New Jersey Assessment of Skills and Knowledge

2009

TECHNICAL REPORT

Grades 3-8

June 2010

PTM 1507-34

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PART 1: INTRODUCTION

The purpose of this Technical Report is to provide information about the technical characteristics of the 2009 administration of the 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, quality control procedures, scoring, standard setting, item and test statistics, scaling and equating, 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 content of the tests, the processes of consulting with stakeholders, the processes of communicating about the test to users, the processes of scoring and reporting, and the processes of data analysis. Each is an inherent part of validity.

Data for the analyses presented in this Technical Report were collected during the spring administration in April/May 2009. The short time duration between test administration and score reporting necessitated the use of a priority sample for both the standard setting at grades 3 and 4 and the equating/scaling analyses presented in Part 7 – Scaling and equating.

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 2009 NJ ASK 3–8 are provided in Sections 2.2 and 2.3. A discussion of the link between 2009 NJ ASK 3–4 and 2008 NJ ASK 3–4 tests is provided in Section 7.3.

1.1 Description of the Assessment

The New Jersey Assessment of Skills and Knowledge (NJ ASK) was administered as an operational assessment in Spring 2009 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. 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.

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, LAL 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:

Elementary School:

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

Middle School:

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

High School:

- High School Proficiency Assessment (HSPA)

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
- Special Review Assessment (SRA), for students who have not demonstrated proficiency in one or more content areas of the HSPA

Please Note: The results from the redesigned 2008 NJ ASK 3–8 LAL 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. It is important to note that the redesigned 2008 NJ ASK 3–8 for LAL 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. The same holds true for 2009 NJ ASK 3–4 LAL and Mathematics. These assessments should not be directly compared with grades 3 and 4 LAL and mathematics assessments from previous years.

The NJ ASK Language Arts Literacy 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 this 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 language arts literacy 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.

The results are to be used by schools and districts to identify strengths and weaknesses in their educational programs. It is anticipated that this process will lead to improved instruction and 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 reviews, security, and quality-assurance procedures. Measurement Incorporated (MI) is 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. MI was also responsible for the development of test items for the 2009 NJ ASK 3–8.

PART 2: TEST DEVELOPMENT

In 2008–2009, the LAL 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 LAL, mathematics, and science
- Revised NJ ASK grades 5, 6, and 7 replaced the interim ASK 5–7 administered in 2006 and 2007
- Spanish versions of the assessments in all content areas
- Test administered later in school year (May)

Language Arts Literacy (LAL)

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

Mathematics

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

A directory of test specifications and sample items was 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 2009 NJ ASK 3-8 was designed to measure the knowledge and skills identified in the 2004 revision of the NJ CCCS. Brief descriptions of the test content measured in LAL, 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.

Language Arts Literacy

The Language Arts Literacy (LAL) assessment focuses on a student's reading and writing knowledge and skills based on the NJ CCCS. The LAL test consists of multiple-choice items, constructed-response items, and writing tasks. The LAL score is reported in two content clusters: Reading (standard 3.1) and Writing (standard 3.2).

- **Reading** (3.1)
  - Working with or Interpreting Text
  - Analyzing and Critiquing Text
- **Writing** (3.2)
  - Grades 3–4
    - Expository prompt (2)
  - Grade 5
    - Speculative prompt
    - Expository prompt
  - Grade 6–8
    - Persuasive prompt
    - Explanatory prompt

Reading. The Reading cluster of the test requires that students read passages selected from previously published work and respond to related multiple-choice and constructed-response items. The constructed-response questions are designed to measure a student's comprehension of the reading selection/passage. Students must write their own response using examples and/or information from the reading.

There are two types of reading passages on the NJ ASK 3–8: narrative and informational.

- Narrative Reading
  - Literature written primarily to tell a story
  - Selections from previously published works
  - 500 – 1,000 words in length (approximate)
- Informational Reading
  - Nonfiction text written to convey information
  - Selections from previously published materials
  - 400 – 900 words in length (approximate)

The Reading cluster targets the following skill areas: Working with/Interpreting Text and Analyzing/Critiquing Text.

Working with/Interpreting Text involves strategies that interpret or reformulate meaning from text:

- Recognizing central idea or theme
- Recognizing supporting details
- Extrapolating information/following directions
- Paraphrasing/retelling (vocabulary)
- Recognizing text organization
- Recognizing a purpose for reading

Analyzing/Critiquing Text involves strategies to analyze and critique text:

- Questioning, clarifying, predicting
- Predicting tentative meanings
- Forming opinions about text and author's techniques
- Making judgments/drawing conclusions
- Interpreting textual conventions and literary elements

Writing. All tasks in the Writing cluster require students to write a response that is subsequently scored using the NJ Registered Holistic Scoring Rubric. The Writing cluster consists of writing tasks in response to the following types of prompts:

Grades 3–4	Grade 5	Grades 6–8
Expository prompt (2)	Speculative prompt (1)	Persuasive prompt (1)
	Expository prompt (1)	Explanatory prompt (1)

Expository prompt. In grades 3–5, there are two formats for assessing expository writing: one introduces a topic in a brief verbal prompt and asks students to develop a composition about that topic; the second format begins with a poem that introduces a topic. That topic is elaborated further by a brief verbal prompt that students use as a basis for writing their composition. The expository prompts are based on topics familiar to students and ask them to describe, discuss, explain, or analyze some aspect of the topic. Students draw on their own experience and what they know to develop their ideas for their composition. Students in Grades 3–5 have 30 minutes within which to respond to the expository prompt.

Speculative prompt. The speculative prompt presents a brief scenario. Students use that scenario as a springboard for writing a story, drawing on stories they have read as well as their own experiences to develop ideas for their own stories. In Grade 5, students have 30 minutes to plan and develop their story or composition.

Explanatory prompt. In grades 6-8, explanatory prompts present students with an essay topic based on a quotation, an adage, or a familiar topic. Each is a springboard for the student to write a composition. Explanatory writing is used to share knowledge and to convey ideas and experience. In responding to the topic or quotation presented, students are asked to explain their points of view and to create original works. Explanatory writing may be based on the writer's personal knowledge and experience or on information presented to the writer. Students in Grades 6–8 have 25 minutes within which to respond to the explanatory prompt.

Persuasive prompt. Persuasive writing prompts, which only apply to students in grades 6–8, elicit students' points of view or opinions about a given controversy. The controversies presented can be interpersonal, school/community-related, or societal in nature. Students in grades 6–8 have 45 minutes within which to respond to the persuasive prompt.

A Writer's Checklist is provided to all students during testing to encourage students to read, reread, revise, and edit their written work for all writing tasks.

Please note: In grades 6–8 each examinee's score on the Persuasive prompt is doubled and thus weighted more heavily in calculating the total score as examinees are given 45 minutes to complete the Persuasive prompt. Whereas, the examinee's score from the Explanatory prompt is not doubled because the examinees are allotted only 25 minutes to complete this writing task.

Mathematics

The mathematics test measures students' ability to solve problems by applying mathematical concepts. The mathematics component measures knowledge and skills in four content clusters corresponding to standards. These content clusters/standards and their associated strands are enumerated below:

4.1. Number and Numerical Operations

A. Number Sense
B. Numerical Operations
C. Estimation

4.2. Geometry and Measurement

A. Geometric Properties
B. Transforming Shapes
C. Coordinate Geometry
D. Units of Measurement
E. Measuring Geometric Objects

4.3. Patterns and Algebra

A. Patterns
B. Functions and Relationships
C. Modeling
D. Procedures

4.4. Data Analysis, Probability, and Discrete Mathematics

A. Data Analysis (Statistics)
B. Probability
C. Discrete Mathematics--Systematic Listing and Counting
D. Discrete Mathematics--Vertex-Edge Graphs and Algorithms

Mathematics contains both multiple-choice and constructed-response items. There are two types of constructed-response items: extended constructed-response (ECR) (previously known as open-ended) and short constructed-response (SCR). The ECR items require students to solve a problem as well as explain their solution. The SCR items only require an answer, not an explanation.

Some mathematics items are also classified and reported as Problem Solving which means that the items require problem solving skills in applying mathematical concepts (for example: solving, applying, reasoning, communicating, modeling, constructing, etc.).

Problem Solving items are defined based on the Mathematical Processes standard of the NJ CCCS: "Problem posing and problem solving involve examining situations that arise in mathematics and other disciplines and in common experiences, describing these situations mathematically, formulating appropriate mathematical questions, and using a variety of strategies to find solutions. Through problem solving, students experience the power and usefulness of mathematics. Problem solving is interwoven throughout the grades to provide a context for learning and applying mathematical ideas."

Science

The grade 4 science section measures students' ability to recall information and to solve problems by applying science concepts. This test assesses 10 core curriculum content standards – with a focus on the Life, Physical, and Earth clusters. The standards for grade 4 science are:

- Scientific Processes
- Science and Society
- Mathematical Applications
- Nature and Process of Technology
- Characteristics of Life
- Chemistry
- Physics
- Earth Science
- Astronomy and Space Science
- Environmental Studies

The reported science clusters are Life Science, Physical Science, Earth Science and Application.

For an in-depth description of the NJ ASK Science Test Specifications visit the NJ Department of Education website at:

http://www.nj.gov/education/njpep/assessment/TestSpecs/ScienceNJASK/index.html

The grade 8 science test also measures students' ability to recall information and to solve problems by applying science concepts. The science test assesses knowledge and application skills in three clusters; each cluster contains multiple-choice items and constructed-response items. The CCCS standard numbers corresponding to the three clusters are indicated in parentheses.

- **Life Science** (5.5, 5.10)
  Matter, Energy, and Organization in Living Systems
  Diversity and Biological Evolution
  Reproduction and Heredity
  Natural Systems and Interactions
  Human Interactions and Impact

- **Physical Science** (5.6, 5.7)
  Structure and Properties of Matter
  Chemical Reactions
  Motion and Forces
  Energy Transformations

- **Earth Science** (5.8, 5.9)
  Earth's Properties and Materials
  Atmosphere and Weather
  Processes that Shape the Earth
  How We Study the Earth
  Earth, Moon, Sun System
  Solar System
  Stars
  Galaxies and Universe

Science items are also classified and reported as either

- Knowledge (Comprehension and Science, Society/Technology), or
- Application (Habits of Mind/Inquiry and Mathematics)

For a complete description of the 2009 NJ ASK 3–8 test redesign, visit the following page on the NJ DOE website:

http://www.state.nj.us/education/assessment/updates/update121908_files/frame.htm#slide0024.htm

For the full text of the NJ CCCS, please visit the following page on the NJ DOE website:

http://www.nj.gov/education/cccs/

Table 2.1.1 summarizes the total points possible for each of the content areas of the operational NJ ASK administered in 2009 for grades 3 through 8. Table 2.1.2 shows the number of items by content cluster and skill.

Table 2.1.1: 2009 NJ ASK 3–8 Total Points Possible by Content Area

Language Arts Literacy	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Total	**50 points**	**59 points**	**63 points**	**70 points**	**70 points**	**70 points**
Writing	20	20	20	18	18	18
Persuasive/Speculative Prompt			10*	12*	12*	12*
Explanatory/ Expository Prompt	20*	20*	10*	6	6	6
Reading	30	39	43	52	52	52
Working with Text	12	14	18	19	21	19
Analyzing Text	18	25	25	33	31	33
Mathematics	**Grade 3**	**Grade 4**	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
Total	**50 points**	**50 points**	**50 points**	**50 points**	**52 points**	**52 points**
Number & Numerical Operations	20	20	14	13	13	13
Geometry & Measurement	11	11	12	13	13	13
Patterns & Algebra	11	11	12	12	13	13
Data Analysis, Prob., & Discrete Math	8	8	12	12	13	13
Problem Solving	*29*	*32*	*25*	*26*	*30*	*30*
Science	**Grade 3**	**Grade 4**	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
Total		**39 points**	**-**	**-**	**-**	**54 points**
Life Science		15	-	-	-	21
Physical Science		12	-	-	-	16
Earth Science		12	-	-	-	17
Knowledge		*6*	-	-	-	*9*
Application		*33*	-	-	-	*45*

*Scores doubled

Table 2.1.2: 2009 NJ ASK 3–8 Number of Items by Content Cluster and Skill

Language Arts Literacy*	Grade 3		Grade 4		Grade 5		Grade 6		Grade 7		Grade 8	
Skill	**W**	**A**	**W**	**A**	**W**	**A**	**W**	**A**	**W**	**A**	**W**	**A**
Writing	0	0	0	0	0	0	0	0	0	0	0	0
Reading	12	9	14	16	18	16	19	21	21	19	19	21
Total	**12**	**9**	**14**	**16**	**18**	**16**	**19**	**21**	**21**	**19**	**19**	**21**
Mathematics**	**Grade 3**		**Grade 4**		**Grade 5**		**Grade 6**		**Grade 7**		**Grade 8**	
Skill	**PS**	**NC**	**PS**	**NC**	**PS**	**NC**	**PS**	**NC**	**PS**	**NC**	**PS**	**NC**
Number & Numerical Operations	10	8	12	6	4	10	7	4	6	5	6	7
Geometry & Measurement	1	8	4	5	2	8	3	8	6	5	5	6
Patterns & Algebra	6	3	6	3	5	5	3	7	6	7	5	6
Data Analysis, Prob., & Discrete Math	6	2	4	4	8	2	7	5	6	5	8	3
Total	**23**	**21**	**26**	**18**	**19**	**25**	**20**	**24**	**24**	**22**	**24**	**22**
Science***			**Grade 4**								**Grade 8**	
Skill			**A**	**K**							**A**	**K**
Life Science			11	2							17	4
Physical Science			10	2							12	2
Earth Science			8	2							12	3
Total			**29**	**6**							**41**	**9**

*W = Working with Text, A = Analyzing Text, **PS= Problem Solving, NC = Not Classified, ***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 2009 NJ ASK 3–8 is included.

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

Text 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 (Speculative or Expository)				2	30 minutes each	20 (10 points each)*
Reading Passages	3	18 (Grade 3) 27 (Grade 4) 31 (Grade 5)	3 (Grade 3) 3 (Grade 4) 3 (Grade 5)		30 minutes each	30** (Grade 3) 39** (Grade 4) 43** (Grade 5)
Total	3	18 (Grade 3) 27 (Grade 4) 31 (Grade 5)	3 (Grade 3) 3 (Grade 4) 3 (Grade 5)	2	150	50 (Grade 3) 59 (Grade 4) 63 (Grade 5)

*Grades 3 - 5 utilize a 5-point scoring rubric. **O/E items in the reading passages are scored on a 0 – 4 scoring rubric.

Table 2.1.4: Actual Test Map for 2009 Grade 3 Language Arts Literacy NJ ASK

CLUSTER	MACRO	MC (1 pt.)	CR (4 pts.)	# of Items	# of Points
	1	0	0	0	0
	2	1	0	1	1
A	**3**	0	1	1	4
	4	4	2	6	12
	5	1	0	1	1
A Total		**6**	**3**	**9**	**18**
	1	1	0	1	1
	2	3	0	3	3
W	**3**	4	0	4	4
	4	1	0	1	1
	5	3	0	3	3
W Total		**12**	**0**	**12**	**12**
WRITE	EXPOSITORY		1	1	10
WRITE	EXPOSITORY		1	1	10
Total Writing			**2**	**2**	**20**
Grand Total		**18**	**5**	**23**	**50**

Table 2.1.5: Actual Test Map for 2009 Grade 4 Language Arts Literacy NJ ASK

CLUSTER	MACRO	MC (1 pt.)	CR (4 pts.)	# of Items	# of Points
	1	0	0	0	0
	2	1	0	1	1
A	**3**	0	3	3	12
	4	7	0	7	7
	5	5	0	5	5
A Total		**13**	**3**	**16**	**25**
	1	3	0	3	3
	2	3	0	3	3
W	**3**	3	0	3	3
	4	3	0	3	3
	5	2	0	2	2
W Total		**14**	**0**	**14**	**14**
WRITE	EXPOSITORY		1	1	10
WRITE	EXPOSITORY		1	1	10
Total Writing			**2**	**2**	**20**
Grand Total		**27**	**5**	**32**	**59**

Table 2.1.6: Actual Test Map for 2009 Grade 5 Language Arts Literacy NJ ASK

CLUSTER	MACRO	MC (1 pt.)	CR (4 pts.)	# of Items	# of Points
	1	0	0	0	0
	2	1	0	1	1
A	**3**	0	2	2	8
	4	5	0	5	5
	5	7	1	8	11
A Total		**13**	**3**	**16**	**25**
	1	2	0	2	2
	2	7	0	7	7
W	**3**	4	0	4	4
	4	2	0	2	2
	5	3	0	3	3
W Total		**18**	**0**	**18**	**18**
WRITE	SPECULATIVE		1	1	10
WRITE	EXPOSITORY		1	1	10
Total Writing			**2**	**2**	**20**
Grand Total		**31**	**5**	**36**	**63**

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

Text types/Strand (additional field test content embedded throughout)	Reading Selections	MC (Number of Items)	OE (Number of Items)	Writing Tasks (Number of Items)	Time on Task(s) in Approximate Minutes	Total Points
Persuasive Prompt				1	45	12*
Explanatory Prompt				1	25	6*
Reading Passages	4	36	4		120	52**
Total	4	36	4	2	190	70

*Grades 6-8 utilize a 6-point rubric. **O/E items in the reading passages are scored on a 0 – 4 scoring rubric.

