New Jersey Assessment of Skills and Knowledge

2013

TECHNICAL REPORT

Grades 3-8

March 2014

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NJ ASK 2013 GRADES 3–8 TECHNICAL REPORT
TABLE OF CONTENTS

PART 1: INTRODUCTION 1

1.1 Description of the Assessment 2
1.2 Purpose of the Assessment 3
1.3 Organizational Support 3

PART 2: TEST DEVELOPMENT 5

2.1 Test Specifications 6
Test Blueprints 9
2.2 Development of Test Items 19
Test Form Distribution 19

PART 3: TEST ADMINISTRATION 21

3.1 Participation 21
3.2 Test Security Procedures 21
3.3 Test Administration Procedures 22
3.4 Test Accommodations 23
3.5 Reliability and Validity of Tests for Special Populations 28

PART 4: SCORING 30

4.1 Multiple-Choice Items 30
4.2 Constructed-Response Items 30
4.3 Quality Control 32

PART 5: STANDARD SETTING 33

PART 6: ITEM and TEST STATISTICS 34

6.1 Classical Item Statistics 34
Descriptive Statistics 35
6.2 Speededness 48
6.3 Intercorrelations 51
6.4 DIF Analysis 59
6.5 Summary Statistics 61
Descriptive Statistics for Total Raw Score 61
Descriptive Statistics for Total Raw Score by Cluster 63
Scale Score Distributions by Content Area and Grade 67
Scale Score Distributions by Demographic Group 68
Scale Score Distributions by District Factor Groups (DFG) 69

PART 7: EQUATING AND SCALING 75

7.1 Descriptive Statistics for Equating Data 75
7.2 Equating and Scaling Procedures 90
Item Calibration 90
7.3 Summary of Cut Scores 112

7.4 Equating and Scaling for Braille, Large Print, and Alternate forms 114
Braille and Large Print Tests 115
Alternate Forms. 116

PART 8: RELIABILITY 117

8.1 Classical Reliability Estimates of Test Scores 117
Reliability and Measurement Error 117
Raw Score Internal Consistency 117
8.2 Reliability of Performance Classifications 125
Item Maps and Test Information Functions 127
8.3 Conditional Estimate of Error at Each Cut-Score 135
8.4 Rater Reliability 135

PART 9: VALIDITY 142

9.1 Content and Curricular Validity 142
Appropriateness of Content Definition 142
Adequacy of Content Representation 143
Adherence to Test Specification 144
Test Administration and Accommodations 144
9.2 Construct Validity 145
Scaling and Performance Score Reporting 145
9.3 Criterion-Related Validity 145

PART 10: REPORTING 147

10.1 Reports 147
10.2 State Summary Reporting 147

APPENDIX A 148

Field Test Form Distribution Plan 148

APPENDIX B 155

CHECKLIST FOR FORMS DEVELOPMENT 155

APPENDIX C 157

MODIFICATIONS OF TEST ADMINISTRATION PROCEDURES FOR LIMITED ENGLISH PROFICIENT, SPECIAL EDUCATION STUDENTS, AND STUDENTS ELIGIBLE UNDER SECTION 504 OF THE REHABILITATION ACT OF 1973 157

APPENDIX D 162

SCORING RUBRICS 162

APPENDIX E 169

STANDARD SETTING 169
PERFORMANCE LEVEL DESCRIPTORS 169

APPENDIX F **187**

SCALE SCORE CUMULATIVE FREQUENCY DISTRIBUTIONS **187**

APPENDIX G **210**

ITEM PARAMETERS TABLES **210**

APPENDIX H **225**

RAW SCORE TO SCALE SCORE CONVERSION TABLES **225**

APPENDIX I **260**

ITEM MAPS **260**

NJ ASK 2013 GRADES 3-8 TECHNICAL REPORT
TABLES and FIGURES

Table 2.1.1: NJ ASK 2013 3–8 Total Points Possible by Content Area 7
Table 2.1.2: NJ ASK 2013 3–8 Number of Items by Content Cluster and Skill 8
Table 2.1.3: Test Construction Map for NJ ASK 3–5 English Language Arts 9
Table 2.1.4: Actual Test Map for 2013 Grade 3 English Language Arts NJ ASK 9
Table 2.1.5: Actual Test Map for 2013 Grade 4 English Language Arts NJ ASK 9
Table 2.1.6: Actual Test Map for 2013 Grade 5 English Language Arts NJ ASK 10
Table 2.1.7: Test Construction Map for NJ ASK 6–8 English Language Arts 10
Table 2.1.8: Actual Test Map for 2013 Grade 6 English Language Arts NJ ASK 10
Table 2.1.9: Actual Test Map for 2013 Grade 7 English Language Arts NJ ASK 11
Table 2.1.10: Actual Test Map for 2013 Grade 8 English Language Arts NJ ASK 11
Table 2.1.11: Test Construction Map for NJ ASK 3-5 Mathematics 12
Table 2.1.12: Actual Test Map for 2013 Grade 3 Mathematics NJ ASK 13
Table 2.1.13: Actual Test Map for 2013 Grade 4 Mathematics NJ ASK 14
Table 2.1.14: Actual Test Map for 2013 Grade 5 Mathematics NJ ASK 15
Table 2.1.15: Test Construction Map for NJ ASK 6–8 Mathematics 16
Table 2.1.16: Actual Test Map for 2013 Grade 6 Mathematics NJ ASK 16
Table 2.1.17: Actual Test Map for 2013 Grade 7 Mathematics NJ ASK 17
Table 2.1.18: Actual Test Map for 2013 Grade 8 Mathematics NJ ASK 18
Table 2.1.19: Test Construction Map for NJ ASK 4 and 8 Science 18
Table 2.1.20: Actual Test Map for 2013 Grade 4 Science NJ ASK 19
Table 2.1.21: Actual Test Map for 2013 Grade 8 Science NJ ASK 19
Table 3.3.1: NJ ASK 2013 Testing Window 22
Table 3.4.1: Statistics for Students Classified as Special Education 25
Table 3.4.2: Statistics for Students Classified as Section 504 26
Table 4.2.1: Scoring Personnel by Grade and Content Area - NJ ASK 2013 31
Table 4.2.2: Automatic Rescore Statistics - NJ ASK 2013 32
Table 6.1.1: Grade 3 - Item Difficulty and Discrimination Summary Statistics by Cluster ... 36
Table 6.1.2: Grade 4 - Item Difficulty and Discrimination Summary Statistics by Cluster ... 37
Table 6.1.3: Grade 5 - Item Difficulty and Discrimination Summary Statistics by Cluster ... 38
Table 6.1.4: Grade 6 - Item Difficulty and Discrimination Summary Statistics by Cluster ... 39
Table 6.1.5: Grade 7 - Item Difficulty and Discrimination Summary Statistics by Cluster ... 40
Table 6.1.6: Grade 8 - Item Difficulty and Discrimination Summary Statistics by Cluster ... 41
Table 6.1.7: Grade 3 - Difficulty and Discrimination Indices for MC Items by Cluster 42
Table 6.1.8: Grade 4 - Difficulty and Discrimination Indices for MC Items by Cluster 43
Table 6.1.9: Grade 5 - Difficulty and Discrimination Indices for MC Items by Cluster 44
Table 6.1.10: Grade 6 - Difficulty and Discrimination Indices for MC Items by Cluster 45
Table 6.1.11: Grade 7 - Difficulty and Discrimination Indices for MC Items by Cluster 46
Table 6.1.12: Grade 8 - Difficulty and Discrimination Indices for MC Items by Cluster 47
Table 6.1.13: Number of Multiple-Choice Items Flagged by Distractor Analyses 48
Table 6.2.1: Testing Schedule – Items and Time Allocations 49
Table 6.2.2: Percent of Students Omitting the Last MC Item in Each Test Section 49
Table 6.3.1: Grade 3 Correlation Coefficients among Content Domains and Clusters 53
Table 6.3.2: Grade 4 Correlation Coefficients among Content Domains and Clusters 54
Table 6.3.3: Grade 5 Correlation Coefficients among Content Domains and Clusters 55

Table 6.3.4: Grade 6 Correlation Coefficients among Content Domains and Clusters 56
Table 6.3.5: Grade 7 Correlation Coefficients among Content Domains and Clusters 57
Table 6.3.6: Grade 8 Correlation Coefficients among Content Domains and Clusters 58
Table 6.4.1: 2013 NJ ASK Operational Items - DIF Categories by Item Type and Grade 60
Table 6.5.1: Descriptive Statistics for Total Raw Score by Content Area and Grade Level .. 61
Table 6.5.2: Grade 3 Means and Standard Deviations for Raw Score..... 63
Table 6.5.3: Grade 4 Means and Standard Deviations for Raw Score..... 63
Table 6.5.4: Grade 5 Means and Standard Deviations for Raw Score..... 64
Table 6.5.5: Grade 6 Means and Standard Deviations for Raw Score..... 64
Table 6.5.6: Grade 7 Means and Standard Deviations for Raw Score..... 65
Table 6.5.7: Grade 8 Means and Standard Deviations for Raw Score..... 66
Table 6.5.8: Descriptive Statistics of Students' Performance Levels by Content and Grade . 67
Table 6.5.9: Descriptive Statistics for ELA Performance Levels by DFG 70
Table 6.5.10: Descriptive Statistics for Mathematics Performance Levels by DFG 72
Table 6.5.11: Descriptive Statistics for Science Performance Levels by DFG 74
Table 7.1.1: N-Counts for the Equating Samples by Content and Grade+ 75
Table 7.1.2: Comparison of the Equating Sample and the Statewide DFGs – Grade 3..... 76
Table 7.1.3: Comparison of the Equating Sample and the Statewide DFGs – Grade 4..... 76
Table 7.1.4: Comparison of the Equating Sample and the Statewide DFGs – Grade 5..... 77
Table 7.1.5: Comparison of the Equating Sample and the Statewide DFGs – Grade 6..... 77
Table 7.1.6: Comparison of the Equating Sample and the Statewide DFGs – Grade 7..... 78
Table 7.1.7: Comparison of the Equating Sample and the Statewide DFGs – Grade 8..... 78
Table 7.1.8: Equating Sample N-Counts by Gender and Ethnicity: ELA 79
Table 7.1.9: Equating Sample N-Counts by Gender and Ethnicity: Mathematics 81
Table 7.1.10: Equating Sample N-Counts by Gender and Ethnicity: Science..... 83
Table 7.1.11: Descriptive Statistics for Raw Scores by Grade and Test Content..... 84
Table 7.1.12: Descriptive Statistics for Raw Scores by Gender 84
Table 7.1.13: Descriptive Statistics for Raw Scores by District Factor Group: ELA..... 85
Table 7.1.14: Descriptive Statistics for Raw Scores by District Factor Group: Mathematics 87
Table 7.1.15: Descriptive Statistics for Raw Scores by District Factor Group: Science 89
Figure 7.2.1: Scatter Plot of Anchor Items – ELA Grade 3 Backward..... 92
Figure 7.2.2: Scatter Plot of Anchor Items – ELA Grade 3 Forward 92
Figure 7.2.3: Scatter Plot of Anchor Items – ELA Grade 3 Delta Plot - Backward 93
Figure 7.2.4: Scatter Plot of Anchor Items – ELA Grade 3 Delta Plot - Forward..... 93
Figure 7.2.5: Scatter Plot of Anchor Items – ELA Grade 4 Backward..... 94
Figure 7.2.6: Scatter Plot of Anchor Items – ELA Grade 4 Forward 94
Figure 7.2.7: Scatter Plot of Anchor Items – ELA Grade 4 Delta Plot - Backward 95
Figure 7.2.8: Scatter Plot of Anchor Items – ELA Grade 4 Delta Plot - Forward..... 95
Figure 7.2.9: Scatter Plot of Anchor Items – ELA Grade 5 Backward..... 96
Figure 7.2.10: Scatter Plot of Anchor Items – ELA Grade 5 Forward 96
Figure 7.2.11: Scatter Plot of Anchor Items – ELA Grade 5 Delta Plot - Backward 97
Figure 7.2.12: Scatter Plot of Anchor Items – ELA Grade 5 Delta Plot - Forward..... 97
Figure 7.2.13: Scatter Plot of Anchor Items – ELA Grade 6..... 98
Figure 7.2.14: Scatter Plot of Anchor Items – ELA Grade 6 Delta Plot..... 98
Figure 7.2.15: Scatter Plot of Anchor Items – ELA Grade 7..... 99
Figure 7.2.16: Scatter Plot of Anchor Items – ELA Grade 7 Delta Plot..... 99
Figure 7.2.17: Scatter Plot of Anchor Items – ELA Grade 8..... 100

Figure 7.2.18: Scatter Plot of Anchor Items – ELA Grade 8 Delta Plot 100
Figure 7.2.19: Scatter Plot of Anchor Items – Mathematics Grade 3 101
Figure 7.2.20: Scatter Plot of Anchor Items – Mathematics Grade 3 Delta Plot 101
Figure 7.2.21: Scatter Plot of Anchor Items – Mathematics Grade 4 102
Figure 7.2.22: Scatter Plot of Anchor Items – Mathematics Grade 4 Delta Plot 102
Figure 7.2.23: Scatter Plot of Anchor Items – Mathematics Grade 5 103
Figure 7.2.24: Scatter Plot of Anchor Items – Mathematics Grade 5 Delta Plot 103
Figure 7.2.25: Scatter Plot of Anchor Items – Mathematics Grade 6 104
Figure 7.2.26: Scatter Plot of Anchor Items – Mathematics Grade 6 Delta Plot 104
Figure 7.2.27: Scatter Plot of Anchor Items – Mathematics Grade 7 105
Figure 7.2.28: Scatter Plot of Anchor Items – Mathematics Grade 7 Delta Plot 105
Figure 7.2.29: Scatter Plot of Anchor Items – Mathematics Grade 8 106
Figure 7.2.30: Scatter Plot of Anchor Items – Mathematics Grade 8 Delta Plot 106
Figure 7.2.31: Scatter Plot of Anchor Items – Science Grade 4 107
Figure 7.2.32: Scatter Plot of Anchor Items – Science Grade 4 Delta Plot 107
Figure 7.2.33: Scatter Plot of Anchor Items – Science Grade 8 108
Figure 7.2.34: Scatter Plot of Anchor Items – Science Grade 8 Delta Plot 108
Table 7.2.1: ELA – Summary of the Infit and Outfit Statistics by Grade 109
Table 7.2.2: Mathematics – Summary of the Infit and Outfit Statistics by Grade 110
Table 7.2.3: Science – Summary of the Infit and Outfit Statistics by Grade 111
Table 7.3.1: Slope and Intercept of Theta to Scale Score Transformation 113
Table 7.4.1: Special Equatings 114
Table 8.1.1: Summary of Coefficient Alpha and SEM by Grade and Content Area 118
Table 8.1.1: Summary of Coefficient Alpha and SEM by Grade and Content Area (continued) 119
Table 8.1.2: Grade 3 Coefficient Alpha and SEM for Clusters 119
Table 8.1.2.a: Grade 3 Coefficient Alpha and SEM for MC Clusters and SCRs 120
Table 8.1.3: Grade 4 Coefficient Alpha and SEM for Clusters 120
Table 8.1.3.a: Grade 4 Coefficient Alpha and SEM for MC Clusters and SCRs 121
Table 8.1.4: Grade 5 Coefficient Alpha and SEM for Clusters 121
Table 8.1.4.a: Grade 5 Coefficient Alpha and SEM for MC Clusters and SCRs 122
Table 8.1.5: Grade 6 Coefficient Alpha and SEM for Clusters 122
Table 8.1.5.a: Grade 6 Coefficient Alpha and SEM for MC Clusters and SCRs 123
Table 8.1.6: Grade 7 Coefficient Alpha and SEM for Clusters 123
Table 8.1.6.a: Grade 7 Coefficient Alpha and SEM for MC Clusters and SCRs 124
Table 8.1.7: Grade 8 Coefficient Alpha and SEM for Clusters 124
Table 8.1.7.a: Grade 8 Coefficient Alpha and SEM for MC Clusters and SCRs 125
Table 8.2.1: Consistency Indices for Performance Levels 126
Figure 8.2.1: Grade 3 ELA Test Information Function 128
Figure 8.2.2: Grade 4 ELA Test Information Function 128
Figure 8.2.3: Grade 5 ELA Test Information Function 129
Figure 8.2.4: Grade 6 ELA Test Information Function 129
Figure 8.2.5: Grade 7 ELA Test Information Function 130
Figure 8.2.6: Grade 8 ELA Test Information Function 130
Figure 8.2.7: Grade 3 Math Test Information Function 131
Figure 8.2.8: Grade 4 Math Test Information Function 131
Figure 8.2.9: Grade 5 Math Test Information Function 132

Figure 8.2.10: Grade 6 Math Test Information Function 132
Figure 8.2.11: Grade 7 Math Test Information Function 133
Figure 8.2.12: Grade 8 Math Test Information Function 133
Figure 8.2.13: Grade 4 Science Test Information Function 134
Figure 8.2.14: Grade 8 Science Test Information Function 134
Table 8.3.1: Raw Score Cut Scores with Conditional Standard Error of Measurement 135
Table 8.4.1: Grade 3 Scoring Consistency of WT and CR Items* 136
Table 8.4.2: Grade 4 Scoring Consistency of WT and CR Items* 137
Table 8.4.3: Grade 5 Scoring Consistency of WT and CR Items* 138
Table 8.4.4: Grade 6 Scoring Consistency of WT and CR Items* 139
Table 8.4.5: Grade 7 Scoring Consistency of WT and CR Items* 140
Table 8.4.6: Grade 8 Scoring Consistency of WT and CR Items* 141
Table A.1: NJ ASK 2013 Grade 3 Test Form Distribution Plan 149
Table A.2: NJ ASK 2013 Grade 4 Test Form Distribution Plan 150
Table A.3: NJ ASK 2013 Grade 5 Test Form Distribution Plan 151
Table A.4: NJ ASK 2013 Grade 6 Test Form Distribution Plan 152
Table A.5: NJ ASK 2013 Grade 7 Test Form Distribution Plan 153
Table A.6: NJ ASK 2013 Grade 8 Test Form Distribution Plan 154
Table B-1: Checklist for Forms Development 156
Table D.1: New Jersey Registered Holistic Scoring Rubric Grades 3 - 5 163
Table D.2: New Jersey Registered Holistic Scoring Rubric Grades 6 - 8 165
Table D.3: Open-Ended Scoring Rubric Reading 167
Table D.4: NJ ASK Generic Mathematics Rubric 167
Table D.5: NJ ASK Generic Science Rubric 168
Table F.1: ELA Grade 3 188
Table F.2: ELA Grade 4 189
Table F.3: ELA Grade 5 190
Table F.4: ELA Grade 6 191
Table F.5: ELA Grade 7 194
Table F.6: ELA Grade 8 197
Table F.7: Mathematics Grade 3 200
Table F.8: Mathematics Grade 4 201
Table F.9: Mathematics Grade 5 202
Table F.10: Mathematics Grade 6 203
Table F.11: Mathematics Grade 7 204
Table F.12: Mathematics Grade 8 205
Table F.13: Science Grade 4 207
Table F.14: Science Grade 8 208
Table G.1: ELA Grade 3: – Item Parameters 211
Table G.2: ELA Grade 4: – Item Parameters 212
Table G.3: ELA Grade 5: – Item Parameters 213
Table G.4: ELA Grade 6: – Item Parameters 214
Table G.5: ELA Grade 7: – Item Parameters 215
Table G.6: ELA Grade 8: – Item Parameters 216
Table G.7: Mathematics Grade 3: – Item Parameters 217
Table G.8: Mathematics Grade 4: – Item Parameters 218
Table G.9: Mathematics Grade 5: – Item Parameters 219

Table G.10: Mathematics Grade 6: – Item Parameters 220
Table G.11: Mathematics Grade 7: – Item Parameters 221
Table G.12: Mathematics Grade 8: – Item Parameters 222
Table G.13: Science Grade 4: – Item Parameters 223
Table G.14: Science Grade 8: – Item Parameters 224
Table H.1: ELA Grade 3 226
Table H.2: ELA Grade 3: Alternate 226
Table H.3: ELA Grade 3: Braille 227
Table H.4: ELA Grade 4 228
Table H.5: ELA Grade 4: Alternate 229
Table H.6: ELA Grade 4: Braille 229
Table H.7: ELA Grade 5 230
Table H.8: ELA Grade 5: Alternate 231
Table H.9: ELA Grade 5: Braille 232
Table H.10: ELA Grade 6 233
Table H.11: ELA Grade 6: Alternate 234
Table H.12: ELA Grade 6: Braille 235
Table H.13: ELA Grade 7 236
Table H.14: ELA Grade 7: Alternate 237
Table H.15: ELA Grade 7: Braille 238
Table H.16: ELA Grade 8 239
Table H.17: ELA Grade 8: Alternate 240
Table H.18: ELA Grade 8: Braille 241
Table H.19: Mathematics Grade 3 242
Table H.20: Mathematics Grade 3: Alternate 242
Table H.21: Mathematics Grade 3: Braille 243
Table H.22: Mathematics Grade 4 244
Table H.23: Mathematics Grade 4: Alternate 244
Table H.24: Mathematics Grade 4: Braille 246
Table H.25: Mathematics Grade 5 246
Table H.26: Mathematics Grade 5: Alternate 247
Table H.27: Mathematics Grade 5: Braille 248
Table H.28: Mathematics Grade 6 249
Table H.29: Mathematics Grade 6: Alternate 249
Table H.30: Mathematics Grade 6: Braille 250
Table H.31: Mathematics Grade 7 251
Table H.32: Mathematics Grade 7: Alternate 251
Table H.33: Mathematics Grade 7: Braille 252
Table H.34: Mathematics Grade 8 253
Table H.35: Mathematics Grade 8: Alternate 253
Table H.36: Mathematics Grade 8: Braille 254
Table H.37: Science Grade 4 255
Table H.38: Science Grade 4: Alternate 255
Table H.39: Science Grade 4: Braille 256
Table H.40: Science Grade 8 256
Table H.41: Science Grade 8: Alternate 257
Table H.42: Science Grade 8: Braille 258

Figure I.1: Item Map ELA Grade 3 262
Figure I.2: Item Map ELA Grade 4 264
Figure I.3: Item Map ELA Grade 5 265
Figure I.4: Item Map ELA Grade 6 266
Figure I.5: Item Map ELA Grade 7 267
Figure I.6: Item Map ELA Grade 8 268
Figure I.7: Item Map Math Grade 3 269
Figure I.8: Item Map Math Grade 4 270
Figure I.9: Item Map Math Grade 5 271
Figure I.10: Item Map Math Grade 6 272
Figure I.11: Item Map Math Grade 7 273
Figure I.12: Item Map Math Grade 8 274
Figure I.13: Item Map Science Grade 4 275
Figure I.14: Item Map Science Grade 8 276

PART 1: INTRODUCTION

The purpose of this Technical Report is to provide information about the technical characteristics of the 2013 administration of the New Jersey Assessment of Skills and Knowledge (NJ ASK) for grades 3 through 8. This report is intended for use by those who evaluate tests, interpret scores, or use test results for making educational decisions. It includes the following sections: test development, test administration, scoring, standard setting, item and test statistics, equating and scaling, reliability, validity, and score reporting.

This report provides extensive detail about the development and operation of NJ ASK. The traditional concerns with a program are often labeled reliability and validity. The empirical reliability and validity of the assessments are reported explicitly in this document. While reliability (Part 8) is relatively straightforward, the steps in creating the program and putting it into operation are all aspects of validity (Part 9). The validity of any assessment stems from the steps taken in planning it; the processes of developing the tests' content; the processes of consulting with stakeholders; the processes of communicating with users about the test; the processes of scoring and reporting; and the processes of data analysis and appropriate uses of outcomes. Each is an integral part of validity.

Data for the analyses presented in this Technical Report were collected during the spring administration in April/May 2013. The short time duration between test administration and score reporting necessitated the use of a priority sample for the equating/scaling analyses presented in Part 7 – Equating and Scaling.

A priority sample consists of a sub-group (approximately 30%) of the entire state student population that contains a representative sample of students from across the state based on ethnicity, gender and District Factor Group (DFG), a measure of socioeconomic status (see Section 6.5). The answer documents from the selected priority sample are scored and prioritized such that the results from this group are available for score-reporting-timeline-driven-analyses. The entire student population test results were utilized in less time sensitive analyses such as those reported in Part 6 – Item and Test Statistics and Part 8 – Reliability. The student N-counts are provided for each analysis in order for the reader to quickly ascertain whether the total student population or a sub-group was used for a given analysis.

In reading this technical report, it is critical to remember that the testing program does not exist in a vacuum; it is not just a test. It is one part of a complex network intended to help schools focus their energies on dramatic improvement in student learning. NJ ASK is an integrated program of testing, accountability, and curricular and instructional support. It can only be evaluated properly within this full context. Detailed descriptions of the NJ ASK 2013 3–8 are provided in Sections 2.2 and 2.3.

1.1 Description of the Assessment

The NJ ASK was administered as an operational assessment in Spring 2013 to students in grades 3 through 8. It consisted of two content areas in grades 3, 5, 6, and 7 - Language Arts Literacy (LAL) and mathematics, and three content areas in grades 4 and 8 - LAL, mathematics, and science. To align with the naming conventions of the Common Core State Standards (CCSS), the name of the Language Arts Literacy assessment was change to English Language Arts in 2012. This assessment will henceforth be referred to as the English Language Arts assessment or ELA. The NJ ASK is designed to give an early indication of the progress students are making in mastering the knowledge and skills described in New Jersey's Core Curriculum Content Standards (CCCS). In addition, these assessments fulfill the requirements under the 2001 No Child Left Behind (NCLB) Act and are in a transitory phase of alignment with the Common Core State Standards.

In 2008, grades 5 through 8 assessments were redesigned as NJ ASK 5–8. Grades 5 through 7 of the new ASK 5–8 replaced the interim ASK 5–7 administered in 2006 and 2007. For grade 8, ASK 8 replaced the Grade Eight Proficiency Assessment (GEPA), marking 2007 as the last GEPA administration; however, the ASK 8 science test design remains unchanged from GEPA. In 2009, ELA and mathematics assessments in grades 3 and 4 were also redesigned.

New Jersey's statewide assessments currently include the following components, with versions in both English and Spanish for NJ ASK:

Elementary School:

- Grade 3 New Jersey Assessment of Skills and Knowledge (NJ ASK)
- Grade 4 New Jersey Assessment of Skills and Knowledge (NJ ASK)

Middle School:

- Grade 5 New Jersey Assessment of Skills and Knowledge (NJ ASK)
- Grade 6 New Jersey Assessment of Skills and Knowledge (NJ ASK)
- Grade 7 New Jersey Assessment of Skills and Knowledge (NJ ASK)
- Grade 8 New Jersey Assessment of Skills and Knowledge (NJ ASK)

High School:

- High School Proficiency Assessment (HSPA)
- New Jersey Biology Competency Test (NJBTC)

In addition, the statewide assessment program currently includes two tests for special populations:

- Alternate Proficiency Assessment (APA), for students with the most significant cognitive disabilities
- Alternative High School Assessment (AHSA), (formerly SRA) for students who have not demonstrated proficiency in one or more content areas of the HSPA

It is important to note that the results from the redesigned NJ ASK 3–8 ELA and Mathematics assessments cannot be compared with those of previous assessments due to changes in the test designs for grades 5-8 in 2008 and grades 3 and 4 in 2009. The redesigned NJ ASK 3–8 for ELA and Mathematics differ significantly in terms of item type, passage length, and testing time. Therefore direct comparisons of student performance across these assessments are inappropriate and should not be made.

The NJ ASK English Language Arts and Mathematics scores at grades 3–8 and Science scores at grades 4 and 8 are reported as scale scores, with score ranges as follows:

- Partially Proficient 100–199
- Proficient 200–249
- Advanced Proficient 250–300

The scores of students who are included in the Partially Proficient level are considered to be below the state minimum of proficiency and those students may be most in need of instructional support. The standard-setting procedures used in 2008 and 2009 for determining proficiency levels are detailed in Part 5 of the 2009 technical report.

1.2 Purpose of the Assessment

New Jersey's state-required assessment program was designed to measure the extent to which all students at the elementary-, middle-, and secondary-school levels have attained New Jersey's CCCS.

As a result of the NCLB requirements, New Jersey established additional statewide assessments in grades 3 through 8 and high school. The statewide assessments for elementary and middle school grades are administered annually as the New Jersey Assessment of Skills and Knowledge (NJ ASK) in English Language Arts and mathematics at grades 3 through 8 and in science at grades 4 and 8. Testing is conducted in the spring of each year to allow school staff and students the greatest opportunity to achieve the goal of Proficiency.

Schools and districts should use the results to identify strengths and weaknesses in their educational programs. This process is designed to improve instruction and foster better alignment with the CCCS. The results may also be used, along with other indicators of student progress, to identify those students who may need instructional support in any of the content areas. This support, which could be in the form of individual or programmatic intervention, would be a means to address any identified knowledge or skill gaps.

1.3 Organizational Support

New Jersey's Office of State Assessments (OSA) coordinates the development and implementation of the NJ ASK 3–8. In addition to planning, scheduling, and directing all NJ ASK activities, the staff is extensively involved in numerous test design, item and statistical reviews, security, quality-assurance and analytical procedures. Measurement Incorporated (MI), the contractor for NJ ASK Grades 3–8, is responsible for all aspects of the testing program including activities such as program management, development of test materials (test items, test booklets, answer documents, and ancillary materials), and psychometric support, including standard setting. MI's other activities include enrollment verification; distribution of

all materials; receiving, scanning, editing, and scoring the answer documents; scoring constructed-response items; and creating, generating, and distributing all score reports of test results to students, schools, districts, and the state.

PART 2: TEST DEVELOPMENT

In 2008–2009, the ELA and mathematics assessments in grades 3 and 4 were redesigned to reflect the new test design features implemented in 2007–2008 in grades 5 through 8. As with grade 8 science, the design of grade 4 science assessment remained unchanged. The redesign changes in grades 5–8 described below were also applied to the grade 3 and 4 assessments in 2008 – 2009.

Overall

- NJ ASK grade 8 replaced GEPA in ELA, mathematics, and science
- NJ ASK grades 5, 6, and 7 were revised and replaced the interim ASK 5–7 administered in 2006 and 2007
- Spanish versions of the assessments in all content areas were included
- Test was administered later in school year (April/May)

English Language Arts (ELA)

- Reading passages – more, shorter in length, more diverse in content
- Writing prompts – two prompts
- Test items and score points in total - increased

Mathematics

- Two days (grades 5-7) instead of one
- New item type: short constructed response (SCR)
- Test items and score points in total - increased

Since 2011, the OSA has worked to align the NJ ASK ELA and mathematics assessments with the Common Core State Standards (CCSS). To accomplish this transition, an alignment study between the New Jersey Core Curriculum Content Standards (CCCS) and the CCSS was conducted. Field testing of CCSS aligned items began in 2012 to ensure that the current NJ ASK assessments in ELA grades 3-8 and mathematics grades 3-5 measured the CCSS within the current NJ ASK blueprint. Administration of CCSS aligned mathematics items in grades 6-8 will begin in 2014. The Partnership for Assessment of Readiness for College and Careers (PARCC) is currently developing the "next generation assessments" for the Spring 2015 administration. For more information on the CCCS please see: *2013 NJ ASK Score Interpretation Manual* at http://www.state.nj.us/education/assessment/ms/5-8/ref/SIM13.pdf.

A directory of test specifications and sample items were developed for each content area. These specifications describe the test, format of the items, and the scores to be generated by the test. The material in the test specifications is designed for use by curriculum specialists and teachers to improve instruction at the district, school, and classroom levels. This document serves as the foundation for all test item development.

2.1 Test Specifications

The 2013 NJ ASK was designed to measure the knowledge and skills identified in the 2004 revision of the New Jersey Core Curriculum Content Standards (CCCS) for mathematics in grades 6-8 and science in grades 4 and 8. The ELA grades 3-8 and mathematics grades 3-5 assessments; however, were based upon the Common Core State Standards (CCSS). Brief descriptions of the test content measured in ELA, mathematics, and science are presented in the following sections. Table 2.1.1 details the total possible points by grade and content area. Table 2.1.2 shows the skills assessed by each content cluster or standard. An in-depth discussion of the composition of the English Language Arts (ELA), mathematics, and science assessments can be found in the 2009 NJ ASK Technical Report (PTM 1507-34), Part 2, section 2.1.

The following tables provide information about item type, content cluster/standards, and total point value by test section. Table 2.1.1 summarizes the total points possible for each of the content areas of the operational NJ ASK administered in 2013 for grades 3 through 8. Table 2.1.2 shows the number of items by content cluster/standard and skill, where appropriate.

Table 2.1.1: NJ ASK 2013 3–8 Total Points Possible by Content Area

English Language Arts	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Total	**50 points**	**56 points**	**62 points**	**70 points**	**70 points**	**70 points**
Writing	**20**	**20**	**20**	**18**	**18**	**18**
Informative/Explanatory Prompt	10*	10*	10*	6+		6+
Narrative Prompt	10*	10*	10*		6+	
Persuasive Prompt				12*	12*	12*
Reading	**30**	**36**	**42**	**52**	**52**	**52**
Literature	10	12	14	13	13	13
Informational Text	20	24	28	39	39	39
Mathematics	**Grade 3**	**Grade 4**	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
Total	**50 points**	**50 points**	**50 points**	**49 points**	**49 points**	**49 points**
Geometry (G)	6	6	6			
Measurement and Data (MD)	13	6	13			
Num. & Ops in Base Ten (NBT)	6	10	11			
Nums. & Ops – Fractions (NF)	11	18	14			
Ops & Algebraic Thinking (OA)	14	10	6			
Number & Numerical Operations				13	13	13
Geometry & Measurement				14	14	14
Patterns & Algebra				14	14	14
Data Analysis, Prob., & Discrete Math				8	8	8
Problem Solving				*23*	*29*	*27*
Science	**Grade 3**	**Grade 4**	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
Total		**39 points**	**-**	**-**	**-**	**54 points**
Life Science		15	-	-	-	23
Physical Science		13	-	-	-	16
Earth Science		11	-	-	-	15
Knowledge		*5*	-	-	-	*8*
Application		*34*	-	-	-	*46*

*Scores summed +Scores averaged

Table 2.1.2: NJ ASK 2013 3–8 Number of Items by Content Cluster and Skill

English Language Arts*	Grade 3		Grade 4		Grade 5		Grade 6		Grade 7		Grade 8	
Skill	**L**	**I**	**L**	**I**	**L**	**I**	**L**	**I**	**L**	**I**	**L**	**I**
Writing (2 Items)	0	0	0	0	0	0	0	0	0	0	0	0
Reading	7	14	9	18	11	22	10	30	10	30	10	30
Total	**7**	**14**	**9**	**18**	**11**	**22**	**10**	**30**	**10**	**30**	**10**	**30**

Mathematics**	Grade 3	Grade 4	Grade 5	Grade 6		Grade 7		Grade 8	
Skill				**PS**	**CU**	**PS**	**CU**	**PS**	**CU**
Geometry (G)	6	4	6						
Measurement and Data (MD)	13	4	13						
Num. & Ops in Base Ten (NBT)	6	10	9						
Nums. & Ops – Fractions (NF)	7	16	10						
Ops & Algebraic Thinking (OA)	12	10	6						
Number & Numerical Operations				7	6	8	8	3	2
Geometry & Measurement				5	7	4	5	8	11
Patterns & Algebra				2	6	5	5	6	7
Data Analysis, Prob., & Discrete Math				3	3	6	4	4	2
Total	**44**	**44**	**44**	**17**	**22**	**23**	**22**	**21**	**22**

Science***	Grade 4		Grade 8	
Skill	**A**	**K**	**A**	**K**
Life Science	10	3	19	2
Physical Science	10	1	13	3
Earth Science	10	1	10	3
Total	**30**	**5**	**42**	**8**

*L = Literature, I = Informational Text, **PS= Problem Solving, CU = Calculator Usage, ***K = Knowledge, A = Application

Test Blueprints

The following tables outline the test construction blueprints. The actual test map for each grade and content area for the NJ ASK 2013 3–8 is included.

Table 2.1.3: Test Construction Map for NJ ASK 3–5 English Language Arts

Test Types/Strand (additional field test content embedded throughout)	Reading Sections	MC (Number of Items)	OE (Number of Items)	Writing Tasks (Number of Items)	Time on Task(s) in Minutes	Total Points*
Writing (Narrative or Explanatory)				2	30 minutes each	20 (10 pts each)
Reading Passages (Literature and Informational Text)	3	18 (Grade 3) 24 (Grade 4) 30 (Grade 5)	3 (Grade 3) 3 (Grade 4) 3 (Grade 5)		30 minutes each	30 (Grade 3) 36 (Grade 4) 42 (Grade 5)
Total	3	18 (Grade 3) 24 (Grade 4) 30 (Grade 5)	3 (Grade 3) 3 (Grade 4) 3 (Grade 5)	2	150 minutes	50 (Grade 3) 56 (Grade 4) 62 (Grade 5)

*NJ ASK 3- 5 writing is scored using a 5-point rubric. OE reading items are scored using a 0-4 point rubric.

Table 2.1.4: Actual Test Map for 2013 Grade 3 English Language Arts NJ ASK

STANDARD		MC (1 pt.)	OE (4 pts.)	WT (5 pts.)	# of Items	# of Points
Literature		6	1		7	10
Informational Text		12	2		14	20
Total Reading		**18**	**3**		**21**	**30**
Prompt	Informative/Explanatory			1	1	10
Prompt	Narrative			1	1	10
Total Writing				**2**	**2**	**20**
Grand Total		**18**	**3**	**2**	**23**	**50**

Table 2.1.5: Actual Test Map for 2013 Grade 4 English Language Arts NJ ASK

STANDARD		MC (1 pt.)	OE (4 pts.)	WT (5 pts.)	# of Items	# of Points
Literature		8	1		9	12
Informational Text		16	2		18	24
Total Reading		**24**	**3**		**27**	**36**
Prompt	Informative/Explanatory			1	1	10
Prompt	Narrative			1	1	10
Total Writing				**2**	**2**	**20**
Grand Total		**24**	**3**	**2**	**29**	**56**

Table 2.1.6: Actual Test Map for 2013 Grade 5 English Language Arts NJ ASK

STANDARD		MC (1 pt.)	OE (4 pts.)	WP (5 pts.)	# of Items	# of Points
Literature		10	1		11	14
Informational Text		20	2		22	28
Total Reading		**30**	**3**		**33**	**42**
Prompt	Informative/Explanatory			1	1	10
Prompt	Narrative			1	1	10
Total Writing				**2**	**2**	**20**
Grand Total		**30**	**3**	**2**	**35**	**62**

Table 2.1.7: Test Construction Map for NJ ASK 6–8 English Language Arts

Test Types/Strand (additional field test content embedded throughout)	Reading Sections	MC (Number of Items)	OE (Number of Items)	Writing Tasks (Number of Items)	Time on Task(s) in Approximate Minutes	Total Points*
Writing: Persuasive OR Argument Task				1	45	12
Writing: Informative/ Explanatory OR Narrative Task				1	30	6
Reading Passage	4	36	4		30(each)	52
Total	**4**	**36**	**4**	**2**	**195**	**70**

*NJ ASK 6- 8 writing is scored using a 6 - point rubric. OE reading items are scored using a 0 - 4 point rubric.

Table 2.1.8: Actual Test Map for 2013 Grade 6 English Language Arts NJ ASK

STANDARD		MC (1 pt.)	OE (4 pts.)	WP (6 pts.)	# of Items	# of Points
Literature		9	1		10	13
Informational Text		27	3		30	39
Total Reading		**36**	**4**		**40**	**52**
Prompt	Persuasive			1	1	12
Prompt	Informative/Explanatory			1	1	6
Total Writing				**2**	**2**	**18**
Grand Total		**36**	**4**	**2**	**42**	**70**

Table 2.1.9: Actual Test Map for 2013 Grade 7 English Language Arts NJ ASK

STANDARD		MC (1 pt.)	OE (4 pts.)	WP (6 pts.)	# of Items	# of Points
Literature		9	1		10	13
Informational Text		27	3		30	39
Total Reading		**36**	**4**		**40**	**52**
Prompt	Persuasive			1	1	12
Prompt	Narrative			1	1	6
Total Writing				**2**	**2**	**18**
Grand Total		**36**	**4**	**2**	**42**	**70**

Table 2.1.10: Actual Test Map for 2013 Grade 8 English Language Arts NJ ASK

STANDARD		MC (1 pt.)	OE (4 pts.)	WP (6 pts.)	# of Items	# of Points
Literature		9	1		10	13
Informational Text		27	3		30	39
Total Reading		**36**	**4**		**40**	**52**
Prompt	Persuasive			1	1	12
Prompt	Informative/Explanatory			1	1	6
Total Writing				**2**	**2**	**18**
Grand Total		**36**	**4**	**2**	**42**	**70**

Table 2.1.11: Test Construction Map for NJ ASK 3-5 Mathematics

MC – multiple choice, 1 raw score point
SCR – short constructed-response, 1 raw score point
ECR – extended constructed-response, 3 raw score points

		Grade 3 (1 calculator active part)	Grade 4 (1 calculator active part)	Grade 5 (2 calculator active parts)
Item Count by Type (does not include embedded field test content)	MC	35	35	33
	SCR	6	6	8
	ECR	3	3	3
Total raw score points possible		50	50	50
Approximate total testing time (including field test content)		131 minutes	131 minutes	136 minutes

Table 2.1.12: Actual Test Map for 2013 Grade 3 Mathematics NJ ASK

DOMAIN	Standards	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
Geometry (G)	3.G.1	6	0	0	6	6
	3.G.2	0	0	0	0	0
G Total	**2**	**6**	**0**	**0**	**6**	**6**
Measurement and Data (MD)	3.MD.1	0	0	0	0	0
	3.MD.2	0	0	0	0	0
	3.MD.3	7	0	0	7	7
	3.MD.4	1	0	0	1	1
	3.MD.5	1	0	0	1	1
	3.MD.6	3	0	0	3	3
	3.MD.7	0	0	0	0	0
	3.MD.8	1	0	0	1	1
MD Total	**8**	**13**	**0**	**0**	**13**	**13**
Numbers and Operations in Base Ten (NBT)	3.NBT.1	2	0	1	3	3
	3.NBT.2	2	0	1	3	3
	3.NBT.3	0	0	0	0	0
NBT Total	**3**	**4**	**0**	**2**	**6**	**6**
Number and Operations – Fractions (NF)	3.NF.1	2	0	1	3	3
	3.NF.2	1	1	0	2	4
	3.NF.3	0	1	1	2	4
NF Total	**3**	**3**	**2**	**2**	**7**	**11**
Operations & Algebraic Thinking (OA)	3.OA.1	2	0	1	3	3
	3.OA.2	0	0	0	0	0
	3.OA.3	0	1	1	2	4
	3.OA.4	0	0	0	0	0
	3.OA.5	0	0	0	0	0
	3.OA.6	0	0	0	0	0
	3.OA.7	3	0	0	3	3
	3.OA.8	1	0	0	1	1
	3.OA.9	3	0	0	3	3
OA Total	**9**	**9**	**1**	**2**	**12**	**14**
Grand Total		**35**	**3**	**6**	**44**	**50**

Table 2.1.13: Actual Test Map for 2013 Grade 4 Mathematics NJ ASK

DOMAIN	Standards	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
Geometry (G)	4.G.1	2	0	0	2	2
	4.G.2	0	1	0	1	3
	4.G.3	1	0	0	1	1
G Total	**3**	**3**	**1**	**0**	**4**	**6**
Measurement and Data (MD)	4.MD.1	0	0	0	0	0
	4.MD.2	3	1	0	4	6
	4.MD.3	0	0	0	0	0
	4.MD.4	0	0	0	0	0
	4.MD.5	0	0	0	0	0
	4.MD.6	0	0	0	0	0
	4.MD.7	0	0	0	0	0
MD Total	**7**	**3**	**1**	**0**	**4**	**6**
Numbers and Operations in Base Ten (NBT)	4.NBT.1	0	0	1	1	1
	4.NBT.2	2	0	0	2	2
	4.NBT.3	1	0	0	1	1
	4.NBT.4	0	0	0	0	0
	4.NBT.5	3	0	1	4	4
	4.NBT.6	2	0	0	2	2
NBT Total	**6**	**8**	**0**	**2**	**10**	**10**
Number and Operations – Fractions (NF)	4.NF.1	0	0	0	0	0
	4.NF.2	3	0	0	3	3
	4.NF.3	1	1	0	2	4
	4.NF.4	2	0	1	3	3
	4.NF.5	0	0	0	0	0
	4.NF.6	1	0	0	1	1
	4.NF.7	5	0	2	7	7
NF Total	**7**	**12**	**1**	**3**	**16**	**18**
Operations & Algebraic Thinking (OA)	4.OA.1	0	0	0	0	0
	4.OA.2	0	0	1	1	1
	4.OA.3	5	0	0	5	5
	4.OA.4	0	0	0	0	0
	4.OA.5	4	0	0	4	4
OA Total	**5**	**9**	**0**	**1**	**10**	**10**
Grand Total		**35**	**3**	**6**	**44**	**50**

Table 2.1.14: Actual Test Map for 2013 Grade 5 Mathematics NJ ASK

DOMAIN	Standards	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
Geometry (G)	5.G.1	1	0	1	2	2
	5.G.2	1	0	1	2	2
	5.G.3	0	0	0	0	0
	5.G.4	2	0	0	2	2
G Total	**4**	**4**	**0**	**2**	**6**	**6**
Measurement and Data (MD)	5.MD.1	6	0	1	7	7
	5.MD.2	2	0	0	2	2
	5.MD.3	0	0	0	0	0
	5.MD.4	2	0	0	2	2
	5.MD.5	0	0	2	2	2
MD Total	**5**	**10**	**0**	**3**	**13**	**13**
Numbers and Operations in Base Ten (NBT)	5.NBT.1	0	0	0	0	0
	5.NBT.2	0	0	0	0	0
	5.NBT.3	2	0	1	3	3
	5.NBT.4	0	0	0	0	0
	5.NBT.5	0	0	0	0	0
	5.NBT.6	1	0	0	1	1
	5.NBT.7	4	1	0	5	7
NBT Total	**7**	**7**	**1**	**1**	**9**	**11**
Number and Operations – Fractions (NF)	5.NF.1	3	0	1	4	4
	5.NF.2	3	1	0	4	6
	5.NF.3	1	1	0	2	4
	5.NF.4	0	0	0	0	0
	5.NF.5	0	0	0	0	0
	5.NF.6	0	0	0	0	0
	5.NF.7	0	0	0	0	0
NF Total	**7**	**7**	**2**	**1**	**10**	**14**
Operations & Algebraic Thinking (OA)	5.OA.1	0	0	0	0	0
	5.OA.2	3	0	0	3	3
	5.OA.3	2	0	1	3	3
OA Total	**3**	**5**	**0**	**1**	**6**	**6**
Grand Total		**33**	**3**	**8**	**44**	**50**

Table 2.1.15: Test Construction Map for NJ ASK 6–8 Mathematics

MC – multiple choice, 1 raw score point
SCR – short constructed-response, 1 raw score point
ECR – extended constructed-response, 3 raw score points

		Grade 6 (2 calculator active parts)	Grade 7 (2 calculator active parts)	Grade 8 (2 calculator active parts)
Item Count by Type (does not include embedded filed test content)	MC	32	32	32
	SCR	8	8	8
	ECR	3	3	3
Total raw score points possible		49	49	49
Approximate total testing time (including field test content)		133 minutes	133 minutes	133 minutes

Table 2.1.16: Actual Test Map for 2013 Grade 6 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	6	0	2	8	8
	B	4	0	1	5	5
	C	0	0	0	0	0
1 Total		**10**	**0**	**3**	**13**	**13**
2	A	2	0	0	2	2
	B	0	0	0	0	0
	C	2	0	0	2	2
	D	1	0	0	1	1
	E	4	1	2	7	9
2 Total		**9**	**1**	**2**	**12**	**14**
3	A	0	0	0	0	0
	B	1	0	0	1	1
	C	3	1	1	5	7
	D	5	0	1	6	6
3 Total		**9**	**1**	**2**	**12**	**14**
4	A	1	0	1	2	2
	B	1	0	0	1	1
	C	1	1	0	2	4
	D	1	0	0	1	1
4 Total		**4**	**1**	**1**	**6**	**8**
Grand Total		**32**	**3**	**8**	**43**	**49**

Table 2.1.17: Actual Test Map for 2013 Grade 7 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	7	1	0	8	10
	B	2	0	1	3	3
	C	0	0	0	0	0
1 Total		**9**	**1**	**1**	**11**	**13**
2	A	3	1	0	4	6
	B	0	0	1	1	1
	C	2	0	1	3	3
	D	1	0	0	1	1
	E	3	0	0	3	3
2 Total		**9**	**1**	**2**	**12**	**14**
3	A	0	1	1	2	4
	B	0	0	0	0	0
	C	3	0	0	3	3
	D	5	0	2	7	7
3 Total		**8**	**1**	**3**	**12**	**14**
4	A	2	0	0	2	2
	B	2	0	1	3	3
	C	2	0	1	3	3
	D	0	0	0	0	0
4 Total		**6**	**0**	**2**	**8**	**8**
Grand Total		**32**	**3**	**8**	**43**	**49**

Table 2.1.18: Actual Test Map for 2013 Grade 8 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	4	0	2	6	6
	B	1	1	2	4	6
	C	1	0	0	1	1
1 Total		**6**	**1**	**4**	**11**	**13**
2	A	6	0	1	7	7
	B	0	0	0	0	0
	C	1	0	0	1	1
	D	1	0	0	1	1
	E	5	0	0	5	5
2 Total		**13**	**0**	**1**	**14**	**14**
3	A	0	0	0	0	0
	B	2	1	0	3	5
	C	4	0	0	4	4
	D	4	0	1	5	5
3 Total		**10**	**1**	**1**	**12**	**14**
4	A	3	1	0	4	6
	B	0	0	1	1	1
	C	0	0	1	1	1
	D	0	0	0	0	0
4 Total		**3**	**1**	**2**	**6**	**8**
Grand Total		**32**	**3**	**8**	**43**	**49**

Table 2.1.19: Test Construction Map for NJ ASK 4 and 8 Science

Science assessment includes Life, Physical, and Earth Sciences. Each multiple choice item is worth one point; each constructed response item is worth up to three points.
Each constructed response item is scored using an item-specific rubric

		Grade 4	Grade 8
Item Count by Type (does not include field test content)	MC	33	48
	CR	2	2
Total raw score points possible		39	54
Approximate total testing time (includes field test content)		60 min.	120 min.

Table 2.1.20: Actual Test Map for 2013 Grade 4 Science NJ ASK

Cluster	Cog/Prob	MC (1 pt.)	CR (3 pts.)	# of Items	# of Points
Earth	Application	10	0	10	10
	Knowledge	1	0	1	1
Earth Total		**11**	**0**	**11**	**11**
Life	Application	9	1	10	12
	Knowledge	3	0	3	3
Life Total		**12**	**1**	**13**	**15**
Physical	Application	9	1	10	12
	Knowledge	1	0	1	1
Physical Total		**10**	**1**	**11**	**13**
Grand Total		**33**	**2**	**35**	**39**

Table 2.1.21: Actual Test Map for 2013 Grade 8 Science NJ ASK

Cluster	Cog/Prob	MC (1 pt.)	CR (3 pts.)	# of Items	# of Points
Earth	Application	9	1	10	12
	Knowledge	3	0	3	3
Earth Total		**12**	**1**	**13**	**15**
Life	Application	18	1	19	21
	Knowledge	2	0	2	2
Life Total		**20**	**1**	**21**	**23**
Physical	Application	13	0	13	13
	Knowledge	3	0	3	3
Physical Total		**16**	**0**	**16**	**16**
Grand Total		**48**	**2**	**50**	**54**

2.2 Development of Test Items

The NJ ASK consists of two types of items:

1. Operational items used to determine students' scores and
2. Field-test items evaluated for use as future base test items.

In the item development process, MI developed test and item specifications based upon requirements of the NJ CCCS for mathematics in grades 6-8 and science in grades 4 and 8. Test development and item specifications for ELA grades 3-8 and mathematics grades 3-5 were based upon the CCSS. Details regarding the item development process can be found in the 2009 NJ ASK Technical Report (PTM 1507-34), Part 2, section 2.2.

Test Form Distribution

Before Spring of 2008, the NJ DOE developed items for the NJ ASK using a standalone field-test format. Beginning with the operational administration in Spring of 2008, the NJ DOE

began embedding field-test items for ELA, mathematics, and science. Thus, twenty-four forms of the NJ ASK 2013 assessments were distributed to New Jersey schools. Each of the 24 test forms at each grade level included identical base test items or operational items as well as a semi-unique set of field-test items. Note that students earned scores only on operational items. The 24 field test forms were assigned to school districts such that each district has one and only one test form, except in the case of unusually large districts (i.e., Jersey City, Newark, and Patterson), which received two forms. Moreover, the field test forms were distributed across ethnic groups and DFG classifications, such that each group or classification was represented across each form. Finally, approximately equal numbers of students (approximately 4,500) were given each test form. Tables showing the final form distribution plan, by test form, grade, and DFG classification can be found in Appendix A.

Information regarding the Item Review Process, Item Use, Test Forms Assembly, and Quality Control for Test Construction can also be found in the 2009 NJ ASK Technical Report (PTM 1507-34), Part 2, sections 2.3 through 2.6, respectively.

PART 3: TEST ADMINISTRATION

Great care is taken to ensure standard administration of the NJ ASK. Close attention to details is necessary to ensure that students taking the test in different locations have equal opportunities for success. Information about the administration of NJ ASK is available in the Test Coordinator Manual (*New Jersey Assessment of Skills & Knowledge Spring 2013 Test Coordinator Manual Grades 3–8*). That information is not fully replicated here, but the following elements are of importance to this technical report.

3.1 Participation

State regulations require that all students be included in the statewide assessment program and assessed annually. This includes limited English proficient (LEP) students and students with disabilities. Beginning in school year 2001–2002, students with severe cognitive disabilities were administered the Alternative Proficiency Assessment (APA) for the first time statewide.

All public schools, including those without assessed grades, are counted in the state's accountability system. All schools without assessed grades are counted as one unit with their respective receiving schools. This helps ensure closer vertical alignment of instructional services. In addition, special education students served in proprietary schools are counted in the sending schools' accountability results, which ensure that placement decisions are reviewed closely at the school and district level for optimum student academic performance.

New Jersey does not include in the accountability system the results of any student enrolled less than one full academic year in a school for school accountability, or in a district for district accountability. This does not exclude from a district's accountability the results of those students who transfer from one school to another within a district.

3.2 Test Security Procedures

The NJ ASK test booklets and their contents were treated as secure materials. Detailed procedures for maintaining the security of test materials while they were in the districts were outlined in the *New Jersey Assessment of Skills & Knowledge Spring 2013 Test Coordinator Manual Grades 3–8*. It was the responsibility of the district to guarantee the security of the test materials. Examiners, proctors, and other school personnel were prohibited from copying, reading, discussing, or disclosing any test items before, during, or after test administration. When not being used during a test period, test materials were stored in a secure, locked location that was accessible only to individuals whose access was authorized by the school test coordinator. Inventory forms tracked test materials as they moved from one location to another in districts.

As part of the test development procedures, "breach" test forms and examiner manuals were prepared in the event of a security breach. If the NJ DOE identified a security breach during the test administration window, MI immediately removed the NJ ASK test materials from the involved district or school. The test booklets for the content area affected were coded with a void code indicating a security breach. If the NJ DOE determined that there was enough time for testing, the breach forms were delivered to the district and the test was administered to the

affected students in the content area impacted by the security breach. For students re-tested during the test administration window, scores were reported based on the breach form. If a security breach was identified after the testing window, the impacted test booklets were coded with a security breach void code and no test results were reported for that content area. However, students received a score for the content area not impacted by the security breach.

3.3 Test Administration Procedures

Detailed instructions for administering the NJ ASK were provided in the *New Jersey Assessment of Skills & Knowledge Spring 2013 Test Coordinator Manual Grades 3–8.* The NJ ASK 3–8 was administered according to the following schedule:

Table 3.3.1: NJ ASK 2013 Testing Window

Grade	Test Dates		Testing Time (minutes)*				
			ELA		Math		Science
	Regular testing	Make-up testing	Day 1	Day 2	Day 3	Day 4	Day 4/Day 5
Grade 3	5/13/13–5/16/13	5/20/13–5/24/13	90	90	63	68	N/A
Grade 4	5/13/13–5/17/13	5/20/13–5/24/13	90	90	63	68	60
Grade 5	5/6/13–5/9/13	5/13/13–5/17/13	90	90	68	68	N/A
Grade 6	5/6/13–5/9/13	5/13/13–5/17/13	105	120-135	68	69	N/A
Grade 7	4/29/13–5/2/13	5/6/13–5/10/13	105	120-135	68	69	N/A
Grade 8	4/29/13–5/2/13	5/6/13–5/10/13	105	120-135	137	*N/A*	120

*Does not include administrative time but does include field test time.

Testing was not to be scheduled immediately after an athletic event or an assembly. All test schedules were checked with the appropriate school officials to ensure that other school activities did not interfere with the test administration. Other test administration procedures included:

- All testing had to be scheduled in the morning. Exceptions included homebound and bedside students, as well as students attending out-of-district placements who were tested at that placement by staff from the student's home district.
- The district and school test coordinators (DTCs/STCs) were responsible for scheduling times and places for regular and make-up testing and for ensuring that all testing was completed according to the procedures and schedule described in the *Test Coordinator Manual* and in the *Examiner Manual*.
- Students who were required to test but were absent for the regular test administration had to be tested on the make-up dates.
- Students whose answer folders were voided during testing were considered to have attempted the test section. They were not allowed to retake or resume taking the voided test section during the make-up.

- Students who began a section of the test and did not complete it during the specified testing time were not allowed to complete the test section during the make-up period or any other time unless additional time was specified in their IEP or 504 plan.

3.4 Test Accommodations

To ensure that students are tested under appropriate conditions, the Department of Education has adopted test accommodations and modifications that may be used when testing special populations of students. The content of the test typically remains the same, but administration procedures, setting, and answer modes may be adapted. Students requiring accommodations must be tested in a separate location from general education students.

General education students receive no special testing accommodations other than the standard room setup and materials distribution described in the examiner's section of the Test Manual.

Limited English Proficient (LEP) students who do not take the Spanish form of the test are tested with one or more of these accommodations:

- Additional time up to 150% of the administration times indicated
- Translation of directions only to the student's native language
- Use of a bilingual dictionary, preferably one normally used by the student as part of the instructional program.

Translations of passages, items, prompts, and tasks are NOT permitted.

Students with Disabilities (SE/504) must take the NJ ASK unless their Individualized Education Program (IEP) specifically states that they take the Alternate Proficiency Assessment (APA) and not the NJ ASK.

Students who are eligible under Section 504 of the Rehabilitation Act of 1973 may be tested using modified testing procedures that must be specified in the student's 504 accommodation plan.

Visually impaired students may take either a Braille or large-print version of the test. Specific instructions for administering the Braille and large-print versions of the test are provided in the supplementary instructions for examiners administering these forms.

Students using the Braille test booklets:

- are instructed to bring a Braille ruler and a talking calculator to the test session.
- are instructed to skip some items identified in the Braille instructions. The spaces for these items must be left blank on the student answer folder.
- have answer folders transcribed from Braille version by the examiner.
- dictate their answers to the examiner or use a device that produces Braille.

For dictations and responses recorded in Braille:

- Students must indicate all punctuation and must spell all key words.
- Examiners must transcribe the Brailled responses into the regular answer folder.

Students using the large-print test booklets:

- mark their answers in the large-print answer folders.
- may be instructed to skip some questions. The spaces for these questions must be left blank in the student's large-print answer folder.
- dictate responses on constructed-response items and writing tasks, indicate all punctuation, and spell key words.

Accommodations and modifications of test administration procedures are listed in Appendix C of this report. Also, the accommodations and modifications are included in the Test Coordinator Manual**.**

If a student requires an accommodation or modification that is not listed, district staff are instructed to contact the Office of Assessments, NJ ASK Program Coordinator. Accommodations or modifications are classified as follows:

A = Setting Accommodations
B = Scheduling Accommodations
C = Test Materials/Modifications
D = Test Procedures Modifications

Tables 3.4.1 – 3.4.2 provide counts and performance results of special education and Section 504 students. Descriptive statistics are also provided for those students classified as Section 504 or special education who were tested without accommodations or modifications. Not every special education and Section 504 student is tested with an accommodation or modification. Accommodations and modifications may be used separately or in combination. The use of multiple accommodations for individual students is common.

Table 3.4.1: Statistics for Students Classified as Special Education

Content Area	Grade	Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
ELA	3	Yes	11359	185.06	20.70	100	288	70.36	29.27	0.37
		No	4848	203.85	23.21	100	300	35.87	60.79	3.34
	4	Yes	12841	176.78	25.10	100	297	79.65	19.77	0.58
		No	4015	202.19	30.76	100	300	41.57	51.53	6.90
	5	Yes	13529	178.74	25.81	100	295	76.41	22.77	0.82
		No	3077	199.69	31.30	100	295	45.01	48.10	6.89
	6	Yes	13997	183.07	21.94	100	288	75.52	24.26	0.23
		No	2517	196.39	26.85	108	285	52.01	45.41	2.58
	7	Yes	14025	179.46	27.28	100	300	76.00	22.91	1.09
		No	1958	191.84	34.88	100	300	59.65	34.07	6.28
	8	Yes	14302	197.02	19.91	100	278	54.71	44.56	0.73
		No	1791	202.46	23.68	134	284	46.29	50.87	2.85
Math	3	Yes	11392	196.01	45.57	100	300	51.02	33.21	15.77
		No	4852	233.86	45.22	100	300	20.12	34.62	45.26
	4	Yes	12874	199.83	39.63	100	300	48.16	39.55	12.29
		No	4023	230.44	42.90	100	300	21.10	42.46	36.44
	5	Yes	13565	198.78	40.77	100	300	52.02	34.52	13.45
		No	3077	231.41	46.47	100	300	24.93	33.34	41.73
	6	Yes	14013	190.46	34.98	100	300	57.25	36.62	6.12
		No	2515	211.61	42.80	104	300	37.34	41.75	20.91
	7	Yes	14030	176.12	34.48	100	300	76.31	19.59	4.11
		No	1959	193.47	44.44	100	300	59.11	26.44	14.45
	8	Yes	14259	178.04	36.94	100	300	71.65	23.13	5.22
		No	1777	189.60	45.98	100	300	61.56	24.59	13.84

Content Area	Grade	Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
Science	4	Yes	12870	218.54	33.53	111	300	25.77	53.26	20.96
		No	4041	240.65	35.29	123	300	11.41	42.74	45.85
	8	Yes	14302	198.50	30.21	100	300	54.36	37.68	7.96
		No	1788	207.60	36.88	118	300	45.69	37.30	17.00

Table 3.4.2: Statistics for Students Classified as Section 504

Content Area	Grade	Accommodations	N	Mean	STD	Min	Max	%PP	%P	%AP
ELA	3	Yes	2570	199.56	19.10	118	288	43.35	55.53	1.13
		No	465	207.57	19.97	147	281	28.60	69.46	1.94
	4	Yes	3034	197.31	25.38	108	297	51.38	45.12	3.49
		No	476	206.66	28.01	132	287	36.34	55.88	7.77
	5	Yes	3104	199.51	25.44	118	300	49.03	46.62	4.35
		No	533	208.68	26.93	134	300	33.77	57.60	8.63
	6	Yes	2905	203.74	21.35	130	285	40.38	57.76	1.86
		No	543	210.66	21.17	139	267	27.62	68.88	3.50
	7	Yes	2747	205.75	28.63	105	300	40.84	51.33	7.83
		No	631	216.51	28.34	130	296	23.93	62.60	13.47
	8	Yes	2657	217.65	20.24	129	300	17.58	75.61	6.81
		No	666	223.51	19.35	161	284	9.76	78.68	11.56

Content Area	Grade	Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
Math	3	Yes	2574	224.49	41.79	100	300	24.83	42.39	32.79
		No	465	238.94	41.82	125	300	15.48	38.28	46.24
	4	Yes	3039	223.21	36.58	115	300	23.82	51.04	25.14
		No	476	231.69	38.85	100	300	17.23	48.32	34.45
	5	Yes	3105	228.59	39.17	100	300	32.95	44.09	22.96
		No	532	241.72	40.70	126	300	15.60	35.53	48.87
	6	Yes	2901	220.65	35.14	115	300	23.37	54.26	22.37
		No	543	231.85	34.67	130	300	15.47	50.28	34.25
	7	Yes	2745	208.86	37.98	100	300	40.91	41.89	17.19
		No	629	223.12	38.13	115	300	27.66	42.77	29.57
	8	Yes	2651	217.27	41.01	100	300	32.70	41.15	26.14
		No	665	225.06	40.14	121	300	24.81	43.61	31.58
Science	4	Yes	3035	238.59	32.07	148	300	9.65	48.83	41.52
		No	476	246.22	31.96	148	300	4.83	44.12	51.05
	8	Yes	2647	226.99	33.13	118	300	20.10	49.53	30.37
		No	664	236.61	31.08	131	300	11.45	47.59	40.96

3.5 Reliability and Validity of Tests for Special Populations[1]

Assessing the reliability and validity of the modifications made for the special populations is as important as assessing these psychometric properties of the operational tests. Reliability of assessment is the degree to which assessment results measure particular knowledge and skills. Validity of assessment is the degree to which an assessment measures what it is intended to measure and the extent to which the inferences made and actions taken on the basis of the assessment outcomes are accurate and appropriate. An assessment that is not reliable cannot be valid (AERA, APA, & NCME, 1999).

New Jersey state regulations require that all students be included in the statewide assessment program and assessed annually including limited English proficient (LEP) students and students with disabilities. Beginning in school year 2001–2002, students with severe cognitive disabilities were administered the Alternative Proficiency Assessment (APA) for the first time statewide. All public schools, including those without assessed grades, are counted in the state's accountability system.

Given the high stakes nature of the tests for school accountability, it is important that the tests be reliable and valid. The NJ ASK tests are offered in English, Spanish, Braille, and Large Print; and students are allowed various accommodations as determined by the individualized education plan (IEP) and 504 plan. Spanish forms are offered for current limited English proficient (CLEP) students whose dominant language is Spanish, as identified by school districts. Alternate forms of the tests are generated for students who cannot participate in the regular administration of the tests.

The reliability and validity evidence for the 2013 NJ ASK tests for the regular and special populations are documented in various parts of this report. A reliable test is one that produces scores that are expected to be relatively stable if the test is administered repeatedly under similar conditions for the general testing population and across subgroups. For evidence that a test is performing similarly across subgroups, the reliability values for these subgroups can be compared to those of the total population. Note that the reliability measures are impacted by the population distribution and can be lower when the subgroup is homogenous in performance. However, one would expect the subgroup reliabilities to be adequately high for all groups. The test reliabilities measured by Cronbach alpha for the 2013 NJASK tests are described in Part 8. The alphas for overall student responses ranged from 0.81 to 0.89 for ELA, 0.90 to 0.93 for mathematics, and 0.83 to 0.90 for science indicating that the tests are highly reliable. The reliability of the tests for Spanish students only is lower than the general population, ranging from 0.76 to 0.80 for ELA, 0.83 to 0.88 for math, and 0.75 to 0.77 for science (see Table 8.1.1) which is still reasonable given the student population (N<900). Reliability estimates for special education and limited English proficient students can also be found in Table 8.1.1. The reliabilities for these special populations are quite similar to the general population.

[11] Sato, E., Worth, P, Gallagher, C., Lagunoff, R., and McKeag, H., (2007). Guidelines for Ensuring the Technical Quality of Assessments Affecting English Language Learners and Students with Disabilities: Development and Implementation of Regulations

The reliability of the test and test scores is reflected in the evidence of rater consistency (i.e. inter-rater reliability). Although there is no separate inter-rater reliability analysis for CLEP students, the rater reliability coefficient for the total population shows relatively high agreement between the raters on the constructed-response items. The scoring processes are described in Part 4 and inter-rater reliability of test scores in constructed-response and writing items are presented in Part 8 of this report.

The 2013 NJ ASK tests validity evidence specifically for special populations are described here in terms of test content, test administration and response process, internal structure, and score reporting as proposed by Sato et. al (2007) for guidelines of evaluating reliability and validity of assessments.

The fact that all tests are constructed under same blueprint and specifications is evidence of content validity. The NJ ASK tests for special populations including Spanish, Braille, and Large Print versions are translated directly from the operational forms. The items are developed to align and measure the NJ core curriculum standards so that all students can demonstrate the knowledge and skills necessary for the attainment of English language proficiency and the language necessary for achievement in the academic content areas. All standards and assessments are reviewed by specialists from NJ content as well as bias and sensitivity review committees to identify and eliminate elements that may favor one group (e.g., language, culture, ethnicity) over another. Test items are developed under universal test design principle with NJ special student populations in mind so that no student group is disadvantaged. The test development process is described in Part 2 of this Technical report.

The test validity is also reflected in the fact that the test is inclusive for all students. In order to minimize or eliminate factors that contribute to assessment ambiguity and inaccuracy such that assessment results accurately reflect student knowledge and ability, various accommodations are provided to the special needs students based on their IEP or 504 plans. A list of acceptable test accommodations or modifications of test administrations is provided in Appendix C.

The test validity further ensures the comparability and interpretation of scores and proficiency standards across different student groups. All NJ ASK item responses for a given grade/content from the general and special populations are combined for item analysis, calibration, and equating. These analyses include all students regardless of the test version taken, i.e., operational, Spanish, Braille, or Large Print. An entirely different score conversion table is prepared for tests requiring modifications such that a subset of the total number of items constitutes the total score. However, these special test versions are placed on the same scale as the operational tests; thus, proficiency standards can be applied uniformly to all tests.

The performance of students from various groups including gender, ethnicity, special education, and LEP are reported at the school level. Table 6.5.8 presents mean and standard deviation of scale scores for Braille, Large Print, and Spanish test takers. As shown in this table, students from the sub-populations performed less well than the general population in all content areas. The number of students in the sub-groups is small, however.

PART 4: SCORING

4.1 Multiple-Choice Items

The answer keys approved by NJ DOE are used to score the multiple-choice items after the responses have been scanned. Each item has a key associated with the item (A, B, C, or D), which has been supplied and verified by the NJ ASK content specialists. All correct answers are assigned the value of "1" while incorrect answers are assigned the value of "0." At no time in this process is the original scanned answer overwritten, in case the key is determined to be incorrect during the post-scoring quality assurance check. After scoring is completed, simple item statistics are provided to the appropriate NJ ASK content specialist to ensure that the correct keys are being applied. If a key changes, then the process is repeated until the scoring file is correct. The key-check data file contains the following information:

- percent of students getting the question correct (PC);
- correlation of the item to the test as a whole (RPB);
- correlation of each possible response option to the test as a whole (RPBA, RPBB, etc.);
- percentage of students choosing each response option (A, B, C, D or X-omits); and
- flags for items with high difficulty (DFLAG) or low correlations (CFLAG).

4.2 Constructed-Response Items

A discussion of the following topics germane to the scoring of constructed response items can be found in the 2009 NJ ASK Technical Report (PTM 1507-34), Part 4 , section 4.2.

- Scorer Selection
- Range Finding
- Field Test Range Finding
- Scoring Guides
- Team Leader Training and Qualifying
- Scorer Training/Qualifying
- Monitoring Scorer Performance

As the number of scoring personnel varies from year to year, Table 4.2.1 details the levels of staffing for scoring the 2013 NJ ASK. The table shows the numbers of scorers, team leaders and scoring directors at each grade level who participated in scoring.

Table 4.2.1: Scoring Personnel by Grade and Content Area - NJ ASK 2013

Content Area	Grade	Scorers	Team Leaders	Scoring Director
ELA				
Writing Tasks and Open-Ended Items	3	186	20	7
	4	187	20	6
	5	220	24	6
	6	256	22	6
	7	258	25	8
	8	225	25	7
Math				
Extended Constructed Response Only	3	36	3	3
	4	48	3	3
	5	48	5	1
	6	45	3	3
	7	35	3	3
	8	48	6	3
SCR*	3-8	48	5	1
Science				
Constructed Response	4	37	2	2
	8	37	4	2

*Short Constructed Response

As shown in Part 8, Reliability, the raters are not in perfect agreement 100% of the time. Thus to ensure that no student is unjustly penalized because a rater may have been a little too stringent, rescoring is conducted automatically for any student who scores within one raw score point of the proficient cut score. MI reviews writing and constructed-response items and verifies the original scores or makes changes where warranted. Scores are never lowered during the automatic rescoring process even if a lower score results. Districts do not need to request rescoring. Table 4.2.2 provides automatic rescoring information for each grade level and content area. Previously, all writing tasks and open-ended/constructed response item types were scored by a single rater. Beginning in 2012 however, the writing tasks were scored by two raters while single-rater-scoring continued for the open-ended/constructed response items. As the informative/explanatory writing task (grades 6 and 8) and the narrative writing task (grade 7) are averaged, half score points are now possible. Thus, not every score change resulting from the automatic rescoring of tests in ELA 6-8 produces a proficiency change, in contrast to the other grade/content areas. The values in parentheses for ELA 6-8 represent the number and percentage of changes in proficiency levels.

Table 4.2.2: Automatic Rescore Statistics - NJ ASK 2013

		Eligible for Automatic Rescore	Score/Proficiency Changes	
ELA	**Grade**		#	%*
	3	4906	78	1.59
	4	4031	66	1.64
	5	3779	76	2.01
	6	3188	49 (49)*	1.54 (1.54)+
	7	3361	275 (275)*	8.18 (8.18)+
	8	2124	131 (128)*	6.17 (6.03)+
Mathematics	**Grade**			
	3	2153	107	4.97
	4	2507	63	2.51
	5	1911	45	2.35
	6	2318	134	5.78
	7	3118	223	7.15
	8	2573	103	4.00
Science	**Grade**			
	4	2075	51	2.46
	8	2375	63	2.65

*Percentage of eligible students whose scores changed
+Value in parentheses indicates proficient level changes in ELA 6-8

4.3 Quality Control[2]

In order to ensure the quality of the testing materials, MI and the NJ DOE work together to rigorously proof all materials prior to printing/production. The steps of the quality control procedures can be found in the 2009 NJ ASK Technical Report (PTM 1507-34), Part 4 , section 4.3.

[2] The NJ DOE checks all test result data for consistency, replicates reported summary data to ensure accuracy, and reviews all printed reporting materials to verify appropriateness. Additionally, the NJ DOE checks the recording and tallying of item scores.

PART 5: STANDARD SETTING

Two separate standard settings have been held for NJ ASK. The first was conducted after the first administration of the new NJ ASK grades 5 through 8 in April–May 2008 and the second occurred after the 2009 administration of the new NJ ASK assessments in grades 3 and 4.

Detailed information regarding these two standard settings can be found in the 2009 NJ ASK Technical Report (PTM 1507-34) and the New Jersey Assessment of Skills and Knowledge (NJ ASK) Standard Setting Report from 2008 and 2009. No recent standard settings have been held for science.

PART 6: ITEM and TEST STATISTICS

6.1 Classical Item Statistics

For each administration, classical item analyses were completed prior to item calibration, scaling, and equating. These statistics were calculated again once all of the data were available. These analyses involve computing a set of statistics based on classical test theory for every item in each form. Each statistic was designed to provide some key information about the quality of each item from an empirical perspective. The statistics estimated for the NJ ASK are described below.

- Classical item difficulty ("P-Value"):
  This statistic indicates the percentage of examinees in the sample that answered the item correctly. Desired p-values generally fall within the range of 0.20 to 0.90.

- Item discrimination ("r-biserial"):
  This statistic is measured by the poly-serial correlation between the item score and the test criterion score and describes the relationship between performance on the specific item and performance on the entire form. Higher values indicate greater differences in the performance of competent and less competent examinees. Items with negative correlations can indicate serious problems with the item content (e.g., multiple correct answers or unusually complex content), or can indicate that students have not been taught the content. For ELA, the test criterion score is the total score of all reading items (MC and OE) and the writing prompt. For mathematics, the test criterion score is the total score of all MC and CR (Extended Constructed Response (ECR) and Short Constructed Response (SCR) items. For science, the test criterion score is also the total score of all MC and CR items.

- The proportion of students choosing each response option:
  These statistics indicate the percentage of examinees that select each of the available answer options and the percentage of examinees that omitted the item.

- Distractor analyses for MC items:
  This statistic reports the percentage of examinees who select each incorrect response (distractor).

- Percentage of students omitting an item:
  This statistic is useful for identifying problems with test features such as testing time and item/test layout. Typically, we would expect that if students have an adequate amount of testing time, 95% of students should attempt to answer each question.

  When a pattern of omit percentages exceeds 5% for a series of items at the end of a timed section, this may indicate that there was insufficient time for students to complete all items. Alternatively, if the omit percentage is greater than 5% for a single item, this could be an indication of an item/test layout problem. For example, students might accidentally skip an item that follows a lengthy stem.

Item analyses were conducted for the 2013 NJ ASK 3–8 in the content areas of ELA, mathematics, and science. In this section, summary information is presented by grade at both the content domain and content cluster level. The information includes mean item scores and discrimination indices, as well as descriptive statistics for number correct raw score and for scale scores. Statistics include N-counts, means, standard deviations, minimum and maximum values, and a variety of data disaggregations, including student demographic group and DFG.

For multiple-choice (MC) items, the mean score is simply the proportion of students who gave a correct response to the item (usually referred to as item difficulty or the p-value), and the discrimination index is the point biserial correlation between the item score and the total score based on the remaining items.

For mathematics constructed-response (CR) items, the mean score is the mean of students' scores on a scale of 0 to 3 for the ECR items and a scale of 0 to 1 for the SCR items. The mean scores for the science CR items are based on a 0 to 3 point scale whereas the ELA OE mean scores are based on a 0 to 4 point scale. Writing is scored on a scale of 0 to 5 for grades 3–5 and 0 to 6 for grades 6–8. Note that the writing scores were summed for the Persuasive prompt but averaged for the explanatory prompt in data analyses and score reporting in grades 6-8. In grades 3-5, the writing prompt scores were summed for each prompt. The discrimination index is the correlation between the item score and the total score based on the remaining items.

Descriptive Statistics

Tables 6.1.1 through 6.1.6 summarize by item response format, item difficulty, and discrimination of the items that comprise each content domain and cluster for grades 3 through 8, respectively. For MC items, both the mean and standard deviation are given. The mean value is the average of the p-values of the items in the cluster. For CR items, the mean value is the average item score for the items in the cluster. Item discrimination is the correlation between students' item score and the total score of the remaining items on the test. Both item difficulty and discrimination are expressed in terms of the raw score metric.

Tables 6.1.7 through 6.1.12 summarize frequency distributions for MC item difficulty and discrimination indices of items comprising each content domain and cluster for grades 3 through 8, respectively. The median item difficulty and discrimination is also displayed.

Table 6.1.13 summarizes distractor analyses for MC items by test. The number in each cell indicates the number of items where at least one p-value or discrimination index (point-biserial) for the distractors was higher than the keyed option (answer identified as the correct response).

Table 6.1.1: Grade 3 - Item Difficulty and Discrimination Summary Statistics by Cluster

Test Section/ Cluster	Multiple-Choice					Constructed-Response[1]			
	Item Difficulty			Item Discrimination		Item Difficulty			Item Discrimination
	Nitem	Mean	S.D.	Mean		Nitem	Mean	S.D.	Mean
ELA	**18**	**0.68**	**0.14**	**0.31**					
Writing					WT1[2]	1	4.80		0.58
					WT2[3]	1	5.24		0.67
Reading	18	0.68	0.14	0.31		3	1.53	0.24	0.56
Literature	6	0.68	0.16	0.30		1	1.71		0.57
Informational Text	12	0.68	0.14	0.32		2	1.44	0.26	0.55
Math	**35**	**0.69**	**0.15**	**0.42**	**SCR**	**6**	**0.58**	**0.14**	**0.51**
					ECR	**3**	**1.33**	**0.29**	**0.58**
Operation and Algebraic Thinking	9	0.57	0.18	0.38	SCR	2	0.50	0.04	0.48
					ECR	1	1.62	-	0.64
Number and Operations in Base Ten	4	0.72	0.13	0.49	SCR	2	0.58	0.04	0.55
					ECR	0	-	-	-
Number and Operations- Fractions	3	0.67	0.04	0.46	SCR	2	0.68	0.26	0.49
					ECR	2	1.19	0.21	0.55
Measurement and Data	13	0.72	0.14	0.43	SCR	0	-	-	-
					ECR	0	-	-	-
Geometry	6	0.79	0.07	0.36	*SCR*	0	-	-	-
					ECR	0	-	-	-
Calculator	*8*	*0.65*	*0.13*	*0.48*	*SCR*	*0*	-	-	-
					ECR	*1*	*1.62*	-	*0.64*

[1] For ELA OE items, the mean score is the mean of students' scores on a scale of 0 to 4. Writing is scored on a scale of 0 to 5 then summed for grades 3 through 5. In mathematics, the constructed-response (CR) items consist of short constructed response (SCR) items scored on a scale from 0 to 1 and extended constructed response (ECR) items scored on a scale from 0 to 3.

[2] Writing Task One

[3] Writing Task Two

Table 6.1.2: Grade 4 - Item Difficulty and Discrimination Summary Statistics by Cluster

Test Section/ Cluster	Multiple-Choice					Constructed-Response[1]			
	Item Difficulty			Item Discrimination		Item Difficulty			Item Discrimination
	Nitem	Mean	S.D.	Mean		Nitem	Mean	S.D.	Mean
ELA	**24**	**0.65**	**0.12**	**0.38**					
Writing					WT1[2]	1	5.58		0.62
					WT2[3]	1	5.94		0.64
Reading	24	0.65	0.12	0.38		3	1.53	0.11	0.56
Literature	8	0.67	0.13	0.35		1	1.51		0.55
Informational Text	16	0.64	0.12	0.40		2	1.55	0.15	0.57
Math	**35**	**0.68**	**0.14**	**0.40**	**SCR**	**6**	**0.62**	**0.20**	**0.39**
					ECR	**3**	**1.47**	**0.66**	**0.52**
Operation and Algebraic Thinking	9	0.66	0.13	0.39	SCR	1	0.44	-	0.36
					ECR	0	-	-	-
Number and Operations in Base Ten	8	0.71	0.16	0.43	SCR	2	0.72	0.23	0.44
					ECR	0	-	-	-
Number and Operations- Fractions	12	0.70	0.10	0.42	SCR	3	0.62	0.23	0.37
					ECR	1	1.79	-	0.52
Measurement and Data	3	0.53	0.21	0.38	SCR	0	-	-	-
					ECR	1	0.71	-	0.56
Geometry	3	0.76	0.16	0.34	*SCR*	0	-	-	-
					ECR	1	1.91	-	0.49
Calculator	*8*	*0.63*	*0.17*	*0.40*	*SCR*	*1*	*1.79*	-	*0.52*
					ECR	*0*	-	-	-
Science	**33**	**0.68**	**0.12**	**0.32**		**2**	**1.54**	**0.19**	**0.48**
Life Science	12	0.70	0.08	0.32		1	1.40	-	0.49
Physical Science	10	0.75	0.06	0.30		1	1.67	-	0.48
Earth Science	11	0.61	0.15	0.34		0	-	-	-
Knowledge	*5*	*0.75*	*0.10*	*0.34*		0	-	-	-
Application	*28*	*0.67*	*0.12*	*0.32*		*2*	*1.54*	*0.19*	*0.48*

[1] For ELA OE items, the mean score is the mean of students' scores on a scale of 0 to 4. Writing is scored on a scale of 0 to 5 then summed for grades 3 through 5. In mathematics, the constructed-response (CR) items consist of short constructed response (SCR) items scored on a scale from 0 to 1 and extended constructed response (ECR) items scored on a scale from 0 to 3.

[2] Writing Task One

[3] Writing Task Two

Table 6.1.3: Grade 5 - Item Difficulty and Discrimination Summary Statistics by Cluster

Test Section/ Cluster	Multiple-Choice					Constructed-Response[1]			
	Item Difficulty			Item Discrimination		Item Difficulty			Item Discrimination
	Nitem	Mean	S.D.	Mean		Nitem	Mean	S.D.	Mean
ELA	**30**	**0.60**	**0.14**	**0.35**					
Writing					WT1[2]	1	5.79		0.62
					WT2[3]	1	6.36		0.65
Reading	30	0.60	0.14	0.35		3	1.46	0.15	0.55
Literature	10	0.57	0.15	0.34		1	1.36		0.62
Informational Text	20	0.62	0.14	0.35		2	1.51	0.17	0.51
Math	**33**	**0.72**	**0.14**	**0.45**	**SCR**	**8**	**0.75**	**0.09**	**0.51**
					ECR	**3**	**1.25**	**0.23**	**0.62**
Operation and Algebraic Thinking	5	0.73	0.16	0.44	SCR	1	0.70	-	0.54
					ECR	0	-	-	-
Number and Operations -Base Ten	7	0.79	0.09	0.41	SCR	1	0.90	-	0.38
					ECR	1	1.47	-	0.59
Number and Operations - Fractions	7	0.62	0.17	0.51	SCR	1	0.75	-	0.57
					ECR	2	1.15	0.19	0.63
Measurement and Data	10	0.71	0.12	0.46	SCR	3	0.68	0.04	0.56
					ECR	0	-	-	-
Geometry	4	0.76	0.08	0.40	SCR	2	0.81	0.04	0.44
					ECR	*0*	-	-	-
Calculator	*20*	*0.65*	*0.13*	*0.47*	*SCR*	*0*	-	-	-
					ECR	*2*	*1.15*	*0.19*	*0.63*

[1] For ELA OE items, the mean score is the mean of students' scores on a scale of 0 to 4. Writing is scored on a scale of 0 to 5 then summed for grades 3 through 5. In mathematics, the constructed-response (CR) items consist of short constructed response (SCR) items scored on a scale from 0 to 1 and extended constructed response (ECR) items scored on a scale from 0 to 3.

[2] Writing Task One

[3] Writing Task Two

Table 6.1.4: Grade 6 - Item Difficulty and Discrimination Summary Statistics by Cluster

Test Section/ Cluster	Multiple-Choice					Constructed-Response[1]			
		Item Difficulty		Item Discrimination			Item Difficulty		Item Discrimination
ELA	**36**	**0.62**	**0.13**	**0.34**					
					WT1[2]	1	6.87		0.68
Writing					WT2[3]	1	3.45		0.64
Reading	36	0.62	0.13	0.34		4	1.98	0.11	0.53
Literature	9	0.59	0.15	0.36		1	1.99		0.56
Informational Text	27	0.63	0.12	0.34		3	1.98	0.13	0.53
Math	**32**	**0.66**	**0.15**	**0.42**	**SCR**	**8**	**0.69**	**0.18**	**0.43**
					ECR	**3**	**1.50**	**0.42**	**0.63**
Number and Numerical Operation	10	0.58	0.16	0.43	SCR	3	0.67	0.11	0.48
					ECR	0	-	-	-
Geometry and Measurement	9	0.69	0.09	0.41	SCR	2	0.47	0.11	0.37
					ECR	1	1.02	-	0.63
Patterns and Algebra	9	0.75	0.10	0.42	SCR	2	0.86	0.10	0.41
					ECR	1	1.68	-	0.67
Data Analysis, Probability, and Discrete Mathematics	4	0.59	0.19	0.40	SCR	1	0.81	-	0.41
					ECR	1	1.80	-	0.61
Problem Solving	*10*	*0.59*	*0.15*	*0.41*	*SCR*	*4*	*0.65*	*0.19*	*0.44*
					ECR	*3*	*1.50*	*0.42*	*0.63*
Calculator	*20*	*0.64*	*0.15*	*0.43*	*SCR*	*0*	-	-	-
					ECR	*2*	*1.35*	*0.47*	*0.65*

[1] For ELA OE items, the mean score is the mean of students' scores on a scale of 0 to 4. Writing is scored on a scale of 0 to 6 for grades 6 through 8. Note that WT1 scores were summed and WT2 scores were averaged. In mathematics, the constructed-response (CR) items consist of short constructed response (SCR) items scored on a scale from 0 to 1 and extended constructed response (ECR) items scored on a scale from 0 to 3.

[2] Writing Task One

[3] Writing Task Two

Table 6.1.5: Grade 7 - Item Difficulty and Discrimination Summary Statistics by Cluster

Test Section/ Cluster	Multiple-Choice					Constructed-Response[1]			
	Item Difficulty			Item Discrimination		Item Difficulty			Item Discrimination
	Nitem	Mean	S.D.	Mean		Nitem	Mean	S.D.	Mean
ELA	**36**	**0.58**	**0.14**	**0.33**					
Writing					WT1[2]	1	6.96		0.66
					WT2[3]	1	3.84		0.68
Reading	36	0.58	0.14	**0.33**		4	2.04	0.14	0.54
Literature	9	0.58	0.21	0.29		1	2.14		0.59
Informational Text	27	0.59	0.11	0.35		3	2.01	0.15	0.53
Math	**32**	**0.62**	**0.17**	**0.41**	**SCR**	**8**	**0.52**	**0.18**	**0.52**
					ECR	**3**	**1.35**	**0.46**	**0.65**
Number and Numerical Operation	9	0.55	0.16	0.39	SCR	1	0.26	-	0.59
					ECR	1	0.86	-	0.70
Geometry and Measurement	9	0.66	0.17	0.41	SCR	2	0.53	0.05	0.50
					ECR	1	1.41	-	0.69
Patterns and Algebra	8	0.67	0.18	0.40	SCR	3	0.59	0.23	0.56
					ECR	1	1.77	-	0.55
Data Analysis, Probability, and Discrete Mathematics	6	0.59	0.17	0.43	SCR	2	0.52	0.19	0.44
					ECR	0	-	-	-
Problem Solving	*16*	*0.58*	*0.17*	*0.41*	*SCR*	*4*	*0.46*	*0.18*	*0.52*
					ECR	*3*	*1.35*	*0.46*	*0.65*
Calculator	*20*	*0.55*	*0.16*	*0.41*	*SCR*	0	-	-	-
					ECR	*2*	*1.59*	*0.25*	*0.62*

[1] For ELA OE items, the mean score is the mean of students' scores on a scale of 0 to 4. Writing is scored on a scale of 0 to 6 for grades 6 through 8. Note that WT1 scores were summed and WT2 scores were averaged. In mathematics, the constructed-response (CR) items consist of short constructed response (SCR) items scored on a scale from 0 to 1 and extended constructed response (ECR) items scored on a scale from 0 to 3.

[2] Writing Task One

[3] Writing Task Two

Table 6.1.6: Grade 8 - Item Difficulty and Discrimination Summary Statistics by Cluster

Test Section/ Cluster	Multiple-Choice					Constructed-Response[1]			
	Item Difficulty			Item Discrimination		Item Difficulty			Item Discrimination
	Nitem	Mean	S.D.	Mean		Nitem	Mean	S.D.	Mean
ELA	**36**	**0.70**	**0.11**	**0.35**					
					WT1[2]	1	7.48		0.72
Writing					WT2[3]	1	3.61		0.68
Reading	36	0.70	0.11	0.35		4	2.13	0.10	0.58
Literature	9	0.70	0.09	0.30		1	2.20		0.48
Informational Text	27	0.70	0.12	0.36		3	2.11	0.10	0.61
Math	**32**	**0.64**	**0.13**	**0.42**	**SCR**	**8**	**0.51**	**0.16**	**0.51**
					ECR	**3**	**1.70**	**0.06**	**0.67**
Number and Numerical Operation	6	0.59	0.15	0.40	SCR	4	0.59	0.16	0.49
					ECR	1	1.67	-	0.71
Geometry and Measurement	13	0.63	0.14	0.40	SCR	1	0.31	-	0.44
					ECR	0	-	-	-
Patterns and Algebra	10	0.67	0.11	0.45	SCR	1	0.59	-	0.62
					ECR	1	1.76	-	0.70
Data Analysis, Probability, and Discrete Mathematics	3	0.67	0.06	0.45	SCR	2	0.41	0.06	0.51
					ECR	1	1.66	-	0.61
Problem Solving	*15*	*0.58*	*0.13*	*0.43*	*SCR*	*3*	*0.40*	*0.08*	*0.47*
					ECR	*3*	*1.70*	*0.06*	*0.67*
Calculator	*20*	*0.64*	*0.13*	*0.44*	*SCR*	-	-	-	-
					ECR	*2*	*1.72*	*0.06*	*0.71*
Science	**48**	**0.67**	**0.13**	**0.37**		**2**	**1.19**	**0.28**	**0.58**
Life Science	20	0.69	0.12	0.38		1	0.99	-	0.53
Physical Science	16	0.68	0.14	0.33		-	-	-	-
Earth Science	12	0.63	0.13	0.40		1	1.38	-	0.62
Knowledge	*8*	*0.69*	*0.17*	*0.33*		-	-	-	-
Application	*40*	*0.67*	*0.12*	*0.37*		*2*	*1.19*	*0.28*	*0.58*

[1] For ELA OE items, the mean score is the mean of students' scores on a scale of 0 to 4. Writing is scored on a scale of 0 to 6 for grades 6 through 8. Note that WT1 scores were summed and WT2 scores were averaged. In mathematics, the constructed-response (CR) items consist of short constructed response (SCR) items scored on a scale from 0 to 1 and extended constructed response (ECR) items scored on a scale from 0 to 3.

