Female	14.0	22.2	44.5	19.3
Unknown	25.0	0.0	25.0	50.0
American Indian/Alaska Native	40.8	30.1	26.1	2.9
Asian	14.0	24.6	43.9	17.5
African American	17.6	41.9	28.4	12.2
Native Hawaiian or other/Pacific Islander	40.0	30.0	20.0	10.0
Hispanic/Latino	27.0	30.8	33.3	8.8
White	13.3	21.2	45.0	20.5
Multiracial	17.9	23.4	40.0	18.6
Unknown	36.4	9.1	36.4	18.2
Free/Reduced Lunch	23.8	27.3	38.4	10.5
Not Free/Reduced Lunch	12.1	20.7	44.7	22.5
Special Education	44.3	25.4	24.3	6.0
Not Special Education	12.1	22.8	45.1	20.0
English Language Learner	50.0	32.6	16.1	1.3
Not English Language Learner	15.0	22.7	43.5	18.8

Table N3. Performance Levels of Reading by Grade 4 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	15.6	24.3	42.8	17.3
Male	18.1	25.6	41.5	14.8
Female	12.9	23.1	44.1	20.0
Unknown	66.7	16.7	16.7	0.0
American Indian/Alaska Native	40.3	30.7	23.2	5.8
Asian	14.3	26.8	39.3	19.6
African American	23.0	20.3	40.5	16.2
Native Hawaiian or other/Pacific Islander	27.3	18.2	54.5	0.0
Hispanic/Latino	22.8	31.0	36.9	9.3
White	12.7	22.6	45.1	19.6
Multiracial	17.0	28.3	38.4	16.4
Unknown	25.0	30.0	40.0	5.0
Free/Reduced Lunch	21.6	30.4	36.7	11.2
Not Free/Reduced Lunch	12.2	21.0	46.1	20.7
Special Education	45.9	28.3	20.4	5.4
Not Special Education	10.9	23.7	46.2	19.2
English Language Learner	60.0	29.3	10.2	0.5
Not English Language Learner	14.3	24.2	43.7	17.8

Table N4. Performance Levels of Reading by Grade 5 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	15.7	26.0	37.0	21.3
Male	18.6	26.2	35.2	20.0
Female	12.5	25.8	38.8	22.8
Unknown	14.3	42.9	28.6	14.3
American Indian/Alaska Native	43.2	33.1	19.5	4.3
Asian	10.8	27.7	32.3	29.2
African American	19.1	41.6	32.6	6.7
Native Hawaiian or other/Pacific Islander	37.5	25.0	37.5	0.0
Hispanic/Latino	25.3	33.2	31.0	10.4
White	12.8	24.0	39.1	24.2
Multiracial	9.5	31.8	33.1	25.7
Unknown	40.0	40.0	20.0	0.0
Free/Reduced Lunch	21.8	32.2	33.9	12.1
Not Free/Reduced Lunch	12.2	22.6	38.7	26.5
Special Education	51.3	28.0	16.4	4.3
Not Special Education	9.9	25.7	40.3	24.1
English Language Learner	67.7	26.9	5.4	0.0
Not English Language Learner	14.7	26.0	37.6	21.8

Table N5. Performance Levels of Reading by Grade 6 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	15.3	28.2	37.0	19.5
Male	17.5	29.0	35.6	17.9
Female	13.0	27.3	38.5	21.2
Unknown	0.0	0.0	0.0	0.0
American Indian/Alaska Native	36.3	36.0	21.7	6.0
Asian	15.9	24.6	33.3	26.1
African American	19.4	34.7	31.9	13.9
Native Hawaiian or other/Pacific Islander	25.0	62.5	12.5	0.0
Hispanic/Latino	22.5	37.6	30.8	9.2
White	12.9	26.1	39.2	21.8
Multiracial	19.3	29.7	28.3	22.8
Unknown	30.0	40.0	30.0	0.0
Free/Reduced Lunch	21.4	34.3	33.1	11.2
Not Free/Reduced Lunch	12.1	25.0	39.0	23.8
Special Education	50.6	30.3	15.3	3.7
Not Special Education	10.2	27.9	40.2	21.8
English Language Learner	63.5	26.9	8.7	1.0
Not English Language Learner	14.6	28.2	37.4	19.7



Table N6. Performance Levels of Reading by Grade 7 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	19.1	24.6	40.9	15.5
Male	22.0	24.3	39.6	14.2
Female	16.0	24.9	42.3	16.8
Unknown	0.0	0.0	0.0	0.0
American Indian/Alaska Native	47.6	27.1	21.9	3.3
Asian	16.1	25.0	39.3	19.6
African American	32.4	25.4	31.0	11.3
Native Hawaiian or other/Pacific Islander	25.0	33.3	41.7	0.0
Hispanic/Latino	26.6	31.9	34.6	7.0
White	16.3	23.0	43.1	17.6
Multiracial	13.4	27.6	41.8	17.2
Unknown	33.3	33.3	33.3	0.0
Free/Reduced Lunch	27.3	28.8	35.7	8.2
Not Free/Reduced Lunch	14.9	22.4	43.5	19.2
Special Education	61.8	22.8	13.7	1.7
Not Special Education	13.3	24.8	44.6	17.3
English Language Learner	65.5	26.6	6.5	1.4
Not English Language Learner	18.1	24.5	41.6	15.8