Table 2.1.8: Actual Test Map for 2009 Grade 6 Language Arts Literacy NJ ASK

CLUSTER	MACRO	MC (1 pt.)	CR (4 pts.)	# of Items	# of Points
A	**1**	1	0	1	1
	2	0	1	1	4
	3	2	3	5	14
	4	9	0	9	9
	5	5		5	5
A Total		**17**	**4**	**21**	**33**
W	**1**	2	0	2	2
	2	6	0	6	6
	3	2	0	2	2
	4	4	0	4	4
	5	4	0	4	4
	6	1	0	1	1
W Total		**19**	**0**	**19**	**19**
WRITE	EXPLANATORY		1	1	6
WRITE	PERSUASIVE		1	1	12
Total Writing			**2**	**2**	**18**
Grand Total		**36**	**6**	**42**	**70**

Table 2.1.9: Actual Test Map for 2009 Grade 7 Language Arts Literacy NJ ASK

CLUSTER	MACRO	MC (1 pt.)	CR (4 pts.)	# of Items	# of Points
A	**1**	0	0	0	0
	2	3	0	3	3
	3	1	3	4	13
	4	3	1	4	7
	5	8	0	8	8
A Total		**15**	**4**	**19**	**31**
W	**1**	2	0	2	2
	2	7	0	7	7
	3	3	0	3	3
	4	4	0	4	4
	5	3	0	3	3
	6	2	0	2	2
W Total		**21**	**0**	**21**	**21**
WRITE	EXPLANATORY		1	1	6
WRITE	PERSUASIVE		1	1	12
Total Writing			**2**	**2**	**18**
Grand Total		**36**	**6**	**42**	**70**

Table 2.1.10: Actual Test Map for 2009 Grade 8 Language Arts Literacy NJ ASK

CLUSTER	MACRO	MC (1 pt.)	CR (4 pts.)	# of Items	# of Points
A	**1**	0	0	0	0
	2	8	0	8	8
	3	0	3	3	12
	4	6	1	7	10
	5	3	0	3	3
A Total		**17**	**4**	**21**	**33**
W	**1**	2	0	2	2
	2	3	0	3	3
	3	7	0	7	7
	4	2	0	2	2
	5	3	0	3	3
	6	2	0	2	2
W Total		**19**	**0**	**19**	**19**
WRITE	EXPLANATORY		1	1	6
WRITE	PERSUASIVE		1	1	12
Total Writing			**2**	**2**	**18**
Grand Total		**36**	**6**	**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
Calculator active except where noted

		Grade 3	Grade 4	Grade 5
Item Count by Type (does not include embedded field test content)	MC	35	35	35
	SCR	6 (non-calculator)	6 (non-calculator)	6 (non-calculator)
	ECR	3	3	3
Total raw score points possible		50	50	50
Approximate total testing time (including field test content)		114 min.	114 min.	114 min.

Table 2.1.12: Actual Test Map for 2009 Grade 3 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	5	0	2	7	7
	B	5	1	1	7	9
	C	4	0	0	4	4
1 Total		14	1	3	18	20
2	A	2	1	0	3	5
	B	1	0	0	1	1
	C	1	0	1	2	2
	D	2	0	0	2	2
	E	1	0	0	1	1
2 Total		7	1	1	9	11
3	A	2	0	0	2	2
	B	2	0	1	3	3
	C	1	1	0	2	4
	D	2	0	0	2	2
3 Total		7	1	1	9	11
4	A	1	0	1	2	2
	B	2	0	0	2	2
	C	2	0	0	2	2
	D	2	0	0	2	2
4 Total		7	0	1	8	8
Grand Total		**35**	**3**	**6**	**44**	**50**

Table 2.1.13: Actual Test Map for 2009 Grade 4 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	5	1	0	6	8
	B	6	0	3	9	9
	C	3	0	0	3	3
1 Total		14	1	3	18	20
2	A	1	0	1	2	2
	B	1	0	0	1	1
	C	2	1	0	3	5
	D	1	0	0	1	1
	E	2	0	0	2	2
2 Total		7	1	1	9	11
3	A	2	0	0	2	2
	B	1	1	0	2	4
	C	2	0	1	3	3
	D	2	0	0	2	2
3 Total		7	1	1	9	11
4	A	1	0	1	2	2
	B	2	0	0	2	2
	C	2	0	0	2	2
	D	2	0	0	2	2
4 Total		7	0	1	8	8
Grand Total		**35**	**3**	**6**	**44**	**50**

Table 2.1.14: Actual Test Map for 2009 Grade 5 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	5	0	1	6	6
	B	3	0	1	4	4
	C	3	0	1	4	4
1 Total		11	0	3	14	14
2	A	2	0	0	2	2
	B	1	0	0	1	1
	C	2	0	0	2	2
	D	2	0	0	2	2
	E	1	1	1	3	5
2 Total		8	1	1	10	12
3	A	3	1		4	6
	B	1	0	0	1	1
	C	3	0	0	3	3
	D	1	0	1	2	2
3 Total		8	1	1	10	12
4	A	2	1	1	4	6
	B	2	0	0	2	2
	C	2	0	0	2	2
	D	2	0	0	2	2
4 Total		8	1	1	10	12
Grand Total		**35**	**3**	**6**	**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 Calculator active except where noted				
		Grade 6	Grade 7	Grade 8
Item Count by Type (does not include embedded field test content)	MC	35	35	35
	SCR	6 (non-calculator)	8	8
	ECR	3	3	3
Total raw score points possible		50	52	52
Approximate total testing time (including field test content)		114 min.	118 min.	128 min.

Table 2.1.16: Actual Test Map for 2009 Grade 6 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	4	1	1	6	8
	B	3	0	1	4	4
	C	1	0	0	1	1
1 Total		8	1	2	11	13
2	A	2	0	0	2	2
	B	0	0	1	1	1
	C	1	0	0	1	1
	D	3	0	0	3	3
	E	2	1	1	4	6
2 Total		8	1	2	11	13
3	A	3	1	0	4	6
	B	0	0	0	0	0
	C	2	0	1	3	3
	D	3	0	0	3	3
3 Total		8	1	1	10	12
4	A	4	0		4	4
	B	2	0	1	3	3
	C	4	0	0	4	4
	D	1	0	0	1	1
4 Total		11	0	1	12	12
Grand Total		**35**	**3**	**6**	**44**	**50**

Table 2.1.17: Actual Test Map for 2009 Grade 7 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	3	0	1	4	4
	B	2	1	1	4	6
	C	3	0	0	3	3
1 Total		8	1	2	11	13
2	A	2	0	1	3	3
	B	2	0	0	2	2
	C	1	1	1	3	5
	D	2	0	0	2	2
	E	1	0	0	1	1
2 Total		8	1	2	11	13
3	A	1	0	1	2	2
	B	1	0	0	1	1
	C	6	0	0	6	6
	D	3	0	1	4	4
3 Total		11	0	2	13	13
4	A	2	1	0	3	5
	B	4	0	0	4	4
	C	1	0	1	2	2
	D	1	0	1	2	2
4 Total		8	1	2	11	13
Grand Total		**35**	**3**	**8**	**46**	**52**

Table 2.1.18: Actual Test Map for 2009 Grade 8 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	4	0	0	4	4
	B	4	0	1	5	5
	C	3	0	1	4	4
1 Total		11	0	2	13	13
2	A	1	0	1	2	2
	B	1	1	0	2	4
	C	3	0	0	3	3
	D	2	0	0	2	2
	E	1	0	1	2	2
2 Total		8	1	2	11	13
3	A		1	1	2	4
	B	2	0	0	2	2
	C	3	0	0	3	3
	D	3	0	1	4	4
3 Total		8	1	2	11	13
4	A	2	0	1	3	3
	B	2	1	0	3	5
	C	2	0	0	2	2
	D	2	0	1	3	3
4 Total		8	1	2	11	13
Grand Total		35	3	8	**46**	**52**

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

- Science assessment includes four parts –
- Each multiple choice item is worth one point; each open-ended item is worth up to three points.
- Each open-ended item is scored using an item-specific rubric
- Life Science – 40% of the test
- Physical Science – 30% of the test
- Earth Science – 30% of the test

		Grade 4	Grade 8
Item Count by Type (does not include field test content)	MC	33	48
	OE	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 2009 Grade 4 Science NJ ASK

Cluster	Cog/Prob	MC (1 pt.)	CR (3 pts.)	# of Items	# of Points
Earth	A	7	1	8	10
	K	2	0	2	2
Earth Total		9	1	10	12
Life	A	10	1	11	13
	K	2	0	2	2
Life Total		12	1	13	15
Physical	A	10	0	10	10
	K	2	0	2	2
Physical Total		12	0	12	12
Grand Total		**33**	**2**	**35**	**39**

Table 2.1.21: Actual Test Map for 2009 Grade 8 Science NJ ASK

Cluster	Cog/Prob	MC (1 pt.)	CR (3 pts.)	# of Items	# of Points
Earth	A	11	1	12	14
	K	3	0	3	3
Earth Total		14	1	15	17
Life	A	17	0	17	17
	K	4	0	4	4
Life Total		21	0	21	21
Physical	A	11	1	12	14
	K	2	0	2	2
Physical Total		13	1	14	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 New Jersey Core Curriculum Content Standards (CCCS). All items developed and field tested for the 2009 NJ ASK went through the following steps of the item development process:

- MI wrote items to ASK standards
- MI content experts reviewed items
- NJ state content experts reviewed items
- NJ teachers and a sensitivity committee reviewed items to determine whether items could be field-tested
- Range-finding committee involving state educators reviewed items before scoring
- Items field-tested with New Jersey students
- State content experts, NJ teachers, and a sensitivity committee reviewed items again after field-testing.
- Approved items placed in item bank

Some of the items residing in the NJ ASK item bank and used on the 2009 NJ ASK assessments were developed by Riverside Publishing and Educational Testing Service (ETS). The item development procedures are described below.

Riverside[22]:

- Riverside: Created test and item specifications based on requirements of state
- Riverside: Selected and trained item writers
- Item Writers: Wrote test items
- Riverside: Conducted initial item review
- Riverside: Conducted item review by experienced senior staff
- Riverside: Conducted content and bias review with committees comprised of educators
- Field-tested items with New Jersey students (1998), with Ohio students, or with Georgia students
- Riverside: Conducted Statistical Item Review

[22] Riverside was the administrator for the grades 5-7 NJ ASK from 2006-2007.

In December 2005, January 2006, and fall of 2006 the following additional development processes were undertaken.

- Riverside: Aligned items to the CCCS
- NJ DOE: Approved alignment of items, including the balance of standards reflected in the test blueprint; also improved item quality
- Removed all items that did not have NJ DOE approval for adherence to the CCCS

ETS[23]:

1. NJDOE and ETS: Review test specifications and create item specifications
2. ETS: Select and train item writers
3. Item Writers: Write test items
4. ETS: Conduct initial item review
5. ETS: Conduct item review by experienced senior staff
6. NJDOE: Conduct content and bias review with test committees
7. Items are field tested
8. NJDOE: Conduct Statistical Item Review with test committees
9. Approved items go into the item bank

Only an item that has been found acceptable at every stage of the cycle is entered into the bank for possible use on an operational test. Although statistical data on test items play an essential role, this cycle of development employs a due process model of validity. This model relies on the expertise of educators participating in the test development process. The strength of this process is dependent on the degree to which the following critical components are integrated into the test development process:

- Recruitment of educators familiar with the state's content specifications and population for the assessment;
- Training of item writers and reviewers on item writing specifications, content specifications, and the goals and functions of the assessment;
- the degree to which the items measure the knowledge, skills, and abilities the assessment is intended to measure with opportunities to reject or revise items per committee recommendation; and
- Sensitivity to guarantee that performance on the item is related to classroom achievement and not cultural or social experiences outside the classroom with opportunities to reject or revise items per committee recommendation.

At MI, item writers are instructed on the state specifications and item types necessary for the tests. They are trained on the ASK content specifications and directed to write original items tailored to NJ content standards. Content expert reviewers at MI validate (or not) the initial coding of items by item writers to meet ASK content standards. At this point in the process,

[23] ETS was the vendor for the grade 4 NJ ASK from 2003-2008. ETS assumed responsibility for grade 3 NJ ASK in 2004-2008.

some items are rejected from further consideration on the grounds that the items are not tied closely enough to ASK standards or are not at an appropriate level of difficulty.

When NJ educators review items, they look beyond the item wording and scoring rubric. In mathematics, teachers validate an assignment of each item to a NJ content specification Standard and Strand using the same standards used for the ASK. Teachers also review an item assignment to a Knowledge or Problem-solving category. LAL committee members review the type of passage and skill cell of each LAL item. For all content review meetings, reviewers are furnished copies of the NJ skill code (LAL) and Strand-Standard (MATH and SCI) sheets to allow committee members to validate assignment of items to NJ content standards. Reviewers may accept or revise an item coding assignment, or reject an item as not fulfilling any specific part of the content specifications. For each item, both committees also rate each item for a level of difficulty.

All test items are field tested and reviewed again before they can be used as operational test items. For the statistical item review, the Mantel-Haenszel statistic is calculated to show whether or not students are responding to an item in a way that their overall ability (as measured by the base test) would lead us to expect. The statistic allows the committees to examine group membership (by ethnicity or by gender). The Mantel-Haenszel statistic is used for a classification determination of category A, B, or C. An item in Category A shows no or minor relationship between group membership and performance. Category B items show small to moderate relationship between membership and performance. Category C items show a substantial relationship between group membership and item performance and must be examined carefully by the committees to make sure these items are not biased. Items are assessed for DIF only when they are field tested. DIF analyses are not conducted on operational items.

A separate sensitivity committee meets to review LAL passages before field-testing to identify potential item bias. After field-testing, the same committee reviews all MC and CR items flagged as Mantel-Haenszel "C" items (probable DIF) in LAL, mathematics, and science using student data disaggregated by demographic group for all tests. Like the content committee, the sensitivity committee has the power to reject an item. If either the sensitivity committee or content committee rejects an item, it is considered rejected. If one requires that the item be revised, that decision outweighs an acceptance by the other committee.

Each field tested item has a Mantel-Haenszel statistics for each of three comparisons that New Jersey student population will support. A White/African American, White/Hispanic, and Male/Female comparison for each item is done with sample sizes for the focus group (African Americans, Hispanic, or Females) greater than 500. A small number of the 2009 NJ ASK operational items were flagged as Mantel-Haenszel "C" items. All of these items were reviewed by the sensitivity committee and none appeared to exhibit bias.

At item review sessions, items are presented one-per-page with the footer below. This footer is used for LAL, mathematics, and science. This is a critical step in the item review process as it records, item by item, the appropriateness of each item for the assessment. Only items approved by both the content and sensitivity committees are field tested.

Sensitivity	Content
*Comments:	*Comments:
Sensitivity Issue Yes No	Meets Specifications Yes No
If yes, identify category and explain*	Appropriate Difficulty Yes No
	Accurate Coding Yes No
Definitely Use	Definitely Use
Revise and Use With Approval	Revise and Use With Approval
Revise and Resubmit	Revise and Resubmit
Do Not Use*	Do Not Use*

At the bottom of each footer there is a place for committee members to sign off on their decision:

_____ _____

Sensitivity Sign-off Date Content Chairperson's Signature Date

Test Form Distribution

Before Spring of 2007, the NJ DOE developed items for the NJ ASK using a standalone field-test format. Beginning with the operational administration in Spring of 2007, the NJ DOE began embedding field test items for LAL, mathematics, and science. Thus, twenty-two forms of the 2009 NJ ASK assessments were distributed to New Jersey schools. Each of the 22 test forms at each grade level included identical base test items as well as field test items. Note that students earned scores only on the identical common items. The 22 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 (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 was represented across each form. Finally, approximately equal numbers of students (approximately 5,500) 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.

2.3 Item Review Process

Following a field test, the NJ DOE conducts a statistical analysis review session with New Jersey teachers. The teachers on the content and sensitivity committees review the items and evaluate the performance of the items based on field test data. The following variables are included:

Item ID
N-count
p-value
Biserial correlation
% answering each option (A-D) and omits
p-value for bottom 20%
p-value for top 20%
% of Whites answering each option (A-D) and omits; N-count for Whites
% of Blacks answering each option (A-D) and omits; N-count for Blacks
% of Hispanics answering each option (A-D) and omits; N-count for Hispanics
% of Males answering each option (A-D) and omits; N-count for Males
% of Females answering each option (A-D) and omits; N-count for Females
Total Reading Score for students taking that form
Total Writing Score for students taking that form
CR items' mean score
Correlation of each CR item with total reading score
Correlation of each CR item with total writing score
CR item score distribution, frequency, percent, mean, and standard deviation for total group
CR item score distribution, frequency, percent, mean, and standard deviation for Whites
CR item score distribution, frequency, percent, mean, and standard deviation for Blacks
CR item score distribution, frequency, percent, mean, and standard deviation for Hispanics
CR item score distribution, frequency, percent, mean, and standard deviation for Males
CR item score distribution, frequency, percent, mean, and standard deviation for Females
Mantel-Haenszel statistics

For the meeting, teachers are provided with a training session on how to interpret these statistics. To draw their attention to items that may be problematic, several flags are used. The flags include:

Difficulty flag to indicate that an item has a *p*-value less than 0.25 or greater than 0.95
Correlation flag to indicate an item that has an item-total correlation of less than 0.25
Mantel-Haenszel flags to indicate any group comparison flagged as "C" using the standard ETS coding of Mantel-Haenszel results into A, B, C

At the statistical review meetings, teachers are presented with forms similar to those used at initial item development meetings. The teachers must decide whether to:

- **Accept (Definitely Use):** All content related issues (importance, theme, grammar, clarity, accuracy, validity, soundness of measurement, grade-appropriateness), all statistical criteria, and all sensitivity issues have been met or exceeded and the item appears suitable for operational use.
- **Revise (Revise and Re-Field Test):** One or more of the content related issues have not been met or the item needs minor changes to make it acceptable. Reviewers provide recommendations on changes to be made to the item that will make the item suitable for re-field testing.
- **Reject (Do Not Use):** Several content related issues, statistical criteria, or sensitivity issues have not been met, or are suspect, or need radical changes to make the item acceptable. In such cases, the item may be vague or ambiguous, inappropriate, or not clearly related to the text or to the standard. Without severe modifications, it is unlikely to be salvaged. Reviewers provide comments as to why the item should be rejected.
- **Revise and Use With Approval:** A very minor content related issue needs to be resolved and the NJ DOE content representative feels it is minor enough to use operationally without re-field testing.