[2] Writing Task One

[3] Writing Task Two

Table 6.1.7: Grade 3 - Difficulty and Discrimination Indices for MC Items by Cluster

			p-value					Discrimination					
	Nitem	Median	p < 0.25	0.25 <= p < 0.50	0.50 <= p < 0.75	0.75 <= p < 0.90	p >= 0.90	Median	*pb < 0.20	0.20 <= pb < 0.30	0.30 <= pb < 0.40	0.40 <= pb < 0.50	pb >= 0.50
ELA	**18**	**0.66**	**0**	**1**	**9**	**7**	**1**	**0.32**	**1**	**6**	**10**	**1**	**0**
Literature	6	0.70	0	1	2	3	0	0.32	1	1	4	0	0
Informational Text	12	0.66	0	0	7	4	1	0.31	0	5	6	1	0
Math	**35**	**0.70**	**1**	**2**	**17**	**13**	**2**	**0.42**	**0**	**4**	**12**	**10**	**9**
Operation and Algebraic Thinking	9	0.59	1	1	6	1	0	0.36	0	3	3	2	1
Number and Operations - Base Ten	4	0.73	0	0	2	2	0	0.49	0	0	0	2	2
Number and Operations - Fractions	3	0.69	0	0	3	0	0	0.40	0	0	1	1	1
Measurement and Data	13	0.76	0	1	5	5	2	0.42	0	1	4	3	5
Geometry	*6*	*0.81*	*0*	*0*	*1*	*5*	*0*	*0.35*	*0*	*0*	*4*	*2*	*0*
Calculator	*8*	*0.69*	*0*	*1*	*4*	*3*	*0*	*0.49*	*0*	*0*	*1*	*4*	*3*

* While ideally items should have a point-biserial correlation of at least 0.20, these items had acceptable p-values and were retained to preserve adequate content coverage at the cluster level.

Table 6.1.8: Grade 4 - Difficulty and Discrimination Indices for MC Items by Cluster

			p-Value					Discrimination					
	Nitem	Median	p < 0.25	0.25 <= p < 0.50	0.50 <= p < 0.75	0.75 <= p < 0.90	p >= 0.90	Median	*pb < 0.20	0.20 <= pb < 0.30	0.30 <= pb < 0.40	0.40 <= pb < 0.50	pb >= 0.50
ELA	**24**	**0.65**	**0**	**3**	**15**	**6**	**0**	**0.41**	**1**	**2**	**6**	**15**	**0**
Literature	8	0.71	0	1	5	2	0	0.37	1	1	2	4	0
Informational Text	16	0.61	0	2	10	4	0	0.41	0	1	4	11	0
Math	**35**	**0.68**	**0**	**3**	**22**	**8**	**2**	**0.38**	**0**	**4**	**15**	**11**	**5**
Operation and Algebraic Thinking	9	0.65	0	0	8	0	1	0.34	0	0	6	1	2
Number and Operations -Base Ten	8	0.70	0	1	4	3	0	0.41	0	0	4	4	0
Number and Operations - Fractions	12	0.68	0	0	8	4	0	0.43	0	2	2	5	3
Measurement and Data	3	0.48	0	2	0	1	0	0.37	0	1	1	1	0
Geometry	3	0.70	0	0	2	0	1	0.35	0	1	2	0	0
Calculator	*8*	*0.65*	*0*	*2*	*4*	*2*	*0*	*0.37*	*0*	*1*	*4*	*2*	*1*
Science	**33**	**0.71**	**0**	**3**	**19**	**11**	**0**	**0.32**	**1**	**12**	**15**	**5**	**0**
Life Science	12	0.71	0	0	8	4	0	0.30	0	6	3	3	0
Physical Science	10	0.75	0	0	5	5	0	0.32	1	3	6	0	0
Earth Science	11	0.67	0	3	6	2	0	0.35	0	3	6	2	0
Knowledge	*5*	*0.78*	*0*	*0*	*1*	*4*	*0*	*0.35*	*0*	*2*	*2*	*1*	*0*
Application	*28*	*0.70*	*0*	*3*	*18*	*7*	*0*	*0.32*	*1*	*10*	*13*	*4*	*0*

* While ideally items should have a point-biserial correlation of at least 0.20, these items had acceptable p-values and were retained to preserve adequate content coverage at the cluster level.

Table 6.1.9: Grade 5 - Difficulty and Discrimination Indices for MC Items by Cluster

			p-value					Discrimination					
	Nitem	Median	p < 0.25	0.25 <= p < 0.50	0.50 <= p < 0.75	0.75 <= p < 0.90	p >= 0.90	Median	pb < 0.20	0.20 <= pb < 0.30	0.30 <= pb < 0.40	0.40 <= pb < 0.50	pb >= 0.50
ELA	**30**	**0.61**	**0**	**10**	**16**	**4**	**0**	**0.35**	**0**	**6**	**16**	**8**	**0**
Literature	10	0.59	0	4	6	0	0	0.33	0	3	5	2	0
Informational Text	20	0.62	0	6	10	4	0	0.35	0	3	11	6	0
Math	**33**	**0.76**	**0**	**3**	**12**	**17**	**1**	**0.46**	**0**	**0**	**10**	**15**	**8**
Operation and Algebraic Thinking	5	0.81	0	1	1	3	0	0.45	0	0	2	2	1
Number and Operations - Base Ten	7	0.76	0	0	2	4	1	0.39	0	0	4	3	0
Number and Operations - Fractions	7	0.73	0	2	3	2	0	0.52	0	0	0	2	5
Measurement and Data	10	0.75	0	0	5	5	0	0.45	0	0	2	6	2
Geometry	4	0.78	0	0	1	3	0	0.41	0	0	2	2	0
Calculator	*20*	*0.71*	*0*	*3*	*11*	*6*	*0*	*0.48*	*0*	*0*	*4*	*8*	*8*

* While ideally items should have a point-biserial correlation of at least 0.20, these items had acceptable p-values and were retained to preserve adequate content coverage at the cluster level.

Table 6.1.10: Grade 6 - Difficulty and Discrimination Indices for MC Items by Cluster

			p-value						Discrimination				
	Nitem	Median	p < 0.25	0.25 <= p < 0.50	0.50 <= p < 0.75	0.75 <= p < 0.90	p >= 0.90	Median	*pb < 0.20	0.20 <= pb < 0.30	0.30 <= pb < 0.40	0.40 <= pb < 0.50	pb >= 0.50
ELA	**36**	**0.66**	**0**	**9**	**22**	**4**	**1**	**0.35**	**2**	**9**	**14**	**11**	**0**
Literature	9	0.58	0	4	3	2	0	0.38	1	2	2	4	0
Informational Text	27	0.66	0	5	19	2	1	0.34	1	7	12	7	0
Math	**32**	**0.71**	**0**	**6**	**15**	**11**	**0**	**0.43**	**0**	**1**	**10**	**18**	**3**
Number and Numerical Operation	10	0.64	0	4	5	1	0	0.44	0	0	3	7	0
Geometry and Measurement	9	0.70	0	0	6	3	0	0.40	0	0	4	4	1
Patterns and Algebra	9	0.77	0	0	3	6	0	0.44	0	0	3	5	1
Data Analysis, Probability, and Discrete Mathematics	4	0.60	0	2	1	1	0	0.43	0	1	0	2	1
Problem Solving	*10*	*0.60*	*0*	*3*	*6*	*1*	*0*	*0.43*	*0*	*1*	*3*	*6*	*0*
Calculator	*20*	*0.66*	*0*	*4*	*9*	*7*	*0*	*0.43*	*0*	*0*	*7*	*11*	*2*

* While ideally items should have a point-biserial correlation of at least 0.20, these items had acceptable p-values and were retained to preserve adequate content coverage at the cluster level.

Table 6.1.11: Grade 7 - Difficulty and Discrimination Indices for MC Items by Cluster

			p-value					Discrimination					
	Nitem	Median	p < 0.25	0.25 <= p < 0.50	0.50 <= p < 0.75	0.75 <= p < 0.90	p >= 0.90	Median	*pb < 0.20	0.20 <= pb < 0.30	0.30 <= pb < 0.40	0.40 <= pb < 0.50	pb >= 0.50
ELA	**36**	**0.59**	**0**	**9**	**23**	**4**	**0**	**0.35**	**1**	**11**	**15**	**8**	**1**
Literature	9	0.61	0	3	4	2	0	0.29	1	4	2	2	0
Informational Text	27	0.57	0	6	19	2	0	0.36	0	7	13	6	1
Math	**32**	**0.65**	**0**	**11**	**12**	**9**	**0**	**0.39**	**0**	**3**	**15**	**9**	**5**
Number and Numerical Operation	9	0.50	0	5	3	1	0	0.37	0	1	5	2	1
Geometry and Measurement	9	0.72	0	3	2	4	0	0.39	0	1	4	2	2
Patterns and Algebra	8	0.69	0	1	4	3	0	0.40	0	1	3	3	1
Data Analysis, Probability, and Discrete Mathematics	6	0.61	0	2	3	1	0	0.41	0	0	3	2	1
Problem Solving	*16*	*0.61*	*0*	*7*	*6*	*3*	*0*	*0.40*	*0*	*1*	*7*	*6*	*2*
Calculator	*20*	*0.51*	*0*	*10*	*7*	*3*	*0*	*0.38*	*0*	*1*	*10*	*6*	*3*

* While ideally an item should have a point-biserial correlation of at least .20, this item had an acceptable p-value and was retained to preserve adequate content coverage at the cluster level.

Table 6.1.12: Grade 8 - Difficulty and Discrimination Indices for MC Items by Cluster

			p-Value					Discrimination					
	Nitem	Median	p < 0.25	0.25 <= p < 0.50	0.50 <= p < 0.75	0.75 <= p < 0.90	p >= 0.90	Median	*pb < 0.20	0.20 <= pb < 0.30	0.30 <= pb < 0.40	0.40 <= pb < 0.50	pb >= 0.50
ELA	**36**	**0.70**	**0**	**1**	**22**	**12**	**1**	**0.36**	**1**	**10**	**15**	**10**	**0**
Literature	9	0.67	0	0	8	0	1	0.27	1	4	3	1	0
Informational Text	27	0.72	0	1	14	12	0	0.38	0	6	12	9	0
Math	**32**	**0.66**	**0**	**6**	**20**	**6**	**0**	**0.42**	**0**	**2**	**10**	**14**	**6**
Number and Numerical Operation	6	0.65	0	2	3	1	0	0.41	0	0	2	4	0
Geometry and Measurement	13	0.65	0	3	8	2	0	0.41	0	2	4	5	2
Patterns and Algebra	10	0.69	0	1	6	3	0	0.48	0	0	3	3	4
Data Analysis, Probability, and Discrete Mathematics	3	0.65	0	0	3	0	0	0.46	0	0	1	2	0
Problem Solving	*15*	*0.62*	*0*	*5*	*9*	*1*	*0*	*0.46*	*0*	*1*	*5*	*5*	*4*
Calculator	*20*	*0.65*	*0*	*4*	*11*	*5*	*0*	*0.46*	*0*	*2*	*4*	*9*	*5*
Science	**48**	**0.68**	**0**	**6**	**28**	**13**	**1**	**0.36**	**1**	**12**	**15**	**17**	**3**
Life Science	20	0.70	0	2	11	7	0	0.37	0	5	6	8	1
Physical Science	16	0.67	0	2	8	5	1	0.32	1	4	6	5	0
Earth Science	12	0.65	0	2	9	1	0	0.40	0	3	3	4	2
Knowledge	*8*	*0.70*	*0*	*1*	*4*	*2*	*1*	*0.33*	*0*	*2*	*4*	*2*	*0*
Application	*40*	*0.67*	*0*	*5*	*24*	*11*	*0*	*0.37*	*1*	*10*	*11*	*15*	*3*

* While ideally items should have a point-biserial correlation of at least 0.20, these items had acceptable p-values and were retained to preserve adequate content coverage at the cluster level.

Table 6.1.13: Number of Multiple-Choice Items Flagged by Distractor Analyses

Test	Grade	#-items	P-value*	Point-Biserial*
ELA	3	18	0	0
	4	24	0	0
	5	30	1	0
	6	36	1	0
	7	36	3	1
	8	36	0	0
Math	3	35	1	0
	4	35	0	0
	5	33	0	0
	6	32	0	0
	7	32	0	0
	8	32	1	0
Science	4	33	0	0
	8	48	1	0

* The p-value and point-biserial correlation in this table are calculated in the same way as for a correct answer, except in this case the distractor is used instead of the correct answer.

6.2 Speededness

The consequence of time limits on examinee's scores is called speededness. An examination is "speeded" to the degree that those taking the exam score lower than they would have had the test not been timed. Most speededness statistics are based on the number of items that were not attempted by students. In each separately timed subsection of a test, if a student does not attempt the last item of the test, it can be assumed that the student may have run out of time before reaching the last item. The percentage of students omitting an item provides information about speededness, although it must be kept in mind that students can omit an item for reasons other than speededness (for example, choosing to not put effort into answering a constructed response item). Thus, if the percentage of omits is low, that implies that there is little speededness; if a percentage of omits is high, speededness, as well as other factors, may be the cause.

The NJ ASK was not designed to be a speeded test, but rather a power test. That is, all students are expected to have ample time to finish all items and prompts. As the tests were administered over four days, with multiple sessions each day, students were assumed to have enough time to complete the test. The number of items and item types composing each test, along with the testing time and day of administration are detailed in Table 6.2.1. Table 6.2.2 presents the percentage of students omitting the last MC item in each test section.

Table 6.2.1: Testing Schedule – Items and Time Allocations

Subject	Grade	Day 1 Items	Time*	Day 2 Items	Time*
ELA	3	1WT, 12 MC 2 OE	90	1WT, 6 MC 1 OE	90
	4	1WT, 16 MC 2 OE	90	1WT, 8 MC 1 OE	90
	5	1WT, 20 MC 2 OE	90	1WT, 10 MC 1 OE	90
	6	1WT, 18 MC 2 OE	105	1WT, 18 MC 2 OE	120-135
	7	1WT, 18 MC 2 OE	105	1WT, 18 MC 2 OE	120-135
	8	1WT, 18 MC 2 OE	105	1WT, 18 MC 2 OE	120-135
		Day 3		**Day 4**	
Math	3	6SCR, 19 MC, 1ECR	63	16 MC, 2 ECR	68
	4	6SCR, 19 MC, 1ECR	63	16 MC, 2 ECR	68
	5	8SCR, 13 MC, 1ECR	68	20 MC, 2 ECR	68
	6	8SCR, 12 MC, 1ECR	64	20 MC, 2 ECR	69
	7	8SCR, 12 MC, 1ECR	64	20 MC, 2 ECR	69
	8	8SCR, 32 MC, 3ECR	133		
		Day 5		`	
Science	4	33 MC, 2 CR	60		
	8	48 MC, 2 CR	120		

* Time in minutes

Table 6.2.2: Percent of Students Omitting the Last MC Item in Each Test Section

Grade	Section	Content Area	Location	%
3	1	ELA	N/A	N/A
	2		Item 6	0.64
	3		Item 13	1.01
	4		N/A	N/A
	5		Item 20	0.94
	1	Math	N/A	N/A
	2		Item 19	1.42
	3		Item 27	0.46
	4		Item 36	0.73
	5		Item 45	0.36

Grade	Section	Content Area	Location	%
4	1	ELA	N/A	N/A
	2		Item 8	0.57
	3		Item 17	0.84
	4		N/A	N/A
	5		Item 26	0.57
	1	Math	N/A	N/A
	2		Item 19	0.50
	3		Item 27	0.23
	4		Item 36	1.67
	5		Item 45	0.65
	1	Science	Item 13	0.66
	2		Item 23	0.82
	3		Item 34	0.62
5	1	ELA	N/A	N/A
	2		Item 10	2.49
	3		Item 21	0.74
	4		N/A	N/A
	5		Item 32	0.67
	1	Math	N/A	N/A
	2		Item 23	0.73
	3		N/A	N/A
	4		Item 40	0.90
	5		Item 51	0.68
6	1	ELA	Item 9	0.57
	2		Item 19	0.41
	3		N/A	N/A
	4		N/A	N/A
	5		Item 29	0.31
	6		Item 39	0.32
	1	Math	N/A	N/A
	2		Item 18	0.44
	3		Item 23	1.16
	4		Item 38	1.28
	5		Item 49	0.63

Grade	Section	Content Area	Location	%
7	1	ELA	Item 9	0.85
	2		Item 19	0.62
	3		N/A	N/A
	4		N/A	N/A
	5		Item 29	0.21
	6		Item 39	0.34
	1	Math	N/A	N/A
	2		Item 18	0.68
	3		Item 23	0.24
	4		Item 38	1.33
	5		Item 49	0.84
8	1	ELA	Item 9	0.63
	2		Item 19	0.26
	3		N/A	N/A
	4		N/A	N/A
	5		Item 29	0.35
	6		Item 39	0.30
	1	Math	N/A	N/A
	2		Item 18	0.45
	3		Item 23	0.59
	4		Item 38	0.83
	5		Item 49	0.80
	1	Science	Item 18	0.11
	2		Item 33	0.33
	3		Item 49	0.18

6.3 Intercorrelations

The Pearson product-moment correlations between the content areas and test sections/clusters are presented in Tables 6.3.1–6.3.6. Generally, the more items a cluster (standard) has, the higher the correlation with the total score. After all, the cluster (standard) makes up more of the points of the total score. For example, the Reading total score at grade 3 is highly correlated with the ELA score (0.95) because the Reading score makes up 30 of the 50 possible points for ELA. In mathematics at grade 5, the correlation between the Math 6 and the total mathematics score is 0.96. This is due in part to the fact that Math 6 consists of the items identified as Calculator Active. These items account for 26 of the 50 possible total points for grade 5 mathematics.

These tables illustrate, as expected, a higher correlation between clusters within content areas than clusters from different content areas. For example, at grade 3, the correlation between the Writing items (WT1 and WT2) and the Reading items (ELA1 and ELA2) is 0.68. The correlations between Writing items and the mathematics clusters (Math 1 – 6) ranged from 0.48 to 0.56.

Table 6.3.1: Grade 3 Correlation Coefficients among Content Domains and Clusters

	ELA	Writing	WT1	WT2	Reading	ELA1	ELA 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5	Math 6
ELA	1.00													
Writing	0.87	1.00												
*WT1	0.76	0.90	1.00											
WT2	0.82	0.92	0.66	1.00										
Reading	0.95	0.68	0.58	0.66	1.00									
ELA1	0.82	0.60	0.52	0.58	0.85	1.00								
ELA2	0.91	0.64	0.54	0.62	0.96	0.67	1.00							
Math	0.74	0.62	0.53	0.59	0.72	0.62	0.70	1.00						
Math 1	0.66	0.55	0.47	0.53	0.65	0.55	0.62	0.91	1.00					
Math 2	0.64	0.54	0.46	0.52	0.61	0.53	0.59	0.84	0.74	1.00				
Math 3	0.62	0.51	0.43	0.49	0.61	0.52	0.59	0.86	0.72	0.65	1.00			
Math 4	0.67	0.56	0.48	0.53	0.65	0.56	0.62	0.89	0.75	0.73	0.68	1.00		
Math 5	0.57	0.48	0.41	0.46	0.55	0.48	0.53	0.72	0.58	0.56	0.53	0.60	1.00	
Math 6	0.66	0.55	0.47	0.53	0.65	0.55	0.62	0.90	0.90	0.79	0.70	0.82	0.58	1.00

*WT1 = Writing Prompt One, WT2 = Writing Prompt Two, ELA1 = Literature, ELA2 = Informational Text, Math 1 = Operation and Algebraic Thinking, Math 2 = Number and Operations -Base Ten, Math 3 = Number and Operations - Fractions, Math 4 = Measurement and Data, Math 5 =Geometry, Math 6 = Calculator

Table 6.3.2: Grade 4 Correlation Coefficients among Content Domains and Clusters

	ELA	Writing	WT1	WT2	Reading	ELA1	ELA 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5	Math 6	Science	Life	Physical	Earth	Knowledge	Application
ELA	1.00																			
Writing	0.85	1.00																		
*WT1	0.77	0.92	1.00																	
WT2	0.79	0.92	0.70	1.00																
Reading	0.97	0.69	0.62	0.65	1.00															
ELA1	0.85	0.62	0.57	0.58	0.87	1.00														
ELA2	0.93	0.65	0.59	0.62	0.97	0.72	1.00													
Math	0.75	0.61	0.56	0.57	0.74	0.62	0.73	1.00												
Math 1	0.66	0.53	0.48	0.49	0.65	0.54	0.64	0.87	1.00											
Math 2	0.67	0.55	0.51	0.52	0.65	0.55	0.64	0.87	0.71	1.00										
Math 3	0.70	0.56	0.51	0.52	0.69	0.57	0.68	0.93	0.74	0.75	1.00									
Math 4	0.55	0.42	0.39	0.39	0.55	0.45	0.54	0.75	0.61	0.59	0.63	1.00								
Math 5	0.56	0.46	0.42	0.42	0.54	0.46	0.54	0.72	0.54	0.56	0.59	0.47	1.00							
Math 6	0.65	0.52	0.48	0.49	0.64	0.53	0.63	0.87	0.78	0.75	0.79	0.75	0.54	1.00						
Science	0.79	0.60	0.54	0.57	0.79	0.66	0.79	0.78	0.67	0.68	0.72	0.57	0.57	0.67	1.00					
Life	0.71	0.53	0.48	0.50	0.72	0.59	0.72	0.68	0.58	0.59	0.63	0.49	0.51	0.58	0.90	1.00				
Physical	0.69	0.55	0.49	0.52	0.69	0.58	0.68	0.69	0.59	0.61	0.64	0.49	0.51	0.59	0.88	0.68	1.00			
Earth	0.69	0.51	0.47	0.48	0.70	0.57	0.69	0.70	0.60	0.61	0.65	0.52	0.51	0.60	0.87	0.68	0.66	1.00		
Know	0.57	0.42	0.38	0.40	0.58	0.47	0.58	0.56	0.48	0.49	0.53	0.40	0.42	0.47	0.74	0.73	0.61	0.61	1.00	
Application	0.78	0.60	0.54	0.57	0.79	0.65	0.78	0.77	0.67	0.68	0.72	0.57	0.57	0.66	0.99	0.88	0.88	0.87	0.64	1.00

*WT1 = Writing Prompt One, WT2 = Writing Prompt Two, ELA1 = Literature, ELA2 = Informational Text, Math 1 = Operation and Algebraic Thinking, Math 2 = Number and Operations -Base Ten, Math 3 = Number and Operations - Fractions, Math 4 = Measurement and Data, Math 5 =Geometry, Math 6 = Calculator

Table 6.3.3: Grade 5 Correlation Coefficients among Content Domains and Clusters

	ELA	Writing	WT1	WT2	Reading	ELA1	ELA 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5	Math 6
ELA	1.00													
Writing	0.84	1.00												
*WT1	0.77	0.93	1.00											
WT2	0.79	0.93	0.72	1.00										
Reading	0.97	0.69	0.62	0.65	1.00									
ELA1	0.86	0.59	0.53	0.56	0.89	1.00								
ELA2	0.94	0.68	0.61	0.64	0.96	0.74	1.00							
Math	0.76	0.63	0.57	0.60	0.74	0.62	0.73	1.00						
Math 1	0.63	0.54	0.49	0.51	0.60	0.50	0.60	0.83	1.00					
Math 2	0.67	0.57	0.52	0.54	0.65	0.54	0.64	0.87	0.70	1.00				
Math 3	0.68	0.55	0.50	0.52	0.67	0.57	0.66	0.91	0.67	0.71	1.00			
Math 4	0.69	0.56	0.51	0.53	0.68	0.57	0.68	0.92	0.73	0.76	0.78	1.00		
Math 5	0.58	0.51	0.46	0.49	0.56	0.46	0.56	0.76	0.63	0.61	0.60	0.64	1.00	
Math 6	0.72	0.58	0.53	0.55	0.71	0.60	0.70	0.96	0.76	0.79	0.95	0.90	0.64	1.00

*WT1 = Writing Prompt One, WT2 = Writing Prompt Two, ELA1 = Literature, ELA2 = Informational Text, Math 1 = Operation and Algebraic Thinking, Math 2 = Number and Operations -Base Ten, Math 3 = Number and Operations - Fractions, Math 4 = Measurement and Data, Math 5 =Geometry, Math 6 = Calculator

Table 6.3.4: Grade 6 Correlation Coefficients among Content Domains and Clusters

	ELA	Writing	WT1	WT2	Reading	ELA1	ELA 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5	Math 6
ELA	1.00													
Writing	0.84	1.00												
*WT1	0.81	0.97	1.00											
WT2	0.75	0.87	0.74	1.00										
Reading	0.98	0.74	0.71	0.66	1.00									
ELA1	0.86	0.65	0.63	0.58	0.87	1.00								
ELA2	0.97	0.72	0.69	0.65	0.98	0.76	1.00							
Math	0.80	0.68	0.66	0.60	0.78	0.68	0.77	1.00						
Math 1	0.72	0.60	0.59	0.52	0.71	0.62	0.69	0.92	1.00					
Math 2	0.70	0.61	0.59	0.53	0.69	0.60	0.67	0.91	0.77	1.00				
Math 3	0.75	0.65	0.63	0.57	0.73	0.64	0.72	0.91	0.78	0.76	1.00			
Math 4	0.69	0.59	0.57	0.52	0.68	0.60	0.67	0.84	0.71	0.69	0.72	1.00		
Math 5	0.76	0.65	0.63	0.57	0.75	0.66	0.73	0.96	0.88	0.89	0.85	0.83	1.00	
Math 6	0.76	0.64	0.63	0.56	0.75	0.66	0.73	0.96	0.88	0.90	0.88	0.78	0.93	1.00

* WT1 = Writing Prompt One, WT2 = Writing Prompt Two, ELA1 = Literature, ELA2 = Informational Text, Math 1 = Number & Numerical Operations, Math 2 = Geometry & Measurement, Math 3 = Patterns & Algebra, Math 4 = Data Analysis, Probability, & Discrete Mathematics, Math 5 =Problem Solving, Math 6 = Calculator

Table 6.3.5: Grade 7 Correlation Coefficients among Content Domains and Clusters

	ELA	Writing	WT1	WT2	Reading	ELA1	ELA 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5	Math 6
ELA	1.00													
Writing	0.85	1.00												
*WT1	0.80	0.97	1.00											
WT2	0.78	0.87	0.74	1.00										
Reading	0.99	0.74	0.70	0.71	1.00									
ELA1	0.82	0.62	0.57	0.60	0.84	1.00								
ELA2	0.97	0.73	0.69	0.69	0.98	0.72	1.00							
Math	0.78	0.66	0.63	0.60	0.78	0.62	0.77	1.00						
Math 1	0.68	0.54	0.52	0.49	0.68	0.54	0.67	0.90	1.00					
Math 2	0.73	0.62	0.59	0.57	0.72	0.58	0.72	0.92	0.75	1.00				
Math 3	0.74	0.64	0.61	0.58	0.72	0.58	0.72	0.92	0.75	0.79	1.00			
Math 4	0.67	0.56	0.54	0.51	0.66	0.54	0.66	0.86	0.72	0.73	0.73	1.00		
Math 5	0.77	0.64	0.61	0.58	0.76	0.61	0.76	0.98	0.90	0.88	0.89	0.85	1.00	
Math 6	0.76	0.63	0.60	0.57	0.75	0.60	0.74	0.97	0.89	0.88	0.89	0.82	0.96	1.00

* WT1 = Writing Prompt One, WT2 = Writing Prompt Two, ELA1 = Literature, ELA2 = Informational Text, Math 1 = Number & Numerical Operations, Math 2 = Geometry & Measurement, Math 3 = Patterns & Algebra, Math 4 = Data Analysis, Probability, & Discrete Mathematics, Math 5 =Problem Solving, Math 6 = Calculator

Table 6.3.6: Grade 8 Correlation Coefficients among Content Domains and Clusters

		ELA	Writing	WT1	WT2	Reading	ELA 1	ELA 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5	Math 6	Science	Life	Physical	Earth	Knowledge	Application
ELA		1.00																			
Writing		0.87	1.00																		
	*WT1	0.84	0.98	1.00																	
	WT2	0.79	0.88	0.76	1.00																
Reading		0.99	0.78	0.75	0.71	1.00															
	ELA1	0.84	0.67	0.65	0.61	0.85	1.00														
	ELA2	0.97	0.77	0.74	0.70	0.98	0.74	1.00													
Math		0.77	0.66	0.65	0.59	0.76	0.62	0.75	1.00												
	Math 1	0.69	0.60	0.58	0.53	0.68	0.55	0.67	0.92	1.00											
	Math 2	0.69	0.59	0.57	0.52	0.68	0.56	0.67	0.90	0.76	1.00										
	Math 3	0.73	0.63	0.61	0.56	0.72	0.59	0.72	0.93	0.80	0.77	1.00									
	Math 4	0.68	0.60	0.58	0.53	0.68	0.56	0.67	0.87	0.74	0.73	0.77	1.00								
	Math 5	0.74	0.63	0.62	0.56	0.74	0.60	0.73	0.97	0.86	0.88	0.90	0.87	1.00							
	Math 6	0.76	0.65	0.63	0.57	0.75	0.61	0.75	0.97	0.86	0.91	0.91	0.82	0.96	1.00						
Science		0.81	0.66	0.64	0.59	0.81	0.67	0.81	0.81	0.72	0.74	0.76	0.71	0.80	0.80	1.00					
	Life	0.78	0.64	0.62	0.57	0.78	0.65	0.78	0.77	0.69	0.70	0.72	0.68	0.75	0.76	0.94	1.00				
	Physical	0.71	0.59	0.57	0.53	0.72	0.59	0.71	0.72	0.64	0.67	0.68	0.63	0.71	0.71	0.90	0.77	1.00			
	Earth	0.73	0.58	0.57	0.52	0.74	0.60	0.73	0.73	0.65	0.67	0.68	0.65	0.73	0.72	0.91	0.79	0.75	1.00		
	Know	0.63	0.51	0.50	0.46	0.63	0.52	0.62	0.62	0.55	0.58	0.58	0.54	0.61	0.61	0.80	0.72	0.73	0.75	1.00	
	Application	0.81	0.66	0.64	0.58	0.81	0.67	0.81	0.81	0.72	0.74	0.76	0.71	0.80	0.80	0.99	0.94	0.89	0.90	0.72	1.00

* WT1 = Writing Prompt One, WT2 = Writing Prompt Two, ELA1 = Literature, ELA2 = Informational Text, Math 1 = Number & Numerical Operations, Math 2 = Geometry & Measurement, Math 3 = Patterns & Algebra, Math 4 = Data Analysis, Probability, & Discrete Mathematics, Math 5 =Problem Solving, Math 6 = Calculator

6.4 DIF Analysis

Using data from the field test items embedded in the 2013 operational tests, Differential Item Functioning (DIF) was examined using the Mantel-Haenszel (1959)[24] procedure for the MC items and CR items. As all items must be field tested and scrutinized including DIF analyses prior to appearing as an operational item, DIF analyses are not conducted on operational items.

For DIF analyses, all members of the reference group (typically male/majority) are compared against all members of the focal group (typically female/minority). The DIF analyses conducted for NJ ASK 3–8 focused on gender and ethnicity. The number of examinees composing the reference and focal groups differ dependent upon the year in which a given item was field tested. In general, appropriately 4,500 examinees respond to each field test item. The proportion of examinees involved in the DIF analyses are quite similar to the proportions that can be derived from the Performance by Demographic Groups reports found at http://www.nj.gov/education/schools/achievement/2013/. .

The Mantel-Haenszel (MH) method is a non-parametric approach to DIF. In the MH procedure, total raw scores are held constant while the odds ratio is estimated. The ETS categorization is applied to flag the significance of DIF effects (Dorans & Holland, 1993)[25]. DIF analyses are detailed in Section 2.2 - Development of Test Items. The letters A, B, and C are used to denote the ETS categorizations. A indicates a smaller degree of DIF, B indicates moderated DIF, and C indicates larger differences in the performance of the reference and focal groups on a given item. Slightly different categorizations were used for the constructed response items. A or NS indicates a smaller degree of DIF, B or S indicates moderated DIF, and C- indicates larger differences. Table 6.4.1 represents the ETS categorization of each of the items used in the 2013 NJ ASK operational test when they were field tested.

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

[25] Dorans, N. J. & Holland, P. W. (1993). DIF detection and description: Mantel-Haenszel and standardization. In P. W. Holland & H. Wainer (Eds.), *Differential item functioning* (pp. 35-66). Hillsdale, NJ: Lawrence Erlbaum.

Table 6.4.1: 2013 NJ ASK Operational Items - DIF Categories by Item Type and Grade

Test	Grade	Group	Multiple Choice*			Constructed-Response*		
			A**	B**	C**	A/NS+	B/S+	C-+
ELA	3	M/F***	17	1	0	4	1	0
		W/B***	14	4	0	4	1	0
		W/H***	16	2	0	4	1	0
	4	M/F	21	2	1	2	3	0
		W/B	23	1	0	3	2	0
		W/H	23	1	0	5	0	0
	5	M/F	28	2	0	2	1	2
		W/B	27	3	0	3	2	0
		W/H	28	2	0	4	1	0
	6	M/F	31	4	1	3	2	1
		W/B	33	3	0	4	2	0
		W/H	33	3	0	5	0	0
	7	M/F	35	1	0	1	4	1
		W/B	35	1	0	5	1	0
		W/H	30	4	2	4	2	0
	8	M/F	35	1	0	0	4	2
		W/B	31	5	0	6	0	0
		W/H	35	1	0	6	0	0
Math	3	M/F	34	1	0	7	2	0
		W/B	28	7	0	7	2	0
		W/H	26	9	0	7	1	1
	4	M/F	35	0	0	8	1	0
		W/B	32	2	1	8	1	0
		W/H	33	2	0	5	4	0
	5	M/F	29	4	0	9	2	0
		W/B	29	4	0	7	4	0
		W/H	29	4	0	11	0	0
	6	M/F	27	5	0	5	6	0
		W/B	29	3	0	9	2	0
		W/H	28	4	0	7	4	0
	7	M/F	32	0	0	10	1	0
		W/B	29	3	0	4	6	1
		W/H	30	2	0	8	3	0
	8	M/F	26	5	0	8	3	0
		W/B	31	0	0	8	3	0
		W/H	27	4	0	8	3	0
Science	4	M/F	31	2	0	2	0	0
		W/B	30	3	0	0	2	0
		W/H	26	7	0	0	2	0
	8	M/F	26	6	0	1	1	0
		W/B	29	3	0	1	1	0
		W/H	28	4	0	1	1	0

* The Mantel-Haenszel procedure is applied for the MC and CR items.
** DIF categories for MC items: A, negligible; B, slight to moderate; and C, moderate to severe.
*** DIF contrast groups: M/F, Male versus Female; W/B, White versus Black; and W/H, White versus Hispanic.
\+ DIF categories for CR items: A/NS, negligible; B/S, moderate to severe; and C-, severe.

6.5 Summary Statistics

Descriptive Statistics for Total Raw Score

Descriptive statistics of total scores for NJ ASK 2013 are summarized in Table 6.5.1 by test content, form, and grade level. A total of 611,930 students participated in the ELA grades 3–8 tests, 613,452 students participated in the mathematics grades 3–8 tests, and 205,036 students participated in the science tests in grades 4 and 8 test.

Table 6.5.1: Descriptive Statistics for Total Raw Score by Content Area and Grade Level

Test	Grade	Form	N	Mean	STD	Min	Max	Nitem	Max Possible
ELA	3	OP	100696	26.95	6.68	0	48	23	50
	4	OP	100444	31.85	8.32	1	53	29	56
	5	OP	99730	34.70	8.96	0	60	35	62
	6	OP	101453	40.81	9.81	1	67	42	70
	7	OP	101705	40.12	9.93	2	68	42	70
	8	OP	102380	44.95	9.69	1	69	42	70
	3	AL	33	26.67	5.62	13	36	23	50
	4	AL	10	24.90	10.51	12	39	29	56
	5	AL	13	22.23	9.44	8	37	35	62
	6	AL	2	25.75	4.60	22.5	29	42	70
	7	AL	61	31.38	14.83	5	57	42	70
	8	AL	21	28.71	9.37	13	50	42	70
	3	BR	3	30.00	5.20	27	36	23	50
	4	BR	11	28.36	9.09	11	45	29	56
	5	BR	4	35.00	6.78	25	40	35	62
	6	BR	5	41.20	10.25	31	56.5	42	70
	7	BR	7	33.00	13.14	16	48.5	42	70
	8	BR	8	39.94	13.38	16	56.5	42	70
	3	LP	99	22.55	7.55	6	40	23	50
	4	LP	96	26.31	8.65	6	46	29	56
	5	LP	120	30.52	9.42	8	51	35	62
	6	LP	109	33.97	10.55	8	63.5	42	70
	7	LP	111	32.34	10.82	8	59.5	42	70
	8	LP	84	37.79	11.70	11	59.5	42	70
	3	SP	686	20.87	7.35	0	41	23	50
	4	SP	737	21.68	7.88	1	45	29	56
	5	SP	740	25.04	8.38	1	47	35	62
	6	SP	784	28.10	8.44	2	52.5	42	70
	7	SP	879	27.67	7.71	5	51	42	70
	8	SP	899	33.05	8.88	3	61.5	42	70

Table 6.5.1: Descriptive Statistics for Total Raw Score by Content Area and Grade Level (con't)

Test	Grade	Form	N	Mean	STD	Min	Max	Nitem	Max Possible
Math	3	OP	101046	31.74	10.64	0	50	44	50
	4	OP	100749	32.11	9.88	1	50	44	50
	5	OP	100035	33.63	10.74	0	50	44	50
	6	OP	101632	31.27	10.26	0	49	43	49
	7	OP	101964	28.05	10.77	0	49	43	49
	8	OP	102412	29.69	11.01	0	49	43	49
	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4	AL	12	20.25	10.01	7	47	44	50
	5	AL	10	22.10	9.26	10	35	44	50
	6	AL	56	26.84	9.69	6	43	43	49
	7	AL	68	26.16	11.77	8	47	43	49
	8	AL	76	29.07	13.49	3	49	43	49
	3	BR	3	35.67	2.31	33	37	44	50
	4	BR	11	32.91	10.64	13	45	44	50
	5	BR	4	33.00	9.35	22	43	43	49
	6	BR	5	28.20	10.83	12	42	43	49
	7	BR	7	17.00	6.24	11	29	43	49
	8	BR	9	15.67	7.18	6	31	39	41
	3	LP	101	26.13	11.45	6	46	44	50
	4	LP	98	26.84	9.91	9	46	44	50
	5	LP	122	27.88	12.06	4	50	44	50
	6	LP	111	25.41	10.70	3	49	43	49
	7	LP	111	21.32	11.42	4	47	43	49
	8	LP	84	22.79	11.63	1	47	43	49
	3	SP	686	17.92	8.93	2	49	44	50
	4	SP	738	19.21	8.41	3	48	44	50
	5	SP	743	16.75	8.35	2	48	43	49
	6	SP	781	15.76	8.18	0	43	43	49
	7	SP	883	14.24	6.98	3	45	43	49
	8	SP	895	14.36	7.68	1	46	43	49
Science	4	OP	100709	25.70	6.58	1	39	35	39
	8	OP	102485	34.64	10.02	2	54	50	54
	4	AL	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8	AL	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4	BR	11	20.27	8.04	9	36	33	37
	8	BR	9	29.78	8.70	18	43	50	54
	4	LP	101	22.38	7.11	3	37	35	39
	8	LP	85	28.88	9.91	11	47	50	54
	4	SP	737	16.84	5.86	4	35	35	39
	8	SP	899	21.20	6.84	5	46	50	54

*OP: Operational Test; AL: Alternative Operational Test; BR: Braille; LP: Large Print; SP: Spanish Version.

Descriptive Statistics for Total Raw Score by Cluster

Tables 6.5.2 through 6.5.7 summarize the means and standard deviations for raw score attained by cluster for the 2013 NJ ASK operational test forms.

Table 6.5.2: Grade 3 Means and Standard Deviations for Raw Score

	Number of Items			Number of Possible Points	Raw Score		Mean % of Points Available
	MC	CR	SCR		Mean	Standard Deviation	
ELA	**18**	**5**	**0**	**50**	**26.95**	**6.68**	**53.90%**
Writing	0	2	0	20	10.05	2.75	50.25%
Reading	18	3	0	30	16.90	4.62	56.33%
Literature	6	1	0	10	5.81	1.74	58.10%
Informational Text	12	2	0	20	11.10	3.32	55.50%
Math	**35**	**3**	**6**	**50**	**31.74**	**10.64**	**63.47%**
Operation and Algebraic Thinking	9	1	2	14	7.79	3.38	55.68%
Number and Operations -Base Ten	4	0	2	6	4.02	1.76	67.06%
Number and Operations - Fractions	3	2	2	11	5.75	3.03	52.25%
Measurement and Data	13	0	0	13	9.41	2.92	72.40%
Geometry	6	0	0	6	4.76	1.39	79.31%
Calculator	*8*	*1*	*0*	*11*	6.87	2.94	62.50%

Table 6.5.3: Grade 4 Means and Standard Deviations for Raw Score

	Number of Items			Number of Possible Points	Raw Score		Mean % of Points Available
	MC	CR	SCR		Mean	Standard Deviation	
ELA	**24**	**5**	**0**	**56**	**31.85**	**8.32**	**56.88%**
Writing	0	2	0	20	11.54	2.79	57.70%
Reading	24	3	0	36	20.31	6.28	56.42%
Literature	8	1	0	12	6.93	2.26	57.75%
Informational Text	16	2	0	24	13.38	4.52	55.75%
Math	**35**	**3**	**6**	**50**	**32.11**	**9.88**	**64.23%**
Operation and Algebraic Thinking	9	0	1	10	6.42	2.30	64.21%
Number and Operations -Base Ten	8	0	*2*	10	7.16	2.28	71.62%
Number and Operations - Fractions	12	1	*3*	18	12.02	3.98	66.78%
Measurement and Data	3	1	0	6	2.30	1.54	38.36%
Geometry	3	1	0	6	4.21	1.63	70.14%
Calculator	*8*	*1*	*0*	*11*	*6.85*	*2.59*	*62.30%*

	Number of Items			Number of Possible Points	Raw Score		Mean % of Points Available
	MC	CR	SCR		Mean	Standard Deviation	
Science	**33**	**2**	**0**	**39**	**25.70**	**6.58**	65.90%
Life Science	12	1	0	15	9.77	2.82	65.13%
Physical Science	10	1	0	13	9.21	2.40	70.85%
Earth Science	11	0	0	11	6.71	2.36	61.00%
Knowledge	*5*	*0*	*0*	*5*	3.74	1.18	74.80%
Application	*28*	*2*	*0*	*34*	21.96	5.81	64.59%

Table 6.5.4: Grade 5 Means and Standard Deviations for Raw Score

	Number of Items			Number of Possible Points	Raw Score		Mean % of Points Available
	MC	CR	SCR		Mean	Standard Deviation	
ELA	**30**	**5**	**0**	**62**	**34.70**	**8.96**	**55.97%**
Writing	0	2	0	20	12.16	2.77	60.80%
Reading	30	3	0	42	22.53	6.95	53.64%
Literature	10	1	0	14	7.12	2.81	50.86%
Informational Text	20	2	0	28	15.41	4.68	55.04%
Math	**33**	**3**	**8**	**50**	**33.63**	**10.74**	**67.26%**
Operation and Algebraic Thinking	5	0	1	6	4.39	1.51	73.21%
Number and Operations -Base Ten	7	1	1	11	7.95	2.39	72.31%
Number and Operations - Fractions	7	2	1	14	7.45	3.80	53.19%
Measurement and Data	10	0	3	13	9.16	3.23	70.44%
Geometry	4	0	2	6	4.68	1.48	78.00%
Calculator	*20*	*2*	*0*	*26*	*15.44*	*6.33*	*59.38%*

Table 6.5.5: Grade 6 Means and Standard Deviations for Raw Score

	Number of Items			Number of Possible Points	Raw Score		Mean % of Points Available
	MC	CR	SCR		Mean	Standard Deviation	
ELA	**36**	**6**	**0**	**70**	**40.81**	**9.81**	**58.30%**
Writing	0	2	0	18	10.34	2.54	57.44%
Reading	36	4	0	52	30.47	7.91	58.60%
Literature	9	1	0	13	7.35	2.43	56.54%
Informational Text	27	3	0	39	23.12	5.98	59.28%

	Number of Items			Number of Possible Points	Raw Score		Mean % of Points Available
	MC	CR	SCR		Mean	Standard Deviation	
Math	**32**	**3**	**8**	**49**	**31.27**	**10.26**	**63.82%**
Number & Numerical Operations	10	0	3	13	7.88	3.14	60.60%
Geometry & Measurement	9	1	2	14	8.17	3.28	58.35%
Patterns & Algebra	9	1	2	14	10.23	3.02	73.06%
Data Analysis, Probability, & Discrete Mathematics	4	1	1	8	5.00	2.07	62.45%
Problem Solving	*10*	*3*	*4*	*23*	*13.07*	*5.35*	*56.84%*
Calculator	*20*	*2*	*0*	*26*	*15.64*	*5.87*	*60.16%*

Table 6.5.6: Grade 7 Means and Standard Deviations for Raw Score

	Number of Items			Number of Possible Points	Raw Score		Mean % of Points Available
	MC	CR	SCR		Mean	Standard Deviation	
ELA	**36**	**6**	**0**	**70**	**40.12**	**9.93**	**57.31%**
Writing	0	2	0	18	10.82	2.51	60.11%
Reading	36	4	0	52	29.30	8.05	56.35%
Literature	9	1	0	13	7.38	2.17	56.77%
Informational Text	27	3	0	39	21.93	6.43	56.23%
Math	**32**	**3**	**8**	**49**	**28.05**	**10.77**	**57.24%**
Number & Numerical Operations	9	1	1	13	6.08	3.22	46.80%
Geometry & Measurement	9	1	2	14	8.43	3.44	60.23%
Patterns & Algebra	8	1	3	14	8.95	3.30	63.93%
Data Analysis, Probability, & Discrete Mathematics	6	0	2	8	4.58	2.08	57.29%
Problem Solving	*16*	*3*	*4*	*29*	*15.25*	*6.84*	*52.57%*
Calculator	*20*	*2*	*0*	*26*	*14.25*	*5.95*	*54.81%*

Table 6.5.7: Grade 8 Means and Standard Deviations for Raw Score

	Number of Items			Number of Possible Points	Raw Score		Mean % of Points Available
	MC	CR	SCR		Mean	Standard Deviation	
ELA	**36**	**6**	**0**	**70**	**44.95**	**9.69**	**64.21%**
Writing	0	2	0	18	11.10	2.48	61.67%
Reading	36	4	0	52	33.85	7.75	65.10%
Literature	9	1	0	13	8.48	2.06	65.23%
Informational Text	27	3	0	39	25.38	6.21	65.08%
Math	**32**	**3**	**8**	**49**	**29.69**	**11.01**	**60.58%**
Number & Numerical Operations	6	1	4	13	7.57	3.37	58.22%
Geometry & Measurement	13	0	1	14	8.48	3.18	60.55%
Patterns & Algebra	10	1	1	14	9.11	3.54	65.09%
Data Analysis, Probability, & Discrete Mathematics	3	1	2	8	4.53	2.14	*56.59%*
Problem Solving	*15*	*3*	*3*	*27*	*15.02*	*6.50*	*55.64%*
Calculator	*20*	*2*	*0*	*26*	*16.28*	*6.12*	*62.63%*
Science	**48**	**2**	**0**	**54**	**34.64**	**10.02**	**64.15%**
Life Science	20	1	0	23	14.84	4.54	64.52%
Physical Science	16	0	0	16	10.87	3.01	67.94%
Earth Science	12	1	0	15	8.93	3.46	59.53%
Knowledge	*8*	*0*	*0*	*8*	*5.50*	*1.66*	*68.75%*
Application	*40*	*2*	*0*	*46*	*29.13*	*8.82*	*63.33%*

Scale Score Distributions by Content Area and Grade

Descriptive statistics for scale scores and percentage distributions of students' performance levels are summarized in Table 6.5.8 by content area and grade. ELA, mathematics, and science student records flagged as void, not present, or missing were removed. For all test forms, scale scores have a range of 100 to 300. A student is classified as Partially Proficient (PP) if his/her scale score is lower than 200. A student is classified as Advanced Proficient (AP) if his/her scale score is 250 or higher. All other students are classified as Proficient (P).

Table 6.5.8: Descriptive Statistics of Students' Performance Levels by Content and Grade

Test	Grade	Form	N+	Mean	StdDev	Min	Max	%PP	%P	%AP
ELA	3	OP	100696	205.60	22.74	100	300	33.39	62.61	3.99
	4	OP	100444	204.86	29.77	100	300	40.20	51.33	8.47
	5	OP	99730	205.81	29.44	100	300	38.43	52.83	8.75
	6	OP	101453	208.11	24.64	100	300	33.43	61.87	4.70
	7	OP	101705	211.13	31.92	100	300	34.29	52.82	12.89
	8	OP	102380	220.29	23.02	100	300	17.71	70.81	11.48
	3	AL	33	217.39	22.80	171	260	18.18	69.70	12.12
	4	AL	10	192.10	35.88	150	242	60.00	40.00	0.00
	5	AL	13	175.62	28.96	131	222	69.23	30.77	0.00
	6	AL	2	175.50	13.44	166	185	100.00	0.00	0.00
	7	AL	61	190.97	42.49	105	277	59.02	26.23	14.75
	8	AL	21	188.57	16.56	162	231	85.71	14.29	0.00
	3	BR	3	215.33	19.63	204	238	0.00	100.00	0.00
	4	BR	11	193.18	31.57	140	259	54.55	36.36	9.09
	5	BR	4	205.00	20.35	175	220	25.00	75.00	0.00
	6	BR	5	209.80	28.56	184	255	40.00	40.00	20.00
	7	BR	7	189.00	38.06	140	236	42.86	57.14	0.00
	8	BR	8	209.38	27.87	163	251	25.00	62.50	12.50
	3	LP	99	191.48	23.85	143	258	57.58	39.39	3.03
	4	LP	96	185.80	28.16	125	265	66.67	31.25	2.08
	5	LP	120	192.36	29.36	125	268	55.83	40.83	3.33
	6	LP	109	191.72	25.50	133	288	62.39	34.86	2.75
	7	LP	111	187.42	32.82	114	287	66.67	28.83	4.50
	8	LP	84	204.46	24.34	153	262	41.67	54.76	3.57
	3	SP	686	185.90	22.92	100	263	67.20	32.07	0.73
	4	SP	737	170.83	24.41	100	259	85.89	13.84	0.27
	5	SP	740	175.38	25.35	100	250	80.68	18.92	0.41
	6	SP	784	177.85	18.59	100	239	86.86	13.14	0.00
	7	SP	879	173.18	22.10	100	246	87.03	12.97	0.00
	8	SP	899	193.96	17.45	123	271	62.29	37.49	0.22
Math	3	OP	101046	231.60	45.10	100	300	21.91	36.35	41.73
	4	OP	100749	230.11	41.06	100	300	21.30	43.99	34.71
	5	OP	100035	236.64	42.73	100	300	19.69	37.00	43.31
	6	OP	101632	227.40	39.05	100	300	20.70	48.07	31.23

Test	Grade	Form	N+	Mean	StdDev	Min	Max	%PP	%P	%AP
Math	7	OP	101964	215.86	42.48	100	300	35.93	38.41	25.66
	8	OP	102412	221.61	44.87	100	300	30.18	38.23	31.59
	3	AL	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4	AL	12	184.08	43.44	122	300	83.33	8.33	8.33
	5	AL	10	192.20	32.14	148	237	60.00	40.00	0.00
	6	AL	56	209.55	32.04	132	269	32.14	53.57	14.29
	7	AL	68	211.59	43.65	142	300	45.59	30.88	23.53
	8	AL	76	222.03	57.10	100	300	35.53	28.95	35.53
	3	BR	3	245.67	9.24	235	251	0.00	33.33	66.67
	4	BR	11	233.55	43.49	156	294	18.18	36.36	45.45
	5	BR	4	235.75	37. 38	194	279	25.00	25.00	50.00
	6	BR	5	214.80	38.32	160	267	20.00	60.00	20.00
	7	BR	7	174.57	22.71	151	217	85.71	14.29	0.00
	8	BR	9	179.00	34.24	129	250	88.89	0.00	11.11
	3	LP	101	207.97	49.52	110	300	39.60	35.64	24.75
	4	LP	98	208.48	39.56	135	300	38.78	44.90	16.33
	5	LP	122	213.86	46.39	111	300	36.07	40.98	22.95
	6	LP	111	205.49	39.10	104	300	38.74	48.65	12.61
	7	LP	111	189.97	45.46	106	300	62.16	23.42	14.41
	8	LP	84	193.39	45.30	100	300	51.19	35.71	13.10
	3	SP	686	172.52	39.40	100	300	74.49	19.97	5.54
	4	SP	738	178.66	33.42	100	300	73.17	24.12	2.71
	5	SP	743	173.63	32.16	100	300	77.39	19.92	2.69
	6	SP	781	170.95	30.33	100	273	80.03	18.95	1.02
	7	SP	883	162.31	28.21	100	293	88.90	9.51	1.59
	8	SP	895	160.85	31.19	100	300	87.15	10.95	1.90
Science	4	OP	100709	240.15	33.82	100	300	10.21	45.35	44.44
	8	OP	102485	228.53	34.76	100	300	20.49	46.57	32.94
	4	AL	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8	AL	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4	BR	11	217.64	41.09	162	300	27.27	54.55	18.18
	8	BR	9	211.11	26.47	176	254	33.33	55.56	11.11
	4	LP	101	223.15	35.03	111	300	19.80	52.48	27.72
	8	LP	85	208.93	31.50	151	274	38.82	44.71	16.47
	4	SP	737	197.20	27.10	123	300	49.66	45.73	4.61
	8	SP	899	184.76	21.29	118	268	77.42	21.91	0.67

*OP: Operational Test; AL: Alternative Operational Test; BR: Braille; LP: Large Print; SP: Spanish Version
+Reflects N counts

Scale Score Distributions by Demographic Group

Descriptive statistics of scale scores and percentage distributions of students' Performance by Demographic Groups can be found at http://www.nj.gov/education/schools/achievement/2013/. Scale score cumulative frequency distributions are attached as Appendix F. Note that Alternate and Braille forms are excluded from the cumulative frequency distributions.

Scale Score Distributions by District Factor Groups (DFG)

New Jersey has an established history of applying DFGs[26] in the analysis and reporting of assessment results. DFG is an indicator of the socioeconomic status of citizens in each district and has been useful for the comparative reporting of test results from New Jersey's statewide testing programs. The measure was first developed in 1974 using demographic variables from the 1970 United States Census. A revision was made in 1984 to take into account new data from the 1980 United States Census. The DFG designations were updated again in 1992 after the 1990 census. The current DFG designations are based upon the 2000 census. The DFGs are labeled from A (lowest) to J (highest). Additional DFGs are designated for special groups that are not defined geographically. For example N is used to designate districts with a percentage of students in public schools too low for a DFG value to be assigned; O and S indicate schools receiving special populations; R represents charter schools; and V denotes vocational schools

Descriptive statistics of scale scores and percentage distributions of student performance by DFG for General Education group are summarized in Tables 6.5.9 through 6.5.11 by content area and grade. For each of the content areas, students who were flagged as "void" or "not present" were removed. For an in-depth analysis of student performance by DFG, please see the statewide summary reports at: http://www.nj.gov/education/schools/achievement/2013/

[26] For more information on DFGs, see the following link: http://www.state.nj.us/education/finance/sf/dfg.pdf

Table 6.5.9: Descriptive Statistics for ELA Performance Levels by DFG

Grade	DFG+	N	Mean	StdDev	Min	Max	%PP	%P	%AP
3	A	18228	192.66	21.37	100	288	55.97	43.37	0.66
	B	10498	198.98	20.65	102	288	44.71	53.96	1.32
	CD	9489	201.02	20.70	100	297	40.21	58.12	1.67
	DE	12324	205.50	20.60	100	288	32.05	65.21	2.73
	FG	12076	208.33	21.02	118	300	27.21	69.10	3.69
	GH	13454	211.16	21.88	118	300	23.88	70.26	5.86
	I	17961	215.66	21.23	128	300	17.22	74.70	8.08
	J	4250	221.29	21.32	139	300	11.06	76.85	12.09
	N	469	185.37	19.98	128	243	70.58	29.42	0.00
	R	2765	202.03	22.36	102	281	39.49	57.58	2.93
4	A	17555	185.78	26.85	100	300	67.11	31.57	1.32
	B	10262	194.93	26.61	100	297	54.03	42.96	3.00
	CD	9259	198.59	26.93	108	300	48.75	46.97	4.28
	DE	12435	204.23	27.22	108	300	40.23	53.45	6.31
	FG	12167	208.56	27.65	108	300	33.84	57.51	8.65
	GH	13855	212.85	28.09	100	300	28.49	59.78	11.74
	I	18422	219.02	27.73	100	300	21.35	62.21	16.44
	J	4398	225.11	26.83	115	300	13.92	64.67	21.42
	N	478	181.99	24.75	100	253	75.31	23.64	1.05
	R	2462	196.97	28.68	121	297	51.54	42.77	5.69
5	A	16887	186.82	26.61	100	300	65.38	33.26	1.37
	B	10096	196.25	25.97	107	300	51.80	44.93	3.27
	CD	9340	198.84	26.59	107	300	47.61	48.35	4.04
	DE	12387	204.88	26.67	100	300	38.56	55.06	6.39
	FG	12042	209.43	27.08	100	300	31.88	59.36	8.76
	GH	13479	213.83	27.76	100	300	26.43	61.47	12.10
	I	18904	219.39	27.64	118	300	20.41	62.97	16.62
	J	4329	227.56	27.26	128	300	12.57	62.90	24.53
	N	392	185.43	25.72	100	268	70.15	27.55	2.30
	R	2746	196.54	26.75	125	300	51.75	44.46	3.79

Table 6.5.9 Descriptive Statistics for ELA Performance Levels by DFG (con't)

Grade	DFG+	N	Mean	StdDev	Min	Max	%PP	%P	%AP
6	A	16583	190.89	22.72	100	285	62.02	37.56	0.42
	B	9973	200.09	22.86	100	282	47.03	51.14	1.83
	CD	9670	203.15	22.71	126	300	40.38	57.62	2.00
	DE	12853	207.60	22.51	126	295	32.55	64.31	3.14
	FG	12376	210.94	22.48	116	300	27.42	68.20	4.37
	GH	13982	214.74	23.36	116	300	22.68	70.48	6.84
	I	19226	219.33	22.03	116	300	15.98	74.99	9.03
	J	4431	225.43	21.65	133	300	9.98	75.90	14.13
	N	388	191.37	21.16	142	247	64.43	35.57	0.00
	R	2846	201.27	22.55	139	285	44.45	53.41	2.14
	V	18	213.83	20.44	179	243	27.78	72.22	0.00
7	A	16278	188.58	27.98	100	300	64.26	33.61	2.13
	B	10165	199.63	28.21	100	300	48.41	47.00	4.58
	CD	9676	204.14	28.94	100	300	42.19	50.81	7.01
	DE	12731	209.55	28.79	100	300	34.00	56.67	9.32
	FG	13289	213.80	28.91	100	300	28.51	59.67	11.81
	GH	13575	219.05	30.79	110	300	24.21	58.28	17.50
	I	19823	227.16	29.51	100	300	15.37	60.15	24.48
	J	4294	235.48	28.32	121	300	9.01	56.87	34.12
	N	379	184.94	25.38	118	271	73.88	24.27	1.85
	R	2525	202.88	28.30	110	300	45.70	47.37	6.93
	V	18	220.00	27.18	171	266	22.22	55.56	22.22
8	A	16075	204.07	20.65	123	298	40.01	58.21	1.78
	B	10382	211.87	20.58	139	298	26.53	69.56	3.91
	CD	9644	215.07	20.94	100	300	21.30	72.77	5.93
	DE	13184	219.35	20.57	134	300	15.82	75.99	8.18
	FG	13513	222.53	20.85	129	300	12.90	76.27	10.83
	GH	13702	226.59	22.21	139	300	10.59	72.66	16.75
	I	19928	231.15	21.05	113	300	6.46	72.56	20.98
	J	4414	237.65	20.89	148	300	3.90	64.93	31.17
	N+	298	200.76	19.48	145	251	50.34	49.33	0.34
	R	2214	212.16	19.85	134	287	26.78	68.79	4.43
	V	14	221.50	14.85	194	250	7.14	85.71	7.14

+N = majority of students in private schools, R = charter schools; V = vocational schools

Table 6.5.10: Descriptive Statistics for Mathematics Performance Levels by DFG

Grade	DFG+	N	Mean	StdDev	Min	Max	%PP	%P	%AP
3	A	18299	205.42	45.03	100	300	42.46	36.73	20.82
	B	10540	217.48	43.50	100	300	31.33	40.97	27.70
	CD	9524	223.38	42.60	100	300	25.97	41.42	32.61
	DE	12361	232.26	42.49	100	300	19.73	39.31	40.96
	FG	12106	236.93	42.02	100	300	16.66	37.33	46.01
	GH	13506	243.44	41.29	100	300	13.28	34.58	52.13
	I	18009	250.71	39.13	100	300	9.27	31.33	59.40
	J	4254	262.20	35.36	100	300	5.03	23.18	71.79
	N	468	185.68	41.02	101	300	60.26	30.34	9.40
	R	2766	223.88	43.93	100	300	26.50	39.84	33.66
4	A	17610	206.46	39.87	100	300	41.40	42.76	15.84
	B	10307	217.98	38.18	100	300	29.62	48.00	22.38
	CD	9284	222.22	37.90	100	300	25.36	49.22	25.42
	DE	12469	229.55	38.09	100	300	19.62	47.98	32.39
	FG	12204	233.32	38.69	100	300	16.98	46.42	36.60
	GH	13906	240.54	39.06	100	300	13.76	42.05	44.20
	I	18474	247.47	37.10	100	300	8.96	39.74	51.30
	J	4406	257.41	35.82	115	300	5.79	30.69	63.53
	N	478	201.94	35.17	100	300	44.14	46.44	9.41
	R	2465	217.63	40.84	100	300	32.33	44.14	23.53
5	A	16953	209.41	41.89	100	300	40.99	39.30	19.71
	B	10141	224.09	40.20	100	300	26.89	43.36	29.75
	CD	9366	227.79	40.42	100	300	24.24	42.10	33.66
	DE	12417	236.56	40.28	100	300	17.62	40.65	41.73
	FG	12073	240.21	39.45	100	300	15.27	38.95	45.77
	GH	13524	247.88	39.70	100	300	11.87	33.98	54.15
	I	18956	255.32	37.55	100	300	8.30	29.31	62.39
	J	4337	265.83	34.58	119	300	4.93	21.05	74.01
	N	392	207.02	37.51	100	300	43.62	41.07	15.31
	R	2750	221.75	40.43	100	300	28.15	44.95	26.91

Table 6.5.10: Descriptive Statistics for Mathematics Performance Levels by DFG (con't)

6	A	16626	203.55	36.71	100	300	41.97	46.01	12.02
	B	10011	216.79	36.21	100	300	27.51	52.23	20.26
	CD	9689	219.03	35.87	100	300	24.36	53.92	21.73
	DE	12874	226.79	36.03	100	300	18.82	52.52	28.65
	FG	12404	229.52	36.78	100	300	17.42	50.69	31.89
	GH	14012	236.05	38.22	104	300	14.47	45.90	39.62
	I	19276	243.55	36.66	100	300	9.68	43.00	47.32
	J	4433	253.98	35.42	104	300	5.75	34.67	59.58
	N	390	205.81	34.05	104	300	40.00	46.67	13.33
	R	2845	219.09	35.94	115	300	25.94	52.27	21.79
	V	18	240.33	39.96	147	300	11.11	44.44	44.44
7	A	16352	189.51	37.53	100	300	62.17	29.09	8.74
	B	10211	202.75	38.11	100	300	47.85	37.97	14.18
	CD	9702	206.83	38.77	100	300	43.88	38.65	17.47
	DE	12744	214.46	39.95	100	300	35.69	41.43	22.88
	FG	13313	217.34	39.40	100	300	32.31	43.17	24.52
	GH	13606	224.82	41.83	100	300	27.30	40.37	32.32
	I	19867	235.04	40.21	100	300	18.86	39.68	41.47
	J	4303	248.06	38.75	100	300	10.55	33.86	55.59
	N	383	184.20	35.04	106	300	67.10	26.63	6.27
	R	2524	204.39	38.60	100	300	46.75	37.36	15.89
	V	18	216.50	35.99	130	293	27.78	61.11	11.11
8	A	16059	194.45	41.73	100	300	54.78	32.22	13.00
	B	10405	208.02	41.75	100	300	40.83	39.43	19.74
	CD	9656	212.47	41.62	100	300	36.52	40.88	22.61
	DE	13181	219.45	42.39	100	300	31.13	40.32	28.56
	FG	13526	222.71	42.22	100	300	27.23	41.99	30.78
	GH	13713	232.61	43.56	100	300	20.94	38.61	40.46
	I	19966	240.13	41.46	100	300	15.06	37.94	46.99
	J	4420	253.98	39.43	114	300	8.51	29.64	61.86
	N	299	186.80	34.64	104	300	62.21	32.44	5.35
	R	2213	208.62	42.55	104	300	42.66	35.79	21.55
	V	14	207.00	36.70	150	300	28.57	64.29	7.14

[+]N = majority of students in private schools; R = charter schools; V = vocational schools

Table 6.5.11: Descriptive Statistics for Science Performance Levels by DFG

Grade	DFG+	N	Mean	StdDev	Min	Max	%PP	%P	%AP
4	A	17590	217.90	32.29	100	300	25.72	54.67	19.61
	B	10322	229.16	31.55	111	300	14.84	55.04	30.12
	CD	9280	235.52	31.61	123	300	10.54	52.20	37.26
	DE	12460	240.79	31.31	111	300	7.63	48.66	43.71
	FG	12199	245.94	31.06	123	300	5.63	42.89	51.48
	GH	13893	249.22	31.44	111	300	4.97	39.75	55.29
	I	18466	254.66	30.07	123	300	3.20	34.32	62.48
	J	4404	258.95	29.02	133	300	2.07	29.77	68.17
	N	478	207.12	28.63	123	300	38.91	51.46	9.62
	R	2461	230.02	34.32	133	300	17.72	49.33	32.95
8	A	16064	203.24	29.97	100	300	46.93	43.36	9.70
	B	10417	214.64	31.58	125	300	32.02	50.49	17.48
	CD	9653	221.56	32.04	125	300	24.29	51.60	24.11
	DE	13165	227.99	31.58	118	300	17.44	52.40	30.16
	FG	13532	232.51	32.35	109	300	15.20	48.80	36.00
	GH	13710	237.07	33.06	131	300	12.71	45.79	41.50
	I	19962	245.39	31.29	131	300	7.00	41.40	51.60
	J	4423	253.48	30.23	118	300	4.21	33.26	62.54
	N	300	200.02	27.54	137	296	50.67	43.00	6.33
	R	2213	217.69	32.16	131	300	29.60	49.75	20.65
	V	14	226.57	27.28	169	288	14.29	71.43	14.29

+N = majority of students in private schools; R = charter schools; V = vocational schools

PART 7: EQUATING AND SCALING

This section details the equating and scaling procedures applied to the NJ ASK 2013 Operational tests[27]. Equating and scaling procedures were applied to the Grades 3-8 ELA and Mathematics assessments in addition to the grades 4 and 8 Science assessments.

7.1 Descriptive Statistics for Equating Data

In 2008, data from approximately 35,000 students were used as impact data for standard setting. These data were used to establish new Proficient and Advanced Proficient cut scores for ELA and mathematics in grades 5 through 8. Thus, 2008 became the new base year to which future ELA and mathematics grade 5-8 assessments are equated. Likewise, standard settings were conducted for grades 3-4 ELA and mathematics in 2009; thus, making 2009 the year to which future grades 3-4 ELA and mathematics assessments are equated. The base years for science grades 4 and 8 are 2005 and 2000, respectively. The 2013 assessments were placed on the corresponding base-year scale using common item non-equivalent group equating design based on an equating sample of approximately 30% of the total student population in ELA, mathematics, and science. The NJ ASK 2013 equating samples are summarized in Table 7.1.1. Generally, less than 1.6 % of the records was invalid and removed from analyses.

Table 7.1.1: N-Counts for the Equating Samples by Content and Grade[+]

Test	Total	Percent	Valid	Invalid*
ELA 3	35506	34.98	35027	479
ELA 4	35911	35.45	35353	558
ELA 5	35110	34.90	34535	575
ELA 6	36107	35.28	35598	509
ELA 7	35214	34.27	34688	526
ELA 8	35296	34.14	34749	547
Math 3	35456	34.82	35077	379
Math 4	35619	35.06	35157	462
Math 5	35145	34.83	34647	498
Math 6	36135	35.22	35686	449
Math 7	35350	34.31	34885	465
Math 8	35348	34.16	34810	538
Science 4	36210	35.65	35721	489
Science 8	35444	34.25	34897	547

*Invalidation occurs when void codes are applied or a non-attempt flag is present
[+]Please Note: All Tables in Part 7 are based on the equating sample

The 2013 equating sample was selected using a stratified random sampling methodology with DFG as a stratum. In addition, the samples were representative of the total student population in terms of demographic variables such as gender ethnicity, economic status, and Current Limited

[27] All equating results are verified by two external reviewers.

English Proficiency (CLEP). Comparisons between data from the 2013 form distribution plan and the sample data used for equating and scaling are presented in Tables 7.1.2 to 7.1.7. These tables show the differences between the 2013 form distribution plan and the equating sample to be approximately 2.0% or less for any DFG group across all tests.

Table 7.1.2: Comparison of the Equating Sample and the Statewide DFGs – Grade 3

	Statewide	ELA		Math	
DFG+	Distribution	Obs(%)	Diff	Obs(%)	Diff
A	17.68	18.23	-0.55	17.85	-0.17
B	10.02	9.64	0.38	9.62	0.40
CD	9.24	8.58	0.66	8.62	0.62
DE	12.33	13.80	-1.47	13.82	-1.49*
FG	11.85	12.33	-0.48	12.22	-0.37
GH	13.45	13.39	0.06	13.49	-0.04
I	18.62	17.17	1.45	17.41	1.21
J	4.16	4.46	-0.30	4.49	-0.33
N	0.44	0.05	0.39	0.05	0.39
O	0.31	0.00	0.31	0.05	0.26
R	1.61	2.36	-0.75	2.35	-0.74
S	0.27	0.01	0.26	0.03	0.24
V	0.00	0.00	0.00	0.00	0.00

*Indicates the maximum difference between statewide distribution and the sample.
+N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.3: Comparison of the Equating Sample and the Statewide DFGs – Grade 4

	Statewide	ELA		Math		Science	
DFG+	Distribution	Obs(%)	Diff	Obs(%)	Diff	Obs(%)	Diff
A	16.96	17.73	-0.77	17.07	-0.11	17.96	-1.00
B	10.13	9.59	0.54	9.78	0.35	9.70	0.43
CD	9.09	8.16	0.93	8.22	0.87	8.12	0.97
DE	12.52	14.44	-1.92*	14.20	-1.68	14.27	-1.75
FG	12.21	12.19	0.02	12.23	-0.02	12.15	0.06
GH	13.55	13.72	-0.17	13.80	-0.25	13.43	0.12
I	18.77	17.84	0.93	18.24	0.53	18.00	0.77
J	4.32	4.38	-0.06	4.41	-0.09	4.35	-0.03
N	0.38	0.00	0.38	0.05	0.33	0.05	0.33
O	0.37	0.00	0.37	0.04	0.33	0.04	0.33
R	1.50	1.92	-0.42	1.93	-0.43	1.90	-0.40
S	0.20	0.01	0.19	0.03	0.17	0.03	0.17
V	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*Indicates the maximum difference between statewide distribution and the sample.

+N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.4: Comparison of the Equating Sample and the Statewide DFGs – Grade 5

DFG+	Statewide Distribution	ELA		Math	
		Obs(%)	Diff	Obs(%)	Diff
A	16.16	17.52	-1.36*	17.49	-1.33
B	9.88	8.82	1.06	8.81	1.07
CD	9.19	8.64	0.55	8.63	0.56
DE	12.69	13.56	-0.87	13.59	-0.90
FG	12.19	12.33	-0.14	12.37	-0.18
GH	13.86	13.66	0.20	13.65	0.21
I	18.85	18.47	0.38	18.46	0.39
J	4.27	4.52	-0.25	4.52	-0.25
N	0.37	0.05	0.32	0.05	0.32
O	0.47	0.00	0.47	0.00	0.47
R	1.84	2.42	-0.58	2.41	-0.57
S	0.23	0.01	0.22	0.01	0.22
V	0.00	0.00	0.00	0.00	0.00

*Indicates the maximum difference between statewide distribution and the sample.
+N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.5: Comparison of the Equating Sample and the Statewide DFGs – Grade 6

DFG+	Statewide Distribution	ELA		Math	
		Obs(%)	Diff	Obs(%)	Diff
A	15.42	16.73	-1.31	16.78	-1.36
B	9.95	9.40	0.55	9.39	0.56
CD	9.24	8.92	0.32	8.91	0.33
DE	12.86	14.89	-2.03	14.90	-2.04*
FG	12.43	12.03	0.40	12.02	0.41
GH	13.57	12.85	0.72	12.85	0.72
I	19.12	18.29	0.83	18.26	0.86
J	4.38	4.50	-0.12	4.50	-0.12
N	0.36	0.05	0.31	0.05	0.31
O	0.52	0.00	0.52	0.00	0.52
R	1.92	2.28	-0.36	2.28	-0.36
S	0.21	0.01	0.20	0.01	0.20
V	0.02	0.05	-0.03	0.05	-0.03

*Indicates the maximum difference between statewide distribution and the sample.
+N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.6: Comparison of the Equating Sample and the Statewide DFGs – Grade 7

DFG+	Statewide Distribution	ELA		Math	
		Obs(%)	Diff	Obs(%)	Diff
A	15.07	16.86	-1.79	16.91	-1.84*
B	9.84	8.64	1.20	8.65	1.19
CD	9.42	9.08	0.34	9.06	0.36
DE	12.79	14.12	-1.33	14.13	-1.34
FG	12.89	12.53	0.36	12.46	0.43
GH	13.25	13.20	0.05	13.22	0.03
I	19.50	19.18	0.32	19.15	0.35
J	4.15	4.27	-0.12	4.29	-0.14
N	0.35	0.04	0.31	0.04	0.31
O	0.64	0.01	0.63	0.01	0.63
R	1.78	2.02	-0.24	2.01	-0.23
S	0.30	0.01	0.29	0.01	0.29
V	0.02	0.05	-0.03	0.05	-0.03

*Indicates the maximum difference between statewide distribution and the sample.
+N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.7: Comparison of the Equating Sample and the Statewide DFGs – Grade 8

DFG+	Statewide Distribution	ELA		Math		Science	
		Obs(%)	Diff	Obs(%)	Diff	Obs(%)	Diff
A	15.31	16.31	-1.00	16.33	-1.02	16.38	-1.07
B	9.91	8.88	1.03	8.85	1.06	8.89	1.02
CD	9.55	8.85	0.70	8.84	0.71	8.84	0.71
DE	12.97	14.65	-1.68*	14.65	-1.68*	14.63	-1.66
FG	13.34	12.66	0.68	12.67	0.67	12.65	0.69
GH	13.04	13.09	-0.05	13.07	-0.03	13.07	-0.03
I	18.82	19.18	-0.36	19.20	-0.38	19.15	-0.33
J	4.04	4.49	-0.45	4.51	-0.47	4.50	-0.46
N	0.32	0.02	0.30	0.02	0.30	0.02	0.30
O	0.80	0.06	0.74	0.06	0.74	0.06	0.74
R	1.54	1.76	-0.22	1.75	-0.21	1.75	-0.21
S	0.36	0.01	0.35	0.01	0.35	0.01	0.35
V	0.01	0.04	-0.03	0.04	-0.03	0.04	-0.03

*Indicates the maximum difference between statewide distribution and the sample.
+N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Tables 7.1.8 through 7.1.10 present the N-counts for the 2013 equating samples by DFG, gender, and ethnicity. Note that the sum for males and females does not equal the total in Table 7.1.1 as some examinees did not identify their gender. Similarly, some examinees did not identify ethnicity or marked multiple ethnicities, therefore the sum over ethnic groups does not equal the total number of students. Also reported in Tables 7.1.8 through 7.1.10 are the numbers of economically disadvantaged students as well as CLEP students.

Table 7.1.8: Equating Sample N-Counts by Gender and Ethnicity: ELA

Test Grade	DFG[+]	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	ED[2]	LEP[1]
ELA 3	A	3215	3124	82	2765	2826	9	3	568	5443	860
	B	1724	1645	96	510	1017	9	13	1683	1926	236
	CD	1549	1450	212	622	625	5	8	1462	1425	162
	DE	2394	2432	451	682	711	6	10	2865	1497	182
	FG	2188	2127	337	326	561	5	12	2981	916	142
	GH	2457	2226	619	394	574	4	14	2996	826	328
	I	3076	2927	813	281	388	10	17	4368	343	148
	J	836	726	618	53	66	2	1	776	37	37
	N	7	9	0	1	1	0	0	14	0	0
	R	410	414	27	545	193	1	0	53	633	7
	S	4	0	0	1	2	0	0	0	2	0
	Total	**17860**	**17080**	**3255**	**6180**	**6964**	**51**	**78**	**17766**	**13048**	**2102**
ELA 4	A	3164	3065	63	2843	2704	8	6	534	5281	771
	B	1711	1675	97	530	1050	5	10	1651	1968	179
	CD	1468	1397	219	626	589	0	3	1364	1381	120
	DE	2607	2488	514	775	739	3	5	2975	1610	143
	FG	2162	2143	370	307	533	5	24	2991	888	146
	GH	2470	2374	622	400	633	9	9	3066	876	270
	I	3277	3012	845	358	431	6	19	4543	379	137
	J	771	776	567	58	83	0	2	811	62	27
	R	315	361	37	443	144	0	4	38	499	4
	S	5	0	0	3	1	0	0	0	3	0
	Total	**17950**	**17291**	**3334**	**6343**	**6907**	**36**	**82**	**17973**	**12947**	**1797**
ELA 5	A	3007	2897	57	2795	2430	12	3	614	5009	522
	B	1519	1474	76	456	942	6	12	1527	1749	157
	CD	1471	1431	212	628	673	2	5	1374	1514	78
	DE	2310	2294	406	716	664	2	8	2804	1464	104
	FG	2172	2046	338	345	524	4	22	2955	859	90
	GH	2427	2254	596	402	602	6	12	3019	881	207
	I	3226	3100	829	351	419	8	22	4654	362	101
	J	763	787	592	60	60	0	0	803	42	26
	N	5	12	0	4	3	0	0	9	0	1
	O	0	1	0	0	0	0	0	1	0	0
	R	385	438	32	571	166	1	2	49	631	4
	S	1	1	0	0	1	0	0	1	2	0
	Total	**17286**	**16735**	**3138**	**6328**	**6484**	**41**	**86**	**17810**	**12513**	**1290**

[1]Current LEP status in 2013
[2]Economically Disadvantaged
[+]N = majority of students in private schools, O and S = schools receiving special populations;

Table 7.1.8: Equating Sample N-Counts by Gender and Ethnicity ELA (continued)

Test Grade	DFG[+]	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	ED[2]	LEP[1]
ELA 6	A	3060	2885	62	2774	2437	10	2	582	4886	430
	B	1716	1625	73	551	926	10	10	1719	1830	104
	CD	1673	1501	219	783	674	4	3	1412	1572	73
	DE	2708	2590	422	736	795	6	6	3242	1584	82
	FG	2221	2061	270	316	415	0	15	3211	753	57
	GH	2346	2227	531	434	655	4	7	2878	915	164
	I	3289	3216	772	361	428	8	19	4814	438	73
	J	788	813	607	64	86	0	1	823	68	18
	N	12	6	0	3	2	0	0	13	0	1
	R	394	417	36	509	183	3	1	63	566	2
	S	2	0	0	1	1	0	0	0	2	0
	V	9	9	3	4	6	0	0	5	11	0
	Total	**18218**	**17350**	**2995**	**6536**	**6608**	**45**	**64**	**18762**	**12625**	**1004**
ELA 7	A	2987	2846	53	2704	2350	13	2	578	4605	371
	B	1572	1421	71	576	895	1	13	1395	1682	90
	CD	1636	1512	224	778	693	4	1	1373	1533	52
	DE	2527	2370	370	824	695	3	6	2908	1517	60
	FG	2213	2126	284	397	414	6	20	3169	743	49
	GH	2303	2275	546	454	592	6	9	2896	813	128
	I	3290	3352	835	364	385	12	17	4894	369	50
	J	742	740	555	59	70	0	1	774	54	15
	N	6	7	2	2	0	0	0	9	0	0
	O	3	1	0	3	0	0	0	0	3	0
	R	322	375	21	440	169	0	1	60	512	1
	S	3	0	0	3	0	0	0	0	3	0
	V	6	11	2	6	6	0	0	3	10	0
	Total	**17610**	**17036**	**2963**	**6610**	**6269**	**45**	**70**	**18059**	**11844**	**816**
ELA 8	A	2834	2811	41	2699	2206	7	2	602	4368	316
	B	1584	1495	71	563	926	5	6	1465	1646	93
	CD	1555	1519	235	811	623	7	2	1310	1478	49
	DE	2649	2439	307	877	677	5	14	3127	1567	61
	FG	2278	2118	244	410	406	3	16	3265	729	46
	GH	2375	2173	534	449	597	7	8	2874	809	128
	I	3398	3263	720	393	392	8	19	5020	351	53
	J	799	762	545	68	77	0	1	840	60	21
	N	5	3	0	0	0	0	0	8	0	0
	O	19	1	0	7	4	0	0	0	3	0
	R	287	323	27	375	147	0	0	50	431	6
	S	1	1	0	2	0	0	0	0	2	0
	V	4	10	2	6	3	0	0	3	10	0
	Total	17788	16918	2726	6660	6058	42	68	18564	11454	773

[1]Current LEP status in 2013
[2]Economically Disadvantaged
[+]N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.9: Equating Sample N-Counts by Gender and Ethnicity: Mathematics

Test Grade	DFG+	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	ED[2]	LEP[1]
Math 3	A	3042	2994	91	2659	2645	8	6	554	5176	833
	B	1694	1612	94	492	984	9	13	1659	1874	228
	CD	1542	1441	215	616	617	7	8	1459	1412	163
	DE	2366	2430	460	661	713	6	11	2858	1475	196
	FG	2177	2085	332	316	550	5	12	2951	896	146
	GH	2453	2234	618	391	571	7	13	3007	823	342
	I	3092	2937	786	282	382	11	17	4423	331	148
	J	844	725	621	52	67	2	1	781	38	45
	N	7	9	0	1	1	0	0	14	0	0
	O	1	1	0	0	1	0	0	1	1	0
	R	409	415	27	544	193	1	0	53	623	7
	S	7	1	0	5	2	0	0	1	5	0
	Total	**17634**	**16884**	**3244**	**6019**	**6726**	**56**	**81**	**17761**	**12654**	**2108**
Math 4	A	2944	2875	63	2731	2420	9	5	513	4898	692
	B	1694	1653	95	528	1022	5	9	1644	1942	176
	CD	1412	1355	214	591	555	0	4	1346	1330	117
	DE	2529	2418	480	724	714	3	5	2937	1525	136
	FG	2143	2130	364	298	531	4	24	2980	849	137
	GH	2458	2355	615	397	630	9	9	3053	871	272
	I	3294	3024	813	361	428	6	18	4608	381	139
	J	770	773	555	57	82	0	2	807	61	31
	N	6	11	0	2	0	1	0	13	0	0
	O	1	0	0	1	1	0	0	1	3	0
	R	316	361	37	444	143	0	4	38	495	4
	S	5	1	0	4	1	0	0	0	4	0
	Total	**17572**	**16956**	**3236**	**6138**	**6527**	**37**	**80**	**17940**	**12359**	**1704**
Math 5	A	3008	2905	58	2801	2433	12	3	613	5018	528
	B	1526	1474	77	458	942	6	13	1533	1757	165
	CD	1476	1432	212	631	673	2	5	1377	1520	80
	DE	2322	2305	414	720	665	2	10	2816	1472	113
	FG	2186	2058	345	347	524	4	22	2973	866	97
	GH	2432	2257	601	403	602	6	12	3020	885	215
	I	3233	3104	839	349	420	8	22	4655	361	117
	J	765	789	595	60	60	0	0	804	42	31
	N	5	12	0	4	3	0	0	9	0	1
	O	0	1	0	0	0	0	0	1	0	0
	R	385	438	32	571	166	1	2	49	631	4
	S	1	1	0	0	1	0	0	1	2	0
	Total	**17339**	**16776**	**3173**	**6344**	**6489**	**41**	**89**	**17851**	**12554**	**1351**

[1]Current LEP status in 2013
[2]Economically Disadvantaged
[+]N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.9: Equating Sample N-Counts by Gender and Ethnicity: Mathematics (con't)

Test Grade	DFG[+]	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	ED[2]	LEP[1]
Math 6	A	3084	2892	64	2799	2440	10	2	583	4895	446
	B	1725	1623	73	553	926	10	10	1724	1837	108
	CD	1678	1498	220	785	671	4	3	1413	1570	74
	DE	2717	2598	428	740	799	6	6	3245	1596	92
	FG	2228	2060	274	315	415	0	15	3212	756	61
	GH	2352	2233	541	431	655	4	7	2883	920	178
	I	3292	3216	775	359	428	8	19	4816	438	81
	J	791	816	612	64	86	0	1	824	69	24
	N	12	6	0	3	2	0	0	13	0	1
	R	395	417	36	510	183	3	1	63	567	2
	S	2	0	0	1	1	0	0	0	2	0
	V	9	9	3	4	6	0	0	5	11	0
	Total	**18285**	**17368**	**3026**	**6564**	**6612**	**45**	**64**	**18781**	**12661**	**1067**
Math 7	A	3019	2867	55	2740	2362	13	2	580	4647	383
	B	1584	1430	73	583	897	1	13	1403	1693	97
	CD	1645	1514	224	782	696	4	1	1378	1537	52
	DE	2550	2379	375	823	699	3	6	2930	1526	66
	FG	2209	2128	286	395	417	6	20	3164	747	49
	GH	2325	2286	553	455	595	6	10	2915	820	145
	I	3304	3367	842	367	385	12	17	4907	368	63
	J	751	747	560	60	72	0	1	779	57	22
	N	7	7	2	2	0	0	0	10	1	0
	O	3	1	0	3	0	0	0	0	3	0
	R	322	376	21	441	169	0	1	60	513	1
	S	3	0	0	3	0	0	0	0	3	0
	V	7	11	2	7	6	0	0	3	11	0
	Total	**17729**	**17113**	**2993**	**6661**	**6298**	**45**	**71**	**18129**	**11926**	**878**
Math 8	A	2843	2818	43	2703	2211	7	2	601	4378	336
	B	1579	1496	70	558	926	5	6	1465	1642	96
	CD	1556	1521	236	813	625	7	2	1308	1479	53
	DE	2658	2439	315	873	680	5	14	3128	1569	72
	FG	2290	2117	247	411	406	3	16	3267	731	53
	GH	2381	2169	536	447	597	7	8	2876	813	136
	I	3402	3276	731	392	393	8	19	5024	352	69
	J	803	766	551	69	77	0	1	840	60	27
	N	5	3	0	0	0	0	0	8	0	0
	O	20	1	0	6	4	0	0	0	3	0
	R	286	323	27	374	147	0	0	50	430	6
	S	1	1	0	2	0	0	0	0	2	0
	V	4	10	2	6	3	0	0	3	10	0
	Total	**17828**	**16940**	**2758**	**6654**	**6069**	**42**	**68**	**18570**	**11469**	**848**

[1]Current LEP status in 2013
[2]Economically Disadvantaged
[+]N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.10: Equating Sample N-Counts by Gender and Ethnicity: Science

Test Grade	DFG[+]	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	ED[2]	LEP[1]
SCI 4	A	3181	3049	66	2796	2756	9	6	520	5274	752
	B	1713	1661	95	538	1022	5	9	1662	1957	177
	CD	1415	1356	213	593	552	0	4	1353	1332	118
	DE	2574	2468	505	770	728	3	6	2953	1585	147
	FG	2159	2151	368	309	533	5	25	2998	851	137
	GH	2432	2327	614	388	611	9	9	3032	855	262
	I	3299	3033	812	360	428	6	18	4624	393	139
	J	767	772	561	57	83	0	2	810	61	32
	N	6	11	0	2	0	1	0	13	0	0
	O	1	0	0	1	1	0	0	1	3	0
	R	313	362	37	442	144	0	4	38	495	4
	S	5	1	0	4	1	0	0	0	4	0
	Total	**17865**	**17191**	**3271**	**6260**	**6859**	**38**	**83**	**18004**	**12810**	**1768**
SCI 8	A	2863	2830	43	2725	2217	7	2	605	4401	333
	B	1597	1498	71	567	927	5	6	1475	1653	96
	CD	1563	1521	237	812	627	7	2	1313	1480	53
	DE	2662	2440	315	878	681	5	14	3128	1576	72
	FG	2289	2124	247	411	407	3	16	3271	731	53
	GH	2387	2173	535	449	599	7	8	2882	815	136
	I	3404	3276	731	394	390	8	19	5027	352	69
	J	804	767	551	70	76	0	1	842	60	27
	N	5	3	0	0	0	0	0	8	0	0
	O	21	1	0	7	4	0	0	0	3	0
	R	287	323	27	375	147	0	0	50	431	6
	S	1	1	0	2	0	0	0	0	2	0
	V	4	10	2	6	3	0	0	3	10	0
	Total	**17887**	**16967**	**2759**	**6696**	**6078**	**42**	**68**	**18604**	**11514**	**845**

[1]Current LEP status in 2013
[2]Economically Disadvantaged
[+]N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.11 displays descriptive statistics of the raw scores for the equating samples by grade and test content. Table 7.1.12 summarizes descriptive statistics for raw scores for the equating samples by gender. Tables 7.1.13 through 7.1.15 summarize descriptive statistics for raw scores for the samples by DFG. Note that the maximum possible score for ELA was not achieved in any grade; whereas, the maximum possible score was achieved at all grade levels in mathematics and science.