Table N7. Performance Levels of Reading by Grade 8 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	20.9	27.9	39.9	11.3
Male	26.1	29.0	36.0	9.0
Female	15.3	26.8	44.0	13.9
Unknown	0.0	0.0	0.0	0.0
American Indian/Alaska Native	51.8	29.6	18.1	0.4
Asian	18.9	26.4	41.5	13.2
African American	26.9	42.3	26.9	3.8
Native Hawaiian or other/Pacific Islander	37.5	31.3	31.3	0.0
Hispanic/Latino	30.1	33.6	31.6	4.7
White	17.9	26.5	42.5	13.1
Multiracial	20.7	36.3	33.3	9.6
Unknown	12.5	37.5	50.0	0.0
Free/Reduced Lunch	29.7	33.2	31.3	5.8
Not Free/Reduced Lunch	16.3	25.2	44.3	14.2
Special Education	63.2	23.8	11.8	1.3
Not Special Education	15.4	28.5	43.5	12.6
English Language Learner	66.7	26.1	7.2	0.0
Not English Language Learner	19.9	28.0	40.5	11.6

Mathematics

Table N8. Performance Levels of Mathematics by Grade 3 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	15.4	35.3	37.0	12.3
Male	14.5	34.4	37.2	13.9
Female	16.4	36.2	36.8	10.7
Unknown	40.0	40.0	20.0	0.0
American Indian/Alaska Native	42.7	38.7	16.1	2.6
Asian	10.5	29.8	47.4	12.3
African American	22.4	43.4	28.9	5.3
Native Hawaiian or other/Pacific Islander	45.5	45.5	9.1	0.0
Hispanic/Latino	23.4	45.9	24.6	6.1
White	12.5	33.3	40.2	14.0
Multiracial	21.2	32.9	34.9	11.0
Unknown	23.5	29.4	41.2	5.9
Free/Reduced Lunch	20.9	41.0	30.4	7.8
Not Free/Reduced Lunch	12.3	32.0	40.8	15.0
Special Education	36.6	36.6	20.7	6.1
Not Special Education	12.2	35.1	39.4	13.3
English Language Learner	37.3	49.4	12.7	0.6
Not English Language Learner	14.5	34.7	38.0	12.8

Table N9. Performance Levels of Mathematics by Grade 4 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	11.9	37.9	37.4	12.8
Male	12.1	36.4	37.2	14.3
Female	11.7	39.4	37.6	11.3
Unknown	12.5	37.5	37.5	12.5
American Indian/Alaska Native	31.8	43.5	17.1	7.5
Asian	8.9	30.4	39.3	21.4
African American	20.0	42.7	32.0	5.3
Native Hawaiian or other/Pacific Islander	20.0	40.0	30.0	10.0
Hispanic/Latino	19.3	46.2	28.3	6.2
White	9.2	35.9	40.3	14.5
Multiracial	15.6	39.4	36.3	8.8
Unknown	16.7	33.3	33.3	16.7
Free/Reduced Lunch	16.2	42.9	32.6	8.3
Not Free/Reduced Lunch	9.6	35.1	40.1	15.3
Special Education	32.2	43.4	20.4	4.0
Not Special Education	8.9	37.1	39.9	14.1
English Language Learner	43.4	43.9	12.2	0.5
Not English Language Learner	11.0	37.7	38.1	13.1

Table N10. Performance Levels of Mathematics by Grade 5 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	15.2	32.4	39.9	12.4
Male	16.4	31.9	38.7	13.0
Female	13.9	32.9	41.3	11.8
Unknown	28.6	28.6	28.6	14.3
American Indian/Alaska Native	31.6	43.0	23.8	1.6
Asian	8.8	39.7	33.8	17.6
African American	22.2	36.7	37.8	3.3
Native Hawaiian or other/Pacific Islander	37.5	37.5	25.0	0.0
Hispanic/Latino	25.3	38.4	31.0	5.3
White	12.7	30.6	42.4	14.3
Multiracial	10.8	37.2	41.2	10.8
Unknown	36.4	18.2	18.2	27.3
Free/Reduced Lunch	20.8	37.9	35.1	6.2
Not Free/Reduced Lunch	12.1	29.3	42.6	16.0
Special Education	42.4	36.2	17.8	3.6
Not Special Education	10.9	31.8	43.5	13.8
English Language Learner	53.3	31.9	14.1	0.7
Not English Language Learner	14.5	32.4	40.5	12.7