Only items designated as revise and use with approval or accepted by both committees are added to the item bank for possible use on future operational tests. The decision regarding each item must be recorded on forms like the following:

ITEM CODE AND KEY	**Admin: March 2008**	**Form:**	**Position:**
***Comments**		***Comments**	
Sensitivity Issue	☐ **Yes** ☐ **No**	**Appropriate Difficulty**	☐ **Yes** ☐ **No**
If a sensitivity issue, explain* **Mantel-Haenszel Category C W-AA W-H M-F**		P-value = Biserial =	

☐	**Definitely Use**	☐
☐	**Revise and Use With Approval ****	☐
☐	**Revise and Re-Field Test**	☐
☐	**Do Not Use ***	☐

Sensitivity Sign-Off	**Date**	**Content Chairperson's Signature**	**Date**

**** Requires director's approval**

2.4 Item Use

All field-test items approved for use on an operational test form are moved into the item bank. Test development staff members choose from the available banked items when building an operational test form. In most cases, a test item is used operationally one time, unless the item is used a second time as an anchor item. After operational use, items are generally retired.

2.5 Test Forms Assembly

There are four steps associated with assembling test forms for NJ ASK:

1. Determine form design
2. Select items that meet content specifications
3. Evaluate statistical specifications and select items to meet these specifications
4. Review and approve test forms

1. **Determine form design** – Each form consists of a set of operational items along with embedded field test items.

2. **Select items that meet content specifications** – Each content area contains subsets of items called clusters.

   a. LAL includes two clusters: Writing (Writing about a Persuasive prompt or Writing about a Speculative prompt) and Reading (Working with or Interpreting Text and Analyzing or Critiquing Text).

   b. Mathematics includes four clusters: Number and Numerical Operations; Geometry and Measurement; Patterns and Algebra; and Data Analysis, Probability, and Discrete Mathematics. Some mathematics items are also classified and reported as Problem Solving which means that the items require problem solving skills in applying mathematical concepts.

   c. Science includes three clusters: Life, Physical, and Earth Sciences. In addition, items are classified and reported as Knowledge or Application which means the item requires recall of factual information or application of scientific concepts.

Future test forms must be similar to previous forms in terms of the number of items, the number of points, and the distribution of the content.

3. **Evaluate statistical specifications and select items to meet these specifications** – Statistical specifications based on previous forms provide guidelines for building new test forms. These data are reviewed to make certain that current forms are not substantially harder or easier than previous forms. Linking designs are also evaluated at this stage.

4. **Final approval of forms** – Once the content and statistical specifications have been met for each grade and subject, and approved internally within MI, the forms are approved by the NJ DOE. The forms are then released for editorial reviews then production.

Checklists and quality control procedures accompany each stage of forms development. A checklist for forms development is attached as Appendix B.

2.6 Quality Control for Test Construction

Jointly, MI and the NJ DOE ensure that the content and editorial quality of the test booklets meet or exceed the state's expectations for NJ ASK. This requires consistent vigilance and quality control checks during the test booklet assembly process. The test booklet assembly process includes the following steps:

- operational tests are assembled from the approved NJ ASK test designed using field-tested items that are proven valid and fair to all students;
- test booklets are assembled using approved general and NJ ASK style guidelines;
- typeset test booklets are proofread by two editorial staff members for typographical and format errors, as well as to determine whether the version of the item used is consistent with the field-tested version;
- test booklets are sent to NJ DOE for a typeset review;
- MI makes revisions requested by NJ DOE, repeating the process until NJ DOE approves the test booklet;
- upon NJ DOE approval, the operational test booklet is sent to a proofreading agency external to MI for an independent review;
- the final approved version of the test booklet is then converted to a Portable Document Format (pdf) electronic file for printing;
- the pdf version of the test booklet is proofread by editorial staff before submitting to the printing manager.
- MI project management staff reviews the first copies of the production run of the test booklets for possible problems.

Ancillary test materials are subject to the same consistent vigilance and quality control. The following procedures apply to all ancillary test materials:

- typeset copies are proofread by at least two editorial staff members
- typeset copies are then submitted to NJ DOE for a typeset review
- NJ DOE must approve materials prior to printing
- approved versions of the ancillary materials are converted to pdf files for printing.

All accommodated materials are also subject to consistent vigilance and quality control at all stages.

- The large print test and supporting materials are subject to the same assembly quality control discussed previously.
- The Braille translation of the test and supporting materials is performed by an independent, certified translation agency.
- The large print and Braille versions of the test materials are then submitted to NJ DOE for review by specialists from the state commission for the blind.
- Revisions to the materials are made based on recommendations from these state specialists, and then the accommodated materials are sent to production.
- The Spanish translation of the test and supporting materials is performed by Second Language Testing, Inc.

PART 3: TEST ADMINISTRATION

Great care is taken to assure 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 2009 Test Coordinator Manual Grades 3–8*)**.** That information will not be 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 its 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 2009 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 2009 Test Coordinator Manual Grades 3–8***.** The NJ ASK 3–8 was administered according to the following schedule:

Table 3.3.1 2009 NJ ASK Testing Window

	Test Dates		**Testing[24] Time (minutes)**				
			LAL		Math		Science
	Regular testing	Make-up testing	Day 1	Day 2	Day 3	Day 4	Day 4
Grade 3	5/4/09 – 5/8/09	5/11/09 – 5/15/09	90	90	54	60	N/A
Grade 4	5/4/09 – 5/8/09	5/11/09 – 5/15/09	90	90	54	60	60
Grade 5	5/11/09 – 5/14/09	5/18/09 – 5/21/09	90	90	45	69	N/A
Grade 6	5/11/09 – 5/14/09	5/18/09 – 5/21/09	105	130	45	69	N/A
Grade 7	4/28/09 – 5/1/09	5/4/09 – 5/7/09	105	130	49	69	N/A
Grade 8	4/28/09 – 5/1/09	5/4/09 – 5/7/09	105	130	128	N/A	120

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.

[24] Does not include administrative time

- 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
- 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.

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 State Assessments, NJ ASK 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 disaggregations of special education and Section 504 students by the specific accommodation or modification required. 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. These tables show the performance results of students classified as either special education or Section 504. Descriptive statistics are also provided for those students classified as Section 504 or special education who were tested without accommodations or modifications.

Table 3.4.1: Statistics for Students Classified as Special Education

Content Area	Grade	Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
LAL	3	Yes	33676	180.69	26.48	100	300	74.56	24.99	0.45
		No	4681	190.05	42.98	100	300	47.75	48.00	4.25
	4	Yes	38735	178.80	28.25	100	300	75.05	24.42	0.53
		No	3892	189.94	45.2	100	300	46.84	48.30	4.86
	5	Yes	40868	182.03	21.19	100	299	33.47	62.70	3.83
		No	2467	202.86	28.94	100	300	41.75	52.66	5.59
	6	Yes	41374	184.19	23.44	100	275	71.92	27.72	0.35
		No	1795	198.28	29.77	100	285	47.19	48.64	4.18
	7	Yes	42507	182.55	28.25	100	300	69.63	28.84	1.52
		No	1637	195.07	34.39	100	300	53.33	39.16	7.51
	8	Yes	43935	196.75	21.34	114	293	53.64	45.68	0.69
		No	1516	201.54	25.67	114	287	46.17	50.59	3.23
Math	3	Yes	33438	201.27	40.57	100	300	48.86	37.76	13.38
		No	4101	225.47	41.59	100	300	25.65	43.26	31.09
	4	Yes	38487	196.97	39.70	100	300	52.81	36.24	10.95
		No	3380	221.72	40.71	100	300	27.6	45.41	26.98
	5	Yes	40975	198.22	36.49	100	300	52.45	37.08	10.46
		No	2467	222.67	40.04	100	300	28.29	42.89	28.82
	6	Yes	41447	188.60	31.63	100	290	65.98	28.74	5.29
		No	1795	206.12	40.14	113	300	47.24	35.1	17.66
	7	Yes	42648	178.80	33.63	117	300	73.32	23.11	3.57
		No	1642	192.01	41.61	100	300	57.49	31.06	11.45
	8	Yes	43777	158.78	36.55	115	300	70.77	24.81	4.40
		No	1514	187.77	46.26	100	300	59.51	28.07	12.42

Content Area	Grade	Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
Science	4	Yes	38440	222.85	31.25	121	287	22.42	52.11	25.47
		No	3391	238.24	28.95	140	287	11.09	42.05	46.86
	8	Yes	43796	206.64	26.71	114	300	42.22	50.32	7.46
		No	1516	212	32.62	141	300	39.91	44.66	15.44

Table 3.4.2: Statistics for Students Classified as Section 504

Content Area	Grade	Accommodations	N	Mean	STD	Min	Max	%PP	%P	%AP
LAL	3	Yes	3779	197.91	23.28	100	300	49.51	48.82	1.67
		No	319	206.4	24.39	100	295	33.86	62.7	3.45
	4	Yes	4832	199.95	24.31	100	296	46.48	51.12	2.40
		No	388	207.88	25.95	100	277	34.79	59.54	5.67
	5	Yes	4872	203.13	22.50	100	299	40.97	56.32	2.71
		No	393	210.66	24.6	148	290	31.30	61.07	7.63
	6	Yes	4354	206.89	21.01	140	290	33.93	62.49	3.58
		No	442	211.35	22.13	154	295	27.38	67.19	5.43
	7	Yes	4108	211.17	27.11	118	300	29.40	60.03	10.57
		No	444	218.37	27.13	139	300	19.59	64.41	15.99
	8	Yes	3853	218.91	19.61	123	293	14.04	79.24	6.72
		No	1637	195.07	34.39	100	300	53.33	39.16	7.51
Math	3	Yes	3787	223.77	37.61	105	300	25.29	47.87	26.83
		No	318	230.27	37.12	139	300	18.87	47.48	33.65
	4	Yes	4833	223.03	37.44	109	300	26.15	47.82	26.03

Content Area	Grade	Accommodations	N	Mean	STD	Min	Max	%PP	%P	%AP
		No	389	225.97	39	109	300	25.45	44.99	29.56
	5	Yes	4874	224.24	33.67	125	300	22.77	51.95	25.28
		No	395	228.44	35.85	116	300	19.75	49.87	30.38
	6	Yes	4361	216.78	32.61	128	290	31.44	49.00	19.56
		No	442	221.2	31.6	134	300	24.66	53.85	21.49
	7	Yes	4108	213.59	34.21	117	300	34.03	48.08	17.89
		No	449	218.95	35.9	129	300	28.73	48.11	23.16
	8	Yes	3844	220.08	36.86	115	300	24.90	50.91	24.19
		No	439	229.59	36.99	115	300	20.5	47.38	32.12
Science	4	Yes	4821	239.94	26.02	157	287	7.61	46.88	45.51
		No	388	244.12	26.71	145	284	7.22	37.89	54.90
	8	Yes	3833	231.60	28.65	157	300	12.34	59.82	27.84
		No	439	241.74	28.78	162	300	6.61	49.66	43.74

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

Scorer Selection

MI employs experienced readers and recruits new ones as needed through advertising in local newspapers, with the job services, and elsewhere. Individuals selected as scorers must have a four-year college degree in English, language arts, education, mathematics, science, or a related field. Each qualified applicant must perform successfully in an interview, write an acceptable essay, and receive good recommendations from references.

All files of the returning staff are reviewed to find team leaders, who are experienced with a record of good performance on previous projects and who have been recommended for promotion to the team leader position.

Range Finding

Range finding meetings are conducted to establish "true" scores for a representative sample of papers. Between 100 and 220 sample papers per task are chosen either from the available field test papers or from the current test administration. For items using specific rubrics, the rubrics are discussed and refined. The sample responses brought to the range finding meetings are selected from a broad range of New Jersey school districts in order to ensure that the sample is representative of overall student performance. To maximize the probability that papers eligible for the highest score points are included in the sample, special efforts are made to ensure that papers from the typically higher performing DFGs are included in the sample. The range finding committees consist of NJ DOE content specialists, NJ teacher representatives, MI management personnel, as well as the scoring director responsible for each content area.

Field Test Range Finding

Prior to field test scoring, content committees consisting of NJ DOE personnel, NJ teacher representatives, and MI leadership personnel meet in New Jersey to determine "true" scores for 30 selected papers representing each of the score points for each item to be tested. Field test scoring guides and training sets are developed using the papers scored at the range finding.

Developing Scoring Guides

After the range finding meeting, training materials are developed consisting of an anchor set (examples of responses for each score point) and training/qualifying sets (practice papers) for each task using the responses scored at range finding. Anchor sets usually consist of three, or more, annotated examples of each score point in score point order. Training/qualifying sets consist of clearly anchored papers in random score point order. Please see scoring rubrics in Appendix D.

Team Leader Training and Qualifying

After the anchor papers, training, and qualifying papers have been identified and finalized, team leader training is conducted by the scoring director for each task, a process which typically takes up to four days depending on the content. Procedures are similar to those for training scorers but are more comprehensive, dealing with resolution of discrepant scores, identification of non-scorable responses, unusual prompt treatment, alert situation responses (e.g., child-in-danger), and other duties performed only by team leaders. Team leaders take notes on the training papers in preparation for discussion with the scorers, and the scoring directors counsel team leaders on application of the rubric and training techniques. Effective scorer training relies to a great extent on having knowledgeable, flexible team leaders. Team leaders assist in training scorers in discussions of training sets and are responsible for distributing, collecting, and accounting for training packets and sample papers during each

scoring session. During scoring, team leaders respond to questions, spot-check scorer packets, and counsel scorers having difficulty with the criteria.

Team leaders also administer the quality control validity sets, monitor the scoring patterns of each scorer throughout the project, conduct retraining as necessary, perform some resolution readings, and maintain a professional working environment.

Scorer Training/Qualifying

All scorers are trained using the rubrics, anchor papers, training papers, and qualifying papers selected during the range finding meetings and approved by the NJ DOE. Scorers are assigned to a scoring group consisting of one team leader and 10–12 scorers. After the contracts and nondisclosure forms are signed, training begins. Scorer training follows the same format as team leader training. The scoring director introduces the set of anchor papers and thoroughly discusses each score point. This presentation is followed by practice scoring on the training sets. Scorers break into teams to discuss the papers in the training sets. This arrangement gives scorers an opportunity to discuss any possible points of confusion or problems in understanding the criteria in a small group setting.

Team leaders collect the monitor sheets after the scoring of each training set, and record results on a customized log which is examined by the scoring director to determine which papers are giving scorers difficulty. The scoring director also "floats" from team to team, listening to the team leaders' explanations and adding additional information when necessary. If a particular paper or type of paper seems to be causing difficulty across teams, the problem is discussed with the room at large to ensure that everyone hears the same explanation.

Scorers must demonstrate their ability to score accurately by attaining 90% adjacent agreement (within one point) percentage on the qualifying sets before they read packets of actual papers. Any reader unable to meet the standards set by the NJ DOE is dismissed. All scorers understand this stipulation when they are hired.

Training is carefully orchestrated so that scorers understand how to apply the rubric in scoring the papers, learn how to reference the scoring guide, develop the flexibility needed to deal with a variety of responses, and retain the consistency needed to score all papers accurately. In addition to completing all of the initial training and qualifying, a significant amount of time is allotted for demonstrations of paper flow, explanations of "alerts" and "flagging," and instructions about other procedures which are necessary for the conduct of a smooth project.

Levels of staffing for scoring of the 2008 NJ ASK are listed in Table 4.2.1. 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 - 2009 NJ ASK

Content Area	Grade	Scorers	Team Leaders	Scoring Director
LAL				
	3	190	22	5
	4	192	22	5
	5	187	21	5
	6	161	14	6
	7	157	12	6
	8	192	18	6
Math				
	3	72	4	3
	4	45	3	3
	5	49	5	1
	6	63	3	3
	7	45	3	3
	8	84	4	3
Science				
	4	20	0	2
	8	20	0	2

Monitoring Scorer Performance

The quality of each scorer's work is monitored throughout every project. Methods used to monitor scorers' scoring habits in this project include the use of Daily Reader Status Reports.

Each student writing sample was scored holistically using the Registered Holistic Scoring Method. Beginning in 2009, only one reader was used to score the LAL writing tasks. In previous years, two readers scored the LAL writing tasks; however, a single reader scored the constructed response items in LAL, mathematics, and science. Thus, the only change in 2009 is the use of a single reader for the writing tasks. Validity packets (benchmark papers) were incorporated to ensure that raters were scoring accurately. In addition, ten percent of the responses were independently scored by a second reader to obtain statistical data in order to calculate reader accuracy (inter-rater reliability).

After the scores from each day's work were entered, results were calculated and a status report was generated. The report shows the total number of papers read and score point distributions. These reports are used to determine the need for retraining of individual readers or the group as a whole.

Retraining is an ongoing process once scoring begins. Daily monitoring of completed packets provided by the Daily Reader Status Reports and validity packets alert team leaders and management personnel to individual retraining needs. If it becomes apparent that a whole team or a whole group is having difficulty with a particular type of response, large group training sessions are conducted. Standard retraining procedures include room-wide discussions led by the scoring director, team discussions conducted by team leaders, spot-checking of individual scorers by team leaders, and discussions between team leaders and individual scorers.

Scorers are dismissed when, in the opinion of the scoring director and the project director, they have been counseled, retrained, and given every reasonable opportunity to improve and are still performing below the acceptable standard.

Rescoring is conducted automatically for any student who scores within two raw score points of the proficient cut score. MI reviews writing and constructed-response items and verifies the original scores or makes changes if warranted. Scores are never lowered during the automatic rescoring process even if a lower score results. Districts do not need to request rescore. Table 4.2.2 provides automatic rescoring information for each grade level and content area.