Table 7.1.11: Descriptive Statistics for Raw Scores by Grade and Test Content

Test	N	Mean	STD	Min	Max	Max Possible
ELA 3	35027	26.88	6.91	0	48	50
ELA 4	35353	31.64	8.48	0	53	56
ELA 5	34535	34.26	9.08	0	60	62
ELA 6	35598	40.64	10.15	0	67	70
ELA 7	34688	39.98	10.24	0	67	70
ELA 8	34749	44.82	10.04	0	68	70
Math 3	35077	31.68	10.68	1	50	50
Math 4	35157	31.91	9.87	2	50	50
Math 5	34647	33.34	10.88	0	50	50
Math 6	35686	31.03	10.41	1	49	49
Math 7	34885	28.02	10.93	0	49	49
Math 8	34810	29.49	11.16	0	49	49
SCI 4	35721	25.70	6.59	3	39	39
SCI 8	34897	34.52	10.18	0	54	54

Table 7.1.12: Descriptive Statistics for Raw Scores by Gender

Test	Gender	N	Mean	STD	Min	Max
ELA 3	Male	17860	25.88	6.97	0	47
ELA 4	Male	17950	30.18	8.48	0	52
ELA 5	Male	17286	32.87	9.05	1	57
ELA 6	Male	18218	39.48	10.44	0	65.5
ELA 7	Male	17610	38.59	10.43	0	67
ELA 8	Male	17788	43.31	10.29	0	68
Math 3	Male	17634	32.06	10.90	1	50
Math 4	Male	17572	32.19	10.04	2	50
Math 5	Male	17339	33.64	11.07	0	50
Math 6	Male	18285	30.72	10.75	1	49
Math 7	Male	17729	27.80	11.26	0	49
Math 8	Male	17828	29.40	11.62	0	49
SCI 4	Male	17865	25.80	6.74	3	39
SCI 8	Male	17887	34.92	10.61	1	54

Table 7.1.12: Descriptive Statistics for Raw Scores by Gender (continued)

Test	Gender	N	Mean	STD	Min	Max
ELA 3	Female	17080	27.94	6.67	0	48
ELA 4	Female	17291	33.19	8.19	3	53
ELA 5	Female	16735	35.85	8.80	0	60
ELA 6	Female	17350	41.87	9.68	2	67
ELA 7	Female	17036	41.43	9.83	2	67
ELA 8	Female	16918	46.43	9.51	1	68
Math 3	Female	16884	31.47	10.33	2	50
Math 4	Female	16956	31.77	9.58	2	50
Math 5	Female	16776	33.23	10.61	3	50
Math 6	Female	17368	31.38	10.03	1	49
Math 7	Female	17113	28.27	10.56	0	49
Math 8	Female	16940	29.63	10.65	0	49
SCI 4	Female	17191	25.71	6.37	3	39
SCI 8	Female	16967	34.12	9.68	0	54

Table 7.1.13: Descriptive Statistics for Raw Scores by District Factor Group: ELA

Test	DFG[+]	N	Mean	STD	Min	Max
ELA 3	A	6384	22.31	6.85	0	45
	B	3375	25.53	6.28	0	43
	CD	3005	25.65	6.47	0	46
	DE	4832	26.96	6.32	0	45
	FG	4320	28.07	6.21	0	47
	GH	4691	28.01	6.38	0	46
	I	6013	29.99	6.06	0	48
	J	1562	32.00	5.71	10	47
	N	16	30.38	2.78	25	35
	R	825	26.49	6.54	1	43
	S	4	10.50	6.45	6	20
ELA 4	A	6269	25.64	8.39	2	50
	B	3390	29.71	7.69	0	50
	CD	2886	29.93	7.89	3	52
	DE	5106	31.90	7.66	4	51
	FG	4311	33.01	7.55	0	52
	GH	4851	33.50	7.76	3	52
	I	6306	35.52	7.36	2	53
	J	1550	37.71	6.69	9	52
	R	679	30.18	8.25	5	49
	S	5	20.40	9.86	6	32

[+]N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.13: Descriptive Statistics for Raw Score by District Factor Group: ELA (continued)

Test	DFG+	N	Mean	STD	Min	Max
ELA 5	A	6050	28.03	8.57	1	56
	B	3045	32.18	8.13	1	57
	CD	2983	31.94	8.46	6	56
	DE	4683	34.33	8.34	0	56
	FG	4258	35.55	8.04	0	59
	GH	4719	36.32	8.38	0	57
	I	6379	38.33	8.11	7	58
	J	1562	41.77	7.32	13	60
	N	17	35.82	9.19	20	49
	O	1	24.00	N/A	24	24
	R	836	31.44	8.43	11	55
	S	2	27.50	4.95	24	31
ELA 6	A	5956	32.81	10.21	0	60
	B	3345	39.00	9.33	2	62.5
	CD	3177	38.72	9.85	7	67
	DE	5301	40.71	9.30	6	64.5
	FG	4284	42.42	8.70	4	63.5
	GH	4575	42.58	9.34	5	63.5
	I	6510	45.42	8.26	0	66
	J	1601	47.70	7.71	0	65.5
	N	18	41.64	8.96	22.5	54
	R	811	39.23	9.53	13	63
	S	2	22.00	7.07	17	27
	V	18	43.22	7.96	28.5	53.5
ELA 7	A	5847	31.87	9.57	3	61
	B	2996	37.58	9.20	6	66
	CD	3149	38.04	9.39	6	65
	DE	4897	39.77	9.26	0	65
	FG	4348	41.47	8.84	5	65
	GH	4580	41.87	9.44	4	65.5
	I	6653	45.46	8.75	0	67
	J	1482	47.69	8.14	10	67
	N	13	44.65	7.80	31	54.5
	O	4	16.88	3.97	13.5	22
	R	699	38.00	9.21	14	63
	S	3	27.67	20.55	8	49
	V	17	43.97	7.28	33	55.5

+N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.13: Descriptive Statistics for Raw Score by District Factor Group: ELA (continued)

Test	DFG+	N	Mean	STD	Min	Max
ELA 8	A	5669	36.67	10.18	3	64.5
	B	3086	42.63	9.26	2	66
	CD	3075	42.85	9.20	1	65.5
	DE	5092	44.68	9.08	0	68
	FG	4399	46.60	8.34	1	67
	GH	4549	47.12	9.09	3	67
	I	6664	49.58	8.25	6	68
	J	1561	51.96	8.12	4	68
	N	8	47.06	6.10	39.5	55
	O	20	27.65	8.65	12	45.5
	R	610	43.01	9.31	16	64.5
	S	2	25.50	2.12	24	27
	V	14	46.18	5.99	33.5	56

+N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.14: Descriptive Statistics for Raw Scores by District Factor Group: Mathematics

Test	DFG+	N	Mean	STD	Min	Max
Math 3	A	6260	24.33	10.28	2	50
	B	3376	29.47	10.04	2	50
	CD	3023	29.90	10.04	2	50
	DE	4848	31.63	10.21	3	50
	FG	4286	33.50	9.60	5	50
	GH	4733	33.87	9.80	2	50
	I	6108	36.52	9.06	5	50
	J	1575	39.33	8.42	4	50
	N	16	34.88	6.62	21	49
	O	16	16.00	9.63	4	37
	R	826	31.12	9.79	6	50
	S	10	11.40	6.00	1	24
Math 4	A	6000	25.47	9.66	2	50
	B	3437	29.65	9.20	2	50
	CD	2891	29.82	9.40	5	50
	DE	4992	32.03	9.21	4	50
	FG	4298	33.00	8.90	3	50
	GH	4853	34.08	9.17	5	50
	I	6412	36.07	8.49	5	50
	J	1552	39.46	8.02	7	50
	N	17	26.71	8.98	13	44
	O	15	15.20	8.89	4	43
	R	679	30.19	9.82	4	49
	S	11	17.27	8.28	8	34

+N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.14: Descriptive Statistics for Raw Scores by District Factor Group: Mathematics (continued)

Test	DFG+	N	Mean	STD	Min	Max
Math 5	A	6060	25.76	10.69	0	50
	B	3054	30.70	9.98	3	50
	CD	2990	30.97	10.46	3	50
	DE	4710	33.62	10.36	4	50
	FG	4286	34.84	9.44	3	50
	GH	4729	35.86	9.98	4	50
	I	6395	38.20	9.15	4	50
	J	1567	41.64	7.95	5	50
	N	17	29.18	11.89	14	47
	O	1	21.00	N/A	21	21
	R	836	30.29	10.38	6	50
	S	2	18.50	10.61	11	26
Math 6	A	5988	23.43	9.97	2	49
	B	3352	29.50	9.45	4	49
	CD	3179	28.63	9.89	2	49
	DE	5318	31.52	9.59	2	49
	FG	4290	32.44	9.14	1	49
	GH	4587	32.91	9.94	3	49
	I	6515	35.45	9.11	3	49
	J	1607	38.64	8.52	6	49
	N	18	28.94	10.54	11	45
	R	812	31.10	10.02	5	49
	S	2	11.50	9.19	5	18
	V	18	34.56	10.22	9	47
Math 7	A	5900	19.93	9.27	0	49
	B	3017	25.90	9.84	0	49
	CD	3160	25.97	10.09	1	49
	DE	4929	28.07	10.49	2	49
	FG	4347	29.19	9.79	4	49
	GH	4613	29.76	10.46	3	49
	I	6682	33.39	9.71	3	49
	J	1498	36.46	9.47	1	49
	N	14	27.93	11.59	9	46
	O	4	9.25	2.99	6	13
	R	700	26.39	10.50	3	49
	S	3	15.00	8.89	8	25
	V	18	28.50	8.95	7	45

+N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.14: Descriptive Statistics for Raw Scores by District Factor Group: Mathematics (continued)

Test	DFG+	N	Mean	STD	Min	Max
Math 8	A	5683	21.29	10.04	0	49
	B	3082	27.29	10.36	3	49
	CD	3078	27.95	10.54	2	49
	DE	5101	28.97	10.60	0	49
	FG	4410	30.64	10.11	0	49
	GH	4551	32.03	10.44	1	49
	I	6682	34.46	9.88	0	49
	J	1569	37.30	9.33	5	49
	N	8	29.13	6.40	19	39
	O	21	10.67	4.13	4	18
	R	609	28.40	10.84	5	49
	S	2	13.50	0.71	13	14
	V	14	26.07	9.16	11	46

+N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

Table 7.1.15: Descriptive Statistics for Raw Scores by District Factor Group: Science

Test	DFG+	N	Mean	STD	Min	Max
SCI 4	A	6414	21.03	6.74	3	38
	B	3464	24.32	6.10	4	39
	CD	2902	24.82	6.31	4	38
	DE	5098	25.71	6.15	4	39
	FG	4339	27.27	5.59	4	39
	GH	4799	27.36	5.92	3	39
	I	6429	28.39	5.58	4	39
	J	1555	29.75	5.18	5	39
	N	17	24.00	6.43	13	39
	O	14	16.71	8.24	6	33
	R	679	24.52	6.53	5	39
	S	11	19.73	7.80	10	34
SCI 8	A	5716	26.26	9.24	1	53
	B	3102	32.17	9.47	6	52
	CD	3085	32.77	9.71	7	53
	DE	5106	33.83	9.32	3	54
	FG	4416	36.78	8.91	8	53
	GH	4561	36.90	9.29	8	54
	I	6684	39.54	8.56	0	54
	J	1571	41.30	7.95	3	54
	N	8	39.75	7.40	28	48
	O	22	18.27	7.00	7	35
	R	610	32.51	10.11	9	54
	S	2	16.50	2.12	15	18
	V	14	34.50	7.92	16	49

+N = majority of students in private schools, O and S = schools receiving special populations; R = charter schools; V = vocational schools

7.2 Equating and Scaling Procedures

Item Calibration

In order to accomplish equating and scaling for ELA and mathematics in grades 3-8 and science in grades 4 and 8, the NJ ASK 2013 operational tests were calibrated using Winsteps (Linacre, 2006)[28]. Winsteps is designed to produce a single scale by jointly analyzing data resulting from students' responses to both multiple-choice and open-ended items. Multiple-choice items were calibrated using the Rasch model (Rasch, 1960[29], Wright & Stone, 1979[30]; Anderich, 1978[31]), while the partial credit model (Masters, 1982)[32] was used for open-ended items.

Rasch scaling is "a method for obtaining objective, fundamental, linear measures from stochastic observations of ordered category responses" (Linacre, 2006, p.10). In the Rasch model, the probability of a correct response to item *i* given θ is:

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

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

Similar to other IRT models (Hambleton, 1989[33]; Hambleton & Swaminathan, 1985[34]), the Rasch model requires an assumption of unidimensionality (Smith, Jr., 2004)[35]. Unidimensionality means that all items measure a single construct. If the data fit the model, the measurement units (logits) have the desirable property of maintaining the same size over the whole continuum. These interval measures may then be used in subsequent statistical analyses that assume an interval scale (Smith, Jr., 2004). Also, like other IRT models, the Rasch model allows for separability of parameter estimates (Hambleton, Swaminathan, & Rogers, 1991[36]; van der Linden & Hambleton, 1997[37]). That is, the ability estimates of persons are freed from the distributional properties of the specific items attempted. Likewise, the estimated difficulties of items are freed from the distributional

[28] Linacre, J. M. (2006). A *User's Guide to WINSTEPS MINISTEP Rasch-Model Computer Programs*. Chicago
[29] Rasch, G. (1960). *Probabilistic models for some intelligence and attainment tests*. Copenhagen: Danish Institute for Educational Research.
[30] Wright, B. D., & Stone, M. H. (1979). *Best test design*. Chicago: MESA Press.
[31] Anderich, D. (1978). A rating formulation for ordered response categories. *Psychometrika*, 43, 561-573.
[32] Masters, G. N. (1982). A Rasch model for partial credit scoring. *Psychometrika*, *47*, 149-174.
[33] Hambleton, R. K (1989). Principles and selected applications of item response theory. In R. L. Linn (Ed.), *Educational Measurement* (3rd ed.). Washington, DC: American Council on Education.
[34] Hambleton, R. K., & Swaminathan, H. (1985). *Item Response Theory. Principles and Applications*. Boston: Kluwer.
[35] Smith, Jr. E. V. (2004). Evidence for the reliability of measures and validity of measure interpretation: A Rasch measurement perspective. In E. V. Smith, Jr. & R. M. Smith, Introduction to Rasch measurement: Theory, models and applications. Maple Grove, MN: JAM Press.
[36] Hambleton, R. K., Swaminathan, H. & Rogers, H. J. (1991). Fundamentals of Items Response Theory. Newbury Park, CA: Sage Publications.
[37] van der Linden, W. J. & Hambleton, R. K. (1997). Handbook of Modern Item Response Theory. New York: Springer-verlagVerlag.

properties of specific examinees used in the calibration. This property was useful for the Braille and Large Print test score scaling described below in Section 7.4.

The following steps detail the procedure used to equate the NJ ASK 2013 tests to the base scale.

(1) Calibrate the 2013 assessment without constraint

The first step in equating the NJ ASK 2013 tests to the base scale was to create data files for each test by grade and content area. These data were imported into Winsteps where an unconstrained or free calibration was conducted. This free calibration allowed Winsteps to calculate the 2013 Rasch values based strictly on how the examinees and items performed without regard to previous performance.

(2) Examine the stability of the common items

A set of items largely from the 2012 NJ ASK Operational tests calibrated to the base scale were selected as the potential anchor items for the NJ ASK 2013 Operational tests in ELA, mathematics, and science. These anchor items were internal – contributing to the students' total score. These items were sound in statistical characteristics and representative of the test contents. Given that these tests were not released, these anchors can still be considered secure. The anchor sets included both multiple-choice and constructed response items. In mathematics, one to two short constructed response items were also included in the pool of anchor items.

A slightly different procedure was used for ELA in grades 3-5. A set of internal anchor items as described above was used. However, an additional external set of anchor items was also used in an equating methodology designated as Forward/Backward Equating. Equating is conducted twice - first using the internal anchor set as the *forward* component, followed by the external link as the *backward* component. The process concludes by averaging the Rasch values resulting from both the Forward and Backward equating procedures.

Assessing the stability of the common items was accomplished through comparing the constrained Rasch values from prior usage with the unconstrained 2013 Rasch values of the common items for all content area and grade combinations. The stability of common items refers to the expectation that common items function the same way for the groups involved in an equating study. It is recommended that the stability of common items be examined visually and statistically (Kolen and Brennan, 2004)[38]. In the NJ ASK 2013 anchor evaluation, both visual and analytical methods were applied. Anchor items were evaluated using both the 0.3 Criterion and the Delta Plot. In order for an anchor item to be considered for removal from the anchor set, the absolute logit difference between the adjusted 2013 "free" calibrations and the 2012 "base" calibrations has to be greater than 0.3 logits (Miller, Rotou, & Twing. 2004)[39] and more than two standard deviations away from the line of best fit fitted to the base year and current year normalized inverse p-values in the delta

[38] Kolen, M. J., & Brennan, R. L. (2004). *Test equating: Methods and practice*. NY: Springer.

[39] Miller, G.E., Rotou, O., & **Twing, J.S.** (2004). Evaluation of the 0.3 logits screening criterion in common item equating. *Journal of Applied Measurement*, 5(2), 172-177.

plot. Figures 7.2.1 to 7.2.34 present scatter plots by content area and grade that were used for visual examination. Tables supporting the analytical examination are presented in the appendices of the 2013 Equating Report, Equating of NJ ASK Regular, Braille, Large Print, and Alternate Test Forms.