Table N11. Performance Levels of Mathematics by Grade 6 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	15.0	35.7	39.6	9.8
Male	15.7	35.8	38.3	10.2
Female	14.2	35.6	41.0	9.3
Unknown	0.0	0.0	0.0	0.0
American Indian/Alaska Native	39.2	36.9	19.4	4.5
Asian	12.9	28.6	35.7	22.9
African American	18.3	43.7	31.0	7.0
Native Hawaiian or other/Pacific Islander	44.4	22.2	33.3	0.0
Hispanic/Latino	22.8	42.4	29.5	5.3
White	12.2	34.5	42.6	10.8
Multiracial	21.4	35.9	35.9	6.9
Unknown	44.4	44.4	11.1	0.0
Free/Reduced Lunch	20.5	42.3	32.1	5.1
Not Free/Reduced Lunch	12.0	32.3	43.5	12.2
Special Education	44.5	37.3	16.1	2.1
Not Special Education	10.6	35.5	43.0	10.9
English Language Learner	58.2	34.5	6.4	0.9
Not English Language Learner	14.3	35.7	40.1	9.9

Table N12. Performance Levels of Mathematics by Grade 7 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	17.9	39.0	32.9	10.2
Male	17.9	38.7	32.3	11.1
Female	17.9	39.3	33.7	9.1
Unknown	0.0	0.0	0.0	0.0
American Indian/Alaska Native	36.2	48.1	13.4	2.2
Asian	12.3	31.6	36.8	19.3
African American	36.6	38.0	21.1	4.2
Native Hawaiian or other/Pacific Islander	41.7	41.7	16.7	0.0
Hispanic/Latino	25.0	46.6	23.0	5.5
White	15.5	37.1	35.9	11.5
Multiracial	17.8	45.9	30.4	5.9
Unknown	0.0	66.7	33.3	0.0
Free/Reduced Lunch	24.9	44.7	24.8	5.6
Not Free/Reduced Lunch	14.4	36.0	37.1	12.5
Special Education	54.5	34.0	10.4	1.1
Not Special Education	13.0	39.6	36.0	11.4
English Language Learner	53.6	40.7	5.7	0.0
Not English Language Learner	17.2	38.9	33.5	10.4

Table N13. Performance Levels of Mathematics by Grade 8 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	16.4	36.5	36.8	10.2
Male	18.7	36.0	35.6	9.7
Female	13.9	37.2	38.1	10.8
Unknown	0.0	0.0	0.0	0.0
American Indian/Alaska Native	52.9	36.4	9.3	1.3
Asian	5.6	38.9	31.5	24.1
African American	28.2	44.9	25.6	1.3
Native Hawaiian or other/Pacific Islander	23.5	52.9	23.5	0.0
Hispanic/Latino	23.9	43.2	28.7	4.2
White	13.5	35.0	39.8	11.7
Multiracial	17.0	43.0	31.1	8.9
Unknown	25.0	50.0	25.0	0.0
Free/Reduced Lunch	24.2	42.3	29.0	4.6
Not Free/Reduced Lunch	12.4	33.6	40.9	13.2
Special Education	51.7	36.6	10.2	1.4
Not Special Education	11.9	36.5	40.2	11.4
English Language Learner	52.7	34.9	11.6	0.7
Not English Language Learner	15.6	36.6	37.4	10.4

Science

Table N14. Performance Levels of Science by Grade 4 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	11.4	37.3	41.0	10.3
Male	11.7	37.4	40.7	10.2
Female	11.0	37.3	41.3	10.3
Unknown	14.3	28.6	42.9	14.3
American Indian/Alaska Native	37.9	43.4	16.2	2.4
Asian	8.9	39.3	42.9	8.9
African American	16.2	41.9	37.8	4.1
Native Hawaiian or other/Pacific Islander	20.0	40.0	40.0	0.0
Hispanic/Latino	19.9	45.6	31.7	2.8
White	8.2	35.2	44.4	12.2
Multiracial	15.1	40.3	35.2	9.4
Unknown	23.1	53.8	7.7	15.4
Free/Reduced Lunch	16.2	43.8	34.2	5.8
Not Free/Reduced Lunch	8.7	33.7	44.8	12.7
Special Education	23.7	45.5	26.8	4.0
Not Special Education	9.5	36.1	43.1	11.2
English Language Learner	45.6	45.1	9.3	0.0
Not English Language Learner	10.4	37.1	41.9	10.6

Table N15. Performance Levels of Science by Grade 8 Demographic Subgroup

Group	Below Basic	Basic	Proficient	Advanced
Total	18.7	40.1	31.1	10.1
Male	20.7	38.1	31.6	9.6
Female	16.6	42.1	30.6	10.7
Unknown	0.0	0.0	0.0	0.0
American Indian/Alaska Native	52.3	39.2	8.1	0.5
Asian	14.8	31.5	44.4	9.3
African American	28.2	55.1	14.1	2.6
Native Hawaiian or other/Pacific Islander	29.4	47.1	23.5	0.0
Hispanic/Latino	29.0	46.3	21.3	3.5
White	15.2	38.9	34.1	11.8
Multiracial	26.7	37.0	25.2	11.1
Unknown	12.5	62.5	12.5	12.5
Free/Reduced Lunch	25.7	45.8	23.3	5.3
Not Free/Reduced Lunch	15.1	37.1	35.2	12.7
Special Education	47.7	40.7	10.5	1.0
Not Special Education	15.0	40.0	33.7	11.3
English Language Learner	60.4	37.5	2.1	0.0
Not English Language Learner	17.8	40.1	31.7	10.4