Table 4.2.2: Automatic Rescore Statistics - 2009 NJ ASK

LAL	Grade	N	Eligible for Automatic Rescore	Score Change (at least one item)		Proficiency Change (by content area)	
	3	102,761	9,700	159	0.2%	88	0.1%
	4	103,360	7,160	133	0.1%	103	0.1%
	5	103,339	7,078	67	0.1%	38	0.0%
	6	103,584	5,991	172	0.2%	102	0.1%
	7	104,297	5,671	261	0.3%	161	0.2%
	8	105,808	3,654	65	0.1%	47	0.0%
Math	**Grade**						
	3	102,761	4,489	144	0.1%	85	0.1%
	4	103,360	5,164	137	0.1%	82	0.1%
	5	103,339	4,486	92	0.1%	63	0.1%
	6	103,584	5,434	260	0.3%	149	0.1%
	7	104,297	5,454	168	0.2%	104	0.1%
	8	105,808	4,351	347	0.3%	195	0.2%
Sci	**Grade**						
	4	103,360	3,774	229	0.2%	140	0.1%
	8	105,808	4,727	177	0.2%	97	0.1%

4.3 Quality Control[25]

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 following steps are included in the quality control procedures:

- Items have undergone multiple reviews to ensure that operational and field test items are valid and fair for all students.
- All assessment materials are submitted to rigorous editing and proofreading procedures.
- The MI editorial staff first checks all copy materials to be developed prior to being typeset to assure continuity exists across all documents.
- Prior to typesetting of any documents, sample layouts based on the approved NJ ASK Style Guide are provided to NJ DOE staff for review and approval.
- Typeset page proofs are then prepared and thoroughly proofread.
- Well-trained staff members read the documents in their entirety for typographical errors and potential problems in context.
- Copies of the page proofs are provided to the NJ DOE for review and approval.
- Upon approval of the page proofs, blueline (or printer's) proofs are produced.
- Two staff members and two independent editors proofread the blueline proofs of all documents and then give them to the NJ DOE for final approval prior to printing.
- NJ DOE approves all forms necessary for test administration prior to final production.

Additionally, all accommodated materials are reviewed for accuracy and quality at multiple stages.

- The first stage of review involves content specialists ensuring that the items used on the tests are still valid in the accommodated format.
- Once this is completed, the large print test follows the quality control procedures discussed previously, while the other formats undergo additional quality control procedures.
- The Braille test is reviewed by an independent contractor that double-checks the integrity of the translation from print to Braille.
- The Spanish test is reviewed by an independent contractor that double-checks the integrity of the translation from English to Spanish

MI used a successive check of quality assurance and control system to ensure and maintain accurate and timely scoring results, reporting, and dissemination of data. Throughout the execution of the software testing, all defects were logged, assigned, and followed through to resolution. Software changes or “fixes” provided by the developer to resolve defects were re-tested until satisfactory results were achieved. Regression testing of previously tested functionality was performed to ensure that the fix did not adversely affect any other functionality of the application/system. Deployment of software applications to the staging

[25] 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.

environment was also tested during the QA process. The staging environment closely matched the production environment.

PART 5: STANDARD SETTING

5.1 Overview of the Process

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.

Standard setting is typically conducted shortly after the initial administration of an operational test (i.e., in the base year). For NJ ASK, standard setting is used to establish two raw score cuts that distinguish performance among three levels: Partially Proficient, Proficient, and Advanced Proficient. Equating procedures utilizing item response theory (IRT) are used to ensure that future test forms are equivalent to the base year test. See Part 7, Scaling and Equating, for more information about equating procedures.

The standard settings were conducted for each grade in order to determine the cut scores for LAL and mathematics. Standard settings were not conducted for science as the eighth grade science assessment was based on the same test design as the 2007 GEPA science assessment. GEPA science cut scores were set in 2000. The grade 4 science assessment was based on the 2008 test design, thus the grade 4 science standards set in 2005 were still applicable.

2008 Standard Setting for grades 5-8. The NJ ASK grades 5–8 standard setting was held June 24 through June 27, 2008. The meeting involved 86 educator-panelists* from around the state who recommended performance standards on the following tests:

- Language Arts Literacy (LAL), Grades 5–8
- Mathematics, Grades 5–8
- Spanish Language Arts Literacy, Grades 5–8

On June 30, 2008, the Commissioner and senior staff of the NJ DOE met to review the recommendations of the panelists. Minor adjustments were made to the recommended cut scores. The cut scores for the Spanish-language versions of the Language Arts tests were adjusted to match the English version cut scores. The Commissioner's recommendations were submitted at the New Jersey state board meeting and were adopted on July 16, 2008.

2009 Standard Setting for grades 3-4. The NJ DOE conducted standard setting for tests in LAL and mathematics for grades 3–4 during the week of June 23–26, 2009. Because the constructs measured by the Spanish LAL versions are substantively different from those measured by the Spanish math versions, separate standards settings for Spanish LAL were conducted as well during this week. Educators from throughout the state of New Jersey recommended performance standards on the following tests:

- Language Arts Literacy, Grades 3 and 4
- Mathematics, Grades 3 and 4
- Spanish Language Arts Literacy, Grades 3 and 4

*See Appendix E-1 for a list of participants.

Similar meetings occurred in June 2009 regarding the grade 3 and 4 cut scores. On June 26, Dr. Deville (Director of Psychometrics at MI) met with NJ DOE officials to review the results of the standard setting session of the previous week. The purpose of this meeting was to make sure that policymakers understood the intentions of the panelists and that there was some degree of consistency across grades and between subjects. While the primary focus was on Proficient cut scores, there was considerable discussion about both cut scores on each of the six tests.

Further discussion among NJ DOE senior staff took place. The senior staff set the Spanish LAL cut scores to be the same as those for English LAL, as they did last year. The final decisions of this group are summarized in Table 5.3.1. Most cut scores recommended by the panelists were lowered approximately 1–2 points.

The full Standard Setting report, available from the New Jersey Department of Education (NJ DOE), provides details about the standard setting procedures, demographic information of the panelists, panelists' ratings from one round to the next, and their responses on the evaluation forms. The final cut scores approved by the State Board of Education are also presented. The sections below summarize the most important steps of the standard setting process. For more detail, the full Standard Setting Report should be referenced.

5.2 Procedures

Development of Performance Level Descriptors (PLDs)

NJ DOE staff, working with MI staff developed draft performance level descriptors (PLDs). These are statements describing what students at the Partially Proficient, Proficient, and Advanced Proficient levels know and can do. The PLDs are stated in terms of the state content standards for LAL and mathematics (the Core Curriculum Content Standards, or CCCS). NJ DOE staff placed the draft PLDs on the state website for NJ educators' comments during January–March 2008 and made further refinements. On May 30, 2008, NJ DOE staff, together with MI staff, presented the revised PLDs to committees of New Jersey educators meeting in Princeton for further review and revision. At this one-day meeting, participants made numerous suggestions for revisions which were collated by NJ DOE staff to integrate into final PLDs. These final PLDs were edited, reviewed, and made ready for use at the June 24–27 standard setting meeting. The PLDs for the Spanish-language versions of the LAL tests were translated by Second Language Testing, Incorporated. These translated PLDs were then reviewed by NJ DOE staff and approved for use in the standard setting meeting. Similar meetings occurred in 2009 for the development of PLD's for grades 3 and 4 LAL and mathematics. The final PLDs for all grades and content areas appear in Appendix E-2.

Standard Setting Process

The 2008 and 2009 standard settings included student data based on a sample of data from priority districts that consisted of more than 30% of the student population. As stated previously, the priority districts are a small sample of districts representing the statewide DFG and ethnic composition. As standard setting must occur shortly after the first administration of a new test, a sample of student work must be scored expeditiously for use in establishing new cut scores. The scores for 143,184 students from grades 5, 6, 7, and 8 were used in setting the LAL standards and a total of 155,548 students were used in setting the mathematics standards. In addition, the scores for 2,490 students were used in setting the standards for the Spanish version of LAL in 2008. In grades 3 and 4, 61,755 LAL students and 63,411 mathematics students were used in establishing the new LAL and mathematics standards, respectively.

For standard setting activities prior to 2008, NJ DOE has employed a combination of modified Angoff and Body of Work procedures (Cizek & Bunch, 2007)[26]. For this activity, the Bookmark procedure was utilized.

The Bookmark procedure was developed specifically for mixed-format tests. The overall format of the NJ ASK tests is predominantly multiple-choice (MC) with a significant number of short constructed-response (SCR) items and extended-constructed-response (ECR) items. SCR items are mathematics items that can be answered with a brief response that is scored correct or incorrect (1/0). ECR items are 3- or 4-point brief essay items in both LAL and mathematics. The LAL tests also include two writing prompts scored on a 6-point scale, with the exception being Grade 5 which uses a 5-point scale.

With the Bookmark procedure, panelists examine test items in a difficulty-ordered booklet and determine whether or not a minimally Proficient or minimally Advanced Proficient student would have a 2/3 chance of answering the item correctly (for MC items) or obtain the given score point (for CR items). The difficulty-ordered booklet consists of the items from the actual test but arranged in order of difficulty, with the easiest item on the first page and the most difficult item on the last page. MC and SCR items appear only once in the booklet, but ECR items and writing prompts appear once for each score point. An item worth three points would appear three times, the first time with a sample response representing one point, later with a sample response representing two points, and so on. Each page contains essential information about the item, including its position in the ordered booklet, its position in the original booklet, and the achievement level (theta) required for a student to have a 2/3 chance of answering correctly or obtaining that point. These theta values are derived from analysis of the student responses to the items through the use of item response theory (IRT) procedures. Specifically, for NJ ASK, MI uses the Rasch model for item calibration and test construction. This model allows for the calibration of all items and students on a common scale. This common calibration allows for the calculation of a probability of a correct response to a given item by a given student from information about the student's achievement level (θ) and the item's difficulty level (δ).

[26] Cizek, G. J. & Bunch, M. B. (2007). Standard setting: A guide to establishing and evaluating performance standards on tests. Thousand Oaks, CA: Sage.

Panelists enter two bookmarks on a special form, one each for the last page they believe a minimally Proficient or minimally Advanced Proficient student would have a 2/3 chance of answering correctly. The page number is associated with a theta required for a 2/3 chance of answering correctly. These theta values are averaged across all panelists. The mean theta is then translated into a score via a table from the Rasch (in this case) analysis of the live test results. The tabled raw score closest to this value becomes the cut score. In practice, panelists usually engage in three rounds of rating in this manner, with feedback between rounds. Typically, normative feedback is provided between Rounds 1 and 2 so that panelists can compare their judgments to those of other panelists. Between Rounds 2 and 3 impact data are usually supplied.

5.3 Summary of Results

Panelists, working in two-grade groups considered each test in three rounds. During Round 1, each panelist placed two bookmarks, one for Proficient and one for Advanced Proficient. MI staff analyzed the data for Round 1 and led discussions of the results. Panelists then repeated the process of placing bookmarks in Round 2. After Round 2, MI staff again analyzed the data and presented results to the panelists, along with score distributions showing percentages of students who would be classified as Partially Proficient, Proficient, and Advanced Proficient on the basis of the Round 2 cut scores. After discussion of these results, panelists once again placed two bookmarks in Round 3. These bookmarks defined the final cut scores (averaged over all panelists in a given group) to be forwarded to the NJ DOE.

After each standard setting meeting, the Commissioner and senior staff met to review the recommendations of the panelists. This group focused on the range of cut scores across grades and the resulting percentages of students classified at Proficient or above. As a result of their review and discussions, this group reset some of the cut scores for LAL and mathematics recommended by the New Jersey educators who had met previously. In general, the changes were within one standard deviation of the original cut scores recommended by the panelists. See the standard setting report from the specific details.
http://www.state.nj.us/education/assessment/

The commissioner's advisory group also decided to set aside the cut scores for the Spanish-language versions of the Language Arts tests in 2008. The decision rested largely on the fact that the committees making the recommendations consisted of only four panelists each, too small a number to yield reliable consensus. After the meetings of the 2009 standard setting panels, the senior staff again decided to set the Spanish LAL cut scores the same as the English LAL cut scores at all grade levels.

Final recommended performance standards are reported in Table 5.3.1. The tables include the total number of points possible on each test. The Proficient Cut Score Mean includes both the raw score mean and the mean expressed in terms of a percentage of the Total Points Possible. This latter figure is shown in parentheses in the Proficient Cut Score Mean column. The final column in Table 5.3.1 shows the total number of points possible for each test.

Please note new standards for Grade 8 science **were not** established during the 2008 standard setting meeting, as the item types and timing of the science test has not changed from GEPA. Grade 4 science standards were set in 2005 and grade 8 science standards were set in 2000. Science will be discussed in greater detail in Part 7 - Scaling and Equating.

Table 5.3.1: Approved Cut Scores

	Proficient Cut Score		**Advanced Proficient Cut Score**		**Total Points Possible**
	Raw Score	% of Total Points Available	Raw Score	% of Total Points Available	
LAL 5*	40.0	53	57.5	77	75
LAL 6*	41.5	53	59.0	76	78
LAL 7*	39.0	50	55.0	71	78
LAL 8*	42.5	54	60.0	77	78
Math 5*	25	50	40	80	50
Math 6*	25	50	41	82	50
Math 7*	27	52	42	81	52
Math 8*	29	56	43	83	52
Spanish LAL 5*	40.0	53	57.5	77	75
Spanish LAL 6*	41.5	53	59.0	76	78
Spanish LAL 7*	39.0	50	55.0	71	78
Spanish LAL 8*	42.5	54	60.0	77	78
LAL 3+	25	50	36	72	50
LAL 4+	32	54	45	76	59
Math 3+	26	52	40	80	50
Math 4+	25	50	39	78	50
Spanish LAL 3+	25	50	36	72	50
Spanish LAL 4+	32	54	45	76	59
Science 4++	19	49	30	77	39
Science 8+++	23	43	41	76	54

*Cut scores were approved by the New Jersey State Board of Education on July 16, 2008.
+Approved in 2009
++Approved in 2005
+++Approved in 2000

The impact of these cut scores on New Jersey students from both 2008 and 2009 is summarized in Table 5.3.2. The number of students upon which these percentages are based is only a representative sample of the entire population. Thus, a slightly different outcome may result when all of the data are analyzed. For the Spanish-language version of the LAL tests, all students tested were included.

State Board of Education Review and Adoption

On July 16, 2008, Deputy Commissioner Willa Spicer, Dr. Jay Doolan, Dr. Timothy Peters, and Dr. Michael Bunch presented the information in Tables 5.3.2 and 5.3.3, relevant to grades 5–8, to the Board, along with a formal recommendation to adopt the cut scores shown in Table 5.3.1. The Board approved the cut scores without modification. A similar meeting occurred in 2009 to formally adopt the grade 3 and 4 LAL and mathematics cut scores.

Table 5.3.2: Percentages of Students Classified at Each Level

Test	Number Tested	% Partially Proficient	% Proficient	% Advanced Proficient	% Proficient or Above
LAL 3	31,651	37	57	6.0	63
LAL 4	30,104	36	57	7.0	64
LAL 5	35,472	39.5	55.5	5.0	60.5
LAL 6	34,080	45.8	51.4	2.8	54.2
LAL 7	35,093	30.5	55.6	13.9	69.5
LAL 8	38,539	19.0	67.7	13.3	81.0
Math 3	31,870	25	43	32	75
Math 4	31,541	26	46	28	74
Math 5	34,205	23.2	48.6	28.2	76.8
Math 6	31,732	26.2	52.7	21.1	73.8
Math 7	44,060	34.3	45.4	20.3	65.7
Math 8	45,551	32.2	42.8	25.0	67.8
Science 4	31,676	9.3	43.6	47.1	90.7
Science 8	30,952	15.0	54.5	30.5	85.0
Spanish Version of LAL					
LAL 3	573	75	24	1.0	25
LAL 4	602	83	17	0.0	17
LAL 5	500	88.0	12.0	0.0	12.0
LAL 6	655	92.1	7.9	0.0	7.9
LAL 7	670	82.8	17.2	0.0	17.2
LAL 8	665	69.8	30.2	0.0	30.2

Table 5.3.3 shows the percentages of students who scored high enough to be classified as Proficient or Advanced Proficient. The percentage is calculated by summing the total number of students classified as Proficient and the total number classified as Advanced Proficient by subgroup.

Table 5.3.3: Percentage of Students - Proficient or Above by Subgroup

	Grade											
	3		4		5		6		7		8	
	LAL	Math	LAL	Math	LAL	Math	LAL	Math	LAL	Math	LAL	Math
All Students	63	75	64	74	61	77	54	74	70	66	81	68
By Race/Sex												
Asian	78	91	80	89	79	92	71	91	86	85	90	86
African American	50	67	49	64	38	55	30	49	45	38	62	39
Hispanic	69	75	67	74	41	66	37	61	55	52	69	52
White	78	91	80	89	72	86	65	83	80	76	91	80
Female	50	67	49	64	66	77	58	74	73	66	86	67
Male	69	75	67	74	55	77	50	74	66	65	77	68
By Status												
LEP	30	54	33	50	22	54	21	53	31	40	40	35
Special Education	43	58	44	58	25	49	19	38	28	26	44	28
Economically Disadvantaged	36	59	35	55	37	60	34	56	49	45	65	46
% Correct for Proficient or Above	30	54	33	50	53	50	53	50	50	52	54	56

State Board of Education Review and Adoption

On July 16, 2008, Deputy Commissioner Willa Spicer, Dr. Jay Doolan, Dr. Timothy Peters, and Dr. Michael Bunch presented the information in Tables 5.3.2 and 5.3.3, relevant to grades 5–8, to the Board, along with a formal recommendation to adopt the cut scores shown in Table 5.3.1. The Board approved the cut scores without modification. A similar meeting occurred in 2009 to formally adopt the grade 3 and 4 LAL and mathematics cut scores.