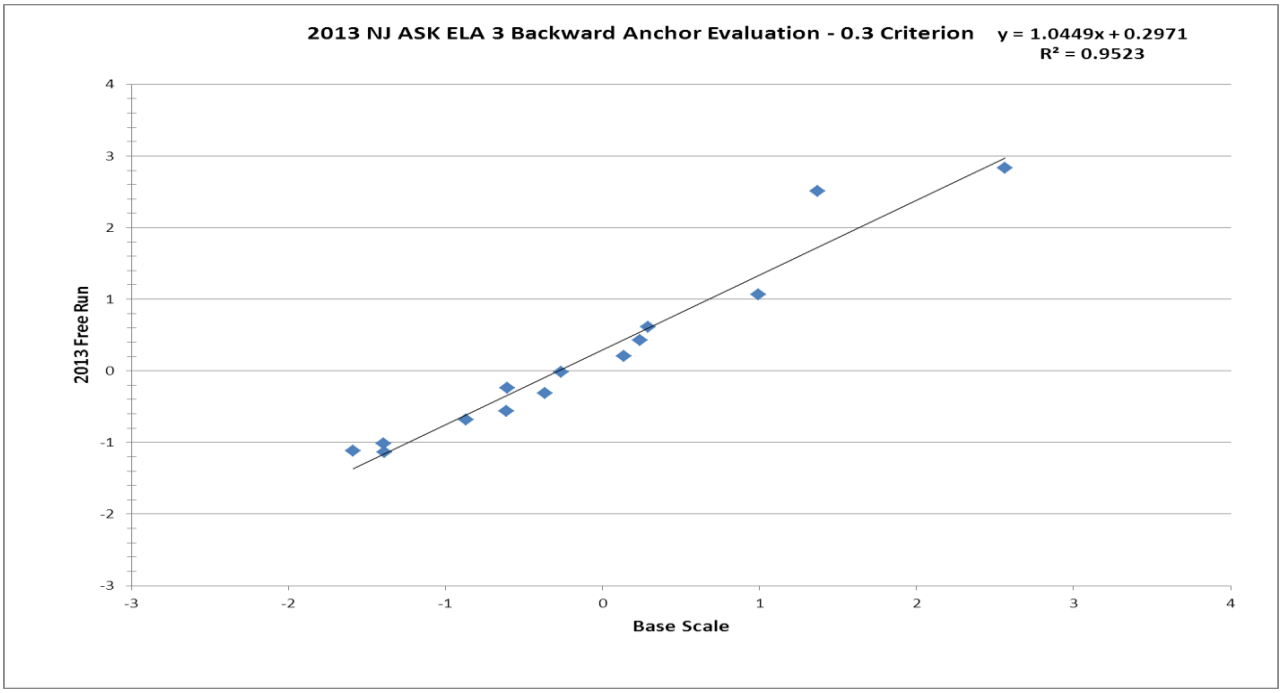

Figure 7.2.1: Scatter Plot of Anchor Items – ELA Grade 3 Backward

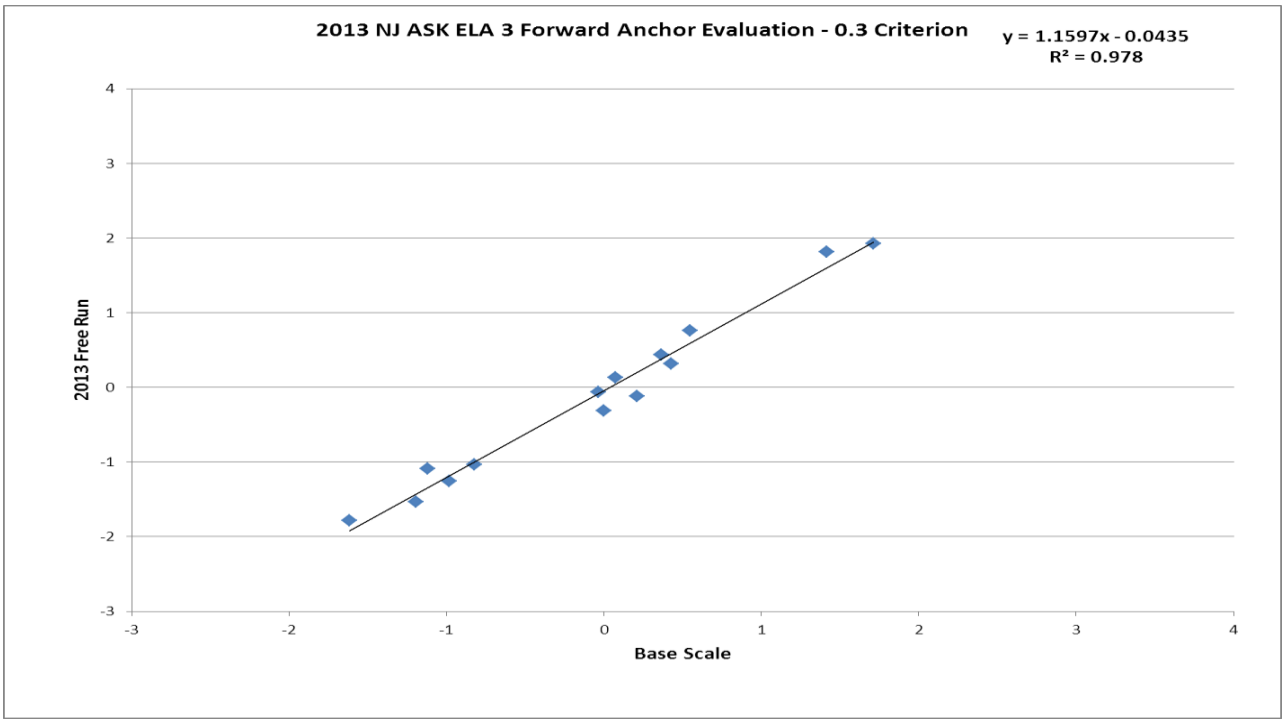

Figure 7.2.2: Scatter Plot of Anchor Items – ELA Grade 3 Forward

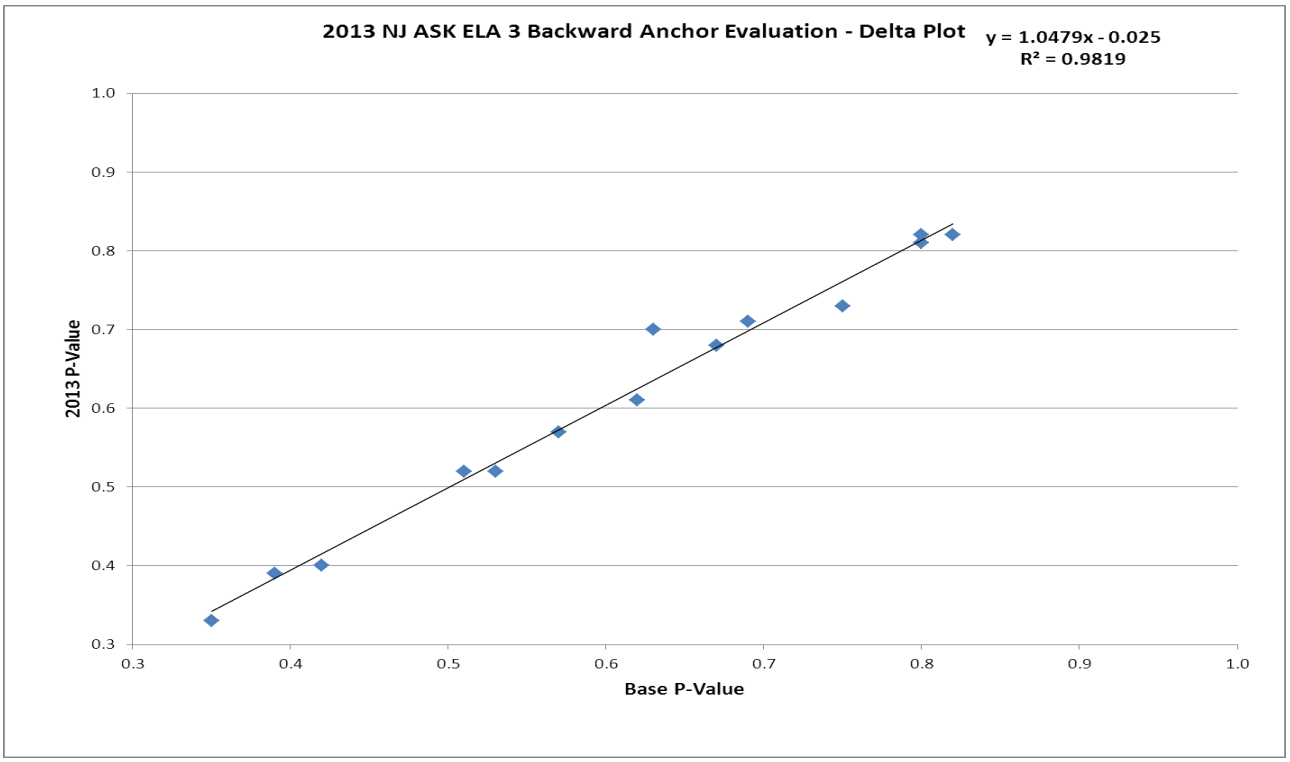

Figure 7.2.3: Scatter Plot of Anchor Items – ELA Grade 3 Delta Plot - Backward

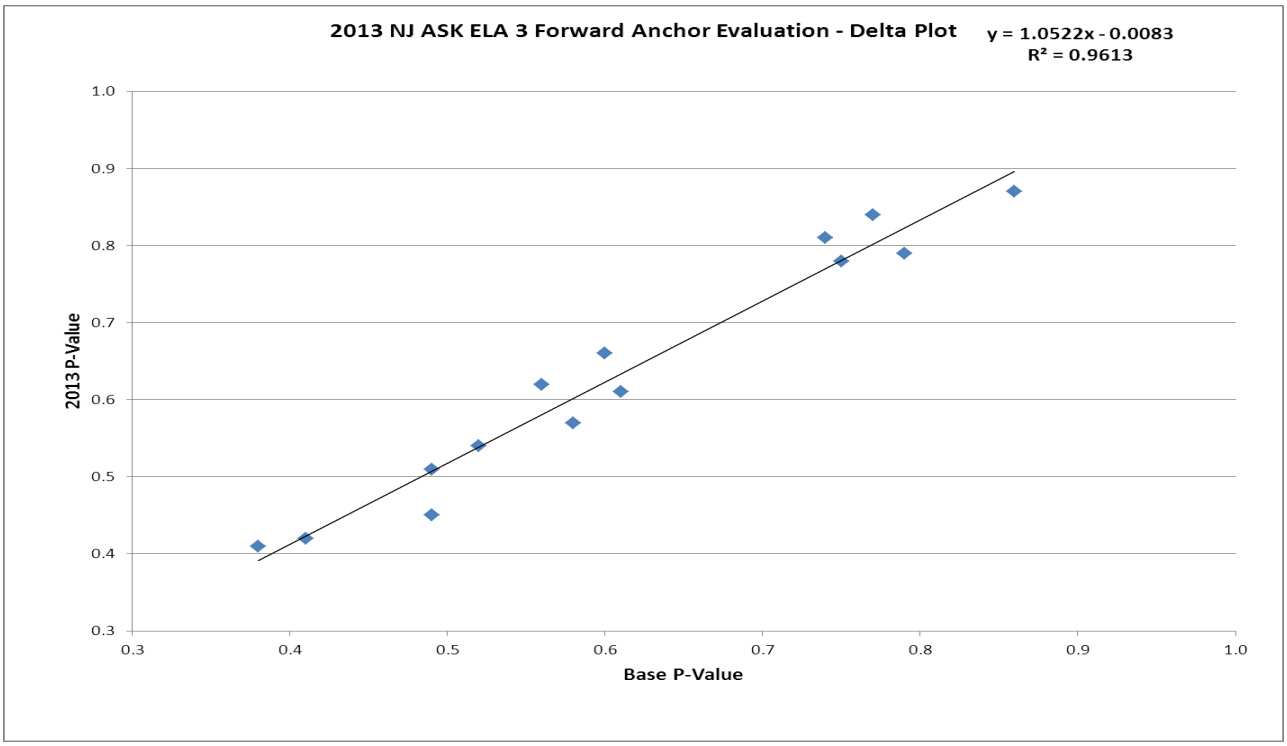

Figure 7.2.4: Scatter Plot of Anchor Items – ELA Grade 3 Delta Plot - Forward

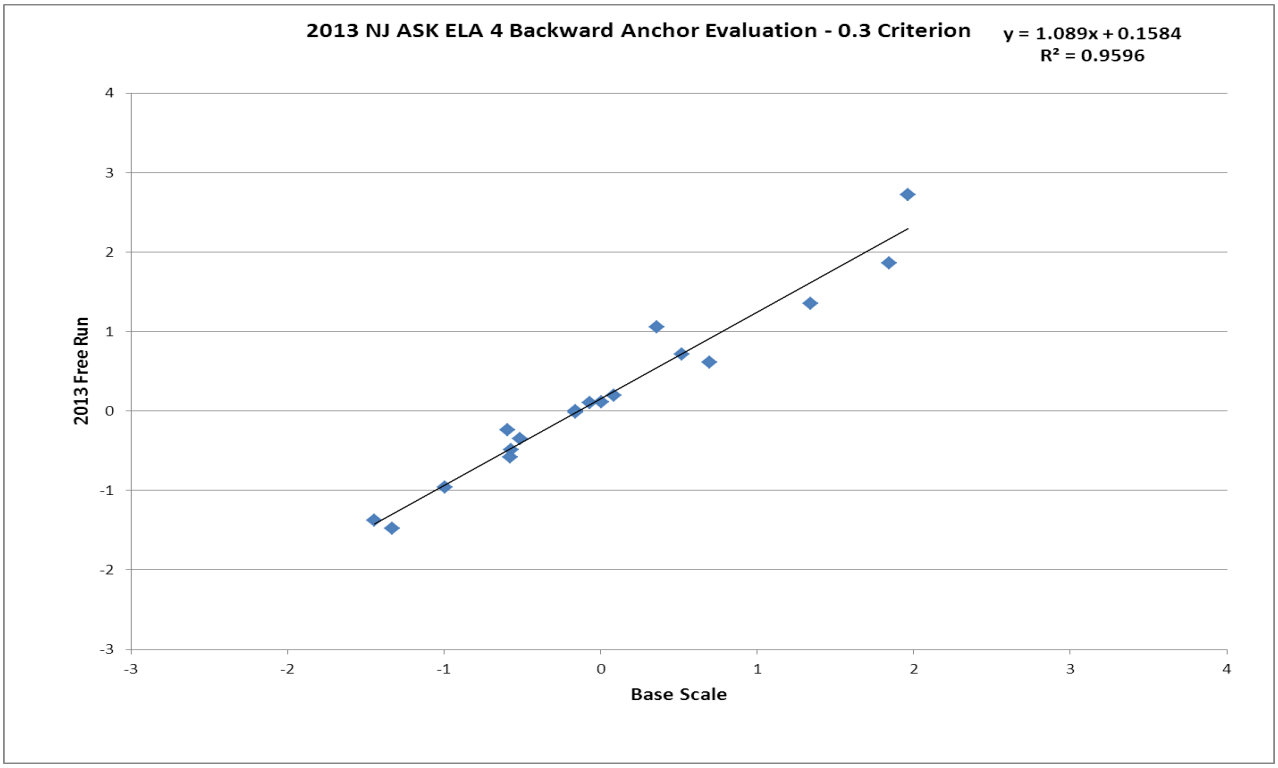

Figure 7.2.5: Scatter Plot of Anchor Items – ELA Grade 4 Backward

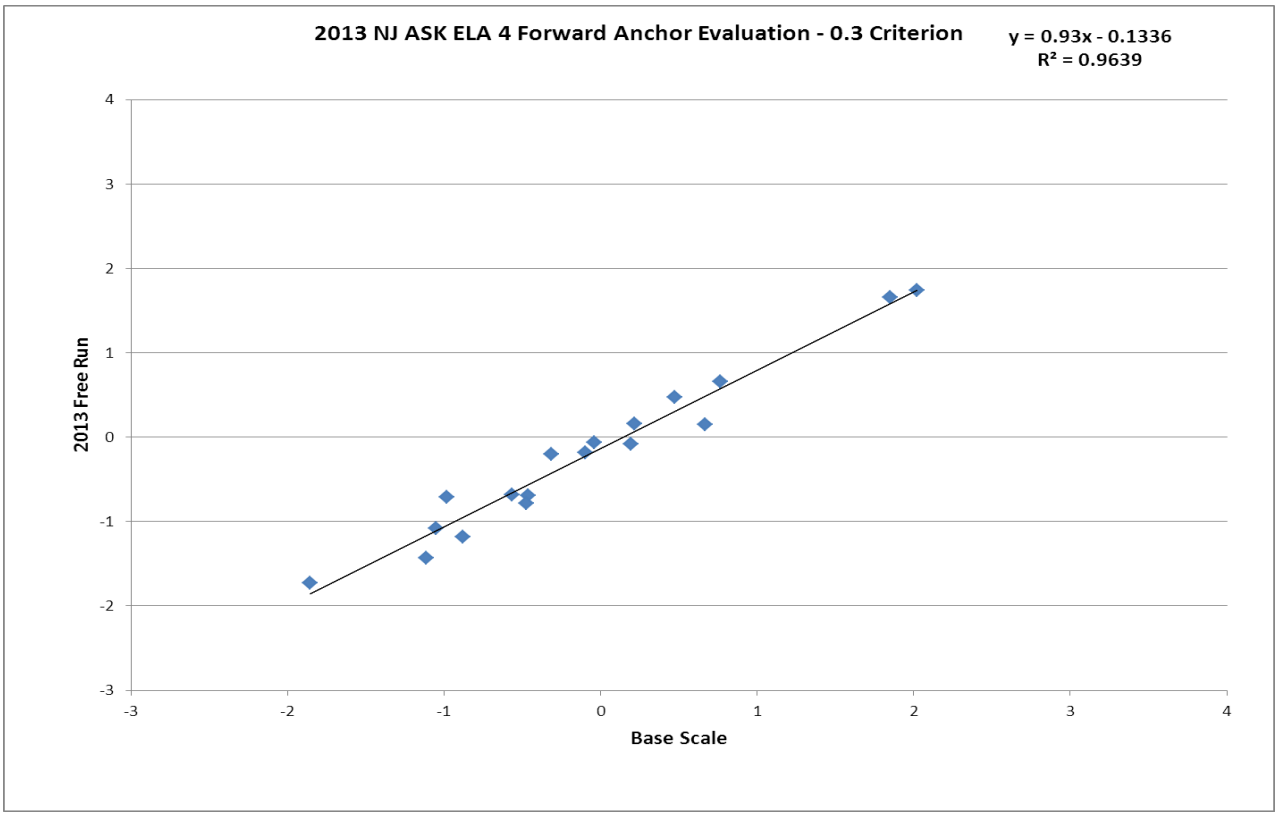

Figure 7.2.6: Scatter Plot of Anchor Items – ELA Grade 4 Forward

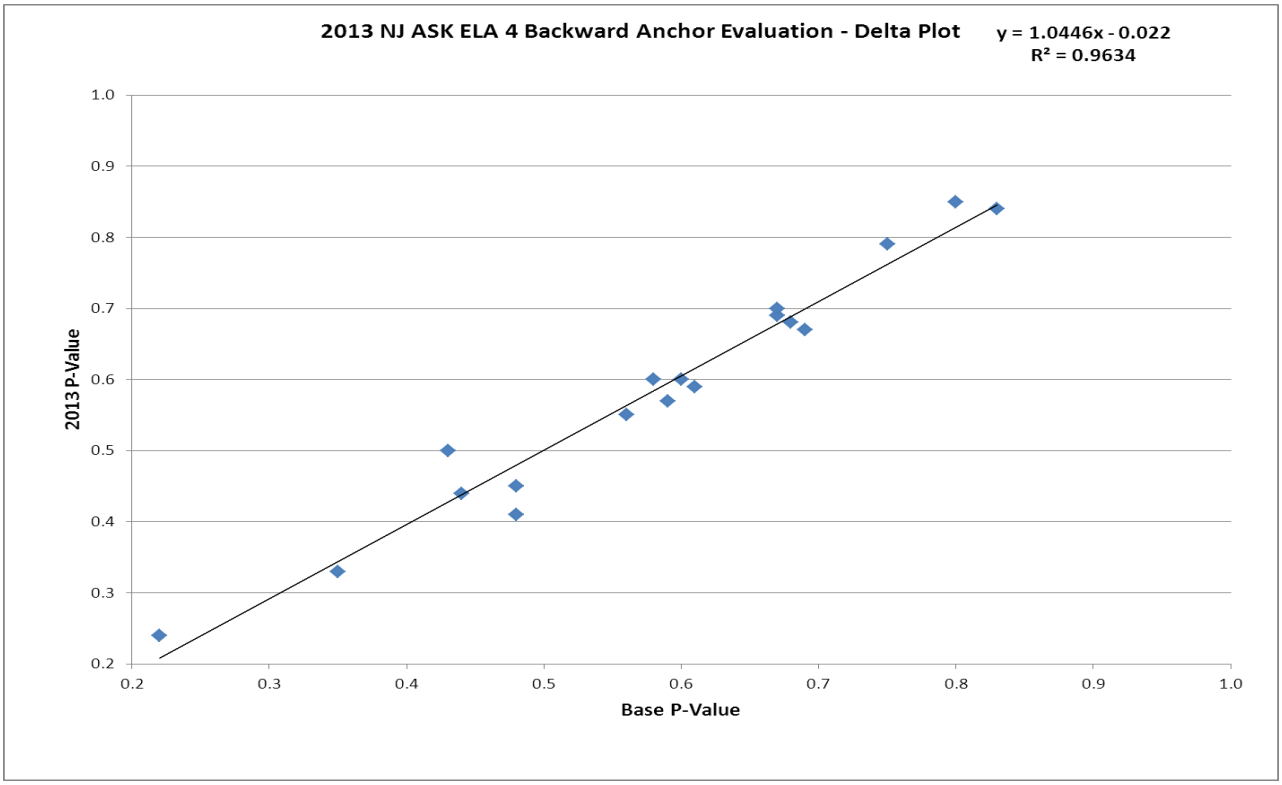

Figure 7.2.7: Scatter Plot of Anchor Items – ELA Grade 4 Delta Plot - Backward

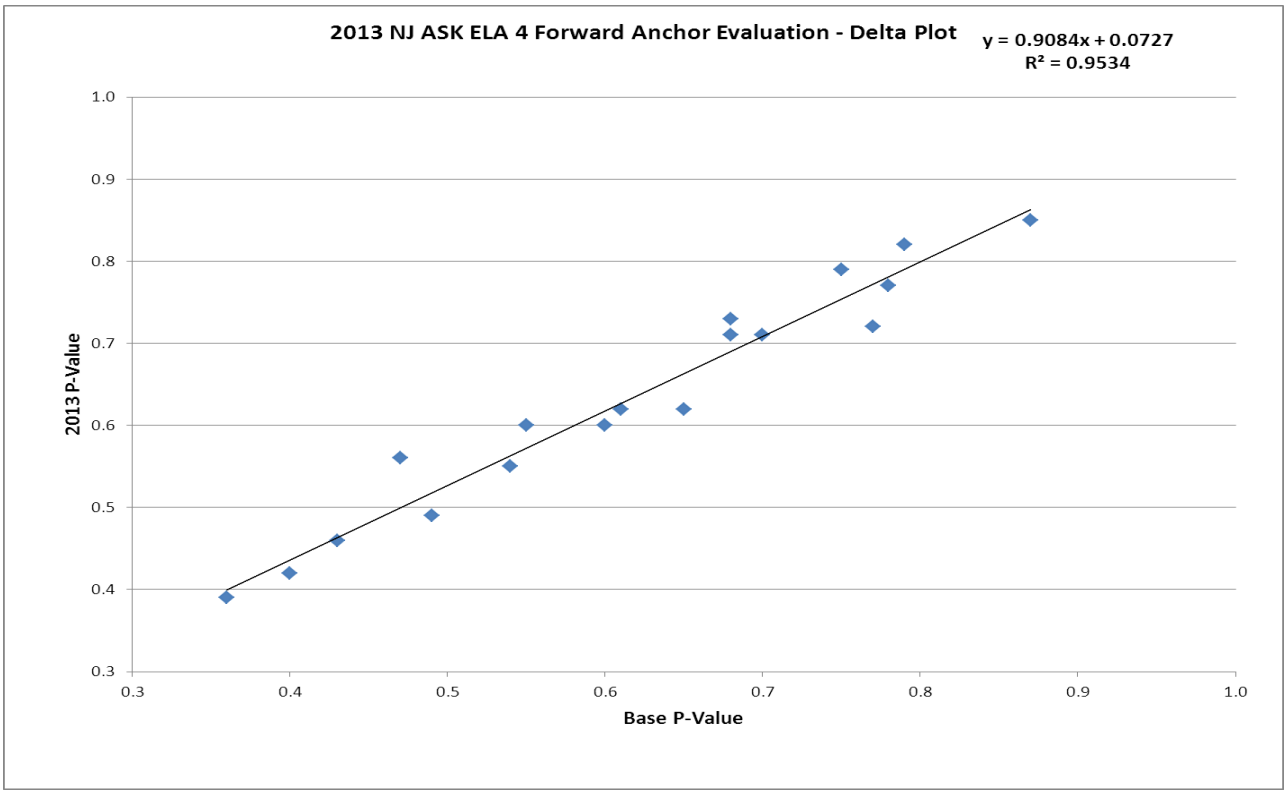

Figure 7.2.8: Scatter Plot of Anchor Items – ELA Grade 4 Delta Plot - Forward

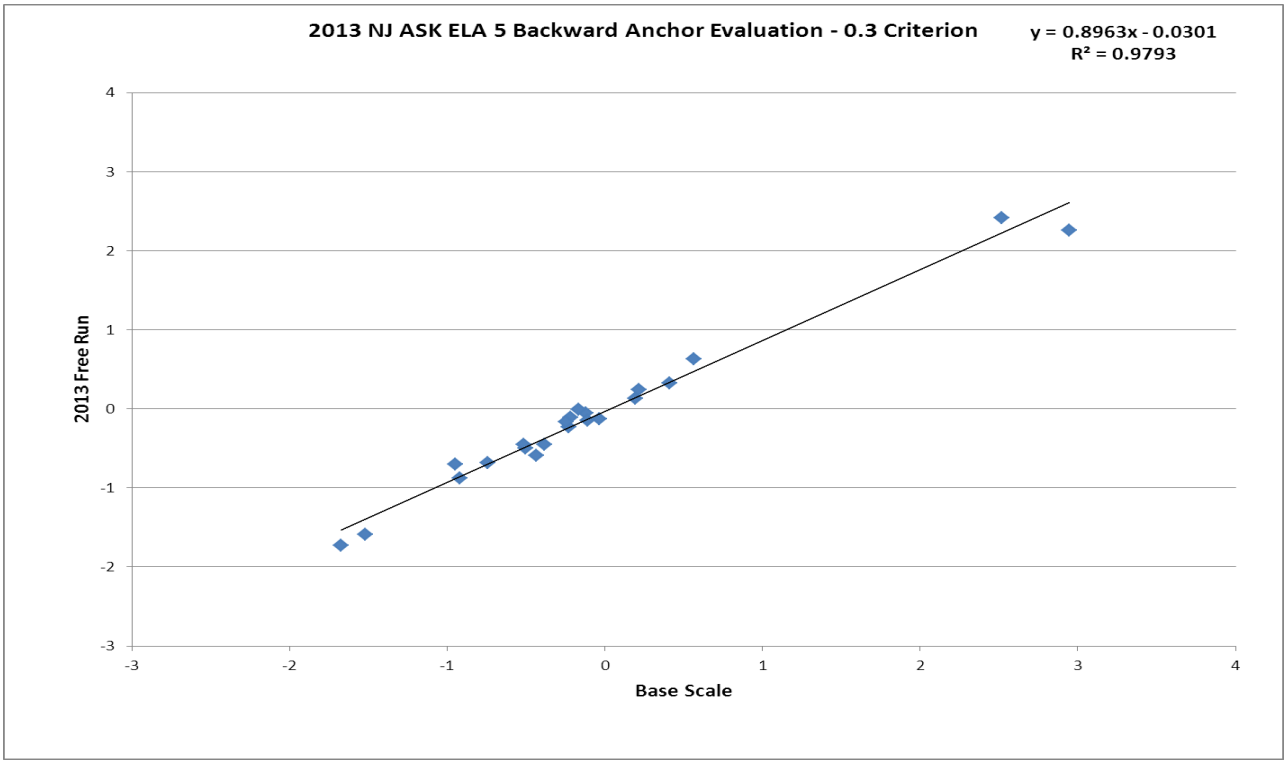

Figure 7.2.9: Scatter Plot of Anchor Items – ELA Grade 5 Backward

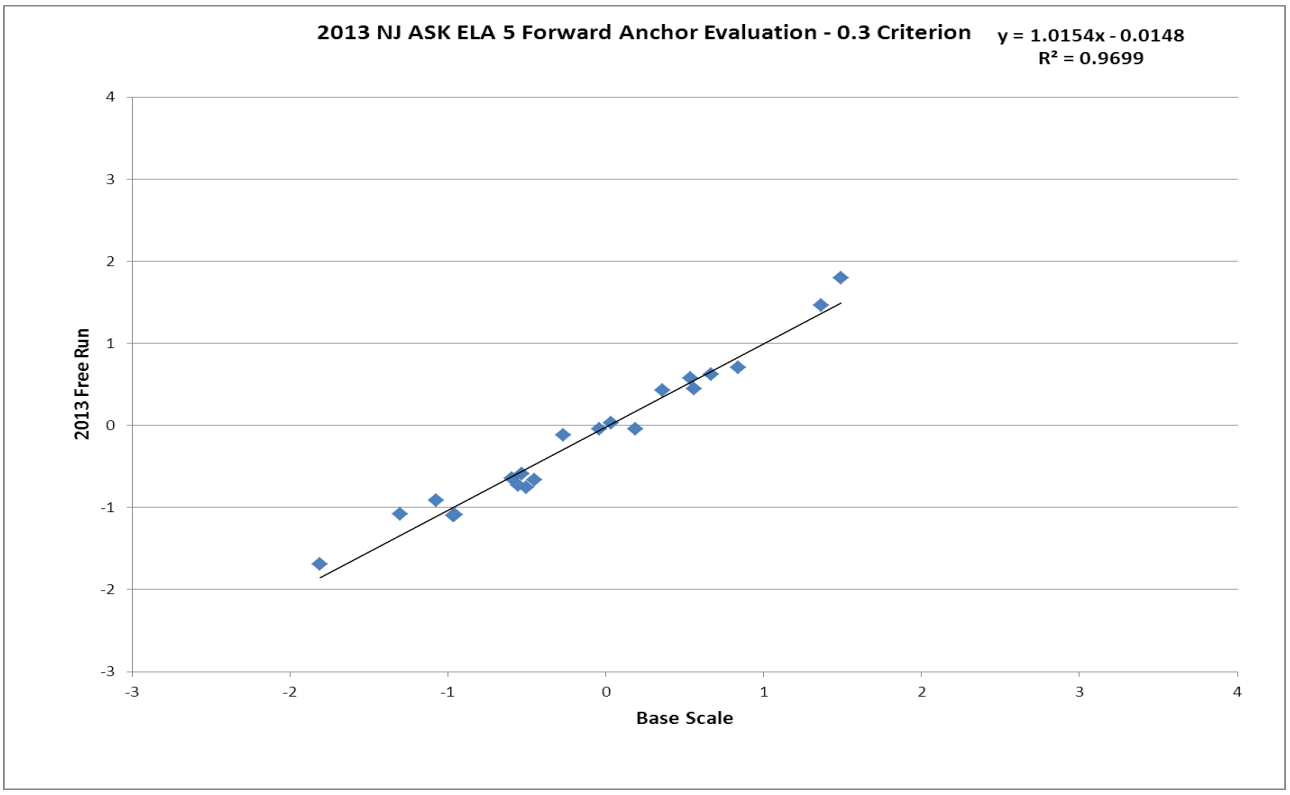

Figure 7.2.10: Scatter Plot of Anchor Items – ELA Grade 5 Forward

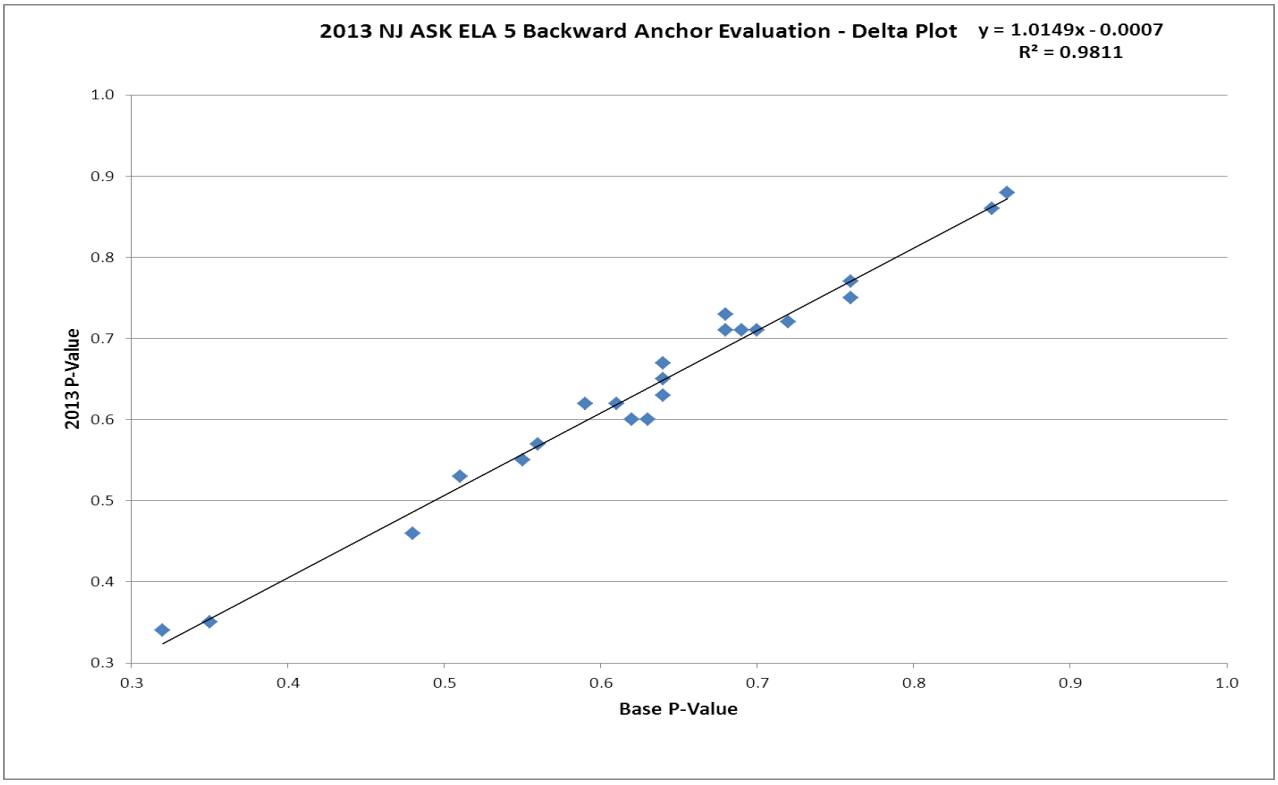

Figure 7.2.11: Scatter Plot of Anchor Items – ELA Grade 5 Delta Plot - Backward

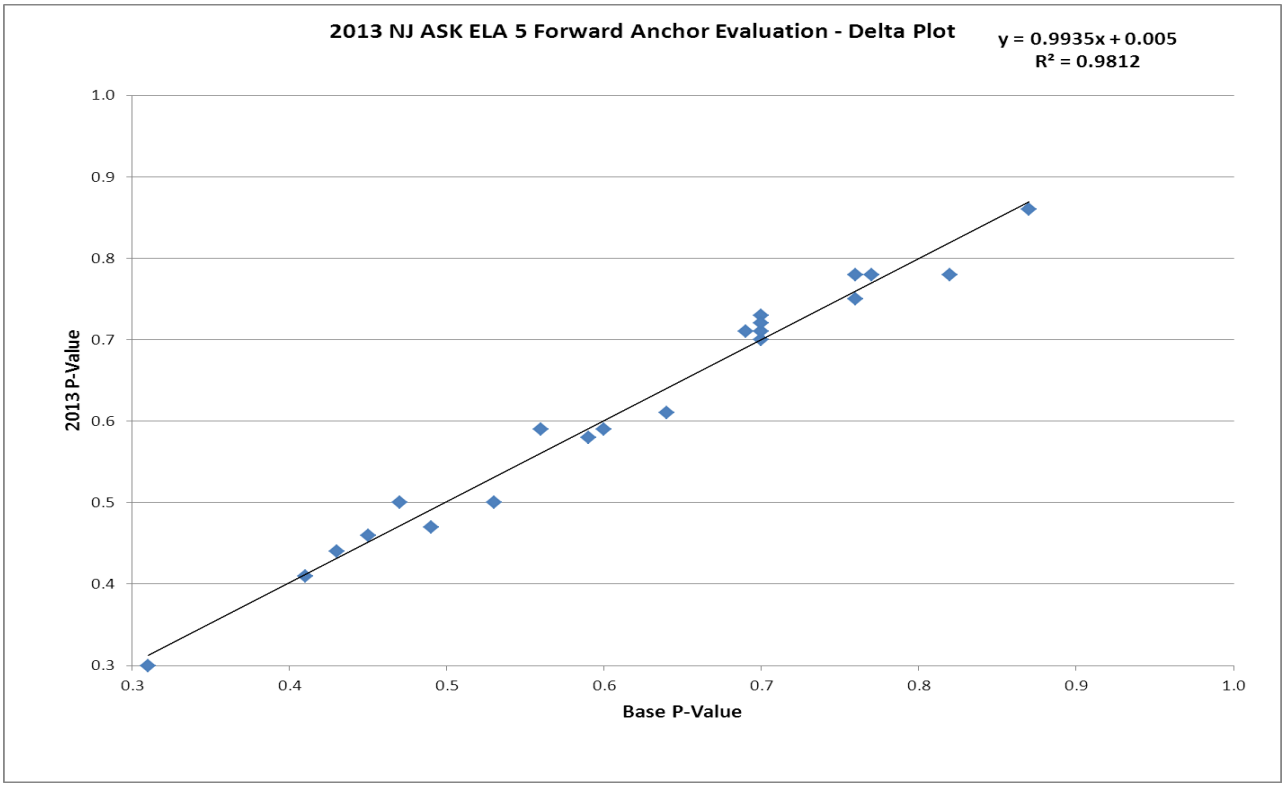

Figure 7.2.12: Scatter Plot of Anchor Items – ELA Grade 5 Delta Plot - Forward

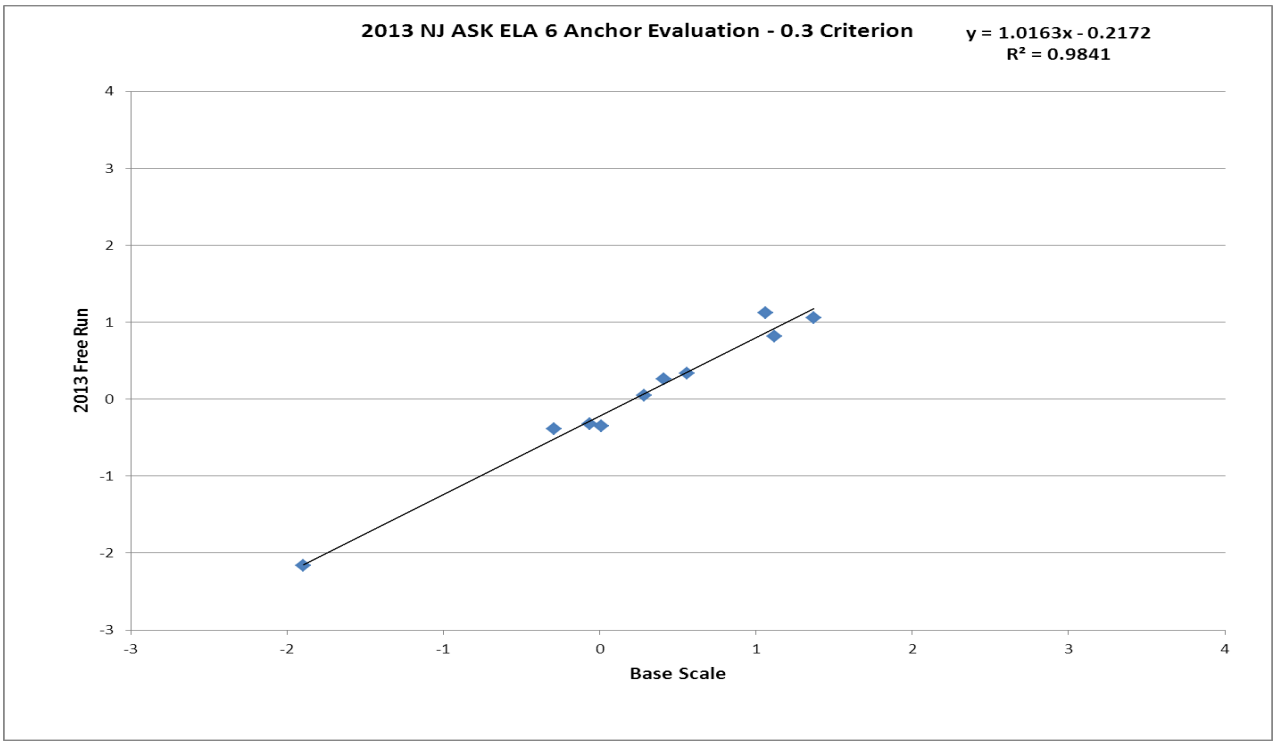

Figure 7.2.13: Scatter Plot of Anchor Items – ELA Grade 6

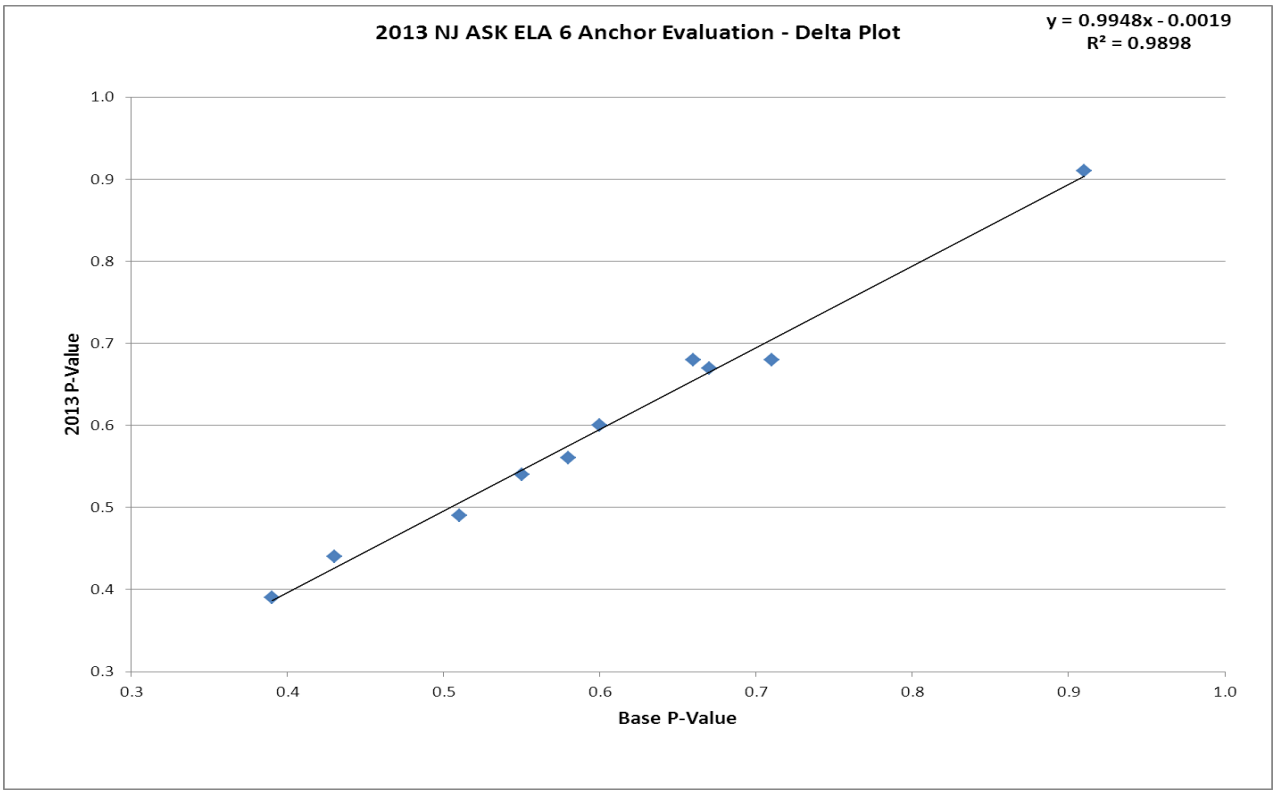

Figure 7.2.14: Scatter Plot of Anchor Items – ELA Grade 6 Delta Plot

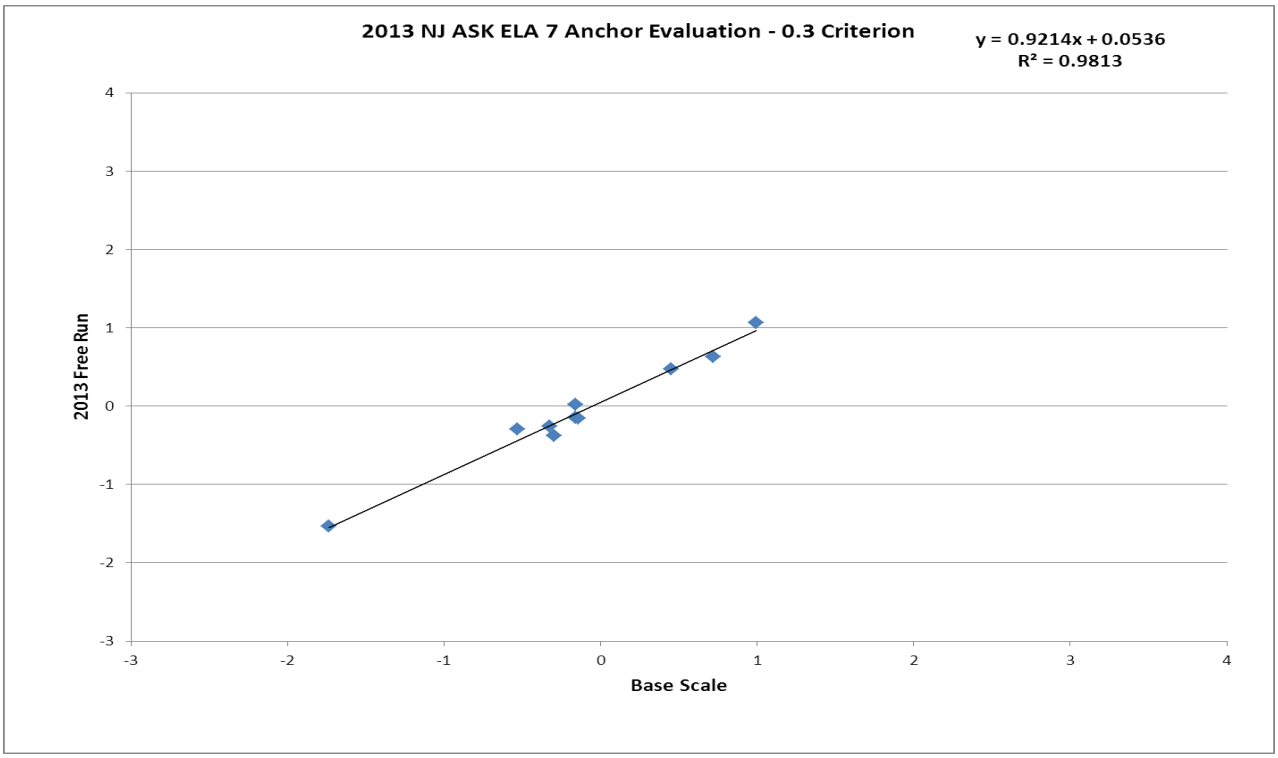

Figure 7.2.15: Scatter Plot of Anchor Items – ELA Grade 7

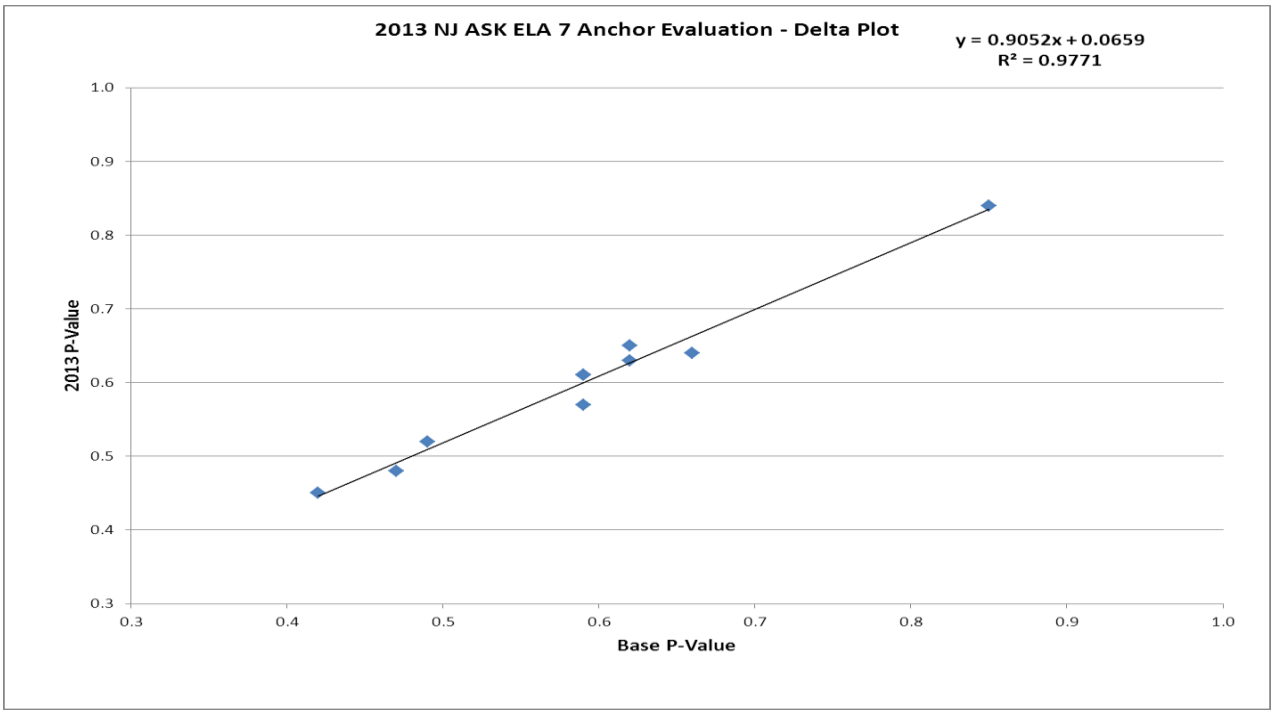

Figure 7.2.16: Scatter Plot of Anchor Items – ELA Grade 7 Delta Plot

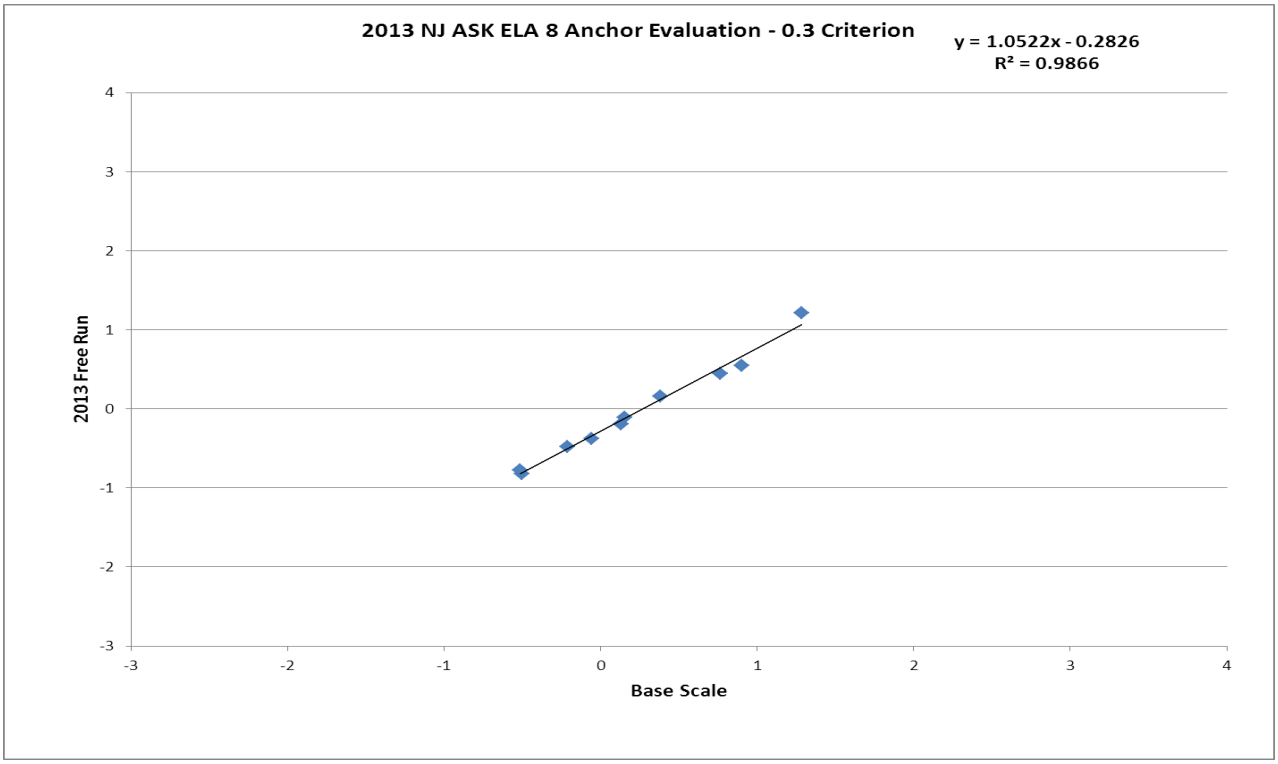

Figure 7.2.17: Scatter Plot of Anchor Items – ELA Grade 8

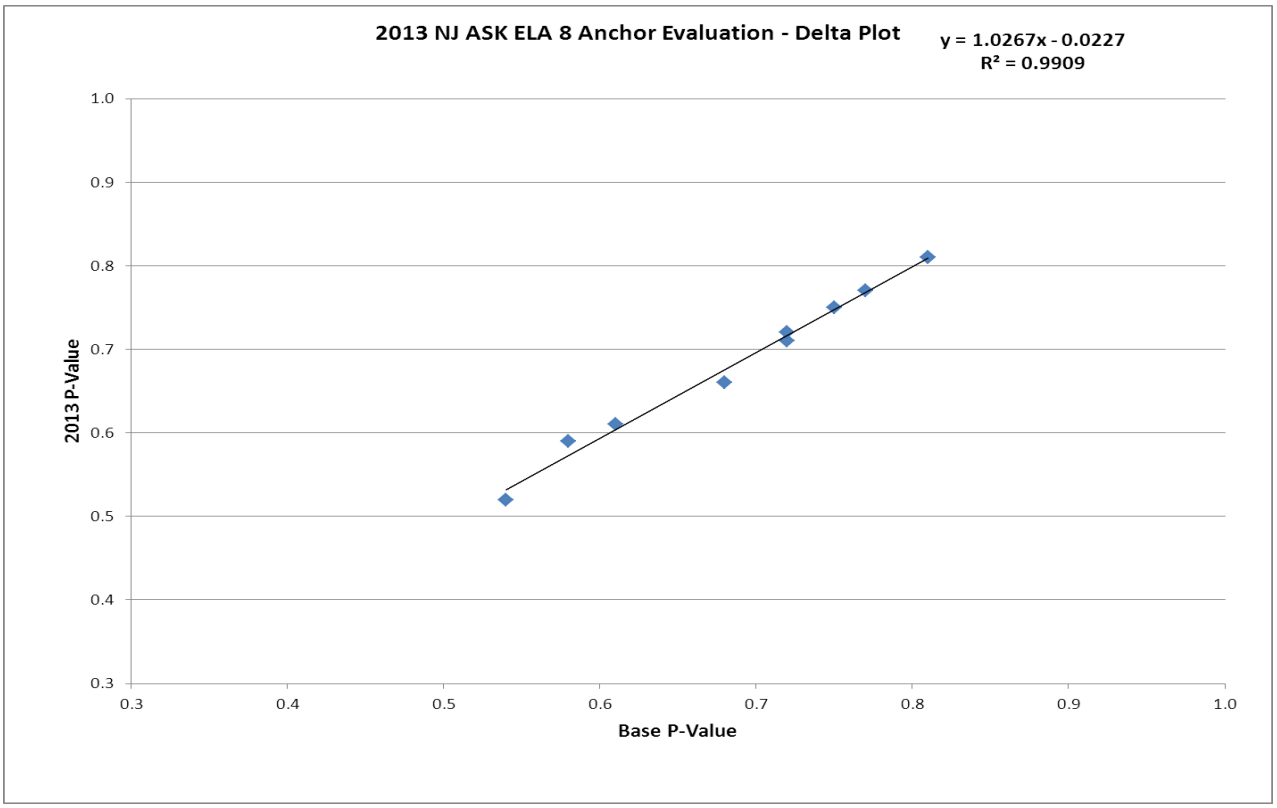

Figure 7.2.18: Scatter Plot of Anchor Items – ELA Grade 8 Delta Plot

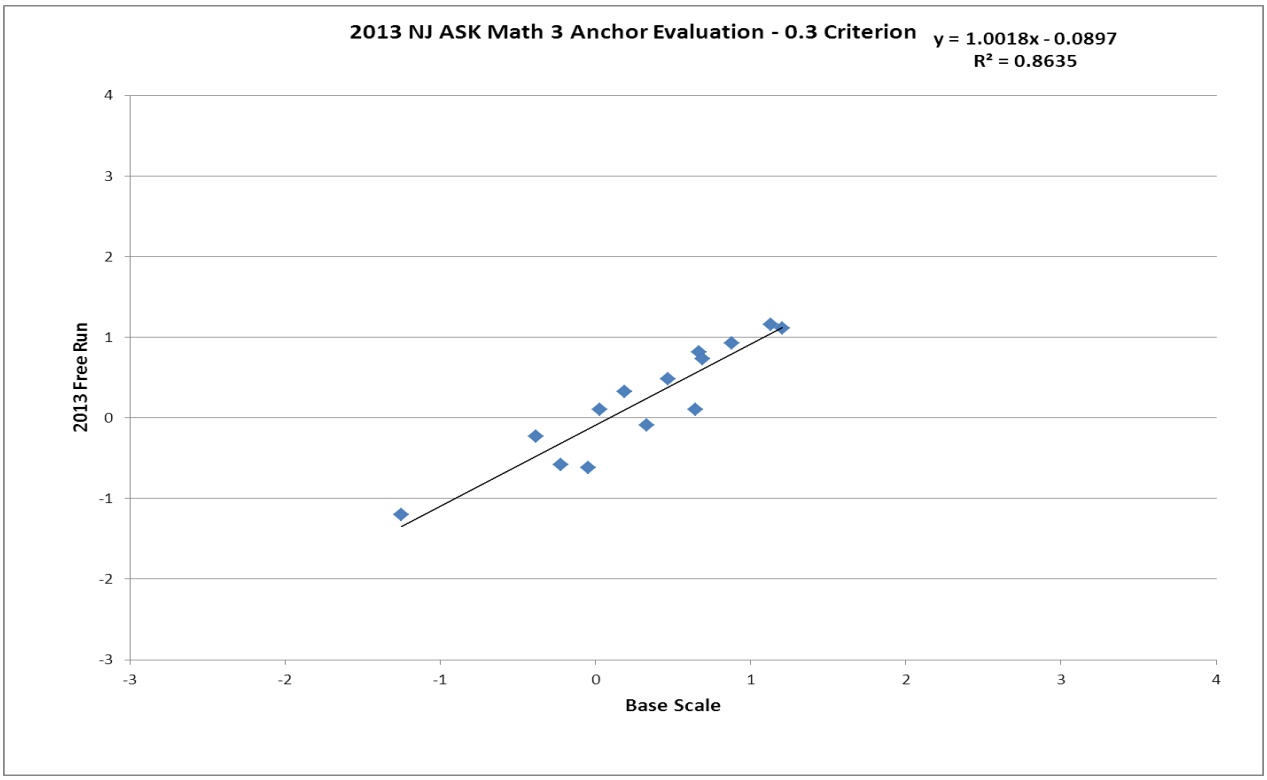

Figure 7.2.19: Scatter Plot of Anchor Items – Mathematics Grade 3

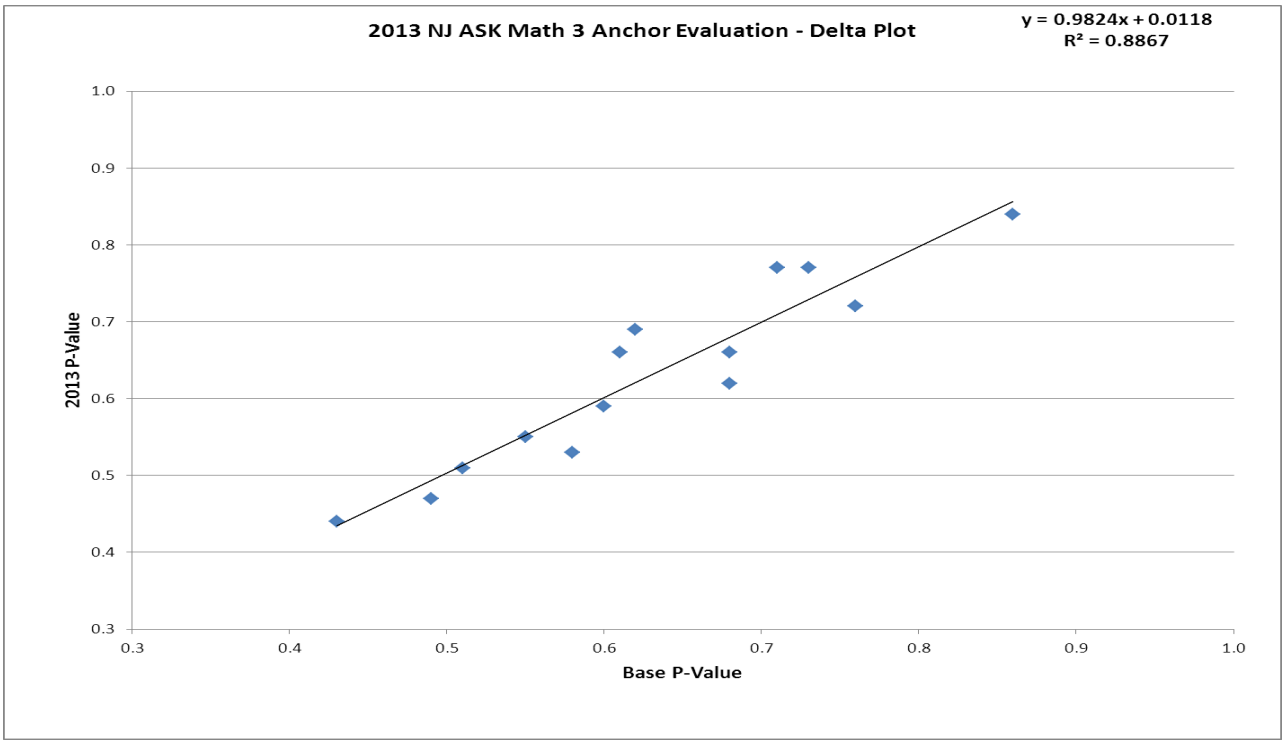

Figure 7.2.20: Scatter Plot of Anchor Items – Mathematics Grade 3 Delta Plot

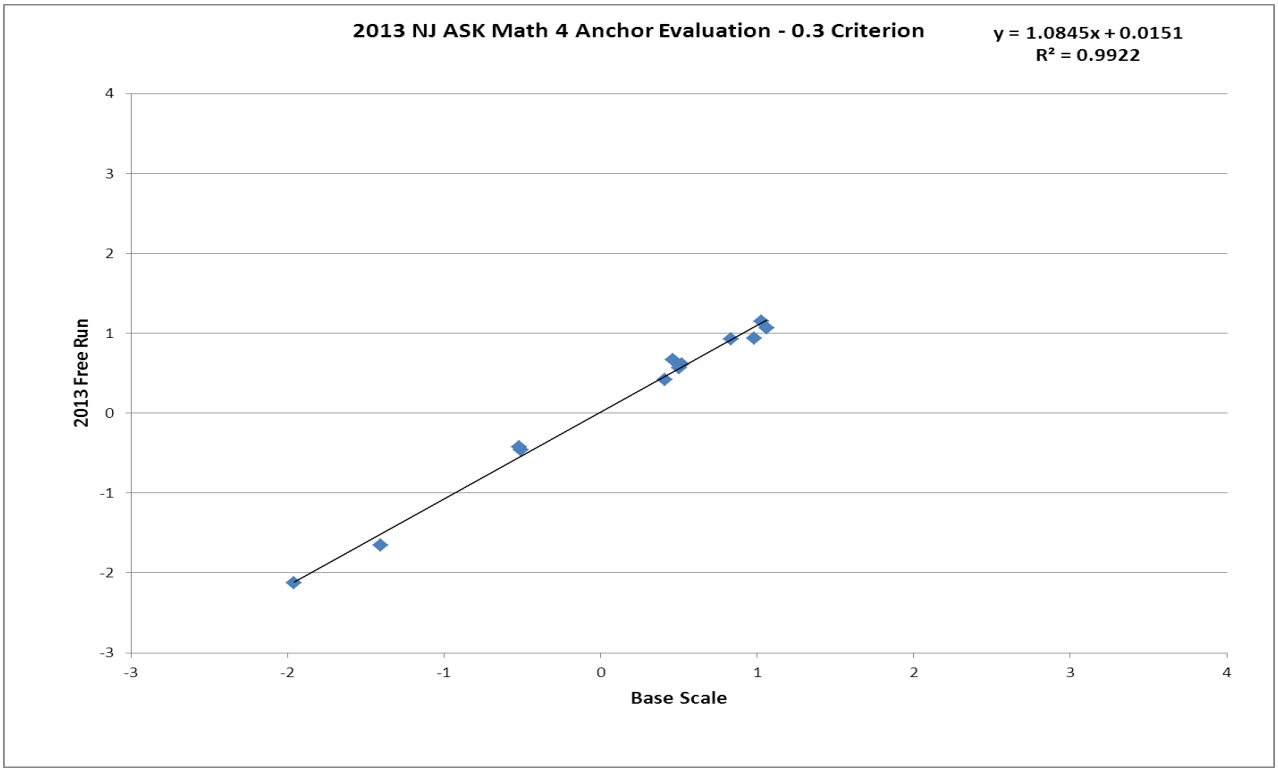

Figure 7.2.21: Scatter Plot of Anchor Items – Mathematics Grade 4

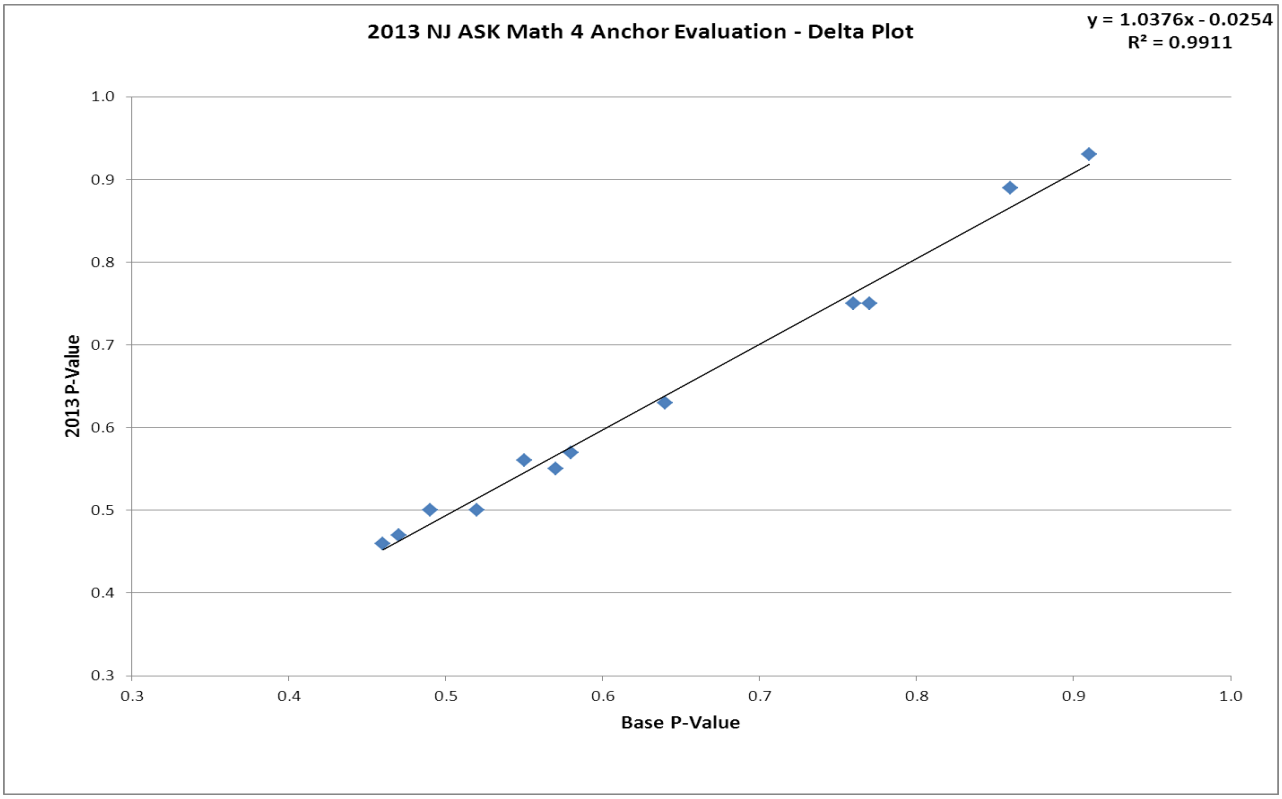

Figure 7.2.22: Scatter Plot of Anchor Items – Mathematics Grade 4 Delta Plot

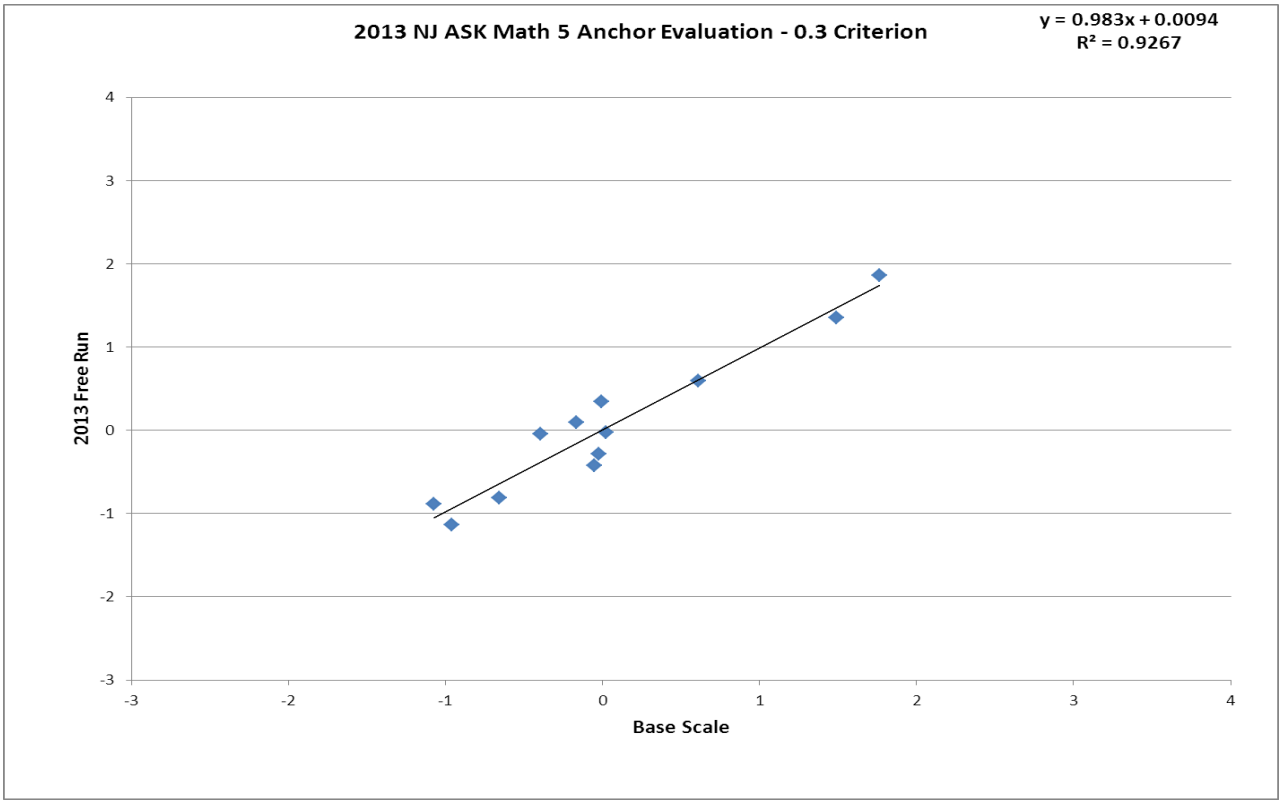

Figure 7.2.23: Scatter Plot of Anchor Items – Mathematics Grade 5

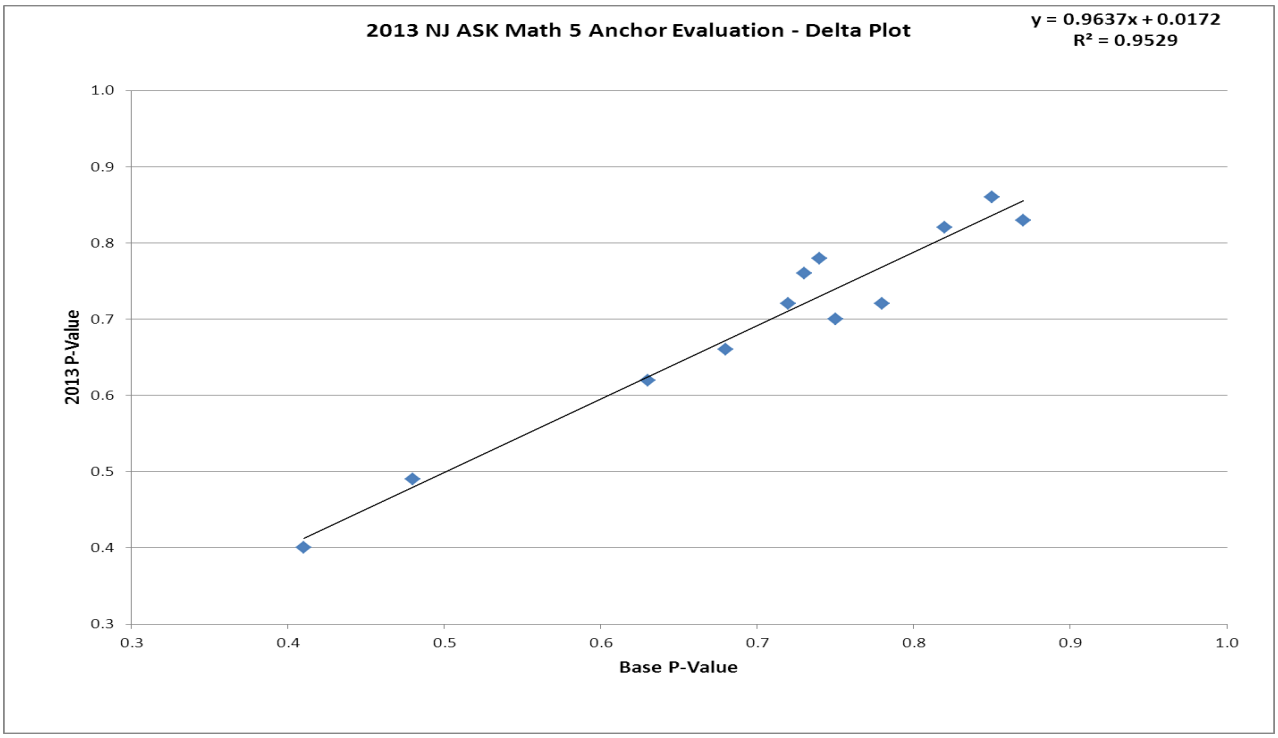

Figure 7.2.24: Scatter Plot of Anchor Items – Mathematics Grade 5 Delta Plot

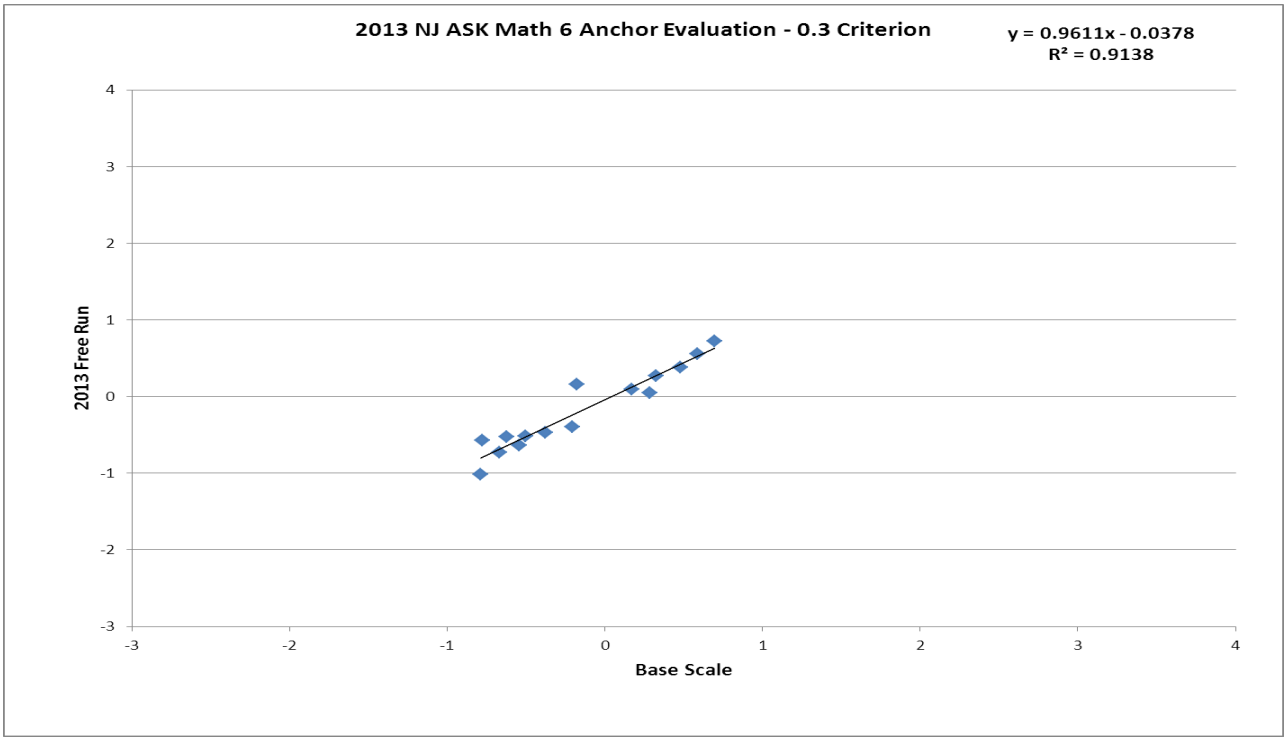

Figure 7.2.25: Scatter Plot of Anchor Items – Mathematics Grade 6

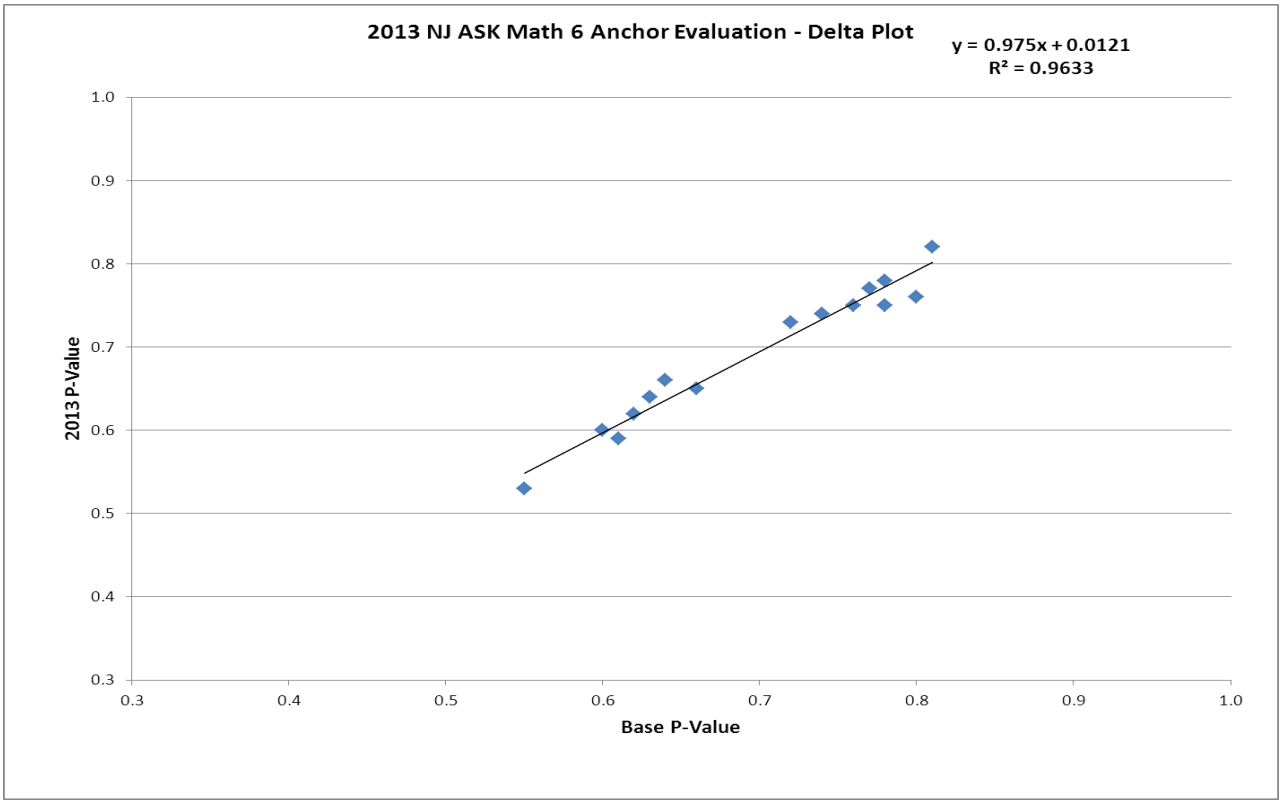

Figure 7.2.26: Scatter Plot of Anchor Items – Mathematics Grade 6 Delta Plot

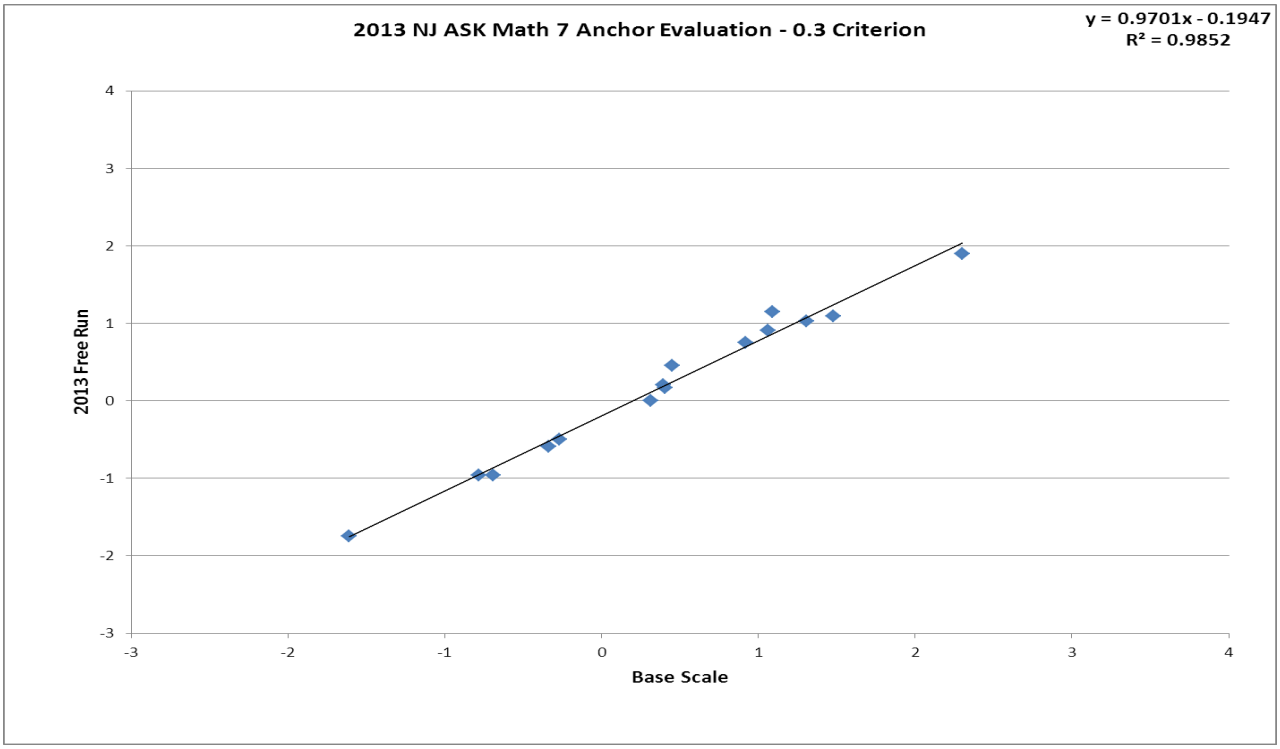

Figure 7.2.27: Scatter Plot of Anchor Items – Mathematics Grade 7

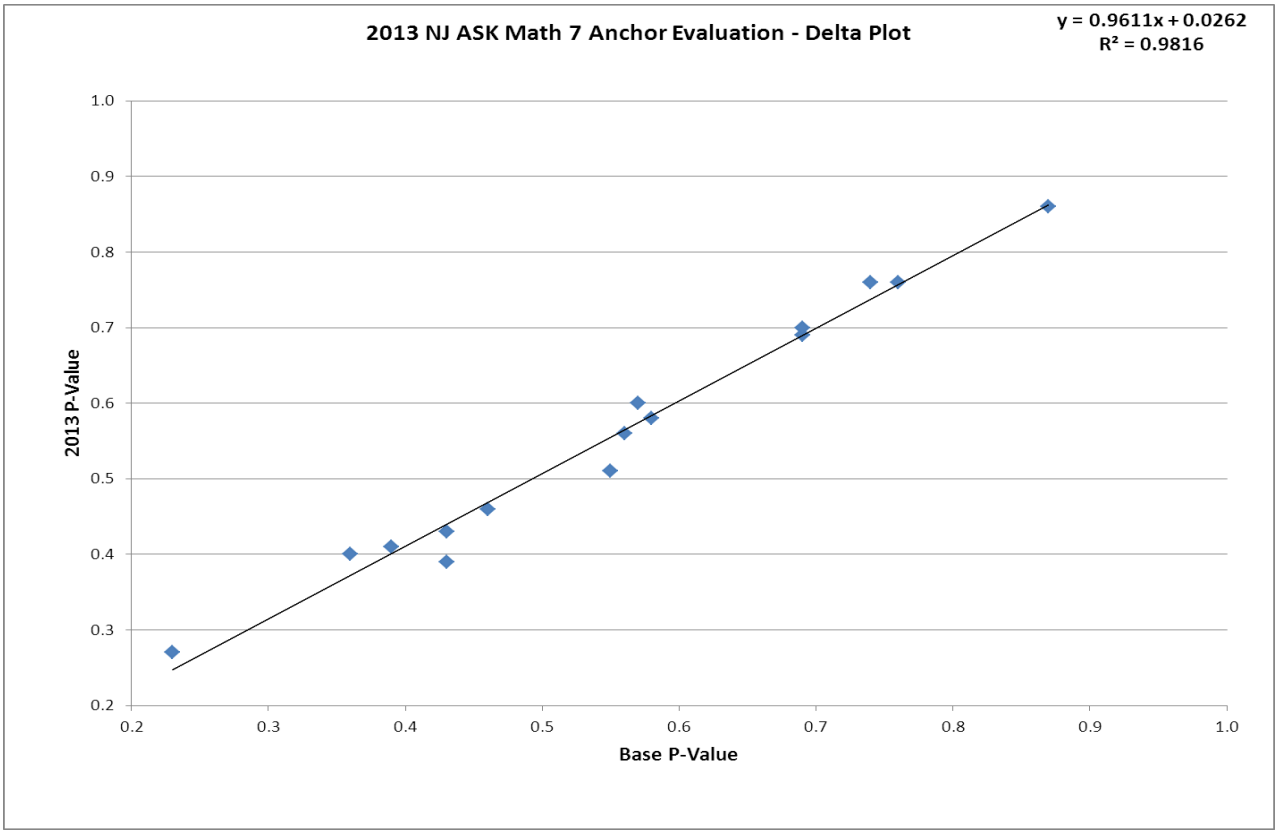

Figure 7.2.28: Scatter Plot of Anchor Items – Mathematics Grade 7 Delta Plot

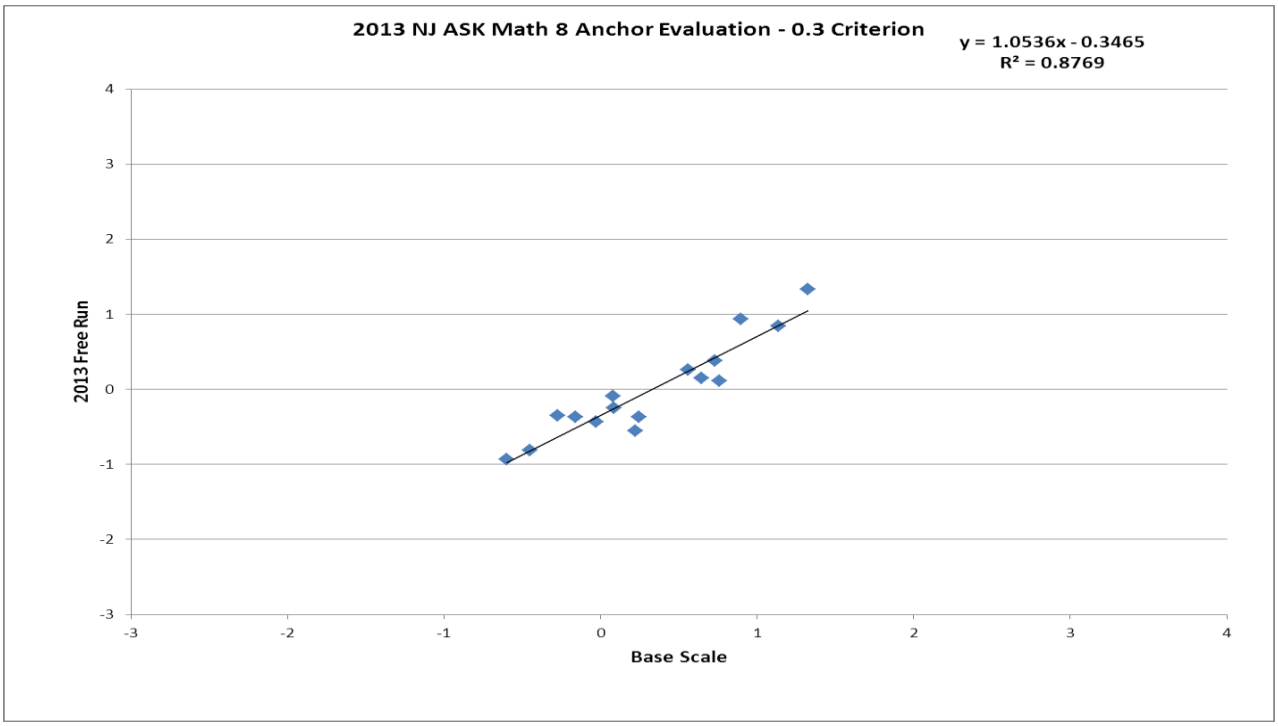

Figure 7.2.29: Scatter Plot of Anchor Items – Mathematics Grade 8

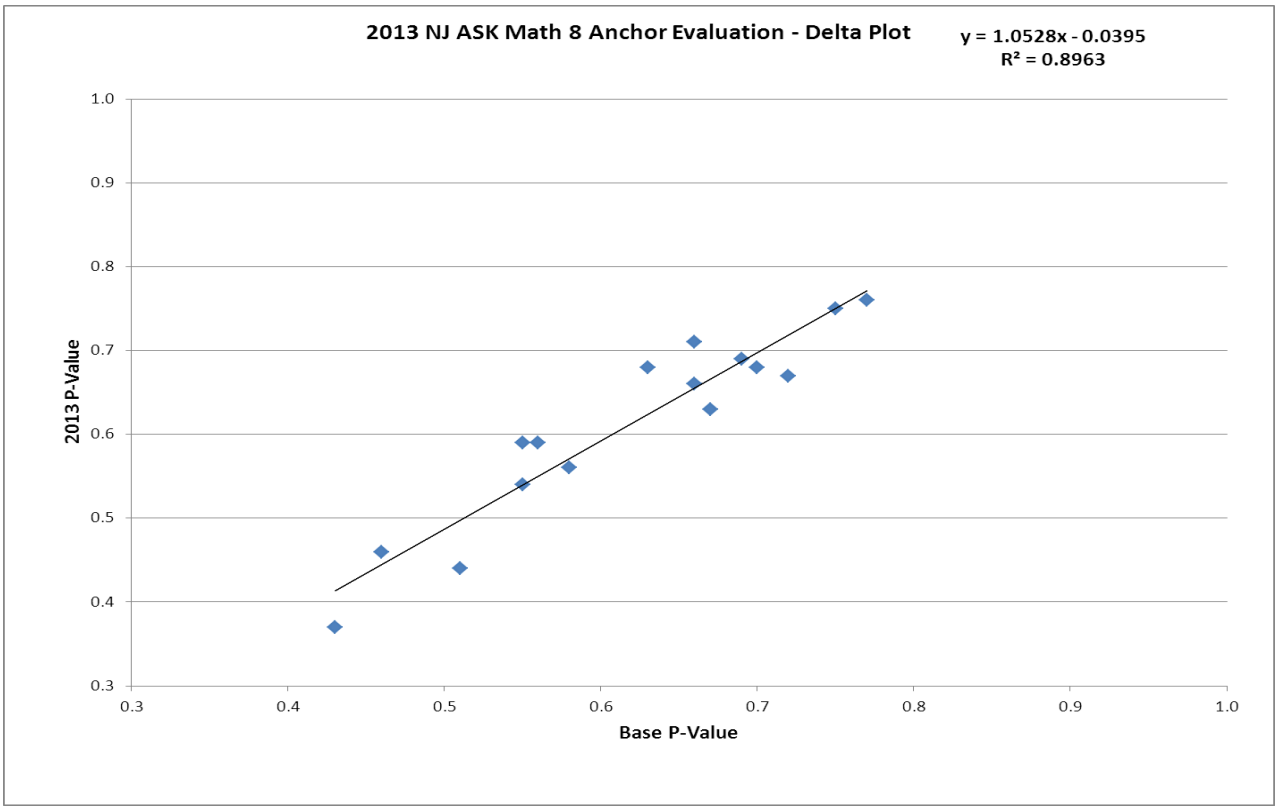

Figure 7.2.30: Scatter Plot of Anchor Items – Mathematics Grade 8 Delta Plot

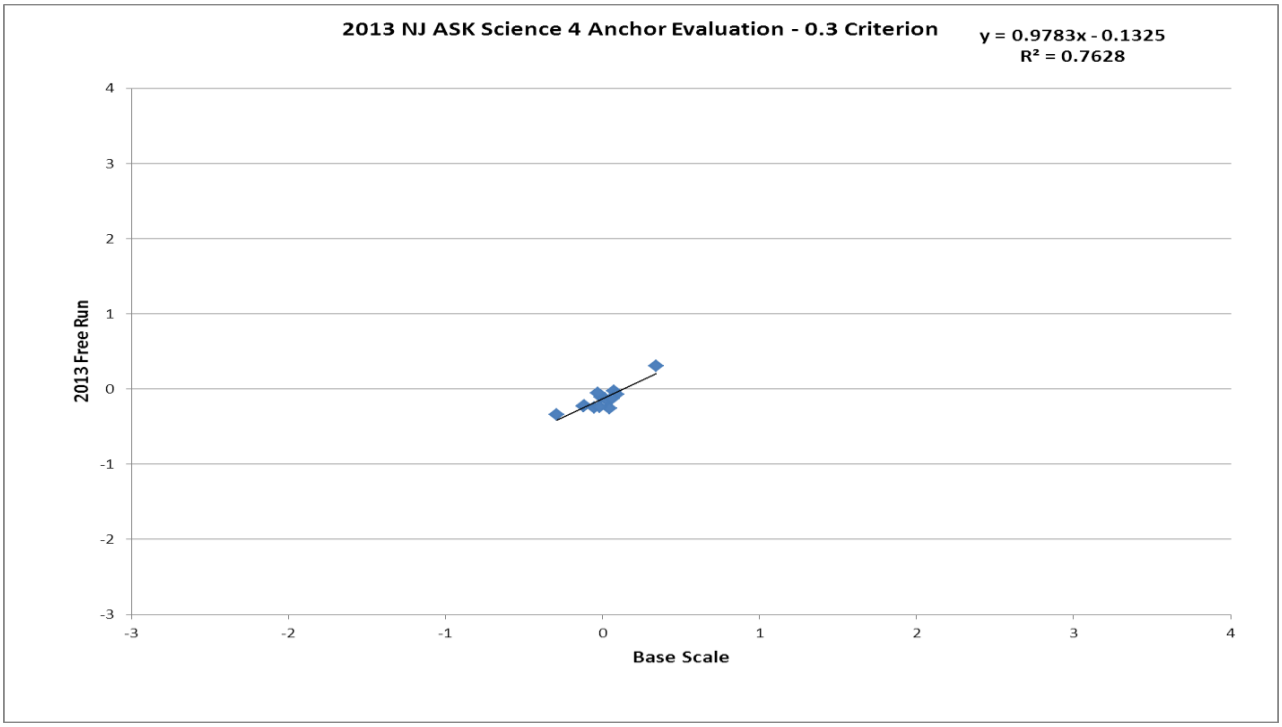

Figure 7.2.31: Scatter Plot of Anchor Items – Science Grade 4

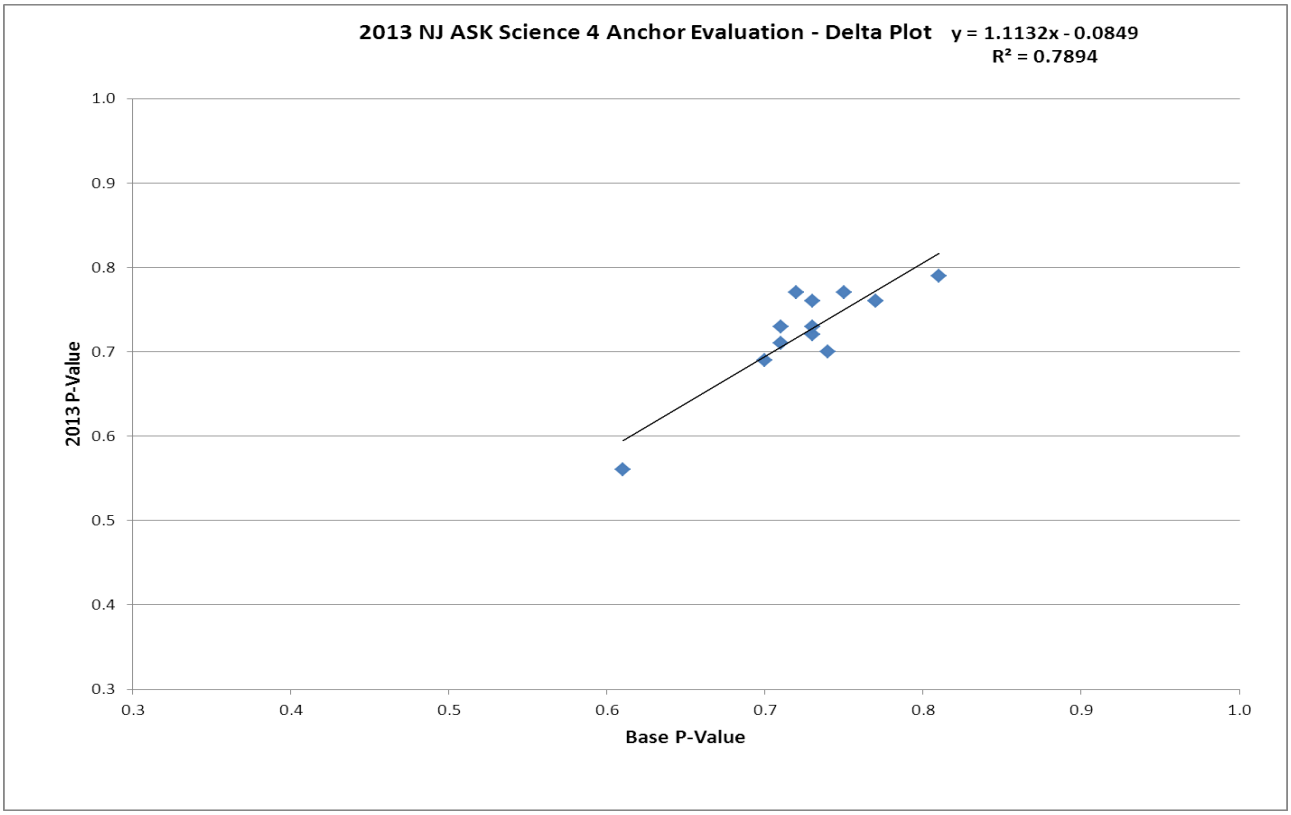

Figure 7.2.32: Scatter Plot of Anchor Items – Science Grade 4 Delta Plot

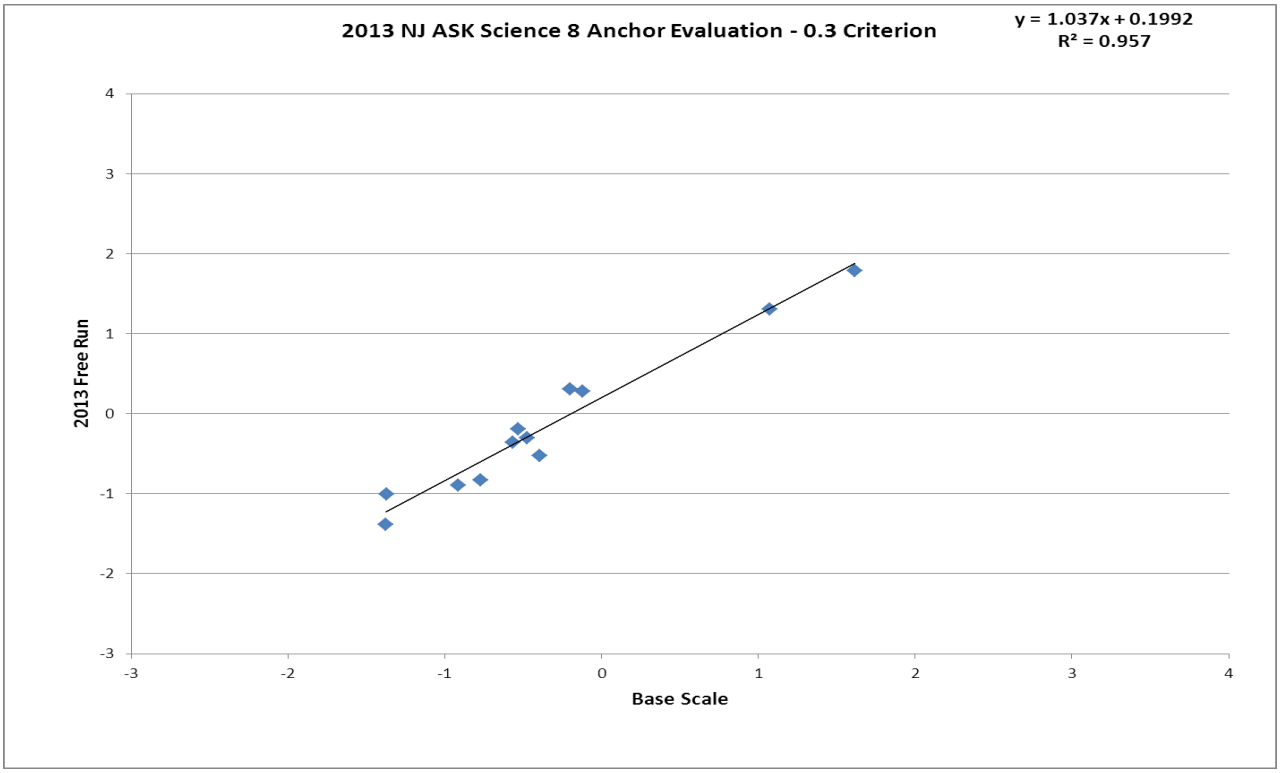

Figure 7.2.33: Scatter Plot of Anchor Items – Science Grade 8

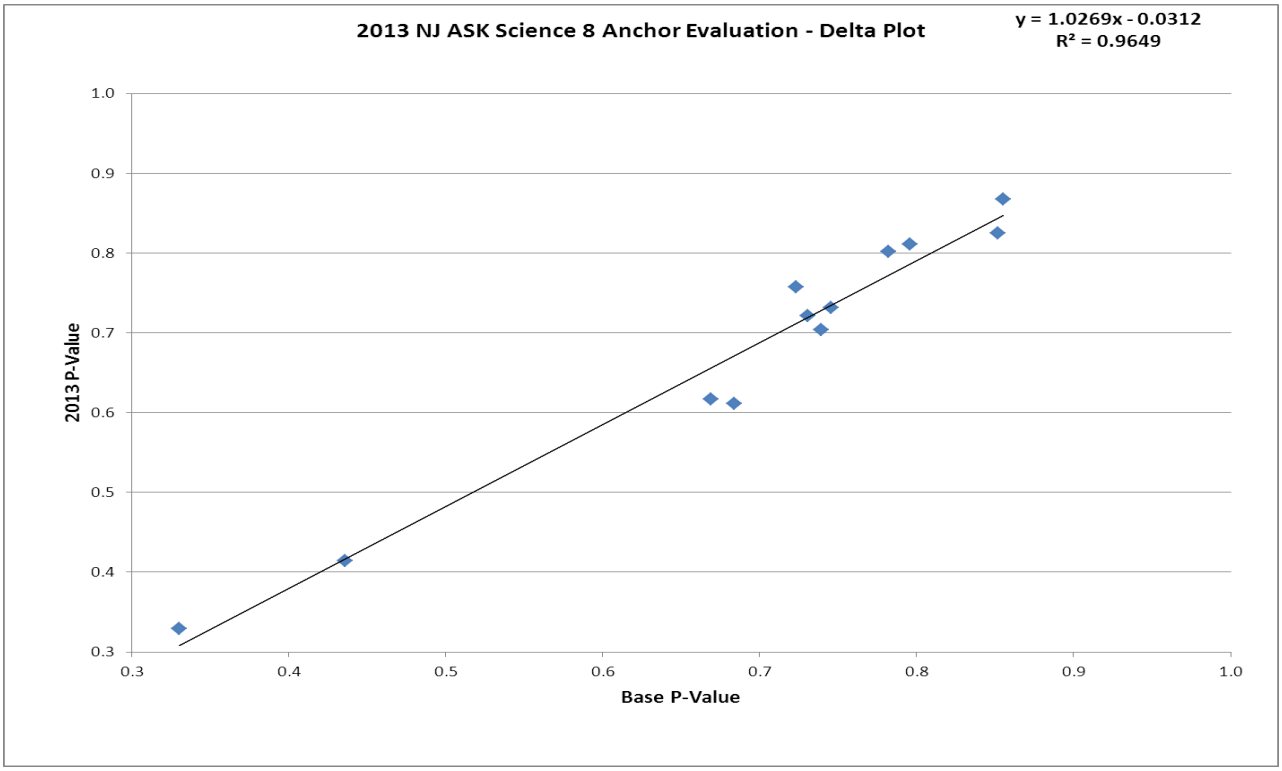

Figure 7.2.34: Scatter Plot of Anchor Items – Science Grade 8 Delta Plot

(3) Equate the 2013 assessments to the "base" scale

It was assumed that the latent traits measured by the 2013 operational tests and the "base" tests were the same. Note that all anchor items for 2013 operational assessments were selected from previous administrations where the items were already calibrated to the base scale. Given the fact that common anchor items were used and the blueprint and item specifications were the same, it appears reasonable to assume that the underlying latent trait or construct measured by each assessment was the same. To equate the 2013 assessments to the "base" scale, the Rasch values (difficulties and Rasch-Anderich thresholds for the open-ended items) of the common items were fixed to the "base" scale. This resulted in a raw score to theta conversion on the "base" scale for the 2013 assessment (i.e., the 2013 assessments were scaled to the "base" metric).

(4) Assess the model fit

Winsteps was able to produce an ability estimate (theta) for every possible number correct, raw score total as one or more examinees obtained a perfect score on each CR item in ELA, mathematics, and science. Table 7.1.1 shows the number of examinees used for the calibrations by grade and content area.

Tables 7.2.15 – 7.2.17 summarizes Infit and Outfit statistics for the NJ ASK 2013 tests. The Infit statistic is more sensitive to unexpected behavior affecting responses near an examinee's ability level while the Outfit statistic is more sensitive to unexpected behavior by examinees far from their ability level (see Winsteps Manual, pp.199-202). Infit and Outfit can be expressed as a mean square (MNSQ) statistic or on a standardized metric (ZSTD). MNSQ values are more oriented toward practical significance, whereas Z values are more closely related to statistical significance. As a rule of thumb, the Rasch model fits the data well when the item mean square ("Infit") indices are within the range of 0.70 to 1.30. The tables indicate that the majority of Infit indices are in the range of 0.70 to 1.30. The Infit statistics for most grades of ELA, mathematics, and science were within the recommended range. One item each in ELA grade 7 and mathematics grades 4 and 5 showed above the upper limit of 1.3. With the exception noted above the Rasch model fits the data very well with an average Infit of approximately 1.0.

Table 7.2.1: ELA – Summary of the Infit and Outfit Statistics by Grade

				INFIT		OUTFIT	
		Measure	**Model Error**	**MNSQ**	**ZSTD**	**MNSQ**	**ZSTD**
ELA 3	**Mean**	-0.22	0.01	0.99	-0.23	1.01	0.38
	SD	1.14	0.00	0.09	7.98	0.16	8.13
	Max	2.05	0.02	1.13	9.90	1.34	9.90
	Min	-2.50	0.00	0.86	-9.90	0.70	-9.90
ELA 4	**Mean**	-0.13	0.01	1.00	-1.56	1.02	-0.62
	SD	1.00	0.00	0.10	7.79	0.21	7.98
	Max	2.57	0.02	1.29	9.90	1.78	9.90
	Min	-1.88	0.01	0.83	-9.90	0.67	-9.90

		Measure	Model Error	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
ELA 5	**Mean**	0.07	0.01	0.99	0.32	1.00	0.65
	SD	0.93	0.00	0.09	8.42	0.14	8.80
	Max	2.43	0.02	1.18	9.90	1.29	9.90
	Min	-1.76	0.01	0.84	-9.90	0.76	-9.90
ELA 6	**Mean**	0.21	0.01	0.99	-0.59	1.00	-0.30
	SD	0.72	0.00	0.11	8.73	0.17	8.90
	Max	1.37	0.02	1.26	9.90	1.39	9.90
	Min	-1.90	0.00	0.74	-9.90	0.72	-9.90
ELA 7	**Mean**	-0.01	0.01	1.01	0.61	1.03	1.04
	SD	0.75	0.00	0.10	8.02	0.15	8.49
	Max	1.46	0.02	1.33	9.90	1.52	9.90
	Min	-1.79	0.00	0.80	-9.90	0.77	-9.90
ELA 8	**Mean**	0.26	0.01	0.99	-0.19	1.01	-0.45
	SD	0.70	0.00	0.10	8.52	0.18	8.85
	Max	2.18	0.02	1.24	9.90	1.38	9.90
	Min	-1.52	0.00	0.72	-9.90	0.71	-9.90

Table 7.2.2: Mathematics – Summary of the Infit and Outfit Statistics by Grade

		Measure	Model Error	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
Math 3	**Mean**	0.08	0.01	0.99	-0.45	1.01	-0.77
	SD	1.01	0.00	0.12	8.36	0.27	7.96
	Max	2.81	0.02	1.21	9.90	2.30	9.90
	Min	-2.15	0.01	0.76	-9.90	0.58	-9.90
Math 4	**Mean**	-0.04	0.01	0.99	-0.91	0.98	-1.19
	SD	0.99	0.00	0.12	8.81	0.21	8.78
	Max	2.42	0.02	1.38	9.90	1.56	9.90
	Min	-2.39	0.01	0.75	-9.90	0.62	-9.90
Math 5	**Mean**	0.01	0.01	1.00	-1.05	1.01	-1.00
	SD	0.97	0.00	0.12	7.72	0.22	7.50
	Max	2.32	0.02	1.37	9.90	1.71	9.90
	Min	-1.80	0.01	0.78	-9.90	0.67	-9.90

		Measure	Model Error	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
Math 6	**Mean**	0.03	0.01	0.99	-0.92	1.00	-0.08
	SD	0.95	0.00	0.09	7.84	0.18	8.47
	Max	1.77	0.02	1.29	9.90	1.52	9.90
	Min	-2.23	0.01	0.86	-9.90	0.66	-9.90
Math 7	**Mean**	0.21	0.01	1.00	-0.31	1.01	-0.34
	SD	1.05	0.00	0.12	8.27	0.22	8.13
	Max	2.30	0.02	1.25	9.90	1.56	9.90
	Min	-1.91	0.01	0.80	-9.90	0.67	-9.90
Math 8	**Mean**	0.33	0.01	0.99	-1.47	1.01	-1.54
	SD	0.77	0.00	0.11	8.30	0.21	8.15
	Max	2.04	0.02	1.25	9.90	1.56	9.90
	Min	-1.09	0.01	0.79	-9.90	0.70	-9.90

Table 7.2.3: Science – Summary of the Infit and Outfit Statistics by Grade

		Measure	Model Error	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
Science 4	**Mean**	0.12	0.01	0.99	-1.16	0.98	-1.21
	SD	0.33	0.00	0.08	7.70	0.13	7.96
	Max	0.90	0.01	1.17	9.90	1.25	9.90
	Min	-0.55	0.00	0.78	-9.90	0.68	-9.90
Science 8	**Mean**	-0.19	0.01	1.00	-1.15	1.00	-0.99
	SD	0.77	0.00	0.10	8.50	0.17	8.33
	Max	1.62	0.02	1.22	9.90	1.40	9.90
	Min	-2.04	0.01	0.80	-9.90	0.68	-9.90

The Item Parameter tables located in Appendix G contain the displacement statistics for the common items generated from the anchor calibrations. The displacement statistic is a measure of the size of the change in the parameter estimate that would be observed in the next iteration if the targeted parameter were unconstrained and all other parameter estimates were held constant at current values. A large displacement value indicates lack of convergence, or the presence of anchored or targeted values. It is recommended that "random displacements of less than 0.50 logits are unlikely to have much impact in a test instrument" (Linacre, 2006, p. 280) [40]. The tables in

[40] Linacre, J. M. (2006). A user's guide to Winsteps Ministep Rasch-model computer program. Chicago: MESA Press.

Appendix G show that all displacement statistics of the common items are smaller than 0.50, indicating the anchored calibrations converged well.

7.3 Summary of Cut Scores

Total scores for NJ ASK 2013 were reported in scale scores with a range of 100–300. Note that scores of 100 and 300 were a theoretical floor and ceiling and may not actually have been observed for some grades and/or content areas. However, for each test, for a perfect raw score, the scale score was set to 300. A scale score of 200 represents the cut point between Partially Proficient (PP) and Proficient (P) while a scale score of 250 represents the cut point between Proficient and Advanced Proficient (AP). The scale score ranges are as following:

Partially Proficient	100 to 199
Proficient	200 to 249
Advanced Proficient	250 to 300

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

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

where θ_1 and θ_2 are person parameter estimates that correspond to the cut score points, and $sc(y_1)$ and $sc(y_2)$ are scale score points. The above formula was adopted from Kolen and Brennan (2004, p. 337)[41]. New standards have been set for various grades and content areas of the NJ ASK assessment at different times. Regardless of when new standards have been set, $sc(y_1)$ has always been 200 and $sc(y_2)$ has always been 250. Slopes and intercepts of the transformation functions are summarized in Table 7.3.1. The following sections specify how these slopes and intercepts were used to generate the scale scores in each content area and grade level. The complete raw to scale score conversion tables can be found in Appendix H.

[41] Kolen, M. J., & Brennan, R. L. (2004). *Test equating: Methods and practice*. NY: Springer.

Table 7.3.1: Slope and Intercept of Theta to Scale Score Transformation

Test	Grade	Proficient			Advanced Proficient			Slope	Intercept
		RS	Theta	SS	RS	Theta	SS		
ELA	3	25	0.0539	200	38	2.3663	250	21.66	196.39
	4	31	0.2312	200	43	2.0806	250	26.40	193.00
	5	33	0.2383	200	47	1.9658	250	28.41	191.97
	6	38	0.4088	200	55	2.3214	250	25.91	188.59
	7	37	0.0316	200	51.5	1.5050	250	33.07	198.38
	8	36.5	0.3283	200	56	2.5253	250	22.35	192.36
Math	3	23	0.0998	200	36	1.4043	250	38.76	192.26
	4	24	0.0188	200	38	1.4271	250	36.98	196.89
	5	24	0.1104	200	38	1.6655	250	32.12	195.32
	6	23	0.0129	200	38	1.6069	250	31.54	196.96
	7	24	0.2831	200	37	1.6500	250	33.84	190.37
	8	24	0.3025	200	37	1.6040	250	36.45	187.18
Science	4	17	-0.0020	200	28	0.6648	250	73.99	198.51
	8	26	-0.1738	200	41	1.2227	250	33.51	205.16

After calibrating the 2013 ELA and Mathematics assessments in grades 3-8 and the Science assessments in grades 4 and 8 to the base scales, the raw score to theta conversion table produced by Winsteps was used to develop the raw score to scale score tables. Using the slopes and intercepts shown in Table 7.3.1, linear transformations of the Winsteps theta estimates were conducted to produce the final content area scaled scores for grades 3-8.

NJDOE policy requires that scaled scores below 100 are rounded up to 100 and scaled scores above 300 are rounded down to 300. Additionally, NJDOE requires that the following rules apply:

1. If a raw score maps to an unrounded scaled score that is greater than 199.499 and less than or equal to 200.000, it will serve as the proficient cut score. Otherwise, the highest raw score that maps to a scaled score less than or equal to 199.499 will serve as the cut score. The selected cut score will be assigned a value of exactly 200.
2. If a raw score maps to an unrounded scaled score that is greater than 249.499 and less than or equal to 250.000, it will serve as the advanced cut score. Otherwise, the highest raw score that maps to a scaled score less than or equal to 249.499 will serve as the cut score. The selected cut score will be assigned a value of exactly 250.
3. In the unlikely event that two scores fall >199.499 and <200.000 or >249.999 and <250.000, the lower of these two scores would become the cut score.
4. When the implementation of the above rounding rules results in two raw scores mapping to a rounded scaled score of 200 or two raw scores mapping to a rounded scaled score 250, the scaled score associated with the higher of the two raw scores will be adjusted upwards by one (1) scaled score. Thus, the higher of the two raw

scores at the proficient or advanced proficient cut point will be mapped to a rounded scaled score of 201 or 251, respectively.

7.4 Equating and Scaling for Braille, Large Print, and Alternate forms

This section describes the equating procedures for scores from the Large Print, Braille, and Alternate forms of the NJ ASK 2013. Items that the Commission of the Blind deemed inappropriate were not scored for student with visual impairments. Braille and Large Print test forms were constructed by removing the inappropriate items from the corresponding regular test forms. No items were removed from the 2013 NJ ASK Large Print forms for any grade/content areas. Additionally, no items were removed from the Braille forms of the ELA tests; however the writing tasks were replaced. All required modifications are summarized in Table 7.4.1. Results from these "special equatings" appear in Appendix H.

Table 7.4.1: Special Equatings

	Total Items	# Items Removed or Modified	Raw Score Range
ELA Grade 3			
Alternate	23	None	0-50
Braille	23	None	0-50
ELA Grade 4			
Alternate	29	None	0-56
Braille	29	None	0-56
ELA Grade 5			
Alternate	35	None	0-62
Braille	35	None	0-62
ELA Grade 6			
Alternate	42	None	0-70
Braille	42	None	0-70
ELA Grade 7			
Alternate	42	None	0-70
Braille	42	None	0-70
Special Equating	36	6	0-61
ELA Grade 8			
Alternate	42	None	0-70
Braille	42	None	0-70

Mathematics Grade 3			
Alternate	44	None	0-50
Braille	44	None	0-50
Mathematics Grade 4			
Alternate	44	None	0-50
Braille	44	None	0-50
Mathematics Grade 5			
Alternate	44	None	0-50
Braille	43	1	0-49
Spanish	43	1	0-49
Mathematics Grade 6			
Alternate	43	None	0-49
Braille	43	None	0-49
Mathematics Grade 7			
Alternate	43	None	0-49
Braille	43	None	0-49
Mathematics Grade 8			
Alternate	43	None	0-49
Braille	39	4	0-41
Science Grade 4			
Alternate	35	None	0-39
Braille	33	2	0-37
Science Grade 8			
Alternate	50	None	0-54
Braille	50	None	0-54

Braille and Large Print Tests. Several assumptions had to be made in order to equate the scores of the Braille and Large Print tests to the scores of the regular test. First, it was assumed that the latent trait measured by the Braille tests and the regular test was the same. Given the fact that the same items were used across the tests within each content area, with the exception of the removed items, it seemed reasonable to assume that changes to item format or item presentation would not greatly change the overall latent trait or construct measured by each assessment.

A second, stronger assumption, however, was that item parameters across the tests within each content area were identical. This of course is a very strong assumption considering the different item formats across the tests. However, this assumption was necessary because sample sizes for

the Braille tests were too small to get reliable parameter estimates. Moreover, making these assumptions is considered common and current best practice for these populations. Because the first assumption noted above is reasonable, i.e., for each test the mathematics assessment measures mathematics, the following steps for equating the Braille tests to the regular tests were used:

- Conduct an anchored item calibration. The items in Table 7.4.1 were removed and the parameters and steps of the Braille test items were fixed with the estimates resulting from the corresponding regular test items.

- Transform the theta metric to the scale score metric. Because the theta values obtained from the anchored calibration and those obtained from the regular test score calibration are on the same metric, the transformation functions applied to the regular test scores can be applied to the Braille test scores.

- Create raw score to scale score look-up tables for each Braille test. In cases where no raw score corresponds to the cut scale scores (200 for Proficient and 250 for Advanced Proficient), the raw score point immediately below the cut score was assigned as the cut point scale score.

Alternate Forms. A security violation or a deviation from the standardized administration procedures of the NJ ASK is defined as a testing breach. An alternate form of the test was constructed for each grade and content area of the 2013 NJ ASK tests with items from previous administrations. The alternate form was administered to all students of a given grade/content area affected when a breach occurred. Equating of the alternate forms was conducted in a manner similar to that used with the Braille**.**

PART 8: RELIABILITY

The New Jersey Department of Education is required by federal law to ensure that the instruments it uses to measure student achievement for school accountability provide reliable results. This section shows that results of the NJ ASK 2013 3–8 measure student achievement in a reliable manner. The size of the measurement error associated with test scores is reasonable and can be taken into account when interpreting the scores for individual students.

8.1 Classical Reliability Estimates of Test Scores

Reliability and Measurement Error

A detailed review of the relationship between reliability and measurement can be found in the 2009 NJ ASK Technical Report (PTM 1507-34), Part 8 , section 8.1.

Raw Score Internal Consistency

Consistency of individual student performance was estimated using Cronbach's coefficient alpha. Coefficient alpha is conceptualized as the proportion of total raw score variance that may be attributed to a student's true score variance. Ideally, more score variance should be attributable to true test scores than to measurement error. Alpha is an appropriate index of internal consistency for use on untimed tests such as NJ ASK.

Separate analyses were performed for each grade level and content area. Both MC and CR items scores were used in the computations. Coefficient alpha can be interpreted as a lower bound to reliability and was estimated using the following formula:

$$\alpha_{\text{Cronbach}} = \frac{n}{n-1}\left[1-\frac{\sum_{i=1}^{n}\sigma_{Y_i}^2}{\sigma_X^2}\right],$$

where n is the number of items, $\sigma_{Y_i}^2$ is the variance of item i, and σ_X^2 is the variance of total score. SEMs were calculated using the following formula: $SEM = S_X\sqrt{1-\alpha_{\text{Cronbach}}}$,
where S_X is the standard deviation of observed total scores. Table 8.1.1 summarizes coefficient alpha and SEMs by content and form. Note that the special education and CLEP N counts are included in the content area N counts as well as reported separately in Table 8.1.1; however, the Spanish version is excluded from the N counts. Tables 8.1.2 through 8.1.7 summarize coefficient alpha and SEMs of content clusters by test. Tables 8.1.2a – 8.1.7a summarize coefficient alpha and SEMs by item type at the test and cluster level for MC items and at the test level for SCR items. Reliability coefficients are commonly low when based upon small numbers of items [42]. Note that Spanish test takers are include in Tables 8.1.2 through 8.1.7.

(See the following for a further discussion of the relationship between measures of reliability and numbers of items: Traub, R. E. and Rowley, G. L. (2008). Understanding reliability. *Instructional topics in educational measurement.*

Table 8.1.1: Summary of Coefficient Alpha and SEM by Grade and Content Area

Test	Form*	Grade	N-count	Cronbach Alpha	SEM
ELA	OP	3	100831	0.81	2.91
	OP	4	100561	0.86	3.06
	OP	5	99867	0.87	3.27
	OP	6	101569	0.88	3.39
	OP	7	101884	0.88	3.47
	OP	8	102493	0.89	3.28
Spanish ELA	SP	3	686	0.76	3.60
	SP	4	737	0.77	3.76
	SP	5	740	0.78	3.92
	SP	6	784	0.78	3.93
	SP	7	879	0.77	3.71
	SP	8	899	0.80	4.00
ELA Special Education	OP	3	16207	0.83	3.01
	OP	4	16856	0.86	3.34
	OP	5	16606	0.85	3.51
	OP	6	16514	0.87	3.68
	OP	7	15983	0.85	3.71
	OP	8	16093	0.87	3.63
ELA Current Limited English Proficient	OP	3	5574	0.76	3.04
	OP	4	3520	0.80	3.41
	OP	5	2627	0.81	3.59
	OP	6	2338	0.82	3.79
	OP	7	2476	0.81	3.73
	OP	8	2499	0.83	3.86
Mathematics	OP	3	101150	0.91	3.12
	OP	4	100870	0.90	3.09
	OP	5	100170	0.93	2.94
	OP	6	101804	0.91	3.04
	OP	7	102150	0.92	3.10
	OP	8	102581	0.92	3.05
Spanish Mathematics	SP	3	686	0.88	3.04
	SP	4	738	0.86	3.13
	SP	5	693	0.88	2.89
	SP	6	781	0.87	2.98
	SP	7	883	0.83	2.92
	SP	8	895	0.85	2.95
Mathematics Special Education	OP	3	16244	0.92	3.13
	OP	4	16897	0.91	3.20
	OP	5	16611	0.93	3.08
	OP	6	16528	0.91	3.15
	OP	7	15989	0.89	3.06
	OP	8	16036	0.90	3.12

Madison, WI: National Council on Measurement and Education 176-177. [42]

Table 8.1.1: Summary of Coefficient Alpha and SEM by Grade and Content Area (continued)

Test	Form*	Grade	N-count	Cronbach Alpha	SEM
Mathematics Current Limited English Proficient	OP	3	5830	0.90	3.13
	OP	4	3774	0.89	3.20
	OP	5	2180	0.93	3.01
	OP	6	2567	0.91	3.09
	OP	7	2718	0.89	3.05
	OP	8	2716	0.91	3.06
Science	OP	4	100821	0.83	2.68
	OP	8	102579	0.90	3.17
Spanish Science	SP	4	737	0.75	2.92
	SP	8	899	0.77	3.30
Science Special Education	OP	4	16911	0.85	2.80
	OP	8	16090	0.88	3.32
Science Current Limited English Proficient	OP	4	3770	0.80	2.90
	OP	8	2719	0.83	3.33

- OP: Operational Test; SP: Spanish Version; SE: Special Education, LEP: Current Limited English Proficient N-counts were insufficient to produce values for Braille and Large Print.

Table 8.1.2: Grade 3 Coefficient Alpha and SEM for Clusters

	Number of Items			Max		
	MC	CR	SCR	Points	Alpha	SEM
ELA	**18**	**5**		**50**	**0.81**	**2.91**
Writing		2		20	0.76	1.36
Reading	18	3		30	0.79	2.12
Literature	6	1		10	0.54	1.19
Informational Text	12	2		20	0.70	1.82
Math	**35**	**3**	**6**	**50**	**0.91**	**3.12**
Geometry (G)	6			6	0.60	0.88
Measurement and Data (MD)	13			13	0.79	1.36
Num.&Ops in Base Ten (NBT)	4		2	6	0.72	0.94
Nums. & Ops – Fractions (NF)	3	2	2	11	0.68	1.71
Ops&Algebraic Thinking (OA)	9	1	2	14	0.74	1.74

Table 8.1.2.a: Grade 3 Coefficient Alpha and SEM for MC Clusters and SCRs*

Subject/Cluster	Number of Items	Alpha	SEM
ELA MC	**18**	**0.73**	**1.76**
Literature	6	0.44	1.02
Informational Text	12	0.63	1.50
Math MC	**35**	**0.89**	**2.33**
Geometry (G)	6	0.60	0.88
Measurement and Data (MD)	13	0.79	1.36
Num. & Ops in Base Ten (NBT)	4	0.59	0.75
Nums. & Ops – Fractions (NF)	3	0.46	0.72
Ops & Algebraic Thinking (OA)	9	0.64	1.27
Math SCR	**6**	**0.71**	**0.98**

*Except where a cluster contains no constructed responses (extended or short), the statistics apply to item types that comprise parts of tests or parts of clusters.

Table 8.1.3: Grade 4 Coefficient Alpha and SEM for Clusters

	Number of Items			Max		
	MC	CR	SCR	Points	Alpha	SEM
ELA	**24**	**5**		**56**	**0.87**	**3.07**
Writing		2		20	0.78	2.81
Reading	24	3		36	0.86	2.34
Literature	8	1		12	0.65	1.35
Informational Text	16	2		24	0.82	1.90
Math	**35**	**3**	**6**	**50**	**0.90**	**3.09**
Geometry (G)	3	1		6	0.40	1.17
Measurement and Data (MD)	3	1		6	0.47	1.11
Num.&Ops in Base Ten (NBT)	8		2	10	0.73	1.19
Nums. & Ops – Fractions (NF)	12	1	3	18	0.79	1.85
Ops&Algebraic Thinking (OA)	9		1	10	0.67	1.33
Science	**33**	**2**		**39**	**0.84**	**2.68**
Life Science	12	1		15	0.66	1.64
Physical Science	10	1		13	0.59	1.56
Earth Science	11	0		11	0.63	1.44
Knowledge	*5*	*0*		*5*	*0.44*	*0.88*
Application	*28*	*2*		*34*	*0.76*	*2.89*

Table 8.1.3.a: Grade 4 Coefficient Alpha and SEM for MC Clusters and SCRs*

Subject/Cluster	Number of Items	Alpha	SEM
ELA MC	24	**0.84**	**2.06**
Literature	8	0.59	1.18
Informational Text	16	0.80	1.67
Math MC	**35**	**0.89**	**2.38**
Geometry (G)	3	0.45	0.62
Measurement and Data (MD)	3	0.36	0.75
Num. & Ops in Base Ten (NBT)	8	0.68	1.07
Nums. & Ops – Fractions (NF)	12	0.76	0.46
Ops & Algebraic Thinking (OA)	9	0.65	1.25
Math SCR	**6**	**0.56**	**1.50**
Science MC	**33**	**0.63**	**2.82**
Life Science	12	0.62	1.40
Physical Science	10	0.54	1.89
Earth Science	11	0.63	1.44
Knowledge	*5*	*0.44*	*0.88*
Application	*28*	*0.72*	*2.60*

*Except where a cluster contains no constructed responses (extended or short), the statistics apply to item types that comprise parts of tests or parts of clusters.

Table 8.1.4: Grade 5 Coefficient Alpha and SEM for Clusters

	Number of Items			Max		
	MC	CR	SCR	Points	Alpha	SEM
ELA	**30**	**5**		**62**	**0.87**	**3.27**
Writing		2		20	0.80	1.25
Reading	30	3		42	0.86	2.61
Literature	10	1		14	0.69	1.56
Informational Text	20	2		28	0.80	2.08
Math	**33**	**3**	**8**	**50**	**0.93**	**2.96**
Geometry (G)	4		2	6	0.66	0.88
Measurement and Data (MD)	10		3	13	0.82	1.39
Num. & Ops in Base Ten (NBT)	7	1	1	11	0.64	1.44
Nums. & Ops – Fractions (NF)	7	2	1	14	0.81	1.66
Ops & Algebraic Thinking (OA)	5		1	6	0.64	0.92

Table 8.1.4.a: Grade 5 Coefficient Alpha and SEM for MC Clusters and SCRs*

Subject/Cluster	Number of Items	Alpha	SEM
ELA MC	**30**	**0.84**	**2.38**
Literature	10	0.65	1.38
Informational Text	20	0.78	1.93
Math MC	**33**	**0.90**	**2.19**
Geometry (G)	4	0.50	0.75
Measurement and Data (MD)	10	0.75	1.22
Num. & Ops in Base Ten (NBT)	7	0.62	0.94
Nums. & Ops – Fractions (NF)	7	0.77	1.18
Ops & Algebraic Thinking (OA)	5	0.58	0.83
Math SCR	**8**	**0.79**	**0.99**

*Except where a cluster contains no constructed responses (extended or short), the statistics apply to item types that comprise parts of tests or parts of clusters.

Table 8.1.5: Grade 6 Coefficient Alpha and SEM for Clusters

	Number of Items			Max		
	MC	CR	SCR	Points	Alpha	SEM
ELA	**36**	**6**		**70**	**0.88**	**3.40**
Writing		2		18	0.68	1.43
Reading	36	4		52	0.87	2.82
Literature	9	1		13	0.68	1.39
Informational Text	27	3		39	0.83	2.46
Math	**32**	**3**	**8**	**49**	**0.91**	**3.04**
Number & Numerical Operations	10	0	3	13	0.77	1.50
Geometry & Measurement	9	1	2	14	0.73	1.70
Patterns & Algebra	9	1	2	14	0.76	1.50
Data Analysis, Probability, & Discrete Mathematics	4	1	1	8	0.57	1.37
Problem Solving	*10*	*3*	*4*	*20*	*0.84*	*2.35*
Calculator	*20*	*2*	*0*	*26*	*0.86*	*2.24*

Table 8.1.5.a: Grade 6 Coefficient Alpha and SEM for MC Clusters and SCRs*

Subject/Cluster	Number of Items	Alpha	SEM
ELA MC	**36**	**0.85**	**2.61**
Literature	9	0.63	1.28
Informational Text	27	0.80	2.28
Math MC	**32**	**0.88**	**2.30**
Number & Numerical Operations	10	0.71	1.33
Geometry & Measurement	9	0.67	1.24
Patterns & Algebra	9	0.70	1.12
Data Analysis, Probability, & Discrete Mathematics	4	0.45	0.84
Problem Solving	*10*	*0.68*	*1.39*
Calculator	*20*	*0.83*	*1.82*
Math SCR	**8**	**0.67**	**1.09**

*Except where a cluster contains no constructed responses (extended or short), the statistics apply to item types that comprise parts of tests or parts of clusters.

Table 8.1.6: Grade 7 Coefficient Alpha and SEM for Clusters

	Number of Items			Max		
	MC	CR/ECR	SCR	Points	Alpha	SEM
ELA	**36**	**6**		**70**	**0.88**	**3.47**
Writing		2		18	0.67	1.45
Reading	36	4		52	0.87	2.92
Literature	9	1		13	0.56	1.45
Informational Text	27	3		39	0.85	2.50
Math	**32**	**3**	**8**	**49**	**0.92**	**3.10**
Number & Numerical Operations	9	1	1	13	0.74	1.63
Geometry & Measurement	9	1	2	14	0.76	1.63
Patterns & Algebra	8	1	3	14	0.76	1.70
Data Analysis, Probability, & Discrete Mathematics	6	0	2	8	0.68	1.18
Problem Solving	*16*	*3*	*4*	*29*	*0.87*	*2.42*
Calculator	*20*	*2*	*0*	*26*	*0.84*	*2.38*

Table 8.1.6.a: Grade 7 Coefficient Alpha and SEM for MC Clusters and SCRs*

Subject/Cluster	Number of Items	Alpha	SEM
ELA MC	**36**	**0.84**	**2.65**
Literature	9	0.48	1.30
Informational Text	27	0.82	2.28
Math MC	**32**	**0.87**	**2.34**
Number & Numerical Operations	9	0.64	1.30
Geometry & Measurement	9	0.67	1.21
Patterns & Algebra	8	0.62	1.13
Data Analysis, Probability, & Discrete Mathematics	6	0.60	1.02
Problem Solving	*16*	*0.78*	*1.64*
Calculator	*20*	*0.82*	*1.91*
Math SCR	**8**	**0.77**	**1.12**

*Except where a cluster contains no constructed responses (extended or short), the statistics apply to item types that comprise parts of tests or parts of clusters.

Table 8.1.7: Grade 8 Coefficient Alpha and SEM for Clusters

	Number of Items					
	MC	**CR**	**SCR**	**Max Points**	**Alpha**	**SEM**
ELA	**36**	**6**		**70**	**0.89**	**3.29**
Writing		2		18	0.69	1.40
Reading	36	4		52	0.88	2.72
Literature	9	1		13	0.59	1.33
Informational Text	27	3		39	0.85	2.38
Math	**32**	**3**	**8**	**49**	**0.92**	**3.06**
Number & Numerical Operations	6	1	4	13	0.76	1.66
Geometry & Measurement	13	0	1	14	0.76	1.57
Patterns & Algebra	10	1	1	14	0.81	1.57
Data Analysis, Probability, & Discrete Mathematics	3	1	2	8	0.66	1.26
Problem Solving	*15*	*3*	*3*	*27*	*0.87*	*2.51*
Calculator	*20*	*2*	*0*	*26*	*0.87*	*2.26*
Science	**48**	**2**		**54**	**0.90**	**3.17**
Life Science	20	1		23	0.80	2.02
Physical Science	16	0		16	0.69	1.68
Earth Science	12	1		15	0.74	1.76
Knowledge	*8*	*0*		*8*	*0.51*	*1.16*
Application	*40*	*2*		*46*	*0.85*	*3.52*

Table 8.1.7.a: Grade 8 Coefficient Alpha and SEM for MC Clusters and SCRs*

Subject/Cluster	Number of Items	Alpha	SEM
ELA MC	**36**	**0.85**	**2.48**
Literature	9	0.55	1.24
Informational Text	27	0.82	2.16
Math MC	**32**	**0.88**	**2.36**
Number & Numerical Operations	6	0.58	1.04
Geometry & Measurement	13	0.74	1.52
Patterns & Algebra	10	0.75	1.27
Data Analysis, Probability, & Discrete Mathematics	3	0.45	0.72
Problem Solving	*15*	*0.79*	*1.85*
Calculator	*20*	*0.84*	*1.84*
Math SCR	**8**	**0.77**	**1.14**
Science MC	**48**	**0.89**	**3.30**
Life Science	20	0.79	1.83
Physical Science	16	0.69	1.68
Earth Science	12	0.71	1.47
Knowledge	*8*	*0.51*	*1.16*
Application	*40*	*0.85*	*3.22*

*Except where a cluster contains no constructed responses (extended or short), the statistics apply to item types that comprise parts of tests or parts of clusters.

8.2 Reliability of Performance Classifications

Two measures of reliability are presented below in Table 8.2.1. Stratified Alpha is used to assess the reliability of the different item types, e.g., multiple choice and constructed response. Stratified Cronbach Alpha can be calculated using the following formula:

$$\text{Stratified } \alpha = 1 - \frac{\sum \sigma_i^2 \left(1 - \rho_{ii'}\right)}{\sigma_t^2}$$ [43]

where

σ_i^2 = variance of score on cluster *i*,

σ_t^2 = variance of total score, and

$\rho_{ii'}$ = reliability coefficient of score on cluster *i*.

[43] Maryland school assessment – Reading: Grades 3 through 8 (2004). http://www.marylandpublicschools.org/NR/rdonlyres/26BD65BE-6F27-4F35-8699-139BC98BF99F/8812/2004_MDTech_Reading_Report_3.pdf

Reliability index for proficiency classifications (kappa) is an estimate of how reliably the test classifies students into the performance categories (Partially Proficient, Proficient, and Advanced Proficient). Kappa was computed with the BB-CLASS program (Brennan, 2004)[44] that is based on the beta-binomial model. Coefficient kappa is given by:

$$\kappa = \frac{\varphi - \varphi_c}{1 - \varphi_c},$$

where φ is the probability of a consistent classification and φ_c is the probability of a consistent classification by chance. A classification consistency index can be regarded as the percentage of examinees that would be assigned to, hypothetically, the same achievement level if the same test was administered a second time or an equivalent test was administered under the same conditions.

Table 8.2.1 displays two cut scores for each grade level and content area. The lower cut score is the minimum raw score required to be classified as proficient and the higher cut score is the minimum raw score required for classification as advanced proficient.

Table 8.2.1: Consistency Indices for Performance Levels

Test	Grade	Stratified Alpha		Cut Score	Kappa	φ
		Coefficient	SEM			
ELA	3	0.87	2.45	25, 38	0.55	78%
	4	0.90	2.62	31, 43	0.58	76%
	5	0.90	2.84	33, 47	0.60	77%
	6	0.90	3.12	38, 55	0.62	81%
	7	0.90	3.20	37, 51.5	0.60	76%
	8	0.91	3.00	36.5, 56	0.56	80%
Math	3	0.92	2.97	23, 36	0.66	78%
	4	0.91	3.00	24, 38	0.65	77%
	5	0.93	2.79	24, 38	0.71	81%
	6	0.92	2.90	23, 38	0.66	78%
	7	0.93	2.94	24, 37	0.69	79%
	8	0.93	2.90	24, 37	0.68	79%
Science	4	0.84	2.64	17, 28	0.57	74%
	8	0.90	3.11	26, 41	0.65	78%

[44] Brennan, R. L. (2004). Manual for BB-CLASS: A computer program that uses the beta-binomial model for classification consistency and accuracy (version 1). CASMA Research Report 9. Iowa City, IA.

Item Maps and Test Information Functions

Item maps for ELA, mathematics, and science are presented in Appendix I. These Figures indicate how well the item difficulties and person ability levels match.

The test information function is another method of assessing the reliability or the precision of a test. The reliability of a test, however, is not uniform across the entire range of test scores. The highest and lowest scores typically have more measurement error than do scores in the middle of the range because more examinees tend to score in the middle of the score range. With item response theory (IRT), the item and test information functions can assess test reliability across the range of scores. The item information function is the probability of a correct response multiplied by the probability of an incorrect response. Item information functions (I_{ij}) for every item (j) at every level of student ability (i) can be calculated for each item using the following equation:

$$\boldsymbol{I_{ij}\left(\theta_i, \delta_j\right) = P_{ij} * \left(1 - P_{ij}\right)}$$

The total test information function for a given ability level is simply the sum of all the item information functions for that ability level (Lord & Novick, 1968[45]; Hambleton, 1989[46]). Computing an item information function for each ability level and summing these functions to derive test information functions for each ability level, one can plot the total information function for a test, as shown in Figures 8.2.2 – 8.2.15. Each item yields the greatest amount of information at the point at which the difficulty of the item (δ_j) is equal to the ability of the student (θ_i).

These figures illustrate the level of information at theta values ranging from -4 to $+4$. As shown, the information or reliability of the test scores is lower at the extremes and higher in the middle. More information implies less measurement error. Ideally, the Proficient cut score would occur at the peak of the information function where the most information and the least measurement error occur. Thus, scores in this area yield the most error free measurements. Two arrows appear in each TIF shown below. The arrow with the lower value on the x-axis (measure) represents the proficient cut and the arrow with the higher value represents the advance proficient cut. As depicted in these figures, the Proficient cut scores for ELA, mathematics, and science all occur near the peak of information.

[45] Lord, F. M., & Novick, M. R. (1968). *Statistical theories of mental test scores*. Reading MA: Addison-Welsley.
[46] Hambleton, R. K. (1989). Principles and selected applications of item response theory. In R. L. Linn (Ed.), *Educational measurement* (3rd ed.). New York: American Council on Education and Macmillan.

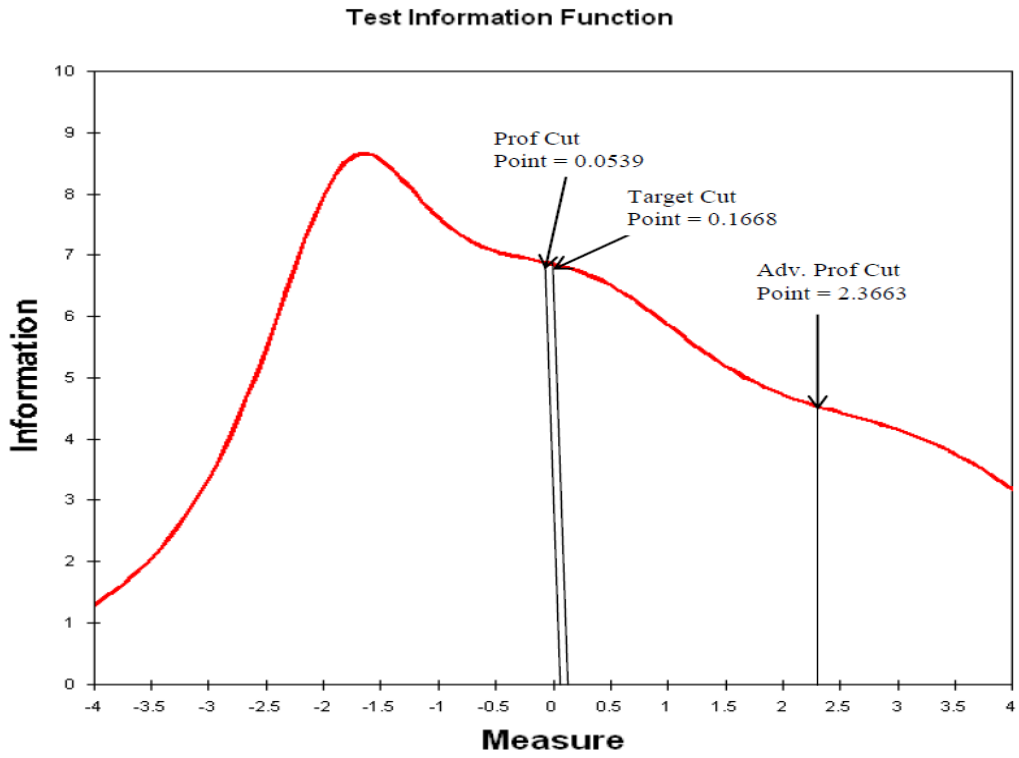

Figure 8.2.1: Grade 3 ELA Test Information Function

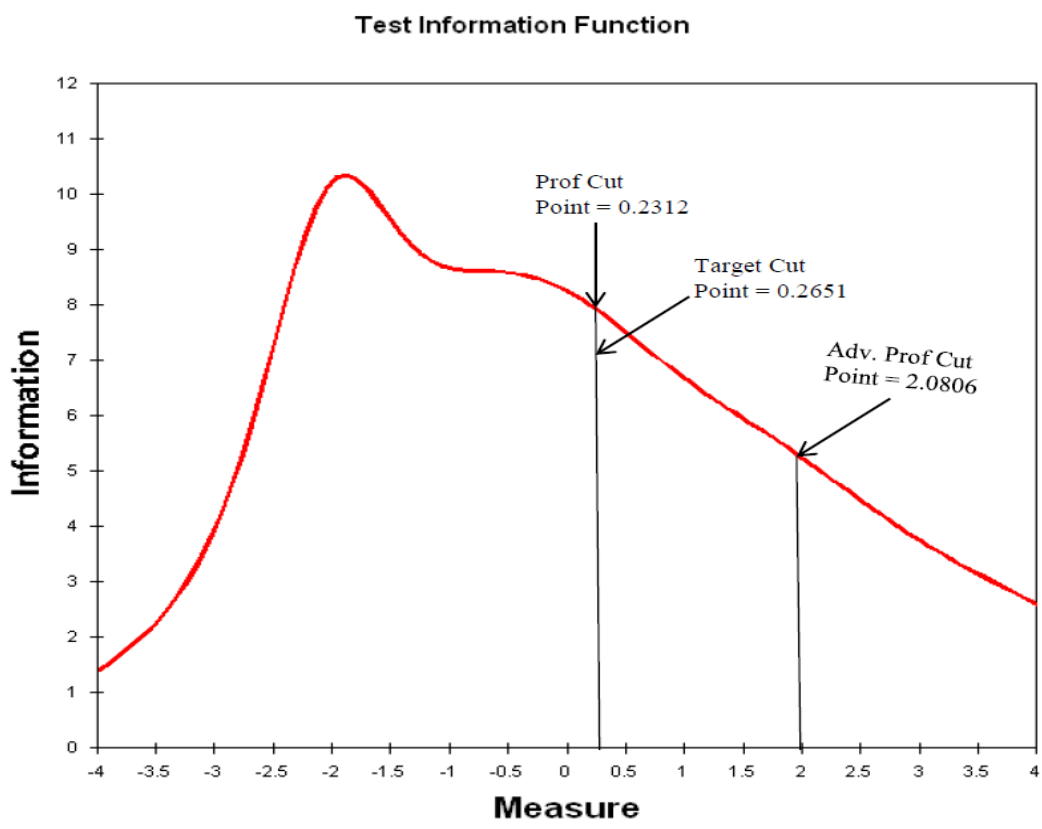

Figure 8.2.2: Grade 4 ELA Test Information Function

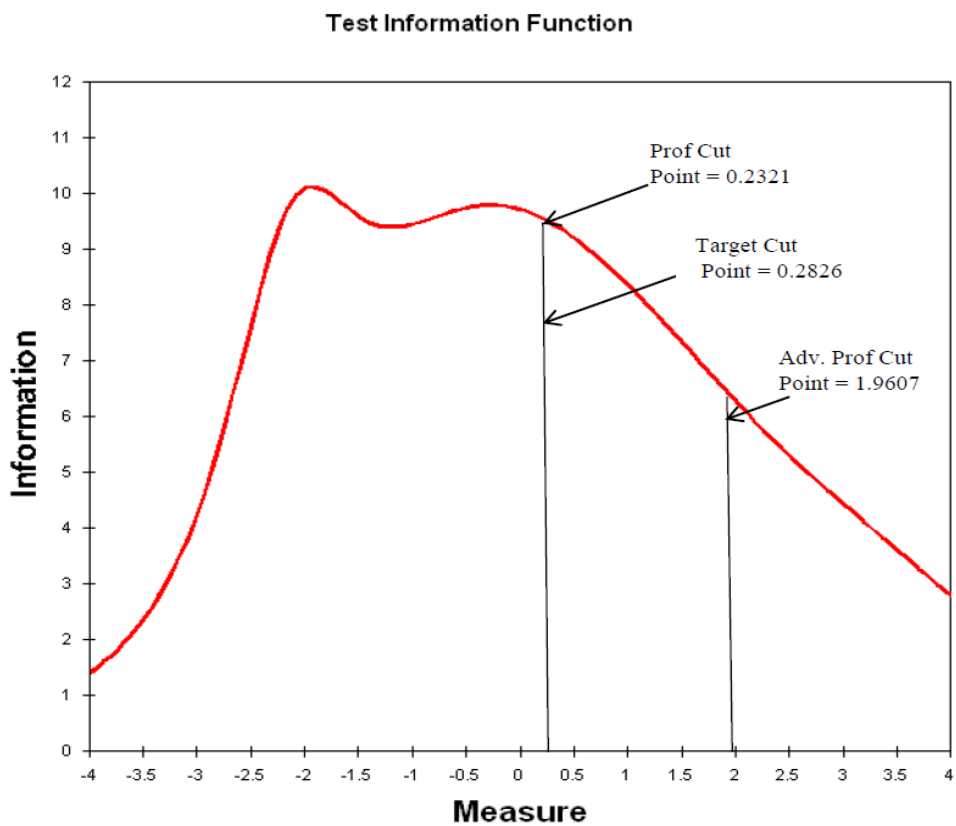

Figure 8.2.3: Grade 5 ELA Test Information Function

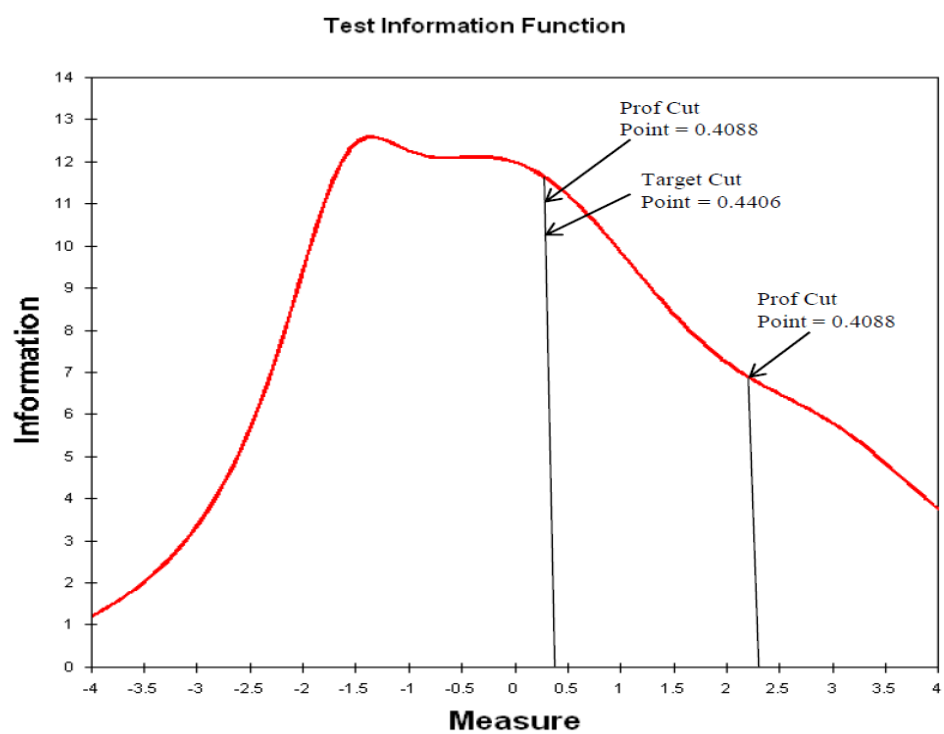

Figure 8.2.4: Grade 6 ELA Test Information Function

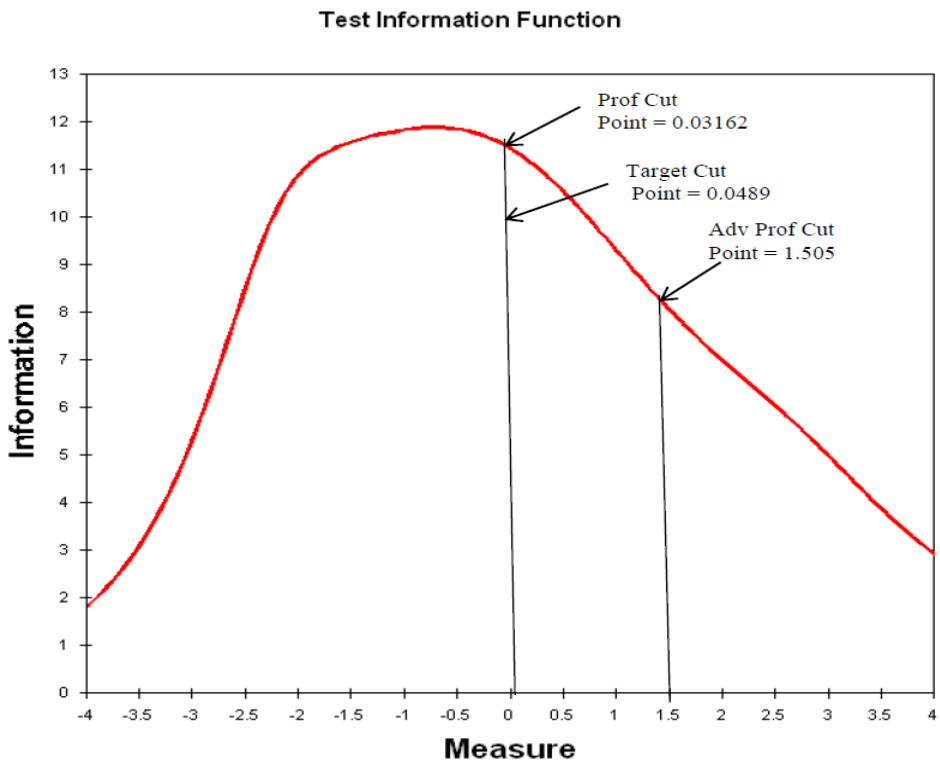

Figure 8.2.5: Grade 7 ELA Test Information Function

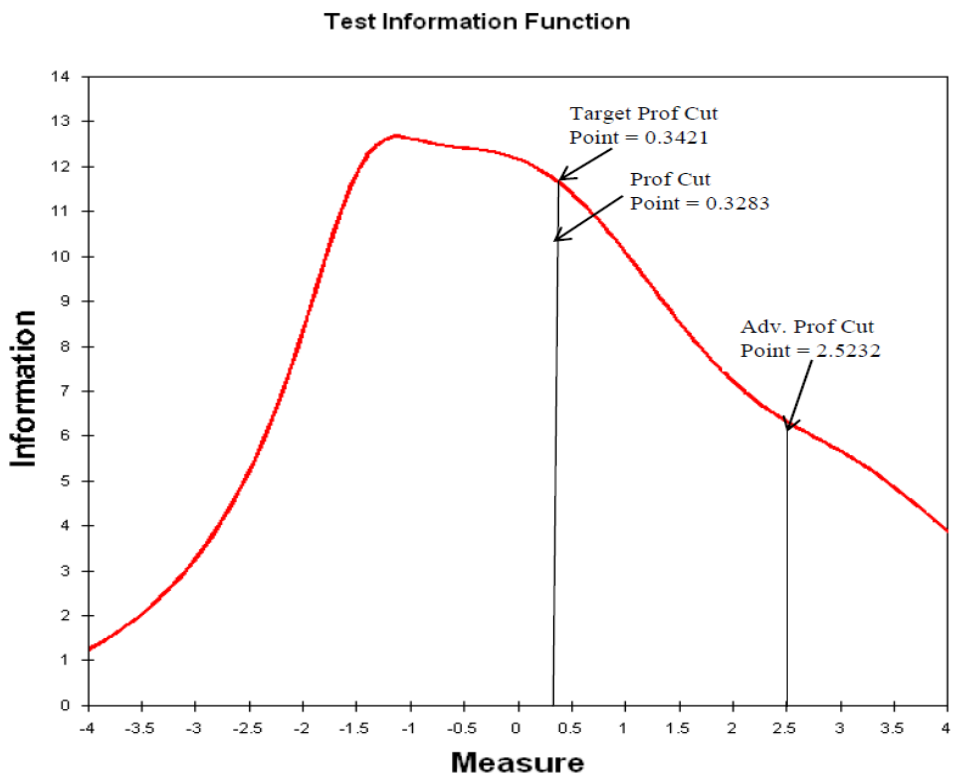

Figure 8.2.6: Grade 8 ELA Test Information Function

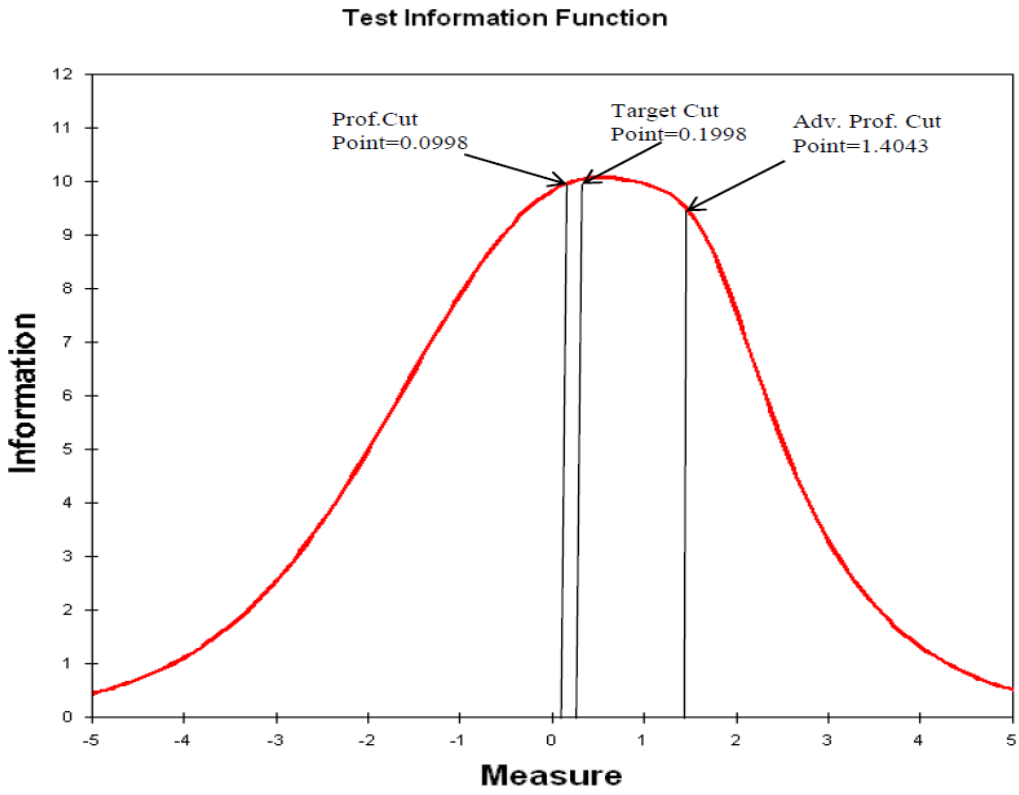

Figure 8.2.7: Grade 3 Math Test Information Function

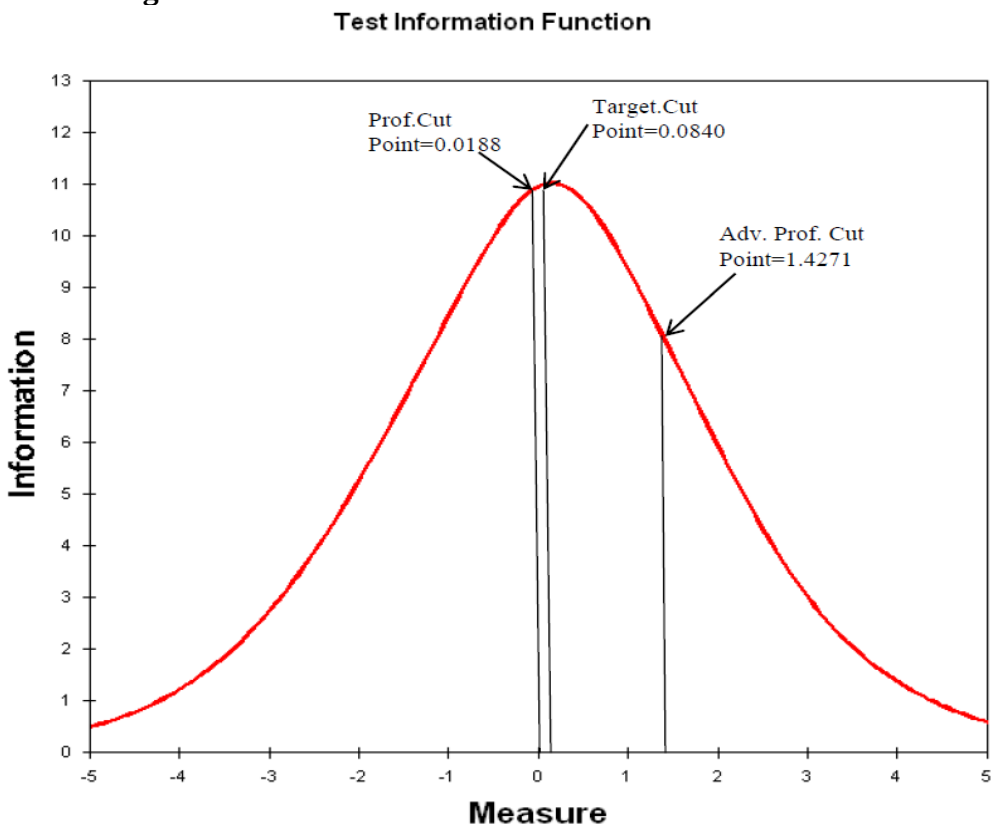

Figure 8.2.8: Grade 4 Math Test Information Function

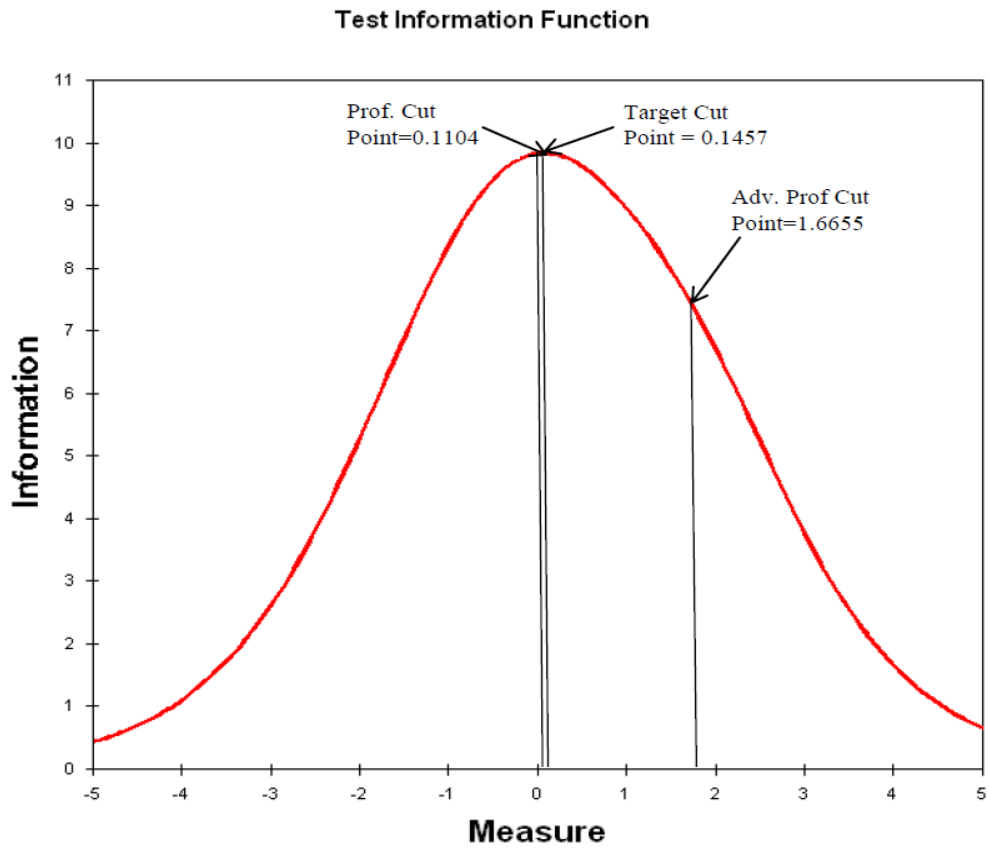

Figure 8.2.9: Grade 5 Math Test Information Function

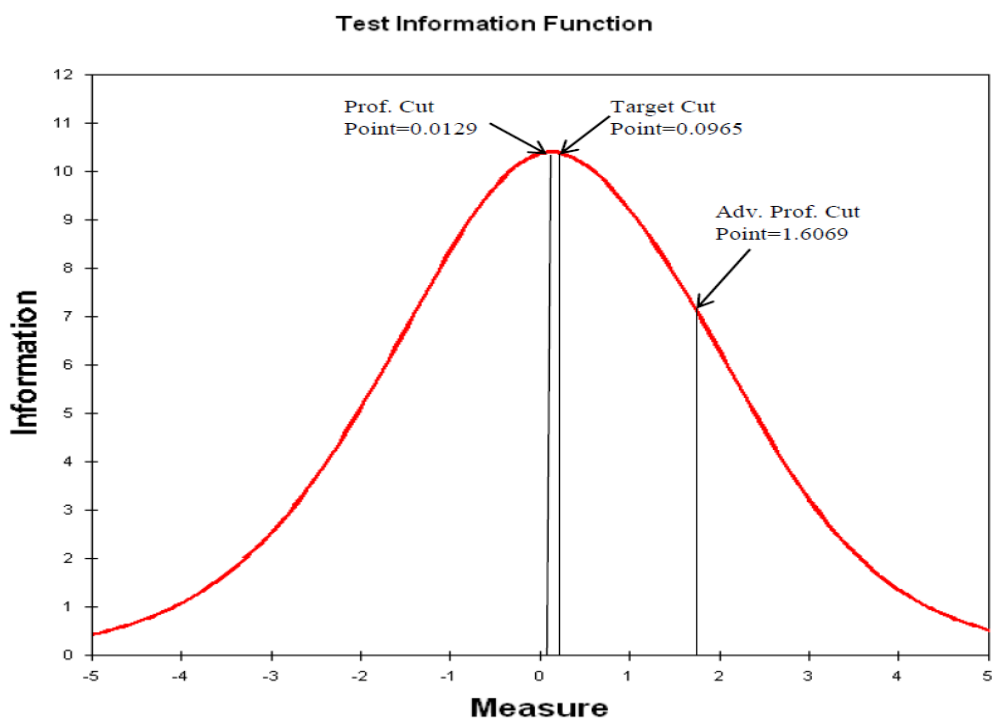

Figure 8.2.10: Grade 6 Math Test Information Function

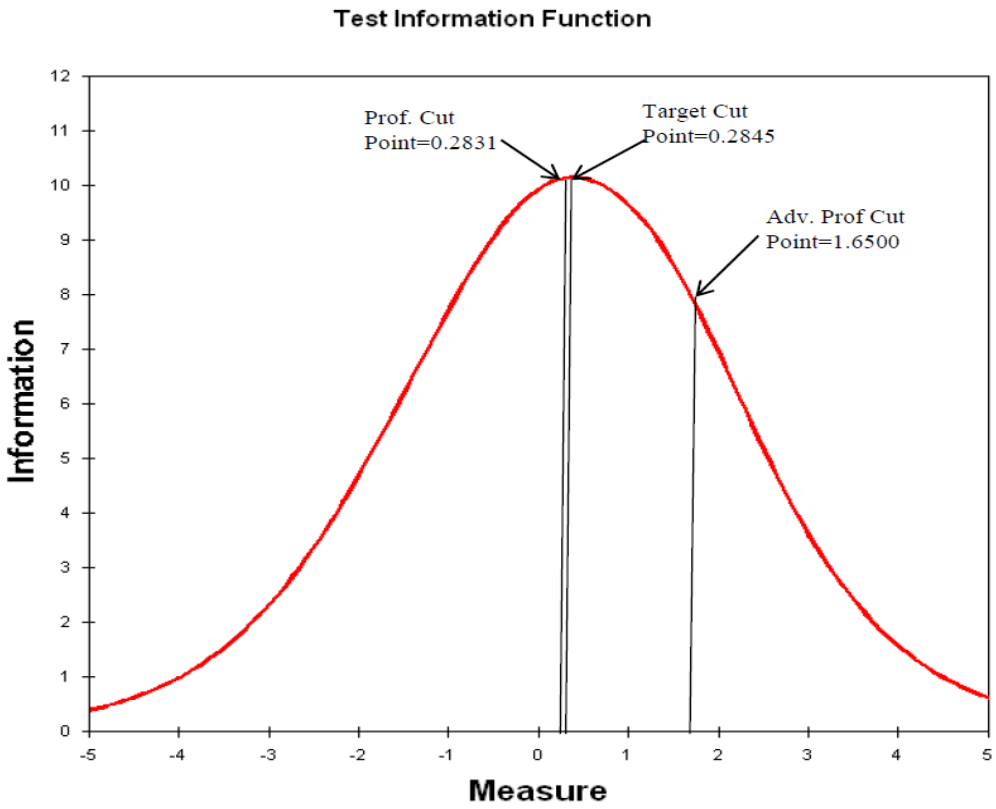

Figure 8.2.11: Grade 7 Math Test Information Function

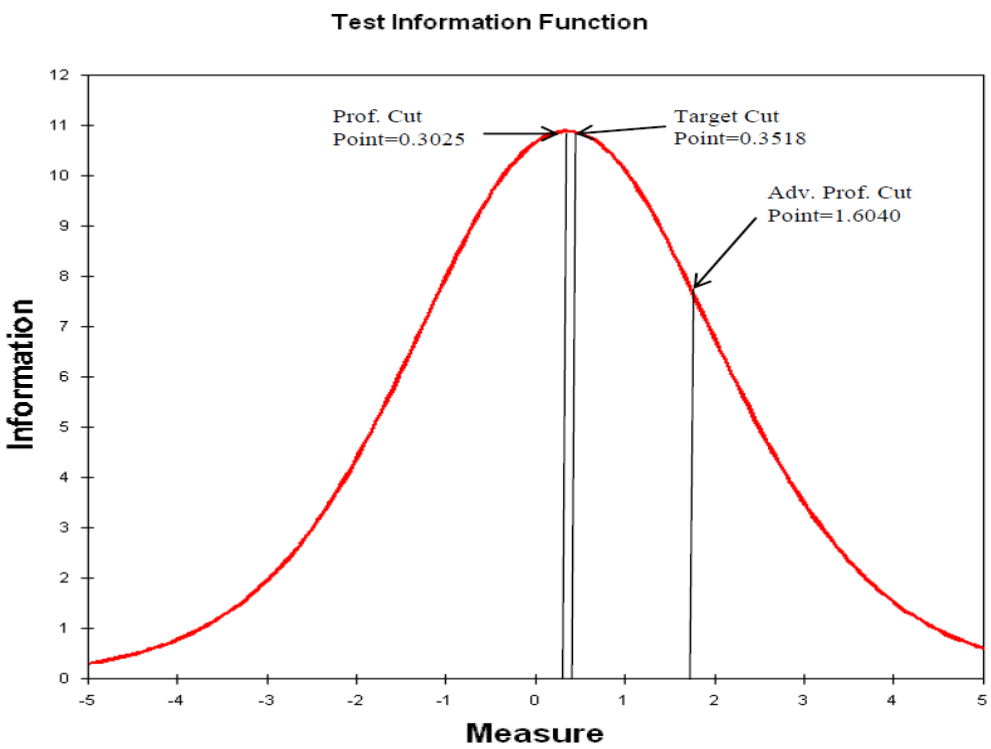

Figure 8.2.12: Grade 8 Math Test Information Function

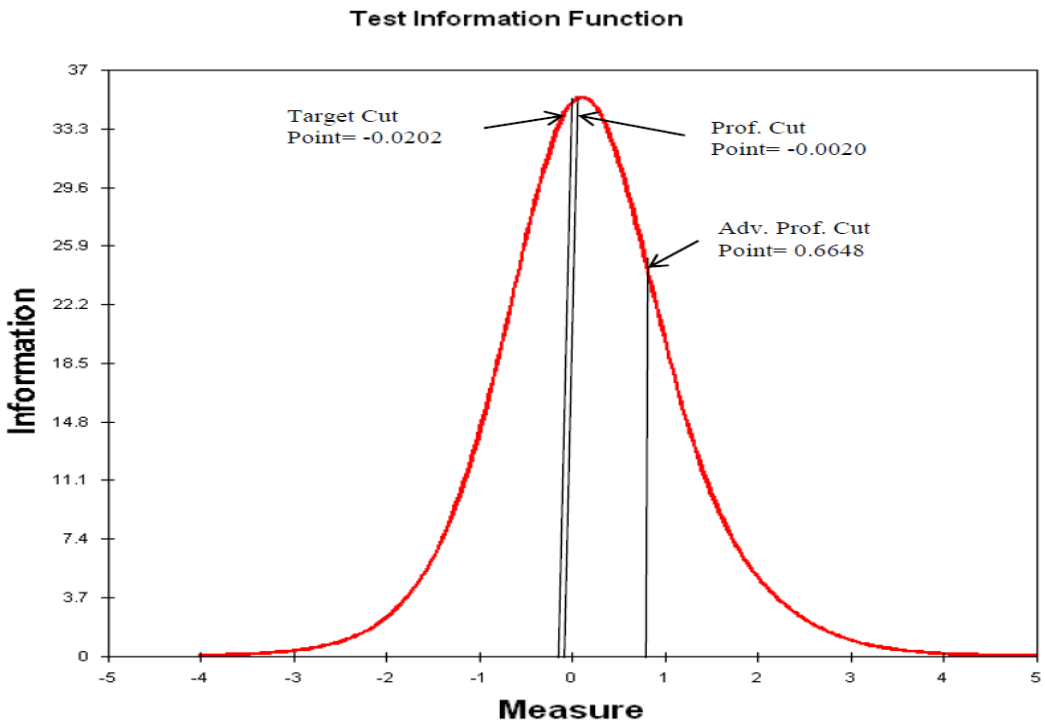

Figure 8.2.13: Grade 4 Science Test Information Function

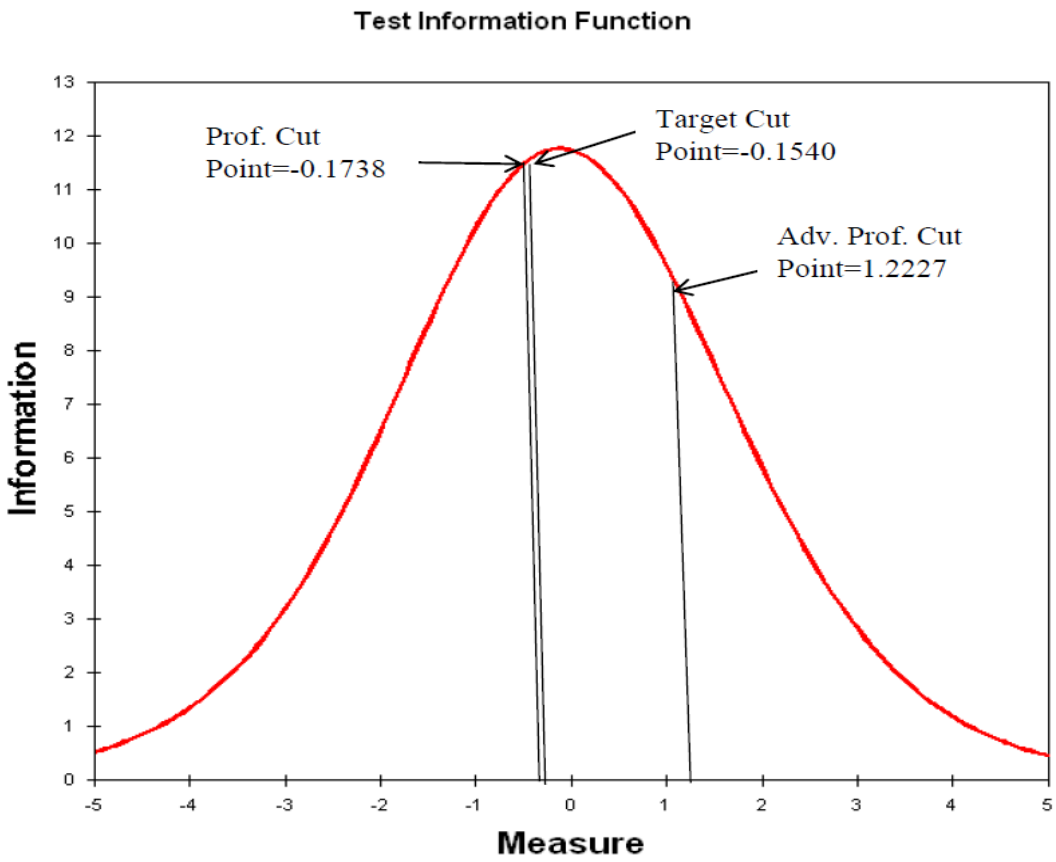

Figure 8.2.14: Grade 8 Science Test Information Function

8.3 Conditional Estimate of Error at Each Cut-Score

The NJ ASK 2013 3–8 raw cut scores and the corresponding conditional standard error of measurement (CSEM) are summarized in Table 8.3.1. WINSTEPS calculates the standard error at each score point using item response theory and the information function. The equation for the standard error at each value of theta (ability) is given by

$$SE\left(\hat{\theta}\right) = \frac{1}{\sqrt{I\left(\theta\right)}}$$

where $I\left(\theta\right)$ is the information function for a test at θ. For the Rasch model, the information provided by a test at θ is the sum of the item information functions at θ. Interpolation of the raw cut scores were used to derive the CSEM from the standard error associated with the theta at each cut score.

Table 8.3.1: Raw Score Cut Scores with Conditional Standard Error of Measurement

		ELA		Mathematics		Science	
		Proficient	Advanced Proficient	Proficient	Advanced Proficient	Proficient	Advanced Proficient
Grade 3	Cut score	25	38	23	36	N/A	N/A
	(CSEM)	(2.61)	(2.12)	(3.14)	(3.07)		
Grade 4	Cut score	31	43	24	38	17	28
	(CSEM)	(2.81)	(2.26)	(3.29)	(2.81)	(2.94)	(2.62)
Grade 5	Cut score	33	47	24	38	N/A	N/A
	(CSEM)	(3.08)	(2.53)	(3.12)	(2.74)		
Grade 6	Cut score	38	55	23	38	N/A	N/A
	(CSEM)	(3.37)	(2.60)	(3.20)	(2.74)		
Grade 7	Cut score	37	51.5	24	37	N/A	N/A
	(CSEM)	(3.37)	(2.99)	(3.17)	(2.83)		
Grade 8	Cut score	36.5	56	24	37	26	41
	(CSEM)	(3.42)	(2.52)	(3.28)	(2.86)	(3.41)	(2.96)

8.4 Rater Reliability

Tables 8.4.1–8.4.6 show the percentages of writing tasks and constructed-response items scored with exact agreement, adjacent agreement, and resolution needed by grade level and content area. Raters used scoring rubrics with a score range of 0 to 5 for the grades 3–5 writing prompt, and 0 to 6 for the grade 6, 7, and 8 writing prompts. For grades 3 through 5, the scores for each writing prompt was calculated by summing the scores from both raters; whereas, in grades 6–8 the

Persuasive writing prompt score resulted from summing both raters' scores but the *Explanatory* writing prompt scores was obtained by averaging the two raters' scores. The rubrics had score points that ranged from 0 to 4 for the ELA OE items and from 0 to 3 for the mathematics and science CR items. There were no half points assigned for any of the CR items, however half score points were possible for the writing prompts.

One hundred percent (100%) of the writing prompts were read by a second rater; whereas, only 10% of the constructed-response items in all content areas were read by a second rater. The purpose of the second-reading for the constructed-response items was to investigate the consistency between raters for the NJ ASK 2013. As shown in the tables below, the exact agreement rates ranged from 70.4% to 97.3% at the test level. An adjacent score is a score assigned by the second rater that is no more than ±1 score point from the score assigned by the first rater. The adjacent agreement rates ranged from 2.5% to 28.4%. In general, less than 2% of the scores require resolution by a third rater.

Table 8.4.1: Grade 3 Scoring Consistency of WT and CR Items*

	% Raters in Exact Agreement	% Raters in Adjacent Agreement	% Resolution Needed
ELA Total	**73.3**	**25.9**	**0.6**
Writing Total	**67.0**	**32.0**	**0.8**
Writing Task 1	66.6	32.2	0.8
Writing Task 2	67.3	31.8	0.8
Reading Total	**77.5**	**21.9**	**0.5**
CR 1	75.5	24.0	0.3
CR 2	78.1	21.0	0.8
CR 3	78.8	20.6	0.4
Math Total	**96.1**	**3.4**	**0.3**
ECR Total	**90.8**	**8.1**	**0.9**
ECR 1	90.6	8.3	0.8
ECR 2	88.6	10.5	0.6
ECR 3	93.2	5.4	1.2
SCR Total	**98.8**	**1.1**	**0.0**
SCR 1	99.2	0.8	0.0
SCR 2	99.0	1.0	0.0
SCR 3	98.9	1.1	0.0
SCR 4	98.2	1.7	0.0
SCR 5	99.1	0.8	0.0
SCR 6	98.5	1.4	0.0

* WT= Writing Tasks, CR= Constructed Response

Table 8.4.2: Grade 4 Scoring Consistency of WT and CR Items*

	% Raters in Exact Agreement	% Raters in Adjacent Agreement	% Resolution Needed
ELA Total	**74.3**	**24.9**	**0.6**
Writing Total	**67.5**	**31.6**	**0.7**
Writing Task 1	67.1	32.0	0.6
Writing Task 2	67.8	31.2	0.8
Reading Total	**78.9**	**20.5**	**0.5**
CR 1	79.3	20.6	0.2
CR 2	83.4	16.2	0.4
CR 3	74.0	24.7	1.0
Math Total	**97.3**	**2.5**	**0.1**
ECR Total	**94.5**	**5.0**	**0.4**
ECR 1	97.3	2.3	0.4
ECR 2	91.5	7.8	0.6
ECR 3	94.7	4.8	0.3
SCR Total	**98.7**	**1.2**	**0.0**
SCR 1	99.1	0.8	0.0
SCR 2	99.5	0.4	0.0
SCR 3	98.5	1.4	0.0
SCR 4	97.7	2.2	0.0
SCR 5	99.1	1.0	0.0
SCR 6	98.5	1.4	0.0
Science Total	**91.2**	**8.6**	**0.1**
CR 1	90.0	9.6	0.2
CR 2	92.3	7.6	0.0

* WT= Writing Tasks, CR= Constructed Response

Table 8.4.3: Grade 5 Scoring Consistency of WT and CR Items*

	% Raters in Exact Agreement	% Raters in Adjacent Agreement	% Resolution Needed
ELA Total	**71.3**	**28.1**	**0.6**
Writing Total	**64.7**	**34.2**	**1.1**
Writing Task 1	62.8	35.8	1.4
Writing Task 2	66.5	32.6	0.8
Reading Total	**75.8**	**24.0**	**0.2**
CR 1	76.0	23.7	0.2
CR 2	76.5	23.4	0.2
CR 3	74.8	25.0	0.2
Math Total	**96.9**	**2.9**	**0.1**
ECR Total	**92.2**	**7.3**	**0.5**
ECR 1	92.1	7.0	0.8
ECR 2	94.2	5.6	0.2
ECR 3	90.2	9.2	0.4
SCR Total	**98.7**	**1.3**	**0.0**
SCR 1	99.2	0.8	0.0
SCR 2	97.6	2.2	0.0
SCR 3	98.8	1.2	0.0
SCR 4	99.2	0.8	0.0
SCR 5	98.8	1.2	0.0
SCR 6	98.9	1.0	0.0
SCR 7	98.7	1.2	0.0
SCR 8	98.0	1.8	0.0

* WT= Writing Tasks, CR= Constructed Response

Table 8.4.4: Grade 6 Scoring Consistency of WT and CR Items*

	% Raters in Exact Agreement	% Raters in Adjacent Agreement	% Resolution Needed
ELA Total	**74.1**	**25.1**	**0.8**
Writing Total	**65.0**	**33.5**	**1.4**
Writing Task 1	65.9	32.8	1.2
Writing Task 2	64.1	34.2	1.6
Reading Total	**78.6**	**20.8**	**0.6**
CR 1	79.1	20.2	0.6
CR 2	77.3	22.2	0.6
CR 3	80.1	19.3	0.6
CR 4	78.0	21.6	0.4
Math Total	**94.9**	**4.6**	**0.4**
ECR Total	**84.8**	**13.7**	**1.5**
ECR 1	86.6	10.4	3.0
ECR 2	90.2	9.4	0.2
ECR 3	77.5	21.2	1.2
SCR Total	**98.6**	**1.2**	**0.0**
SCR 1	98.4	1.6	0.0
SCR 2	99.0	0.8	0.0
SCR 3	99.5	0.4	0.0
SCR 4	98.4	1.4	0.0
SCR 5	97.5	2.4	0.0
SCR 6	99.0	0.8	0.0
SCR 7	99.4	0.6	0.0
SCR 8	97.9	1.6	0.0

* WT= Writing Tasks, CR= Constructed Response

Table 8.4.5: Grade 7 Scoring Consistency of WT and CR Items*

	% Raters in Exact Agreement	% Raters in Adjacent Agreement	% Resolution Needed
ELA Total	**70.4**	**28.4**	**1.1**
Writing Total	**60.2**	**37.7**	**2.0**
Writing Task 1	60.5	37.4	2.0
Writing Task 2	59.8	38.0	2.0
Reading Total	**75.5**	**23.8**	**0.7**
CR 1	77.7	21.8	0.4
CR 2	72.8	26.2	1.0
CR 3	73.6	25.8	0.6
CR 4	77.9	21.2	0.8
Math Total	**95.0**	**4.6**	**0.2**
ECR Total	**85.6**	**13.4**	**0.9**
ECR 1	84.1	14.6	1.0
ECR 2	85.9	13.0	1.0
ECR 3	86.8	12.6	0.6
SCR Total	**98.5**	**1.3**	**0.0**
SCR 1	98.7	1.2	0.0
SCR 2	98.1	1.8	0.0
SCR 3	98.8	0.8	0.0
SCR 4	98.2	1.8	0.0
SCR 5	97.9	1.0	0.0
SCR 6	97.8	2.0	0.0
SCR 7	99.4	0.6	0.0
SCR 8	98.9	0.8	0.0

* WT= Writing Tasks, CR= Constructed Response

Table 8.4.6: Grade 8 Scoring Consistency of WT and CR Items*

	% Raters in Exact Agreement	% Raters in Adjacent Agreement	% Resolution Needed
ELA Total	**70.8**	**28.4**	**0.7**
Writing Total	**64.8**	**33.7**	**1.4**
Writing Task 1	61.8	36.2	1.8
Writing Task 2	67.8	31.2	1.0
Reading Total	**73.9**	**25.7**	**0.4**
CR 1	72.7	27.0	0.2
CR 2	77.7	21.8	0.4
CR 3	73.4	26.2	0.4
CR 4	71.6	27.8	0.6
Math Total	**95.8**	**4.0**	**0.1**
ECR Total	**88.5**	**11.3**	**0.2**
ECR 1	84.1	15.4	0.2
ECR 2	94.1	5.8	0.2
ECR 3	87.3	12.6	0.2
	% Raters in Exact Agreement	**% Raters in Adjacent Agreement**	**% Resolution Needed**
SCR Total	**98.5**	**1.2**	**0.0**
SCR 1	98.7	1.2	0.0
SCR 2	97.6	2.2	0.0
SCR 3	99.3	0.6	0.0
SCR 4	99.0	0.8	0.0
SCR 5	98.1	1.6	0.0
SCR 6	99.1	0.6	0.0
SCR 7	98.7	0.9	0.0
SCR 8	97.7	2.0	0.0
Science Total	**81.4**	**17.5**	**0.9**
CR 1	79.9	18.8	1.0
CR 2	82.9	16.2	0.8

* WT= Writing Tasks, CR= Constructed Response

PART 9: VALIDITY

The *Standards for Educational and Psychological Testing* states, "Ultimately, the validity of an intended interpretation of test scores relies on all the available evidence relevant to the technical quality of a testing program. This includes evidence of careful test construction; adequate score reliability; appropriate test administration and scoring; accurate score scaling, equating, and standard setting; and careful attention to fairness for all examinees" (p. 17).[47] While this section summarizes evidence supporting claims as to the validity of NJ ASK performance scores, many parts of this technical report provide appropriate evidence for validity. Given the procedural and empirical evidence available and the rationale presented below, valid performance standards-based interpretations and uses of the scores are generally supported.

The following section begins with a review of important federal statutes requiring the NJ ASK 3–8 and explains the purposes and intended uses of performance test scores, suggesting the value implications of performance scores for schools, teachers, students, and parents. Content-related evidence supporting validity is presented in terms of the adequacy and appropriateness of the state content standards and the representation of the content standards on the tests. Then, validity evidence based on the internal structure of NJ ASK is provided through a correlational analysis of NJ ASK content clusters with each other. Reference to specific Standards within the *Standards for Educational and Psychological Testing* are provided where appropriate.

9.1 Content and Curricular Validity[48]

Content validity of a test refers to the degree to which the content of a test is congruent with the purpose of testing, as defined by the curriculum. Baker and Linn (2002)[49] suggest that "Two questions are central in the evaluation of content aspects of validity. Is the definition of the content domain to be assessed adequate and appropriate? Does the test provide an adequate representation of the content domain the test is intended to measure?" (p. 6). The following two sections help answer these two very important questions and also address Standard 1.6 of the *Standards for Educational and Psychological Testing*.

Appropriateness of Content Definition

In 1996, the New Jersey State Board of Education adopted the New Jersey Core Curriculum Content Standards, an ambitious framework for educational reform in the State's public schools. New Jersey's standards were created to improve student achievement by clearly defining what all students should know and be able to do at the end of thirteen years of public education. Since the adoption of those standards, the NJ DOE has continuously engaged in discussions with educators, business representatives, and national experts about the impact of the standards on classroom

[47] American Educational Research Association, American Psychological Association, and National Council on Measurement in Education. (1999). *Standards for Educational and Psychological Testing*. Washington: APA.
[48] Standard 1.6 – When the validation rests in part on the appropriateness of test content, the procedures followed in specifying and generating test content should be described and justified in reference to the construct the test is intended to measure or the domain it is intended to represent. If the definition of the content sampled incorporates criteria such as importance, frequency, or criticality, these criteria should also be clearly explained and justified (page 18).
[49] Baker, E. L., & Linn, R. L. (2002). Validity Issues for Accountability Systems. Center for the Study of Evaluation. Technical Report 585, Los Angeles, CA.

practices. To assist teachers and curriculum specialists in aligning curriculum with the standards, the NJ DOE provided local school districts with a curriculum framework for each content area. The frameworks provided classroom teachers and curriculum specialists with sample teaching strategies, adaptations, and background information relevant to each of the content areas.

The review process required by the State Board involved teachers, school administrators, students, parents, and representatives from business, higher education, and the community. In addition, several content areas were reviewed by Achieve, Inc., and the Council of Chief State School Officers (CCSSO). In response to this unprecedented review, the 2004 New Jersey Core Curriculum Content Standards provide the level of specificity and depth of content that better prepares students for post secondary education and employment. The standards are based on the latest research in each of the content areas and identify the essential core of learning for all students.

Since the adoption of the original 1996 New Jersey Core Curriculum Content Standards (CCCS), the New Jersey State Board of Education approved administrative code that implements all aspects of standards-based reform. N.J.A.C. 6A:8 requires districts to align all curriculum to the standards; ensure that teachers provide instruction according to the standards; ensure student performance is assessed in each content area; and provide teachers with opportunities for professional development that focuses on the standards.

Adequacy of Content Representation

The content-related evidence of validity includes the extent to which the test items represent these specified content domains and cognitive dimensions. Adequacy of the content representation of the NJ ASK is critical because the tests must provide an indication of student progress toward achieving the knowledge and skills identified in the CCCS, and the tests must fulfill the requirements under NCLB.

Adequate representation of the content domains defined in the CCCS is assured through use of a test blueprint and a responsible test construction process. New Jersey performance standards, as well as the CCCS, are taken into consideration in the writing of multiple-choice and constructed-response items and constructed-response rubric development. Each test must align with and proportionally represent the sub-domains of the test blueprint. Evidence to support the above is described in Part 2, Test Development Process, and Part 6, Item and Test Statistics. Part 2 provides evidence that the NJ test specifications were followed in the development of test items; alignment of items with the CCCS; and the review of items by NJ content experts, teachers, and Sensitivity committee. Item writers were recruited with specific qualifications and were trained and validated before they started writing items. Tables 2.1.3 through 2.1.21 in Part 2 provide a comparison of target test construction maps to actual test maps for ELA, mathematics, and science. The tables indicate that the target blueprint representation in terms of number of items and score points for each sub-domain was adequately met.

The CCCS are represented on each test by balancing sub-domain coverage on each test, by proportionally representing items corresponding to Partially Proficient, Proficient, and Advanced Proficient performance categories on each test, and by matching item format to the requirements of the content and standards descriptions.

Adherence to Test Specification

MI followed statistical and content specifications to make sure that the 2013 NJ ASK assessments are valid. The statistical specification described the psychometric characteristics of the items included in the 2013 assessments. The primary statistical targets used for NJ ASK test assembly were the p-value estimates also called proportion correct or item difficulty, the point bi-serial correlation which is a measure of how well the items discriminate among test takers and is related to the overall reliability of the test, and proportion correct value which is an indication of test difficulty. Similarly, the minimum target value for a proportion-correct was set at 0.25 and maximum was set at 0.95. In addition, content experts made sure that the items selected for the 2013 NJ ASK tests were free from poor model fit and differential item functioning when they were first field tested.

Content specification pertains to the adherence to content representation across content standards and sub-domains. MI developed all test items to conform to the NJ ASK content standards and test blueprints. Part 2 of this document describes test development activities of the NJ ASK assessments. The actual test maps for NJ ASK are shown in Tables 2.1.3 through 2.1.21 and the 2013 tests configurations are shown in Tables 2.1.1 and 2.1.2. The Tables indicate that the 2013 assessments adequately adhere to the test blueprints.

Qualified item writers who were familiar with the NJ state specifications and populations were recruited and trained for item writing. Detail procedures are described in Part 2 of this document. The items were reviewed by NJ's content review committee and sensitivity review committee comprised of NJ teachers making sure that the items align with the state standards and are free from bias for a specific group of student population. Only items accepted from the committees were added to the bank for possible use in future operational tests.

Test Administration and Accommodations

Part 3 of this report describes the test administration process. In order to securely administer the tests the test administrator were trained on the process and test co-coordinator manuals were produced for the step by step process. A test form distribution list was prepared for the proportional representation of DFG prior to the test administration. Tests were administered under standard condition. For the case where the standard condition was compromised or breached a separate alternate form was developed for each grade and content area. The alternate test forms matched test blueprint and difficulty of the regular tests.

The tests were also translated into large print and Braille, and a separate Spanish version of the test was developed for state approved accommodations for LEP. Similarly, various accommodations (see Appendix C for the list of accommodations) were offered for students identified by IEP and 504 plans to minimize assessment ambiguity and inaccuracy.

9.2 Construct Validity[50]

Because the NJ ASK testing program assesses student performance in several content areas using a variety of testing methods, it is important to study the pattern of relationships among the content areas and testing methods. Therefore, this section addresses evidence based on responses and internal structure. One method for studying patterns of relationships to provide evidence supporting the inferences made from test scores is the multi-trait matrix. Tables 6.3.1 through 6.3.6 summarize Pearson correlation coefficients among test content domains and clusters by grade level. The correlations between clusters within a content area were generally found to be higher than the correlations between clusters across the content areas.

Scaling and Performance Score Reporting

The NJ ASK 3–8 are scaled in several ways: raw score points, Item Response Theory (IRT), and performance standard level (based on scale-score cuts). New Jersey actively promotes the use of performance level results, reporting them annually on each content test at the student, school, district and state levels. Individual student and average scale scores are also used, but should play a secondary role, generally interpreted with reference to their distance from performance-score cut points. Test results are reported for students as a whole as well as by student group including sex, ethnicity, disability, English language proficiency, migrant status, and DFG. Scores are reported to schools and districts in the annually published reports (see Part 10: Reporting).

NJ ASK performance scores indicate that an individual student performs at the Partially Proficient, Proficient, and Advanced Proficient level in a content area. Performance standard descriptions associated with each level provide details of the performance that students have met or exceeded. No stakes for students or teachers are attached by the state to student-level scores. Teachers are counseled to interpret individual student scores only in the context of other assessment results and their own experience.

9.3 Criterion-Related Validity

Validity evidence related to other Standards is listed below:

Standard 1.5[51]

- The composition of the sample of examinees from which validity evidence was obtained is described in detail in Part 6 – Item and Test Statistics, including major relevant sociodemographic characteristics. This information is imbedded within the Tables of Part 6. These tables also provide descriptive statistics for number correct raw score and for

[50] Standard 1.11 – If the rationale for a test use or interpretation depends on premises about the relationships among parts of the test, evidence concerning the internal structure of the test should be provided.
Standard 1.12 – When interpretation of subscores, score differences, or profiles is suggested, the rationale and relative evidence in support of such interpretation should be provided. Where composite scores are developed, the basis and rationale for arriving at the composites should be given.

[51] Standard 1.5 - The composition of any sample of examinees from which validity evidence is obtained should be described in as much detail as is practical, including major relevant sociodemographic and developmental characteristics.

scale scores. Statistics include N-counts, means, standard deviations, minimum and maximum values, and a variety of data disaggregations, including student demographic group and DFG.

Standard 1.7[52]

- Standard setting procedures, including the selection process and the characteristics of judges, is described in detail in Part 5.
- The NJ ASK 2013 3–8 constructed-response items and writing responses required hand scoring. The processes of selecting and training scorers, reading and scoring papers, and monitoring scoring are described in detail in Part 4.

Standard 1.13[53]

- The conditions under which the data were collected are described in Part 2. Information about the administration of NJ ASK is available in the *New Jersey Assessment of Skills & Knowledge Spring 2013 Test Coordinator Manual Grades 3–8* which can be found at https://www.measinc.com/nj/NJASK/Default.aspx

[52] Standard 1.7 – When a validation rests in part on the opinions or decisions of expert judges, observers, or raters, procedures for selecting such experts and for eliciting judgments or ratings should be fully described. The qualifications, and experience, of the judges should be presented. The description of procedures should include any training and instructions provided, should indicate whether participants reached their decisions independently, and should report the level of agreement reached. If participants interacted with one another or exchanged information, the procedures through which they may have influenced one another should be set forth.

[53] Standard 1.13 - When validity evidence includes statistical analyses of test results, either alone or together with data on other variables, the conditions under which the data were collected should be described in enough detail that users can judge the relevance of the statistical findings to local conditions. Attention should be drawn to any features of a validation data collection that are likely to differ from typical operational testing conditions and that could plausibly influence test performance.

PART 10: REPORTING

Previously, scores were reported in two cycles. Data for Cycle I reporting were produced after districts submit record changes. Data for Cycle II reporting were produced after the completion of automatic rescoring of the constructed-response items and writing tasks.

Beginning in 2011, only one reporting cycle was used. Reports were produced after districts submitted record changes and the automatic rescoring of the constructed response items and writing tasks were completed.

10.1 Reports

While there is only one reporting cycle currently, the same reports were produced as in previous years, with one exception. The Preliminary Performance by Demographic Group –School and District are no longer produced.

The following reports were produced separately for each grade.

- Student Sticker (1 per student)
- Individual Student Report (ISR) (2 per student)
- Student Roster – Science (Grade 8 only)
- Student Roster – Mathematics
- Student Roster – English Language Arts
- All Sections Roster
- Performance by Demographic Group –School
- Performance by Demographic Group –District
- Cluster Means Report

With the transition to the Common Core of State Standards, changes to the score reporting categories were made. Brief descriptions of each report and the new score reporting categories can be found in the *2013 NJ ASK Score Intrepretation Manual* (PTM 1507-34), Part 3, at http://www.state.nj.us/education/assessment/ms/5-8/ref/SIM13.pdf

10.2 State Summary Reporting

The state summary data file contains the same type of test results based on the performance by demographics reports at the state, district, and school levels. This data file is available in text and in Excel formats and is posted on the NJ DOE's Web site.
(http://www.nj.gov/education/schools/achievement/)

APPENDIX A
Field Test Form Distribution Plan

Table A.1: NJ ASK 2013 Grade 3 Test Form Distribution Plan

	DFG[1]												
G3 Form	**A**	**B**	**CD**	**DE**	**FG**	**GH**	**I**	**J**	**N**	**O**	**R**	**V**	**Grand Total**
A	1662	411	311	447	451	477	728				20		4507
B	1636	172	337	425	398	462	826	209			47		4512
C	1016	574	340	432	544	500	802	88			65		4361
D	989	375	335	393	477	619	797	78			124		4187
E	461	970	381	447	441	586	772	77			66		4201
F	664	1047	357	340	478	491	710	112			90		4289
G	988	385	337	701	500	488	741	93			91		4324
H	362	425	346	772	456	1136	799	96			18		4410
J	1662	418	337	356	314	552	767	33			66		4505
K	372	264	359	969	458	529	889	371			115		4326
L	703	416	577	407	455	612	829	158			81		4238
M	1167	412	333	291	534	665	865	146					4413
N	403	376	377	336	460	539	747	738			96		4072
O	613	305	238	802	446	503	776	461			40		4184
P	785	360	824	471	456	533	842	104					4375
R	412	489	340	560	587	468	873	67	439		101		4336
S	483	509	374	432	631	519	797	408			73		4226
T	615	301	477	381	714	570	781	292		39	81	25	4276
U	339	397	328	1256	388	487	798	160		57	145	36	4391
V	951	276	313	413	450	765	871	37		33	46	82	4237
W	428	156	566	716	441	806	796	106		46	107	37	4205
X	396	469	371	434	504	698	866	372		49	53	12	4227
Y	744	547	334	514	753	382	734			49	139	19	4215
Z	399	283	645	433	892	498	812	90	11	50		66	4179
Grand Total	**18250**	**10337**	**9537**	**12728**	**12228**	**13885**	**19218**	**4296**	**450**	**323**	**1664**	**277**	**103196**

[1]DFG, or district factor group, is a district-level socioeconomic measure based upon 2000 U.S. Census data, with A referring to districts at the lowest end and J at the highest end. N = districts with too low a percentage of students in public schools for a DFG value to be assigned. O and S = schools receiving special populations. R = charter school. V= vocational school

Table A.2: NJ ASK 2013 Grade 4 Test Form Distribution Plan

	DFG[1]												
G4 Form	**A**	**B**	**CD**	**DE**	**FG**	**GH**	**I**	**J**	**N**	**O**	**R**	**V**	**Grand Total**
A	1514	444	317	438	498	406	757				20		4394
B	1542	201	322	438	419	495	865	180			50		4512
C	1028	542	319	477	571	513	856	92			74		4472
D	1021	392	293	405	502	604	819	108			88		4232
E	419	1056	395	472	457	586	702	69			61		4217
F	706	1025	333	343	492	515	755	116			97		4382
G	890	368	310	769	495	473	714	101			91		4211
H	348	416	354	733	462	1057	819	81			77		4347
J	1631	416	356	363	303	593	736	35			64		4497
K	345	239	356	955	502	521	935	423			123		4399
L	720	466	542	424	433	658	886	169			63		4361
M	1158	421	307	304	574	633	862	167			20		4446
N	359	370	410	369	484	583	816	716			95		4202
O	574	273	238	831	449	469	797	457			39		4127
P	735	369	810	498	474	538	799	110					4333
R	385	478	387	588	527	516	943	77	388		100		4389
S	511	553	367	425	666	522	843	472			72		4431
T	577	304	484	367	733	645	835	328		39	100	30	4442
U	366	403	345	1241	396	512	717	177		71	67	30	4325
V	896	313	316	395	492	807	861	30		35	24	38	4207
W	408	161	562	752	491	866	776	116		53	84	25	4294
X	389	472	324	441	523	657	820	365		69	50	12	4123
Y	758	522	318	547	742	392	749			65	98	18	4209
Z	332	319	669	421	990	511	823	95	11	57		52	4280
Grand Total	**17612**	**10523**	**9434**	**12996**	**12675**	**14072**	**19485**	**4484**	**399**	**389**	**1557**	**205**	**103832**

[1]DFG, or district factor group, is a district-level socioeconomic measure based upon 2000 U.S. Census data, with A referring to districts at the lowest end and J at the highest end. N = districts with too low a percentage of students in public schools for a DFG value to be assigned. O and S = schools receiving special populations. R = charter school. V= vocational school

Table A.3: NJ ASK 2013 Grade 5 Test Form Distribution Plan

	DFG[1]												
G5 Form	**A**	**B**	**CD**	**DE**	**FG**	**GH**	**I**	**J**	**N**	**O**	**R**	**V**	**Grand Total**
A	1420	472	314	424	448	438	709				20		4245
B	1376	151	285	417	423	527	890	184			50		4303
C	1023	528	335	494	549	566	812	90			66		4463
D	991	381	286	425	503	650	780	81			84		4181
E	431	1012	426	499	433	602	756	77			131		4367
F	663	924	371	332	498	539	726	102			150		4305
G	925	369	340	793	483	499	748	78			242		4477
H	330	453	339	783	477	1032	817	85			146		4462
J	1581	385	321	335	343	631	762	41			66		4465
K	340	256	355	1031	464	537	973	445			73		4474
L	639	449	515	452	480	619	828	182			59		4223
M	954	413	321	285	551	693	823	143			13		4196
N	382	342	407	365	487	534	845	718			72		4152
O	569	286	260	852	418	579	845	449			231		4489
P	764	372	841	444	467	540	772	100					4300
R	331	441	336	578	574	517	1001	73	375				4226
S	506	529	419	440	663	556	818	469			56		4456
T	538	314	475	375	726	612	833	307		46	92	35	4353
U	367	398	328	1294	411	514	764	179		93	68	22	4438
V	830	288	346	389	520	812	956	51		50	85	46	4373
W	415	183	568	707	475	889	814	106		61	63	40	4321
X	343	477	374	461	562	600	826	387		73	44	14	4161
Y	769	542	349	551	778	399	680			73	77	18	4236
Z	320	310	650	480	950	538	833	93	6	94	27	61	4362
Grand Total	**16807**	**10275**	**9561**	**13206**	**12683**	**14423**	**19611**	**4440**	**381**	**490**	**1915**	**236**	**104028**

[1]DFG, or district factor group, is a district-level socioeconomic measure based upon 2000 U.S. Census data, with A referring to districts at the lowest end and J at the highest end. N = districts with too low a percentage of students in public schools for a DFG value to be assigned. O and S = schools receiving special populations. R = charter school. V= vocational school

Table A.4: NJ ASK 2013 Grade 6 Test Form Distribution Plan

	DFG[1]												
G6 Form	**A**	**B**	**CD**	**DE**	**FG**	**GH**	**I**	**J**	**N**	**O**	**R**	**V**	**Grand Total**
A	1492	460	348	408	444	437	679				20		4288
B	1482	166	306	404	390	512	874	217			50		4401
C	954	578	357	451	575	547	851	95			62		4470
D	969	369	270	437	543	628	837	109			82		4244
E	369	1029	408	449	442	604	748	74			109		4232
F	671	1011	325	371	448	528	753	99			146		4352
G	854	343	343	770	536	484	748	100			216		4394
H	338	419	362	812	417	1082	814	90			172		4506
J	1392	416	345	365	345	579	782				80		4304
K	328	249	362	1006	506	535	976	459			37		4458
L	681	432	509	463	448	611	880	157			62		4243
M	805	409	318	288	585	728	918	167			38		4256
N	344	350	386	313	502	548	810	817			57		4127
O	540	345	248	892	447	519	830	449			209		4479
P	697	402	786	475	483	545	803	125			39		4355
R	334	481	398	598	596	518	1031	84	362				4402
S	421	488	419	465	728	523	830	454			23		4351
T	525	306	463	385	784	560	811	300		60	71	40	4305
U	345	406	302	1354	408	512	809	192		102	68	19	4517
V	757	299	352	450	523	810	971	28		67	93	50	4400
W	402	177	636	791	471	867	788	110		72	66	39	4419
X	360	476	328	474	533	619	886	376		74	134	13	4273
Y	721	482	377	547	822	339	681			74	93	18	4154
Z	302	282	687	439	992	514	832	64	14	96	78	43	4364
Grand Total	**16083**	**10375**	**9635**	**13407**	**12968**	**14149**	**19942**	**4566**	**376**	**545**	**2005**	**222**	**104294**

[1]DFG, or district factor group, is a district-level socioeconomic measure based upon 2000 U.S. Census data, with A referring to districts at the lowest end and J at the highest end. N = districts with too low a percentage of students in public schools for a DFG value to be assigned. O and S = schools receiving special populations. R = charter school. V= vocational school

Table A.5: NJ ASK 2013 Grade 7 Test Form Distribution Plan

	DFG[1]												
G7 Form	**A**	**B**	**CD**	**DE**	**FG**	**GH**	**I**	**J**	**N**	**O**	**R**	**V**	**Grand Total**
A	1426	427	334	472	417	412	727				20		4235
B	1422	158	303	455	407	467	961	191			47		4411
C	940	573	247	403	544	541	1123	103			67		4541
D	1002	458	307	418	408	689	840	99			84		4305
E	356	936	405	434	429	664	1013	77			101		4415
F	724	938	386	328	451	494	777	112			89		4299
G	776	429	333	815	513	489	760	83			202		4400
H	309	433	386	820	477	1021	642	87			121		4296
J	1296	368	247	331	736	651	791				72		4492
K	301	251	348	1063	530	497	1035	429			32		4486
L	737	418	543	475	745	553	864	152			60		4547
M	863	432	245	484	570	707	907	158			62		4428
N	392	352	452	484	419	595	823	787			53		4357
O	470	298	250	902	405	431	841	467			213		4277
P	717	406	813	482	489	548	780	120			33		4388
R	322	448	402	576	567	468	1031	72	360		38		4284
S	506	421	430	453	711	500	864	463			23		4371
T	500	344	457	332	760	507	843	278		81	67	43	4212
U	330	364	343	1378	571	302	786	184		101	57	42	4458
V	756	242	310	487	647	821	970	45		68	92	55	4493
W	403	351	944	372	470	877	795	67		89	64	59	4491
X	284	513	357	471	534	618	893	391		83	126	16	4287
Y	710	481	359	588	764	493	739			116	85	13	4348
Z	313	314	705	435	1000	593	707		13	131	67	84	4377
Grand Total	**15855**	**10355**	**9906**	**13458**	**13564**	**13938**	**20512**	**4365**	**373**	**669**	**1875**	**312**	**105198**

[1]DFG, or district factor group, is a district-level socioeconomic measure based upon 2000 U.S. Census data, with A referring to districts at the lowest end and J at the highest end. N = districts with too low a percentage of students in public schools for a DFG value to be assigned. O and S = schools receiving special populations. R = charter school. V= vocational school

Table A.6: NJ ASK 2013 Grade 8 Test Form Distribution Plan

	DFG[1]												
G8 Form	**A**	**B**	**CD**	**DE**	**FG**	**GH**	**I**	**J**	**N**	**O**	**R**	**V**	**Grand Total**
A	1480	426	327	469	437	412	745				19		4315
B	1502	147	310	472	415	461	860	190			41		4398
C	995	597	269	413	515	533	1149	101			64		4636
D	1043	439	305	467	445	680	865	104			75		4423
E	410	1049	417	486	461	611	1035	63			90		4622
F	722	1033	403	328	485	565	717	133			91		4477
G	779	366	350	781	520	488	770	65			179		4298
H	332	432	392	866	494	1101	635	95			110		4457
J	1481	325	221	354	683	591	779				66		4500
K	366	270	330	1080	545	522	1051	450			36		4650
L	690	436	506	478	782	583	809	202			56		4542
M	845	423	284	486	603	706	894	156			64		4461
N	417	348	451	522	452	567	768	810			53		4388
O	567	296	274	932	534	454	813	440			117		4427
P	715	433	860	527	528	492	802	119			34		4510
R	334	469	375	621	581	466	1027	73	338		41		4325
S	385	434	485	460	749	518	855	426			19		4331
T	478	334	499	329	873	485	831	269		114	52	45	4309
U	353	375	369	1429	595	309	770	173		109	54	56	4592
V	804	320	346	416	618	829	956	30		105	43	49	4516
W	416	334	986	419	512	950	751	74		112	64	72	4690
X	291	509	385	475	550	610	882	350		113	127	29	4322
Y	676	487	338	580	864	457	718			154	86	26	4386
Z	290	318	728	475	1023	550	639		8	146	69	106	4364
Grand Total	**16371**	**10600**	**10210**	**13865**	**14264**	**13940**	**20121**	**4323**	**346**	**853**	**1650**	**383**	**106939**

[1]DFG, or district factor group, is a district-level socioeconomic measure based upon 2000 U.S. Census data, with A referring to districts at the lowest end and J at the highest end. N = districts with too low a percentage of students in public schools for a DFG value to be assigned. O and S = schools receiving special populations. R = charter school. V= vocational school

APPENDIX B
CHECKLIST FOR FORMS DEVELOPMENT

Table B-1: Checklist for Forms Development

Item Data
Average Target Rasch value based on standard setting year*
As many items as possible have a p-value above 0.35 and below 0.90
As many items as possible have a pt. bis above 0.25
No item was used as a sample item.

* Targets are the theta cuts from the standard setting year.

Item Pool
For grades 6-8 one linking passage from the previous year's test was used.
All other passages were new to the operational test or had not been used operationally for several years.

Item Distribution
Item standards are distributed equally throughout the test
There are a variety of indicators assessed in each standard
MC items are generally in passage order, and OE items are at the end of the passage sets. WT items are in the appropriate places.
Answer key distribution is nearly equal between answer choices: A B C D
Having more than 2 MC items in a row with the same answer is avoided.

Name, Gender, and Ethnicity Distributions
Check gender distribution (number of passages or prompts which have a male and/or female): Male Female Both
Check ethnicity distribution (number of passages or prompts): Caucasian__Hispanic Asian__African American Other_____
There are NOT two or more items in the same session that have similar contexts.
There are NOT two or more items with similar answers or answer choices.
Sample items and test items do NOT clue each other.
Items do NOT have any fairness or sensitivity related to the names and contexts of the items.

APPENDIX C

MODIFICATIONS OF TEST ADMINISTRATION PROCEDURES FOR LIMITED ENGLISH PROFICIENT, SPECIAL EDUCATION STUDENTS, AND STUDENTS ELIGIBLE UNDER SECTION 504 OF THE REHABILITATION ACT OF 1973

Accommodations for Limited English Proficient (LEP) Students

NCLB prohibits exemptions from testing based on limited English proficient (LEP) status. As permitted by NCLB, Spanish forms of the test were available for LEP students whose dominant language was Spanish, as identified by school districts. For those LEP students who were tested in English, one or more of the following accommodations were permitted.

- Additional time up to 150% of the administration times indicated
- Translation of directions only to the student's native language.
- Translations of passages, items, prompts, and tasks are NOT permitted
- Use of a bilingual dictionary, preferably one normally used by the student as part of the instructional program.

Accommodations for Special Education students, and students eligible under section 504

In accordance with the Individuals with Disabilities Education Act (IDEA), students who are receiving special education services must participate in each subject area of the age-appropriate statewide assessment with the following exception:

Students with disabilities shall participate in the Alternate Proficiency Assessment in each content area where the nature of the student's disability is so severe that the student is not receiving instruction in any of the knowledge and skills measured by the general statewide assessment and the student cannot complete any of the types of questions on the assessment content area(s) even with accommodation and modifications. (New Jersey Administrative Code Chapter 6A:14-4.11[a]2)

Districts may use modifications of test administration procedures when administering the NJ ASK to special education students or to students eligible under Section 504 of the Rehabilitation Act of 1973. Decisions about participation and accommodations/modifications are made by the Individualized Education Program (IEP) or 504 team. Information about test content and item types from the test specifications booklets can be used to make this determination. Modifications in the areas listed below may be used separately or in combination.

Any accommodations or modifications of test administration procedures for students eligible for special education under the IDEA or eligible under Section 504 of the Rehabilitation Act of 1973 must be specified in the student's IEP or 504 accommodation plan. Accommodations or modifications must be consistent with the instruction and assessment procedures used in the student's classroom. Students eligible for modifications under Section 504 may not be classified but do have a permanent or temporary impairment in a major life function (for example: performing manual tasks, walking, seeing, hearing, speaking, etc.).

ACCEPTABLE ACCOMMODATIONS OR MODIFICATIONS

Code

A. Setting Accommodations

1. Administering the assessment:
    a. individually in a separate room
    b. in a small group in a separate room
    c. in the resource room
    d. in a special education classroom
    e. using carrels
    f. at home or in a hospital (this depends on the nature of the assessment task)
2. Seating the student in the front of the room near the examiner or proctor
3. Seating the student facing the examiner or proctor
4. Providing special lighting
5. Providing special furniture (e.g., desks, trays, carrels)

B. Scheduling Accommodations

1. Adding time as needed
2. Providing frequent breaks
3. Terminating a section of the test when a student has indicated that he/she has completed all the items he/she can. The test examiner must ensure that the student has attempted all items in a section since items are not ordered by difficulty. When this accommodation is used, the test must be administered in a small group or individually to avoid distraction.

C. Test Materials Modifications

1. Administering the large-print version of test materials
2. Administering the Braille version of test materials

D. Test Procedures Modifications

1. Administration modifications
    a. reading directions aloud
    b. reading test items (not reading passages) aloud
    c. providing and ensuring that amplification (hearing aid and/or FM system) is in working order
    d. using a sign language or cued speech interpreter for administration of directions or items but not reading passages
    e. masking a portion of the test booklet and/or answer folder to eliminate visual distractors or providing reading windows
    f. repeating, clarifying, or rewording directions
    g. providing written directions on a separate sheet or transparency
    h. using an examiner who is familiar with the student
    i. using an examiner who can communicate fluently in sign language

(American Sign Language or a form of Manually Coded English)

j. providing manipulatives for math items
k. using graph paper for math section
l. using a Braille ruler and talking calculator
m using tactile or visual cues for deaf or hard of hearing students to indicate time to begin, time remaining, and time to end a particular part of the test

2. Response modifications

a. having an examiner record the student's identifying information on the answer folder, or grid corrections to the pre-ID label
b. dictating oral responses to a scribe (person who writes from dictation) – student must indicate all punctuation and must spell all key words
c. using a Braille writer to record responses
d. signing responses to a sign language interpreter (student must indicate all punctuation and must spell all key words)
e. recording responses on a word processor
f. using large-face calculators
g. using talking calculators
h. providing an Augmentative Communication device
i. using a larger diameter or modified special grip #2 pencil
j. masking portions of the answer folder to eliminate visual distractors
k. marking answers in the test booklet (an examiner would transfer the answers to an answer folder)
l. Allowing separate additional continuation pages for writing tasks. These pages MUST be properly marked to link them to the correct student for credit.

OTHER CONSIDERATIONS

Ensure that:

a. any medication has been appropriately adjusted to prevent interference with the student's functioning.
b. eyeglasses are used, if needed.
c. hearing aids, FM systems, Augmentative Communication devices, word processors, or other equipment are functioning properly.
d. source and strength of light are appropriate.
e. all students can clearly see and hear the examiner.
f. all deaf or hard of hearing students who communicate aurally/orally are watching the examiner when instructions are given.
g. responses to CR items and writing tasks which are written or typed on separate sheets of paper by students eligible for this accommodation are labeled with student data paper-clipped to the front of the answer folder, and placed in the fluorescent orange envelope provided. Copies of these pages should be made and retained on file by the school district until scores are received.

h. students using the large-print test booklets
    1. mark their answers in the large-print answer folder. All responses must be transcribed into the regular answer folder provided in the large print kit.
    2. may be instructed to skip items identified in the LP instructions. The spaces for these items must be left blank on the student's answer folder (included in the large-print kit).
    3. who dictate responses on CR items and writing tasks indicate all punctuation and spell all key words.

i. students using the Braille test booklets
    1. are instructed to bring a Braille ruler and a talking calculator to the test session.
    2. are instructed to skip dropped items identified in the Braille instructions. The spaces for these items must be left blank on the student transcription answer folder (included in the Braille kit).
    3. have answer folders transcribed from the Braille version by the examiner.
    4. dictate their answers to the examiner or use a device that produces Braille. For dictations and responses recorded in Braille:
        - Students must indicate all punctuation and must spell all key words.
        - Examiners must transcribe the Braille responses into the regular answer folder included in the Braille kit.

j. students who communicate in sign language
    1. have an interpreter to translate oral directions and test items (but not the Reading passages in the English Language Arts section of the test). The interpreter should be able to communicate in the mode used by the student, American Sign Language or a form of Manually Coded English. The interpreter should be instructed to interpret so as not to give the answer to the student through the use of a particular sign or finger spelling.
    2. using American Sign Language for CR and writing task responses will sign the responses to the interpreter who will interpret them into spoken English and a scribe will record the responses in the answer folder.

    3. using Signed English or cued speech will sign/cue to the interpreter who will transliterate (word for word) into spoken English and a scribe will record the responses.

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APPENDIX D
SCORING RUBRICS

Scoring Rubrics

Table D.1: New Jersey Registered Holistic Scoring Rubric Grades 3 - 5

In scoring, consider the grid of written language	Inadequate Command	Limited Command	Partial Command	Adequate Command	Strong Command
Score	**1**	2	**3**	**4**	**5**
Content and Organization	May lack opening and/or closing	May lack opening and/or closing	May lack opening and/or closing	Generally has opening and/or closing	Opening and closing
	Minimal response to topic; uncertain focus	Attempts to focus May drift or shift focus	Usually has single focus	Single focus	Single focus Sense of unity and coherence Key ideas developed
	No planning evident; disorganized	Attempts organization Few, if any, transitions between ideas	Some lapses or flaws in organization May lack some transitions between ideas	Ideas loosely connected Transitions evident	Logical progression of ideas Moderately fluent Attempts compositional risks
	Details random, inappropriate, or barely apparent	Details lack elaboration, i.e. highlight paper	Repetitious details Several unelaborated details	Uneven development of details	Details appropriate and varied
Usage	No apparent control Severe/numerous errors	Numerous errors	Errors/patterns of errors may be evident	Some errors that do not interfere with meaning	Few errors
Sentence Construction	Assortment of incomplete and/or incorrect sentences	Excessive monotony/same structure Numerous errors	Little variety in syntax Some errors	Some variety Generally correct	Variety in syntax appropriate and effective
Mechanics	Errors so severe they detract from meaning	Numerous serious errors	Patterns of errors evident	No consistent pattern of errors Some errors that do not interfere with meaning	Few errors

Table D.1: New Jersey Registered Holistic Scoring Rubric Grade 3 - 5 (continued)

Content/Organization	Usage	Sentence Construction	Mechanics
Communicates intended message to intended audience Relates to topic Opening and closing Focused Logical progression of ideas Transitions Appropriate details and information	Tense formation Subject-verb agreement Pronouns usage/agreement Word choice/meaning Proper modifiers	Variety of type, structure and length Correct construction	Spelling Capitalization Punctuation

NON-SCORABLE RESPONSES	**FR** = Fragment	Student wrote too little to allow a reliable judgment of his/her writing.
	OT = Off Topic/ Off Task	Student did not write on the assigned topic/task.
	NE = Not English	Student wrote in a language other than English.
	NR = No Response	Blank

Note: All unscorable responses, (NSRs), with the exception of NR, must be coded by the Scoring Director.

Table D.2: New Jersey Registered Holistic Scoring Rubric Grades 6 - 8

In scoring, consider the grid of written language	Inadequate Command	Limited Command	Partial Command	Adequate Command	Strong Command	Superior Command
Score	**1**	**2**	**3**	**4**	**5**	**6**
Content and Organization	• May lack opening and/or closing	• May lack opening and/or closing	• May lack opening and/or closing	• Generally has opening and/or closing	• Opening and closing	• Opening and closing
	• Minimal response to topic; uncertain focus	• Attempts to focus • May drift or shift focus	• Usually has single focus	• Single focus	• Single focus • Sense of unity and coherence • Key ideas developed	• Single, distinct focus • Unified and coherent • Well-developed
	• No planning evident; disorganized	• Attempts organization • Few, if any, transitions between ideas	• Some lapses or flaws in organization • May lack some transitions between ideas	• Ideas loosely connected • Transitions evident	• Logical progression of ideas • Moderately fluent • Attempts compositional risks	• Logical progression of ideas • Fluent, cohesive • Compositional risks successful
	• Details random, inappropriate, or barely apparent	• Details lack elaboration, i.e., highlight paper	• Repetitious details • Several unelaborated details	• Uneven development of details	• Details appropriate and varied	• Details effective, vivid, explicit, and/or pertinent
Usage	• No apparent control • Severe/numerous errors	• Numerous errors	• Errors/patterns of errors may be evident	• Some errors that do not interfere with meaning	• Few errors	• Very few, if any, errors
Sentence Construction	• Assortment of incomplete and/or incorrect sentences	• Excessive monotony/same structure • Numerous errors	• Little variety in syntax • Some errors	• Some variety • Generally correct	• Variety in syntax appropriate and effective • Few errors	• Precision and/or sophistication • Very few, if any, errors
Mechanics	• Errors so severe they detract from meaning	• Numerous serious errors	• Patterns of errors evident	• No consistent pattern of errors • Some errors that do not interfere with meaning	• Few errors	• Very few, if any, errors

Table D.2: New Jersey Registered Holistic Scoring Rubric Grade 6 - 8 (continued)

NON-SCORABLE RESPONSES	**FR** =Fragment	Student wrote too little to allow a reliable judgment of his/her writing.
	OT = Off Topic/ Off Task	Student did not write on the assigned topic/task.
	NE = Not English	Student wrote in a language other than English.
	NR = No Response	Blank

Note: All unscorable responses (NSRs), with the exception of NR, must be coded by the Scoring Director.

Content/Organization	Usage	Sentence Construction	Mechanics
• Communicates intended message to intended audience • Relates to topic • Opening and closing • Focused • Logical progression of ideas • Transitions • Appropriate details and information	• Tense formation • Subject-verb agreement • Pronoun usage/agreement • Word choice/meaning • Proper Modifiers	• Variety of type, structure, and length • Correct construction	• Spelling • Capitalization • Punctuation

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Table D.3: Open-Ended Scoring Rubric Reading

Points	Criteria
4	A 4-point response clearly demonstrates understanding of the task, completes all requirements, and provides an insightful explanation/opinion that links to or extends aspects of the text.
3	A 3-point response demonstrates an understanding of the task, completes all requirements, and provides some explanation/opinion using situations or ideas from the text as support.
2	A 2-point response may address all of the requirements, but demonstrates a partial understanding of the task, and uses text incorrectly or with limited success resulting in an inconsistent or flawed explanation.
1	A 1-point response demonstrates minimal understanding of the task, does not complete the requirements, and provides only a vague reference to or no use of the text.
0	A 0-point response is irrelevant or off-topic.

Table D.4: NJ ASK Generic Mathematics Rubric

3-Point Response	The response shows complete understanding of the problem's essential mathematical concepts. The student executes procedures completely and gives relevant responses to all parts of the task. The response contains few minor errors, if any. The response contains a clear, effective explanation detailing how the problem was solved so that the reader does not need to infer how and why decisions were made.
2-Point Response	The response shows nearly complete understanding of the problem's essential mathematical concepts. The student executes nearly all procedures and gives relevant responses to most parts of the task. The response may have minor errors. The explanation detailing how the problem was solved may not be clear, causing the reader to make some inferences.
1-Point Response	The response shows limited understanding of the problem's essential mathematical concepts. The response and procedures may be incomplete and/or may contain major errors. An incomplete explanation of how the problem was solved may contribute to questions as to how and why decisions were made.
0-Point Response	The response shows insufficient understanding of the problem's essential mathematical concepts. The procedures, if any, contain major errors. There may be no explanation of the solution or the reader may not be able to understand the explanation. The reader may not be able to understand how and why decisions were made.

The zero-to-three point generic scoring rubric below was created to help readers score open-ended responses consistently. In scoring, the reader should accept the use of appropriate diagrams, charts, formulas, and/or symbols which are part of a correct answer even when the question does not specifically request their use.

Table D.5: NJ ASK Generic Science Rubric

3-Point Response	Student response is reasonably complete, clear, and satisfactory.
2-Point Response	Student response has minor omissions and/or some incorrect or non-relevant information.
1-Point Response	Student response includes some correct information, but most information included in the response is either incorrect or not relevant.
0-Point Response	Student attempts the task but the response is incorrect, irrelevant, or inappropriate.

APPENDIX E
STANDARD SETTING
PERFORMANCE LEVEL DESCRIPTORS

Standard Setting

Demographic background information of PLD panelists and standard setting participants from the 2008 and 2009 meetings can be found in Appendix E1 of the 2009 NJ ASK Technical Report (PTM 1507-34),

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
English Language Arts
Grade 3

Partially Proficient

Reading. A student performing at the Partially Proficient level demonstrates **limited** ability to employ strategies needed to understand a variety of texts on a literal level. S/he **may** demonstrate **some** understanding of the central idea, supporting details, purpose, and organization of text, and **may** express **some** understanding of the text in written responses. A student at this level demonstrates **inconsistent** ability, however, to connect ideas, summarize relevant details, make inferences, and draw appropriate conclusions about the text in written responses.

Writing. A student performing at the Partially Proficient level **may** develop a single focus and **may attempt** to organize his/her writing using some supporting details that connect to the topic. S/he **inconsistently** follows the conventions of written language and demonstrates **limited** word choice and sentence structure in developing text. The student at this level **may not** sustain a purpose for writing and **may not** elaborate on ideas.

Proficient

Reading. A student performing at the Proficient level **demonstrates** the ability to employ strategies to comprehend a variety of texts literally and inferentially and to express understanding of the text in written responses. As a proficient reader, the student **recognizes** the central idea, supporting details, purpose, and organization of the text as well as some literary devices. The proficient student **can make connections** to the text, form opinions, and draw conclusions. The proficient reader **is able to synthesize** ideas from the reading and to use these to analyze and extend the meaning of the text in written responses.

Writing. A proficient writer uses a **repertoire of strategies** that enables him/her to accomplish the task of communicating a **clear and cohesive** message. The student **establishes and sustains** a purpose for writing and elaborates on information with specific details as s/he develops the text. The student connects ideas in a **logical progression**, provides support for opinions and conclusions, and generally uses transitions and the conventions of written language as well as varied sentence structures and word choice in his/her writing. S/he may take compositional risks.

Advanced Proficient

Reading. In addition to demonstrating the skills outlined for the proficient student, the Advanced Proficient reader **clearly and consistently** demonstrates the ability to synthesize, analyze, and extend the meaning of the text. In addition, the Advanced Proficient reader **interacts** with the text and makes meaningful connections in order to generate and extend ideas in written responses.

Writing. In addition to consistently demonstrating the skills outlined for the Proficient student, the Advanced Proficient writer **establishes and sustains** a single focus, organizes and connects ideas with **effective** transitions, and elaborates with **vivid** supporting details. The student at this level varies sentence structures, chooses **precise** words to convey meaning and message, and **consistently** uses the conventions of written language. S/he may take compositional risks.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
English Language Arts
Grade 4

Partially Proficient

Reading. A student performing at the Partially Proficient level demonstrates **limited** ability to construct meaning from texts or to employ the strategies needed to analyze and critique a variety of texts. S/he **may** demonstrate **some** understanding of the central idea, supporting details, purpose, and organization of text, and **may** express **some** understanding of the text in written responses. A student at this level demonstrates **inconsistent** ability, however, to connect ideas, summarize relevant details, make inferences, draw appropriate conclusions, and express opinions about the text in written responses.

Writing. A student performing at the Partially Proficient level **may** develop a single focus and **may** attempt to organize his/her writing using some details that connect to the topic. S/he **inconsistently** follows the conventions of written language and demonstrates **limited** word choice and sentence structure in developing text. The student at this level **may not** sustain a purpose for writing and **may not** elaborate on ideas.

Proficient

Reading. A student performing at the Proficient level **constructs** meaning by employing a variety of strategies to synthesize, analyze, and critique text. As a proficient reader, the student **recognizes** the central idea, supporting details, purpose, and organization of the text. The proficient reader **demonstrates** the ability to comprehend a variety of texts literally and inferentially, make connections to the text, and understand the function of some literary devices. The student **is able to use relevant** details to support opinions and conclusions and to use these to analyze ideas and extend the meaning of the text in written responses.

Writing. A proficient writer uses a **repertoire of strategies** that enable him/her to accomplish the task of communicating a **clear and cohesive** message. The proficient writer **establishes and sustains** a single focus for the writing, generally organizes and connects ideas in a **logical progression**, and includes relevant supporting details that elaborate on ideas. The student demonstrates **some fluency** as a writer with his/her use of transitions, varied sentence structure, precise word choice, and the conventions of written language. The student may also attempt compositional risks.

Advanced Proficient

Reading. In addition to demonstrating the skills outlined for the Proficient student, the Advanced Proficient reader **clearly and consistently** demonstrates the ability to synthesize, analyze, and extend the meaning of the text. In addition, the Advanced Proficient reader **interacts** with the text and makes meaningful connections in order to generate and extend ideas in written responses.

Writing. In addition to **consistently** demonstrating the skills outlined for the Proficient student, the Advanced Proficient writer **establishes and sustains** a single focus, organizes and connects ideas with **effective** transitions, and elaborates with **vivid** supporting details. The student varies sentence structure, chooses **precise** words to convey meaning and message, and **consistently** uses the conventions of written language. S/he may take compositional risks.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
English Language Arts
Grade 5

Partially Proficient

Reading. Students performing at the partially proficient level construct meaning by using reading strategies to comprehend on a literal level, make some connections to the text, and provide limited support for opinions and conclusions. They demonstrate limited understanding of text structures and literary elements, and attempt to use context clues to determine the meaning of unknown words.

Writing. As partially proficient writers, these students may develop a single focus and attempt to organize and connect ideas with relevant details. These students use limited word choice and sentence structure, and incorporate basic writing mechanics.

Proficient

Reading. Students performing at the proficient level construct meaning by using reading strategies to comprehend literally and inferentially. Proficient students synthesize details and analyze text. These students identify and explain literary elements, figurative language, and text structures. Proficient fifth grade students make connections, draw conclusions, and identify author's purpose, views, or beliefs. These students determine meaning of words and phrases by applying knowledge of word structure and using context clues.

Writing. As proficient writers, these students develop and maintain a single focus by organizing and connecting ideas with relevant details. Proficient students exhibit some variety in word choice and sentence structure, attempt writing techniques and use some transitions while incorporating basic writing mechanics.

Advanced Proficient

Reading. As readers, students performing at the advanced level of proficiency consistently demonstrate the skills outlined for proficient performance. In addition, the advanced proficient students extend meaning by making connections, generating new ideas, and making sound judgments about text.

Writing. As writers, students performing at the advanced level of proficiency consistently demonstrate the skills outlined for proficient performance. In addition, these students also use supporting details to convey and elaborate ideas. Advanced proficient students use fluid transitions, strong and appropriate word choice and sentence variety to purposefully engage the reader.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
English Language Arts
Grade 6

Partially Proficient

Reading. Students performing at the partially proficient level construct meaning by using reading strategies for literal and limited inferential comprehension, make connections with the text and provide some support for opinions and conclusions. They demonstrate some understanding of text structures and literary elements, and use word structure and context clues to determine the meaning of unknown words.

Writing. As partially proficient writers, these students develop a single focus and organize and connect ideas with some supporting details. They write for a limited variety of purposes, attempt to provide support for opinions and conclusions, and incorporate basic writing mechanics.

Proficient

Reading. Students performing at the proficient level construct meaning by using reading strategies to comprehend literally and inferentially. Students at this level identify the central idea, relevant and essential details, and textual conventions. Proficient students are able to analyze and evaluate organizational structures and literary elements and devices. Proficient sixth grade students make connections and inferences, and identify author's purpose, views or beliefs. These students determine meaning of words and phrases by applying knowledge of word structure and using context clues.

Writing. As proficient writers, these students develop and maintain a single focus and supporting details within a clear and appropriate organizational structure. Proficient students write for a variety of purposes while keeping their audience in mind. Students provide support for opinions and conclusions, and attempt to use literary devices.

Advanced Proficient

Reading. As readers, students performing at the advanced level of proficiency consistently demonstrate the skills outlined for proficient performance. In addition, students demonstrate comprehension and extend meaning by making connections, generating new ideas, and making insightful judgments about text.

Writing. As writers, students performing at the advanced level of proficiency consistently demonstrate the skills outlined for proficient performance. In addition, the advanced proficient students develop a logical progression of ideas with style, voice, and precise word choice. Students at this level apply appropriate compositional risks.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
English Language Arts
Grade 7

Partially Proficient

Reading. Seventh grade students performing at the partially proficient level construct meaning by using reading strategies for literal and inferential comprehension, and make connections with the text. They identify the central idea or theme, demonstrate some understanding of text structures and literary elements and provide limited support for opinions and conclusions. These students use word structure and context clues to determine the meaning of unknown words.

Writing. Seventh grade students partially proficient in writing develop a single focus and organize and connect ideas with some supporting details. They may establish a purpose for writing and provide limited support for opinions and conclusions. These students demonstrate some control of Standard English conventions.

Proficient

Reading. Seventh grade students performing at the proficient level demonstrate an understanding of a variety of texts. Proficient students identify the author's purpose, tone, and central idea or theme. They recognize the main idea and support it with evidence. Students use the organizational structure of text to construct meaning. They use word and sentence structure as well as context clues to determine the meaning of unknown words and phrases. Students interpret, extrapolate, and synthesize information.

Writing. Seventh grade students proficient in writing are able to develop a single focus and supply supporting details in a variety of organizational structures. Students at this level establish a purpose for writing and provide support for opinions and conclusions. Proficient students demonstrate control of Standard English conventions.

Advanced Proficient

Reading. In addition to demonstrating the skills outlined for proficient students, advanced proficient students infer themes or central ideas while analyzing and evaluating texts. Advanced students make connections to extend understanding and critically respond to a variety of texts.

Writing. As writers, students performing at the advanced level of proficiency consistently demonstrate the skills outlined for proficient performance. In addition, the advanced proficient students create a clear and unified composition by developing a central theme, supporting details and appropriate organizational structure. They demonstrate sophisticated use of literary elements as well as a precise vocabulary. Advanced students apply compositional risks.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
English Language Arts
Grade 8

Partially Proficient

Reading. Eighth grade students performing at the partially proficient level construct meaning by using reading strategies for literal and inferential comprehension, and make connections with the text. They identify the central idea or theme, demonstrate some understanding of text structures and literary elements, and provide some support for opinions and conclusions. These students use word structure and context clues to determine the meaning of unknown words, and attempt to interpret, extrapolate, and synthesize information.

Writing. Eighth grade students partially proficient in writing develop a single focus and organize and connect ideas with supporting details. They establish a purpose for writing and provide limited support for opinions and conclusions. These students demonstrate some control of Standard English conventions

Proficient

Reading. Eighth grade students performing at the proficient level show an overall understanding of a variety of texts at literal and inferential levels. They make connections while interpreting and analyzing text. Proficient students recognize the author's purpose and respond critically to central themes, supporting details, and organizational structures of text. They interpret, extrapolate and synthesize information. Students support opinions and conclusions with evidence from the text.

Writing. Eighth grade students proficient in writing develop and sustain a single focus, include and elaborate supporting details, and use a variety of organizational structures. They establish a purpose for writing and elaborate on ideas. Students at this level provide support for opinions and conclusions while demonstrating control of Standard English conventions.

Advanced Proficient

Reading. In addition to demonstrating the skills outlined for proficient students, advanced proficient students show a sophisticated understanding of abstract themes and ideas. They make insightful connections while interacting with, interpreting, analyzing, and critiquing text. The advanced students synthesize, analyze, and evaluate written text.

Writing. As writers, students performing at the advanced level of proficiency consistently demonstrate the skills outlined for proficient performance. The advanced proficient students, in addition to developing a central theme, supporting details and organizational structure, demonstrate sophisticated use of literary elements and vivid vocabulary. Advanced students show a high degree of sustained control over textual conventions and apply compositional risks.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 3

Partially Proficient

Students performing at the Partially Proficient level have **limited** recall, recognition and application of basic facts and informational concepts.

- Partially Proficient students perform **simple routine** procedures such as computing a sum, difference or product, and can use a specified procedure with some accuracy. These students have **limited ability to demonstrate** number sense by using place value concepts and fractions. Partially proficient students **may have difficulty with determining the appropriate operation** for a given situation and with estimating their results.
- Partially Proficient students can **apply basic concepts** of geometry and measurement. These students have a **basic working knowledge** of spatial sense, geometric properties and geometric relationships. Partially proficient students can **sometimes use** appropriate measurement tools accurately.
- Partially Proficient students have a **basic understanding** of how quantities are related to one another and how algebra can be used to concisely represent and analyze those relationships. These students can recognize, describe, extend, and create **simple patterns** as well as solve **simple problems** involving functions.
- Partially Proficient students have a **basic understanding** of how to apply the concepts and methods of data analysis, probability, and discrete mathematics. These students are able to read a graph, table, or chart.
- Partially Proficient students can **identify and use basic mathematical terms** as well as apply some reasoning methods to solve simple problems.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 3 (continued)

Proficient

Students performing at the proficient level demonstrate recall, recognition and application of facts and informational concepts.

- Proficient students **perform routine procedures** such as computing a sum, difference or product, and can use a specified procedure with accuracy. These students are able to demonstrate number sense by using place value concepts and fractions. Proficient students **determine the appropriate operation** for a given situation and can use estimation appropriately.
- Proficient students **understand and apply concepts** of geometry and measurement. These students can **demonstrate a working knowledge** of spatial sense, geometric properties and geometric relationships. Proficient students can use appropriate measurement tools accurately.
- Proficient students **demonstrate an understanding** of how quantities are related to one another and how algebra can be used to concisely represent and analyze those relationships. These students can recognize, describe, extend, and create patterns as well as solve problems involving functions.
- Proficient students **understand and apply** the concepts and methods of data analysis, probability, and discrete mathematics. These students are able to read, interpret, and represent information in a graph, table, or chart.
- Proficient students **use various forms** of representation to illustrate steps to a solution and **effectively communicate** a variety of reasoning methods to solve multi-step problems. Proficient students can explain steps and procedures for finding solutions, as well as check the reasonableness of their results.

Advanced Proficient

Students performing at the Advanced Proficient level demonstrate the qualities outlined for Proficient performance. In addition, these students determine strategies and procedures to solve **routine and non-routine** problems. An Advanced Proficient student draws appropriate inferences and provides explanations that are **consistently clear and thorough**. These students **consistently** demonstrate the ability to abstract relevant information, use **multiple strategies** and/or reasoning methods, and use various forms of representations to solve challenging problems. These students demonstrate an understanding of the reasonableness of their answers.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 4

Partially Proficient

Students performing at the Partially Proficient level have **limited** recall, recognition and application of basic mathematical concepts, skills, and vocabulary to solve problems involving real world situations.

- Partially Proficient students understand and perform **simple routine** numerical operations of whole numbers. The students have **limited ability to demonstrate** number sense by using place value concepts, fractions and decimals. Partially Proficient students can compute **simple** sums and differences of fractions and decimals. These students have difficulty with determining the appropriate operation for a given situation and with estimating their results.
- Partially proficient students **understand and apply basic concepts** of geometry and measurement. These students demonstrate a **basic working knowledge** of spatial sense, geometric properties, and geometric relationships. Partially Proficient students **can use** appropriate measurement tools accurately to solve simple problems involving perimeter, area, and volume. These students have a **basic understanding** of coordinate geometry and lines of symmetry.
- Partially Proficient students have a **basic understanding** of how quantities are related to one another and how to represent and analyze those relationships using algebraic concepts. These students can recognize, describe, extend, and create **simple patterns**, as well as solve **simple problems** involving functions.
- Partially Proficient students have a **basic understanding** of the concepts and methods of data analysis, probability, and discrete mathematics. These students can read, interpret and construct simple graphs, tables, and/or charts, but often find it difficult to predict or make an informed decision based on information retrieved from a variety of sources. Partially Proficient students demonstrate limited skills using tools and strategies for representing, organizing, and interpreting data. These students can solve simple problems involving mean, median, and mode.
- Partially Proficient students can **identify and use basic mathematical terms** and apply some reasoning methods to solve simple problems.

Proficient

Students performing at the proficient level demonstrate recall, recognition and application of mathematical concepts, skills, and vocabulary to solve problems involving real world situations.

- Proficient students **understand and perform** numerical operations of whole numbers and can use a specified procedure with **accuracy.** These students demonstrate number sense by using place value concepts, fractions, and decimals. Proficient students can compute sums and differences of fractions and decimals. These students **determine the appropriate operation** for a given situation and can use estimation appropriately.
- Proficient students **understand and apply concepts** of geometry and measurement. These students **demonstrate a working knowledge** of spatial sense, geometric properties and geometric relationships. Proficient students can use appropriate measurement tools accurately to solve problems involving perimeter, area and volume. These students understand and apply concepts of coordinate geometry as well as identify lines of symmetry.
- Proficient students **demonstrate an understanding** how quantities are related to one another and how to represent and analyze those relationships using algebraic concepts. These students can recognize, describe, extend, and create patterns as well as solve functions for a given variable, including inverse relationships. Proficient students can understand, name, and apply properties of operations and numbers.
- Proficient students have an **understanding of how to apply** the concepts and techniques of data analysis, probability, and discrete mathematics. These students can read, interpret and construct graphs, tables and/or charts as well as predict or make an informed decision based on information retrieved from a variety of sources. Proficient students demonstrate skills using tools and strategies for representing, organizing, and interpreting data as well as solve problems involving mean, median, and mode.
- Proficient students **use various forms** of representation to illustrate steps to a solution and **effectively communicate** a variety of reasoning methods to solve multi-step problems. These students can explain steps and procedures for finding solutions as well as check the reasonableness of their results.

Advanced Proficient

Students performing at the Advanced Proficient level **clearly and consistently demonstrate** the qualities outlined for Proficient performance. These students **clearly and consistently demonstrate** thorough conceptual understanding of procedural and analytical skills. In addition, Advanced Proficient students demonstrate the use of **abstract thinking** and provide explanations that are **consistently clear and thorough**. These students use both inductive and deductive reasoning to solve non-routine problems as well as consistently demonstrate the ability to abstract relevant information, use multiple strategies and/or reasoning methods, and use various forms of representations to solve complex problems. Advanced Proficient students demonstrate an understanding of the reasonableness of their answers.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 5

Partially Proficient

Students performing at the partially proficient level have limited recognition and understanding of and inconsistently apply basic mathematical concepts, skills, and vocabulary to theoretical and real world situations.

- These students may understand that a quantity can be represented numerically in various ways. Partially proficient students perform basic computational procedures with inconsistent accuracy.
- Partially proficient students struggle to apply geometric properties and comprehend spatial relationships.
- Partially proficient students have difficulty using informal algebraic concepts and processes.
- Partially proficient students inconsistently read, construct, and interpret data and graphs. They inconsistently apply the concepts and methods of discrete mathematics.

These students will occasionally infer, reason, and estimate while problem solving. Partially proficient students are frequently ineffectual in selecting a successful process or strategy. These students have difficulty demonstrating a basic understanding of mathematical concepts through written expression and/or symbolic representation.

Proficient

Students performing at the proficient level recognize and understand basic mathematical concepts, skills, and vocabulary and apply them to theoretical and real world situations.

- Proficient students understand that a quantity can be represented numerically in various ways. These students perform basic computational procedures.
- Proficient students apply geometric properties and spatial relationships.
- Proficient students use informal algebraic concepts and processes.
- Proficient students read, construct, and interpret data and graphs. They apply the concepts and methods of discrete mathematics.

These students infer, reason, and estimate while problem solving. Proficient students are flexible in selecting a successful process or strategy. These students demonstrate a basic understanding of mathematical concepts through written expression and/or symbolic representation.

Advanced Proficient

Students performing at the advanced proficient level consistently demonstrate the qualities outlined for proficient performance. In addition, advanced proficient students analyze methods for appropriateness, synthesize processes, and evaluate mathematical relationships. Advanced proficient students demonstrate conceptual understanding by consistently providing clear and complete explanations. These students demonstrate the ability to transfer mathematical concepts to other applications and successfully form conjectures.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 6

Partially Proficient

Sixth grade students performing at the partially proficient level in mathematics demonstrate limited evidence of and/or an inability to communicate conceptual understanding of procedural and analytical skills. Partially proficient students inconsistently apply mathematical skills and knowledge to theoretical and real world situations. These students struggle to integrate skills across the four mathematical content standards.

- Partially proficient students may demonstrate some understanding of but inconsistently apply appropriate standard numerical operations. These students may determine the reasonableness of an answer.
- Partially proficient students have difficulty understanding and applying geometric concepts including properties, measurement, and special relationships.
- Partially proficient students may inconsistently use simple algebraic concepts and processes.
- They inconsistently read, construct, and interpret data and graphs, determine probabilities of events, and may misapply the concepts and methods of discrete mathematics.

Proficient

Sixth grade students performing at the proficient level in mathematics demonstrate evidence of and communicate conceptual understanding of procedural and analytical skills. Proficient students apply mathematical skills and knowledge to theoretical and real world situations. In addition, these students integrate skills across the four mathematical content standards.

- Proficient students understand and apply appropriate standard numerical operations: an understanding for problem solving in practical situations. These students can determine the reasonableness of an answer.
- Proficient students understand and apply geometric concepts including properties, measurement, and special relationships.
- Proficient students use simple algebraic concepts and processes.
- Proficient students read, construct, and interpret data and graphs, determine probabilities of events, and apply the concepts and methods of discrete mathematics.

Advanced Proficient

Sixth grade students performing at the advanced proficient level in mathematics consistently demonstrate the qualities for proficient performance. In addition, these students demonstrate the use of abstract thinking and mathematical fluency to provide explanations that are consistently clear and thorough. Advanced proficient students support logical, efficient methods in solving problems. These students consistently make accurate inferences and predictions. Advanced proficient students may support responses with appropriate mathematical explanation. These students successfully analyze and draw appropriate inferences from data. They demonstrate the ability to transfer mathematical concepts to other applications and successfully form conjectures.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 7

Partially Proficient

Seventh grade students performing at the partially proficient level demonstrate limited evidence of conceptual understanding of mathematical knowledge, procedures, skills, and processes across the four content standards. A partially proficient student inconsistently demonstrates the ability to:

- identify, recognize and compare different representations of numbers. They demonstrate a limited understanding of the meanings and uses of numerical operations.
- identify, describe, and classify two- and three-dimensional shapes, apply geometric properties, and solve problems involving geometry, spatial sense, and measurement.
- recognize, evaluate and identify algebraic representations and simple patterns of theoretical and real-world problems, including the extension of simple patterns.
- model situations, solve problems, and analyze, and draw appropriate inferences from data. They have difficulty understanding and interpreting the fundamental concepts of probability, and inconsistently apply concepts of discrete mathematics to solve problems.

Partially proficient students comprehend some mathematical vocabulary and communicate their reasoning ineffectually.

Proficient

Seventh grade students performing at the proficient level demonstrate evidence of conceptual understanding of mathematical knowledge, procedures, skills, and processes across the four content standards.

- Proficient students identify, recognize and compare different representations of numbers and demonstrate an understanding of the meanings and uses of numerical operations.
- Proficient students identify, describe, and classify two- and three-dimensional shapes, apply geometric properties, and solve problems involving geometry, spatial sense, and measurement.
- Proficient students recognize, evaluate and identify algebraic representations and simple patterns of theoretical and real-world problems, including the extension of simple patterns.
- Proficient students model situations, solve problems, and analyze, and draw appropriate inferences from data. They understand and interpret the fundamental concepts of probability and apply concepts of discrete mathematics to solve problems.

Proficient students are mathematically literate in their ability to comprehend vocabulary, understand appropriate context and communicate their reasoning.

Advanced Proficient

Advanced proficient students demonstrate the qualities outlined for proficient performance. Additionally, they use abstract reasoning and demonstrate mathematical fluency through problem solving and assess the reasonableness of their solution. Advanced proficient students extrapolate information and form and support conclusions through clear and thorough explanations.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 8

Partially Proficient

Eighth grade students performing at the partially proficient level demonstrate limited evidence of conceptual and analytical understanding of mathematical knowledge, procedures, skills and processes across and within the four content standards. A partially proficient student inconsistently demonstrates the ability to:

- identify, recognize and compare different representations of numbers. They demonstrate a limited understanding of the meanings and uses of numerical operations and number systems.
- apply geometrical concepts; identify, describe, and classify two- and three-dimensional shapes; and solve problems involving geometry, spatial sense and measurement.
- represent and analyze relationships among variable quantities and solve problems involving patterns, functions, and algebraic concepts and processes. Students have difficulty modeling situations algebraically, symbolically and graphically.
- analyze, interpret, and make predictions based on appropriate representations for sets of data. They are limited in applying and interpreting the concepts of probability and discrete mathematics to solve problems.

Partially proficient students comprehend some mathematical vocabulary and communicate their reasoning ineffectually within and among the mathematical content areas.

Proficient

Eighth grade students performing at the proficient level demonstrate evidence of conceptual and analytical understanding of mathematical knowledge, procedures, skills and processes across and within the four content standards.

- Proficient students identify, recognize and compare different representations of numbers and demonstrate an understanding of the meanings and uses of numerical operations and number systems.
- Proficient students apply geometrical concepts; identify, describe, and classify two- and three-dimensional shapes; and solve problems involving geometry, spatial sense and measurement.
- Proficient students will represent and analyze relationships among variable quantities and solve problems involving patterns, functions, and algebraic concepts and processes. Students will model situations algebraically, symbolically and graphically.
- Proficient students analyze, interpret, and make predictions based on appropriate representations for sets of data. They apply and interpret the concepts of probability and discrete mathematics to solve problems.

Proficient students are mathematically literate in their ability to comprehend vocabulary, understand appropriate context and communicate their reasoning within and among the mathematical content areas.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 8 (continued)

Advanced Proficient

Advanced proficient students demonstrate the qualities outlined for the proficient student. Additionally, advanced proficient students use inductive and deductive reasoning as well as demonstrate mathematical fluency. Students performing at the advanced proficient level demonstrate clear and thorough conceptual understanding. They are able to extrapolate information to form and support conclusions through clear and thorough explanations as well assess the reasonableness of their solution.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
and Grade Eight Proficiency Assessment (GEPA)
Performance Level Descriptors
Science
Grade 8

Proficient

The Proficient student can recognize the structural levels of living things. This student knows that some traits of organisms are beneficial and some detrimental. This student can interpret visual and textual data to understand the relationship within a food web and the interdependence of living and nonliving systems.

The proficient student can recognize the effect force has on an object, trace the flow of energy through a system, and use the properties of matter to identify and separate materials. This student can understand different types of energy and use information from data charts to interpret relationships and predict outcomes.

The proficient student can recognize the existence of a relationship between the moon and tides, recognize the different characteristics of the planets in the solar system, and understand the natural forces that change the surface of the Earth, including chemical and physical weathering.

Advanced Proficient

The advanced proficient student can support scientific conclusions with valid contextual and visual data and make predictions based on the interactions of living things. This student is able to use interpretive skills to analyze visual and textual data in order to solve problems dealing with the application of force and energy.

The advanced proficient student understands the difference between types of energy waves and can recognize and apply experimental principles and empirical data.

The advanced proficient student can recognize the nature of the tides' relationship to Earth, Sun, and moon; interpret topographical maps; and identify the steps in the process of weathering and erosion.