PART 6: ITEM and TEST STATISTICS

6.1 Classical Item Statistics

For each administration, classical item analyses are completed prior to item calibration, scaling, and equating. These statistics are calculated again once all of the data are available. These analyses involve computing a set of statistics based on classical test theory for every item in each form. Each statistic is 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 0.30 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 LAL, the test criterion score is the total score of all reading items (MC and CR) 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 2009 NJ ASK 3–8 in the content areas of LAL, 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 District Factor Group (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 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 mathematics items. The mean scores for the science CR items are based on a 0 to 3 point scale whereas the LAL CR 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 doubled for the Persuasive prompt but not doubled for the explanatory prompt in data analyses and score reporting in grades 6-8. In grades 3-5, both writing prompt scores were doubled. 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
LAL	**18**	**0.67**	**0.12**	**0.41**					
Writing					WT1[2]	1	4.97		0.70
					WT2[3]	1	4.78		0.64
Reading	**18**	**0.67**	**0.12**	**0.41**		3	1.40	0.14	0.61
Working with Text	12	0.70	0.11	0.44		-	-	-	-
Analyzing Text	6	0.60	0.11	0.37		3	1.40	0.14	0.61
Math	**35**	**0.67**	**0.11**	**0.39**	**SCR**	**6**	**0.66**	**0.07**	**0.46**
					ECR	**3**	**1.77**	**0.23**	**0.60**
Number and Numerical Operation	14	0.68	0.11	0.44	SCR	3	0.64	0.05	0.50
					ECR	1	1.64	-	0.69
Geometry and Measurement	7	0.68	0.14	0.30	SCR	1	0.74	-	0.32
					ECR	1	2.03	-	0.52
Patterns and Algebra	7	0.66	0.14	0.37	SCR	1	0.58	-	0.49
					ECR	1	1.63	-	0.58
Data Analysis, Probability, and Discrete Mathematics	7	0.66	0.09	0.42	SCR	1	0.74	-	0.44
					ECR	0			
Problem Solving	*18*	*0.67*	*0.11*	*0.42*	*SCR*	*2*	*0.58*	*0.00*	*0.53*
					ECR	*3*	*1.77*	*0.23*	*0.60*

[1] 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. For LAL CR 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 doubled for grades 3 through 5. Note that in data analyses and score reporting,.WT1 and WT2 scores were doubled .

[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
LAL	**27**	**0.65**	**0.10**	**0.40**					
Writing					WT1[2]	1	5.98		0.70
					WT2[3]	1	5.06		0.65
Reading	27	0.65	0.10	0.40		3	1.47	0.22	0.55
Working with Text	14	0.67	0.09	0.42		0			
Analyzing Text	13	0.63	0.10	0.39		3	1.47	0.22	0.55
Math	**35**	**0.63**	**0.14**	**0.39**	**SCR**	**6**	**0.65**	**0.19**	**0.38**
					ECR	**3**	**1.73**	**0.08**	**0.64**
Number and Numerical Operation	14	0.59	0.16	0.36	SCR	3	0.70	0.16	0.42
					ECR	1	1.67	-	0.60
Geometry and Measurement	7	0.66	0.11	0.36	SCR	1	0.43	-	0.12
					ECR	1	1.70	-	0.64
Patterns and Algebra	7	0.61	0.14	0.40	SCR	1	0.50	-	.054
					ECR	1	1.80	-	0.68
Data Analysis, Prob., & Discrete Math	7	0.69	0.13	0.42	SCR	1	0.86	-	0.33
					ECR	0	-	-	-
Problem Solving	*18*	*0.61*	*0.14*	*0.38*	*SCR*	*2*	*0.60*	*0.19*	*0.36*
					ECR	*3*	*1.73*	*0.08*	*0.64*
Science	**33**	**.64**	**.15**	**.30**		2	1.61	0.06	0.58
Life Science	12	.61	.17	.29		1	1.65	-	0.58
Physical Science	12	.63	.15	.28		-	-	-	-
Earth Science	9	.68	.10	.35		1	1.56	-	0.60
Knowledge	*6*	*.60*	*.13*	*.30*		-	-	-	-
Application	*27*	*.64*	*.15*	*.30*		*2*	*1.61*	*0.06*	*0.58*

[1] 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. For LAL CR 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 doubled for grades 3 through 5. Note that in data analyses and score reporting,.WT1 and WT2 scores were doubled .

[2] Writing Task One

[3] Writing Task Two

[4] Science CR items are scored on a scale of 0 to 3.

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
LAL	**31**	**0.70**	**0.16**	**0.37**					
Writing					WT1[2]	1	5.70		0.63
					WT2[3]	1	6.53		0.69
Reading	**31**	**0.70**	**0.16**	**0.37**		3	1.72	0.10	0.51
Working with Text	18	0.70	0.18	0.36		-	-	-	-
Analyzing Text	13	0.70	0.13	0.38		3	1.72	0.10	0.51
Math	**35**	**0.68**	**0.13**	**0.43**	**SCR**	**6**	**0.58**	**0.14**	**0.46**
					ECR	**3**	**1.49**	**0.24**	**0.63**
Number and Numerical Operation	11	0.69	0.06	0.47	SCR	3	0.57	0.08	0.50
					ECR	-	-	-	-
Geometry and Measurement	8	0.66	0.12	0.41	SCR	1	0.38	-	0.48
					ECR	1	1.38	-	0.69
Patterns and Algebra	8	0.71	0.14	0.38	SCR	1	0.58	-	0.43
					ECR	1	1.33	-	0.57
Data Analysis, Probability, and Discrete Mathematics	8	0.64	0.20	0.42	SCR	1	0.78	-	0.36
					ECR	1	1.76	-	0.63
Problem Solving	*14*	*0.69*	*0.14*	*0.41*	*SCR*	*2*	*0.65*	*0.19*	*0.48*
					ECR	*3*	*1.49*	*0.24*	*0.63*

[1] 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. For LAL CR 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 doubled for grades 3 through 5. Note that in data analyses and score reporting,.WT1 and WT2 scores were doubled .

[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
	Nitem	Mean	S.D.	Mean		Nitem	Mean	S.D.	Mean
LAL	**36**	**0.68**	**0.15**	**0.34**					
					WT1[2]	1	5.91		0.71
Writing					WT2[3]	1	2.73		0.58
Reading	36	0.68	0.15	0.34		4	1.91	0.38	0.65
Working with Text	19	0.71	0.15	0.35		-	-		-
Analyzing Text	17	0.65	0.15	0.32		4	1.91	0.38	0.65
Math	**35**	**0.65**	**0.13**	**0.40**	**SCR**	**6**	**0.61**	**0.18**	**0.46**
					ECR	**3**	**1.61**	**0.47**	**0.62**
Number and Numerical Operation	8	0.66	0.14	0.42	SCR	2	0.39	0.10	0.51
					ECR	1	1.45	-	0.69
Geometry and Measurement	8	0.66	0.12	0.39	SCR	2	0.68	0.03	0.41
					ECR	1	1.23	-	0.60
Patterns and Algebra	8	0.62	0.16	0.40	SCR	1	0.8	-	0.46
					ECR	1	2.14	-	0.58
Data Analysis, Probability, and Discrete Mathematics	11	0.68	0.11	0.40	SCR	1	0.72	-	0.45
					ECR	-	-	-	-
Problem Solving	*14*	*0.71*	*0.08*	*0.43*	*SCR*	*3*	*0.59*	*0.25*	*0.50*
					ECR	*3*	*1.61*	*0.47*	*0.62*

[1] 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. For LAL CR 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 in data analyses and score reporting,.WT1 scores were doubled .

[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
LAL	**36**	**0.65**	**0.13**	**0.35**					
Writing					WT1[2]	1	6.84		0.74
					WT2[3]	1	3.06		0.65
Reading	**36**	**0.65**	**0.13**	**0.35**		4	1.95	0.26	0.59
Working with Text	21	0.63	0.13	0.35		-	-	-	-
Analyzing Text	15	0.67	0.13	0.35		4	1.95	0.26	0.59
Math	**35**	**0.64**	**0.15**	**0.40**	**SCR**	**8**	**0.58**	**0.12**	**0.47**
					ECR	**3**	**1.38**	**0.35**	**0.64**
Number and Numerical Operation	8	0.58	0.22	0.39	SCR	2	0.60	0.16	0.57
					ECR	1	1.65	-	0.58
Geometry and Measurement	8	0.66	0.06	0.41	SCR	2	0.57	-	0.07
					ECR	1	0.99	-	0.69
Patterns and Algebra	11	0.63	0.16	0.41	SCR	2	0.66	-	0.12
					ECR	-	-	-	-
Data Analysis, Probability, and Discrete Mathematics	8	0.70	0.12	0.40	SCR	2	0.50	0.16	0.47
					ECR	1	1.51	-	0.65
Problem Solving	*16*	*0.56*	*0.16*	*0.42*	*SCR*	*6*	*0.53*	*0.09*	*0.49*
					ECR	*3*	*1.38*	*0.35*	*0.64*

[1]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. For LAL CR 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 in data analyses and score reporting,.WT1 scores were doubled .

[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
LAL	**36**	**0.69**	**0.11**	**0.36**					
					WT1[2]	1	7.35		0.73
Writing					WT2[3]	1	3.51		0.68
Reading	36	0.69	0.11	0.36		4	2.01	0.08	0.63
Working with Text	19	0.71	0.10	0.38		-	-	-	-
Analyzing Text	17	0.65	0.12	0.34		4	2.01	0.08	0.63
Math	**35**	**0.65**	**0.10**	**0.42**	**SCR**	**8**	**0.65**	**0.14**	**0.53**
					ECR	**3**	**1.90**	**0.27**	**0.67**
Number and	11	0.69	0.11	0.43	SCR	2	0.58	0.23	0.47
Numerical Operation					ECR	-	-	-	-
Geometry and Measurement	8	0.63	0.08	0.41	SCR	2	0.77	0.01	0.55
					ECR	1	1.61	-	0.67
Patterns and Algebra	8	0.67	0.07	0.45	SCR	2	0.65	0.05	0.57
					ECR	1	2.15	-	0.66
Data Analysis, Probability,	8	0.59	0.10	0.38	SCR	2	0.61	0.18	0.52
and Discrete Mathematics					ECR	1	1.94	-	0.70
Problem Solving	*18*	*0.65*	*0.10*	*0.45*	*SCR*	*3*	*0.66*	*0.15*	*0.53*
					ECR	*3*	*1.90*	*0.27*	*0.67*
Science[4]	**48**	**0.61**	**0.12**	**0.32**		**2**	**1.19**	**0.11**	**0.64**
Life Science	21	0.60	0.13	0.33		-	-	-	-
Physical Science	13	0.62	0.12	0.29		1	1.11	-	0.60
Earth Science	14	0.60	0.12	0.36		1	1.27	-	0.67
Knowledge	*9*	*0.59*	*0.11*	*0.32*		-	-	-	-
Application	*39*	*0.61*	*0.13*	*0.32*		*2*	*1.19*	*0.11*	*0.64*

[1] 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. For LAL CR 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 in data analyses and score reporting,.WT1 scores were doubled .

[2] Writing Task One

[3] Writing Task Two

[4] Science CR items are scored on a scale of 0 to 3.

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
LAL	**18**	**0.67**	**0**	**1**	**12**	**5**	**0**	**0.43**	**1**	**0**	**6**	**10**	**1**
Working with Text	12	0.69	0	0	8	4	0	0.45	0	0	4	7	1
Analyzing Text	6	0.59	0	1	4	1	0	0.40	1	0	2	3	0
Math	**35**	**0.67**	**0**	**0**	**26**	**8**	**1**	**0.40**	**0**	**6**	**13**	**12**	**4**
Number and Numerical Operation	14	0.68	0	0	10	3	1	0.46	0	1	3	7	3
Geometry and Measurement	7	0.67	0	0	5	2	0	0.30	0	4	3	0	0
Patterns and Algebra	7	0.63	0	0	5	2	0	0.36	0	1	4	2	0
Data Analysis, Probability, and Discrete Mathematics	7	0.67	0	0	6	1	0	0.44	0	0	3	3	1
Problem Solving	*18*	*0.67*	*0*	*0*	*14*	*3*	*1*	*0.45*	*0*	*1*	*5*	*9*	*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
LAL	**27**	**0.61**	**0**	**0**	**22**	**5**	**0**	**.41**	**1**	**0**	**9**	**15**	**2**
Working with Text	14	0.68	0	0	11	3	0	0.41	0	0	6	6	2
Analyzing Text	13	0.61	0	0	11	2	0	0.41	1	0	3	9	0
Math	**35**	**0.61**	**0**	**5**	**24**	**5**	**1**	**0.39**	**0**	**5**	**16**	**11**	**3**
Number and Numerical Operation	14	0.57	0	4	8	2	0	0.37	0	3	5	4	2
Geometry and Measurement	7	0.65	0	0	6	1	0	0.38	0	2	3	2	0
Patterns and Algebra	7	0.59	0	1	5	1	0	0.39	0	0	5	1	1
Data Analysis, Probability, and Discrete Mathematics	7	0.67	0	0	5	1	1	0.42	0	0	3	4	0
Problem Solving	*18*	*0.62*	*0*	*4*	*11*	*3*	*0*	*0.39*	*0*	*3*	*8*	*6*	*1*
Science	**33**	**.61**	**0**	**4**	**20**	**8**	**1**	**0.33**	**6**	**9**	**16**	**2**	**0**
Life Science	12	0.56	0	2	6	3	1	0.31	2	4	6	0	0
Physical Science	12	0.62	0	2	7	3	0	0.29	3	4	4	1	0
Earth Science	9	0.67	0	0	7	2	0	0.36	1	1	6	1	0
Knowledge	6	0.61	0	1	4	1	0	0.33	2	0	4	0	0
Application	27	0.61	0	3	16	7	1	0.31	4	9	12	2	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
LAL	**31**	**0.73**	**1**	**3**	**14**	**12**	**1**	**0.38**	**3**	**2**	**14**	**12**	**0**
Working with Text	18	0.73	1	1	8	7	1	0.36	1	2	10	5	0
Analyzing Text	13	0.71	0	2	6	5	0	0.40	2	0	4	7	0
Math	**35**	**0.68**	**0**	**3**	**22**	**10**	**0**	**0.41**	**0**	**2**	**12**	**14**	**7**
Number and Numerical Operation	11	0.68	0	0	10	1	0	0.48	0	0	3	3	5
Geometry and Measurement	8	0.62	0	0	5	3	0	0.41	0	0	3	5	0
Patterns and Algebra	8	0.72	0	1	4	3	0	0.40	0	1	3	4	0
Data Analysis, Probability, and Discrete Mathematics	8	0.59	0	2	3	3	0	0.38	0	1	3	2	2
Problem Solving	*14*	*0.71*	*0*	*2*	*7*	*5*	*0*	*0.41*	*0*	*1*	*5*	*7*	*1*

* 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
LAL	**36**	**0.70**	**0**	**6**	**16**	**11**	**3**	**0.33**	**3**	**5**	**21**	**7**	**0**
Working with Text	19	0.74	0	2	9	6	2	0.33	2	1	11	5	0
Analyzing Text	17	0.64	0	4	7	5	1	0.33	1	4	10	2	0
Math	**35**	**0.68**	**0**	**5**	**24**	**6**	**0**	**0.41**	**0**	**3**	**11**	**17**	**4**
Number and Numerical Operation	8	0.65	0	1	5	2	0	0.42	0	0	2	5	1
Geometry and Measurement	8	0.67	0	1	5	2	0	0.41	0	1	2	5	0
Patterns and Algebra	8	0.64	0	2	5	1	0	0.41	0	0	3	5	0
Data Analysis, Probability, and Discrete Mathematics	11	0.71	0	1	9	1	0	0.38	0	2	4	2	3
Problem Solving	*14*	*0.72*	*0*	*0*	*10*	*4*	*0*	*0.44*	*0*	*1*	*3*	*6*	*4*

* While ideally items should have a point-biserial correlation of at least .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
LAL	**36**	**0.65**	**0**	**6**	**21**	**9**	**0**	**0.36**	**1**	**6**	**18**	**10**	**1**
Working with Text	21	0.61	0	5	11	5	0	0.36	1	3	10	6	1
Analyzing Text	15	0.65	0	1	10	4	0	0.36	0	3	8	4	0
Math	**35**	**0.67**	**0**	**5**	**23**	**6**	**1**	**0.41**	**0**	**6**	**11**	**12**	**6**
Number and Numerical Operation	8	0.62	0	3	4	0	1	0.38	0	2	3	1	2
Geometry and Measurement	8	0.68	0	0	7	1	0	0.41	0	1	3	2	2
Patterns and Algebra	11	0.69	0	2	7	2	0	0.44	0	1	3	6	1
Data Analysis, Probability, and Discrete Mathematics	8	0.68	0	0	5	3	0	0.41	0	2	2	3	1
Problem Solving	*16*	*0.61*	*0*	*5*	*10*	*1*	*0*	*0.46*	*0*	*3*	*2*	*7*	*4*