APPENDIX F
SCALE SCORE CUMULATIVE FREQUENCY DISTRIBUTIONS

Table F.1: ELA Grade 3

		English Language Arts Grade 3						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
0	100	5	0.00	0.00	0.01	0.01	0.00	0.00
1	102	17	0.02	0.01	0.03	0.05	0.02	0.01
2	118	46	0.05	0.02	0.07	0.12	0.07	0.02
3	128	106	0.10	0.04	0.16	0.24	0.19	0.04
4	134	171	0.17	0.08	0.25	0.39	0.28	0.06
5	139	274	0.27	0.15	0.39	0.63	0.46	0.10
6	143	435	0.43	0.24	0.61	1.05	0.72	0.14
7	147	610	0.60	0.35	0.84	1.43	1.01	0.21
8	150	849	0.84	0.50	1.16	1.91	1.47	0.28
9	153	1126	1.11	0.69	1.51	2.67	1.90	0.36
10	155	1506	1.48	0.88	2.05	3.45	2.56	0.52
11	158	2045	2.01	1.21	2.78	4.75	3.31	0.77
12	160	2636	2.60	1.57	3.58	6.09	4.17	1.06
13	163	3439	3.39	2.12	4.58	7.61	5.43	1.48
14	165	4455	4.39	2.79	5.90	9.52	7.07	2.02
15	168	5681	5.60	3.69	7.39	11.77	9.10	2.67
16	171	7197	7.09	4.89	9.17	14.49	11.46	3.55
17	173	9038	8.90	6.30	11.36	17.36	14.32	4.74
18	176	11280	11.11	8.14	13.92	21.08	17.66	6.19
19	179	13919	13.71	10.30	16.93	25.06	21.54	8.05
20	182	17067	16.81	12.96	20.46	29.91	25.98	10.30
21	185	20690	20.38	16.00	24.53	34.98	31.17	13.05
22	188	24837	24.47	19.60	29.08	40.22	36.74	16.43
23	191	29330	28.89	23.61	33.90	45.72	42.62	20.20
24	194	34156	33.65	28.17	38.85	51.46	48.65	24.46
25	200	39574	38.98	33.13	44.54	57.57	54.91	29.50
26	201	45280	44.60	38.51	50.40	63.31	61.15	35.05
27	204	51152	50.39	44.34	56.14	68.89	66.97	41.17
28	207	57195	56.34	50.52	61.88	74.06	72.73	47.52
29	211	63299	62.35	56.71	67.74	79.15	78.01	54.34
30	214	69236	68.20	62.89	73.26	83.50	82.78	61.03
31	218	74979	73.86	69.19	78.31	87.48	87.06	67.71
32	221	80213	79.01	74.89	82.95	90.52	90.53	74.01
33	225	85149	83.88	80.18	87.41	93.07	93.60	79.94
34	230	89273	87.94	84.82	90.91	95.13	95.76	85.11
35	234	92686	91.30	88.83	93.66	96.66	97.32	89.24
36	238	95442	94.02	92.10	95.84	97.78	98.32	92.75
37	243	97487	96.03	94.61	97.39	98.68	99.01	95.23
38	250	98970	97.49	96.58	98.35	99.19	99.42	97.13
39	253	99987	98.49	97.96	99.01	99.53	99.68	98.33
40	258	100662	99.16	98.83	99.47	99.73	99.83	99.09
41	263	101056	99.55	99.34	99.74	99.83	99.91	99.51
42	268	101285	99.77	99.67	99.87	99.94	99.96	99.76
43	274	101404	99.89	99.83	99.95	99.97	99.98	99.89
44	281	101467	99.95	99.93	99.97	99.99	100.00	99.95
45	288	101499	99.98	99.97	99.99	100.00	100.00	99.98
46	297	101512	100.00	99.99	100.00	100.00	100.00	100.00
47	300	101516	100.00	100.00	100.00	100.00	100.00	100.00
48	300	101517	100.00	100.00	100.00	100.00	100.00	100.00

Table F.2: ELA Grade 4

		English Language Arts Grade 4						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
0	100	0	0.00	0.00	0.00	0.00	0.00	0.00
1	100	3	0.00	0.00	0.00	0.00	0.01	0.00
2	100	11	0.01	0.01	0.02	0.02	0.02	0.00
3	108	30	0.03	0.01	0.04	0.06	0.05	0.01
4	115	79	0.08	0.03	0.12	0.19	0.12	0.03
5	121	153	0.15	0.07	0.22	0.39	0.23	0.06
6	125	247	0.24	0.12	0.36	0.63	0.38	0.09
7	129	382	0.38	0.18	0.56	0.95	0.61	0.14
8	132	548	0.54	0.28	0.79	1.35	0.83	0.22
9	135	750	0.74	0.40	1.07	1.82	1.16	0.31
10	137	1008	1.00	0.55	1.42	2.38	1.60	0.42
11	140	1362	1.34	0.73	1.93	3.22	2.18	0.54
12	143	1775	1.75	0.96	2.51	4.14	2.84	0.72
13	145	2321	2.29	1.31	3.23	5.34	3.75	0.95
14	148	2944	2.91	1.72	4.04	6.73	4.67	1.26
15	150	3784	3.74	2.29	5.11	8.56	6.01	1.63
16	153	4786	4.72	3.04	6.33	10.66	7.60	2.12
17	156	5981	5.90	3.94	7.78	13.04	9.60	2.69
18	159	7384	7.29	5.02	9.46	15.78	11.94	3.39
19	162	9003	8.89	6.29	11.38	18.73	14.55	4.27
20	165	10763	10.63	7.63	13.49	21.95	17.28	5.31
21	168	12755	12.59	9.23	15.81	25.26	20.54	6.49
22	171	15058	14.87	11.12	18.44	29.08	24.08	7.95
23	174	17574	17.35	13.28	21.23	33.12	27.78	9.65
24	177	20292	20.03	15.59	24.26	37.51	31.54	11.56
25	180	23107	22.81	18.02	27.38	41.41	35.53	13.71
26	183	26358	26.02	20.94	30.87	45.70	40.24	16.23
27	186	29672	29.29	23.89	34.44	49.83	44.67	18.93
28	189	33341	32.91	27.05	38.50	54.55	49.36	22.05
29	193	37122	36.65	30.57	42.44	59.08	54.07	25.38
30	196	41087	40.56	34.26	46.57	63.25	58.65	29.13
31	200	45400	44.82	38.28	51.05	67.37	63.31	33.46
32	202	49846	49.21	42.55	55.56	71.34	68.11	38.00
33	206	54477	53.78	46.95	60.30	75.24	72.20	43.12
34	209	59160	58.40	51.67	64.83	79.00	76.39	48.29
35	213	63928	63.11	56.57	69.35	82.51	80.50	53.64
36	217	68793	67.91	61.69	73.85	85.91	84.03	59.48
37	221	73530	72.59	66.66	78.25	88.76	87.55	65.06
38	225	78048	77.05	71.42	82.43	91.33	90.39	70.63
39	229	82225	81.17	76.06	86.05	93.38	92.82	75.85
40	234	86227	85.12	80.58	89.46	95.02	94.97	80.89
41	238	89756	88.61	84.74	92.30	96.47	96.52	85.38
42	243	92784	91.60	88.49	94.56	97.59	97.80	89.24
43	250	95303	94.08	91.77	96.29	98.43	98.61	92.53
44	253	97261	96.01	94.33	97.62	99.04	99.18	95.00
45	259	98690	97.43	96.23	98.56	99.47	99.48	96.85
46	265	99767	98.49	97.72	99.22	99.76	99.75	98.19
47	272	100466	99.18	98.73	99.60	99.90	99.86	99.03

		English Language Arts Grade 4						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
48	279	100866	99.57	99.31	99.83	99.94	99.92	99.54
49	287	101082	99.79	99.67	99.90	99.96	99.96	99.79
50	297	101218	99.92	99.87	99.97	99.99	99.99	99.91
51	300	101274	99.98	99.96	99.99	100.00	100.00	99.97
52	300	101295	100.00	99.99	100.00	100.00	100.00	100.00
53	300	101298	100.00	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

Table F.3: ELA Grade 5

		English Language Arts Grade 5						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
0	100	2	0.00	0.00	0.00	0.00	0.00	0.00
1	100	6	0.01	0.00	0.01	0.01	0.01	0.00
2	100	10	0.01	0.00	0.02	0.01	0.02	0.01
3	100	16	0.02	0.01	0.03	0.03	0.02	0.01
4	107	30	0.03	0.01	0.05	0.08	0.04	0.01
5	113	51	0.05	0.02	0.07	0.17	0.05	0.02
6	118	86	0.09	0.04	0.12	0.25	0.09	0.03
7	122	137	0.14	0.07	0.19	0.38	0.15	0.05
8	125	213	0.21	0.10	0.30	0.56	0.27	0.09
9	128	320	0.32	0.16	0.46	0.83	0.42	0.14
10	131	487	0.48	0.25	0.69	1.23	0.64	0.22
11	134	697	0.69	0.34	1.01	1.73	0.95	0.32
12	137	966	0.96	0.47	1.39	2.40	1.32	0.44
13	140	1308	1.30	0.65	1.89	3.28	1.77	0.59
14	143	1712	1.70	0.87	2.46	4.20	2.44	0.77
15	146	2281	2.27	1.20	3.24	5.45	3.33	1.04
16	148	2939	2.92	1.62	4.10	7.04	4.39	1.32
17	151	3700	3.68	2.17	5.05	8.83	5.58	1.68
18	154	4690	4.66	2.86	6.31	11.09	7.03	2.17
19	157	5759	5.72	3.62	7.66	13.26	8.71	2.74
20	160	7017	6.97	4.48	9.28	15.75	10.72	3.42
21	163	8551	8.50	5.61	11.18	18.81	13.12	4.22
22	166	10235	10.17	6.86	13.25	21.81	15.82	5.19
23	169	12115	12.04	8.35	15.47	25.50	18.65	6.28
24	172	14169	14.08	10.04	17.83	28.90	21.78	7.60
25	175	16590	16.49	11.92	20.74	32.82	25.57	9.18
26	178	19177	19.06	14.02	23.75	36.95	29.29	11.06
27	181	21910	21.78	16.39	26.79	40.98	33.03	13.20
28	184	24972	24.82	19.13	30.13	45.14	37.30	15.66
29	187	28194	28.02	22.02	33.63	49.63	41.80	18.19
30	190	31635	31.44	25.22	37.27	53.80	46.15	21.26
31	193	35295	35.08	28.67	41.08	58.04	50.66	24.58
32	196	38999	38.76	32.27	44.85	61.96	55.40	27.99
33	200	43190	42.93	36.32	49.12	66.17	60.24	32.09
34	202	47400	47.11	40.50	53.32	70.41	64.82	36.30

		English Language Arts Grade 5						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
35	205	51714	51.40	44.84	57.57	74.07	69.15	41.01
36	208	55878	55.54	48.99	61.69	77.57	73.32	45.44
37	211	60190	59.83	53.55	65.74	80.83	77.24	50.26
38	214	64556	64.17	58.23	69.74	84.03	80.84	55.29
39	217	68705	68.29	62.61	73.63	86.75	83.98	60.18
40	221	72772	72.33	67.08	77.28	89.18	87.01	65.06
41	224	76513	76.05	71.17	80.65	91.29	89.52	69.60
42	228	80124	79.64	75.21	83.83	93.26	91.73	74.11
43	232	83457	82.95	78.94	86.75	94.74	93.57	78.32
44	235	86594	86.07	82.50	89.44	95.90	95.22	82.43
45	239	89437	88.90	85.82	91.81	97.04	96.54	85.97
46	243	91875	91.32	88.67	93.83	97.90	97.57	89.06
47	250	93935	93.37	91.20	95.43	98.53	98.32	91.75
48	252	95645	95.07	93.31	96.73	98.99	98.83	93.97
49	257	97073	96.49	95.08	97.82	99.30	99.29	95.77
50	262	98243	97.65	96.65	98.60	99.62	99.61	97.25
51	268	99069	98.47	97.78	99.14	99.77	99.77	98.29
52	274	99647	99.05	98.57	99.50	99.87	99.87	98.93
53	280	100046	99.44	99.14	99.73	99.92	99.94	99.43
54	287	100322	99.72	99.56	99.87	99.97	99.97	99.73
55	295	100463	99.86	99.77	99.95	99.97	99.98	99.86
56	300	100548	99.94	99.90	99.98	99.99	100.00	99.95
57	300	100588	99.98	99.97	99.99	100.00	100.00	99.99
58	300	100600	99.99	99.99	100.00	100.00	100.00	100.00
59	300	100603	100.00	99.99	99.99	100.00	100.00	100.00
60	300	100607	100.00	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

Table F.4: ELA Grade 6

		English Language Arts Grade 6						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
1.0	100	1	0.00	0.00	0.00	0.01	0.00	0.00
2.0	100	4	0.00	0.00	0.01	0.01	0.01	0.00
3.0	108	5	0.00	0.00	0.01	0.02	0.00	0.00
4.0	116	11	0.01	0.01	0.02	0.03	0.02	0.00
4.5	119	12	0.01	0.00	0.02	0.00	0.02	0.00
5.0	121	22	0.02	0.01	0.03	0.05	0.04	0.01
6.0	126	50	0.05	0.02	0.07	0.09	0.08	0.02
7.0	130	94	0.09	0.04	0.14	0.22	0.14	0.04
7.5	132	97	0.09	0.04	0.14	0.23	0.00	0.00
8.0	133	150	0.15	0.08	0.21	0.38	0.21	0.05
8.5	135	152	0.15	0.08	0.21	0.00	0.00	0.06
9.0	136	222	0.22	0.12	0.31	0.55	0.31	0.09
9.5	137	230	0.22	0.13	0.32	0.56	0.32	0.09
10.0	139	322	0.31	0.18	0.44	0.81	0.44	0.13
10.5	140	330	0.32	0.19	0.45	0.82	0.46	0.13
11.0	141	455	0.44	0.26	0.62	1.12	0.63	0.18

English Language Arts Grade 6

		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	**Scale Score**	**#**	**%**	**%**	**%**	**%**	**%**	**%**
11.5	142	474	0.46	0.28	0.64	1.15	0.67	0.19
12.0	144	631	0.62	0.35	0.86	1.56	0.89	0.24
12.5	145	670	0.65	0.38	0.91	1.65	0.96	0.26
13.0	146	848	0.83	0.48	1.16	2.05	1.27	0.32
13.5	147	898	0.88	0.51	1.22	2.17	1.36	0.34
14.0	148	1093	1.07	0.63	1.48	2.55	1.68	0.43
14.5	149	1167	1.14	0.67	1.58	2.71	1.80	0.46
15.0	150	1406	1.37	0.80	1.91	3.36	2.14	0.55
15.5	151	1480	1.45	0.86	2.00	3.50	2.26	0.58
16.0	152	1726	1.69	0.99	2.35	4.08	2.68	0.67
16.5	153	1812	1.77	1.04	2.46	4.33	2.85	0.68
17.0	154	2113	2.06	1.22	2.86	4.99	3.38	0.79
17.5	155	2215	2.16	1.31	2.97	5.24	3.54	0.82
18.0	156	2551	2.49	1.51	3.42	5.98	4.08	0.97
18.5	157	2699	2.64	1.62	3.60	6.34	4.29	1.04
19.0	158	3121	3.05	1.90	4.13	7.15	4.98	1.26
19.5	159	3300	3.22	2.04	4.35	7.61	5.25	1.33
20.0	160	3742	3.66	2.34	4.90	8.54	6.00	1.52
20.5	161	3960	3.87	2.50	5.17	9.03	6.35	1.60
21.0	162	4456	4.35	2.85	5.78	10.00	7.11	1.86
21.5	164	4733	4.62	3.07	6.10	10.51	7.62	1.97
22.0	165	5267	5.15	3.46	6.74	11.68	8.50	2.20
22.5	166	5542	5.41	3.68	7.06	12.20	8.93	2.33
23.0	167	6147	6.01	4.14	7.77	13.28	9.91	2.67
23.5	168	6482	6.33	4.39	8.17	13.93	10.51	2.82
24.0	169	7190	7.02	4.90	9.03	15.37	11.65	3.15
24.5	170	7586	7.41	5.23	9.48	16.17	12.29	3.34
25.0	171	8310	8.12	5.83	10.28	17.49	13.58	3.67
25.5	172	8717	8.52	6.21	10.69	18.30	14.28	3.85
26.0	173	9559	9.34	6.89	11.65	19.80	15.71	4.29
26.5	174	10072	9.84	7.36	12.18	20.71	16.61	4.53
27.0	175	10953	10.70	8.11	13.15	22.25	18.13	5.01
27.5	176	11476	11.21	8.54	13.73	23.22	18.95	5.30
28.0	177	12428	12.14	9.36	14.77	24.92	20.46	5.84
28.5	179	12958	12.66	9.81	15.35	25.90	21.26	6.14
29.0	180	14081	13.76	10.74	16.60	27.75	23.02	6.83
29.5	181	14703	14.36	11.29	17.26	28.64	24.17	7.18
30.0	182	15829	15.47	12.31	18.44	30.58	25.76	7.91
30.5	183	16548	16.17	12.97	19.18	31.71	26.90	8.37
31.0	184	17828	17.42	14.07	20.58	33.74	28.89	9.18
31.5	185	18563	18.14	14.75	21.34	34.82	30.03	9.64
32.0	186	19939	19.48	16.06	22.71	36.79	32.13	10.59
32.5	187	20775	20.30	16.81	23.59	38.06	33.47	11.13
33.0	188	22306	21.79	18.20	25.19	40.29	35.75	12.23
33.5	189	23223	22.69	19.06	26.11	41.65	37.15	12.85
34.0	190	24804	24.23	20.47	27.78	43.89	39.37	14.04
34.5	191	25749	25.16	21.38	28.72	45.22	40.77	14.71
35.0	193	27477	26.85	22.95	30.52	47.58	43.13	16.05
35.5	194	28528	27.87	23.90	31.61	48.93	44.53	16.90
36.0	195	30441	29.74	25.69	33.56	51.33	47.05	18.47

English Language Arts Grade 6

		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	**Scale Score**	**#**	**%**	**%**	**%**	**%**	**%**	**%**
36.5	196	31530	30.81	26.68	34.69	52.72	48.43	19.37
37.0	197	33493	32.72	28.55	36.65	55.11	50.73	21.11
37.5	198	34669	33.87	29.71	37.79	56.43	52.27	22.14
38.0	200	36820	35.97	31.74	39.95	58.80	54.91	24.09
38.5	201	38049	37.17	32.93	41.17	60.22	56.41	25.18
39.0	201	40385	39.46	35.23	43.43	62.72	59.17	27.33
39.5	203	41692	40.73	36.52	44.70	64.19	60.63	28.54
40.0	204	44182	43.17	38.91	47.17	66.52	63.33	31.04
40.5	205	45482	44.44	40.14	48.48	67.81	64.68	32.31
41.0	206	48050	46.95	42.67	50.97	70.22	67.27	34.96
41.5	207	49431	48.29	44.02	52.32	71.49	68.60	36.39
42.0	209	52091	50.89	46.69	54.85	73.88	71.29	39.15
42.5	210	53477	52.25	48.03	56.22	75.05	72.68	40.61
43.0	211	56338	55.04	50.91	58.93	77.37	75.20	43.76
43.5	212	57718	56.39	52.22	60.32	78.40	76.40	45.30
44.0	214	60624	59.23	55.17	63.05	80.48	78.80	48.64
44.5	215	62104	60.68	56.64	64.48	81.64	79.95	50.31
4.05	216	65016	63.52	59.72	67.10	83.57	82.14	53.76
45.5	218	66537	65.01	61.21	68.58	84.63	83.20	55.55
46.0	219	69541	67.94	64.28	71.39	86.42	85.46	59.08
46.5	220	71004	69.37	65.67	72.86	87.46	86.38	60.84
47.0	222	73856	72.16	68.66	75.46	89.21	88.17	64.31
47.5	223	75314	73.58	70.10	76.86	89.97	89.11	66.09
48.0	225	78289	76.49	73.21	79.57	91.49	90.93	69.75
48.5	226	79641	77.81	74.53	80.90	92.17	91.73	71.43
49.0	228	82359	80.47	77.48	83.28	93.42	93.17	74.88
49.5	229	83605	81.68	78.75	84.44	93.97	93.73	76.47
50.0	231	86163	84.18	81.44	86.76	95.11	95.01	79.69
50.5	233	87296	85.29	82.67	87.76	95.54	95.46	81.18
51.0	234	89547	87.49	85.10	89.74	96.36	96.43	84.14
51.5	236	90601	88.52	86.28	90.62	96.76	96.83	85.51
52.0	238	92494	90.37	88.43	92.19	97.48	97.48	87.98
52.5	239	93392	91.25	89.43	92.95	97.77	97.81	89.13
53.0	241	94947	92.76	91.14	94.29	98.26	98.28	91.13
53.5	243	95716	93.52	92.04	94.91	98.53	98.48	92.12
54.0	245	96955	94.73	93.49	95.89	98.85	98.77	93.78
54.5	247	97584	95.34	94.21	96.41	99.05	98.98	94.51
55.0	250	98539	96.27	95.26	97.23	99.27	99.21	95.70
55.5	251	99035	96.76	95.86	97.60	99.39	99.34	96.28
56.0	253	99697	97.41	96.69	98.08	99.51	99.51	97.09
56.5	255	100095	97.79	97.18	98.37	99.57	99.62	97.55
57.0	257	100547	98.24	97.73	98.72	99.66	99.69	98.09
57.5	259	100848	98.53	98.11	98.93	99.73	99.74	98.41
58.0	261	101186	98.86	98.49	99.21	99.80	99.83	98.80
58.5	263	101396	99.07	98.77	99.34	99.86	99.85	99.03
59.0	265	101625	99.29	99.04	99.52	99.90	99.89	99.27
59.5	267	101776	99.44	99.24	99.62	99.93	99.92	99.43
60.0	270	101915	99.57	99.43	99.71	99.96	99.94	99.56
60.5	272	102026	99.68	99.57	99.78	99.97	99.96	99.68
61.0	274	102108	99.76	99.67	99.84	99.98	99.97	99.77

		English Language Arts Grade 6						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
61.5	277	102172	99.82	99.75	99.89	99.98	99.99	99.84
62.0	280	102223	99.87	99.82	99.92	99.99	99.99	99.87
62.5	282	102253	99.90	99.86	99.94	99.99	100.00	99.91
63.0	285	102288	99.94	99.91	99.96	99.99	100.00	99.94
63.5	288	102312	99.96	99.95	99.97	99.99	100.00	99.97
64.0	292	102327	99.97	99.97	99.98	99.99	100.00	99.99
64.5	295	102336	99.98	99.98	99.98	100.00	100.00	99.99
65.0	299	102341	99.99	99.99	99.99	100.00	100.00	100.00
65.5	300	102346	99.99	99.99	99.99	100.00	100.00	100.00
66.0	300	102348	100.00	100.00	99.99	100.00	100.00	100.00
66.5	300	102349	100.00	100.00	100.00	100.00	100.00	100.00
67.0	300	102353	100.00	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

Table F.5: ELA Grade 7

		English Language Arts Grade 7						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
2.0	100	1	0.00	0.00	0.00	0.00	0.00	0.00
3.0	100	3	0.00	0.00	0.01	0.01	0.00	0.00
3.5	100	4	0.00	0.00	0.00	0.01	0.00	0.00
4.0	100	8	0.01	0.00	0.01	0.03	0.00	0.00
5.0	100	16	0.02	0.01	0.02	0.04	0.02	0.01
6.0	105	30	0.03	0.01	0.04	0.08	0.04	0.01
6.5	107	34	0.03	0.02	0.05	0.09	0.05	0.01
7.0	110	61	0.06	0.03	0.09	0.14	0.08	0.03
7.5	112	63	0.06	0.03	0.09	0.15	0.08	0.00
8.0	114	103	0.10	0.06	0.14	0.28	0.11	0.04
8.5	116	112	0.11	0.06	0.15	0.31	0.13	0.05
9.0	118	167	0.16	0.10	0.23	0.45	0.20	0.07
9.5	120	183	0.18	0.10	0.25	0.47	0.24	0.07
10.0	121	266	0.26	0.13	0.38	0.70	0.35	0.10
10.5	123	282	0.27	0.14	0.41	0.74	0.37	0.11
11.0	125	356	0.35	0.16	0.52	0.91	0.48	0.15
11.5	126	384	0.37	0.18	0.56	0.97	0.53	0.16
12.0	128	497	0.48	0.24	0.72	1.24	0.68	0.21
12.5	130	534	0.52	0.27	0.76	1.30	0.75	0.23
13.0	131	690	0.67	0.35	0.97	1.60	1.02	0.30
13.5	133	757	0.74	0.41	1.05	1.76	1.13	0.32
14.0	134	939	0.91	0.50	1.31	2.19	1.41	0.41
14.5	136	1018	0.99	0.54	1.42	2.34	1.59	0.43
15.0	137	1233	1.20	0.64	1.73	2.81	1.88	0.54
15.5	139	1332	1.30	0.71	1.85	3.04	2.06	0.57
16.0	140	1590	1.55	0.86	2.20	3.59	2.46	0.69
16.5	142	1718	1.67	0.93	2.37	3.91	2.64	0.75
17.0	143	2018	1.96	1.07	2.81	4.57	3.17	0.87
17.5	144	2160	2.10	1.15	3.00	4.85	3.41	0.93

English Language Arts Grade 7

		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	**Scale Score**	**#**	**%**	**%**	**%**	**%**	**%**	**%**
18.0	146	2455	2.39	1.28	3.44	5.42	3.88	1.08
18.5	147	2628	2.56	1.41	3.65	5.73	4.21	1.15
19.0	149	2966	2.89	1.59	4.11	6.48	4.71	1.33
19.5	150	3169	3.08	1.78	4.32	6.99	5.03	1.40
20.0	152	3646	3.55	2.11	4.91	7.98	5.75	1.65
20.5	153	3893	3.79	2.28	5.22	8.49	6.12	1.78
21.0	154	4408	4.29	2.63	5.87	9.62	6.91	2.02
21.5	156	4715	4.59	2.83	6.26	10.24	7.46	2.15
22.0	157	5261	5.12	3.21	6.94	11.38	8.31	2.41
22.5	159	5551	5.40	3.40	7.30	11.97	8.79	2.54
23.0	160	6189	6.02	3.85	8.10	13.31	9.82	2.82
23.5	162	6579	6.40	4.15	8.54	14.03	10.50	3.00
24.0	163	7272	7.08	4.72	9.32	15.47	11.70	3.29
24.5	164	7739	7.53	5.12	9.82	16.27	12.59	3.50
25.0	166	8564	8.33	5.74	10.80	17.88	13.86	3.97
25.5	167	9051	8.81	6.14	11.34	18.76	14.66	4.23
26.0	168	9960	9.69	6.82	12.42	20.37	16.21	4.73
26.5	170	10589	10.30	7.36	13.10	21.56	17.26	5.03
27.0	171	11613	11.30	8.16	14.28	23.32	18.99	5.61
27.5	173	12264	11.93	8.70	15.01	24.45	20.08	5.98
28.0	174	13384	13.02	9.58	16.30	26.49	21.73	6.67
28.5	175	14109	13.73	10.24	17.05	27.73	22.86	7.09
29.0	177	15308	14.90	11.26	18.36	29.84	24.61	7.84
29.5	178	16154	15.72	11.99	19.27	31.19	25.99	8.35
30.0	180	17527	17.06	13.20	20.73	33.32	28.09	9.22
30.5	181	18410	17.92	13.93	21.71	34.83	29.44	9.77
31.0	182	19959	19.42	15.32	23.33	37.29	31.69	10.82
31.5	184	20933	20.37	16.25	24.30	38.70	33.17	11.47
32.0	185	22487	21.88	17.64	25.92	40.91	35.44	12.57
32.5	187	23558	22.92	18.61	27.03	42.54	36.98	13.29
33.0	188	25314	24.63	20.22	28.83	44.95	39.44	14.60
33.5	189	26422	25.71	21.20	30.00	46.47	40.95	15.43
34.0	191	28224	27.47	22.87	31.84	48.82	43.45	16.81
34.5	192	29404	28.61	23.97	33.03	50.46	45.01	17.72
35.0	194	31399	30.55	25.84	35.04	52.91	47.55	19.38
35.5	195	32667	31.79	27.02	36.33	54.58	49.16	20.40
36.0	197	34613	33.68	28.80	38.33	56.82	51.60	22.08
36.5	198	35751	34.79	29.83	39.50	58.04	53.02	23.11
37.0	200	38275	37.25	32.29	41.95	60.87	56.26	25.35
37.5	201	39678	38.61	33.60	43.37	62.47	57.86	26.64
38.0	202	42145	41.01	36.07	45.70	64.90	60.76	28.98
38.5	204	43517	42.35	37.33	47.11	66.25	62.25	30.31
39.0	205	45890	44.66	39.69	49.37	68.46	64.76	32.71
39.5	207	47307	46.04	41.05	50.77	69.87	66.11	34.19
40.0	208	49867	48.53	43.55	53.26	72.12	68.77	36.82
40.5	210	51325	49.95	44.99	54.66	73.38	70.21	38.38
41.0	211	53748	52.30	47.38	56.98	75.40	72.39	41.00
41.5	213	55265	53.78	48.87	58.45	76.58	73.86	42.63
42.0	214	57794	56.24	51.42	60.83	78.51	76.17	45.44
42.5	216	59221	57.63	52.83	62.19	79.48	77.42	47.03
43.0	218	61769	60.11	55.41	64.58	81.42	79.59	49.86

English Language Arts Grade 7

		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	**Scale Score**	**#**	**%**	**%**	**%**	**%**	**%**	**%**
43.5	219	63260	61.56	56.98	65.92	82.39	80.69	51.63
44.0	221	65723	63.96	59.47	68.22	84.11	82.51	54.51
44.5	222	67233	65.43	61.04	69.60	85.03	83.66	56.29
45.0	224	69622	67.75	63.50	71.80	86.57	85.40	59.08
45.5	226	71059	69.15	65.01	73.08	87.48	86.42	60.77
46.0	228	73361	71.39	67.43	75.15	88.78	87.85	63.58
46.5	229	74791	72.78	68.96	76.41	89.55	88.72	65.34
47.0	231	77084	75.01	71.29	78.55	90.76	90.12	68.19
47.5	233	78427	76.32	72.80	79.67	91.39	90.91	69.87
48.0	235	80559	78.39	75.02	81.61	92.40	92.19	72.50
48.5	236	81874	79.67	76.41	82.78	93.12	92.81	74.21
49.0	238	83792	81.54	78.35	84.57	94.03	93.84	76.58
49.5	240	85043	82.76	79.74	85.63	94.49	94.41	78.19
50.0	242	86826	84.49	81.57	87.28	95.27	95.20	80.44
50.5	244	88020	85.65	82.85	88.33	95.71	95.72	81.99
51.0	246	89636	87.23	84.56	89.77	96.41	96.35	84.05
51.5	250	90742	88.30	85.83	90.65	96.87	96.80	85.41
52.0	251	92145	89.67	87.40	91.83	97.36	97.34	87.19
52.5	252	93145	90.64	88.57	92.61	97.72	97.67	88.44
53.0	254	94385	91.85	89.99	93.62	98.04	98.04	90.02
53.5	257	95268	92.71	91.01	94.32	98.37	98.29	91.10
54.0	259	96325	93.74	92.18	95.21	98.68	98.59	92.45
54.5	261	97065	94.46	93.03	95.81	98.88	98.78	93.39
55.0	264	97906	95.27	94.00	96.48	99.04	99.01	94.46
55.5	266	98493	95.84	94.69	96.94	99.16	99.16	95.22
56.0	268	99135	96.47	95.49	97.40	99.35	99.30	96.00
56.5	271	99644	96.96	96.05	97.84	99.47	99.46	96.58
57.0	273	100156	97.46	96.67	98.22	99.59	99.56	97.19
57.5	276	100531	97.83	97.14	98.48	99.66	99.65	97.62
58.0	278	100956	98.24	97.66	98.80	99.72	99.77	98.11
58.5	281	101251	98.53	98.02	99.01	99.79	99.82	98.46
59.0	284	101569	98.84	98.46	99.20	99.81	99.90	98.79
59.5	287	101801	99.06	98.76	99.36	99.88	99.92	99.06
60.0	290	102029	99.29	99.05	99.51	99.91	99.95	99.29
60.5	293	102184	99.44	99.23	99.64	99.97	99.96	99.45
61.0	296	102313	99.56	99.39	99.72	99.98	99.98	99.57
61.5	299	102413	99.66	99.52	99.79	99.98	99.98	99.68
62.0	300	102505	99.75	99.64	99.85	99.99	99.99	99.76
62.5	300	102567	99.81	99.73	99.88	99.99	100.00	99.83
63.0	300	102644	99.88	99.84	99.92	99.99	100.00	99.90
63.5	300	102677	99.92	99.89	99.94	100.00	100.00	99.93
64.0	300	102705	99.94	99.93	99.96	100.00	100.00	99.95
64.5	300	102722	99.96	99.94	99.98	100.00	100.00	99.97
65.0	300	102737	99.97	99.96	99.98	100.00	100.00	99.99
65.5	300	102748	99.99	99.98	99.99	100.00	100.00	99.99
66.0	300	102756	99.99	99.99	99.99	100.00	100.00	100.00
66.5	300	102757	99.99	99.99	99.99	100.00	100.00	100.00
67.0	300	102759	100.00	100.00	100.00	100.00	100.00	100.00
67.5	300	102760	100.00	100.00	100.00	100.00	100.00	100.00
68.0	300	102763	100.00	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

Table F.6: ELA Grade 8

		English Language Arts Grade 8						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
1.0	100	1	0.00	0.00	0.00	0.00	0.00	0.00
2.0	113	2	0.00	0.00	0.00	0.00	0.00	0.00
3.0	123	4	0.00	0.00	0.01	0.00	0.00	0.01
4.0	129	8	0.01	0.00	0.01	0.01	0.01	0.01
5.0	134	20	0.02	0.01	0.03	0.04	0.04	0.01
6.0	139	38	0.04	0.03	0.05	0.10	0.05	0.02
7.0	142	64	0.06	0.04	0.09	0.15	0.09	0.03
7.5	144	67	0.06	0.04	0.09	0.16	0.09	0.03
8.0	145	99	0.10	0.06	0.13	0.22	0.16	0.04
8.5	147	106	0.10	0.06	0.14	0.24	0.18	0.04
9.0	148	140	0.14	0.08	0.19	0.33	0.22	0.05
9.5	149	148	0.14	0.08	0.20	0.36	0.23	0.05
10.0	151	212	0.21	0.11	0.29	0.51	0.35	0.07
10.5	152	217	0.21	0.12	0.30	0.52	0.36	0.07
11.0	153	281	0.27	0.16	0.38	0.67	0.42	0.11
11.5	154	294	0.28	0.17	0.39	0.67	0.46	0.12
12.0	155	370	0.36	0.20	0.51	0.82	0.57	0.16
12.5	156	384	0.37	0.21	0.53	0.86	0.58	0.16
13.0	157	485	0.47	0.27	0.66	1.10	0.75	0.20
13.5	158	498	0.48	0.28	0.68	1.12	0.77	0.20
14.0	159	613	0.59	0.35	0.83	1.36	0.94	0.26
14.5	160	633	0.61	0.36	0.86	1.38	0.99	0.26
15.0	161	751	0.73	0.43	1.01	1.62	1.17	0.32
15.5	162	779	0.75	0.44	1.05	1.69	1.22	0.33
16.0	163	927	0.90	0.52	1.26	2.06	1.48	0.37
16.5	164	973	0.94	0.55	1.32	2.14	1.57	0.38
17.0	164	1113	1.08	0.63	1.50	2.43	1.76	0.46
17.5	165	1176	1.14	0.67	1.59	2.60	1.85	0.48
18.0	166	1329	1.29	0.74	1.81	2.98	2.08	0.54
18.5	167	1388	1.34	0.77	1.89	3.11	2.18	0.56
19.0	168	1589	1.54	0.90	2.15	3.52	2.49	0.66
19.5	169	1673	1.62	0.93	2.28	3.69	2.64	0.70
20.0	170	1887	1.83	1.05	2.57	4.14	2.93	0.80
20.5	171	1980	1.92	1.10	2.69	4.37	3.08	0.84
21.0	172	2254	2.18	1.27	3.05	5.01	3.49	0.96
21.5	172	2369	2.29	1.35	3.19	5.30	3.67	1.00
22.0	173	2693	2.60	1.52	3.64	6.02	4.10	1.18
22.5	174	2837	2.74	1.63	3.81	6.36	4.32	1.24
23.0	175	3165	3.06	1.87	4.20	7.06	4.83	1.38
23.5	176	3317	3.21	1.99	4.38	7.41	5.05	1.45
24.0	177	3723	3.60	2.25	4.90	8.30	5.57	1.67
24.5	178	3894	3.77	2.35	5.12	8.64	5.86	1.75
25.0	179	4335	4.19	2.61	5.71	9.67	6.46	1.96
25.5	180	4551	4.40	2.78	5.95	10.10	6.83	2.06
26.0	180	5079	4.91	3.20	6.56	11.21	7.70	2.29
26.5	181	5325	5.15	3.39	6.84	11.82	8.09	2.38
27.0	182	5863	5.67	3.76	7.50	12.83	9.00	2.64
27.5	183	6163	5.96	3.99	7.85	13.46	9.47	2.77

		English Language Arts Grade 8						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
28.0	184	6787	6.56	4.45	8.59	14.75	10.45	3.06
28.5	185	7088	6.86	4.70	8.92	15.37	10.94	3.19
29.0	186	7803	7.55	5.21	9.79	16.73	12.11	3.54
29.5	187	8156	7.89	5.49	10.19	17.43	12.67	3.73
30.0	188	8936	8.64	6.12	11.06	19.06	13.93	4.10
30.5	189	9339	9.03	6.47	11.48	19.82	14.57	4.30
31.0	189	10199	9.86	7.16	12.45	21.53	15.82	4.75
31.5	190	10618	10.27	7.51	12.91	22.28	16.48	4.98
32.0	191	11567	11.19	8.28	13.97	24.02	18.04	5.45
32.5	192	12037	11.64	8.71	14.45	24.85	18.85	5.69
33.0	193	13167	12.74	9.53	15.80	26.98	20.60	6.31
33.5	194	13672	13.22	9.95	16.35	27.88	21.36	6.61
34.0	195	14853	14.37	10.94	17.64	29.87	23.22	7.30
34.5	196	15442	14.94	11.48	18.24	30.80	24.15	7.66
35.0	197	16753	16.20	12.49	19.75	32.92	26.19	8.46
35.5	198	17365	16.80	13.04	20.38	34.03	27.07	8.83
36.0	199	18744	18.13	14.16	21.92	36.37	29.12	9.70
36.5	200	19424	18.79	14.76	22.64	37.52	30.08	10.13
37.0	201	21061	20.37	16.17	24.39	39.98	32.58	11.23
37.5	202	21898	21.18	16.93	25.25	41.23	33.70	11.82
38.0	203	23629	22.85	18.41	27.10	43.93	36.18	12.99
38.5	204	24502	23.70	19.21	27.99	45.18	37.45	13.62
39.0	205	26337	25.47	20.85	29.89	47.72	39.94	15.00
39.5	206	27269	26.37	21.68	30.86	48.97	41.23	15.71
40.0	207	29312	28.35	23.51	32.98	51.63	43.95	17.33
40.5	208	30351	29.36	24.38	34.11	52.93	45.35	18.12
41.0	209	32525	31.46	26.34	36.35	55.71	48.15	19.86
41.5	210	33644	32.54	27.42	37.44	57.14	49.63	20.77
42.0	211	36121	34.94	29.70	39.95	60.07	52.71	22.87
42.5	212	37335	36.11	30.81	41.18	61.46	54.27	23.90
43.0	213	39971	38.66	33.29	43.80	64.41	57.35	26.24
43.5	214	41214	39.86	34.40	45.08	65.68	58.76	27.40
44.0	215	43929	42.49	36.92	47.81	68.27	61.59	30.06
44.5	216	45183	43.70	38.05	49.11	69.45	62.91	31.30
45.0	217	48107	46.53	40.91	51.90	72.09	65.86	34.26
45.5	218	49423	47.80	42.10	53.26	73.28	67.27	35.56
46.0	220	52351	50.63	44.89	56.12	75.68	70.21	38.59
46.5	221	53737	51.97	46.15	57.54	76.79	71.48	40.11
47.0	222	56831	54.97	49.16	60.52	79.04	74.25	43.55
47.5	223	58197	56.29	50.50	61.82	80.13	75.53	44.97
48.0	224	61350	59.34	53.71	64.72	82.57	78.25	48.45
48.5	226	62726	60.67	55.03	66.06	83.50	79.40	50.00
49.0	227	66012	63.85	58.34	69.12	85.42	81.96	53.86
49.5	228	67431	65.22	59.66	70.54	86.20	83.10	55.52
50.0	230	70611	68.29	62.94	73.42	88.14	85.35	59.30
50.5	231	71905	69.55	64.21	74.65	88.88	86.28	60.87
51.0	233	75053	72.59	67.48	77.49	90.46	88.38	64.69
51.5	234	76318	73.81	68.77	78.65	91.04	89.18	66.27
52.0	236	79398	76.79	72.04	81.34	92.57	91.00	70.09
52.5	237	80609	77.96	73.28	82.45	93.15	91.71	71.60

English Language Arts Grade 8

		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	**Scale Score**	**#**	**%**	**%**	**%**	**%**	**%**	**%**
53.0	239	83542	80.80	76.47	84.95	94.34	93.17	75.35
53.5	240	84666	81.89	77.65	85.95	94.76	93.78	76.75
54.0	242	87340	84.47	80.67	88.13	95.80	94.95	80.19
54.5	244	88383	85.48	81.78	89.03	96.21	95.36	81.54
55.0	250	90653	87.68	84.44	90.78	97.12	96.31	84.44
55.5	247	91634	88.63	85.54	91.58	97.45	96.68	85.68
56.0	250	93550	90.48	87.83	93.02	98.00	97.37	88.16
56.5	251	94485	91.39	88.92	93.74	98.25	97.71	89.32
57.0	252	96059	92.91	90.80	94.93	98.66	98.23	91.36
57.5	254	96828	93.65	91.69	95.53	98.87	98.47	92.30
58.0	256	98029	94.81	93.14	96.41	99.12	98.83	93.81
58.5	258	98698	95.46	93.95	96.91	99.26	98.96	94.65
59.0	260	99582	96.31	95.05	97.53	99.44	99.25	95.76
59.5	262	100151	96.87	95.74	97.94	99.54	99.36	96.45
60.0	264	100871	97.56	96.68	98.41	99.65	99.56	97.30
60.5	266	101281	97.96	97.15	98.73	99.72	99.65	97.78
61.0	268	101805	98.47	97.85	99.06	99.80	99.74	98.41
61.5	271	102123	98.77	98.27	99.26	99.84	99.81	98.77
62.0	273	102424	99.06	98.68	99.43	99.87	99.87	99.08
62.5	275	102637	99.27	98.97	99.56	99.88	99.91	99.29
63.0	278	102840	99.47	99.25	99.68	99.93	99.92	99.49
63.5	281	102979	99.60	99.44	99.75	99.94	99.94	99.64
64.0	284	103117	99.73	99.63	99.83	99.96	99.95	99.78
64.5	287	103213	99.83	99.75	99.90	99.96	99.97	99.87
65.0	290	103267	99.88	99.82	99.94	99.96	99.97	99.92
65.5	294	103300	99.91	99.87	99.95	99.98	99.98	99.94
66.0	298	103339	99.95	99.92	99.97	99.98	99.99	99.97
66.5	300	103358	99.97	99.95	99.98	99.99	100.00	99.98
67.0	300	103375	99.98	99.97	99.99	100.00	100.00	99.99
67.5	300	103378	99.99	99.98	99.99	100.00	100.00	99.99
68.0	300	103389	100.00	100.00	100.00	100.00	100.00	100.00
69.0	300	103392	100.00	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

Table F.7: Mathematics Grade 3

		Mathematics Grade 3						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
0	100	1	0.00	0.00	0.00	0.01	0.00	0.00
1	100	5	0.00	0.00	0.01	0.02	0.00	0.00
2	100	14	0.01	0.00	0.02	0.06	0.01	0.00
3	100	30	0.03	0.02	0.04	0.09	0.04	0.01
4	100	68	0.07	0.04	0.09	0.20	0.08	0.02
5	101	167	0.16	0.14	0.19	0.43	0.25	0.05
6	110	373	0.37	0.30	0.43	0.97	0.59	0.12
7	118	718	0.71	0.59	0.81	1.92	1.12	0.22
8	125	1187	1.17	0.98	1.34	3.01	1.84	0.42
9	132	1853	1.82	1.57	2.05	4.48	2.98	0.68
10	137	2739	2.69	2.31	3.04	6.49	4.45	1.04
11	143	3796	3.73	3.28	4.15	8.70	6.18	1.52
12	148	5023	4.93	4.43	5.40	11.39	8.16	2.05
13	153	6343	6.23	5.73	6.69	13.90	10.41	2.67
14	158	7787	7.65	7.08	8.17	16.64	12.92	3.32
15	163	9402	9.23	8.70	9.71	19.66	15.52	4.17
16	167	11116	10.92	10.40	11.39	22.71	18.23	5.16
17	172	12884	12.65	12.22	13.03	25.73	21.07	6.21
18	176	14690	14.43	14.01	14.79	28.59	23.94	7.31
19	180	16651	16.35	16.03	16.63	31.88	26.80	8.58
20	184	18530	18.20	17.94	18.42	34.88	29.49	9.87
21	188	20648	20.28	20.08	20.43	38.07	32.53	11.40
22	192	22695	22.29	22.09	22.44	40.90	35.27	13.02
23	200	25026	24.57	24.49	24.63	44.01	38.47	14.85
24	201	27342	26.85	26.83	26.84	46.91	41.55	16.79
25	204	29778	29.24	29.22	29.24	50.02	44.53	18.92
26	208	32298	31.72	31.87	31.55	53.04	47.43	21.25
27	212	34924	34.29	34.58	33.99	55.88	50.67	23.72
28	215	37641	36.96	37.42	36.50	59.04	53.79	26.27
29	219	40527	39.80	40.36	39.23	62.28	56.97	29.07
30	223	43533	42.75	43.45	42.05	65.46	60.10	32.17
31	227	46536	45.70	46.60	44.81	68.26	63.33	35.27
32	231	49665	48.77	49.89	47.68	71.09	66.56	38.61
33	235	52925	51.97	53.20	50.78	73.97	69.86	42.03
34	239	56258	55.24	56.70	53.83	76.73	72.90	45.71
35	243	59600	58.53	60.10	57.00	79.26	75.84	49.57
36	250	62977	61.84	63.61	60.14	81.71	78.55	53.51
37	251	66488	65.29	67.12	63.52	84.03	81.29	57.63
38	255	69936	68.68	70.59	66.83	86.29	83.90	61.66
39	259	73372	72.05	74.16	70.02	88.46	86.28	65.85
40	264	76833	75.45	77.59	73.40	90.31	88.58	70.13
41	269	80201	78.76	80.92	76.68	92.18	90.64	74.26
42	274	83466	81.96	84.05	79.96	93.87	92.50	78.22
43	280	86610	85.05	86.96	83.22	95.24	94.06	82.14
44	286	89771	88.15	89.87	86.50	96.57	95.64	85.93
45	294	92718	91.05	92.45	89.70	97.63	97.00	89.49
46	300	95481	93.76	94.87	92.70	98.43	98.12	92.83
47	300	97993	96.23	96.99	95.50	99.10	98.98	95.77

Mathematics Grade 3								
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
48	300	100001	98.20	98.64	97.77	99.72	99.56	98.06
49	300	101309	99.48	99.63	99.35	99.92	99.90	99.49
50	300	101836	100.00	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

Table F.8: Mathematics Grade 4

Mathematics Grade 4								
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
1	100	2	0.00	0.00	0.00	0.01	0.00	0.00
2	100	8	0.01	0.01	0.01	0.03	0.01	0.01
3	100	29	0.03	0.03	0.03	0.08	0.04	0.02
4	100	67	0.07	0.06	0.07	0.17	0.11	0.06
5	106	151	0.15	0.15	0.15	0.38	0.23	0.12
6	115	287	0.28	0.27	0.30	0.76	0.42	0.21
7	122	522	0.51	0.45	0.57	1.38	0.75	0.34
8	129	844	0.83	0.73	0.91	2.18	1.20	0.50
9	135	1256	1.24	1.10	1.36	3.24	1.82	0.70
10	141	1758	1.73	1.53	1.91	4.51	2.55	0.95
11	146	2370	2.33	2.14	2.50	6.06	3.46	1.29
12	151	3174	3.12	2.86	3.36	8.02	4.64	1.65
13	156	4046	3.98	3.75	4.19	10.08	6.00	2.17
14	160	5121	5.04	4.75	5.30	12.43	7.66	2.81
15	165	6347	6.25	5.95	6.51	15.02	9.51	3.53
16	169	7733	7.61	7.32	7.87	17.87	11.68	4.32
17	173	9245	9.10	8.80	9.36	20.96	14.02	5.33
18	176	10964	10.79	10.57	10.97	24.17	16.62	6.47
19	180	12870	12.67	12.50	12.80	27.62	19.54	7.84
20	184	14951	14.71	14.56	14.83	31.17	22.64	9.44
21	187	17220	16.95	16.83	17.02	34.78	25.94	11.13
22	191	19608	19.30	19.30	19.26	38.33	29.42	12.97
23	194	22051	21.70	21.85	21.52	42.05	32.83	15.04
24	200	24719	24.33	24.68	23.94	45.94	36.49	17.28
25	201	27507	27.07	27.59	26.53	49.62	40.34	19.80
26	204	30410	29.93	30.61	29.23	53.11	44.13	22.50
27	208	33437	32.91	33.75	32.06	56.64	47.96	25.39
28	211	36465	35.89	36.89	34.88	60.03	51.53	28.44
29	214	39581	38.95	40.07	37.84	63.22	55.12	31.58
30	218	42738	42.06	43.41	40.72	66.49	58.59	35.00
31	221	46026	45.30	46.69	43.92	69.65	62.07	38.38
32	225	49341	48.56	50.13	47.00	72.84	65.56	42.02
33	229	52669	51.84	53.50	50.19	75.52	68.77	45.81
34	233	56111	55.22	56.90	53.57	78.31	72.02	49.77
35	237	59507	58.57	60.28	56.87	80.80	74.91	53.79
36	241	63017	62.02	63.83	60.24	83.30	77.88	58.03
37	245	66598	65.54	67.41	63.72	85.60	80.78	62.36
38	250	70191	69.08	70.88	67.31	87.95	83.53	66.72

Mathematics Grade 4								
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
39	254	73765	72.60	74.41	70.83	89.93	86.05	71.24
40	260	77488	76.26	77.97	74.60	91.92	88.63	75.69
41	265	81088	79.80	81.41	78.24	93.56	90.90	80.05
42	271	84687	83.35	84.78	81.95	95.06	93.08	84.34
43	278	88124	86.73	88.05	85.44	96.49	94.86	88.34
44	285	91345	89.90	91.03	88.80	97.44	96.36	91.89
45	294	94320	92.83	93.78	91.90	98.37	97.66	94.94
46	300	96937	95.40	96.10	94.72	99.07	98.66	97.26
47	300	99010	97.44	97.96	96.94	99.64	99.37	98.88
48	300	100479	98.89	99.14	98.64	99.89	99.76	99.75
49	300	101345	99.74	99.81	99.68	99.97	99.95	100.00
50	300	101608	100.00	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

Table F.9: Mathematics Grade 5

Mathematics Grade 5								
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
0	100	2	0.00	0.00	0.00	0.01	0.00	0.00
1	100	8	0.01	0.01	0.01	0.03	0.01	0.00
2	100	15	0.01	0.01	0.02	0.03	0.03	0.00
3	100	51	0.05	0.02	0.08	0.14	0.07	0.02
4	111	109	0.11	0.07	0.15	0.27	0.15	0.04
5	119	231	0.23	0.16	0.29	0.61	0.30	0.09
6	126	473	0.47	0.33	0.59	1.23	0.66	0.19
7	133	845	0.84	0.62	1.03	2.27	1.22	0.32
8	138	1331	1.32	1.02	1.57	3.49	1.99	0.50
9	143	1974	1.96	1.55	2.29	4.99	3.01	0.77
10	148	2712	2.69	2.20	3.09	6.72	4.08	1.11
11	153	3556	3.52	2.91	4.05	8.78	5.33	1.49
12	157	4452	4.41	3.73	4.98	10.83	6.63	1.95
13	161	5474	5.42	4.71	6.01	13.22	8.07	2.45
14	165	6577	6.52	5.75	7.16	15.59	9.81	3.01
15	168	7719	7.65	6.84	8.32	18.12	11.53	3.58
16	172	8996	8.91	8.13	9.56	20.74	13.41	4.31
17	176	10325	10.23	9.44	10.88	23.19	15.49	5.10
18	179	11824	11.72	10.91	12.36	26.12	17.72	5.98
19	182	13320	13.20	12.46	13.78	28.90	19.95	6.93
20	186	14923	14.79	14.09	15.33	31.64	22.41	7.95
21	189	16630	16.48	15.89	16.92	34.35	25.00	9.13
22	192	18471	18.30	17.80	18.66	37.46	27.59	10.44
23	196	20337	20.15	19.77	20.38	40.48	30.23	11.79
24	200	22357	22.15	21.86	22.31	43.50	33.16	13.32
25	202	24429	24.21	23.91	24.36	46.55	35.82	15.02
26	205	26585	26.34	26.21	26.34	49.48	38.72	16.78
27	209	28808	28.55	28.51	28.45	52.21	41.66	18.75
28	212	31156	30.87	31.01	30.60	54.89	44.70	20.90
29	215	33615	33.31	33.57	32.94	57.93	47.71	23.10

Mathematics Grade 5								
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
30	219	36126	35.80	36.21	35.28	60.74	50.91	25.42
31	222	38816	38.46	39.05	37.78	63.70	54.11	27.99
32	226	41697	41.32	42.04	40.49	66.90	57.55	30.75
33	229	44740	44.33	45.19	43.40	70.01	60.93	33.82
34	233	47784	47.35	48.41	46.22	72.99	64.00	37.10
35	237	50933	50.47	51.69	49.20	75.72	67.42	40.37
36	241	54171	53.68	55.00	52.30	78.30	70.59	44.03
37	245	57542	57.02	58.46	55.53	80.71	73.94	47.78
38	250	61063	60.51	62.05	58.93	83.34	77.05	51.81
39	253	64661	64.08	65.75	62.38	85.64	80.10	56.09
40	258	68403	67.78	69.50	66.06	88.10	83.01	60.59
41	263	72042	71.39	73.24	69.55	90.02	85.98	64.91
42	268	75903	75.22	77.03	73.41	91.86	88.49	69.68
43	273	79750	79.03	80.59	77.47	93.70	90.97	74.39
44	280	83700	82.94	84.33	81.55	95.32	93.23	79.39
45	287	87513	86.72	87.95	85.50	96.75	95.22	84.17
46	295	91154	90.33	91.34	89.32	97.94	96.96	88.65
47	300	94655	93.80	94.50	93.09	98.73	98.30	93.00
48	300	97510	96.63	97.11	96.14	99.36	99.22	96.35
49	300	99691	98.79	99.01	98.57	99.84	99.77	98.74
50	300	100914	100.00	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

Table F.10: Mathematics Grade 6

Mathematics Grade 6								
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
0	100	0	2	0.00	0.00	0.00	0.00	0.00
1	100	0.01	9	0.01	0.00	0.01	0.01	0.01
2	100	0.01	22	0.02	0.01	0.03	0.03	0.04
3	104	0.06	80	0.08	0.06	0.09	0.13	0.16
4	115	0.12	205	0.20	0.16	0.24	0.44	0.39
5	123	0.24	448	0.44	0.34	0.53	1.10	0.72
6	130	0.39	844	0.82	0.63	1.00	2.07	1.25
7	137	0.48	1340	1.31	1.03	1.56	3.21	2.00
8	142	0.6	1957	1.91	1.50	2.30	4.64	2.93
9	147	0.7	2673	2.61	2.08	3.10	6.18	4.12
10	152	0.82	3514	3.43	2.75	4.07	8.08	5.33
11	156	0.87	4411	4.30	3.48	5.08	9.94	6.74
12	160	0.98	5419	5.28	4.32	6.18	12.15	8.12
13	164	1.06	6510	6.35	5.23	7.39	14.50	9.77
14	168	1.17	7712	7.52	6.28	8.68	17.02	11.53
15	172	1.28	9030	8.80	7.50	10.01	19.67	13.54
16	175	1.4	10471	10.21	8.80	11.52	22.53	15.56
17	178	1.5	12008	11.71	10.20	13.11	25.28	17.95
18	182	1.65	13704	13.36	11.76	14.85	28.27	20.61
19	185	1.82	15570	15.18	13.48	16.76	31.27	23.50

Mathematics Grade 6								
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
20	188	1.9	17516	17.07	15.35	18.68	34.53	26.27
21	191	1.98	19544	19.05	17.36	20.64	37.72	29.02
22	194	2.13	21727	21.18	19.41	22.84	40.86	31.92
23	200	2.43	24223	23.61	21.83	25.28	44.39	35.29
24	201	2.59	26877	26.20	24.43	27.86	47.92	38.65
25	203	2.64	29584	28.84	27.12	30.45	51.42	42.00
26	206	2.87	32524	31.70	30.03	33.27	54.86	45.79
27	210	3	35597	34.70	33.03	36.26	58.61	49.55
28	213	3.14	38823	37.84	36.25	39.33	62.35	53.25
29	216	3.33	42236	41.17	39.70	42.54	65.89	57.13
30	219	3.35	45668	44.52	43.13	45.81	68.99	60.89
31	222	3.43	49191	47.95	46.77	49.05	72.17	64.53
32	225	3.57	52858	51.53	50.44	52.54	75.24	68.29
33	229	3.54	56490	55.07	54.10	55.96	78.51	71.79
34	232	3.63	60217	58.70	58.06	59.29	81.27	75.18
35	236	3.56	63873	62.26	61.68	62.80	84.10	78.29
36	240	3.43	67389	65.69	65.27	66.07	86.41	81.16
37	244	3.34	70814	69.03	68.80	69.23	88.57	83.90
38	250	3.19	74089	72.22	72.16	72.28	90.35	86.36
39	252	3.21	77387	75.44	75.46	75.41	91.99	88.52
40	257	3.15	80617	78.59	78.81	78.37	93.47	90.60
41	261	3.15	83849	81.74	81.98	81.50	94.84	92.63
42	267	3.07	86998	84.81	85.04	84.58	96.20	94.37
43	273	2.84	89913	87.65	87.94	87.37	97.34	95.86
44	280	2.77	92753	90.42	90.67	90.17	98.21	97.07
45	288	2.61	95433	93.03	93.33	92.74	98.88	98.15
46	298	2.4	97893	95.43	95.69	95.18	99.41	98.91
47	300	2.1	100043	97.52	97.68	97.37	99.72	99.48
48	300	1.59	101678	99.12	99.15	99.09	99.95	99.89
49	300	0.88	102585	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

Table F.11: Mathematics Grade 7

Mathematics Grade 7								
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
0	100	2	0.00	0.00	0.00	0.00	0.00	0.00
1	100	7	0.01	0.01	0.01	0.01	0.01	0.01
2	100	25	0.02	0.02	0.03	0.04	0.04	0.02
3	100	82	0.08	0.05	0.11	0.16	0.14	0.04
4	106	220	0.21	0.14	0.28	0.47	0.35	0.10
5	115	460	0.45	0.29	0.59	1.05	0.70	0.22
6	123	928	0.90	0.66	1.13	2.12	1.39	0.43
7	130	1662	1.61	1.22	1.98	3.63	2.56	0.79
8	136	2660	2.58	2.00	3.14	5.78	4.15	1.26
9	141	3973	3.86	3.06	4.61	8.53	6.21	1.90
10	146	5453	5.29	4.23	6.30	11.89	8.51	2.56
11	151	7247	7.03	5.78	8.22	16.02	11.08	3.42

Mathematics Grade 7								
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
12	156	9083	8.82	7.47	10.09	19.92	13.79	4.39
13	160	11053	10.73	9.22	12.16	23.92	16.54	5.54
14	164	13287	12.90	11.33	14.38	28.10	19.85	6.86
15	168	15484	15.03	13.35	16.62	31.83	23.12	8.26
16	172	17910	17.38	15.63	19.03	36.00	26.64	9.83
17	176	20379	19.78	18.04	21.42	40.02	30.17	11.51
18	179	23147	22.47	20.79	24.05	44.39	33.59	13.63
19	183	25893	25.13	23.55	26.61	48.19	37.45	15.71
20	186	28775	27.93	26.41	29.35	52.10	41.20	18.06
21	190	31733	30.80	29.27	32.23	55.97	44.90	20.53
22	193	34636	33.62	32.14	35.00	59.27	48.47	23.12
23	197	37526	36.42	35.04	37.72	62.48	51.94	25.75
24	200	40844	39.64	38.48	40.73	66.13	55.67	28.94
25	203	44007	42.71	41.71	43.65	69.21	59.36	32.01
26	207	47158	45.77	44.90	46.59	72.08	62.79	35.19
27	210	50250	48.77	48.08	49.41	74.94	65.95	38.41
28	213	53404	51.83	51.33	52.30	77.42	69.13	41.76
29	217	56514	54.85	54.44	55.23	79.81	72.10	45.19
30	220	59556	57.80	57.54	58.04	81.99	74.87	48.57
31	224	62670	60.83	60.78	60.85	84.24	77.84	51.96
32	227	65706	63.77	63.87	63.66	86.15	80.42	55.48
33	231	68586	66.57	66.87	66.26	87.73	82.65	58.92
34	234	71421	69.32	69.80	68.84	89.34	84.81	62.27
35	238	74159	71.98	72.57	71.39	90.85	86.90	65.52
36	242	76824	74.56	75.29	73.86	92.17	88.61	68.79
37	250	79601	77.26	78.06	76.48	93.50	90.36	72.18
38	251	82212	79.79	80.66	78.95	94.71	91.97	75.39
39	255	84782	82.29	83.17	81.43	95.76	93.32	78.65
40	260	87300	84.73	85.69	83.80	96.70	94.63	81.79
41	265	89753	87.11	88.00	86.25	97.43	95.92	84.85
42	271	92041	89.33	90.16	88.53	97.99	96.90	87.80
43	277	94244	91.47	92.26	90.71	98.53	97.73	90.47
44	285	96514	93.67	94.27	93.10	99.04	98.53	93.25
45	293	98451	95.55	96.00	95.12	99.43	99.04	95.48
46	300	100059	97.11	97.41	96.83	99.64	99.44	97.26
47	300	101517	98.53	98.71	98.36	99.81	99.75	98.73
48	300	102565	99.55	99.60	99.50	99.93	99.95	99.64
49	300	103033	100.00	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

Table F.12: Mathematics Grade 8

Mathematics Grade 8								
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
0	100	1	0.00	0.00	0.00	0.01	0.00	0.00
1	100	5	0.00	0.00	0.01	0.01	0.01	0.00
2	100	21	0.02	0.02	0.02	0.04	0.03	0.01

Mathematics Grade 8

		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	**Scale Score**	**#**	**%**	**%**	**%**	**%**	**%**	**%**
3	100	72	0.07	0.05	0.09	0.19	0.09	0.03
4	104	213	0.21	0.14	0.27	0.56	0.28	0.09
5	114	503	0.49	0.35	0.61	1.26	0.70	0.22
6	121	982	0.95	0.69	1.20	2.43	1.36	0.42
7	128	1762	1.70	1.30	2.09	4.20	2.53	0.78
8	134	2769	2.68	2.07	3.26	6.45	3.97	1.28
9	140	3969	3.84	3.03	4.61	8.93	5.83	1.87
10	145	5343	5.16	4.18	6.10	11.97	7.79	2.56
11	150	6863	6.63	5.50	7.72	15.34	9.97	3.33
12	154	8453	8.17	6.90	9.38	18.66	12.40	4.13
13	159	10152	9.81	8.36	11.20	21.91	14.99	5.05
14	163	11927	11.53	9.95	13.03	25.43	17.46	6.09
15	167	13770	13.31	11.66	14.89	28.94	20.08	7.20
16	170	15751	15.22	13.51	16.86	32.47	22.78	8.53
17	174	17824	17.23	15.50	18.87	35.95	25.81	9.88
18	178	19976	19.30	17.63	20.90	39.50	28.88	11.31
19	181	22196	21.45	19.82	23.00	43.04	31.95	12.89
20	185	24531	23.71	22.20	25.14	46.62	34.99	14.65
21	188	26850	25.95	24.57	27.26	49.63	37.91	16.62
22	191	29304	28.32	27.03	29.55	52.86	40.96	18.70
23	195	31769	30.70	29.64	31.70	55.99	44.01	20.79
24	200	34524	33.36	32.53	34.15	59.27	47.45	23.21
25	202	37270	36.02	35.36	36.63	62.54	50.67	25.69
26	205	40126	38.78	38.37	39.15	65.41	53.85	28.43
27	208	43188	41.74	41.57	41.88	68.50	57.36	31.39
28	212	46244	44.69	44.81	44.55	71.43	60.83	34.36
29	215	49328	47.67	47.94	47.38	74.06	64.24	37.48
30	219	52419	50.66	51.15	50.17	76.64	67.39	40.74
31	222	55517	53.65	54.26	53.05	78.98	70.34	44.12
32	226	58603	56.63	57.42	55.87	81.23	73.20	47.53
33	229	61753	59.68	60.53	58.85	83.61	76.04	51.02
34	233	64853	62.67	63.67	61.70	85.62	78.69	54.57
35	237	67936	65.65	66.76	64.57	87.41	81.25	58.15
36	241	71067	68.68	69.95	67.45	89.25	83.66	61.87
37	250	74123	71.63	73.00	70.31	91.07	85.95	65.44
38	251	77119	74.53	76.01	73.10	92.47	88.05	69.06
39	255	80106	77.42	78.83	76.05	93.78	90.12	72.65
40	260	83065	80.27	81.59	79.00	94.98	91.96	76.30
41	266	85980	83.09	84.35	81.87	96.05	93.41	79.94
42	272	88878	85.89	87.08	84.74	97.04	94.91	83.48
43	279	91621	88.54	89.63	87.50	97.78	96.24	86.92
44	287	94314	91.15	92.19	90.14	98.51	97.37	90.14
45	297	96919	93.66	94.47	92.89	98.99	98.29	93.21
46	300	99193	95.86	96.53	95.22	99.43	99.00	95.81
47	300	101173	97.77	98.11	97.45	99.77	99.58	97.86
48	300	102746	99.29	99.44	99.15	99.93	99.89	99.38
49	300	103476	100.00	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

Table F.13: Science Grade 4

		Science Grade 4						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
1	100	1	0.00	0.00	0.00	0.00	0.00	0.00
3	111	14	0.01	0.01	0.02	0.04	0.01	0.01
4	123	54	0.05	0.04	0.06	0.17	0.05	0.02
5	133	136	0.13	0.11	0.16	0.44	0.15	0.04
6	141	270	0.27	0.22	0.31	0.81	0.32	0.09
7	148	496	0.49	0.41	0.56	1.33	0.70	0.17
8	155	826	0.81	0.66	0.96	2.18	1.19	0.30
9	161	1334	1.31	1.08	1.54	3.43	2.08	0.46
10	166	2003	1.97	1.69	2.24	4.91	3.30	0.67
11	171	2826	2.78	2.48	3.07	6.81	4.73	0.95
12	176	3943	3.88	3.48	4.26	9.27	6.63	1.39
13	181	5250	5.17	4.71	5.60	12.28	8.76	1.91
14	185	6807	6.70	6.25	7.13	15.50	11.58	2.51
15	190	8645	8.51	7.99	9.00	19.05	14.78	3.39
16	194	10668	10.50	10.01	10.97	23.21	18.14	4.34
17	200	13213	13.01	12.60	13.39	27.94	22.08	5.78
18	203	15961	15.72	15.42	15.99	32.56	26.40	7.46
19	207	19057	18.76	18.55	18.95	37.26	31.18	9.53
20	211	22597	22.25	22.16	22.31	42.73	36.15	12.06
21	215	26386	25.98	26.00	25.94	47.82	41.42	15.06
22	219	30529	30.06	30.23	29.87	53.34	46.77	18.43
23	224	35101	34.56	34.90	34.21	58.64	52.23	22.53
24	228	39979	39.37	40.00	38.73	63.68	57.83	27.23
25	233	45300	44.61	45.42	43.81	68.69	63.25	32.69
26	238	50833	50.05	51.04	49.09	73.80	68.75	38.43
27	242	56737	55.87	56.99	54.77	78.37	74.28	44.90
28	250	62630	61.67	62.87	60.50	82.54	79.31	51.65
29	253	68791	67.74	68.90	66.58	86.50	83.96	59.03
30	259	74825	73.68	75.00	72.38	89.90	87.97	66.47
31	266	80553	79.32	80.50	78.16	92.83	91.44	73.69
32	273	86051	84.73	85.82	83.66	95.38	94.19	80.70
33	281	90853	89.46	90.49	88.45	97.31	96.46	86.81
34	290	94856	93.40	94.26	92.57	98.47	97.94	92.02
35	300	97908	96.41	96.93	95.90	99.36	99.04	95.78
36	300	99997	98.46	98.75	98.19	99.81	99.68	98.25
37	300	101058	99.51	99.63	99.39	99.96	99.93	99.46
38	300	101476	99.92	99.93	99.91	99.99	100.00	99.92
39	300	101558	100.00	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

Table F.14: Science Grade 8

		Science Grade 8						
		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	Scale Score	#	%	%	%	%	%	%
2	100	1	0.00	0.00	0.00	0.00	0.00	0.00
4	109	4	0.00	0.00	0.01	0.01	0.01	0.00
5	118	14	0.01	0.01	0.02	0.04	0.02	0.00
6	125	31	0.03	0.02	0.04	0.09	0.04	0.01
7	131	69	0.07	0.05	0.08	0.20	0.07	0.02
8	137	142	0.14	0.09	0.18	0.40	0.18	0.05
9	142	297	0.29	0.19	0.38	0.69	0.46	0.11
10	146	564	0.55	0.41	0.67	1.34	0.91	0.19
11	151	885	0.86	0.65	1.05	2.01	1.53	0.31
12	155	1423	1.38	1.08	1.66	3.20	2.41	0.52
13	159	2117	2.05	1.63	2.45	4.85	3.54	0.77
14	162	2948	2.85	2.30	3.37	6.57	5.01	1.11
15	166	3927	3.80	3.12	4.44	8.73	6.65	1.50
16	169	5135	4.96	4.24	5.65	11.22	8.74	1.98
17	173	6477	6.26	5.46	7.02	14.03	10.99	2.58
18	176	7926	7.66	6.89	8.39	17.02	13.44	3.21
19	179	9531	9.21	8.50	9.89	20.31	16.07	3.93
20	182	11265	10.89	10.17	11.57	23.72	18.93	4.75
21	185	13120	12.68	12.04	13.27	27.22	21.91	5.68
22	188	15104	14.60	14.12	15.04	31.14	24.79	6.74
23	191	17271	16.69	16.41	16.94	34.78	28.35	7.95
24	194	19418	18.77	18.62	18.89	38.36	31.73	9.26
25	196	21728	21.00	21.14	20.84	42.20	35.08	10.74
26	200	24208	23.39	23.80	22.98	46.13	38.59	12.44
27	202	26860	25.96	26.69	25.23	49.77	42.31	14.42
28	205	29552	28.56	29.60	27.54	53.47	45.78	16.52
29	208	32362	31.27	32.61	29.97	57.07	49.39	18.79
30	211	35246	34.06	35.55	32.60	60.57	53.09	21.22
31	214	38148	36.87	38.59	35.19	63.76	56.69	23.80
32	217	41233	39.85	41.81	37.94	67.11	60.09	26.67
33	220	44455	42.96	45.30	40.70	70.20	63.50	29.85
34	223	47760	46.15	48.68	43.72	73.27	66.77	33.24
35	226	51227	49.51	52.10	46.99	76.16	70.08	36.87
36	229	54633	52.80	55.53	50.15	78.90	73.17	40.48
37	232	58413	56.45	59.37	53.62	81.79	76.53	44.61
38	235	62054	59.97	63.13	56.92	84.21	79.42	48.77
39	239	65856	63.64	66.86	60.54	86.74	82.37	53.15
40	242	69694	67.35	70.66	64.16	88.80	84.94	57.84
41	250	73493	71.02	74.32	67.84	90.67	87.54	62.41
42	251	77216	74.62	77.85	71.51	92.60	89.64	67.06
43	254	80968	78.25	81.28	75.32	94.22	91.68	71.81
44	259	84628	81.78	84.64	79.03	95.60	93.62	76.46
45	263	88129	85.17	87.71	82.72	96.80	95.30	80.95
46	268	91243	88.18	90.40	86.04	97.60	96.64	85.01
47	274	94222	91.06	92.91	89.27	98.32	97.79	88.84
48	280	96846	93.59	95.07	92.16	98.98	98.58	92.16
49	288	99047	95.72	96.76	94.71	99.47	99.14	94.84
50	296	100860	97.47	98.13	96.84	99.73	99.57	97.04

Science Grade 8

		All Students* Cumulative		Female Cumul.	Male Cumul.	Afr. A. Cumul.	Hispanic Cumul.	White Cumul.
Raw Score	**Scale Score**	**#**	**%**	**%**	**%**	**%**	**%**	**%**
51	300	102195	98.76	99.10	98.43	99.91	99.78	98.63
52	300	103012	99.55	99.69	99.41	99.93	99.95	99.53
53	300	103386	99.91	99.94	99.89	99.99	100.00	99.92
54	300	103478	100.00	100.00	100.00	100.00	100.00	100.00

* Alternate and Braille forms excluded

APPENDIX G
ITEM PARAMETERS TABLES

Table G.1: ELA Grade 3: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	-1.2517	Yes	0.01440	1.03	3.87	1.01	0.59	0.06	0.06
2	0.50906	Yes	0.01190	1.13	9.90	1.21	9.90	0.16	0.16
3	-1.0743	Yes	0.01386	1.11	9.90	1.34	9.90	-0.05	-0.05
4	-0.04081	Yes	0.01206	1.01	3.14	1.04	4.98	0.08	0.08
5	-1.8483	Yes	0.01684	0.88	-9.90	0.70	-9.90	-0.04	-0.04
6	-0.10068	Yes	0.01211	1.03	6.13	1.06	8.10	-0.12	-0.12
7	0.04455	Yes	0.01200	0.98	-4.17	0.98	-2.23	0.00	0.00
8	-2.5043	Yes	0.02089	0.99	-0.77	0.94	-2.07	0.00	0.00
9	-0.49190	Yes	0.01259	1.08	9.90	1.20	9.90	0.00	0.00
10	-1.0167	Yes	0.01370	1.03	4.35	1.09	7.01	0.00	0.00
11	0.27530	Yes	0.01191	0.99	-3.01	1.01	2.01	0.00	0.00
12	-1.2895	Yes	0.01453	0.99	-0.92	1.01	0.81	0.00	0.00
13	-1.2658	Yes	0.01445	0.87	-9.90	0.74	-9.90	-0.09	-0.09
14	-0.30473	Yes	0.01232	0.98	-4.48	0.96	-4.11	-0.11	-0.11
15	-1.5115	Yes	0.01534	0.90	-9.90	0.84	-9.90	-0.13	-0.13
16	0.22636	Yes	0.01192	1.08	9.90	1.13	9.90	-0.01	-0.01
17	-0.19494	Yes	0.01220	1.10	9.90	1.16	9.90	0.04	0.04
18	0.25290	Yes	0.01191	1.12	9.90	1.19	9.90	0.09	0.09
19	0.83993	Yes	0.00518	1.00	0.53	1.03	3.49	0.00	0.00
20	0.48012	Yes	0.00492	0.86	-9.90	0.86	-9.90	0.00	0.00
21	1.67150	Yes	0.00943	0.91	-9.90	0.91	-9.90	-0.01	-0.01
22	2.05451	Yes	0.00782	0.88	-9.90	0.88	-9.90	0.00	0.00
23	1.46395	Yes	0.00850	0.87	-9.90	0.87	-9.90	-0.01	-0.01

[1] Item indicates the order in which items were entered in Winsteps

Table G.2: ELA Grade 4: – Item Parameters

				INFIT		OUTFIT			Score
ITEM[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	-0.66460	Yes	0.01295	1.05	7.76	1.06	5.39	-0.05	0.33
2	-0.93608	Yes	0.01352	1.29	9.90	1.78	9.90	0.20	0.18
3	-1.87850	Yes	0.01683	1.08	6.98	1.25	9.90	0.12	0.30
4	-0.34517	Yes	0.01246	1.01	2.15	1.01	1.16	0.12	0.42
5	0.10089	Yes	0.01207	0.97	-5.97	1.00	-0.39	0.04	0.43
6	0.62148	Yes	0.01202	1.19	9.90	1.28	9.90	0.02	0.24
7	-0.71426	Yes	0.01304	0.93	-9.90	0.89	-9.63	0.00	0.45
8	-1.15510	Yes	0.01409	0.96	-5.53	0.86	-9.56	0.05	0.43
9	-0.07546	Yes	0.01218	1.10	9.90	1.16	9.90	0.00	0.32
10	0.03948	Yes	0.01210	0.98	-4.63	0.97	-3.72	0.00	0.42
11	-0.65702	Yes	0.01294	0.98	-3.24	0.96	-3.99	0.00	0.41
12	0.18004	Yes	0.01203	1.03	5.38	1.06	7.86	0.00	0.38
13	-1.32710	Yes	0.01462	0.89	-9.90	0.74	-9.90	0.00	0.46
14	0.91397	Yes	0.01218	1.03	5.96	1.15	9.90	0.00	0.34
15	-1.10910	Yes	0.01396	0.91	-9.90	0.78	-9.90	0.00	0.46
16	-0.49512	Yes	0.01267	0.96	-7.44	0.92	-7.85	0.00	0.43
17	-0.71826	Yes	0.01305	0.95	-8.92	0.97	-2.42	-0.09	0.40
18	-1.12130	Yes	0.01400	0.88	-9.90	0.82	-9.90	-0.09	0.44
19	-0.03144	Yes	0.01215	0.97	-5.16	0.96	-5.04	-0.07	0.42
20	-0.22812	Yes	0.01232	0.99	-2.80	0.97	-2.95	0.03	0.42
21	0.38426	Yes	0.01199	1.10	9.90	1.18	9.90	0.08	0.31
22	0.32129	Yes	0.01200	0.96	-8.18	0.98	-2.48	-0.19	0.43
23	-1.36300	Yes	0.01474	0.83	-9.90	0.67	-9.90	-0.10	0.47
24	-0.14114	Yes	0.01224	1.15	9.90	1.24	9.90	0.06	0.28
25	0.47203	Yes	0.00513	1.06	6.72	1.09	9.90	0.00	0.62
26	0.04429	Yes	0.00515	0.96	-4.50	0.98	-2.10	0.00	0.66
27	1.66400	Yes	0.00860	0.89	-9.90	0.91	-9.90	-0.02	0.56
28	2.57274	Yes	0.00935	0.91	-9.90	0.91	-9.90	0.00	0.55
29	1.78762	Yes	0.00826	0.97	-3.92	0.98	-2.01	-0.03	0.58

[1] Item indicates the order in which items were entered in Winsteps

Table G.3: ELA Grade 5: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	0.02357	Yes	0.01205	1.04	9.34	1.07	8.97	0.01	0.33
2	1.40679	Yes	0.01278	1.06	9.90	1.22	9.90	0.06	0.25
3	0.06635	Yes	0.01203	0.97	-7.28	0.94	-8.50	-0.10	0.40
4	0.38574	Yes	0.01192	1.05	9.90	1.07	9.90	0.05	0.33
5	-0.56663	Yes	0.01279	1.00	0.51	0.97	-2.89	-0.09	0.33
6	0.54620	Yes	0.01193	1.09	9.90	1.13	9.90	0.03	0.29
7	-1.00030	Yes	0.01379	1.11	9.90	1.29	9.90	0.10	0.26
8	-0.63781	Yes	0.01293	0.88	-9.90	0.81	-9.90	-0.11	0.44
9	-0.56791	Yes	0.01280	0.92	-9.90	0.86	-9.90	-0.01	0.44
10	0.76189	Yes	0.01202	1.02	3.39	1.06	8.92	-0.05	0.35
11	-1.04270	Yes	0.01391	0.87	-9.90	0.80	-9.90	-0.05	0.44
12	-0.62869	Yes	0.01291	1.00	-0.15	1.00	0.25	-0.01	0.35
13	-0.20266	Yes	0.01226	1.18	9.90	1.28	9.90	0.09	0.22
14	-1.19870	Yes	0.01439	1.03	3.32	1.03	1.71	0.14	0.37
15	0.49660	Yes	0.01192	1.06	9.90	1.10	9.90	-0.04	0.32
16	-0.04970	Yes	0.01211	0.95	-9.90	0.92	-9.90	0.02	0.42
17	-1.03230	Yes	0.01388	0.87	-9.90	0.82	-9.90	-0.05	0.44
18	-1.76050	Yes	0.01666	0.94	-5.67	0.82	-9.54	0.08	0.40
19	0.63615	Yes	0.01195	1.15	9.90	1.23	9.90	-0.01	0.22
20	-0.64954	Yes	0.01295	0.90	-9.90	0.89	-9.90	-0.07	0.43
21	0.78095	Yes	0.01203	1.05	9.90	1.12	9.90	0.00	0.31
22	0.65050	Yes	0.01196	1.03	6.62	1.07	9.90	0.00	0.34
23	0.39379	Yes	0.01192	1.05	9.90	1.09	9.90	0.00	0.32
24	-0.34507	Yes	0.01244	1.02	2.89	1.07	8.19	0.00	0.35
25	0.66630	Yes	0.01197	1.07	9.90	1.12	9.90	0.00	0.30
26	-0.50932	Yes	0.01269	0.98	-2.75	0.96	-3.85	0.00	0.38
27	-0.79777	Yes	0.01327	0.87	-9.90	0.76	-9.90	0.00	0.49
28	0.73930	Yes	0.01200	0.98	-4.57	0.99	-1.43	0.00	0.39
29	-0.14572	Yes	0.01220	1.06	9.90	1.10	9.90	0.00	0.31
30	-0.20883	Yes	0.01227	1.01	2.03	1.03	3.42	0.00	0.36
31	0.23764	Yes	0.00515	1.02	2.04	1.03	4.14	0.00	0.62
32	-0.07321	Yes	0.00517	0.93	-8.58	0.95	-6.52	0.00	0.65
33	2.43357	Yes	0.00814	0.84	-9.90	0.83	-9.90	0.00	0.62
34	1.63417	Yes	0.00983	0.84	-9.90	0.83	-9.90	0.04	0.51
35	2.07206	Yes	0.00959	0.90	-9.90	0.90	-9.90	0.00	0.53

[1] Item indicates the order in which items were entered in Winsteps

Table G.4: ELA Grade 6: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	1.36965	Yes	0.01195	1.09	9.90	1.21	9.90	-0.10	0.25
2	0.28111	Yes	0.01185	1.26	9.90	1.39	9.90	-0.02	0.10
3	0.00731	Yes	0.01216	0.94	-9.90	0.93	-9.46	-0.14	0.39
4	0.55818	Yes	0.01167	1.02	5.01	1.04	6.36	-0.01	0.34
5	0.41154	Yes	0.01175	1.10	9.90	1.13	9.90	0.06	0.28
6	1.11821	Yes	0.01174	1.08	9.90	1.15	9.90	-0.09	0.27
7	-0.29424	Yes	0.01266	1.07	9.90	1.12	9.90	0.12	0.33
8	-1.90110	Yes	0.01910	0.90	-7.53	0.77	-9.90	-0.05	0.34
9	-0.06370	Yes	0.01226	1.13	9.90	1.20	9.90	-0.05	0.21
10	1.00105	Yes	0.01168	1.11	9.90	1.16	9.90	0.00	0.25
11	-0.25931	Yes	0.01260	1.06	9.90	1.12	9.90	0.00	0.29
12	-0.46911	No	0.01304	0.93	-9.90	0.90	-9.90	0.00	0.43
13	-0.60432	No	0.01338	0.88	-9.90	0.80	-9.90	0.00	0.48
14	1.27188	No	0.01186	1.16	9.90	1.31	9.90	0.00	0.17
15	-0.64651	No	0.01349	0.92	-9.90	0.84	-9.90	0.00	0.43
16	0.75727	No	0.01163	0.97	-7.93	0.97	-4.52	0.00	0.39
17	0.36788	No	0.01178	0.91	-9.90	0.89	-9.90	0.00	0.45
18	0.82070	No	0.01163	1.01	1.52	1.02	3.41	0.00	0.35
19	0.72226	No	0.01163	1.03	6.22	1.05	8.90	0.00	0.33
20	0.80440	No	0.01163	1.16	9.90	1.21	9.90	0.00	0.21
21	-0.22790	No	0.01254	1.01	2.61	1.02	1.93	0.00	0.34
22	-0.20657	No	0.01250	0.95	-8.53	0.91	-9.90	0.00	0.41
23	-0.31388	No	0.01270	0.93	-9.90	0.89	-9.90	0.00	0.43
24	0.13235	No	0.01200	1.04	8.06	1.05	7.32	0.00	0.33
25	-0.14738	No	0.01239	0.99	-2.27	0.98	-2.08	0.00	0.37
26	1.03973	No	0.01169	1.10	9.90	1.16	9.90	0.00	0.26
27	-0.01418	No	0.01219	0.91	-9.90	0.87	-9.90	0.00	0.46
28	0.64378	No	0.01164	1.11	9.90	1.17	9.90	0.00	0.25
29	-0.04226	No	0.01223	1.01	1.02	1.01	1.50	0.00	0.36
30	-0.57216	No	0.01330	1.03	4.80	1.09	7.96	0.00	0.31
31	0.22344	No	0.01190	0.88	-9.90	0.83	-9.90	0.00	0.49
32	-0.87000	No	0.01416	0.86	-9.90	0.73	-9.90	0.00	0.49
33	-0.93008	No	0.01437	0.86	-9.90	0.72	-9.90	0.00	0.48
34	0.02199	No	0.01214	0.99	-1.00	1.00	0.51	0.00	0.37
35	-0.21175	No	0.01251	0.99	-1.45	1.01	1.30	0.00	0.37
36	-0.35196	No	0.01278	0.90	-9.90	0.86	-9.90	0.00	0.46
37	0.60736	No	0.00430	0.96	-5.51	0.95	-6.09	0.00	0.70
38	0.54536	No	0.00450	1.18	9.90	1.20	9.90	0.00	0.66
39	1.05884	Yes	0.00921	0.74	-9.90	0.72	-9.90	0.13	0.52
40	1.05381	No	0.00934	0.82	-9.90	0.80	-9.90	0.00	0.57
41	1.27862	No	0.00931	0.85	-9.90	0.84	-9.90	0.00	0.56
42	0.92650	No	0.00986	0.82	-9.90	0.80	-9.90	0.00	0.56

[1] Item indicates the order in which items were entered in Winsteps

Table G.5: ELA Grade 7: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	-1.12820	No	0.01395	0.96	-5.86	0.90	-8.37	0.00	0.38
2	0.48272	No	0.01182	1.01	2.70	1.03	4.87	0.00	0.35
3	0.03904	No	0.01190	1.00	0.09	1.01	0.77	0.00	0.37
4	-0.60870	No	0.01269	1.06	9.67	1.04	4.02	0.00	0.30
5	0.01512	No	0.01192	1.05	9.90	1.09	9.90	0.00	0.32
6	-0.42362	No	0.01238	1.13	9.90	1.21	9.90	0.00	0.22
7	1.15672	No	0.01237	0.96	-8.65	1.01	1.66	0.00	0.37
8	-0.77647	No	0.01303	0.95	-8.83	0.89	-9.90	0.00	0.41
9	-0.00698	No	0.01193	1.14	9.90	1.19	9.90	0.00	0.23
10	-1.73810	No	0.01630	1.01	1.26	0.88	-6.98	0.20	0.42
11	-0.16284	No	0.01206	0.84	-9.90	0.78	-9.90	0.01	0.53
12	-0.32933	Yes	0.01225	1.02	4.41	1.06	7.80	0.07	0.36
13	-0.53173	Yes	0.01255	0.97	-5.66	0.93	-8.56	0.24	0.47
14	-0.14438	Yes	0.01204	0.97	-5.98	0.95	-7.20	-0.01	0.39
15	0.45095	Yes	0.01181	1.11	9.90	1.17	9.90	0.03	0.26
16	0.71934	Yes	0.01192	1.05	9.90	1.10	9.90	-0.08	0.32
17	-0.29755	Yes	0.01221	0.98	-4.06	0.98	-2.34	-0.08	0.37
18	-0.16067	Yes	0.01206	1.02	4.23	1.01	1.41	0.18	0.38
19	-1.45010	Yes	0.01505	0.88	-9.90	0.78	-9.90	0.00	0.44
20	-1.79200	Yes	0.01656	0.92	-8.13	0.77	-9.90	0.00	0.38
21	0.05477	No	0.01189	1.14	9.90	1.17	9.90	0.00	0.23
22	1.42657	No	0.01284	1.03	5.20	1.17	9.90	0.00	0.28
23	0.64448	No	0.01187	1.33	9.90	1.52	9.90	0.00	0.01
24	-0.35680	No	0.01229	0.96	-7.57	0.93	-9.37	0.00	0.40
25	-0.69053	No	0.01285	1.00	-0.67	1.02	1.83	0.00	0.35
26	1.46465	No	0.01291	1.02	2.89	1.14	9.90	0.00	0.29
27	-0.15497	No	0.01205	1.15	9.90	1.30	9.90	0.00	0.21
28	0.66180	No	0.01188	1.07	9.90	1.10	9.90	0.00	0.29
29	0.29004	No	0.01181	1.04	8.89	1.06	9.67	0.00	0.33
30	-0.52825	No	0.01254	1.01	1.32	1.04	4.00	0.00	0.35
31	0.42262	No	0.01181	0.92	-9.90	0.91	-9.90	0.00	0.44
32	0.19777	No	0.01183	1.01	2.76	1.05	8.27	0.00	0.36
33	-0.37655	No	0.01231	0.95	-9.90	0.93	-9.06	0.00	0.41
34	-0.50195	No	0.01250	0.93	-9.90	0.88	-9.90	0.00	0.43
35	0.32765	No	0.01181	1.13	9.90	1.19	9.90	0.00	0.24
36	0.33317	No	0.01181	1.12	9.90	1.18	9.90	0.00	0.25
37	0.13263	No	0.00440	0.96	-5.13	0.97	-3.43	0.00	0.69
38	-0.24034	No	0.00471	1.02	2.93	1.04	5.37	0.00	0.70
39	1.11871	No	0.00983	0.89	-9.90	0.89	-9.90	0.00	0.52
40	0.99224	Yes	0.00966	1.15	9.90	1.16	9.90	-0.26	0.55
41	0.37356	No	0.00866	0.80	-9.90	0.79	-9.90	0.00	0.62
42	0.49167	No	0.00872	0.86	-9.90	0.85	-9.90	0.00	0.57

[1] Item indicates the order in which items were entered in Winsteps

Table G.6: ELA Grade 8: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	2.17533	No	0.01269	1.10	9.90	1.26	9.90	0.00	0.25
2	-0.78233	No	0.01584	0.95	-4.77	0.87	-7.24	0.00	0.38
3	0.23881	No	0.01281	0.98	-3.26	0.98	-2.23	0.00	0.39
4	-0.66098	No	0.01534	0.91	-9.90	0.77	-9.90	0.00	0.43
5	0.75776	No	0.01212	1.06	9.90	1.11	9.90	0.00	0.32
6	0.41329	No	0.01252	0.92	-9.90	0.88	-9.90	0.00	0.46
7	0.96229	No	0.01199	1.11	9.90	1.19	9.90	0.00	0.28
8	0.96586	No	0.01199	1.05	9.90	1.10	9.90	0.00	0.33
9	-0.11066	No	0.01357	0.99	-1.77	0.98	-1.89	0.00	0.38
10	-1.51750	No	0.01987	1.00	0.25	1.15	5.40	0.00	0.25
11	0.37648	No	0.01258	1.11	9.90	1.21	9.90	0.00	0.28
12	0.21176	No	0.01286	1.05	8.37	1.07	6.36	0.00	0.33
13	0.90582	No	0.01202	1.24	9.90	1.38	9.90	0.00	0.16
14	0.11530	No	0.01305	1.01	1.38	0.94	-5.37	0.00	0.37
15	0.03688	No	0.01322	1.10	9.90	1.18	9.90	0.00	0.27
16	0.41076	No	0.01253	0.99	-1.89	0.95	-5.45	0.00	0.39
17	0.35962	No	0.01260	0.96	-7.64	0.91	-9.88	0.00	0.42
18	0.56559	No	0.01232	1.13	9.90	1.21	9.90	0.00	0.26
19	0.15356	Yes	0.01297	0.93	-9.90	0.86	-9.90	0.00	0.45
20	-0.06174	Yes	0.01345	0.96	-6.66	0.90	-8.64	-0.05	0.39
21	-0.50742	Yes	0.01477	0.91	-9.90	0.80	-9.90	-0.05	0.41
22	0.37985	Yes	0.01257	1.13	9.90	1.26	9.90	0.04	0.26
23	0.76259	Yes	0.01212	1.05	9.90	1.06	7.67	-0.06	0.32
24	-0.51506	Yes	0.01480	0.89	-9.90	0.73	-9.90	0.00	0.46
25	0.90102	Yes	0.01202	1.08	9.90	1.15	9.90	-0.10	0.30
26	0.12978	Yes	0.01302	1.00	-0.55	1.09	7.86	-0.06	0.35
27	-0.21332	Yes	0.01385	0.96	-6.19	0.88	-9.59	0.00	0.41
28	0.47543	No	0.01243	1.00	-0.52	1.00	-0.55	0.00	0.39
29	0.59908	No	0.01228	1.11	9.90	1.15	9.90	0.00	0.28
30	-0.29824	No	0.01409	1.08	9.90	1.22	9.90	0.00	0.26
31	-0.65865	No	0.01533	0.92	-9.00	0.88	-7.45	0.00	0.42
32	-0.41710	No	0.01447	1.08	9.90	1.36	9.90	0.00	0.25
33	-0.06536	No	0.01346	0.95	-7.95	0.89	-9.09	0.00	0.42
34	-0.83628	No	0.01607	0.95	-5.39	0.86	-7.68	0.00	0.38
35	-0.46658	No	0.01463	0.98	-1.88	0.98	-1.00	0.00	0.36
36	0.51089	No	0.01239	0.94	-9.90	0.89	-9.90	0.00	0.44
37	0.64733	No	0.00452	0.86	-9.90	0.86	-9.90	0.00	0.74
38	0.79285	No	0.00492	1.10	9.90	1.12	9.90	0.00	0.69
39	0.94754	No	0.00936	0.83	-9.90	0.82	-9.90	0.00	0.60
40	0.71735	No	0.01053	0.87	-9.90	0.84	-9.90	0.00	0.51
41	1.28295	Yes	0.00875	0.72	-9.90	0.71	-9.90	0.10	0.63
42	1.41272	No	0.00897	0.78	-9.90	0.77	-9.90	0.00	0.64

[1] Item indicates the order in which items were entered in Winsteps

Table G.7: Mathematics Grade 3: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	0.04076	No	0.01307	1.10	9.90	1.08	6.76	0.00	0.37
2	-1.25380	Yes	0.01681	1.01	1.06	0.88	-5.16	0.15	0.42
3	-2.14720	No	0.02213	0.94	-4.00	0.74	-8.07	0.00	0.32
4	0.88207	No	0.01230	0.82	-9.90	0.77	-9.90	0.00	0.59
5	0.11621	No	0.01296	1.17	9.90	1.21	9.90	0.00	0.31
6	-1.06400	No	0.01602	1.02	2.53	1.12	5.23	0.00	0.34
7	-1.33470	No	0.01717	1.02	1.71	0.95	-1.92	0.00	0.33
8	-0.82249	No	0.01515	1.03	3.35	1.02	0.93	0.00	0.36
9	0.61261	No	0.01243	1.08	9.90	1.08	8.94	0.00	0.39
10	-0.88186	No	0.01535	0.96	-4.82	0.97	-1.74	0.00	0.41
11	0.36241	No	0.01265	0.89	-9.90	0.82	-9.90	0.00	0.54
12	-0.67583	No	0.01469	1.11	9.90	1.16	8.64	0.00	0.31
13	-2.04270	No	0.02134	1.00	0.15	1.10	2.86	0.00	0.26
14	0.18447	Yes	0.01286	0.88	-9.90	0.82	-9.90	0.22	0.59
15	-0.65609	No	0.01463	1.09	9.90	1.11	6.45	0.00	0.33
16	-0.09605	No	0.01331	0.91	-9.90	0.91	-7.66	0.00	0.50
17	0.06418	No	0.01304	1.06	9.42	1.01	1.24	0.00	0.40
18	0.84912	No	0.01231	1.18	9.90	1.29	9.90	0.00	0.31
19	0.78667	No	0.01233	1.05	9.05	1.07	8.15	0.00	0.42
20	-0.68598	No	0.01472	0.98	-2.28	0.94	-3.32	0.00	0.42
21	0.87508	Yes	0.01230	0.95	-9.18	0.93	-8.72	0.12	0.49
22	0.66870	Yes	0.01239	1.14	9.90	1.22	9.90	0.22	0.37
23	-0.05001	Yes	0.01323	0.78	-9.90	0.70	-9.90	-0.50	0.51
24	-0.74593	No	0.01490	0.79	-9.90	0.63	-9.90	0.00	0.56
25	1.12905	Yes	0.01228	0.96	-8.05	0.95	-5.63	0.10	0.48
26	-0.38622	Yes	0.01392	1.10	9.90	1.17	9.90	0.24	0.42
27	0.02609	Yes	0.01310	0.90	-9.90	0.85	-9.90	0.16	0.56
28	1.13127	No	0.01228	0.92	-9.90	0.91	-9.90	0.00	0.51
29	0.32827	Yes	0.01268	1.15	9.90	1.23	9.90	-0.34	0.27
30	0.64380	Yes	0.01241	0.97	-5.94	0.97	-3.12	-0.46	0.45
31	-0.22570	Yes	0.01356	0.78	-9.90	0.66	-9.90	-0.27	0.53
32	2.80651	No	0.01482	1.07	8.10	1.40	9.90	0.00	0.30
33	-0.02674	No	0.01319	1.21	9.90	1.33	9.90	0.00	0.27
34	-0.76596	No	0.01496	0.76	-9.90	0.58	-9.90	0.00	0.58
35	-0.90710	No	0.01543	1.04	4.55	0.97	-1.45	0.00	0.36
36	0.46431	Yes	0.01255	0.91	-9.90	0.91	-9.90	0.10	0.54
37	0.69134	Yes	0.01238	0.88	-9.90	0.84	-9.90	0.12	0.56
38	1.08762	No	0.01227	0.81	-9.90	0.75	-9.90	0.00	0.60
39	0.91466	No	0.01229	0.97	-5.16	0.98	-2.02	0.00	0.48
40	-1.27990	No	0.01692	0.95	-4.96	0.95	-2.27	0.00	0.38
41	1.29682	No	0.01231	0.97	-6.09	0.94	-6.73	0.00	0.47
42	1.20534	Yes	0.00700	1.02	3.09	1.07	7.95	0.02	0.55
43	0.86970	No	0.00678	1.06	7.43	1.06	6.46	0.00	0.64
44	1.66514	No	0.00616	1.19	9.90	2.30	9.90	0.00	0.55

[1] Item indicates the order in which items were entered in Winsteps

Table G.8: Mathematics Grade 4: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	-2.38500	No	0.02342	0.94	-3.43	0.73	-8.10	0.00	0.29
2	-0.97817	No	0.01505	0.93	-8.67	0.79	-9.90	0.00	0.42
3	-0.24098	No	0.01305	0.94	-9.47	0.91	-7.40	0.00	0.45
4	-0.79177	No	0.01442	1.10	9.90	1.38	9.90	0.00	0.25
5	-0.35365	No	0.01328	0.88	-9.90	0.75	-9.90	0.00	0.51
6	1.41756	No	0.01234	0.90	-9.90	0.92	-9.26	0.00	0.49
7	0.13902	No	0.01247	1.06	9.90	1.05	4.68	0.00	0.36
8	-0.33221	No	0.01324	0.88	-9.90	0.78	-9.90	0.00	0.50
9	-0.08478	No	0.01278	0.92	-9.90	0.85	-9.90	0.00	0.48
10	-1.40700	Yes	0.01685	0.75	-9.90	0.62	-9.90	-0.30	0.38
11	-1.96110	Yes	0.02009	0.80	-9.90	0.66	-9.90	-0.22	0.32
12	0.20298	No	0.01240	0.94	-9.90	0.90	-9.90	0.00	0.47
13	0.82984	Yes	0.01208	1.12	9.90	1.16	9.90	0.05	0.32
14	0.17283	No	0.01244	1.00	-0.77	0.95	-5.68	0.00	0.42
15	0.13512	No	0.01248	0.89	-9.90	0.83	-9.90	0.00	0.51
16	0.54501	No	0.01214	1.06	9.90	1.13	9.90	0.00	0.37
17	0.68240	No	0.01209	1.07	9.90	1.09	9.90	0.00	0.35
18	-1.14660	No	0.01569	0.95	-5.70	0.99	-0.71	0.00	0.37
19	0.51893	Yes	0.01216	0.82	-9.90	0.76	-9.90	0.05	0.58
20	1.67418	No	0.01264	1.15	9.90	1.28	9.90	0.00	0.28
21	-1.58540	No	0.01777	0.88	-9.90	0.63	-9.90	0.00	0.43
22	0.11572	No	0.01250	1.09	9.90	1.20	9.90	0.00	0.33
23	-0.13253	No	0.01286	1.03	4.63	1.00	0.39	0.00	0.38
24	0.50300	Yes	0.01216	0.84	-9.90	0.78	-9.90	0.02	0.57
25	-0.51046	Yes	0.01364	0.90	-9.90	0.82	-9.90	0.01	0.48
26	1.06085	Yes	0.01211	1.06	9.90	1.10	9.90	-0.04	0.36
27	0.09357	No	0.01253	1.08	9.90	1.08	7.54	0.00	0.34
28	-0.94328	No	0.01492	1.06	7.15	1.31	9.90	0.00	0.27
29	-0.07441	No	0.01277	1.01	2.40	1.00	0.32	0.00	0.39
30	-0.97036	No	0.01502	1.04	4.73	1.16	7.98	0.00	0.30
31	-0.52308	Yes	0.01367	1.09	9.90	1.22	9.90	0.06	0.31
32	0.15913	No	0.01245	0.97	-6.39	0.92	-8.17	0.00	0.44
33	-0.21864	No	0.01301	1.02	3.09	0.99	-1.00	0.00	0.38
34	0.33137	No	0.01228	0.91	-9.90	0.86	-9.90	0.00	0.49
35	0.42975	No	0.01221	0.91	-9.90	0.88	-9.90	0.00	0.49
36	-1.45160	No	0.01707	0.89	-9.90	0.77	-9.90	0.00	0.41
37	-1.54980	No	0.01758	1.02	1.57	1.12	4.85	0.00	0.26
38	1.20664	No	0.01218	1.07	9.90	1.08	9.90	0.00	0.36
39	0.45989	Yes	0.01219	0.96	-8.17	1.00	-0.57	0.16	0.48
40	0.97970	Yes	0.01209	1.16	9.90	1.24	9.90	-0.09	0.28
41	1.02425	Yes	0.01210	0.83	-9.90	0.78	-9.90	0.08	0.57
42	0.40889	Yes	0.00633	1.38	9.90	1.56	9.90	-0.03	0.48
43	0.47948	No	0.00676	1.26	9.90	1.31	9.90	0.00	0.50
44	2.41888	No	0.00783	0.99	-1.18	0.91	-7.66	0.00	0.55

[1] Item indicates the order in which items were entered in Winsteps

Table G.9: Mathematics Grade 5: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	-1.01770	No	0.01676	1.05	5.07	1.15	5.50	0.00	0.36
2	-0.58720	No	0.01529	0.99	-1.53	0.94	-2.97	0.00	0.45
3	-0.66097	Yes	0.01551	0.98	-2.84	1.11	4.71	-0.15	0.39
4	-0.02258	Yes	0.01395	1.10	9.90	1.09	5.44	-0.25	0.35
5	-0.96045	Yes	0.01653	0.84	-9.90	0.76	-9.90	-0.17	0.46
6	0.50160	No	0.01319	1.25	9.90	1.37	9.90	0.00	0.32
7	-1.49720	No	0.01897	0.94	-4.69	0.99	-0.30	0.00	0.39
8	-0.22264	No	0.01436	0.99	-1.78	0.90	-5.87	0.00	0.48
9	-1.80010	No	0.02075	1.02	1.10	1.38	9.25	0.00	0.30
10	-0.96622	No	0.01656	0.91	-9.90	0.77	-9.51	0.00	0.48
11	-0.80296	No	0.01597	0.98	-1.67	0.97	-1.32	0.00	0.43
12	-0.60820	No	0.01535	0.98	-2.20	0.91	-4.25	0.00	0.45
13	-1.08320	No	0.01702	0.87	-9.90	0.71	-9.90	0.00	0.49
14	1.88274	No	0.01304	0.89	-9.90	0.99	-0.59	0.00	0.52
15	-0.00562	Yes	0.01392	1.28	9.90	1.71	9.90	0.37	0.37
16	-0.17607	No	0.01426	1.08	9.90	1.18	9.90	0.00	0.40
17	0.02002	Yes	0.01387	1.01	1.32	0.97	-1.69	-0.03	0.47
18	-0.39835	Yes	0.01477	1.06	7.47	0.90	-5.41	0.38	0.55
19	1.76585	Yes	0.01295	0.90	-9.90	0.97	-3.16	0.11	0.52
20	-0.05177	Yes	0.01401	0.88	-9.90	0.80	-9.90	-0.37	0.48
21	-0.20141	No	0.01431	0.91	-9.90	0.78	-9.90	0.00	0.53
22	1.09215	No	0.01281	1.08	9.90	1.16	9.90	0.00	0.43
23	1.43106	No	0.01281	1.19	9.90	1.33	9.90	0.00	0.37
24	-0.49049	No	0.01502	1.16	9.90	1.19	9.02	0.00	0.34
25	-0.50245	No	0.01505	1.01	0.85	0.85	-7.77	0.00	0.45
26	0.60827	Yes	0.01309	0.98	-3.51	0.97	-2.75	0.00	0.51
27	0.15309	No	0.01365	0.92	-9.90	0.86	-9.90	0.00	0.54
28	1.29851	No	0.01279	1.12	9.90	1.25	9.90	0.00	0.40
29	0.34701	No	0.01340	0.78	-9.90	0.67	-9.90	0.00	0.64
30	-0.26310	No	0.01445	0.99	-1.83	0.96	-2.20	0.00	0.47
31	-0.28692	No	0.01450	0.99	-1.82	1.09	5.02	0.00	0.46
32	0.99939	No	0.01284	1.00	0.44	1.01	1.17	0.00	0.49
33	0.01516	No	0.01388	0.89	-9.90	0.76	-9.90	0.00	0.56
34	-1.67950	No	0.02000	0.94	-4.19	0.93	-2.09	0.00	0.37
35	-0.42265	No	0.01484	0.97	-3.86	0.90	-5.36	0.00	0.47
36	-1.07680	Yes	0.01699	1.14	9.90	1.46	9.90	0.21	0.37
37	0.26776	No	0.01348	0.87	-9.90	0.89	-8.53	0.00	0.57
38	-0.16952	No	0.01424	0.86	-9.90	0.78	-9.90	0.00	0.57
39	0.05218	No	0.01382	0.92	-9.90	0.87	-9.03	0.00	0.53
40	-0.16557	Yes	0.01423	1.02	2.64	0.99	-0.35	0.28	0.53
41	0.54829	No	0.01315	0.88	-9.90	0.85	-9.90	0.00	0.58
42	1.48786	Yes	0.00713	1.37	9.90	1.42	9.90	-0.12	0.59
43	1.67598	No	0.00726	1.06	7.81	1.05	4.97	0.00	0.64

[1] Item indicates the order in which items were entered in Winsteps

Table G.10: Mathematics Grade 6: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	-0.20677	Yes	0.01317	0.89	-9.90	0.82	-9.90	-0.16	0.48
2	-0.29622	No	0.01334	1.00	0.59	1.04	2.85	0.00	0.42
3	-0.67002	Yes	0.01421	1.03	4.48	1.31	9.90	-0.03	0.35
4	-0.38073	Yes	0.01351	1.00	0.41	0.95	-3.47	-0.06	0.41
5	-0.21528	No	0.01318	0.90	-9.90	0.82	-9.90	0.00	0.51
6	0.28440	Yes	0.01249	0.94	-9.90	0.92	-7.92	-0.21	0.47
7	-0.84943	No	0.01474	0.97	-3.61	0.92	-4.14	0.00	0.42
8	-1.27310	No	0.01629	0.86	-9.90	0.68	-9.90	0.00	0.48
9	0.18769	No	0.01259	1.18	9.90	1.31	9.90	0.00	0.30
10	1.55945	No	0.01256	1.29	9.90	1.52	9.90	0.00	0.23
11	-0.58060	No	0.01398	0.96	-5.81	0.91	-5.95	0.00	0.45
12	1.10837	No	0.01224	1.07	9.90	1.16	9.90	0.00	0.39
13	0.56970	No	0.01228	1.00	0.37	1.02	1.95	0.00	0.45
14	-0.77995	Yes	0.01453	0.97	-3.39	0.86	-7.84	0.24	0.52
15	-0.67781	No	0.01424	1.01	0.99	0.95	-2.96	0.00	0.40
16	0.12828	No	0.01266	0.98	-2.75	0.96	-3.41	0.00	0.46
17	-1.73770	No	0.01855	0.93	-5.78	1.08	2.80	0.00	0.35
18	-0.69106	No	0.01427	0.95	-6.82	0.83	-9.90	0.00	0.45
19	-0.62252	Yes	0.01409	1.09	9.90	1.21	9.90	0.14	0.38
20	-0.50704	Yes	0.01380	1.00	0.66	0.98	-1.10	0.03	0.42
21	1.70923	No	0.01273	1.05	7.93	1.26	9.90	0.00	0.37
22	-0.18022	Yes	0.01312	1.13	9.90	1.19	9.90	0.38	0.44
23	0.80976	No	0.01221	1.08	9.90	1.13	9.90	0.00	0.38
24	1.30635	No	0.01234	1.00	-0.18	1.09	9.90	0.00	0.43
25	-0.54583	Yes	0.01389	0.88	-9.90	0.79	-9.90	-0.06	0.49
26	0.74006	No	0.01222	1.07	9.90	1.11	9.90	0.00	0.39
27	-0.79173	Yes	0.01456	0.86	-9.90	0.69	-9.90	-0.19	0.45
28	1.20399	No	0.01228	1.02	3.49	1.09	9.90	0.00	0.43
29	0.16917	Yes	0.01261	1.09	9.90	1.16	9.90	-0.04	0.36
30	1.67228	No	0.01269	0.95	-8.32	1.06	5.57	0.00	0.44
31	-0.19915	No	0.01315	1.00	-0.73	0.93	-5.36	0.00	0.44
32	-0.02697	No	0.01287	0.90	-9.90	0.85	-9.90	0.00	0.52
33	0.32150	Yes	0.01246	0.91	-9.90	0.89	-9.90	-0.02	0.52
34	-2.22810	No	0.02175	0.87	-8.29	0.66	-9.90	0.00	0.37
35	-0.98893	No	0.01520	0.95	-6.10	1.07	3.40	0.00	0.41
36	0.48041	Yes	0.01233	1.00	0.23	1.00	0.42	-0.07	0.45
37	0.69364	Yes	0.01223	1.10	9.90	1.16	9.90	0.07	0.38
38	-0.71986	No	0.01435	0.92	-9.90	0.82	-9.90	0.00	0.47
39	-0.81735	No	0.01464	0.86	-9.90	0.77	-9.90	0.00	0.51
40	1.52051	No	0.01252	1.10	9.90	1.14	9.90	0.00	0.37
41	0.58884	Yes	0.00676	1.14	9.90	1.15	9.90	-0.01	0.61
42	1.76526	No	0.00708	0.95	-6.76	0.91	-8.08	0.00	0.62
43	0.60706	No	0.00719	0.90	-9.90	0.90	-9.90	0.00	0.68

[1] Item indicates the order in which items were entered in Winsteps

Table G.11: Mathematics Grade 7: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	-1.14170	No	0.01510	0.93	-9.08	0.82	-8.87	0.00	0.43
2	-1.06600	No	0.01486	0.99	-1.15	1.00	0.08	0.00	0.38
3	-0.27281	Yes	0.01307	1.05	8.93	1.00	0.28	-0.02	0.39
4	-0.90661	No	0.01439	0.98	-3.24	0.93	-3.99	0.00	0.41
5	-1.91290	No	0.01849	1.02	1.46	0.99	-0.19	0.00	0.28
6	-0.67133	No	0.01381	1.01	1.68	1.02	1.24	0.00	0.40
7	-0.51077	No	0.01348	1.01	1.94	1.09	5.82	0.00	0.40
8	-0.10585	No	0.01285	0.90	-9.90	0.80	-9.90	0.00	0.53
9	-0.78464	Yes	0.01407	0.85	-9.90	0.75	-9.90	0.03	0.52
10	1.49309	No	0.01294	1.22	9.90	1.56	9.90	0.00	0.27
11	-0.01767	No	0.01276	1.02	4.23	1.00	-0.42	0.00	0.43
12	-1.61310	Yes	0.01695	1.02	2.13	1.04	1.64	0.07	0.34
13	0.31440	Yes	0.01250	1.09	9.90	1.15	9.90	-0.11	0.38
14	-0.33826	Yes	0.01317	1.10	9.90	1.14	9.84	-0.05	0.34
15	-0.69138	Yes	0.01385	0.97	-3.77	0.92	-4.84	-0.07	0.41
16	-0.72342	No	0.01393	1.01	1.85	1.03	1.57	0.00	0.39
17	0.91644	Yes	0.01247	1.00	-0.19	1.03	2.92	0.04	0.47
18	-0.04385	No	0.01278	0.82	-9.90	0.72	-9.90	0.00	0.59
19	1.53043	No	0.01299	1.09	9.90	1.22	9.90	0.00	0.38
20	-1.03090	No	0.01475	0.98	-2.73	0.99	-0.73	0.00	0.39
21	0.72955	No	0.01242	1.14	9.90	1.25	9.90	0.00	0.36
22	1.08992	Yes	0.01256	1.24	9.90	1.40	9.90	0.26	0.27
23	1.05946	Yes	0.01254	0.88	-9.90	0.87	-9.90	0.06	0.55
24	1.78815	No	0.01337	1.19	9.90	1.47	9.90	0.00	0.29
25	0.79717	No	0.01243	1.02	4.61	1.05	5.83	0.00	0.45
26	0.85275	No	0.01245	1.03	6.57	1.07	8.16	0.00	0.44
27	-0.59237	No	0.01364	0.83	-9.90	0.72	-9.90	0.00	0.54
28	-0.91514	No	0.01441	0.87	-9.90	0.75	-9.90	0.00	0.49
29	0.45049	Yes	0.01245	1.00	-0.86	0.97	-2.93	0.21	0.48
30	0.17084	No	0.01259	1.12	9.90	1.14	9.90	0.00	0.37
31	1.30713	Yes	0.01273	1.12	9.90	1.23	9.90	-0.07	0.38
32	1.47389	No	0.01291	1.10	9.90	1.22	9.90	0.00	0.38
33	-1.42310	No	0.01613	0.83	-9.90	0.67	-9.90	0.00	0.47
34	-0.11773	No	0.01287	1.11	9.90	1.26	9.90	0.00	0.35
35	0.39172	No	0.01247	0.80	-9.90	0.73	-9.90	0.00	0.62
36	0.81606	No	0.01244	0.95	-9.90	0.91	-9.90	0.00	0.51
37	1.47663	Yes	0.01292	0.85	-9.90	0.78	-9.90	-0.17	0.60
38	0.39057	Yes	0.01247	0.96	-8.24	0.96	-3.98	0.02	0.50
39	1.36360	No	0.01279	0.94	-9.90	0.89	-9.90	0.00	0.51
40	2.30120	Yes	0.01448	0.86	-9.90	0.68	-9.90	-0.19	0.59
41	1.79295	No	0.00735	0.82	-9.90	0.73	-9.90	0.00	0.70
42	0.40061	Yes	0.00695	1.25	9.90	1.36	9.90	-0.02	0.57
43	0.85162	No	0.00685	0.94	-7.78	0.94	-6.27	0.00	0.70

[1] Item indicates the order in which items were entered in Winsteps

Table G.12: Mathematics Grade 8: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	0.21791	Yes	0.01275	0.97	-6.10	0.88	-9.90	-0.46	0.42
2	-0.59989	Yes	0.01413	0.93	-9.90	0.83	-9.90	0.00	0.47
3	0.35924	No	0.01263	1.01	1.77	0.95	-4.47	0.00	0.46
4	-0.45242	Yes	0.01379	1.07	9.90	1.14	8.33	-0.03	0.35
5	0.01328	No	0.01299	1.05	7.67	1.05	4.04	0.00	0.41
6	-0.09242	No	0.01313	1.16	9.90	1.42	9.90	0.00	0.31
7	-0.27815	Yes	0.01344	1.23	9.90	1.53	9.90	0.26	0.32
8	0.22109	No	0.01275	0.90	-9.90	0.84	-9.90	0.00	0.53
9	-0.48365	No	0.01386	1.03	3.77	1.04	2.54	0.00	0.39
10	1.54804	No	0.01282	1.18	9.90	1.37	9.90	0.00	0.32
11	1.52333	No	0.01279	1.15	9.90	1.32	9.90	0.00	0.34
12	0.75810	Yes	0.01246	0.98	-4.32	0.94	-6.44	-0.32	0.48
13	-0.58291	No	0.01409	1.04	5.78	1.12	6.54	0.00	0.37
14	-0.78073	No	0.01461	0.89	-9.90	0.92	-4.48	0.00	0.48
15	-0.96015	No	0.01517	1.00	-0.31	1.01	0.36	0.00	0.38
16	0.07924	Yes	0.01290	0.97	-4.90	0.90	-8.42	0.16	0.51
17	0.24379	Yes	0.01273	1.01	2.54	1.00	0.23	-0.29	0.41
18	0.43297	No	0.01258	0.88	-9.90	0.83	-9.90	0.00	0.55
19	-0.02909	Yes	0.01304	0.94	-9.90	0.87	-9.90	-0.08	0.48
20	-0.30840	No	0.01350	0.90	-9.90	0.78	-9.90	0.00	0.52
21	-0.16231	Yes	0.01324	1.03	5.46	1.25	9.90	0.12	0.43
22	0.33968	No	0.01265	0.90	-9.90	0.84	-9.90	0.00	0.54
23	0.73109	Yes	0.01246	1.05	9.90	1.06	5.90	-0.03	0.42
24	-0.70881	No	0.01441	0.87	-9.90	0.76	-9.90	0.00	0.51
25	1.76340	No	0.01308	0.89	-9.90	0.93	-6.66	0.00	0.51
26	0.89600	Yes	0.01245	1.25	9.90	1.40	9.90	0.36	0.28
27	0.12562	No	0.01285	1.23	9.90	1.56	9.90	0.00	0.27
28	1.08866	No	0.01250	1.07	9.90	1.13	9.90	0.00	0.40
29	0.08323	Yes	0.01290	0.98	-4.21	0.99	-0.83	-0.01	0.47
30	0.12139	No	0.01285	1.09	9.90	1.15	9.90	0.00	0.38
31	1.21768	No	0.01255	0.98	-3.20	0.99	-1.20	0.00	0.48
32	-1.08640	No	0.01560	0.83	-9.90	0.74	-9.90	0.00	0.49
33	-0.59506	No	0.01412	0.91	-9.90	0.86	-8.37	0.00	0.48
34	1.16989	No	0.01253	0.98	-4.14	0.96	-5.01	0.00	0.49
35	1.13389	Yes	0.01251	0.96	-8.27	0.91	-9.90	0.03	0.50
36	0.00392	No	0.01300	0.89	-9.90	0.92	-6.94	0.00	0.53
37	1.33384	No	0.01263	0.99	-2.20	0.96	-4.57	0.00	0.48
38	2.04103	No	0.01352	0.98	-2.32	1.04	3.20	0.00	0.44
39	0.64051	Yes	0.01248	0.79	-9.90	0.70	-9.90	-0.17	0.62
40	1.32131	Yes	0.01262	0.90	-9.90	0.83	-9.90	0.33	0.52
41	0.60916	No	0.00756	1.07	9.38	1.07	9.55	0.00	0.61
42	0.55489	Yes	0.00683	0.88	-9.90	0.85	-9.90	0.04	0.72
43	0.53155	No	0.00750	0.85	-9.90	0.86	-9.90	0.00	0.70

[1] Item indicates the order in which items were entered in Winsteps

Table G.13: Science Grade 4: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr.
1	-0.17405	No	0.00684	0.95	-6.87	0.89	-8.52	0.00	0.36
2	0.05431	No	0.00627	1.04	6.38	1.09	9.13	0.00	0.28
3	0.05483	No	0.00627	1.04	6.52	1.06	6.15	0.00	0.28
4	-0.00761	Yes	0.00640	0.93	-9.90	0.86	-9.90	0.02	0.42
5	0.41129	No	0.00583	0.96	-8.57	0.95	-8.33	0.00	0.37
6	-0.13836	No	0.00673	0.98	-3.43	0.99	-1.01	0.00	0.33
7	0.87949	No	0.00598	1.10	9.90	1.18	9.90	0.00	0.21
8	0.07140	Yes	0.00624	1.00	0.58	0.98	-1.62	0.02	0.33
9	-0.29252	Yes	0.00723	1.10	9.90	1.17	9.90	0.07	0.25
10	0.23179	No	0.00599	1.06	9.90	1.07	8.42	0.00	0.26
11	0.02022	Yes	0.00634	0.98	-3.67	0.95	-4.94	-0.04	0.31
12	0.15898	No	0.00609	0.98	-3.26	0.97	-3.55	0.00	0.34
13	-0.03102	Yes	0.00645	1.11	9.90	1.16	9.90	0.09	0.27
14	0.39456	No	0.00584	1.02	5.77	1.02	3.12	0.00	0.30
15	-0.10785	No	0.00665	0.90	-9.90	0.80	-9.90	0.00	0.42
16	-0.05317	Yes	0.00651	0.96	-6.31	0.98	-1.98	-0.08	0.28
17	0.04160	Yes	0.00630	0.93	-9.90	0.90	-9.90	-0.18	0.27
18	0.08838	Yes	0.00621	0.97	-4.92	0.91	-9.90	-0.05	0.32
19	0.16510	No	0.00608	1.17	9.90	1.25	9.90	0.00	0.14
20	0.90454	No	0.00601	1.06	9.90	1.12	9.90	0.00	0.24
21	0.05812	Yes	0.00626	0.86	-9.90	0.79	-9.90	-0.07	0.44
22	-0.11499	Yes	0.00667	0.91	-9.90	0.84	-9.90	0.01	0.42
23	0.55839	No	0.00579	0.96	-9.72	0.95	-7.90	0.00	0.37
24	-0.36967	No	0.00753	0.94	-6.28	0.84	-9.90	0.00	0.35
25	-0.54626	No	0.00834	0.91	-8.61	0.76	-9.90	0.00	0.37
26	0.63035	No	0.00580	0.98	-4.80	0.99	-2.25	0.00	0.34
27	0.05476	No	0.00627	1.01	1.14	1.01	0.68	0.00	0.31
28	-0.12020	Yes	0.00668	0.99	-0.99	1.05	4.29	0.01	0.32
29	0.12531	No	0.00614	1.01	1.64	1.01	1.49	0.00	0.31
30	-0.01856	Yes	0.00643	0.78	-9.90	0.68	-9.90	-0.11	0.49
31	0.03880	No	0.00630	0.95	-8.30	0.90	-9.90	0.00	0.37
32	0.18041	No	0.00606	1.11	9.90	1.16	9.90	0.00	0.21
33	-0.04243	No	0.00648	1.06	9.90	1.22	9.90	0.00	0.23
34	0.34113	Yes	0.00342	1.00	0.42	1.01	1.70	0.09	0.48
35	0.80139	No	0.00398	0.95	-7.00	0.95	-7.62	0.00	0.49

[1] Item indicates the order in which items were entered in Winsteps

Table G.14: Science Grade 8: – Item Parameters

				INFIT		OUTFIT			Score
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Corr
1	0.40913	No	0.01200	1.22	9.90	1.28	9.90	0.00	0.19
2	-0.81709	No	0.01390	1.09	9.90	1.19	9.90	0.00	0.25
3	-1.37890	Yes	0.01589	0.92	-8.10	1.01	0.64	-0.20	0.25
4	-0.20201	Yes	0.01259	1.19	9.90	1.25	9.90	0.33	0.30
5	-0.47434	Yes	0.01307	0.89	-9.90	0.80	-9.90	-0.01	0.48
6	-1.23060	No	0.01528	0.92	-8.88	0.79	-9.90	0.00	0.41
7	-0.12027	Yes	0.01247	1.01	2.56	0.98	-2.69	0.21	0.43
8	1.04448	No	0.01208	1.10	9.90	1.16	9.90	0.00	0.28
9	-0.40298	No	0.01293	0.91	-9.90	0.86	-9.90	0.00	0.46
10	-0.34525	No	0.01282	0.99	-1.74	0.95	-5.32	0.00	0.39
11	-0.93279	No	0.01424	0.89	-9.90	0.78	-9.90	0.00	0.45
12	-0.24038	No	0.01265	0.97	-5.47	0.97	-3.44	0.00	0.41
13	0.17561	No	0.01215	0.88	-9.90	0.83	-9.90	0.00	0.51
14	0.66612	No	0.01195	0.84	-9.90	0.81	-9.90	0.00	0.55
15	-0.96692	No	0.01435	0.99	-1.60	0.99	-0.90	0.00	0.35
16	0.02253	No	0.01230	1.00	-0.87	0.99	-1.25	0.00	0.40
17	-0.84656	No	0.01398	0.90	-9.90	0.79	-9.90	0.00	0.46
18	-1.08920	No	0.01476	1.02	1.99	1.12	7.30	0.00	0.30
19	-0.32418	No	0.01278	1.08	9.90	1.05	5.00	0.00	0.30
20	-0.01714	No	0.01234	0.90	-9.90	0.86	-9.90	0.00	0.49
21	0.05023	No	0.01226	1.08	9.90	1.07	8.48	0.00	0.32
22	-0.21874	No	0.01261	1.21	9.90	1.32	9.90	0.00	0.18
23	-0.91780	Yes	0.01420	0.94	-7.64	1.03	2.04	-0.17	0.31
24	1.06957	Yes	0.01209	1.06	9.90	1.10	9.90	0.04	0.32
25	-0.56802	Yes	0.01327	1.04	6.28	1.20	9.90	0.02	0.32
26	-0.07140	No	0.01240	0.95	-9.90	0.90	-9.90	0.00	0.44
27	-0.39740	Yes	0.01292	0.96	-7.45	0.93	-6.41	-0.32	0.31
28	0.42707	No	0.01200	1.05	9.90	1.07	9.09	0.00	0.34
29	-0.37959	No	0.01288	1.13	9.90	1.29	9.90	0.00	0.24
30	-0.08668	No	0.01243	0.98	-3.08	0.96	-4.52	0.00	0.40
31	-0.55517	No	0.01324	0.94	-9.88	0.88	-9.90	0.00	0.43
32	1.38117	No	0.01239	1.16	9.90	1.32	9.90	0.00	0.21
33	0.16276	No	0.01216	0.95	-9.90	0.91	-9.90	0.00	0.44
34	-1.37360	Yes	0.01587	1.11	9.90	1.40	9.90	0.18	0.30
35	-0.77092	Yes	0.01377	0.89	-9.90	0.87	-9.90	-0.25	0.36
36	-2.04030	No	0.01952	0.92	-5.76	0.80	-8.02	0.00	0.34
37	-0.16652	No	0.01253	0.92	-9.90	0.85	-9.90	0.00	0.46
38	0.75555	No	0.01196	1.15	9.90	1.22	9.90	0.00	0.26
39	-0.21152	No	0.01260	1.02	3.74	1.03	3.36	0.00	0.36
40	-0.53363	Yes	0.01319	1.03	5.48	1.06	5.13	0.15	0.39
41	-0.13543	No	0.01249	0.90	-9.90	0.82	-9.90	0.00	0.49
42	1.62314	No	0.01274	0.91	-9.90	0.90	-9.90	0.00	0.44
43	0.00275	No	0.01232	0.96	-8.39	0.94	-7.07	0.00	0.43
44	-0.31580	No	0.01277	1.03	4.84	1.05	4.96	0.00	0.35
45	-0.85307	No	0.01400	0.89	-9.90	0.79	-9.90	0.00	0.46
46	-0.67926	No	0.01353	0.98	-2.61	0.96	-3.12	0.00	0.37
47	0.52914	No	0.01197	1.13	9.90	1.16	9.90	0.00	0.27
48	-0.49421	No	0.01311	0.80	-9.90	0.68	-9.90	0.00	0.57
49	0.88429	No	0.00667	0.94	-8.61	0.94	-7.40	0.00	0.62
50	1.61661	Yes	0.00732	1.06	7.82	1.04	4.28	-0.06	0.54

APPENDIX H
RAW SCORE TO SCALE SCORE CONVERSION TABLES

English Language Arts

Table H.1: ELA Grade 3

ELA Grade 3 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.59335	1.84426	26	201	0.20076	0.38448
1	102	-4.34657	1.02675	27	204	0.34978	0.38774
2	118	-3.60891	0.73162	28	207	0.50172	0.39203
3	128	-3.17592	0.59503	29	211	0.65747	0.39750
4	134	-2.87237	0.51177	30	214	0.81808	0.40423
5	139	-2.63968	0.45589	31	218	0.98464	0.41217
6	143	-2.45015	0.41676	32	221	1.15817	0.42112
7	147	-2.28846	0.38885	33	225	1.33956	0.43071
8	150	-2.14531	0.36892	34	230	1.52928	0.44039
9	153	-2.01460	0.35501	35	234	1.72736	0.44959
10	155	-1.89203	0.34587	36	238	1.93334	0.45792
11	158	-1.77441	0.34065	37	243	2.1465	0.46533
12	160	-1.65919	0.33874	38	250	2.36627	0.47221
13	163	-1.54429	0.33959	39	253	2.59254	0.47923
14	165	-1.42804	0.34263	40	258	2.82596	0.4873
15	168	-1.30913	0.34725	41	263	3.06823	0.49757
16	171	-1.18665	0.35277	42	268	3.32246	0.51163
17	173	-1.06017	0.35848	43	274	3.59403	0.53183
18	176	-0.92970	0.36381	44	281	3.89201	0.56181
19	179	-0.79562	0.36837	45	288	4.23197	0.60717
20	182	-0.65853	0.37199	46	297	4.64092	0.67585
21	185	-0.51908	0.37474	47	300	5.16500	0.77694
22	188	-0.37784	0.37682	48	300	5.87990	0.92097
23	191	-0.23519	0.37852	49	300	6.95139	1.18336
24	194	-0.09103	0.38015	50	300	8.43781	1.93236
25	200	0.05391	0.38204				

Table H.2: ELA Grade 3: Alternate

ELA Grade 3 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-6.24133	1.88522	26	212	0.55283	0.42198
1	100	-4.89165	1.09326	27	216	0.73362	0.42847
2	109	-4.02068	0.81359	28	221	0.92026	0.43572
3	121	-3.46575	0.68696	29	225	1.11367	0.44404
4	130	-3.04782	0.61066	30	229	1.31502	0.45359
5	138	-2.70770	0.55813	31	234	1.52554	0.46418
6	144	-2.41875	0.51822	32	239	1.74611	0.47501
7	149	-2.16744	0.48499	33	244	1.97646	0.48447

ELA Grade 3 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
8	154	-1.94661	0.45509	34	250	2.21444	0.49043
9	158	-1.75208	0.42719	35	255	2.45573	0.49097
10	162	-1.58048	0.40167	36	260	2.69429	0.4846
11	165	-1.42803	0.37984	37	264	2.92275	0.46982
12	168	-1.29043	0.36288	38	268	3.13343	0.44707
13	171	-1.16322	0.35133	39	272	3.32214	0.4219
14	174	-1.04223	0.34521	40	275	3.49133	0.40209
15	176	-0.92370	0.34417	41	279	3.64846	0.39266
16	179	-0.80428	0.34766	42	282	3.80307	0.39603
17	182	-0.68108	0.35485	43	286	3.96607	0.41398
18	184	-0.55179	0.36456	44	291	4.15088	0.44843
19	187	-0.41494	0.37535	45	297	4.37455	0.49955
20	191	-0.27003	0.38581	46	300	4.65635	0.5631
21	194	-0.11749	0.39507	47	300	5.01531	0.63648
22	200	0.0418	0.40292	48	300	5.47967	0.73038
23	201	0.20694	0.40968	49	300	6.11317	0.87057
24	205	0.37735	0.41587	50	300	7.09453	1.14719
25	208	0.55283	0.42198				

Table H.3: ELA Grade 3: Braille

ELA Grade 3 2013 Braille							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.59335	1.84426	26	201	0.20076	0.38448
1	102	-4.34657	1.02675	27	204	0.34978	0.38774
2	118	-3.60891	0.73162	28	207	0.50172	0.39203
3	128	-3.17592	0.59503	29	211	0.65747	0.3975
4	134	-2.87237	0.51177	30	214	0.81808	0.40423
5	139	-2.63968	0.45589	31	218	0.98464	0.41217
6	143	-2.45015	0.41676	32	221	1.15817	0.42112
7	147	-2.28846	0.38885	33	225	1.33956	0.43071
8	150	-2.14531	0.36892	34	230	1.52928	0.44039
9	153	-2.0146	0.35501	35	234	1.72736	0.44959
10	155	-1.89203	0.34587	36	238	1.93334	0.45792
11	158	-1.77441	0.34065	37	243	2.1465	0.46533
12	160	-1.65919	0.33874	38	250	2.36627	0.47221
13	163	-1.54429	0.33959	39	253	2.59254	0.47923
14	165	-1.42804	0.34263	40	258	2.82596	0.4873
15	168	-1.30913	0.34725	41	263	3.06823	0.49757
16	171	-1.18665	0.35277	42	268	3.32246	0.51163
17	173	-1.06017	0.35848	43	274	3.59403	0.53183
18	176	-0.9297	0.36381	44	281	3.89201	0.56181

ELA Grade 3 2013 Braille							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
19	179	-0.79562	0.36837	45	288	4.23197	0.60717
20	182	-0.65853	0.37199	46	300	4.64092	0.67585
21	185	-0.51908	0.37474	47	300	5.16500	0.77694
22	188	-0.37784	0.37682	48	300	5.87990	0.92097
23	191	-0.23519	0.37852	49	300	6.95139	1.18336
24	194	-0.0913	0.38015	50	300	8.43781	1.93236
25	200	0.05391	0.38204				

Table H.4: ELA Grade 4

ELA Grade 4 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.6216	1.8421	29	193	-0.0152	0.3477
1	100	-4.3809	1.0220	30	196	0.1068	0.3509
2	100	-3.6549	0.7220	31	200	0.2312	0.3547
3	108	-3.2385	0.5789	32	202	0.3585	0.3592
4	115	-2.9556	0.4897	33	206	0.4894	0.3643
5	121	-2.7457	0.4297	34	209	0.6241	0.3700
6	125	-2.5792	0.3885	35	213	0.7633	0.3761
7	129	-2.4398	0.3598	36	217	0.9072	0.3826
8	132	-2.3178	0.3400	37	221	1.0562	0.3894
9	135	-2.2071	0.3264	38	225	1.2106	0.3965
10	137	-2.1035	0.3177	39	229	1.3707	0.4039
11	140	-2.0043	0.3128	40	234	1.5369	0.4117
12	143	-1.9072	0.3109	41	238	1.7099	0.4203
13	145	-1.8105	0.3116	42	243	1.8906	0.4302
14	148	-1.7126	0.3143	43	250	2.0806	0.4418
15	150	-1.6126	0.3185	44	253	2.2819	0.4559
16	153	-1.5096	0.3234	45	259	2.4973	0.4727
17	156	-1.4033	0.3285	46	265	2.7300	0.4926
18	159	-1.2939	0.3329	47	272	2.9838	0.5154
19	162	-1.1819	0.3364	48	279	3.2627	0.5413
20	165	-1.0679	0.3387	49	287	3.5719	0.5716
21	168	-0.9526	0.3400	50	297	3.9204	0.6112
22	171	-0.8368	0.3407	51	300	4.3294	0.6728
23	174	-0.7206	0.3409	52	300	4.8512	0.7808
24	177	-0.6044	0.3411	53	300	5.5963	0.9498
25	180	-0.4879	0.3414	54	300	6.6644	1.1106
26	183	-0.3712	0.3422	55	300	8.1463	1.3549
27	186	-0.2537	0.3434	56	300	9.9158	2.0195
28	189	-0.1352	0.3452				

Table H.5: ELA Grade 4: Alternate

ELA Grade 4 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.9122	1.8411	29	203	0.396	0.364
1	100	-4.6674	1.0296	30	207	0.530	0.368
2	100	-3.9122	0.7510	31	211	0.666	0.371
3	102	-3.4413	0.6322	32	214	0.806	0.376
4	112	-3.0870	0.5626	33	218	0.948	0.380
5	119	-2.7982	0.5142	34	222	1.094	0.384
6	126	-2.5535	0.4761	35	226	1.243	0.387
7	131	-2.3423	0.4433	36	230	1.394	0.389
8	136	-2.1588	0.4140	37	234	1.544	0.387
9	140	-1.9982	0.3880	38	238	1.693	0.384
10	144	-1.8563	0.3661	39	242	1.838	0.378
11	147	-1.7288	0.3487	40	245	1.978	0.371
12	150	-1.6119	0.3360	41	250	2.115	0.367
13	153	-1.5019	0.3279	42	252	2.248	0.365
14	156	-1.3959	0.3238	43	256	2.382	0.368
15	159	-1.2915	0.3232	44	260	2.520	0.376
16	162	-1.1864	0.3254	45	263	2.666	0.389
17	165	-1.0793	0.3295	46	268	2.824	0.407
18	167	-0.9691	0.3346	47	272	3.000	0.432
19	170	-0.8554	0.3398	48	277	3.200	0.465
20	174	-0.7384	0.3444	49	284	3.435	0.507
21	177	-0.6184	0.3481	50	291	3.722	0.566
22	180	-0.4963	0.3508	51	300	4.092	0.657
23	183	-0.3725	0.3528	52	300	4.619	0.804
24	186	-0.2474	0.3544	53	300	5.440	1.006
25	190	-0.1213	0.3559	54	300	6.606	1.140
26	193	0.0059	0.3574	55	300	8.129	1.364
27	197	0.1343	0.3593	56	300	9.909	2.022
28	200	0.2642	0.3615				

Table H.6: ELA Grade 4: Braille

ELA Grade 4 2013 Braille							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.6216	1.8421	29	193	-0.0152	0.3477
1	100	-4.3809	1.0220	30	196	0.1068	0.3509
2	100	-3.6549	0.7220	31	200	0.2312	0.3547
3	108	-3.2385	0.5789	32	202	0.3585	0.3592
4	115	-2.9556	0.4897	33	206	0.4894	0.3643
5	121	-2.7457	0.4297	34	209	0.6241	0.3700
6	125	-2.5792	0.3885	35	213	0.7633	0.3761

ELA Grade 4 2013 Braille							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
7	129	-2.4398	0.3598	36	217	0.9072	0.3826
8	132	-2.3178	0.3400	37	221	1.0562	0.3894
9	135	-2.2071	0.3264	38	225	1.2106	0.3965
10	137	-2.1035	0.3177	39	229	1.3707	0.4039
11	140	-2.0043	0.3128	40	234	1.5369	0.4117
12	143	-1.9072	0.3109	41	238	1.7099	0.4203
13	145	-1.8105	0.3116	42	243	1.8906	0.4302
14	148	-1.7126	0.3143	43	250	2.0806	0.4418
15	150	-1.6126	0.3185	44	253	2.2819	0.4559
16	153	-1.5096	0.3234	45	259	2.4973	0.4727
17	156	-1.4033	0.3285	46	265	2.7300	0.4926
18	159	-1.2939	0.3329	47	272	2.9838	0.5154
19	162	-1.1819	0.3364	48	279	3.2627	0.5413
20	165	-1.0679	0.3387	49	287	3.5719	0.5716
21	168	-0.9526	0.3400	50	297	3.9204	0.6112
22	171	-0.8368	0.3407	51	300	4.3294	0.6728
23	174	-0.7206	0.3409	52	300	4.8512	0.7808
24	177	-0.6044	0.3411	53	300	5.5963	0.9498
25	180	-0.4879	0.3414	54	300	6.6644	1.1106
26	183	-0.3712	0.3422	55	300	8.1463	1.3549
27	186	-0.2537	0.3434	56	300	9.9158	2.0195
28	189	-0.1352	0.3452				

Table H.7: ELA Grade 5

ELA Grade 5 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.58625	1.83904	32	196	0.13399	0.32222
1	100	-4.35523	1.01423	33	200	0.23831	0.32382
2	100	-3.64643	0.70982	34	202	0.3438	0.32581
3	100	-3.24592	0.56672	35	205	0.45071	0.32819
4	107	-2.97469	0.48011	36	208	0.5593	0.33096
5	113	-2.77209	0.42327	37	211	0.66987	0.33412
6	118	-2.60976	0.38466	38	214	0.78268	0.3377
7	122	-2.4724	0.35806	39	217	0.89806	0.34172
8	125	-2.35102	0.33982	40	221	1.01635	0.34621
9	128	-2.23992	0.32764	41	224	1.13792	0.35122
10	131	-2.13526	0.32004	42	228	1.26322	0.35681
11	134	-2.03431	0.31594	43	232	1.39273	0.36305
12	137	-1.93505	0.31454	44	235	1.52703	0.37002
13	140	-1.83601	0.31513	45	239	1.66679	0.3778
14	143	-1.73616	0.31703	46	243	1.81277	0.38648

ELA Grade 5 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
15	146	-1.63486	0.31958	47	250	1.96584	0.39615
16	148	-1.53188	0.32218	48	252	2.12700	0.40689
17	151	-1.42734	0.32435	49	257	2.29736	0.41878
18	154	-1.32163	0.32578	50	262	2.47821	0.43195
19	157	-1.21525	0.32640	51	268	2.67108	0.44663
20	160	-1.10872	0.32628	52	274	2.87794	0.46336
21	163	-1.00246	0.32560	53	280	3.10165	0.48319
22	166	-0.89676	0.32457	54	287	3.34682	0.50806
23	169	-0.79179	0.32339	55	295	3.62122	0.54116
24	172	-0.68759	0.32222	56	300	3.93832	0.58750
25	175	-0.58411	0.32118	57	300	4.32163	0.65422
26	178	-0.48124	0.32035	58	300	4.81068	0.74805
27	181	-0.37881	0.31980	59	300	5.45838	0.86121
28	184	-0.27663	0.31957	60	300	6.29973	0.97338
29	187	-0.17449	0.31968	61	300	7.42491	1.18692
30	190	-0.07217	0.32015	62	300	8.90066	1.92367
31	193	0.03058	0.32099				

Table H.8: ELA Grade 5: Alternate

ELA Grade 5 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.6596	1.8411	32	205	0.4640	0.3357
1	100	-4.4193	1.0235	33	208	0.5778	0.3391
2	100	-3.6838	0.7334	34	212	0.6941	0.3430
3	100	-3.2441	0.6036	35	215	0.8131	0.3471
4	109	-2.9281	0.5254	36	219	0.9351	0.3514
5	116	-2.6809	0.4715	37	222	1.0600	0.3556
6	122	-2.4778	0.4314	38	226	1.1880	0.3597
7	126	-2.3052	0.4005	39	229	1.3187	0.3632
8	131	-2.1546	0.3766	40	233	1.4515	0.3657
9	135	-2.0199	0.3583	41	237	1.5858	0.3668
10	138	-1.8966	0.3449	42	241	1.7203	0.3665
11	141	-1.7811	0.3355	43	245	1.8541	0.3650
12	145	-1.6707	0.3294	44	250	1.9866	0.3629
13	148	-1.5634	0.3261	45	252	2.1176	0.3613
14	151	-1.4576	0.3247	46	256	2.2481	0.3616
15	154	-1.3522	0.3247	47	260	2.3798	0.3648
16	157	-1.2466	0.3254	48	263	2.5152	0.3717
17	160	-1.1405	0.3262	49	267	2.6572	0.3828
18	163	-1.0339	0.3268	50	272	2.8095	0.3982
19	166	-0.9270	0.3270	51	277	2.9755	0.4173

ELA Grade 5 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
20	169	-0.8201	0.3268	52	282	3.1589	0.4396
21	172	-0.7135	0.3263	53	288	3.3631	0.4646
22	175	-0.6072	0.3257	54	294	3.5923	0.4933
23	178	-0.5013	0.3252	55	300	3.8525	0.5280
24	181	-0.3957	0.3247	56	300	4.1543	0.5727
25	184	-0.2903	0.3246	57	300	4.5166	0.6339
26	187	-0.1849	0.3248	58	300	4.9719	0.7193
27	190	-0.0792	0.3255	59	300	5.5702	0.8295
28	193	0.0271	0.3265	60	300	6.3630	0.9530
29	196	0.1342	0.3281	61	300	7.4601	1.1791
30	200	0.2425	0.3302	62	300	8.9260	1.9211
31	202	0.3523	0.3327				

Table H.9: ELA Grade 5: Braille

ELA Grade 5 2013 Braille							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.59008	1.84101	32	196	0.12454	0.32074
1	100	-4.35327	1.01872	33	200	0.22787	0.32222
2	100	-3.63474	0.71678	34	201	0.33227	0.32405
3	100	-3.22483	0.57428	35	204	0.43796	0.32621
4	108	-2.94599	0.4869	36	207	0.54517	0.32873
5	114	-2.7378	0.42876	37	211	0.65416	0.33161
6	119	-2.57155	0.38882	38	214	0.76519	0.33487
7	123	-2.43156	0.36098	39	217	0.87854	0.33854
8	126	-2.30855	0.34156	40	220	0.99453	0.34267
9	130	-2.19667	0.32822	41	224	1.11352	0.34731
10	133	-2.09201	0.31942	42	227	1.23593	0.35253
11	135	-1.99185	0.31406	43	231	1.36226	0.35842
12	138	-1.89418	0.31137	44	234	1.49306	0.36506
13	141	-1.79753	0.31069	45	238	1.62903	0.37255
14	144	-1.70082	0.31145	46	242	1.77094	0.38101
15	146	-1.60333	0.31312	47	250	1.91969	0.39053
16	149	-1.50464	0.3152	48	251	2.07634	0.40122
17	152	-1.40463	0.31726	49	256	2.24207	0.41317
18	155	-1.30341	0.31896	50	261	2.41827	0.42657
19	158	-1.20126	0.32014	51	266	2.60664	0.44175
20	161	-1.09856	0.32073	52	272	2.80945	0.45935
21	164	-0.99563	0.32082	53	278	3.02999	0.48054
22	167	-0.89279	0.32052	54	285	3.27343	0.50728
23	170	-0.79021	0.32	55	293	3.54823	0.54275
24	172	-0.68801	0.31938	56	300	3.86870	0.59189

ELA Grade 5 2013 Braille							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
25	175	-0.58620	0.31879	57	300	4.25945	0.66108
26	178	-0.48473	0.31832	58	300	4.76164	0.75904
27	181	-0.38351	0.31804	59	300	5.42899	0.87370
28	184	-0.28238	0.31799	60	300	6.29027	0.98172
29	187	-0.18121	0.31822	61	300	7.42720	1.19015
30	190	-0.07979	0.31874	62	300	8.90696	1.92479
31	193	0.02206	0.31958				

Table H.10: ELA Grade 6

ELA Grade 6 2013 Operational											
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0.0	100	-5.3789	1.8232	23.5	168	-0.8022	0.2872	47.0	222	1.28472	0.33329
0.5	100	-4.8699	1.4112	24.0	169	-0.7609	0.2874	47.5	223	1.34077	0.33636
1.0	100	-4.1808	0.9962	24.5	170	-0.7196	0.2875	48.0	225	1.39787	0.33953
1.5	100	-3.7789	0.8124	25.0	171	-0.6782	0.2876	48.5	226	1.45606	0.34278
2.0	100	-3.4944	0.7028	25.5	172	-0.6369	0.2876	49.0	228	1.51538	0.34609
2.5	104	-3.2741	0.6280	26.0	173	-0.5955	0.2876	49.5	229	1.57586	0.34947
3.0	108	-3.0946	0.5727	26.5	174	-0.5542	0.2876	50.0	231	1.63752	0.35288
3.5	112	-2.9430	0.5296	27.0	175	-0.5128	0.2875	50.5	233	1.70039	0.35632
4.0	116	-2.8121	0.4948	27.5	176	-0.4715	0.2875	51.0	234	1.76448	0.35976
4.5	119	-2.6969	0.4658	28.0	177	-0.4302	0.2874	51.5	236	1.82982	0.36319
5.0	121	-2.5942	0.4413	28.5	179	-0.3889	0.2874	52.0	238	1.89639	0.3666
5.5	124	-2.5016	0.4201	29.0	180	-0.3476	0.2873	52.5	239	1.96421	0.36995
6.0	126	-2.4172	0.4017	29.5	181	-0.3063	0.2873	53.0	241	2.03325	0.37324
6.5	128	-2.3398	0.3856	30.0	182	-0.2650	0.2874	53.5	243	2.10351	0.37645
7.0	130	-2.2682	0.3714	30.5	183	-0.2237	0.2875	54.0	245	2.17496	0.37959
7.5	132	-2.2016	0.3588	31.0	184	-0.1824	0.2876	54.5	247	2.24759	0.38264
8.0	133	-2.1393	0.3477	31.5	185	-0.1410	0.2877	55.0	250	2.32137	0.38563
8.5	135	-2.0805	0.3379	32.0	186	-0.0996	0.2880	55.5	251	2.39630	0.38857
9.0	136	-2.0250	0.3292	32.5	187	-0.0581	0.2882	56.0	253	2.47236	0.39151
9.5	137	-1.9721	0.3215	33.0	188	-0.0165	0.2886	56.5	255	2.54958	0.39448
10.0	139	-1.9215	0.3148	33.5	189	0.0252	0.2890	57.0	257	2.62800	0.39756
10.5	140	-1.8729	0.3089	34.0	190	0.0670	0.2895	57.5	259	2.70767	0.40082
11.0	141	-1.8260	0.3037	34.5	191	0.1090	0.2900	58.0	261	2.78869	0.40434
11.5	142	-1.7806	0.2993	35.0	193	0.1511	0.2906	58.5	263	2.87121	0.40824
12.0	144	-1.7364	0.2955	35.5	194	0.1935	0.2913	59.0	265	2.95542	0.41261
12.5	145	-1.6932	0.2923	36.0	195	0.2360	0.2921	59.5	267	3.04155	0.41758
13.0	146	-1.6509	0.2896	36.5	196	0.2788	0.2930	60.0	270	3.12990	0.42327
13.5	147	-1.6093	0.2873	37.0	197	0.3218	0.2939	60.5	272	3.22084	0.42982
14.0	148	-1.5683	0.2856	37.5	198	0.3652	0.2949	61.0	274	3.31481	0.43737
14.5	149	-1.5277	0.2842	38.0	200	0.4088	0.2960	61.5	277	3.41232	0.44606
15.0	150	-1.4875	0.2831	38.5	201	0.4528	0.2972	62.0	280	3.51400	0.45604
15.5	151	-1.4475	0.2824	39.0	201	0.4972	0.2985	62.5	282	3.62056	0.46748
16.0	152	-1.4077	0.2820	39.5	203	0.5419	0.2999	63.0	285	3.73284	0.48058
16.5	153	-1.3680	0.2818	40.0	204	0.5871	0.3014	63.5	288	3.85188	0.49554
17.0	154	-1.3283	0.2818	40.5	205	0.6328	0.3030	64.0	292	3.97883	0.5126
17.5	155	-1.2886	0.2820	41.0	206	0.6789	0.3046	64.5	295	4.11516	0.53208
18.0	156	-1.2488	0.2823	41.5	207	0.7256	0.3064	65.0	299	4.26258	0.55433
18.5	157	-1.2089	0.2827	42.0	209	0.7728	0.3083	65.5	300	4.42324	0.57987
19.0	158	-1.1689	0.2832	42.5	210	0.8207	0.3103	66.0	300	4.59984	0.60936
19.5	159	-1.1287	0.2837	43.0	211	0.8691	0.3124	66.5	300	4.79592	0.6439

ELA Grade 6 2013 Operational											
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
20.0	160	-1.0884	0.2843	43.5	212	0.9183	0.3147	67.0	300	5.01639	0.6853
20.5	161	-1.0479	0.2848	44.0	214	0.9682	0.3170	67.5	300	5.26859	0.73692
21.0	162	-1.0072	0.2854	44.5	215	1.0188	0.3194	68.0	300	5.56471	0.80535
21.5	164	-0.9664	0.2859	45.0	216	1.0702	0.3220	68.5	300	5.92775	0.9051
22.0	165	-0.9255	0.2863	45.5	218	1.1225	0.3247	69.0	300	6.41008	1.07455
22.5	166	-0.8845	0.2867	46.0	219	1.1756	0.3274	69.5	300	7.18068	1.46798
23.0	167	-0.8434	0.2870	46.5	220	1.2297	0.3303	70.0	300	7.72251	1.86761

Table H.11: ELA Grade 6: Alternate

ELA Grade 6 2013 Alternate											
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0.0	100	-5.3373	1.8305	23.5	173	-0.6061	0.2948	47.0	229	1.5485	0.3274
0.5	100	-4.8230	1.4204	24.0	174	-0.5626	0.2954	47.5	230	1.6025	0.3300
1.0	100	-4.1212	1.0086	24.5	175	-0.5189	0.2959	48.0	232	1.6574	0.3327
1.5	100	-3.7072	0.8268	25.0	250	-0.4751	0.2962	48.5	233	1.7132	0.3356
2.0	100	-3.4111	0.7186	25.5	177	-0.4312	0.2964	49.0	234	1.7700	0.3387
2.5	106	-3.1800	0.6447	26.0	179	-0.3873	0.2964	49.5	236	1.8279	0.3419
3.0	111	-2.9901	0.5899	26.5	180	-0.3433	0.2964	50.0	237	1.8870	0.3454
3.5	115	-2.8289	0.5469	27.0	181	-0.2994	0.2964	50.5	239	1.9473	0.3490
4.0	119	-2.6891	0.5118	27.5	182	-0.2555	0.2962	51.0	241	2.0088	0.3528
4.5	122	-2.5657	0.4823	28.0	183	-0.2116	0.2961	51.5	242	2.0718	0.3568
5.0	125	-2.4555	0.4570	28.5	184	-0.1678	0.2960	52.0	244	2.1361	0.3609
5.5	128	-2.3562	0.4349	29.0	185	-0.1240	0.2958	52.5	246	2.2020	0.3651
6.0	130	-2.2659	0.4153	29.5	187	-0.0803	0.2957	53.0	247	2.2694	0.3694
6.5	132	-2.1833	0.3980	30.0	188	-0.0366	0.2956	53.5	250	2.3385	0.3739
7.0	134	-2.1072	0.3826	30.5	189	0.0071	0.2955	54.0	251	2.4093	0.3785
7.5	136	-2.0366	0.3688	31.0	190	0.0507	0.2955	54.5	253	2.4818	0.3832
8.0	138	-1.9709	0.3566	31.5	191	0.0944	0.2956	55.0	255	2.5561	0.3881
8.5	139	-1.9093	0.3457	32.0	192	0.1381	0.2957	55.5	257	2.6324	0.3931
9.0	141	-1.8512	0.3361	32.5	193	0.1819	0.2959	56.0	259	2.7107	0.3983
9.5	142	-1.7962	0.3275	33.0	194	0.2257	0.2961	56.5	261	2.7911	0.4038
10.0	143	-1.7438	0.3200	33.5	196	0.2695	0.2964	57.0	263	2.8738	0.4097
10.5	145	-1.6937	0.3134	34.0	197	0.3135	0.2968	57.5	265	2.9590	0.4161
11.0	146	-1.6455	0.3076	34.5	198	0.3576	0.2972	58.0	268	3.0470	0.4230
11.5	147	-1.5990	0.3025	35.0	200	0.4018	0.2977	58.5	270	3.1380	0.4305
12.0	148	-1.5539	0.2981	35.5	201	0.4462	0.2982	59.0	272	3.2325	0.4389
12.5	149	-1.5100	0.2944	36.0	201	0.4908	0.2988	59.5	275	3.3308	0.4482
13.0	151	-1.4672	0.2911	36.5	202	0.5355	0.2994	60.0	278	3.4335	0.4584
13.5	152	-1.4252	0.2885	37.0	204	0.5804	0.3001	60.5	280	3.5411	0.4695
14.0	153	-1.3839	0.2862	37.5	205	0.6256	0.3009	61.0	283	3.6541	0.4812
14.5	154	-1.3432	0.2845	38.0	206	0.6710	0.3017	61.5	286	3.7728	0.4932
15.0	155	-1.3030	0.2831	38.5	207	0.7166	0.3025	62.0	290	3.8973	0.5050
15.5	156	-1.2631	0.2821	39.0	208	0.7625	0.3034	62.5	293	4.0276	0.5157
16.0	157	-1.2234	0.2815	39.5	210	0.8086	0.3043	63.0	296	4.1631	0.5249
16.5	158	-1.1838	0.2813	40.0	211	0.8551	0.3053	63.5	300	4.3028	0.5322
17.0	159	-1.1442	0.2814	40.5	212	0.9018	0.3063	64.0	300	4.4461	0.5381
17.5	200	-1.1046	0.2818	41.0	213	0.9489	0.3074	64.5	300	4.5923	0.5435
18.0	161	-1.0648	0.2824	41.5	214	0.9963	0.3085	65.0	300	4.7416	0.5499
18.5	162	-1.0248	0.2833	42.0	216	1.0441	0.3098	65.5	300	4.8952	0.5590
19.0	163	-0.9845	0.2844	42.5	217	1.0923	0.3110	66.0	300	5.0551	0.5731
19.5	164	-0.9439	0.2856	43.0	218	1.1409	0.3124	66.5	300	5.2250	0.5943
20.0	165	-0.9030	0.2869	43.5	219	1.1899	0.3139	67.0	300	5.4105	0.6259

ELA Grade 6 2013 Alternate											
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
20.5	166	-0.8616	0.2882	44.0	221	1.2394	0.3154	67.5	300	5.6204	0.6727
21.0	167	-0.8199	0.2895	44.5	222	1.2894	0.3171	68.0	300	5.8693	0.7428
21.5	168	-0.7778	0.2908	45.0	223	1.3399	0.3189	68.5	300	6.1843	0.8521
22.0	170	-0.7353	0.2920	45.5	225	1.3911	0.3208	69.0	300	6.6241	1.0393
22.5	171	-0.6926	0.2931	46.0	226	1.4428	0.3228	69.5	300	7.3660	1.4552
23.0	172	-0.6495	0.2940	46.5	227	1.4953	0.3250	70.0	300	7.9022	1.8628

Table H.12: ELA Grade 6: Braille

ELA Grade 6 2013 Braille											
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0.0	100	-5.3789	1.8232	23.5	168	-0.8022	0.2872	47.0	222	1.2847	0.3333
0.5	100	-4.8699	1.4112	24.0	169	-0.7609	0.2874	47.5	223	1.3408	0.3364
1.0	100	-4.1808	0.9962	24.5	170	-0.7196	0.2875	48.0	225	1.3979	0.3395
1.5	100	-3.7789	0.8124	25.0	171	-0.6782	0.2876	48.5	226	1.4561	0.3428
2.0	100	-3.4944	0.7028	25.5	250	-0.6369	0.2876	49.0	228	1.5154	0.3461
2.5	104	-3.2741	0.6280	26.0	173	-0.5955	0.2876	49.5	229	1.5759	0.3495
3.0	108	-3.0946	0.5727	26.5	174	-0.5542	0.2876	50.0	231	1.6375	0.3529
3.5	112	-2.9430	0.5296	27.0	175	-0.5128	0.2875	50.5	233	1.7004	0.3563
4.0	116	-2.8121	0.4948	27.5	176	-0.4715	0.2875	51.0	234	1.7645	0.3598
4.5	119	-2.6969	0.4658	28.0	177	-0.4302	0.2874	51.5	236	1.8298	0.3632
5.0	121	-2.5942	0.4413	28.5	179	-0.3889	0.2874	52.0	238	1.8964	0.3666
5.5	124	-2.5016	0.4201	29.0	180	-0.3476	0.2873	52.5	239	1.9642	0.3700
6.0	126	-2.4172	0.4017	29.5	181	-0.3063	0.2873	53.0	241	2.0333	0.3732
6.5	128	-2.3398	0.3856	30.0	182	-0.2650	0.2874	53.5	243	2.1035	0.3765
7.0	130	-2.2682	0.3714	30.5	183	-0.2237	0.2875	54.0	245	2.1750	0.3796
7.5	132	-2.2016	0.3588	31.0	184	-0.1824	0.2876	54.5	247	2.2476	0.3826
8.0	133	-2.1393	0.3477	31.5	185	-0.1410	0.2877	55.0	250	2.3214	0.3856
8.5	135	-2.0805	0.3379	32.0	186	-0.0996	0.2880	55.5	251	2.3963	0.3886
9.0	136	-2.0250	0.3292	32.5	187	-0.0581	0.2882	56.0	253	2.4724	0.3915
9.5	137	-1.9721	0.3215	33.0	188	-0.0165	0.2886	56.5	255	2.5496	0.3945
10.0	139	-1.9215	0.3148	33.5	189	0.0252	0.2890	57.0	257	2.6280	0.3976
10.5	140	-1.8729	0.3089	34.0	190	0.0670	0.2895	57.5	259	2.7077	0.4008
11.0	141	-1.8260	0.3037	34.5	191	0.1090	0.2900	58.0	261	2.7887	0.4043
11.5	142	-1.7806	0.2993	35.0	193	0.1511	0.2906	58.5	263	2.8712	0.4082
12.0	144	-1.7364	0.2955	35.5	194	0.1935	0.2913	59.0	265	2.9554	0.4126
12.5	145	-1.6932	0.2923	36.0	195	0.2360	0.2921	59.5	267	3.0416	0.4176
13.0	146	-1.6509	0.2896	36.5	196	0.2788	0.2930	60.0	270	3.1299	0.4233
13.5	147	-1.6093	0.2873	37.0	197	0.3218	0.2939	60.5	272	3.2208	0.4298
14.0	148	-1.5683	0.2856	37.5	198	0.3652	0.2949	61.0	274	3.3148	0.4374
14.5	149	-1.5277	0.2842	38.0	200	0.4088	0.2960	61.5	277	3.4123	0.4461
15.0	150	-1.4875	0.2831	38.5	201	0.4528	0.2972	62.0	280	3.5140	0.4560
15.5	151	-1.4475	0.2824	39.0	201	0.4972	0.2985	62.5	282	3.6206	0.4675
16.0	152	-1.4077	0.2820	39.5	203	0.5419	0.2999	63.0	285	3.7328	0.4806
16.5	153	-1.3680	0.2818	40.0	204	0.5871	0.3014	63.5	288	3.8519	0.4955
17.0	154	-1.3283	0.2818	40.5	205	0.6328	0.3030	64.0	292	3.9788	0.5126
17.5	155	-1.2886	0.2820	41.0	206	0.6789	0.3046	64.5	295	4.1152	0.5321
18.0	156	-1.2488	0.2823	41.5	207	0.7256	0.3064	65.0	299	4.2626	0.5543
18.5	157	-1.2089	0.2827	42.0	209	0.7728	0.3083	65.5	300	4.4232	0.5799
19.0	158	-1.1689	0.2832	42.5	210	0.8207	0.3103	66.0	300	4.5998	0.6094
19.5	159	-1.1287	0.2837	43.0	211	0.8691	0.3124	66.5	300	4.7959	0.6439
20.0	160	-1.0884	0.2843	43.5	212	0.9183	0.3147	67.0	300	5.0164	0.6853
20.5	161	-1.0479	0.2848	44.0	214	0.9682	0.3170	67.5	300	5.2686	0.7369
21.0	162	-1.0072	0.2854	44.5	215	1.0188	0.3194	68.0	300	5.5647	0.8054
21.5	164	-0.9664	0.2859	45.0	216	1.0702	0.3220	68.5	300	5.9278	0.9051

ELA Grade 6 2013 Braille											
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
22.0	165	-0.9255	0.2863	45.5	218	1.1225	0.3247	69.0	300	6.4101	1.0746
22.5	166	-0.8845	0.2867	46.0	219	1.1756	0.3274	69.5	300	7.1807	1.4680
23.0	167	-0.8434	0.2870	46.5	220	1.2297	0.3303	70.0	300	7.7225	1.8676

Table H.13: ELA Grade 7

ELA Grade 7 2013 Operational											
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0.0	100	-5.7291	1.8206	23.5	162	-1.11508	0.29123	47.0	231	0.9866	0.3273
0.5	100	-5.2221	1.4075	24.0	163	-1.07271	0.29103	47.5	233	1.0405	0.3297
1.0	100	-4.5384	0.9905	24.5	164	-1.03038	0.29084	48.0	235	1.0953	0.3323
1.5	100	-4.1424	0.8049	25.0	166	-0.98811	0.29068	48.5	236	1.1509	0.3349
2.0	100	-3.8641	0.6939	25.5	167	-0.94589	0.29053	49.0	238	1.2075	0.3377
2.5	100	-3.6501	0.6181	26.0	168	-0.9037	0.2904	49.5	240	1.2650	0.3405
3.0	100	-3.4766	0.5623	26.5	170	-0.86155	0.2903	50.0	242	1.3234	0.3434
3.5	100	-3.3308	0.5191	27.0	171	-0.81943	0.29022	50.5	244	1.3829	0.3464
4.0	100	-3.2051	0.4846	27.5	173	-0.77732	0.29017	51.0	246	1.4434	0.3494
4.5	100	-3.0946	0.4564	28.0	174	-0.73523	0.29014	51.5	250	1.5050	0.3525
5.0	100	-2.9959	0.4329	28.5	175	-0.69314	0.29014	52.0	251	1.5677	0.3557
5.5	102	-2.9065	0.4131	29.0	177	-0.65104	0.29017	52.5	252	1.6316	0.3590
6.0	105	-2.8247	0.3963	29.5	178	-0.60894	0.29022	53.0	254	1.6966	0.3623
6.5	107	-2.7491	0.3819	30.0	180	-0.56681	0.29031	53.5	257	1.7629	0.3658
7.0	110	-2.6786	0.3695	30.5	181	-0.52465	0.29043	54.0	259	1.8304	0.3692
7.5	112	-2.6123	0.3587	31.0	182	-0.48246	0.29059	54.5	261	1.8992	0.3728
8.0	114	-2.5497	0.3495	31.5	184	-0.44021	0.29079	55.0	264	1.9694	0.3765
8.5	116	-2.4900	0.3414	32.0	185	-0.39789	0.29102	55.5	266	2.0410	0.3802
9.0	118	-2.4330	0.3345	32.5	187	-0.35551	0.2913	56.0	268	2.1140	0.3841
9.5	120	-2.3780	0.3284	33.0	188	-0.31303	0.29162	56.5	271	2.1886	0.3882
10.0	121	-2.3250	0.3232	33.5	189	-0.27046	0.29199	57.0	273	2.2647	0.3925
10.5	123	-2.2735	0.3188	34.0	191	-0.22777	0.2924	57.5	276	2.3426	0.3970
11.0	125	-2.2233	0.3149	34.5	192	-0.18496	0.29287	58.0	278	2.4224	0.4019
11.5	126	-2.1742	0.3116	35.0	194	-0.14200	0.29339	58.5	281	2.5042	0.4072
12.0	128	-2.1261	0.3088	35.5	195	-0.09888	0.29396	59.0	284	2.5883	0.4129
12.5	130	-2.0788	0.3064	36.0	197	-0.05558	0.29459	59.5	287	2.6748	0.4193
13.0	131	-2.0322	0.3044	36.5	198	-0.01209	0.29528	60.0	290	2.7642	0.4264
13.5	133	-1.9861	0.3027	37.0	200	0.03162	0.29604	60.5	293	2.8568	0.4343
14.0	134	-1.9406	0.3012	37.5	201	0.07556	0.29686	61.0	296	2.9530	0.4433
14.5	136	-1.8954	0.3000	38.0	202	0.11975	0.29774	61.5	299	3.0535	0.4534
15.0	137	-1.8506	0.2989	38.5	204	0.16422	0.29870	62.0	300	3.1588	0.4649
15.5	139	-1.8060	0.2980	39.0	205	0.20898	0.29972	62.5	300	3.2699	0.4780
16.0	140	-1.7618	0.2972	39.5	207	0.25406	0.30082	63.0	300	3.3877	0.4929
16.5	142	-1.7177	0.2965	40.0	208	0.29948	0.30200	63.5	300	3.5133	0.5100
17.0	143	-1.6739	0.2959	40.5	210	0.34527	0.30325	64.0	300	3.6482	0.5294
17.5	144	-1.6302	0.2953	41.0	211	0.39145	0.30458	64.5	300	3.7942	0.5516
18.0	146	-1.5866	0.2948	41.5	213	0.43805	0.306	65.0	300	3.9532	0.5769
18.5	147	-1.5433	0.2944	42.0	214	0.48509	0.30749	65.5	300	4.1280	0.6059
19.0	149	-1.5000	0.2940	42.5	216	0.53261	0.30907	66.0	300	4.3216	0.6392
19.5	150	-1.4568	0.2936	43.0	218	0.58063	0.31074	66.5	300	4.5382	0.6779
20.0	152	-1.4138	0.2932	43.5	219	0.62918	0.3125	67.0	300	4.7832	0.7235
20.5	153	-1.3709	0.2929	44.0	221	0.67829	0.31434	67.5	300	5.0648	0.7790
21.0	154	-1.3280	0.2925	44.5	222	0.72800	0.31627	68.0	300	5.3955	0.8505
21.5	156	-1.2853	0.2923	45.0	224	0.77833	0.31829	68.5	300	5.7986	0.9513
22.0	157	-1.2426	0.2920	45.5	226	0.82932	0.3204	69.0	300	6.3265	1.1184
22.5	159	-1.2000	0.2917	46.0	228	0.88099	0.3226	69.5	300	7.1474	1.5030
23.0	160	-1.1575	0.2915	46.5	229	0.93340	0.32489	70.0	300	7.7103	1.8959

Table H.14: ELA Grade 7: Alternate

ELA Grade 7 2013 Alternate											
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0.0	100	-5.7278	1.8299	23.5	169	-0.8989	0.2693	47.0	232	1.0244	0.3243
0.5	100	-5.2139	1.4197	24.0	170	-0.8627	0.2692	47.5	234	1.0775	0.3275
1.0	100	-4.5128	1.0082	24.5	171	-0.8265	0.2691	48.0	236	1.1316	0.3308
1.5	100	-4.0990	0.8269	25.0	172	-0.7903	0.2691	48.5	238	1.1869	0.3343
2.0	100	-3.8025	0.7196	25.5	173	-0.7540	0.2692	49.0	240	1.2434	0.3379
2.5	100	-3.5704	0.6467	26.0	175	-0.7178	0.2693	49.5	241	1.3011	0.3417
3.0	100	-3.3789	0.5932	26.5	176	-0.6815	0.2695	50.0	243	1.3602	0.3457
3.5	100	-3.2153	0.5519	27.0	177	-0.6451	0.2698	50.5	245	1.4207	0.3498
4.0	100	-3.0723	0.5187	27.5	178	-0.6087	0.2701	51.0	247	1.4826	0.3541
4.5	101	-2.9450	0.4913	28.0	179	-0.5722	0.2704	51.5	250	1.5461	0.3586
5.0	105	-2.8301	0.4681	28.5	181	-0.5356	0.2708	52.0	252	1.6112	0.3633
5.5	108	-2.7252	0.4482	29.0	182	-0.4989	0.2713	52.5	254	1.6780	0.3681
6.0	111	-2.6287	0.4309	29.5	183	-0.4620	0.2717	53.0	256	1.7467	0.3732
6.5	114	-2.5392	0.4156	30.0	184	-0.4250	0.2723	53.5	258	1.8174	0.3785
7.0	117	-2.4557	0.4019	30.5	186	-0.3879	0.2729	54.0	261	1.8900	0.3841
7.5	120	-2.3774	0.3896	31.0	187	-0.3506	0.2735	54.5	263	1.9649	0.3900
8.0	122	-2.3037	0.3785	31.5	188	-0.3131	0.2741	55.0	266	2.0422	0.3963
8.5	125	-2.2340	0.3684	32.0	189	-0.2754	0.2749	55.5	269	2.1220	0.4029
9.0	127	-2.1678	0.3592	32.5	191	-0.2375	0.2756	56.0	271	2.2046	0.4100
9.5	129	-2.1048	0.3508	33.0	192	-0.1994	0.2764	56.5	274	2.2903	0.4177
10.0	131	-2.0447	0.3430	33.5	193	-0.1611	0.2773	57.0	277	2.3792	0.4258
10.5	133	-1.9871	0.3358	34.0	194	-0.1226	0.2782	57.5	280	2.4717	0.4345
11.0	134	-1.9318	0.3293	34.5	196	-0.0837	0.2791	58.0	283	2.5680	0.4435
11.5	136	-1.8786	0.3232	35.0	197	-0.0447	0.2801	58.5	287	2.6684	0.4527
12.0	138	-1.8273	0.3176	35.5	198	-0.0053	0.2811	59.0	290	2.7730	0.4619
12.5	140	-1.7777	0.3125	36.0	200	0.0344	0.2822	59.5	294	2.8817	0.4705
13.0	141	-1.7296	0.3077	36.5	201	0.0744	0.2834	60.0	297	2.9942	0.4782
13.5	143	-1.6829	0.3034	37.0	202	0.1147	0.2846	60.5	300	3.1101	0.4846
14.0	144	-1.6375	0.2994	37.5	204	0.1554	0.2858	61.0	300	3.2288	0.4897
14.5	146	-1.5933	0.2958	38.0	205	0.1964	0.2871	61.5	300	3.3498	0.4937
15.0	147	-1.5500	0.2924	38.5	206	0.2378	0.2885	62.0	300	3.4725	0.4971
15.5	149	-1.5077	0.2894	39.0	208	0.2796	0.2899	62.5	300	3.5969	0.5007
16.0	150	-1.4662	0.2867	39.5	209	0.3219	0.2914	63.0	300	3.7233	0.5051
16.5	151	-1.4255	0.2842	40.0	210	0.3646	0.2930	63.5	300	3.8523	0.5111
17.0	153	-1.3855	0.2820	40.5	212	0.4077	0.2946	64.0	300	3.9849	0.5193
17.5	154	-1.3460	0.2800	41.0	213	0.4513	0.2963	64.5	300	4.1225	0.5304
18.0	155	-1.3070	0.2782	41.5	215	0.4955	0.2980	65.0	300	4.2670	0.5453
18.5	156	-1.2686	0.2766	42.0	216	0.5402	0.2999	65.5	300	4.4208	0.5650
19.0	158	-1.2305	0.2753	42.5	218	0.5854	0.3018	66.0	300	4.5875	0.5910
19.5	159	-1.1928	0.2741	43.0	219	0.6313	0.3039	66.5	300	4.7720	0.6252
20.0	160	-1.1554	0.2730	43.5	221	0.6778	0.3060	67.0	300	4.9811	0.6702
20.5	161	-1.1182	0.2721	44.0	222	0.7249	0.3083	67.5	300	5.2253	0.7298
21.0	163	-1.0813	0.2714	44.5	224	0.7728	0.3106	68.0	300	5.5202	0.8096
21.5	164	-1.0446	0.2707	45.0	226	0.8214	0.3131	68.5	300	5.8923	0.9217
22.0	165	-1.0080	0.2702	45.5	227	0.8708	0.3157	69.0	300	6.3961	1.1000
22.5	166	-0.9716	0.2698	46.0	229	0.9211	0.3184	69.5	300	7.1999	1.4937
23.0	167	-0.9352	0.2695	46.5	231	0.9723	0.3213	70.0	300	7.7576	1.8895

Table H.15: ELA Grade 7: Braille

ELA Grade 7 2013 Braille											
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0.0	100	-5.7291	1.8206	23.5	162	-1.1151	0.2912	47.0	231	0.9866	0.3273
0.5	100	-5.2221	1.4075	24.0	163	-1.0727	0.2910	47.5	233	1.0405	0.3297
1.0	100	-4.5384	0.9905	24.5	164	-1.0304	0.2908	48.0	235	1.0953	0.3323
1.5	100	-4.1424	0.8049	25.0	166	-0.9881	0.2907	48.5	236	1.1509	0.3349
2.0	100	-3.8641	0.6939	25.5	167	-0.9459	0.2905	49.0	238	1.2075	0.3377
2.5	100	-3.6501	0.6181	26.0	168	-0.9037	0.2904	49.5	240	1.2650	0.3405
3.0	100	-3.4766	0.5623	26.5	170	-0.8616	0.2903	50.0	242	1.3234	0.3434
3.5	100	-3.3308	0.5191	27.0	171	-0.8194	0.2902	50.5	244	1.3829	0.3464
4.0	100	-3.2051	0.4846	27.5	173	-0.7773	0.2902	51.0	246	1.4434	0.3494
4.5	100	-3.0946	0.4564	28.0	174	-0.7352	0.2901	51.5	250	1.5050	0.3525
5.0	100	-2.9959	0.4329	28.5	175	-0.6931	0.2901	52.0	251	1.5677	0.3557
5.5	102	-2.9065	0.4131	29.0	177	-0.6510	0.2902	52.5	252	1.6316	0.3590
6.0	105	-2.8247	0.3963	29.5	178	-0.6089	0.2902	53.0	254	1.6966	0.3623
6.5	107	-2.7491	0.3819	30.0	180	-0.5668	0.2903	53.5	257	1.7629	0.3658
7.0	110	-2.6786	0.3695	30.5	181	-0.5247	0.2904	54.0	259	1.8304	0.3692
7.5	112	-2.6123	0.3587	31.0	182	-0.4825	0.2906	54.5	261	1.8992	0.3728
8.0	114	-2.5497	0.3495	31.5	184	-0.4402	0.2908	55.0	264	1.9694	0.3765
8.5	116	-2.4900	0.3414	32.0	185	-0.3979	0.2910	55.5	266	2.0410	0.3802
9.0	118	-2.4330	0.3345	32.5	187	-0.3555	0.2913	56.0	268	2.1140	0.3841
9.5	120	-2.3780	0.3284	33.0	188	-0.3130	0.2916	56.5	271	2.1886	0.3882
10.0	121	-2.3250	0.3232	33.5	189	-0.2705	0.2920	57.0	273	2.2647	0.3925
10.5	123	-2.2735	0.3188	34.0	191	-0.2278	0.2924	57.5	276	2.3426	0.3970
11.0	125	-2.2233	0.3149	34.5	192	-0.1850	0.2929	58.0	278	2.4224	0.4019
11.5	126	-2.1742	0.3116	35.0	194	-0.1420	0.2934	58.5	281	2.5042	0.4072
12.0	128	-2.1261	0.3088	35.5	195	-0.0989	0.2940	59.0	284	2.5883	0.4129
12.5	130	-2.0788	0.3064	36.0	197	-0.0556	0.2946	59.5	287	2.6748	0.4193
13.0	131	-2.0322	0.3044	36.5	198	-0.0121	0.2953	60.0	290	2.7642	0.4264
13.5	133	-1.9861	0.3027	37.0	200	0.0316	0.2960	60.5	293	2.8568	0.4343
14.0	134	-1.9406	0.3012	37.5	201	0.0756	0.2969	61.0	296	2.9530	0.4433
14.5	136	-1.8954	0.3000	38.0	202	0.1198	0.2977	61.5	299	3.0535	0.4534
15.0	137	-1.8506	0.2989	38.5	204	0.1642	0.2987	62.0	300	3.1588	0.4649
15.5	139	-1.8060	0.2980	39.0	205	0.2090	0.2997	62.5	300	3.2699	0.4780
16.0	140	-1.7618	0.2972	39.5	207	0.2541	0.3008	63.0	300	3.3877	0.4929
16.5	142	-1.7177	0.2965	40.0	208	0.2995	0.3020	63.5	300	3.5133	0.5100
17.0	143	-1.6739	0.2959	40.5	210	0.3453	0.3033	64.0	300	3.6482	0.5294
17.5	144	-1.6302	0.2953	41.0	211	0.3915	0.3046	64.5	300	3.7942	0.5516
18.0	146	-1.5866	0.2948	41.5	213	0.4381	0.3060	65.0	300	3.9532	0.5769
18.5	147	-1.5433	0.2944	42.0	214	0.4851	0.3075	65.5	300	4.1280	0.6059
19.0	149	-1.5000	0.2940	42.5	216	0.5326	0.3091	66.0	300	4.3216	0.6392
19.5	150	-1.4568	0.2936	43.0	218	0.5806	0.3107	66.5	300	4.5382	0.6779
20.0	152	-1.4138	0.2932	43.5	219	0.6292	0.3125	67.0	300	4.7832	0.7235
20.5	153	-1.3709	0.2929	44.0	221	0.6783	0.3143	67.5	300	5.0648	0.7790
21.0	154	-1.3280	0.2925	44.5	222	0.7280	0.3163	68.0	300	5.3955	0.8505
21.5	156	-1.2853	0.2923	45.0	224	0.7783	0.3183	68.5	300	5.7986	0.9513
22.0	157	-1.2426	0.2920	45.5	226	0.8293	0.3204	69.0	300	6.3265	1.1184
22.5	159	-1.2000	0.2917	46.0	228	0.8810	0.3226	69.5	300	7.1474	1.5030
23.0	160	-1.1575	0.2915	46.5	229	0.9334	0.3249	70.0	300	7.7103	1.8959

Table H.16: ELA Grade 8

ELA Grade 8 2013 Operational											
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0.0	100	-5.4442	1.8277	23.5	176	-0.7332	0.2829	47.0	222	1.3251	0.3319
0.5	100	-4.9320	1.4167	24.0	177	-0.6931	0.2831	47.5	223	1.3808	0.3351
1.0	100	-4.2352	1.0037	24.5	178	-0.6531	0.2833	48.0	224	1.4375	0.3384
1.5	107	-3.8259	0.8213	25.0	179	-0.6129	0.2834	48.5	226	1.4953	0.3419
2.0	113	-3.5341	0.7130	25.5	180	-0.5727	0.2835	49.0	227	1.5544	0.3454
2.5	118	-3.3067	0.6394	26.0	180	-0.5325	0.2837	49.5	228	1.6147	0.3491
3.0	123	-3.1199	0.5851	26.5	181	-0.4923	0.2838	50.0	230	1.6763	0.3528
3.5	126	-2.9612	0.5430	27.0	182	-0.4520	0.2839	50.5	231	1.7392	0.3566
4.0	129	-2.8232	0.5089	27.5	183	-0.4117	0.2840	51.0	233	1.8035	0.3605
4.5	132	-2.7009	0.4806	28.0	184	-0.3713	0.2842	51.5	234	1.8691	0.3644
5.0	134	-2.5912	0.4566	28.5	185	-0.3309	0.2843	52.0	236	1.9363	0.3684
5.5	137	-2.4918	0.4357	29.0	186	-0.2905	0.2845	52.5	237	2.0048	0.3723
6.0	139	-2.4009	0.4174	29.5	187	-0.2500	0.2847	53.0	239	2.0749	0.3762
6.5	141	-2.3172	0.4012	30.0	188	-0.2094	0.2849	53.5	240	2.1463	0.3800
7.0	142	-2.2397	0.3867	30.5	189	-0.1688	0.2851	54.0	242	2.2193	0.3838
7.5	144	-2.1674	0.3737	31.0	189	-0.1281	0.2854	54.5	244	2.2936	0.3875
8.0	145	-2.0998	0.3620	31.5	190	-0.0874	0.2858	55.0	250	2.3695	0.3912
8.5	147	-2.0362	0.3515	32.0	191	-0.0465	0.2861	55.5	247	2.4467	0.3948
9.0	148	-1.9761	0.3421	32.5	192	-0.0055	0.2865	56.0	250	2.5253	0.3983
9.5	149	-1.9190	0.3336	33.0	193	0.0356	0.2870	56.5	251	2.6053	0.4018
10.0	151	-1.8647	0.3260	33.5	194	0.0769	0.2875	57.0	252	2.6868	0.4054
10.5	152	-1.8126	0.3193	34.0	195	0.1183	0.2881	57.5	254	2.7697	0.4090
11.0	153	-1.7626	0.3133	34.5	196	0.1599	0.2887	58.0	256	2.8541	0.4128
11.5	154	-1.7144	0.3079	35.0	197	0.2016	0.2894	58.5	258	2.9401	0.4169
12.0	155	-1.6677	0.3032	35.5	198	0.2436	0.2901	59.0	260	3.0279	0.4213
12.5	156	-1.6224	0.2991	36.0	199	0.2858	0.2909	59.5	262	3.1177	0.4261
13.0	157	-1.5782	0.2956	36.5	200	0.3283	0.2918	60.0	264	3.2096	0.4316
13.5	158	-1.5350	0.2925	37.0	201	0.3710	0.2928	60.5	266	3.3041	0.4379
14.0	159	-1.4926	0.2899	37.5	202	0.4140	0.2938	61.0	268	3.4015	0.4451
14.5	160	-1.4509	0.2878	38.0	203	0.4573	0.2949	61.5	271	3.5023	0.4533
15.0	161	-1.4097	0.2860	38.5	204	0.5010	0.2961	62.0	273	3.6072	0.4628
15.5	162	-1.3691	0.2845	39.0	205	0.5450	0.2973	62.5	275	3.7168	0.4739
16.0	163	-1.3288	0.2834	39.5	206	0.5894	0.2987	63.0	278	3.8321	0.4866
16.5	164	-1.2887	0.2825	40.0	207	0.6342	0.3001	63.5	281	3.9540	0.5014
17.0	164	-1.2489	0.2818	40.5	208	0.6794	0.3016	64.0	284	4.0839	0.5184
17.5	165	-1.2093	0.2814	41.0	209	0.7252	0.3033	64.5	287	4.2233	0.5379
18.0	166	-1.1697	0.2811	41.5	210	0.7714	0.3050	65.0	290	4.3740	0.5604
18.5	167	-1.1302	0.2810	42.0	211	0.8182	0.3069	65.5	294	4.5382	0.5863
19.0	168	-1.0908	0.2810	42.5	212	0.8656	0.3088	66.0	298	4.7188	0.6162
19.5	169	-1.0513	0.2811	43.0	213	0.9136	0.3109	66.5	300	4.9193	0.6511
20.0	170	-1.0117	0.2813	43.5	214	0.9622	0.3131	67.0	300	5.1447	0.6928
20.5	171	-0.9721	0.2815	44.0	215	1.0116	0.3154	67.5	300	5.4023	0.7445
21.0	172	-0.9325	0.2817	44.5	216	1.0617	0.3178	68.0	300	5.7041	0.8126
21.5	172	-0.8928	0.2820	45.0	217	1.1126	0.3204	68.5	300	6.0731	0.9117
22.0	173	-0.8530	0.2822	45.5	218	1.1644	0.3231	69.0	300	6.5615	1.0801
22.5	174	-0.8131	0.2825	46.0	220	1.2170	0.3259	69.5	300	7.3380	1.4719
23.0	175	-0.7732	0.2827	46.5	221	1.2706	0.3288	70.0	300	7.8820	1.8706