* 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 6.1.12: 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
LAL	**36**	**0.70**	**0**	**3**	**22**	**11**	**0**	**0.35**	**1**	**5**	**21**	**6**	**3**
Working with Text	19	0.71	0	1	12	6	0	0.38	1	1	11	3	3
Analyzing Text	17	0.67	0	2	10	5	0	0.34	0	4	10	3	0
Math	**35**	**0.66**	**0**	**2**	**28**	**5**	**0**	**0.43**	**0**	**2**	**12**	**15**	**6**
Number and Numerical Operation	11	0.72	0	0	7	4	0	0.45	0	0	4	6	1
Geometry and Measurement	8	0.63	0	0	8	0	0	0.42	0	0	3	4	1
Patterns and Algebra	8	0.67	0	0	7	1	0	0.47	0	0	2	3	3
Data Analysis, Probability, and Discrete Mathematics	8	0.59	0	2	6	0	0	0.38	0	2	3	2	1
Problem Solving	*18*	*0.67*	*0*	*2*	*14*	*2*	*0*	*0.45*	*0*	*0*	*5*	*9*	*4*
Science	**48**	**0.61**	**0**	**10**	**31**	**7**	**0**	**.035**	**8**	**9**	**21**	**10**	**0**
Life Science	21	0.61	0	5	13	3	0	0.32	2	6	8	5	0
Physical Science	13	0.60	0	2	8	3	0	0.29	4	3	5	1	0
Earth Science	14	0.62	0	3	10	1	0	0.37	2	0	8	4	0
Knowledge	*9*	*0.61*	*0*	*1*	*7*	*1*	*0*	*0.36*	*2*	*2*	*3*	*2*	*0*
Application	*39*	*0.60*	*0*	*9*	*24*	*6*	*0*	*0.34*	*6*	*7*	*18*	*8*	*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 6.1.13: Number of Multiple-Choice Items Flagged by Distractor Analyses

Test	Grade	N-item	p-value*	Point-Biserial*
LAL	3	18	0	0
	4	27	0	1
	5	31	1	1
	6	36	2	1
	7	36	1	0
	8	36	0	0
Math	3	35	0	0
	4	35	0	0
	5	35	0	0
	6	35	0	0
	7	35	0	0
	8	35	0	0
Science	4	33	2	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*
LAL	3	1WT, 12 MC 2 CR	90	1WT, 6 MC 1 CR	90
	4	1WT, 19 MC 2 CR	90	1WT, 8 MC 1 CR	90
	5	1WT, 21 MC 2 CR	90	1WT, 10 MC 1 CR	90
	6	1WT, 18 MC 2 CR	105	1WT, 18 MC 1 CR	130
	7	1WT, 18 MC 2 CR	105	1WT, 18 MC 1 CR	130
	8	1WT, 18 MC 2 CR	105	1WT, 18 MC 1 CR	130
		Day 3		**Day 4**	
Math	3	6SCR, 19 MC, 1ECR	54	16 MC, 2 ECR	60
	4	6SCR, 19 MC, 1ECR	54	16 MC, 2 ECR	60
	5	6SCR, 15 MC, 1ECR	45	20 MC, 2 ECR	69
	6	6SCR, 15 MC, 1ECR	45	20 MC, 2 ECR	69
	7	8SCR, 15 MC, 1ECR	49	20 MC, 2 ECR	69
	8	8SCR, 35 MC, 3ECR	128	N/A	N/A
				Day 4	
Science	4	N/A	N/A	33 MC, 2 CR	60
	8	N/A	N/A	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	LAL	N/A	N/A
	2		Item 6	1.11
	3		Item 13	1.33
	4		N/A	N/A
	5		Item 20	1.22
	1	Math	N/A	N/A
	2		Item 19	3.05
	3		Item 27	1.06
	4		Item 36	0.74
	5		Item 45	1.09
4	1	LAL	N/A	N/A
	2		Item 11	2.06
	3		Item 20	1.36
	4		N/A	N/A
	5		Item 29	1.37
	1	Math	N/A	N/A
	2		Item 19	3.33
	3		Item 27	0.59
	4		Item 36	0.51
	5		Item 45	0.62
	1	Science	Item 13	1.94
	2		Item 23	0.74
	3		Item 34	1.49
5	1	LAL	N/A	N/A
	2		Item 11	0.4
	3		Item 22	0.22
	4		N/A	N/A
	5		Item 33	0.26
	1	Math	N/A	N/A
	2		Item 23	0.83
	3		Item 34	0.79
	4		Item 45	1.11

Grade	Section	Content Area	Location	%
6	1	LAL	Item 9	0.22
	2		Item 19	0.2
	3		N/A	N/A
	4		N/A	N/A
	5		Item 29	0.13
	6		Item 39	0.2
	1	Math	N/A	N/A
	2		Item 23	2.06
	3		Item 34	1.32
	4		Item 45	1.46
7	1	LAL	Item 9	0.83
	2		Item 19	0.67
	3		N/A	N/A
	4		N/A	N/A
	5		Item 29	0.66
	6		Item 39	0.83
	1	Math	N/A	N/A
	2		Item 25	2.07
	3		Item 36	1.53
	4		Item 47	1.79
8	1	LAL	Item 9	0.78
	2		Item 19	0.67
	3		N/A	N/A
	4		N/A	N/A
	5		Item 29	0.43
	6		Item 39	0.6
	1	Math	N/A	N/A
	2		Item 25	1.14
	3		Item 36	0.88
	4		Item 47	0.91
	1	Science	Item 18	0.45
	2		Item 33	0.86
	3		Item 49	1.27

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 LAL score (0.95) because the Reading score makes up 30 of the 50 possible points for LAL. In mathematics at grade 3, the correlation between the Math 5 and the total mathematics score is 0.97. This is due in part to the fact that Math 5 consists of the items identified as Problem Solving. These items account for 29 of the 50 possible total points for 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 (LAL1 and LAL2) is 0.51. The correlations between Writing items and the mathematics clusters (Math 1 – 5) ranged from 0.32 to 0.39.

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

	LAL	Writing	WT1	WT2	Reading	LAL1	LAL 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5
LAL	1.00												
Writing	0.76	1.00											
*WT1	0.70	0.88	1.00										
(WT2)	0.64	0.88	0.54	1.00									
Reading	0.95	0.51	0.49	0.41	1.00								
LAL1	0.87	0.44	0.42	0.34	0.93	1.00							
LAL2	0.89	0.52	0.49	0.42	0.93	0.73	1.00						
Math	0.70	0.41	0.39	0.31	0.71	0.67	0.65	1.00					
Math 1	0.66	0.38	0.37	0.29	0.68	0.64	0.61	0.94	1.00				
Math 2	0.53	0.33	0.31	0.25	0.53	0.49	0.48	0.77	0.62	1.00			
Math 3	0.57	0.34	0.33	0.27	0.57	0.53	0.53	0.85	0.73	0.55	1.00		
Math 4	0.60	0.32	0.32	0.24	0.63	0.60	0.56	0.83	0.72	0.57	0.62	1.00	
Math 5	0.67	0.39	0.38	0.30	0.69	0.65	0.63	0.97	0.92	0.70	0.85	0.81	1.00

*WT1 = Writing Prompt One, WT2 = Writing Prompt Two, LAL1 = Working with Text, LAL2 = Analyzing 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

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

		LAL	Writing	WT1	WT2	Reading	LAL1	LAL 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5	Science	Earth	Life	Physical	Application	Knowledge
LAL		1.00																		
Writing		0.77	1.00																	
	*WT1	0.70	0.89	1.00																
	(WT2)	0.65	0.85	0.52	1.00															
Reading		0.96	0.56	0.51	0.46	1.00														
	LAL1	0.88	0.48	0.44	0.40	0.93	1.00													
	LAL2	0.93	0.56	0.51	0.47	0.95	0.77	1.00												
Math		0.71	0.47	0.43	0.38	0.70	0.64	0.68	1.00											
	Math 1	0.67	0.45	0.40	0.36	0.66	0.61	0.64	0.94	1.00										
	Math 2	0.57	0.39	0.35	0.32	0.57	0.52	0.55	0.83	0.69	1.00									
	Math 3	0.60	0.40	0.36	0.33	0.60	0.55	0.58	0.88	0.76	0.65	1.00								
	Math 4	0.63	0.41	0.37	0.33	0.63	0.58	0.60	0.83	0.72	0.62	0.67	1.00							
	Math 5	0.68	0.46	0.42	0.38	0.67	0.61	0.65	0.97	0.92	0.80	0.87	0.79	1.00						
Science		0.74	0.44	0.40	0.36	0.76	0.71	0.72	0.74	0.69	0.61	0.63	0.65	0.71	1.00					
	Earth	0.67	0.42	0.38	0.34	0.68	0.63	0.65	0.67	0.63	0.55	0.58	0.59	0.65	0.86	1.00				
	Life	0.64	0.38	0.34	0.31	0.67	0.62	0.63	0.62	0.59	0.51	0.53	0.55	0.60	0.88	0.64	1.00			
	Physical	0.59	0.34	0.31	0.27	0.61	0.58	0.57	0.60	0.56	0.51	0.51	0.53	0.58	0.83	0.59	0.58	1.00		
	Application	0.74	0.44	0.40	0.36	0.75	0.70	0.71	0.73	0.68	0.60	0.62	0.64	0.70	0.98	0.84	0.87	0.81	1.00	
	Knowledge	0.52	0.31	0.28	0.25	0.54	0.51	0.51	0.52	0.49	0.43	0.45	0.46	0.50	0.72	0.64	0.60	0.61	0.58	1.00

*WT1 = Writing Prompt One, WT2 = Writing Prompt Two, LAL1 = Working with Text, LAL2 = Analyzing 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

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

	LAL	Writing	WT1	WT2	Reading	LAL1	LAL 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5
LAL	1.00												
Writing	0.76	1.00											
*WT1	0.63	0.87	1.00										
(WT2)	0.69	0.87	0.52	1.00									
Reading	0.96	0.54	0.43	0.50	1.00								
LAL1	0.87	0.46	0.37	0.43	0.93	1.00							
LAL2	0.91	0.54	0.44	0.51	0.94	0.74	1.00						
Math	0.73	0.49	0.40	0.44	0.73	0.69	0.67	1.00					
Math 1	0.67	0.44	0.36	0.41	0.67	0.63	0.62	0.92	1.00				
Math 2	0.65	0.43	0.36	0.39	0.64	0.61	0.59	0.89	0.75	1.00			
Math 3	0.61	0.40	0.33	0.36	0.61	0.58	0.57	0.85	0.70	0.70	1.00		
Math 4	0.65	0.45	0.37	0.41	0.65	0.61	0.60	0.88	0.76	0.72	0.66	1.00	
Math 5	0.70	0.48	0.40	0.44	0.70	0.65	0.65	0.96	0.84	0.84	0.84	0.89	1.00

*WT1 = Speculative Writing Prompt, WT2 = Expository Writing Prompt, LAL1 = Working with Text, LAL2 = Analyzing 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

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

	LAL	Writing	WT1	WT2	Reading	LAL1	LAL 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5
LAL	1.00												
Writing	0.76	1.00											
*WT1	0.71	0.95	1.00										
(WT2)	0.58	0.75	0.50	1.00									
Reading	0.98	0.63	0.58	0.49	1.00								
LAL1	0.89	0.53	0.50	0.41	0.91	1.00							
LAL2	0.95	0.63	0.58	0.49	0.96	0.77	1.00						
Math	0.77	0.56	0.52	0.43	0.76	0.69	0.74	1.00					
Math 1	0.67	0.49	0.46	0.38	0.67	0.60	0.65	0.90	1.00				
Math 2	0.67	0.49	0.46	0.38	0.67	0.60	0.65	0.87	0.71	1.00			
Math 3	0.68	0.50	0.47	0.39	0.67	0.61	0.65	0.88	0.71	0.69	1.00		
Math 4	0.68	0.49	0.46	0.38	0.67	0.61	0.65	0.88	0.73	0.69	0.71	1.00	
Math 5	0.75	0.55	0.51	0.42	0.74	0.67	0.72	0.96	0.89	0.82	0.84	0.86	1.00

*WT1 = Persuasive Writing Prompt, WT2 = Speculative Writing Prompt, LAL1 = Working with Text, LAL2 = Analyzing 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

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

	LAL	Writing	WT1	WT2	Reading	LAL1	LAL 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5
LAL	1.00												
Writing	0.79	1.00											
*WT1	0.74	0.96	1.00										
(WT2)	0.65	0.78	0.57	1.00									
Reading	0.98	0.65	0.60	0.54	1.00								
LAL1	0.90	0.56	0.52	0.46	0.93	1.00							
LAL2	0.94	0.66	0.61	0.55	0.95	0.77	1.00						
Math	0.78	0.59	0.55	0.48	0.77	0.72	0.73	1.00					
Math 1	0.68	0.51	0.48	0.43	0.68	0.63	0.64	0.89	1.00				
Math 2	0.69	0.51	0.48	0.42	0.69	0.65	0.65	0.90	0.74	1.00			
Math 3	0.68	0.52	0.49	0.43	0.68	0.63	0.64	0.89	0.73	0.73	1.00		
Math 4	0.72	0.55	0.52	0.46	0.71	0.66	0.67	0.90	0.74	0.74	0.73	1.00	
Math 5	0.75	0.56	0.53	0.47	0.75	0.70	0.71	0.97	0.88	0.88	0.85	0.88	1.00

*WT1 = Persuasive Writing Prompt, WT2 = Speculative Writing Prompt, LAL1 = Working with Text, LAL2 = Analyzing 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

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

		LAL	Writing	WT1	WT2	Reading	LAL1	LAL 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5	Science	Earth	Life	Physical	Application	Knowledge
LAL		1.00																		
Writing		0.79	1.00																	
	*WT1	0.73	0.96	1.00																
	(WT2)	0.68	0.81	0.61	1.00															
Reading		0.99	0.67	0.62	0.59	1.00														
	LAL1	0.91	0.59	0.54	0.51	0.93	1.00													
	LAL2	0.95	0.67	0.62	0.59	0.96	0.79	1.00												
Math		0.77	0.59	0.55	0.51	0.77	0.70	0.74	1.00											
	Math 1	0.67	0.51	0.48	0.43	0.66	0.61	0.64	0.90	1.00										
	Math 2	0.68	0.53	0.49	0.45	0.67	0.62	0.66	0.90	0.75	1.00									
	Math 3	0.73	0.56	0.53	0.49	0.72	0.66	0.70	0.92	0.77	0.77	1.00								
	Math 4	0.71	0.52	0.49	0.45	0.71	0.65	0.68	0.90	0.74	0.74	0.77	1.00							
	Math 5	0.77	0.58	0.54	0.50	0.76	0.70	0.74	0.97	0.85	0.87	0.89	0.90	1.00						
Science		0.77	0.53	0.49	0.47	0.78	0.72	0.75	0.78	0.68	0.71	0.71	0.72	0.77	1.00					
	Earth	0.68	0.46	0.42	0.40	0.69	0.64	0.67	0.71	0.62	0.65	0.64	0.66	0.70	0.90	1.00				
	Life	0.71	0.48	0.45	0.43	0.72	0.67	0.69	0.70	0.61	0.63	0.64	0.64	0.69	0.91	0.74	1.00			
	Physical	0.66	0.47	0.43	0.42	0.66	0.61	0.64	0.68	0.59	0.62	0.62	0.62	0.67	0.86	0.67	0.68	1.00		
	Application	0.76	0.53	0.49	0.47	0.77	0.72	0.74	0.78	0.68	0.71	0.71	0.71	0.76	0.99	0.89	0.90	0.86	1.00	
	Knowledge	0.58	0.38	0.35	0.33	0.59	0.55	0.56	0.59	0.52	0.53	0.53	0.55	0.58	0.79	0.73	0.74	0.63	0.69	1.00

*WT1 = Persuasive Writing Prompt, WT2 = Speculative Writing Prompt, LAL1 = Working with Text, LAL2 = Analyzing 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

6.4 DIF Analysis

Using data from the field test items embedded in the 2009 operational tests, Differential Item Functioning (DIF) was examined using the Mantel-Haenszel (1959)[27] 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. Tables 6.5.9 through 6.5.22 indicate the number of examinees, depending on group membership, involved in the DIF analyses.

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)[28]. 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 2009 NJ ASK operational test when they were field tested.

[27] 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.

[28] 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: 2009 NJ ASK Operational Items - DIF Categories by Item Type and Grade[1]

Test	Grade	Group	Multiple Choice*			Constructed-Response*		
			A**	B**	C**	A/NS+	B/S+	C-+
LAL	3	M/F***	15	3	0			
		W/B***	13	3	2			
		W/H***	12	5	1			
	4	M/F	19	6	1			
		W/B	20	5	1			
		W/H	14	9	3			
	5	M/F	27	2	0	1	0	1
		W/B	21	6	2	2	0	0
		W/H	12	6	3	2	0	0
	6	M/F	30	6	0	4	2	0
		W/B	34	1	1	5	1	0
		W/H	29	7	0	5	1	0
	7	M/F	28	8	0	2	3	0
		W/B	30	5	1	4	1	0
		W/H	21	6	0	5	0	0
	8	M/F	13	3	2	3	1	0
		W/B	10	8	0	2	2	0
		W/H	9	7	2	2	2	0
Math	3	M/F	35	0	0	7	2	0
		W/B	30	5	0	6	2	1
		W/H	32	3	0	7	2	0
	4	M/F	35	0	0	8	1	0
		W/B	35	0	0	8	1	0
		W/H	35	0	0	7	2	0
	5	M/F	21	14	0	3	1	0
		W/B	20	14	1	3	1	0
		W/H	16	14	1	3	0	0
	6	M/F	30	5	0	4	3	0
		W/B	27	8	0	6	1	0
		W/H	21	12	0	5	1	0
	7	M/F	23	12	0	8	3	0
		W/B	24	11	0	9	1	1
		W/H	21	14	0	7	4	0
	8	M/F	8	6	0	5	4	0
		W/B	10	4	0	7	2	0
		W/H	9	5	0	9	0	0
Science	4	M/F	32	1	0	2	0	0
		W/B	29	4	0	1	1	0
		W/H	26	6	1	1	1	0
	8	M/F	6	14	1	0	1	0
		W/B	8	12	1	0	1	0
		W/H	10	10	1	0	1	0

[1] DIF was calculated when items were field tested; in some cases, items were field tested by other vendors and DIF calculations were either absent or incomplete.