Table H.17: ELA Grade 8: Alternate

ELA Grade 8 2013 Alternate											
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0.0	100	-5.4256	1.8273	23.5	180	-0.5600	0.2512	47.0	223	1.3733	0.3316
0.5	100	-4.9135	1.4168	24.0	181	-0.5285	0.2510	47.5	224	1.4289	0.3354
1.0	100	-4.2159	1.0053	24.5	181	-0.4970	0.2510	48.0	226	1.4858	0.3394
1.5	107	-3.8043	0.8249	25.0	182	-0.4654	0.2514	48.5	227	1.5441	0.3436
2.0	114	-3.5090	0.7187	25.5	183	-0.4337	0.2521	49.0	228	1.6039	0.3481
2.5	119	-3.2770	0.6473	26.0	183	-0.4018	0.2530	49.5	230	1.6653	0.3528
3.0	123	-3.0846	0.5955	26.5	184	-0.3697	0.2542	50.0	231	1.7284	0.3578
3.5	127	-2.9193	0.5558	27.0	185	-0.3372	0.2557	50.5	232	1.7934	0.3630
4.0	130	-2.7737	0.5244	27.5	186	-0.3043	0.2574	51.0	234	1.8602	0.3683
4.5	133	-2.6430	0.4987	28.0	186	-0.2709	0.2593	51.5	235	1.9290	0.3738
5.0	136	-2.5241	0.4772	28.5	187	-0.2371	0.2613	52.0	237	2.0000	0.3795
5.5	138	-2.4147	0.4589	29.0	188	-0.2026	0.2634	52.5	239	2.0730	0.3852
6.0	141	-2.3131	0.4429	29.5	189	-0.1677	0.2657	53.0	240	2.1484	0.3910
6.5	143	-2.2182	0.4288	30.0	189	-0.1321	0.2679	53.5	242	2.2259	0.3968
7.0	145	-2.1290	0.4162	30.5	190	-0.0959	0.2702	54.0	244	2.3058	0.4026
7.5	147	-2.0448	0.4046	31.0	191	-0.0591	0.2725	54.5	246	2.3881	0.4085
8.0	148	-1.9651	0.3939	31.5	192	-0.0216	0.2747	55.0	248	2.4727	0.4143
8.5	150	-1.8895	0.3839	32.0	193	0.0164	0.2768	55.5	250	2.5598	0.4203
9.0	152	-1.8176	0.3744	32.5	194	0.0550	0.2788	56.0	252	2.6493	0.4264
9.5	153	-1.7492	0.3654	33.0	194	0.0941	0.2807	56.5	254	2.7416	0.4328
10.0	155	-1.6841	0.3568	33.5	195	0.1338	0.2825	57.0	256	2.8368	0.4397
10.5	156	-1.6219	0.3485	34.0	196	0.1739	0.2842	57.5	258	2.9351	0.4472
11.0	157	-1.5625	0.3407	34.5	197	0.2145	0.2858	58.0	260	3.0369	0.4555
11.5	159	-1.5058	0.3332	35.0	198	0.2556	0.2873	58.5	263	3.1427	0.4648
12.0	160	-1.4514	0.3262	35.5	199	0.2970	0.2887	59.0	265	3.2531	0.4753
12.5	161	-1.3993	0.3195	36.0	200	0.3389	0.2900	59.5	268	3.3689	0.4871
13.0	162	-1.3493	0.3133	36.5	201	0.3811	0.2912	60.0	270	3.4907	0.5004
13.5	163	-1.3011	0.3076	37.0	202	0.4237	0.2925	60.5	273	3.6196	0.5154
14.0	164	-1.2546	0.3022	37.5	203	0.4666	0.2937	61.0	276	3.7567	0.5319
14.5	165	-1.2097	0.2973	38.0	204	0.5099	0.2949	61.5	280	3.9029	0.5498
15.0	166	-1.1662	0.2928	38.5	205	0.5536	0.2961	62.0	283	4.0591	0.5681
15.5	167	-1.1240	0.2885	39.0	206	0.5976	0.2973	62.5	287	4.2256	0.5854
16.0	168	-1.0829	0.2846	39.5	207	0.6420	0.2985	63.0	291	4.4013	0.5996
16.5	169	-1.0429	0.2810	40.0	208	0.6867	0.2998	63.5	295	4.5840	0.6084
17.0	170	-1.0039	0.2775	40.5	209	0.7319	0.3012	64.0	299	4.7704	0.6115
17.5	171	-0.9659	0.2743	41.0	210	0.7775	0.3027	64.5	300	4.9570	0.6101
18.0	172	-0.9287	0.2712	41.5	211	0.8235	0.3042	65.0	300	5.1422	0.6068
18.5	172	-0.8923	0.2684	42.0	212	0.8700	0.3059	65.5	300	5.3255	0.6048
19.0	173	-0.8567	0.2657	42.5	213	0.9171	0.3077	66.0	300	5.5087	0.6066
19.5	174	-0.8217	0.2631	43.0	214	0.9647	0.3096	66.5	300	5.6948	0.6149
20.0	175	-0.7874	0.2608	43.5	215	1.0130	0.3117	67.0	300	5.8888	0.6327
20.5	176	-0.7537	0.2587	44.0	216	1.0619	0.3140	67.5	300	6.0983	0.6647
21.0	176	-0.7205	0.2567	44.5	217	1.1116	0.3164	68.0	300	6.3360	0.7187
21.5	177	-0.6877	0.2551	45.0	218	1.1620	0.3190	68.5	300	6.6256	0.8113
22.0	178	-0.6554	0.2537	45.5	219	1.2133	0.3218	69.0	300	7.0210	0.9842
22.5	178	-0.6234	0.2526	46.0	221	1.2656	0.3249	69.5	300	7.6942	1.3981
23.0	179	-0.5916	0.2517	46.5	222	1.3189	0.3281	70.0	300	8.1960	1.8135

Table H.18: ELA Grade 8: Braille

ELA Grade 8 2013 Braille											
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0.0	100	-5.4442	1.8277	23.5	176	-0.7332	0.2829	47.0	222	1.3251	0.3319
0.5	100	-4.9320	1.4167	24.0	177	-0.6931	0.2831	47.5	223	1.3808	0.3351
1.0	100	-4.2352	1.0037	24.5	178	-0.6531	0.2833	48.0	224	1.4375	0.3384
1.5	107	-3.8259	0.8213	25.0	179	-0.6129	0.2834	48.5	226	1.4953	0.3419
2.0	113	-3.5341	0.7130	25.5	180	-0.5727	0.2835	49.0	227	1.5544	0.3454
2.5	118	-3.3067	0.6394	26.0	180	-0.5325	0.2837	49.5	228	1.6147	0.3491
3.0	123	-3.1199	0.5851	26.5	181	-0.4923	0.2838	50.0	230	1.6763	0.3528
3.5	126	-2.9612	0.5430	27.0	182	-0.4520	0.2839	50.5	231	1.7392	0.3566
4.0	129	-2.8232	0.5089	27.5	183	-0.4117	0.2840	51.0	233	1.8035	0.3605
4.5	132	-2.7009	0.4806	28.0	184	-0.3713	0.2842	51.5	234	1.8691	0.3644
5.0	134	-2.5912	0.4566	28.5	185	-0.3309	0.2843	52.0	236	1.9363	0.3684
5.5	137	-2.4918	0.4357	29.0	186	-0.2905	0.2845	52.5	237	2.0048	0.3723
6.0	139	-2.4009	0.4174	29.5	187	-0.2500	0.2847	53.0	239	2.0749	0.3762
6.5	141	-2.3172	0.4012	30.0	188	-0.2094	0.2849	53.5	240	2.1463	0.3800
7.0	142	-2.2397	0.3867	30.5	189	-0.1688	0.2851	54.0	242	2.2193	0.3838
7.5	144	-2.1674	0.3737	31.0	189	-0.1281	0.2854	54.5	244	2.2936	0.3875
8.0	145	-2.0998	0.3620	31.5	190	-0.0874	0.2858	55.0	250	2.3695	0.3912
8.5	147	-2.0362	0.3515	32.0	191	-0.0465	0.2861	55.5	247	2.4467	0.3948
9.0	148	-1.9761	0.3421	32.5	192	-0.0055	0.2865	56.0	250	2.5253	0.3983
9.5	149	-1.9190	0.3336	33.0	193	0.0356	0.2870	56.5	251	2.6053	0.4018
10.0	151	-1.8647	0.3260	33.5	194	0.0769	0.2875	57.0	252	2.6868	0.4054
10.5	152	-1.8126	0.3193	34.0	195	0.1183	0.2881	57.5	254	2.7697	0.4090
11.0	153	-1.7626	0.3133	34.5	196	0.1599	0.2887	58.0	256	2.8541	0.4128
11.5	154	-1.7144	0.3079	35.0	197	0.2016	0.2894	58.5	258	2.9401	0.4169
12.0	155	-1.6677	0.3032	35.5	198	0.2436	0.2901	59.0	260	3.0279	0.4213
12.5	156	-1.6224	0.2991	36.0	199	0.2858	0.2909	59.5	262	3.1177	0.4261
13.0	157	-1.5782	0.2956	36.5	200	0.3283	0.2918	60.0	264	3.2096	0.4316
13.5	158	-1.5350	0.2925	37.0	201	0.3710	0.2928	60.5	266	3.3041	0.4379
14.0	159	-1.4926	0.2899	37.5	202	0.4140	0.2938	61.0	268	3.4015	0.4451
14.5	160	-1.4509	0.2878	38.0	203	0.4573	0.2949	61.5	271	3.5023	0.4533
15.0	161	-1.4097	0.2860	38.5	204	0.5010	0.2961	62.0	273	3.6072	0.4628
15.5	162	-1.3691	0.2845	39.0	205	0.5450	0.2973	62.5	275	3.7168	0.4739
16.0	163	-1.3288	0.2834	39.5	206	0.5894	0.2987	63.0	278	3.8321	0.4866
16.5	164	-1.2887	0.2825	40.0	207	0.6342	0.3001	63.5	281	3.9540	0.5014
17.0	164	-1.2489	0.2818	40.5	208	0.6794	0.3016	64.0	284	4.0839	0.5184
17.5	165	-1.2093	0.2814	41.0	209	0.7252	0.3033	64.5	287	4.2233	0.5379
18.0	166	-1.1697	0.2811	41.5	210	0.7714	0.3050	65.0	290	4.3740	0.5604
18.5	167	-1.1302	0.2810	42.0	211	0.8182	0.3069	65.5	294	4.5382	0.5863
19.0	168	-1.0908	0.2810	42.5	212	0.8656	0.3088	66.0	298	4.7188	0.6162
19.5	169	-1.0513	0.2811	43.0	213	0.9136	0.3109	66.5	300	4.9193	0.6511
20.0	170	-1.0117	0.2813	43.5	214	0.9622	0.3131	67.0	300	5.1447	0.6928
20.5	171	-0.9721	0.2815	44.0	215	1.0116	0.3154	67.5	300	5.4023	0.7445
21.0	172	-0.9325	0.2817	44.5	216	1.0617	0.3178	68.0	300	5.7041	0.8126
21.5	172	-0.8928	0.2820	45.0	217	1.1126	0.3204	68.5	300	6.0731	0.9117
22.0	173	-0.8530	0.2822	45.5	218	1.1644	0.3231	69.0	300	6.5615	1.0801
22.5	174	-0.8131	0.2825	46.0	220	1.2170	0.3259	69.5	300	7.3380	1.4719
23.0	175	-0.7732	0.2827	46.5	221	1.2706	0.3288	70.0	300	7.8820	1.8706

Table H.19: Mathematics Grade 3

MATH Grade 3 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.39875	1.83978	26	208	0.39974	0.31526
1	100	-4.15896	1.02514	27	212	0.49905	0.31507
2	100	-3.41524	0.74179	28	215	0.59833	0.31511
3	100	-2.95981	0.61890	29	219	0.69768	0.31532
4	100	-2.62263	0.54708	30	223	0.79721	0.31568
5	101	-2.35035	0.49900	31	227	0.89701	0.31616
6	110	-2.11913	0.46420	32	231	0.99716	0.31678
7	118	-1.91621	0.43772	33	235	1.09775	0.31759
8	125	-1.73394	0.41684	34	239	1.19895	0.31871
9	132	-1.56735	0.39997	35	243	1.30100	0.32032
10	137	-1.41305	0.38607	36	250	1.40432	0.32271
11	143	-1.26856	0.37445	37	251	1.50953	0.32620
12	148	-1.13209	0.36464	38	255	1.61748	0.33120
13	153	-1.00223	0.35629	39	259	1.72938	0.33818
14	158	-0.87788	0.34914	40	264	1.84683	0.34769
15	163	-0.75817	0.34300	41	269	1.97197	0.36037
16	167	-0.64236	0.33772	42	274	2.10767	0.37706
17	172	-0.52988	0.33318	43	280	2.25785	0.39888
18	176	-0.42019	0.32930	44	286	2.42810	0.42752
19	180	-0.31287	0.32599	45	294	2.62684	0.46573
20	184	-0.20753	0.32321	46	300	2.86777	0.51855
21	188	-0.10383	0.32091	47	300	3.17597	0.59645
22	192	-0.00147	0.31904	48	300	3.60645	0.72665
23	200	0.09983	0.31757	49	300	4.33153	1.01799
24	201	0.20031	0.31648	50	300	5.56351	1.83776
25	204	0.30021	0.31572				

Table H.20: Mathematics Grade 3: Alternate

MATH Grade 3 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.39875	1.83978	26	208	0.39974	0.31526
1	100	-4.15896	1.02514	27	212	0.49905	0.31507
2	100	-3.41524	0.74179	28	215	0.59833	0.31511
3	100	-2.95981	0.61890	29	219	0.69768	0.31532
4	100	-2.62263	0.54708	30	223	0.79721	0.31568
5	101	-2.35035	0.49900	31	227	0.89701	0.31616
6	110	-2.11913	0.46420	32	231	0.99716	0.31678
7	118	-1.91621	0.43772	33	235	1.09775	0.31759
8	125	-1.73394	0.41684	34	239	1.19895	0.31871
9	132	-1.56735	0.39997	35	243	1.30100	0.32032

10	137	-1.41305	0.38607	36	250	1.40432	0.32271
11	143	-1.26856	0.37445	37	251	1.50953	0.32620
12	148	-1.13209	0.36464	38	255	1.61748	0.33120
13	153	-1.00223	0.35629	39	259	1.72938	0.33818
14	158	-0.87788	0.34914	40	264	1.84683	0.34769
15	163	-0.75817	0.34300	41	269	1.97197	0.36037
16	167	-0.64236	0.33772	42	274	2.10767	0.37706
17	172	-0.52988	0.33318	43	280	2.25785	0.39888
18	176	-0.42019	0.32930	44	286	2.42810	0.42752
19	180	-0.31287	0.32599	45	294	2.62684	0.46573
20	184	-0.20753	0.32321	46	300	2.86777	0.51855
21	188	-0.10383	0.32091	47	300	3.17597	0.59645
22	192	-0.00147	0.31904	48	300	3.60645	0.72665
23	200	0.09983	0.31757	49	300	4.33153	1.01799
24	201	0.20031	0.31648	50	300	5.56351	1.83776
25	204	0.30021	0.31572				

Table H.21: Mathematics Grade 3: Braille

MATH Grade 3 2013 Braille							
Raw Score	**Scale Score**	**Theta**	**S.E.**	**Raw Score**	**Scale Score**	**Theta**	**S.E.**
0	100	-5.39875	1.83978	26	208	0.39974	0.31526
1	100	-4.15896	1.02514	27	212	0.49905	0.31507
2	100	-3.41524	0.74179	28	215	0.59833	0.31511
3	100	-2.95981	0.61890	29	219	0.69768	0.31532
4	100	-2.62263	0.54708	30	223	0.79721	0.31568
5	101	-2.35035	0.49900	31	227	0.89701	0.31616
6	110	-2.11913	0.46420	32	231	0.99716	0.31678
7	118	-1.91621	0.43772	33	235	1.09775	0.31759
8	125	-1.73394	0.41684	34	239	1.19895	0.31871
9	132	-1.56735	0.39997	35	243	1.30100	0.32032
10	137	-1.41305	0.38607	36	250	1.40432	0.32271
11	143	-1.26856	0.37445	37	251	1.50953	0.32620
12	148	-1.13209	0.36464	38	255	1.61748	0.33120
13	153	-1.00223	0.35629	39	259	1.72938	0.33818
14	158	-0.87788	0.34914	40	264	1.84683	0.34769
15	163	-0.75817	0.34300	41	269	1.97197	0.36037
16	167	-0.64236	0.33772	42	274	2.10767	0.37706
17	172	-0.52988	0.33318	43	280	2.25785	0.39888
18	176	-0.42019	0.32930	44	286	2.42810	0.42752
19	180	-0.31287	0.32599	45	294	2.62684	0.46573
20	184	-0.20753	0.32321	46	300	2.86777	0.51855
21	188	-0.10383	0.32091	47	300	3.17597	0.59645
22	192	-0.00147	0.31904	48	300	3.60645	0.72665
23	200	0.09983	0.31757	49	300	4.33153	1.01799
24	201	0.20031	0.31648	50	300	5.56351	1.83776
25	204	0.30021	0.31572				

Table H.22: Mathematics Grade 4

MATH Grade 4 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.50779	1.84049	26	204	0.20048	0.30127
1	100	-4.26623	1.02632	27	208	0.29140	0.30190
2	100	-3.52023	0.74323	28	211	0.38291	0.30320
3	100	-3.06281	0.62039	29	214	0.47539	0.30515
4	100	-2.72396	0.54846	30	218	0.56927	0.30776
5	106	-2.45033	0.50016	31	221	0.66497	0.31104
6	115	-2.21815	0.46501	32	225	0.76291	0.31500
7	122	-2.01470	0.43806	33	229	0.86357	0.31965
8	129	-1.83238	0.41660	34	233	0.96744	0.32504
9	135	-1.66627	0.39903	35	237	1.07506	0.33119
10	141	-1.51300	0.38432	36	241	1.18704	0.33821
11	146	-1.37018	0.37181	37	245	1.30409	0.34620
12	151	-1.23600	0.36101	38	250	1.42706	0.35534
13	156	-1.10912	0.35160	39	254	1.55703	0.36591
14	160	-0.98844	0.34333	40	260	1.69537	0.37829
15	165	-0.87311	0.33602	41	265	1.84394	0.39303
16	169	-0.76240	0.32956	42	271	2.00532	0.41096
17	173	-0.65570	0.32386	43	278	2.18319	0.43330
18	176	-0.55247	0.31884	44	285	2.38307	0.46197
19	180	-0.45223	0.31447	45	294	2.61365	0.50006
20	184	-0.35454	0.31073	46	300	2.88949	0.55305
21	187	-0.25898	0.30761	47	300	3.23761	0.63187
22	191	-0.16516	0.30509	48	300	3.71686	0.76362
23	194	-0.07269	0.30320	49	300	4.50606	1.05403
24	200	0.01882	0.30192	50	300	5.79658	1.86287
25	201	0.10975	0.30127				

Table H.23: Mathematics Grade 4: Alternate

MATH Grade 4 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.50779	1.84049	26	204	0.20048	0.30127
1	100	-4.26623	1.02632	27	208	0.29140	0.30190
2	100	-3.52023	0.74323	28	211	0.38291	0.30320
3	100	-3.06281	0.62039	29	214	0.47539	0.30515
4	100	-2.72396	0.54846	30	218	0.56927	0.30776
5	106	-2.45033	0.50016	31	221	0.66497	0.31104
6	115	-2.21815	0.46501	32	225	0.76291	0.31500
7	122	-2.01470	0.43806	33	229	0.86357	0.31965
8	129	-1.83238	0.41660	34	233	0.96744	0.32504
9	135	-1.66627	0.39903	35	237	1.07506	0.33119

MATH Grade 4 2013 Alternate							
Raw Score	**Scale Score**	**Theta**	**S.E.**	**Raw Score**	**Scale Score**	**Theta**	**S.E.**
10	141	-1.51300	0.38432	36	241	1.18704	0.33821
11	146	-1.37018	0.37181	37	245	1.30409	0.34620
12	151	-1.23600	0.36101	38	250	1.42706	0.35534
13	156	-1.10912	0.35160	39	254	1.55703	0.36591
14	160	-0.98844	0.34333	40	260	1.69537	0.37829
15	165	-0.87311	0.33602	41	265	1.84394	0.39303
16	169	-0.76240	0.32956	42	271	2.00532	0.41096
17	173	-0.65570	0.32386	43	278	2.18319	0.43330
18	176	-0.55247	0.31884	44	285	2.38307	0.46197
19	180	-0.45223	0.31447	45	294	2.61365	0.50006
20	184	-0.35454	0.31073	46	300	2.88949	0.55305
21	187	-0.25898	0.30761	47	300	3.23761	0.63187
22	191	-0.16516	0.30509	48	300	3.71686	0.76362
23	194	-0.07269	0.30320	49	300	4.50606	1.05403
24	200	0.01882	0.30192	50	300	5.79658	1.86287
25	201	0.10975	0.30127				

Table H.24: Mathematics Grade 4: Braille

MATH Grade 4 2013 Braille							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.50779	1.84049	26	204	0.20048	0.30127
1	100	-4.26623	1.02632	27	208	0.29140	0.30190
2	100	-3.52023	0.74323	28	211	0.38291	0.30320
3	100	-3.06281	0.62039	29	214	0.47539	0.30515
4	100	-2.72396	0.54846	30	218	0.56927	0.30776
5	106	-2.45033	0.50016	31	221	0.66497	0.31104
6	115	-2.21815	0.46501	32	225	0.76291	0.31500
7	122	-2.01470	0.43806	33	229	0.86357	0.31965
8	129	-1.83238	0.41660	34	233	0.96744	0.32504
9	135	-1.66627	0.39903	35	237	1.07506	0.33119
10	141	-1.51300	0.38432	36	241	1.18704	0.33821
11	146	-1.37018	0.37181	37	245	1.30409	0.34620
12	151	-1.23600	0.36101	38	250	1.42706	0.35534
13	156	-1.10912	0.35160	39	254	1.55703	0.36591
14	160	-0.98844	0.34333	40	260	1.69537	0.37829
15	165	-0.87311	0.33602	41	265	1.84394	0.39303
16	169	-0.76240	0.32956	42	271	2.00532	0.41096
17	173	-0.65570	0.32386	43	278	2.18319	0.43330
18	176	-0.55247	0.31884	44	285	2.38307	0.46197
19	180	-0.45223	0.31447	45	294	2.61365	0.50006
20	184	-0.35454	0.31073	46	300	2.88949	0.55305
21	187	-0.25898	0.30761	47	300	3.23761	0.63187
22	191	-0.16516	0.30509	48	300	3.71686	0.76362
23	194	-0.07269	0.30320	49	300	4.50606	1.05403
24	200	0.01882	0.30192	50	300	5.79658	1.86287
25	201	0.10975	0.30127				

Table H.25: Mathematics Grade 5

MATH Grade 5 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.37413	1.83655	26	205	0.31422	0.31990
1	100	-4.14241	1.01965	27	209	0.41690	0.32104
2	100	-3.40948	0.73477	28	212	0.52043	0.32256
3	100	-2.96401	0.61112	29	215	0.62507	0.32445
4	111	-2.63605	0.53891	30	219	0.73106	0.32673
5	119	-2.37231	0.49069	31	222	0.83866	0.32940
6	126	-2.14901	0.45590	32	226	0.94816	0.33248
7	133	-1.95346	0.42953	33	229	1.05985	0.33601
8	138	-1.77803	0.40885	34	233	1.17408	0.34003
9	143	-1.61781	0.39222	35	237	1.29123	0.34463

MATH Grade 5 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
10	148	-1.46941	0.37863	36	241	1.41178	0.34989
11	153	-1.33040	0.36738	37	245	1.53629	0.35597
12	157	-1.19896	0.35798	38	250	1.66548	0.36305
13	161	-1.07370	0.35009	39	253	1.80025	0.37142
14	165	-0.95351	0.34345	40	258	1.94184	0.38144
15	168	-0.83751	0.33788	41	263	2.09188	0.39366
16	172	-0.72497	0.33321	42	268	2.25268	0.40885
17	176	-0.61526	0.32934	43	273	2.42750	0.42813
18	179	-0.50787	0.32618	44	280	2.62125	0.45325
19	182	-0.40233	0.32365	45	287	2.84155	0.48706
20	186	-0.29824	0.32170	46	295	3.10124	0.53468
21	189	-0.19524	0.32027	47	300	3.42424	0.60673
22	192	-0.09299	0.31933	48	300	3.86402	0.73066
23	196	0.00880	0.31884	49	300	4.59056	1.01630
24	200	0.11042	0.31879	50	300	5.81719	1.83443
25	202	0.21214	0.31915				

Table H.26: Mathematics Grade 5: Alternate

MATH Grade 5 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.37413	1.83655	26	205	0.31422	0.31990
1	100	-4.14241	1.01965	27	209	0.41690	0.32104
2	100	-3.40948	0.73477	28	212	0.52043	0.32256
3	100	-2.96401	0.61112	29	215	0.62507	0.32445
4	111	-2.63605	0.53891	30	219	0.73106	0.32673
5	119	-2.37231	0.49069	31	222	0.83866	0.32940
6	126	-2.14901	0.45590	32	226	0.94816	0.33248
7	133	-1.95346	0.42953	33	229	1.05985	0.33601
8	138	-1.77803	0.40885	34	233	1.17408	0.34003
9	143	-1.61781	0.39222	35	237	1.29123	0.34463
10	148	-1.46941	0.37863	36	241	1.41178	0.34989
11	153	-1.33040	0.36738	37	245	1.53629	0.35597
12	157	-1.19896	0.35798	38	250	1.66548	0.36305
13	161	-1.07370	0.35009	39	253	1.80025	0.37142
14	165	-0.95351	0.34345	40	258	1.94184	0.38144
15	168	-0.83751	0.33788	41	263	2.09188	0.39366
16	172	-0.72497	0.33321	42	268	2.25268	0.40885
17	176	-0.61526	0.32934	43	273	2.42750	0.42813
18	179	-0.50787	0.32618	44	280	2.62125	0.45325
19	182	-0.40233	0.32365	45	287	2.84155	0.48706
20	186	-0.29824	0.32170	46	295	3.10124	0.53468

MATH Grade 5 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
21	189	-0.19524	0.32027	47	300	3.42424	0.60673
22	192	-0.09299	0.31933	48	300	3.86402	0.73066
23	196	0.00880	0.31884	49	300	4.59056	1.01630
24	200	0.11042	0.31879	50	300	5.81719	1.83443
25	202	0.21214	0.31915				

Table H.27: Mathematics Grade 5: Braille

MATH Grade 5 2013 Braille							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.35923	1.83681	25	204	0.26862	0.32362
1	100	-4.12683	1.02014	26	207	0.37365	0.32460
2	100	-3.39290	0.73547	27	211	0.47944	0.32598
3	101	-2.94639	0.61198	28	214	0.58626	0.32773
4	111	-2.61735	0.53993	29	218	0.69435	0.32988
5	120	-2.35249	0.49185	30	221	0.80399	0.33243
6	127	-2.12804	0.45720	31	225	0.91546	0.33539
7	133	-1.93128	0.43096	32	228	1.02907	0.33879
8	139	-1.75460	0.41041	33	232	1.14514	0.34269
9	144	-1.59307	0.39392	34	236	1.26408	0.34716
10	149	-1.44331	0.38046	35	240	1.38635	0.35228
11	153	-1.30287	0.36935	36	244	1.51250	0.35822
12	158	-1.16995	0.36009	37	250	1.64325	0.36515
13	162	-1.04313	0.35235	38	252	1.77951	0.37335
14	166	-0.92131	0.34587	39	257	1.92249	0.38320
15	170	-0.80361	0.34045	40	262	2.07384	0.39525
16	173	-0.68928	0.33595	41	267	2.23583	0.41025
17	177	-0.57769	0.33225	42	273	2.41175	0.42935
18	180	-0.46833	0.32926	43	279	2.60650	0.45430
19	184	-0.36072	0.32692	44	286	2.82770	0.48794
20	187	-0.25445	0.32515	45	295	3.08820	0.53541
21	191	-0.14916	0.32391	46	300	3.41194	0.60731
22	194	-0.04451	0.32317	47	300	3.85240	0.73111
23	200	0.05981	0.32289	48	300	4.57957	1.01660
24	201	0.16410	0.32305	49	300	5.80661	1.83459

Table H.28: Mathematics Grade 6

MATH Grade 6 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.36355	1.83875	25	203	0.20534	0.31028
1	100	-4.12655	1.02309	26	206	0.30180	0.31096
2	100	-3.38728	0.73864	27	210	0.39884	0.31215
3	104	-2.93666	0.61488	28	213	0.49678	0.31385
4	115	-2.60458	0.54231	29	216	0.59595	0.31604
5	123	-2.33757	0.49361	30	219	0.69666	0.31875
6	130	-2.11176	0.45828	31	222	0.79926	0.32197
7	137	-1.91434	0.43134	32	225	0.90411	0.32573
8	142	-1.73764	0.41007	33	229	1.01160	0.33007
9	147	-1.57669	0.39284	34	232	1.12216	0.33505
10	152	-1.42805	0.37862	35	236	1.23630	0.34076
11	156	-1.28928	0.36672	36	240	1.35462	0.34732
12	160	-1.15855	0.35666	37	244	1.47785	0.35494
13	164	-1.03446	0.34808	38	250	1.60694	0.36387
14	168	-0.91590	0.34075	39	252	1.74312	0.37449
15	172	-0.80198	0.33445	40	257	1.88806	0.38732
16	175	-0.69196	0.32907	41	261	2.04406	0.40312
17	178	-0.58522	0.32448	42	267	2.21437	0.42299
18	182	-0.48122	0.32061	43	273	2.40387	0.44866
19	185	-0.37949	0.31740	44	280	2.62013	0.48296
20	188	-0.27959	0.31481	45	288	2.87588	0.53102
21	191	-0.18114	0.31281	46	298	3.19498	0.60351
22	194	-0.08377	0.31137	47	300	3.63089	0.72803
23	200	0.01288	0.31048	48	300	4.35377	1.01463
24	201	0.10914	0.31012	49	300	5.57828	1.83374

Table H.29: Mathematics Grade 6: Alternate

MATH Grade 6 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.30644	1.84012	25	204	0.21271	0.30189
1	100	-4.06635	1.02496	26	207	0.30388	0.30209
2	100	-3.32397	0.74030	27	209	0.39532	0.30277
3	106	-2.87145	0.61601	28	212	0.48732	0.30392
4	117	-2.53839	0.54285	29	215	0.58016	0.30554
5	125	-2.27113	0.49356	30	218	0.67414	0.30766
6	132	-2.04563	0.45767	31	221	0.76957	0.31029
7	139	-1.84899	0.43020	32	224	0.86682	0.31349
8	144	-1.67346	0.40841	33	227	0.96627	0.31732
9	149	-1.51402	0.39070	34	231	1.06837	0.32188
10	154	-1.36721	0.37602	35	234	1.17368	0.32730

MATH Grade 6 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
11	158	-1.23054	0.36367	36	237	1.28288	0.33377
12	162	-1.10216	0.35317	37	241	1.39680	0.34151
13	166	-0.98066	0.34418	38	245	1.51654	0.35083
14	170	-0.86491	0.33644	39	250	1.64350	0.36213
15	173	-0.75401	0.32976	40	253	1.77953	0.37596
16	177	-0.64720	0.32400	41	258	1.92716	0.39305
17	180	-0.54386	0.31905	42	263	2.08990	0.41449
18	183	-0.44345	0.31483	43	269	2.27281	0.44192
19	186	-0.34547	0.31128	44	275	2.48371	0.47808
20	189	-0.24952	0.30835	45	283	2.73549	0.52797
21	192	-0.15519	0.30600	46	293	3.05212	0.60210
22	195	-0.06213	0.30420	47	300	3.48709	0.72791
23	200	0.03000	0.30293	48	300	4.21048	1.01522
24	201	0.12151	0.30216	49	300	5.43615	1.83428

Table H.30: Mathematics Grade 6: Braille

MATH Grade 6 2013 Braille							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.36355	1.83875	25	203	0.20534	0.31028
1	100	-4.12655	1.02309	26	206	0.30180	0.31096
2	100	-3.38728	0.73864	27	210	0.39884	0.31215
3	104	-2.93666	0.61488	28	213	0.49678	0.31385
4	115	-2.60458	0.54231	29	216	0.59595	0.31604
5	123	-2.33757	0.49361	30	219	0.69666	0.31875
6	130	-2.11176	0.45828	31	222	0.79926	0.32197
7	137	-1.91434	0.43134	32	225	0.90411	0.32573
8	142	-1.73764	0.41007	33	229	1.01160	0.33007
9	147	-1.57669	0.39284	34	232	1.12216	0.33505
10	152	-1.42805	0.37862	35	236	1.23630	0.34076
11	156	-1.28928	0.36672	36	240	1.35462	0.34732
12	160	-1.15855	0.35666	37	244	1.47785	0.35494
13	164	-1.03446	0.34808	38	250	1.60694	0.36387
14	168	-0.91590	0.34075	39	252	1.74312	0.37449
15	172	-0.80198	0.33445	40	257	1.88806	0.38732
16	175	-0.69196	0.32907	41	261	2.04406	0.40312
17	178	-0.58522	0.32448	42	267	2.21437	0.42299
18	182	-0.48122	0.32061	43	273	2.40387	0.44866
19	185	-0.37949	0.31740	44	280	2.62013	0.48296
20	188	-0.27959	0.31481	45	288	2.87588	0.53102
21	191	-0.18114	0.31281	46	298	3.19498	0.60351
22	194	-0.08377	0.31137	47	300	3.63089	0.72803
23	200	0.01288	0.31048	48	300	4.35377	1.01463
24	201	0.10914	0.31012	49	300	5.57828	1.83374

Table H.31: Mathematics Grade 7

MATH Grade 7 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.25858	1.83851	25	203	0.38170	0.31394
1	100	-4.02189	1.02309	26	207	0.48030	0.31412
2	100	-3.28208	0.73934	27	210	0.57913	0.31471
3	100	-2.83002	0.61637	28	213	0.67847	0.31571
4	106	-2.49577	0.54457	29	217	0.77857	0.31714
5	115	-2.22607	0.49656	30	220	0.87972	0.31903
6	123	-1.99716	0.46181	31	224	0.98223	0.32140
7	130	-1.79637	0.43534	32	227	1.08645	0.32433
8	136	-1.61613	0.41443	33	231	1.19276	0.32789
9	141	-1.45154	0.39747	34	234	1.30164	0.33217
10	146	-1.29924	0.38343	35	238	1.41364	0.33732
11	151	-1.15682	0.37164	36	242	1.52946	0.34351
12	156	-1.02248	0.36164	37	250	1.64997	0.35097
13	160	-0.89485	0.35308	38	251	1.77624	0.35999
14	164	-0.77282	0.34574	39	255	1.90969	0.37097
15	168	-0.65550	0.33944	40	260	2.05219	0.38443
16	172	-0.54215	0.33403	41	265	2.20623	0.40110
17	176	-0.43215	0.32943	42	271	2.37533	0.42206
18	179	-0.32494	0.32554	43	277	2.56454	0.44894
19	183	-0.22005	0.32230	44	285	2.78164	0.48448
20	186	-0.11705	0.31965	45	293	3.03953	0.53368
21	190	-0.01557	0.31755	46	300	3.36217	0.60702
22	193	0.08474	0.31596	47	300	3.80305	0.73192
23	197	0.18419	0.31485	48	300	4.53227	1.01808
24	200	0.28309	0.31418	49	300	5.76199	1.83588

Table H.32: Mathematics Grade 7: Alternate

MATH Grade 7 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.07900	1.84051	25	206	0.46047	0.30123
1	100	-3.83779	1.02580	26	209	0.55102	0.30068
2	100	-3.09358	0.74158	27	212	0.64135	0.30048
3	101	-2.63916	0.61753	28	215	0.73168	0.30069
4	112	-2.30429	0.54445	29	218	0.82226	0.30132
5	121	-2.03540	0.49511	30	221	0.91338	0.30246
6	129	-1.80848	0.45909	31	224	1.00535	0.30418
7	136	-1.61066	0.43144	32	228	1.09856	0.30656
8	142	-1.43416	0.40948	33	231	1.19347	0.30973
9	147	-1.27394	0.39160	34	234	1.29063	0.31382
10	152	-1.12649	0.37677	35	237	1.39068	0.31898

11	157	-0.98930	0.36432	36	241	1.49441	0.32540
12	161	-0.86048	0.35378	37	245	1.60281	0.33332
13	165	-0.73855	0.34479	38	250	1.71707	0.34303
14	169	-0.62237	0.33710	39	253	1.83872	0.35491
15	173	-0.51100	0.33051	40	257	1.96974	0.36947
16	177	-0.40367	0.32486	41	262	2.11275	0.38741
17	180	-0.29974	0.32003	42	267	2.27133	0.40978
18	184	-0.19866	0.31592	43	273	2.45065	0.43817
19	187	-0.09999	0.31243	44	280	2.65856	0.47530
20	190	-0.00332	0.30948	45	289	2.90805	0.52613
21	193	0.09168	0.30703	46	299	3.22312	0.60113
22	197	0.18530	0.30501	47	300	3.65733	0.72768
23	200	0.27782	0.30339	48	300	4.38084	1.01551
24	203	0.36947	0.30213	49	300	5.60718	1.83467

Table H.33: Mathematics Grade 7: Braille

MATH Grade 7 2013 Braille							
Raw Score	**Scale Score**	**Theta**	**S.E.**	**Raw Score**	**Scale Score**	**Theta**	**S.E.**
0	100	-5.25858	1.83851	25	203	0.38170	0.31394
1	100	-4.02189	1.02309	26	207	0.48030	0.31412
2	100	-3.28208	0.73934	27	210	0.57913	0.31471
3	100	-2.83002	0.61637	28	213	0.67847	0.31571
4	106	-2.49577	0.54457	29	217	0.77857	0.31714
5	115	-2.22607	0.49656	30	220	0.87972	0.31903
6	123	-1.99716	0.46181	31	224	0.98223	0.32140
7	130	-1.79637	0.43534	32	227	1.08645	0.32433
8	136	-1.61613	0.41443	33	231	1.19276	0.32789
9	141	-1.45154	0.39747	34	234	1.30164	0.33217
10	146	-1.29924	0.38343	35	238	1.41364	0.33732
11	151	-1.15682	0.37164	36	242	1.52946	0.34351
12	156	-1.02248	0.36164	37	250	1.64997	0.35097
13	160	-0.89485	0.35308	38	251	1.77624	0.35999
14	164	-0.77282	0.34574	39	255	1.90969	0.37097
15	168	-0.65550	0.33944	40	260	2.05219	0.38443
16	172	-0.54215	0.33403	41	265	2.20623	0.40110
17	176	-0.43215	0.32943	42	271	2.37533	0.42206
18	179	-0.32494	0.32554	43	277	2.56454	0.44894
19	183	-0.22005	0.32230	44	285	2.78164	0.48448
20	186	-0.11705	0.31965	45	293	3.03953	0.53368
21	190	-0.01557	0.31755	46	300	3.36217	0.60702
22	193	0.08474	0.31596	47	300	3.80305	0.73192
23	197	0.18419	0.31485	48	300	4.53227	1.01808
24	200	0.28309	0.31418	49	300	5.76199	1.83588

Table H.34: Mathematics Grade 8

MATH Grade 8 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-4.98127	1.83410	25	202	0.39441	0.30315
1	100	-3.75579	1.01530	26	205	0.48641	0.30358
2	100	-3.03162	0.72884	27	208	0.57881	0.30445
3	100	-2.59475	0.60410	28	212	0.67189	0.30580
4	104	-2.27526	0.53106	29	215	0.76595	0.30765
5	114	-2.01986	0.48217	30	219	0.86131	0.31005
6	121	-1.80481	0.44681	31	222	0.95834	0.31306
7	128	-1.61742	0.41996	32	226	1.05746	0.31673
8	134	-1.45010	0.39884	33	229	1.15914	0.32114
9	140	-1.29794	0.38183	34	233	1.26393	0.32641
10	145	-1.15758	0.36788	35	237	1.37246	0.33264
11	150	-1.02658	0.35629	36	241	1.48551	0.33999
12	154	-0.90317	0.34657	37	250	1.60400	0.34866
13	159	-0.78595	0.33837	38	251	1.72905	0.35888
14	163	-0.67386	0.33143	39	255	1.86212	0.37099
15	167	-0.56601	0.32554	40	260	2.00502	0.38547
16	170	-0.46169	0.32056	41	266	2.16024	0.40299
17	174	-0.36031	0.31636	42	272	2.33116	0.42456
18	178	-0.26136	0.31286	43	279	2.52272	0.45178
19	181	-0.16441	0.30997	44	287	2.74252	0.48736
20	185	-0.06908	0.30764	45	297	3.00324	0.53632
21	188	0.02498	0.30583	46	300	3.32862	0.60918
22	191	0.11808	0.30449	47	300	3.77191	0.73341
23	195	0.21051	0.30361	48	300	4.50300	1.01882
24	200	0.30253	0.30316	49	300	5.73360	1.83613

Table H.35: Mathematics Grade 8: Alternate

MATH Grade 8 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-4.97265	1.83460	25	204	0.46063	0.30709
1	100	-3.74588	1.01623	26	207	0.55507	0.30761
2	100	-3.01978	0.73020	27	211	0.64997	0.30860
3	100	-2.58088	0.60581	28	214	0.74564	0.31010
4	105	-2.25927	0.53309	29	218	0.84240	0.31213
5	114	-2.00167	0.48448	30	221	0.94061	0.31474
6	122	-1.78435	0.44939	31	225	1.04066	0.31797
7	129	-1.59463	0.42276	32	229	1.14298	0.32189
8	135	-1.42492	0.40185	33	233	1.24806	0.32656
9	141	-1.27033	0.38502	34	237	1.35645	0.33206
10	146	-1.12750	0.37123	35	241	1.46881	0.33849

MATH Grade 8 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
11	151	-0.99402	0.35977	36	245	1.58588	0.34597
12	156	-0.86812	0.35015	37	250	1.70852	0.35464
13	160	-0.74841	0.34203	38	254	1.83781	0.36470
14	164	-0.63383	0.33514	39	259	1.97502	0.37643
15	168	-0.52352	0.32929	40	265	2.12182	0.39020
16	172	-0.41675	0.32433	41	270	2.28037	0.40661
17	176	-0.31295	0.32015	42	277	2.45368	0.42662
18	179	-0.21160	0.31665	43	284	2.64616	0.45176
19	183	-0.11228	0.31376	44	292	2.86477	0.48478
20	187	-0.01459	0.31143	45	300	3.12137	0.53081
21	190	0.08181	0.30962	46	300	3.43877	0.60069
22	194	0.17724	0.30829	47	300	3.86913	0.72257
23	200	0.27199	0.30744	48	300	4.58118	1.00771
24	201	0.36636	0.30703	49	300	5.79414	1.82852

Table H.36: Mathematics Grade 8: Braille

MATH Grade 8 2013 Braille							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-4.82803	1.83626	21	202	0.41503	0.33129
1	100	-3.59694	1.01930	22	206	0.52481	0.33148
2	100	-2.86449	0.73460	23	210	0.63495	0.33240
3	100	-2.41903	0.61129	24	214	0.74596	0.33408
4	111	-2.09064	0.53952	25	218	0.85837	0.33663
5	121	-1.82603	0.49179	26	223	0.97281	0.34012
6	129	-1.60145	0.45754	27	227	1.08999	0.34470
7	136	-1.40420	0.43172	28	231	1.21076	0.35053
8	142	-1.22669	0.41161	29	236	1.33610	0.35779
9	148	-1.06402	0.39557	30	241	1.46723	0.36676
10	154	-0.91280	0.38256	31	250	1.60568	0.37776
11	159	-0.77062	0.37189	32	251	1.75338	0.39129
12	164	-0.63568	0.36307	33	257	1.91287	0.40799
13	169	-0.50659	0.35575	34	263	2.08766	0.42888
14	173	-0.38225	0.34968	35	270	2.28276	0.45554
15	178	-0.26177	0.34467	36	279	2.50587	0.49066
16	182	-0.14443	0.34058	37	288	2.76976	0.53921
17	186	-0.02959	0.33730	38	300	3.09822	0.61169
18	190	0.08329	0.33478	39	300	3.54457	0.73550
19	194	0.19472	0.33295	40	300	4.27876	1.02036
20	200	0.30515	0.33179	41	300	5.51160	1.83702

SCIENCE

Table H.37: Science Grade 4

SCIENCE Grade 4 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-2.72654	1.29436	20	211	0.16829	0.16858
1	100	-1.76309	0.50874	21	215	0.22535	0.16933
2	100	-1.39874	0.36601	22	219	0.28308	0.17053
3	111	-1.17792	0.30407	23	224	0.34179	0.17223
4	123	-1.01566	0.26796	24	228	0.40185	0.17445
5	133	-0.88529	0.24393	25	233	0.46366	0.17725
6	141	-0.77491	0.22668	26	238	0.52769	0.18071
7	148	-0.67817	0.21370	27	242	0.59450	0.18494
8	155	-0.59124	0.20362	28	250	0.66476	0.19009
9	161	-0.51164	0.19563	29	253	0.73936	0.19635
10	166	-0.43768	0.18921	30	259	0.81941	0.20402
11	171	-0.36810	0.18400	31	266	0.90644	0.21350
12	176	-0.30197	0.17979	32	273	1.00258	0.22541
13	181	-0.23858	0.17639	33	281	1.11096	0.24074
14	185	-0.17734	0.17369	34	290	1.23643	0.26110
15	190	-0.11776	0.17160	35	300	1.38717	0.28940
16	194	-0.05942	0.17005	36	300	1.57829	0.33144
17	200	-0.00197	0.16900	37	300	1.84250	0.40103
18	203	0.05493	0.16841	38	300	2.27505	0.54878
19	207	0.11158	0.16827	39	300	3.32336	1.31615

Table H.38: Science Grade 4: Alternate

SCIENCE Grade 4 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-2.72508	1.29397	20	208	0.13339	0.16561
1	100	-1.76334	0.50776	21	212	0.18844	0.16627
2	100	-1.40095	0.36469	22	217	0.24408	0.16739
3	111	-1.18204	0.30252	23	221	0.30062	0.16897
4	123	-1.02164	0.26623	24	225	0.35840	0.17105
5	132	-0.89310	0.24206	25	229	0.41779	0.17369
6	140	-0.78452	0.22470	26	234	0.47923	0.17696
7	147	-0.68956	0.21162	27	239	0.54324	0.18094
8	154	-0.60440	0.20145	28	244	0.61042	0.18577
9	160	-0.52656	0.19337	29	250	0.68157	0.19162
10	165	-0.45435	0.18688	30	255	0.75768	0.19874
11	170	-0.38652	0.18161	31	261	0.84008	0.20748
12	175	-0.32215	0.17733	32	267	0.93060	0.21837
13	179	-0.26053	0.17387	33	275	1.03189	0.23222

SCIENCE Grade 4 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
14	184	-0.20106	0.17111	34	283	1.14798	0.25041
15	188	-0.14327	0.16896	35	294	1.28557	0.27541
16	192	-0.08674	0.16735	36	300	1.45697	0.31241
17	200	-0.03113	0.16623	37	300	1.68946	0.37491
18	201	0.02389	0.16559	38	300	2.06884	0.51704
19	204	0.07864	0.16538	39	300	3.04847	1.29844

Table H.39: Science Grade 4: Braille

SCIENCE Grade 4 2013 Braille							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-2.71161	1.29450	19	210	0.15248	0.17238
1	100	-1.74752	0.50911	20	214	0.21215	0.17318
2	100	-1.38240	0.36655	21	219	0.27256	0.17450
3	113	-1.16078	0.30474	22	223	0.33409	0.17639
4	125	-0.99767	0.26877	23	228	0.39716	0.17889
5	134	-0.86641	0.24486	24	233	0.46226	0.18208
6	143	-0.75509	0.22774	25	238	0.52998	0.18606
7	150	-0.65736	0.21489	26	243	0.60100	0.19098
8	156	-0.56938	0.20495	27	250	0.67621	0.19706
9	162	-0.48866	0.19711	28	254	0.75676	0.20456
10	168	-0.41349	0.19084	29	261	0.84419	0.21392
11	173	-0.34262	0.18581	30	268	0.94066	0.22578
12	178	-0.27511	0.18179	31	276	1.04938	0.24113
13	183	-0.21022	0.17860	32	285	1.17532	0.26166
14	188	-0.14734	0.17613	33	297	1.32688	0.29039
15	192	-0.08598	0.17429	34	300	1.51974	0.33334
16	200	-0.02570	0.17303	35	300	1.78789	0.40466
17	201	0.03390	0.17230	36	300	2.22935	0.55442
18	205	0.09318	0.17209	37	300	3.29051	1.31933

Table H.40: Science Grade 8

SCIENCE Grade 8 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.57084	1.83445	28	205	-0.00365	0.29188
1	100	-4.34459	1.01577	29	208	0.08171	0.29254
2	100	-3.61968	0.72921	30	211	0.16757	0.29356
3	100	-3.18247	0.60424	31	214	0.25414	0.29496
4	109	-2.86298	0.53090	32	217	0.34166	0.29676
5	118	-2.60791	0.48168	33	220	0.43036	0.29897

SCIENCE Grade 8 2013 Operational							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
6	125	-2.39347	0.44597	34	223	0.52052	0.30163
7	131	-2.20698	0.41873	35	226	0.61243	0.30477
8	137	-2.04082	0.39722	36	229	0.70641	0.30845
9	142	-1.89008	0.37980	37	232	0.80284	0.31271
10	146	-1.75138	0.36543	38	235	0.90214	0.31764
11	151	-1.62232	0.35340	39	239	1.00481	0.32333
12	155	-1.50109	0.34322	40	242	1.11143	0.32989
13	159	-1.38632	0.33454	41	250	1.22273	0.33748
14	162	-1.27694	0.32710	42	251	1.33954	0.34629
15	166	-1.17208	0.32070	43	254	1.46297	0.35658
16	169	-1.07103	0.31519	44	259	1.59437	0.36870
17	173	-0.97321	0.31044	45	263	1.73553	0.38313
18	176	-0.87813	0.30637	46	268	1.88887	0.40055
19	179	-0.78535	0.30291	47	274	2.05774	0.42202
20	182	-0.69451	0.29998	48	280	2.24704	0.44914
21	185	-0.60527	0.29754	49	288	2.46435	0.48467
22	188	-0.51735	0.29556	50	296	2.72233	0.53363
23	191	-0.43048	0.29399	51	300	3.04470	0.60660
24	194	-0.34441	0.29283	52	300	3.48473	0.73109
25	196	-0.25891	0.29205	53	300	4.21229	1.01702
26	200	-0.17376	0.29163	54	300	5.44022	1.83507
27	202	-0.08874	0.29157				

Table H.41: Science Grade 8: Alternate

SCIENCE Grade 8 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.53906	1.83340	28	205	-0.00020	0.29351
1	100	-4.31539	1.01403	29	208	0.08619	0.29442
2	100	-3.59384	0.72703	30	211	0.17324	0.29569
3	100	-3.15963	0.60187	31	214	0.26114	0.29734
4	110	-2.84286	0.52847	32	217	0.35013	0.29936
5	118	-2.59024	0.47925	33	220	0.44045	0.30178
6	125	-2.37803	0.44358	34	223	0.53237	0.30463
7	132	-2.19356	0.41642	35	226	0.62616	0.30794
8	137	-2.02924	0.39501	36	229	0.72214	0.31176
9	142	-1.88016	0.37771	37	233	0.82067	0.31613
10	147	-1.74298	0.36345	38	236	0.92216	0.32113
11	151	-1.61529	0.35155	39	240	1.02710	0.32686
12	155	-1.49529	0.34151	40	243	1.13604	0.33342
13	159	-1.38162	0.33298	41	250	1.24969	0.34097
14	162	-1.27322	0.32570	42	251	1.36888	0.34971

SCIENCE Grade 8 2013 Alternate							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
15	166	-1.16921	0.31946	43	255	1.49468	0.35990
16	169	-1.06889	0.31412	44	260	1.62844	0.37188
17	173	-0.97168	0.30956	45	265	1.77195	0.38616
18	176	-0.87708	0.30568	46	270	1.92761	0.40342
19	179	-0.78467	0.30241	47	275	2.09877	0.42471
20	182	-0.69406	0.29969	48	282	2.29035	0.45167
21	185	-0.60493	0.29747	49	289	2.50993	0.48702
22	188	-0.51699	0.29571	50	298	2.77020	0.53580
23	191	-0.42996	0.29438	51	300	3.09493	0.60856
24	194	-0.34359	0.29346	52	300	3.53739	0.73280
25	197	-0.25765	0.29292	53	300	4.26754	1.01834
26	200	-0.17191	0.29275	54	300	5.49743	1.83587
27	202	-0.08617	0.29295				

Table H.42: Science Grade 8: Braille

SCIENCE Grade 8 2013 Braille							
Raw Score	Scale Score	Theta	S.E.	Raw Score	Scale Score	Theta	S.E.
0	100	-5.57084	1.83445	28	205	-0.00365	0.29188
1	100	-4.34459	1.01577	29	208	0.08171	0.29254
2	100	-3.61968	0.72921	30	211	0.16757	0.29356
3	100	-3.18247	0.60424	31	214	0.25414	0.29496
4	109	-2.86298	0.53090	32	217	0.34166	0.29676
5	118	-2.60791	0.48168	33	220	0.43036	0.29897
6	125	-2.39347	0.44597	34	223	0.52052	0.30163
7	131	-2.20698	0.41873	35	226	0.61243	0.30477
8	137	-2.04082	0.39722	36	229	0.70641	0.30845
9	142	-1.89008	0.37980	37	232	0.80284	0.31271
10	146	-1.75138	0.36543	38	235	0.90214	0.31764
11	151	-1.62232	0.35340	39	239	1.00481	0.32333
12	155	-1.50109	0.34322	40	242	1.11143	0.32989
13	159	-1.38632	0.33454	41	250	1.22273	0.33748
14	162	-1.27694	0.32710	42	251	1.33954	0.34629
15	166	-1.17208	0.32070	43	254	1.46297	0.35658
16	169	-1.07103	0.31519	44	259	1.59437	0.36870
17	173	-0.97321	0.31044	45	263	1.73553	0.38313
18	176	-0.87813	0.30637	46	268	1.88887	0.40055
19	179	-0.78535	0.30291	47	274	2.05774	0.42202
20	182	-0.69451	0.29998	48	280	2.24704	0.44914
21	185	-0.60527	0.29754	49	288	2.46435	0.48467
22	188	-0.51735	0.29556	50	296	2.72233	0.53363
23	191	-0.43048	0.29399	51	300	3.04470	0.60660

SCIENCE Grade 8 2013 Braille							
Raw Score	**Scale Score**	**Theta**	**S.E.**	**Raw Score**	**Scale Score**	**Theta**	**S.E.**
24	194	-0.34441	0.29283	52	300	3.48473	0.73109
25	196	-0.25891	0.29205	53	300	4.21229	1.01702
26	200	-0.17376	0.29163	54	300	5.44022	1.83507
27	202	-0.08874	0.29157				

APPENDIX I
ITEM MAPS

PERSONS MAP OF ITEMS

```
          <more>|<rare>
 6            +
            . |
              |
              |
            . |
 5            +
              |
            . |
              |
            . |
 4            +
            . |
            . |
            . |
              |
 3          . +
            . |
           .# T|
           .#  |
          .##  |
 2        .###  +T 14      3LA4-0014O1-E61
          .###  |
         .####  |  7       3LA4-0014O1-N47
        .##### S|  21      3LA4-0014O1-E69
        .#####  |
 1      .######  +
       .######  |S WT1     3LGT-0002*-W02-V68
       .######  |  2       3LW5-0006A-N47
   .############ M|  WT2     3LGT-0022*-W01-S12
       .######  |  12      3LA4-0010B-E61      18      3LA5-0012D-E69
                   20      3LW3-0002C-E69
 0  .###########  +  4       3LA2-0009B-N47      8       3LW5-0007D-E61
        .#####  |M 19      3LW4-0004B-E69      6       3LA4-0010C-N47
         .####  |  10      3LA2-0009A-E61      16      3LA4-0009A-E69
       .####### S|
          .###  |
-1        .####  +  11      3LW2-0002C-E61      3       3LW3-0004C-N47
           .#  |  1       3LW1-0001D-N47      13      3LW3-0003A-E61
                 15      3LW1-0001D-E69
          .##  |S
           .#  |  17      3LA5-0011D-E69
           .# T|  5       3LW3-0003C-N47
-2          . +
            . |
            . |T
            . |  9       3LW4-0004C-E61
            . |
-3            +
            . |
```

Proficient Cut 0.0539

```
              |
            . |
              |
 -4            +
              |
            . |
              |
              |
 -5          . +
          <less>|<frequ>
EACH '#' IS 305.
```

Figure I.1: Item Map ELA Grade 3

PERSONS MAP OF ITEMS

```
          <more>|<rare>
  6              +
                 |
               . |
                 |
  5              +
               . |
                 |
               . |
  4             . +
                 |
               . |
               . |
  3             . +
              .# T|
              .#  |  18      4LA3-0018O1-E63
             .##  |
  2        .######  +
           .####  |T 27      4LA4-0017O1-E64     9       4LA4-0017O1-N56
           .#### S|
       .##########  |
  1  .###########  +  15      4LA5-0013D-E63
           .#####  |S
     .########### M|  23      4LW5-0007C-E64      6       4LA5-0016A-N56
                    WT1     4LGT-0002*-W02-V70
     .##########  | 13      4LW5-0007B-E63      24      4LW5-0008D-E
  0    .#########  +  10      4LW1-0001C-E63      11      4LW5-0008B-E63
                    21      4LW5-0006D-E64      5       4LW3-0004B-N56
                    WT2     4LGT-0024*-W01-S12
    .############  |M 22      4LW2-0002C-E64      26      4LA4-0012A-E64
                    4       4LA4-0012C-N56
        .#######  |  17      4LW2-0004C-E63
        .###### S|  1       4LW1-0001D-N56      12      4LW4-0006B-E63
                    19      4LW1-0001D-E64      7       4LA4-0013D-N56
 -1         .####  +S 16      4LA4-0009A-E63      2       4LW5-0006C-N56
                    20      4LA4-0011A-E64
           .####  |  14      4LW2-0002C-E63      25      4LA2-0009C-E64
                    8       4LW3-0002B-N56
           .###  |
             .# T|
 -2           .#  +T 3       4LW4-0005C-N56
               . |
               . |
               . |
 -3             . +
               . |
                 |
               . |
 -4             . +
          <less>|<frequ>
```

Proficient Cut 0.2312

EACH '#' IS 279.

Figure I.2: Item Map ELA Grade 4

```
PERSONS MAP OF ITEMS
          <more>|<rare>
  7            +
               |
               |
             . |
  6            +
               |
             . |
               |
  5            +
             . |
               |
             . |
  4          . +
               |
             . |
             . |
  3          .# +
             . |
            .# T|  11      5LA3-0021O1-N58
           .### |
  2         .##  +T 33      5LA4-0021O1-E65
         .#####  | 22      5LA4-0014O-E34
        ####### S|  2       5LW3-0004D-N58
        ####### |
  1     ########  +S
      #########  |  10      5LA2-0013C-N58      20      5LA2-0008C-E34
                 23      5LA2-0010A-E65      24      5LW5-0008D-E65
                 27      5LA4-0012B-E65      30      5LW5-0009D-E65
      ######### M|  16      5LA4-0011D-E34      25      5LA4-0017B-E65
                 4       5LA5-0015B-N58      6       5LA2-0012C-N58
    ############  | WT1     5LGT-0002*-W02-V72
  0     ########  +M 1       5LW1-0001A-N58      17      5LW4-0004C-E34
                 3       5LW2-0002A-N58      WT2     5LGT-0026*-W01-S12
        #######  |  14      5LA4-0010D-E34      26      5LW4-0005D-E65
                 31      5LW2-0004A-E65      32      5LW5-0007D-E65
      ######### S|  28      5LW2-0003A-E65      5       5LW2-0003A-N58
                 9       5LW5-0009D-N58
          #### |S 13      5LW2-0002B-E34      21      5LW6-0006C-E34
                 29      5LA4-0013B-E65      8       5LW4-0007C-N58
 -1       #####  +  12      5LW1-0001B-E34      18      5LW5-0005A-E34
                 7       5LA5--0020A-N58
           .##  |  15      5LA2-0007C-E34
            .# |
            .# T|T 19      5LW2-0003B-E34
 -2          . +
             . |
             . |
             . |
 -3          . +
             . |
               |
               |
 -4            +
             . |
               |
               |
 -5          . +
          <less>|<frequ>
EACH '#' IS 313.
```

Proficient Cut 0.2383

Figure I.3: Item Map ELA Grade 5

```
PERSONS MAP OF ITEMS
          <more>|<rare>
  5          .  +
                |
             . |
             . |
             . |
             . |
  4          .  +
             . |
             . |
             . |
             . |
             . |
  3          .  +
             . |
            .# T|
            .#  |
           .##  |
          .####  |
  2       .####  +
        .#######  |
         .##### S|T
        .#######  |
     .##########  |  1      6LA4-0010B-I11  15      6LA5-0005A-N21
                 30      6LA3-0019O-I14
      .#########  |  6      6LW4-0006B-I11
  1 .############  +S 10      6LA3-0023O-I11  11      6LW1-0001D-N21
                 20      6LA3-0020O-N21  28      6LW5-0017B-I14
                 40      6LA3-0020O-I13
     .##########  |  17      6LA5-0016A-N21  19      6LW5-0015C-N21
                 22      6LW4-0008B-I14
    .########### M|  21      6LW3-0015D-I14  31      6LW1-0001A-I13
                 WT1     611 PWT 01
       .#######  |  4      6LA5-0014C-I11  WT2     611 EWT 07
      .#########  |  18      6LW4-0003C-N21  2      6LW1-0001C-I11
                 5      6LW2-0015A-I11
       .########  |M 26      6LA4-0004B-I14  34      6LW4-0016D-I13
  0     .#######  +  29      6LA4-0014A-I14  3      6LA4-0002D-I11
                 32      6LW5-0002C-I13  37      6LA4-0011B-I13
                 9      6LW6-0021A-I11
        .###### S|  23      6LA5-0013B-I14  24      6LW4-0006A-I14
                 27      6LA5-0018D-I14  38      6LW6-0017C-I13
         .#####  |  12      6LA4-0012C-N21  25      6LW2-0003D-I14
                 39      6LA4-0012C-I13  7      6LA5-0013D-I11
          .####  |S 13      6LA4-0009D-N21  33      6LW2-0006D-I13
           .###  |  14      6LA2-0013B-N21  16      6LA4-0007D-N21
           .###  |  35      6LW2-0009A-I13
  -1         .##  +  36      6LW2-0010B-I13
            .## T|T
             .#  |
             .#  |
             .  |
             .  | 8      6LW4-0005B-I11
  -2          .  +
             . |
             . |
             . |
             . |
             . |
  -3            +
             . |
               |
             . |
               |
               |
  -4          .  +
          <less>|<frequ>
EACH '#' IS 225.
```

Proficient Cut 0.4088

Figure I.4: Item Map ELA Grade 6

```
PERSONS MAP OF ITEMS
          <more>|<rare>
  5              +
                 . |
                   |
                   |
                 . |
                 . |
  4              .  +
                 . |
                 . |
                 . |
                 . |
                 . |
  3              .  +
                 . |
                 . |
                .# |
                .# T|
               .## |
  2            .##  +
              .#### |
              .### |
            .######  |T 24      7LA4-0015B-N11  28      7LA4-0018C-N11
           .####### S|
          .########  |  10      7LA3-0020O-I17  7       7LA4-0015B-I17
  1       .########  +  20      7LA3-0022O-I14
         .#########  |
         .#########  |S 17      7LW3-0015A-I14  25      7LW4-0012C-N11
                     31      7LW4-0002D-I20
       #############  |  16      7LW3-0018A-I14  2       7LA2-0008C-I17
                     34      7LW2-0011B-I20  40      7LA3-0019O-I20
      ############ M|  30      7LA3-0021O-N11  32      7LW3-0005B-I20
                     38      7LA4-0014C-I20  39      7LA4-0018A-I20
         .#########  |  35      7LW4-0006C-I20  WT1     711 PWT 02
  0  .##########  +M 23      7LW4-0010A-N11  3       7LA5-0018A-I17
                     5       7LA2-0009B-I17  9       7LW5-0007A-I17
        .##########  |  12      7LA4-0017D-I14  15      7LW4-0007B-I14
                     19      7LW3-0016C-I14  29      7LW3-0020C-N11
                     WT2     709 SWT 01
          .########  |  13      7LA4-0003B-I14  18      7LW4-0008D-I14
                     26      7LA5-0019B-N11  36      7LW4-0008D-I20
          .########  |  14      7LW3-0013D-I14  33      7LA5-0004D-I20
                     37      7LW5-0017A-I20  6       7LA4-0014D-I17
           .###### S|  27      7LW3-0017D-N11  4       7LA4-0011A-I17
            .#####  |S 8       7LA5-0006C-I17
  -1         .####  +
              .###  |  1       7LW3-0003B-I17
               .##  |
                .#  |T 21      7LA4-0005B-N11
                .# T|  11      7LA4-0011C-I14
                .#  |  22      7LA4-0013A-N11
  -2             .  +
                 . |
                 . |
                 . |
                 . |
                 . |
  -3             .  +
                 . |
                 . |
                 . |
                   |
                 . |
  -4             .  +
          <less>|<frequ>
EACH '#' IS 203.
```

Proficient Cut 0.0316

Figure I.5: Item Map ELA Grade 7

```
PERSONS MAP OF ITEMS
          <more>|<rare>
  6             +
              . |
                |
              . |
              . |
  5           . +
              . |
              . |
              . |
              . |
  4           . +
              . |
             .# |
             .# T|
            .## |
  3         .## +
           .### |
        .###### |
         .#### S|
       .####### | 1      8LW2-0018A-I19
  2   .########## +
       .####### |
     .########## |T
   .############ | 40     8LA3-0019O-I20
   .############ M| 30     8LA3-0022O-I14
  1  .########### +S 10     8LA4-0020O-I19  14     8LA4-0004B-N13
                27     8LA4-0006C-I14  7      8LA5-0012C-I19
                8      8LA4-0014B-I19
     .######### | 20     8LA3-0020O-N13  25     8LW4-0014B-I14
                5      8LA4-0010A-I19  WT2    811 EWT 10
     .######### | 19     8LW5-0006A-N13  32     8LW4-0002C-I20
                39     8LW5-0018D-I20  WT1    811 PWT 01
        .###### | 12     8LW5-0003C-N13  17     8LA2-0009D-N13
                18     8LW5-0010D-N13  24     8LA4-0009D-I14
                31     8LA5-0005D-I20  6      8LA4-0016A-I19
       .####### S|M 13     8LA4-0011B-N13  15     8LA5-0015B-N13
                21     8LA4-0007D-I14  28     8LA4-0008D-I14
                3      8LW4-0002B-I19
  0      .##### + 16     8LW3-0017C-N13  22     8LA2-0011A-I14
                36     8LA4-0010C-I20
         .#### | 29     8LW2-0002A-I14  33     8LW3-0013C-I20
                9      8LW2-0011C-I19
          .### |S 35     8LW2-0016A-I20  38     8LW5-0017B-I20
           .## | 23     8LW2-0005A-I14  26     8LW3-0004D-I14
                34     8LW4-0008B-I20  4      8LW4-0017D-I19
           .# | 2      8LW3-0004C-I19  37     8LA4-0007D-I20
 -1         .# T+
            . |T
            . |
            . | 11     8LW1-0016C-N13
            . |
 -2         . +
            . |
            . |
            . |
            . |
 -3            +
            . |
              |
            . |
              |
 -4            +
            . |
              |
              |
              |
 -5         . +
          <less>|<frequ>
EACH '#' IS 231.
```

Proficient Cut 0.3282

Figure I.6: Item Map ELA Grade 8

```
PERSONS MAP OF ITEMS
          <more>|<rare>
  5          .  +
            .##  |
  4             +
           .####  |
               T|
           .####  |
  3             +
          .#####  |  42 03M-OA09x-XXXXXXXX-XXX1063XB
          .#####  |
          .#####  |
         .###### S|
         .######  |
  2      .######  +T
         .######  |
    .###########  |  46 03M-NF03x-XXXXXXXX-XXX1061XO
        .#######  |
    .###########  |  6 03M-OA01x-XXXXXXXX-XXX0695XS
    .###########  |  28 03M-NF02x-XXXXXXXX-XXG0201XO
                  3 03M-NF01x-XXXXXXXX-XXX0562XS
                  34 03M-OA09x-XXXXXXXX-CXG5253XA
                  38 03M-MD03x-XXXXXXXX-XXG0467XB
  1       .##### M+S
    .###########  |  12 03M-MD03x-XXXXXXXX-XXG0148XA
                  26 03M-MD04x-XXXXXXXX-XRG00860XB
                  27 03M-NB02x-XXXXXXXX-XXX0609XD
                  30 03M-OA09x-XXXXXXXX-CXG6026XC
                  37 03M-OA03x-XXXXXXXX-CXX7037XO
                  4 03M-OA03x-XXXXXXXX-XXX1042XS
     .##########  |  17 03M-OA08x-XXXXXXXX-XXX0650XD
                  2 03M-NB02x-XXXXXXXX-XXX0030XS
                  31 03M-OA07x-XXXXXXXX-CXX0176XB
                  40 03M-GE01x-XXXXXXXX-XXX4033XC
         .#####  |  1 03M-NB01x-XXXXXXXX-XXX0705XS
      .#########  |  19 03M-OA07x-XXXXXXXX-XXX0906XB
                  39 03M-OA07x-XXXXXXXX-XXX0171XA
      .#########  |  13 03M-MD06x-XXXXXXXX-XXG0371XC
                  22 03M-NF01x-XXXXXXXX-XXX0071XD
  0        .####  +M 25 03M-NF02x-XXXXXXXX-XXG0053XA
                  32 03M-MD03x-XXXXXXXX-CXG6049XC
                  36 03M-NB01x-XXXXXXXX-CXX4024XC
                  43 03M-OA01x-XXXXXXXX-XXX0898XD
                  9 03M-NF01x-XXXXXXXX-XXX0461XB
        .####### S|  24 03M-MD03x-XXXXXXXX-XXG0945XD
                  41 03M-MD03x-XXXXXXXX-XXG0586XA
          .###  |  35 03M-MD08x-XXXXXXXX-CXG5323XC
         .######  |
          .###  |  20 03M-GE01x-XXXXXXXX-XXX0127XC
                  23 03M-GE01x-XXXXXXXX-XXG0354XC
                  29 03M-MD03x-XXXXXXXX-CXG6051XB
                  33 03M-NB02x-XXXXXXXX-CXX6005XA
         .#####  |S 16 03M-MD05x-XXXXXXXX-XXG0949XA
                  18 03M-GE01x-XXXXXXXX-XXG1013XB
                  44 03M-MD03x-XXXXXXXX-XXG0280XB
                  45 03M-GE01x-XXXXXXXX-XXX0182XD
 -1         .##  +  14 03M-OA01x-XXXXXXXX-XXG0666XD
            .##  |
          .###  |  10 03M-NB01x-XXXXXXXX-XXX0497XC
                  15 03M-GE01x-XXXXXXXX-XXX5113XD
                  5 03M-NF03x-XXXXXXXX-XXX0331XS
           .# T|
           .  |
           .  |T
 -2            +  21 03M-MD06x-XXXXXXXX-XXG0167XC
           .  |  11 03M-MD06x-XXXXXXXX-XXG0498XD
           .  |
           .  |
 -3          .  +
           .  |
 -4            +
           .  |
 -5            +
          <less>|<frequ>
EACH '#' IS 180.
```

Proficient Cut 0.09983

Figure I.7: Item Map Math Grade 3

```
PERSONS MAP OF ITEMS
          <more>|<rare>
  5          .  +
            .#  |
               |
  4            +
               |
           .##  |
              T|
          .###  |
  3            +
         .####  |
        .#####  |
               | 46 04M-MD02x-XXXXXXXX-XXG0815XO
        .#####  |
        .##### S|
  2     .######  +T
       .######  |
       .######  | 29 04M-MD02x-XXXXXXXX-CXX0290XC
   .############  | 14 04M-NB06x-XXXXXXXX-XXX0596XD
       .######  |
       .######  | 3 04M-OA02x-XXXXXXXX-XXX0368XS
  1 .############  +S 35 04M-MD02x-XXXXXXXX-CXG4123XD
                  5 04M-NF07x-XXXXXXXX-XXG0364XS
                  6 04M-NF04x-XXXXXXXX-XXG0362XS
   .########### M|  21 04M-OA05x-XXXXXXXX-XXX0735XB
        .#####  | 25 04M-OA03x-XXXXXXXX-XXX0927XA
   .###########  | 24 04M-NF04x-XXXXXXXX-XXG0736XB
                  27 04M-NF03x-XXXXXXXX-XXG3414XB
                  33 04M-OA03x-XXXXXXXX-CXX4084XD
                  37 04M-NF03x-XXXXXXXX-CXG7148XO
                  4 04M-NB05x-XXXXXXXX-XXX0571XS
                  45 04M-NB06x-XXXXXXXX-XXX1024XC
   .########### |  28 04M-GE02x-XXXXXXXX-XXG0322XO
                  44 04M-NF04x-XXXXXXXX-XXG0244XD
    .##########  |  15 04M-GE01x-XXXXXXXX-XXG0998XC
                  20 04M-NF07x-XXXXXXXX-XXX0088XD
                  22 04M-NF02x-XXXXXXXX-XXG0946XA
                  23 04M-OA03x-XXXXXXXX-XXX0433XD
                  31 04M-OA05x-XXXXXXXX-CXG7158XB
                  36 04M-OA03x-XXXXXXXX-CXX7105XB
                  42 04M-NF06x-XXXXXXXX-XXX0732XD
  0   .########  +M 39 04M-NB05x-XXXXXXXX-XXG0854XD
         .####  | 11 04M-OA03x-XXXXXXXX-XXX0888XC
                  17 04M-NB03x-XXXXXXXX-XXX0855XB
                  32 04M-NB05x-XXXXXXXX-CXX0342XC
                  43 04M-GE01x-XXXXXXXX-XXG1003XA
       .####### S|  13 04M-NF02x-XXXXXXXX-XXX1013XA
                  16 04M-NF02x-XXXXXXXX-XXG0460XC
       .######  | 34 04M-MD02x-XXXXXXXX-CXX0287XA
                  41 04M-OA05x-XXXXXXXX-XXX0131XB
           .##  |
         .####  | 12 04M-NF07x-XXXXXXXX-XXX0740XD
 -1          .#  +S 10 04M-NF07x-XXXXXXXX-XXX0667XA
                  38 04M-NF07x-XXXXXXXX-XXG0856XC
                  40 04M-NF07x-XXXXXXXX-XXX0739XB
          .###  | 26 04M-NB02x-XXXXXXXX-XXX0908XA
            .#  | 18 04M-NB02x-XXXXXXXX-XXX3713XA
            . T|  1 04M-NB01x-XXXXXXXX-XXX0979XS
                  2 04M-NF07x-XXXXXXXX-XXG0354XS
            .  | 30 04M-NB05x-XXXXXXXX-CXX6237XA
            .  |
 -2          .  +T 19 04M-OA05x-XXXXXXXX-XXG0078XA
            .  |
               | 9 04M-GE03x-XXXXXXXX-XXG0968XB
            .  |
            .  |
               |
 -3          .  +
               |
            .  |
               |
 -4            +
          <less>|<frequ>
EACH '#' IS 192.
```

Proficient Cut 0.01882

Figure I.8: Item Map Math Grade 4

```
PERSONS MAP OF ITEMS
          <more>|<rare>
  5         .##  +
           .####  |
                  |
                 T|
  4                +
          .#####  |
         .######  |
                  |
        .#######  |
  3               +
        .#######  |
       .######## S|
        .#######  |
        .#######  |  52 05M-NF02x-XXXXXXXX-CXX2688XO
        .#######  |
  2      .#######  +T
        .#######  |  31 05M-NF02x-XXXXXXXX-CXX2764XB
                     36 05M-NF02x-XXXXXXXX-CXG1511XD
        .#######  |  41 05M-NF03x-XXXXXXXX-CXG2016XO
         .######  |  24 05M-NB07x-XXXXXXXX-XXX1698XO
                     40 05M-OA03x-XXXXXXXX-CXX2077XC
    ############ M|  46 05M-MD02x-XXXXXXXX-CXG2767XC
         .######  |  39 05M-MD02x-XXXXXXXX-CXG2765XC
  1  ###########  +S 50 05M-NF03x-XXXXXXXX-CXX2642XD
          .#####  |
      ##########  |  44 05M-MD01x-XXXXXXXX-CXX2072XD
      #########  |  16 05M-GE02x-XXXXXXXX-XXG1639XA
                     8 05M-MD05x-XXXXXXXX-XXX2782XS
           .####  |  4 05M-MD01x-XXXXXXXX-XXX2272XS
                     47 05M-MD01x-XXXXXXXX-CXX1785XD
        ########  |  45 05M-OA03x-XXXXXXXX-CXX2075XC
  0        .####  +M 14 05M-NB03x-XXXXXXXX-XXX1656XA
                     32 05M-NB07x-XXXXXXXX-CXX1362XC
                     34 05M-NB03x-XXXXXXXX-CXX2318XB
                     37 05M-MD01x-XXXXXXXX-CXX1534XC
                     51 05M-NF01x-XXXXXXXX-CXX2740XC
                     6 05M-MD05x-XXXXXXXX-XXG2780XS
        ####### S|  18 05M-GE04x-XXXXXXXX-XXX2421XD
                     33 05M-MD04x-XXXXXXXX-CXG2600XA
                     38 05M-NF01x-XXXXXXXX-CXX2718XB
                     5 05M-NF01x-XXXXXXXX-XXX2746XS
                     7 05M-OA03x-XXXXXXXX-XXG2280XS
         ######  |  35 05M-NF02x-XXXXXXXX-CXX0141XC
                     48 05M-MD01x-XXXXXXXX-CXX1528XA
                     49 05M-NB07x-XXXXXXXX-CXX0083XC
           ###  |  2 05M-GE02x-XXXXXXXX-XXG2699XS
                     42 05M-MD04x-XXXXXXXX-CXG2505XA
                     43 05M-NF01x-XXXXXXXX-CXX2739XA
         #####  |  12 05M-GE04x-XXXXXXXX-XXX2049XD
                     13 05M-OA02x-XXXXXXXX-XXX2043XC
                     22 05M-OA02x-XXXXXXXX-XXX1445XC
           .##  |  21 05M-MD01x-XXXXXXXX-XXX1229XB
  -1       .####  +S 11 05M-GE01x-XXXXXXXX-XXG2502XC
                     15 05M-OA02x-XXXXXXXX-XXX2135XB
                     20 05M-NB07x-XXXXXXXX-XXX1658XA
                     23 05M-MD01x-XXXXXXXX-XXX1253XB
                     3 05M-GE01x-XXXXXXXX-XXG1712XS
           .#  |
           .#  |
           .# T|  17 05M-NB06x-XXXXXXXX-XXX1456XC
           .#  |  1 05M-NB03x-XXXXXXXX-XXG2774XS
           .#  |T 19 05M-NB07x-XXXXXXXX-XXX1448XC
  -2          .  +
              . |
              . |
              . |
  -3          .  +
                |
              . |
                |
  -4          .  +
          <less>|<frequ>
EACH '#' IS 168.
```

Proficient Cut 0.1104

Figure I.9: Item Map Math Grade 5

```
PERSONS MAP OF ITEMS
          <more>|<rare>
  5          .#  +
            .##  |
  4             +
           .###  |
              T|
          .####  |
  3             +
          .####  |
          .####  |
                 |
         .#####  |
         .##### S|
  2       .#####  +
         .#####  |T 39 06M2-C6E02-ABCDXX-XX1797O
    .###########  |  37 06M1-C6A05-XXCDXX-XX1958A
                   47 06M1-C6A05-AXCDXX-XX1418D
        .######  |  21 06M4-X6A02-AXCDEX-XG1932C
                   8 06M2-X6E03-AXXDXX-XX1881S
        .######  |  41 06M1-C6A05-XXCDXX-XX1906B
   .############  |  23 06M1-X6B02-AXCDXX-XX1871C
                   45 06M4-C6B02-XXCDXX-XX1449C
  1      .###### M+S
   .############  |  40 06M3-C6C01-XXCDXX-XX1929C
    .###########  |  19 100023326O
                   43 06M2-C6E03-AXCDXX-XX1972C
                   5 06M2-C6E05-XXCDEX-XG1747S
                   50 06M3-C6C01-ABCDXX-XX1941O
         .#####  |  29 06M2-C6E02-AXXDXX-XG1548B
                   4 06M1-06A07-XXXDXX-XX1355S
     .##########  |  1 06M1-06A01-AXCDEX-XG1234S
                   16 06M1-X6B05-XXXDXX-XX1766D
      .#########  |  20 06M2-06A08-XXXDEX-XG1299B
                   32 06M1-C6B08-XXCDXX-XX1730C
                   46 06M1-C6B01-AXCDXX-XX1515B
  0        .####  +M 49 06M2-C6A01-XXXDEX-XG1732A
        .#######  |  11 06M1-X6A03-AXXDEX-XG1753A
                   15 06M3-X6D02-XXXDXX-XX1924B
                   38 06M1-06A07-AXCDXX-XX1257B
                   48 06M2-C6E03-AXCDEX-XG1821A
        .###### S|  12 06M2-06C01-XXXDEX-XG1280D
                   14 06M3-X6C01-XXCDXX-XX1694B
           .##  |  22 06M3-X6D02-XXXDXX-XX1824A
                   36 06M4-C6D03-XXCDEX-XG1640A
                   42 06M3-C6D01-XXXDXX-XX1686A
         .#####  |  13 06M3-06B01-XXXDEX-XG1326C
                   31 06M2-C6E02-XXCDXX-XX1976C
                   34 06M3-06C01-XXXDXX-XX1225D
                   35 06M2-C6D02-XXCDEX-XG1671D
                   6 06M3-06C02-AXCDEX-XG0038S
          .####  |S 17 06M2-X6C01-XXXDEX-XG1828B
                   30 06M4-C6C02-XXCDXX-XX1417D
                   44 06M3-06D03-XXCDXX-XX1302D
                   7 06M1-06B05-XXXXXX-XX0032S
 -1          .#  +  3 06M4-06A02-AXCDXX-XX0048S
            .#  |
            .#  |  18 06M1-X6A01-AXCDXX-XX1396D
           .##  |
           .# T|  33 06M3-C6D01-XXXDXX-XX1955A
            .  |T
 -2             +
            .  |  2 06M3-X6D01-XXXDXX-XX1883S
            .  |
            .  |
 -3          .  +
            .  |
               |
 -4             +
            .  |
               |
               |
 -5             +
          <less>|<frequ>
EACH '#' IS 200.
```

Proficient Cut 0.0129

Figure I.10: Item Map Math Grade 6

```
PERSONS MAP OF ITEMS
          <more>|<rare>
  5          .#  +
            .##  |
                 |
  4              +
           .###  |
                 |
           .### T|
                 |
  3        .####  +
          .####  |
          .####  |
         .#####  |T 8 07M1-X7B01-AXXDXX-XX1549S
         .#####  |
  2       .##### S+
    .###########  |  19 07M1-X7A03-ABCDXX-XX1763O
                  41 07M3-07D01-AXXDEX-XG0028D
         .#####  |
         .#####  |  21 07M1-X7A04-XXXDXX-XX1858B
                  35 07M4-C7C03-XXCDXX-XX1648D
                  49 07M1-C7A03-AXCDXX-XX1931D
                  5 07M3-07A01-XXXDXX-XX0097S
    .###########  |  48 07M1-07B02-AXXDXX-XX1325D
                  7 07M4-07C01-AXCDXX-XX1268S
   .############  |S 38 07M2-C7E01-AXCDXX-XG1623C
  1      .######  +  40 07M4-C7B04-XXXDXX-XX1436D
   .############ M|  33 07M2-C7D01-AXCDXX-XG1557C
                  4 07M2-X7C01-XXXDEX-XG1662S
                  42 07M2-C7E02-XXCDXX-XX1734B
                  43 07M1-C7B01-AXCDXX-XX1498D
                  50 07M2-07A02-ABCDEX-XG1296O
        .######  |  37 07M1-C7A04-AXCDXX-XX1348A
   .############  |  46 07M3-C7D02-XXXDXX-XX1737A
   .############  |  29 07M4-C7A01-AXCDEX-XG1722A
                  3 07M3-X7D02-AXCDXX-XX1431S
                  39 07M3-07A01-ABCDXX-XX1261O
                  6 07M2-07B01-XXXDEX-XG0031S
   .############  |M 47 07M1-C7A02-XXXDXX-XX1544B
  0      .######  +  22 07M4-X7C03-AXCDXX-XX1908D
                  34 07M3-C7D02-AXCDXX-XX1917A
    .###########  |  18 07M2-X7A02-AXCDEX-XG1819B
                  2 07M4-07B03-AXCDEX-XX1147S
         .#####  |  13 07M3-X7D04-XXXDXX-XX1468C
                  30 07M3-07C01-XXXDXX-XX0144B
     .########## S|  17 07M2-07C02-XXXDEX-XG1133D
          .####  |  16 07M4-07A01-AXCDEX-XG1289C
                  31 07M1-C7A03-AXCDXX-XX1725B
                  32 07M1-C7A01-AXCDXX-XX1575C
                  44 07M1-C7A05-XXXDXX-XX1383A
       .########  |S 14 07M3-X7C01-XXXDXX-XX1433C
                  20 07M2-07A01-XXXDXX-XX0070C
                  45 07M4-C7B03-AXCDXX-XX1513B
 -1        .###  +  12 07M2-X7C01-XXXDXX-XX1621C
                  36 07M2-C7E01-XXCDXX-XX1902B
           .###  |  11 07M3-X7C02-AXCDXX-XX1563B
           .###  |
            .##  |  1 07M3-X7D02-XXXDXX-XX1838S
            .##  |  23 07M2-X7A01-XXXDEX-XG1578A
             .# T|T 15 07M3-X7D01-XXXDEX-XG1362A
 -2          .#  +
             . |
             . |
             . |
 -3              +
             . |
                |
                |
 -4            .  +
                |
                |
                |
 -5            .  +
          <less>|<frequ>
EACH '#' IS 160.
```

Proficient Cut 0.2831

Figure I.11: Item Map Math Grade 7

```
PERSONS MAP OF ITEMS
          <more>|<rare>
  5          .#  +
                |
           .###  |
                |
  4             +
         .####  |
              T|
        .#####  |
                |
  3      .#####  +
                |
        .#####  |
        .#####  |
       .###### S|
       .######  |
  2     .######  +  6 08M2-X8A01-AXXDEX-XG7381S
       .######  |T 42 08M2-C8A02-AXXDEX-XG7660D
    .############  |
       .######  |  21 08M1-X8B01-AXCDXX-XX7611D
                   22 08M1-X8A07-XXXDXX-XX7592A
    .############  |  5 08M1-X8A01-AXCDXX-XX7580S
                   8 08M4-X8B02-XXCDXX-XX7510S
       .######  |S 2 08M1-X8A06-XXXDXX-XX7582S
                   3 08M4-X8C01-AXCDXX-XX7446S
                   45 08M2-C8E03-AXCDXX-XX7360C
                   48 08M3-C8B01-AXCDEX-XG7468A
  1 .############ M+
    ############  |  23 08M3-X8D04-XXXDXX-XX7521D
                   43 08M2-C8A04-AXCDXX-XX7355B
       .######  |  19 08M4-X8A03-ABCDEX-XG7686O
                   40 08M2-C8A04-AXCDXX-XG5317D
                   7 08M3-X8D02-XXXDXX-XX7520S
    .############  |  34 08M3-C8D02-XXXDXX-XX6157D
                   39 08M1-08B04-ABCDXX-XX7202O
                   50 08M3-C8B01-ABCDEX-XG7568O
    .###########  |M 13 08M1-X8C01-XXXDXX-XX7656B
                   38 08M2-C8A02-AXCDEX-XG5812C
     .##########  |  11 08M3-08B01-XXXDEX-XG7277A
                   18 08M3-08C02-AXCDXX-XX7227B
                   33 08M1-08A06-XXXDXX-XX7253C
                   44 08M2-C8E04-XXCDXX-XX7525B
                   47 08M2-C8A02-AXCDXX-XG7603B
  0    .#########  +  15 08M1-X8A01-XXCDXX-XX7653C
                   32 8M4A02-6001C
                   35 08M2-C8D01-AXXDXX-XX2028C
                   4 08M1-X8B03-XXXDXX-XX7558S
                   46 08M4-08A01-AXCDXX-XX7269D
         .####  |  16 08M2-X8C02-XXXDXX-XX7599A
                   37 08M2-C8E04-XXCDXX-XX7542A
      .######### S|  17 08M3-X8C02-AXCDXX-XX3019D
                   36 08M3-C8C02-AXXDEX-XX4002C
       .########  |S 14 08M2-08A07-XXXDEX-XG7219B
                   20 08M4-X8A02-XXCDEX-XG7650B
                   29 08M3-C8D02-AXCDEX-XG7544A
          .###  |  1 08M1-08B03-XXXDXX-XX7189S
                   12 08M1-X8A04-XXXDXX-XX1203C
                   41 08M3-C8C02-XXXDXX-XX7598B
       .#######  |  30 08M2-C8E03-XXXDXX-XX7723A
  -1        .###  +  31 08M3-C8D02-XXXDXX-XX7692A
           .##  |T 49 08M2-C8E03-XXCDXX-XG7536D
           .##  |
           .##  |
            .# T|
            .#  |
  -2          .  +
             .  |
             .  |
  -3          .  +
                |
             .  |
  -4          .  +
          <less>|<frequ>
EACH '#' IS 159..
```

Proficient Cut 0.3025

Figure I.12: Item Map Math Grade 8

```
PERSONS MAP OF ITEMS
          <more>|<rare>
  3          .  +
                |
                |
                |
                |
                |
                |
                |
                |
             . |
                |
                |
  2             +
                |
            .# |
                |
                |
           .## T|
                |
          .### |
                |
         .#### |
                |
        .##### S|
  1     .###### +
       .###### | 20 4SC10-0016C       7 4SC10G0684-0684C
      .####### | 35 4SB01GXXXX-0071O
      .####### |T
      .####### | 27 4SB09GXXXX-4092D
       .###### M| 23 4SC10G0632-0632C
   ############# |
       .#####  |S 14 4SA01-4110D       5 4SB03-0212B
       .##### | 24 4SB08G0012-0012O
     .######### | 10 4SB03G1005-1005A
        .#### | 12 4SB12GXXXX-0985A  19 4SB07G2009-2009C
                30 4SB10GXXXX-0974B  33 4SB01GXXXX-0851A
       .###### S|M 18 4SC08G0001-0001D  2 4SB06G0283-0283A
                21 4SC09-4219C       28 4SB04GXXXX-3068D
                3 4SB03GXXXX-0273B   8 4SB09G1008-1008B
  0         .## + 11 4SB03G0950-0950D  13 4SC09-0013B
                17 4SC01-4116B       31 4SC10G0800-0800D
                32 4SB07GXXXX-0079D  4 4SB01GXXXX-0948A
        .#### | 15 4SA01G0669-0669B  16 4SB08G0867-0867C
                22 4SC03G0642-0642B  29 4SB08G0824-0824A
                34 4SB07GXXXX-2046C
           .# |S 1 4SA12G0343-0343D   6 4SC08G2091-2091D
           .# |
           .## | 25 4SA08-5160A       9 4SA01GXXXX-0363B
            . T|
            . |T
            . | 26 4SB06-5088B
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  -1          .  +
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  -2            +
          <less>|<frequ>
EACH '#' IS 294.
```

Proficient Cut -0.0020

Figure I.13: Item Map Science Grade 4

```
PERSONS MAP OF ITEMS
          <more>|<rare>
  5          .  +
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  4            +
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            .# |
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                |
  3         .##  +
              T|
           .### |
          .#### |
                |
          .#### |
  2       .#####  +
         .##### S|
    .############ | 43 8SC04GXXX-7576D   50 8SB03GXXX-7796O
        .###### |
        .######  |T 32 8SA12GXXX-7221B
    .############ |
  1      .######  +  24 8SC06-4596D       8 8SC09G7891-7891A
    .############ | 34 8SB12GXXX-7836O   39 8SB08GXXX-7688A
    .########### M|  14 8SC04GXXX-7384D
    .###########  |S 28 8SC08GXXX-7855C   48 8SB09GXXX-7233B
     .########## |  1 8SA07GXXX-7618A
          .#### |  13 8SB10GXXX-7703C   33 8SB03-4160C
  0   .######### +  16 8SB10GXXX-7708A   20 8SB04GXXX-7263D
                21 8SC06-2012D       26 8SC09G7892-7892D
                44 8SB01GXXX-7466C
       .########  |M 12 8SB07GXXX-7440A   22 8SB06G7673-7673C
                30 8SB02GXXX-7564B   38 8SB06-4961B
                4 8SC02GXXX-7663D    40 8SB04-4885B
                42 8SB09GXXX-7777C   7 8SB08GXXX-7696C
       .####### S|  10 8SA12-5295B       19 8SA01GXXX-7144A
                27 8SC06-4618B       29 8SB01-5345C
                45 8SA09GXXX-7634B   9 8SC08GXXX-7834D
        .###### |  25 8SB05-4411A       31 8SC05-1108B
                41 8SB01-5627B       49 8SC10-5599A
                5 8SC10-5479A
        .###### |  47 8SB06GXXX-7419A
         .##### |  17 8SA01GXXX-7253D   2 8SB06GXXX-7051A
                36 8SB01G7750-7750C  46 8SB04GXXX-7474B
 -1       .####  +S 11 8SA06-5233B       15 8SB01GXXX-7368B
                23 8SB01GXXX-7468C
            .# |  18 8SB03-4347D       6 8SB09-5200C
           .## |  3 8SB06GXXX-7286C    35 8SB03GXXX-7276A
            . T|
            . |T
            . |
 -2           .  +  37 8SA06GXXX-7400D
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 -4             +
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                |
 -5          .  +
          <less>|<frequ>
EACH '#' IS 198.
```

Proficient Cut 0.0403

Figure I.14: Item Map Science Grade 8