* 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, slight to moderate; and C-, moderate to severe.

6.5 Summary Statistics

Descriptive Statistics for Total Raw Score

Descriptive statistics of total scores for NJ ASK 2009 are summarized in Table 6.5.1 by test content, form, and grade level. A total of 612,390 students participated in the LAL grades 3–8 tests, 616,758 students participated in the mathematics grades 3–8 tests, and 206,580 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
LAL	3	OP	101786	25.98	6.96	0	46	23	50
	4	OP	102298	33.10	9.04	0	55	32	59
	5	OP	101194	39.09	8.58	1	63	36	63
	6	OP	101601	40.81	9.67	0	68	42	70
	7	OP	102025	40.99	10.21	1	68	42	70
	8	OP	103486	43.60	10.05	2	69	42	70
	3	AL	1	13	-	13	13	23	50
	4	AL	29	35.07	6.83	23	46	32	59
	5	AL	138	42.16	7.25	21	58	36	63
	6	AL	75	38.55	8.70	19	56	42	70
	7	AL	46	41.89	7.01	25	53	42	70
	8	AL	92	48.23	7.63	26	64	42	70
	3	BR	5	26.20	7.66	15	36	23	50
	4	BR	10	26.90	12.14	0	43	31	58
	5	BR	3	32.00	7.55	24	39	35	53
	6	BR	6	38.67	11.52	18	52	42	70
	7	BR	6	31.67	12.21	13	45	42	70
	8	BR	9	43.22	13.15	20	60	42	70
	3	LP	86	22.91	6.96	4	35	23	50
	4	LP	101	24.93	11.53	0	43	32	59
	5	LP	96	31.97	9.69	3	54	36	63
	6	LP	83	34.16	12.29	10	55	42	70
	7	LP	61	32.69	10.45	11	55	42	70
	8	LP	61	31.69	11.64	3	54	42	70
	3	SP	576	19.90	6.71	0	39	23	50
	4	SP	603	23.12	8.31	0	45	32	59
	5	SP	641	27.97	7.46	3	50	36	63
	6	SP	662	28.14	8.77	6	55	42	70
	7	SP	757	29.12	8.91	8	56	42	70
	8	SP	782	30.07	8.93	1	56	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	101724	32.89	10.24	0	50	44	50
	4	OP	102409	31.09	10.11	1	50	44	50
	5	OP	102372	31.63	10.81	1	50	44	50
	6	OP	102641	31.38	10.31	0	50	44	50
	7	OP	103166	31.30	10.92	0	52	46	52
	8	OP	104446	33.56	11.48	0	52	46	52
	3	AL	1	9	-	9	9	44	50
	4	AL	29	35.34	6.91	21	48	44	50
	5	AL	138	38.05	9.70	10	50	44	50
	6	AL	76	30.41	10.49	6	50	44	50
	7	AL	46	34.39	8.07	14	50	46	52
	8	AL	92	39.39	9.32	8	52	46	52
	3	BR	5	28.80	9.15	14	38	40	44
	4	BR	10	21.40	9.19	8	34	42	48
	5	BR	3	29.00	15.10	13	43	42	46
	6	BR	6	28.50	10.82	17	44	43	47
	7	BR	6	19.33	9.20	8	32	45	49
	8	BR	9	30.00	7.45	19	39	43	47
	3	LP	85	26.92	9.93	5	43	44	50
	4	LP	97	25.29	12.00	1	45	44	50
	5	LP	97	24.45	10.78	4	49	44	50
	6	LP	83	25.57	11.10	6	46	44	50
	7	LP	60	24.63	10.77	8	46	46	52
	8	LP	61	21.00	10.81	3	48	46	52
	3	SP	570	20.38	9.19	0	48	44	50
	4	SP	602	18.82	9.07	2	47	44	50
	5	SP	642	17.12	7.97	3	46	44	50
	6	SP	662	17.14	8.06	3	46	44	50
	7	SP	758	17.12	8.28	4	49	46	52
	8	SP	778	17.19	9.09	1	51	46	52
Science	4	OP	102286	24.19	6.59	1	39	35	39
	8	OP	104294	31.46	9.85	3	54	50	54
	4	AL	29	23.97	6.24	14	37	35	39
	8	AL	91	37.89	8.65	15	51	50	54
	4	BR	10	19.10	6.85	7	28	32	36
	8	BR	9	37.00	5.61	29	46	50	54
	4	LP	98	20.48	7.53	6	36	35	39
	8	LP	61	24.79	10.03	9	48	50	54
	4	SP	603	16.79	6.09	1	37	35	39
	8	SP	776	20.53	5.90	7	40	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 2009 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	
LAL	**18**	**5**		**50**	**25.98**	**6.96**	**51.96%**
Writing		2		20	9.75	2.60	48.77%
Reading	18	3		30	16.23	5.26	54.09%
Working with Text	12	-		12	8.40	2.89	70.00%
Analyzing Text	6	3		18	7.82	2.76	43.48%
Math	**35**	**3**	**6**	**50**	**32.89**	**10.24**	**65.78%**
Number & Numerical Operations	14	1	3	20	13.12	4.75	65.63%
Geometry & Measurement	7	1	1	11	7.54	2.33	68.55%
Patterns & Algebra	7	1	1	11	6.83	2.66	62.08%
Data Analysis, Probability, & Discrete Mathematics	7	0	1	8	5.39	2.07	67.33%
Problem Solving	*18*	*3*	*2*	*29*	*18.52*	*6.57*	*63.85%*

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	
LAL	**27**	**5**		**59**	**33.10**	**9.04**	**56.10%**
Writing		2		20	11.04	3.09	55.20%
Reading	27	3		39	22.06	6.95	56.56%
Working with Text	14			14	9.44	3.27	67.43%
Analyzing Text	13	3		25	12.61	4.10	50.44%
Math	**35**	**3**	**6**	**50**	**31.09**	**10.11**	**62.18%**
Number & Numerical Operations	*14*	*1*	*3*	20	12.08	4.28	60.41%
Geometry & Measurement	*7*	*1*	*1*	11	6.73	2.49	61.23%
Patterns & Algebra	*7*	*1*	*1*	11	6.58	2.80	59.79%
Data Analysis, Probability, & Discrete Mathematics	*7*	*0*	*1*	8	5.70	1.88	71.21%
Problem Solving	18	4	2	32	18.65	6.46	58.28%
Science	**33**	**2**		**39**	**24.19**	**6.59**	**62.03%**
Life Science	12	1		15	8.97	2.87	59.79%
Physical Science	12			12	7.56	2.29	62.97%
Earth Science	9	1		12	7.67	2.52	63.88%
Knowledge	*6*			*6*	*3.59*	*1.45*	*59.89%*
Application	*27*	*2*		*33*	*20.60*	*5.64*	*62.42%*

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	
LAL	**31**	**5**		**63**	**39.09**	**8.58**	**62.05%**
Writing		2		20	12.23	2.94	61.15%
Reading	31	3		43	26.86	6.64	62.46%
Working with Text	18			18	12.58	3.39	69.89%
Analyzing Text	13	3		25	14.28	3.72	57.11%
Math	**35**	**3**	**6**	**50**	**31.63**	**10.81**	**63.26%**
Number & Numerical Operations	11	0	3	14	9.31	3.59	66.48%
Geometry & Measurement	8	1	1	12	7.07	3.04	58.91%
Patterns & Algebra	8	1	1	12	7.61	2.75	63.40%
Data Analysis, Probability, & Discrete Mathematics	8	1	1	12	7.65	2.80	63.71%
Problem Solving	*14*	*3*	*2*	*25*	*15.43*	*5.63*	*61.71%*

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/ECR	SCR		Mean	Standard Deviation	
LAL	**36**	**6**		**70**	**40.81**	**9.68**	**58.30%**
Writing		2		18	8.64	2.28	48.01%
Reading	36	4		52	32.16	8.09	61.85%
Working with Text	19			19	13.51	3.48	71.12%
Analyzing Text	17	4		33	18.65	5.11	56.52%
Math	**35**	**3**	**6**	**50**	**31.38**	**10.31**	**62.76%**
Number & Numerical Operations	8	1	2	13	7.46	3.25	57.40%
Geometry & Measurement	8	1	2	13	7.84	2.85	60.33%
Patterns & Algebra	8	1	1	12	7.92	2.78	66.00%
Data Analysis, Probability, & Discrete Mathematics	11	0	1	12	8.16	2.77	67.98%
Problem Solving	*14*	*3*	*3*	*26*	*16.56*	*5.75*	*63.71%*

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/ECR	SCR		Mean	Standard Deviation	
LAL	**36**	**6**		**70**	**40.99**	**10.21**	**58.56%**
Writing		2		18	9.90	2.74	55.00%
Reading	36	4		52	31.09	8.22	59.79%
Working with Text	21			21	13.22	4.18	62.94%
Analyzing Text	15	4		31	17.87	4.56	57.65%
Math	**35**	**3**	**8**	**52**	**31.30**	**10.92**	**60.19%**
Number & Numerical Operations	8	1	2	13	7.47	2.94	57.44%
Geometry & Measurement	8	1	2	13	7.44	3.29	57.23%
Patterns & Algebra	11	0	2	13	8.29	2.93	63.76%
Data Analysis, Probability, & Discrete Mathematics	8	1	2	13	8.11	3.03	62.35%
Problem Solving	*16*	*3*	*6*	*31*	*16.23*	*7.19*	*52.47%*

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/ECR	SCR		Mean	Standard Deviation	
LAL	**36**	**6**		**70**	**43.60**	**10.05**	**62.29%**
Writing		2		18	10.86	2.28	60.34%
Reading	36	4		52	32.74	8.38	62.96%
Working with Text	19			19	13.58	3.82	71.46%
Analyzing Text	17	4		33	19.16	5.01	58.07
Math	**35**	**3**	**8**	**52**	**33.56**	**11.48**	**64.54%**
Number & Numerical Operations	11	0	2	13	8.70	3.09	66.92%
Geometry & Measurement	8	1	2	13	8.19	3.16	63.00%
Patterns & Algebra	8	1	2	13	8.81	3.29	67.80%
Data Analysis, Probability, & Discrete Mathematics	8	1	2	13	7.85	3.16	60.41%
Problem Solving	*18*	*3*	*3*	*30*	*19.34*	*7.04*	*64.47%*
Science	**48**	**2**		**54**	**31.46**	**9.85**	**58.26%**
Life Science	21	0		21	12.69	4.04	60.45%
Physical Science	13	1		16	9.15	3.24	57.19%
Earth Science	14	1		17	9.61	3.74	56.55%
Knowledge	*9*			*9*	*5.34*	*2.03*	*59.33%*
Application	*39*	*3*		*45*	*26.12*	*8.35*	*58.04%*

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. LAL, 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. The 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
LAL	3	OP	101786	205.07	28.62	100	300	37.71	56.52	5.77
	4	OP	102298	205.73	30.35	100	300	37.31	55.98	6.72
	5	OP	101194	209.17	27.19	100	300	33.80	57.43	8.76
	6	OP	101601	210.50	25.67	100	300	29.87	62.91	7.22
	7	OP	102025	215.50	32.65	100	300	27.70	53.98	18.32
	8	OP	103486	220.60	23.68	114	300	17.68	71.18	11.14
	3	AL	1	154.00	-	154	154	100.00	0.00	0.00
	4	AL	29	211.52	22.59	174	256	31.03	65.52	3.45
	5	AL	138	219.27	25.93	157	299	17.39	68.12	14.49
	6	AL	75	204.23	22.08	156	256	38.67	60.00	1.33
	7	AL	46	216.80	21.48	168	255	15.22	76.09	8.70
	8	AL	92	231.86	20.73	183	293	6.52	75.00	18.48
	3	BR	5	206.20	31.49	163	250	40.00	40.00	20.00
	4	BR	10	185.40	38.55	100	240	60.00	40.00	0.00
	5	BR	3	186.67	20.60	165	206	66.67	33.33	0.00
	6	BR	6	204.67	29.00	154	241	33.33	66.67	0.00
	7	BR	6	186.33	34.74	133	225	50.00	50.00	0.00
	8	BR	9	221.33	31.37	171	271	33.33	55.56	11.11
	3	LP	86	192.32	27.66	109	244	58.14	41.86	0.00
	4	LP	101	179.04	36.47	100	240	70.30	29.70	0.00
	5	LP	96	187.71	28.23	100	269	67.71	29.17	3.13
	6	LP	83	193.59	31.22	131	252	54.22	40.96	4.82
	7	LP	61	190.10	30.83	126	265	63.93	32.79	3.28
	8	LP	61	194.11	24.27	123	247	54.10	45.90	0.00
	3	SP	576	180.84	26.78	100	270	75.69	23.44	0.87
	4	SP	603	173.60	26.11	100	250	82.92	16.92	0.17
	5	SP	641	176.00	20.14	100	250	87.68	12.17	0.16
	6	SP	662	178.40	21.64	115	252	82.18	17.52	0.30
	7	SP	757	179.46	25.68	113	269	75.69	23.25	1.06
	8	SP	782	190.77	18.04	100	254	69.57	30.05	0.38
Math	3	OP	101724	226.97	40.90	100	300	24.80	43.31	31.89
	4	OP	102409	223.37	39.68	100	300	27.03	45.43	27.54
	5	OP	102372	227.94	37.92	100	300	22.66	45.28	32.05
	6	OP	102641	220.62	37.40	100	300	29.10	45.57	25.33
	7	OP	103166	215.69	39.73	100	300	33.68	42.63	23.68
	8	OP	104446	221.24	43.98	100	300	28.76	41.70	29.54
	3	AL	1	133	-	133	133	100.00	0.00	0.00
	4	AL	29	238.10	27.48	187	300	10.34	48.28	41.38
	5	AL	138	251.72	36.72	154	300	10.14	29.71	60.14
	6	AL	76	215.25	37.78	127	300	36.84	43.42	19.74
	7	AL	46	224.46	29.74	155	300	21.74	60.87	17.39
	8	AL	92	244.42	38.59	127	300	11.96	34.78	53.26
	3	BR	5	223.60	38.99	163	268	20.00	60.00	20.00
	4	BR	10	188.90	34.24	132	234	70.00	30.00	0.00
	5	BR	3	228.33	61.50	167	290	33.33	33.33	33.33

Test	Grade	Form	N	Mean	StdDev	Min	Max	%PP	%P	%AP
	6	BR	6	216.67	42.55	176	287	50.00	33.33	16.67
	7	BR	6	173.83	33.24	129	218	66.67	33.33	0.00
	8	BR	9	216.33	28.30	177	253	44.44	33.33	22.22
Math	3	LP	85	202.51	35.67	105	267	41.18	49.41	9.41
	4	LP	97	200.63	45.56	100	286	48.45	34.02	17.53
	5	LP	97	203.28	36.65	116	300	48.45	38.14	13.40
	6	LP	83	200.29	37.57	128	282	49.40	38.55	12.05
	7	LP	60	191.32	37.21	129	271	55.00	41.67	3.33
	8	LP	61	175.25	38.12	100	288	63.93	32.79	3.28
	3	SP	570	179.05	34.81	100	300	71.23	25.44	3.33
	4	SP	602	176.44	34.93	100	300	73.59	22.43	3.99
	5	SP	642	178.44	28.04	106	285	77.41	21.18	1.40
	6	SP	662	172.37	27.05	102	282	83.84	14.80	1.36
	7	SP	758	165.37	30.21	100	297	85.88	12.40	1.72
	8	SP	778	162.02	32.03	100	300	84.19	14.91	0.90
Science	4	OP	102286	239.53	27.54	121	287	9.06	43.95	46.99
	8	OP	104294	231.31	31.20	114	300	15.85	53.78	30.37
	4	AL	29	238.97	25.07	195	284	3.45	55.17	41.38
	8	AL	91	249.81	28.55	181	300	4.4	39.56	56.04
	4	BR	10	224.20	34.26	159	264	20.00	50.00	30.00
	8	BR	9	247.33	18.62	223	280	55.56	44.44	0.00
	4	LP	98	223.21	33.80	151	281	25.51	47.96	26.53
	8	LP	61	210.64	31.34	157	292	42.62	44.26	13.11
	4	SP	603	207.09	28.87	121	284	38.64	50.91	10.45
	8	SP	776	197.90	18.07	147	256	56.70	42.53	0.77

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

Scale Score Distributions by Demographic Group

Descriptive statistics of scale scores and percentage distributions of students' Performance by Demographic Groups are summarized in Tables 6.5.9 through 6.5.22 by content area and grade. Scale score cumulative frequency distributions are attached as Appendix F.

Table 6.5.9: Grade 3 LAL - Descriptive Statistics - Performance by Demographic Group

LANGUAGE ARTS LITERACY												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	102,761	775	115	450	101,421	37,832	37.3	57,708	56.9	5,881	5.8	206.0
General Education [5]	82,604	0	57	88	82,459	25,291	30.7	51,566	62.5	5,602	6.8	210.4
Special Education	16,159	775	39	85	15,260	9,948	65.2	5,059	33.2	253	1.7	187.3
Limited English Proficient [6]	6,844	24	20	289	6,511	4,146	63.7	2,281	35.0	84	1.3	189.7
Current LEP	4,423	17	20	286	4,100	2,950	72.0	1,122	27.4	28	0.7	184.4
Former LEP	2,421	7	0	3	2,411	1,196	49.6	1,159	48.1	56	2.3	198.8
Gender [7]												
Female	49,876	218	54	195	49,409	15,804	32.0	29,671	60.1	3,934	8.0	210.2
Male	52,807	555	57	255	51,940	21,977	42.3	28,016	53.9	1,947	3.7	202.0
Migrant Status												
Migrant	17	0	0	0	17	12	70.6	5	29.4	0	0.0	185.0
Non-Migrant	102,744	775	115	450	101,404	37,820	37.3	57,703	56.9	5,881	5.8	206.0
Ethnicity [8]												
White	53,773	370	30	125	53,248	14,335	26.9	34,868	65.5	4,045	7.6	212.4
Black or African American	17,388	156	33	114	17,085	9,996	58.5	6,795	39.8	294	1.7	192.7
Asian	9,154	47	19	152	8,936	1,875	21.0	6,013	67.3	1,048	11.7	217.7
Pacific Islander	258	1	0	0	257	79	30.7	152	59.1	26	10.1	211.1
Hispanic or Latino	20,896	180	23	50	20,643	11,002	53.3	9,233	44.7	408	2.0	195.7
Amer. Indian/AK Native	116	1	0	1	114	50	43.9	59	51.8	5	4.4	200.9
Other	1,176	20	10	8	1,138	495	43.5	588	51.7	55	4.8	201.9
Economic Status												
Econ. Disadvantaged	34,417	265	56	216	33,880	19,532	57.7	13,844	40.9	504	1.5	193.3
Non-Econ. Disadvantaged	68,344	510	59	234	67,541	18,300	27.1	43,864	64.9	5,377	8.0	212.4

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded LEP Exempt (LAL only) and students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

Table 6.5.10: Grade 4 LAL - Descriptive Statistics - Performance by Demographic Group

LANGUAGE ARTS LITERACY												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	103,360	698	130	467	102,065	37,772	37.0	57,421	56.3	6,872	6.7	206.5
General Education [5]	83,194	0	72	81	83,041	24,791	29.9	51,658	62.2	6,592	7.9	211.6
Special Education	17,073	698	43	118	16,214	10,896	67.2	5,059	31.2	259	1.6	184.8
Limited English Proficient [6]	5,591	8	20	276	5,287	3,557	67.3	1,655	31.3	75	1.4	186.4
Current LEP	3,397	6	17	273	3,101	2,358	76.0	722	23.3	21	0.7	179.7
Former LEP	2,194	2	3	3	2,186	1,199	54.8	933	42.7	54	2.5	195.9
Gender [7]												
Female	50,376	213	49	209	49,905	17,092	34.2	28,709	57.5	4,104	8.2	209.2
Male	52,935	484	78	258	52,115	20,654	39.6	28,693	55.1	2,768	5.3	204.0
Migrant Status												
Migrant	19	0	0	0	19	10	52.6	8	42.1	1	5.3	196.2
Non-Migrant	103,341	698	130	467	102,046	37,762	37.0	57,413	56.3	6,871	6.7	206.5
Ethnicity [8]												
White	55,268	348	38	139	54,743	14,111	25.8	35,913	65.6	4,719	8.6	213.8
Black or African American	17,771	158	38	108	17,467	10,545	60.4	6,599	37.8	323	1.8	190.8
Asian	8,748	48	15	152	8,533	1,636	19.2	5,537	64.9	1,360	15.9	220.9
Pacific Islander	269	0	0	1	268	69	25.7	171	63.8	28	10.4	214.8
Hispanic or Latino	20,221	132	29	65	19,995	10,934	54.7	8,655	43.3	406	2.0	194.4
Amer. Indian/AK Native	86	1	0	0	85	39	45.9	42	49.4	4	4.7	201.4
Other	997	11	10	2	974	438	45.0	504	51.7	32	3.3	200.2
Economic Status												
Econ. Disadvantaged	33,864	232	67	214	33,351	19,647	58.9	13,179	39.5	525	1.6	191.7
Non-Econ. Disadvantaged	69,496	466	63	253	68,714	18,125	26.4	44,242	64.4	6,347	9.2	213.7

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded LEP Exempt (LAL only) and students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

Table 6.5.11: Grade 5 LAL - Descriptive Statistics - Performance by Demographic Group

LANGUAGE ARTS LITERACY												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	103,339	689	142	432	102,076	34,859	34.2	58,324	57.1	8,893	8.7	209.0
General Education [5]	83,744	0	82	79	83,583	21,703	26.0	53,218	63.7	8,662	10.4	214.3
Special Education	17,078	689	49	89	16,251	11,352	69.9	4,681	28.8	218	1.3	185.2
Limited English Proficient [6]	4,615	16	14	272	4,313	3,063	71.0	1,195	27.7	55	1.3	186.2
Current LEP	2,722	8	11	266	2,437	1,981	81.3	443	18.2	13	0.5	179.5
Former LEP	1,893	8	3	6	1,876	1,082	57.7	752	40.1	42	2.2	195.0
Gender [7]												
Female	49,960	204	66	187	49,503	14,482	29.3	29,552	59.7	5,469	11.0	212.9
Male	53,304	482	76	244	52,502	20,333	38.7	28,748	54.8	3,421	6.5	205.3
Migrant Status												
Migrant	12	0	0	0	12	9	75.0	3	25.0	0	0.0	186.0
Non-Migrant	103,327	689	142	432	102,064	34,850	34.1	58,321	57.1	8,893	8.7	209.0
Ethnicity [8]												
White	55,996	323	53	116	55,504	12,803	23.1	36,519	65.8	6,182	11.1	215.9
Black or African American	17,401	143	41	96	17,121	9,898	57.8	6,863	40.1	360	2.1	193.3
Asian	8,815	50	23	153	8,589	1,400	16.3	5,456	63.5	1,733	20.2	223.6
Pacific Islander	313	3	1	5	304	59	19.4	204	67.1	41	13.5	218.9
Hispanic or Latino	19,655	143	18	52	19,442	10,219	52.6	8,727	44.9	496	2.6	196.8
Amer. Indian/AK Native	94	1	0	3	90	47	52.2	41	45.6	2	2.2	198.8
Other	1,065	26	6	7	1,026	433	42.2	514	50.1	79	7.7	203.7
Economic Status												
Econ. Disadvantaged	32,958	240	51	187	32,480	18,401	56.7	13,405	41.3	674	2.1	194.1
Non-Econ. Disadvantaged	70,381	449	91	245	69,596	16,458	23.6	44,919	64.5	8,219	11.8	215.9

1 These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
2 Includes students coded LEP Exempt (LAL only) and students coded Medical Emergency.
3 Percentages may not total 100 due to rounding.
4 Students are included in Total Students only once, but they appear in all other categories that apply.
5 Includes students coded Former LEP who are not Special Education.
6 Includes students coded Current and Former LEP.
7 Excludes students who did not have Gender coded.
8 Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

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Table 6.5.12: Grade 6 LAL - Descriptive Statistics - Performance by Demographic Group

LANGUAGE ARTS LITERACY												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	103,584	616	200	336	102,432	30,967	30.2	64,123	62.6	7,342	7.2	210.3
General Education [5]	84,596	0	106	52	84,438	18,352	21.7	58,878	69.7	7,208	8.5	215.6
Special Education	16,707	616	68	94	15,929	11,001	69.1	4,800	30.1	128	0.8	185.8
Limited English Proficient [6]	3,970	11	27	197	3,735	2,600	69.6	1,112	29.8	23	0.6	186.1
Current LEP	2,451	3	27	195	2,226	1,765	79.3	455	20.4	6	0.3	180.1
Former LEP	1,519	8	0	2	1,509	835	55.3	657	43.5	17	1.1	194.9
Gender [7]												
Female	50,284	193	92	129	49,870	13,129	26.3	32,248	64.7	4,493	9.0	213.4
Male	53,234	421	105	207	52,501	17,799	33.9	31,853	60.7	2,849	5.4	207.3
Migrant Status												
Migrant	28	0	1	1	26	15	57.7	11	42.3	0	0.0	196.5
Non-Migrant	103,556	616	199	335	102,406	30,952	30.2	64,112	62.6	7,342	7.2	210.3
Ethnicity [8]												
White	56,505	322	52	115	56,016	11,018	19.7	40,080	71.6	4,918	8.8	216.6
Black or African American	17,494	103	59	67	17,265	9,207	53.3	7,782	45.1	276	1.6	195.3
Asian	8,569	42	19	100	8,408	1,107	13.2	5,660	67.3	1,641	19.5	225.2
Pacific Islander	284	1	0	2	281	55	19.6	158	56.2	68	24.2	223.7
Hispanic or Latino	19,548	127	49	48	19,324	9,129	47.2	9,824	50.8	371	1.9	198.9
Amer. Indian/AK Native	108	2	0	2	104	37	35.6	59	56.7	8	7.7	209.2
Other	1,076	19	21	2	1,034	414	40.0	560	54.2	60	5.8	204.4
Economic Status												
Econ. Disadvantaged	32,109	211	103	157	31,638	16,445	52.0	14,744	46.6	449	1.4	196.1
Non-Econ. Disadvantaged	71,475	405	97	179	70,794	14,522	20.5	49,379	69.8	6,893	9.7	216.6

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded LEP Exempt (LAL only) and students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

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Table 6.5.13: Grade 7 LAL - Descriptive Statistics - Performance by Demographic Group

LANGUAGE ARTS LITERACY												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	104,297	685	244	463	102,905	28,889	28.1	55,311	53.7	18,705	18.2	215.2
General Education [5]	84,748	0	151	80	84,517	16,316	19.3	49,875	59.0	18,326	21.7	222.1
Special Education	17,105	685	74	132	16,214	11,002	67.9	4,860	30.0	352	2.2	183.9
Limited English Proficient [6]	3,700	19	25	255	3,401	2,240	65.9	1,083	31.8	78	2.3	185.8
Current LEP	2,620	11	19	253	2,337	1,715	73.4	595	25.5	27	1.2	179.9
Former LEP	1,080	8	6	2	1,064	525	49.3	488	45.9	51	4.8	198.6
Gender [7]												
Female	50,771	264	108	194	50,205	11,999	23.9	27,718	55.2	10,488	20.9	219.1
Male	53,460	418	131	269	52,642	16,855	32.0	27,573	52.4	8,214	15.6	211.6
Migrant Status												
Migrant	15	0	0	0	15	12	80.0	3	20.0	0	0.0	172.3
Non-Migrant	104,282	685	244	463	102,890	28,877	28.1	55,308	53.8	18,705	18.2	215.2
Ethnicity [8]												
White	57,548	350	58	165	56,975	10,415	18.3	33,409	58.6	13,151	23.1	223.0
Black or African American	17,477	127	100	96	17,154	8,696	50.7	7,578	44.2	880	5.1	196.2
Asian	8,546	39	14	112	8,381	907	10.8	4,189	50.0	3,285	39.2	235.7
Pacific Islander	234	2	0	2	230	46	20.0	130	56.5	54	23.5	221.5
Hispanic or Latino	19,324	144	51	76	19,053	8,396	44.1	9,435	49.5	1,222	6.4	200.7
Amer. Indian/AK Native	103	1	1	4	97	29	29.9	60	61.9	8	8.2	212.6
Other	1,065	22	20	8	1,015	400	39.4	510	50.2	105	10.3	204.9
Economic Status												
Econ. Disadvantaged	31,163	270	122	208	30,563	14,945	48.9	14,074	46.0	1,544	5.1	197.3
Non-Econ. Disadvantaged	73,134	415	122	255	72,342	13,944	19.3	41,237	57.0	17,161	23.7	222.8

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded LEP Exempt (LAL only) and students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

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Table 6.5.14: Grade 8 LAL - Descriptive Statistics - Performance by Demographic Group

LANGUAGE ARTS LITERACY												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	105,808	672	289	408	104,439	18,890	18.1	74,003	70.9	11,546	11.1	220.4
General Education [5]	85,650	0	159	110	85,381	8,489	9.9	65,509	76.7	11,383	13.3	225.7
Special Education	17,553	672	104	114	16,663	8,797	52.8	7,712	46.3	154	0.9	197.3
Limited English Proficient [6]	3,741	10	28	190	3,513	2,096	59.7	1,395	39.7	22	0.6	194.7
Current LEP	2,749	4	27	188	2,530	1,721	68.0	800	31.6	9	0.4	190.7
Former LEP	992	6	1	2	983	375	38.1	595	60.5	13	1.3	205.1
Gender [7]												
Female	51,316	247	126	192	50,751	6,910	13.6	36,465	71.9	7,376	14.5	224.5
Male	54,407	422	158	215	53,612	11,939	22.3	37,504	70.0	4,169	7.8	216.5
Migrant Status												
Migrant	16	0	1	0	15	8	53.3	7	46.7	0	0.0	196.7
Non-Migrant	105,792	672	288	408	104,424	18,882	18.1	73,996	70.9	11,546	11.1	220.4
Ethnicity [8]												
White	58,659	352	104	129	58,074	5,244	9.0	44,632	76.9	8,198	14.1	226.9
Black or African American	17,972	133	90	91	17,658	6,745	38.2	10,489	59.4	424	2.4	205.2
Asian	8,359	34	27	116	8,182	579	7.1	5,428	66.3	2,175	26.6	233.6
Pacific Islander	251	0	0	2	249	24	9.6	186	74.7	39	15.7	225.7
Hispanic or Latino	19,464	135	49	63	19,217	6,021	31.3	12,570	65.4	626	3.3	209.1
Amer. Indian/AK Native	118	1	1	2	114	19	16.7	85	74.6	10	8.8	218.2
Other	985	17	18	5	945	258	27.3	613	64.9	74	7.8	213.4
Economic Status												
Econ. Disadvantaged	30,984	230	120	167	30,467	10,931	35.9	18,772	61.6	764	2.5	206.4
Non-Econ. Disadvantaged	74,824	442	169	241	73,972	7,959	10.8	55,231	74.7	10,782	14.6	226.1

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded LEP Exempt (LAL only) and students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

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Table 6.5.15: Grade 3 Math - Descriptive Statistics - Performance by Demographic Group

MATHEMATICS												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	102,761	709	138	185	101,729	25,226	24.8	44,046	43.3	32,457	31.9	227.0
General Education [5]	82,604	0	61	76	82,467	16,713	20.3	36,570	44.3	29,184	35.4	231.8
Special Education	16,159	709	65	96	15,289	6,521	42.7	5,987	39.2	2,781	18.2	207.8
Limited English Proficient [6]	6,844	22	15	18	6,789	2,950	43.5	2,661	39.2	1,178	17.4	207.5
Current LEP	4,423	17	14	16	4,376	2,258	51.6	1,599	36.5	519	11.9	199.1
Former LEP	2,421	5	1	2	2,413	692	28.7	1,062	44.0	659	27.3	222.6
Gender [7]												
Female	49,876	200	50	69	49,557	12,238	24.7	21,837	44.1	15,482	31.2	226.7
Male	52,807	509	85	114	52,099	12,946	24.8	22,187	42.6	16,966	32.6	227.3
Migrant Status												
Migrant	17	0	0	0	17	9	52.9	7	41.2	1	5.9	189.5
Non-Migrant	102,744	709	138	185	101,712	25,217	24.8	44,039	43.3	32,456	31.9	227.0
Ethnicity [8]												
White	53,773	337	41	64	53,331	8,469	15.9	24,515	46.0	20,347	38.2	235.6
Black or African American	17,388	155	48	64	17,121	7,925	46.3	6,706	39.2	2,490	14.5	203.9
Asian	9,154	41	10	6	9,097	871	9.6	2,970	32.6	5,256	57.8	252.2
Pacific Islander	258	1	0	0	257	36	14.0	109	42.4	112	43.6	239.8
Hispanic or Latino	20,896	160	32	43	20,661	7,471	36.2	9,218	44.6	3,972	19.2	213.2
Amer. Indian/AK Native	116	1	0	1	114	37	32.5	51	44.7	26	22.8	218.3
Other	1,176	14	7	7	1,148	417	36.3	477	41.6	254	22.1	215.2
Economic Status												
Econ. Disadvantaged	34,417	250	64	99	34,004	13,998	41.2	14,327	42.1	5,679	16.7	208.7
Non-Econ. Disadvantaged	68,344	459	74	86	67,725	11,228	16.6	29,719	43.9	26,778	39.5	236.2

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

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Table 6.5.16: Grade 4 Math - Descriptive Statistics - Performance by Demographic Group

MATHEMATICS												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	103,360	668	133	148	102,411	27,687	27.0	46,521	45.4	28,203	27.5	223.4
General Education [5]	83,194	0	69	62	83,063	18,278	22.0	39,235	47.2	25,550	30.8	228.5
Special Education	17,073	668	58	78	16,269	7,743	47.6	6,202	38.1	2,324	14.3	202.1
Limited English Proficient [6]	5,591	9	8	12	5,562	2,657	47.8	2,168	39.0	737	13.3	202.7
Current LEP	3,397	6	7	8	3,376	1,866	55.3	1,165	34.5	345	10.2	195.5
Former LEP	2,194	3	1	4	2,186	791	36.2	1,003	45.9	392	17.9	213.9
Gender [7]												
Female	50,376	206	47	59	50,064	13,579	27.1	23,539	47.0	12,946	25.9	222.5
Male	52,935	462	83	89	52,301	14,074	26.9	22,973	43.9	15,254	29.2	224.2
Migrant Status												
Migrant	19	0	0	0	19	9	47.4	8	42.1	2	10.5	205.8
Non-Migrant	103,341	668	133	148	102,392	27,678	27.0	46,513	45.4	28,201	27.5	223.4
Ethnicity [8]												
White	55,268	333	50	57	54,828	9,866	18.0	26,613	48.5	18,349	33.5	231.9
Black or African American	17,771	156	36	47	17,532	8,684	49.5	6,996	39.9	1,852	10.6	200.4
Asian	8,748	43	11	9	8,685	956	11.0	3,150	36.3	4,579	52.7	248.1
Pacific Islander	269	0	0	0	269	44	16.4	109	40.5	116	43.1	237.2
Hispanic or Latino	20,221	127	30	34	20,030	7,731	38.6	9,194	45.9	3,105	15.5	209.9
Amer. Indian/AK Native	86	1	0	0	85	31	36.5	41	48.2	13	15.3	208.3
Other	997	8	6	1	982	375	38.2	418	42.6	189	19.2	211.8
Economic Status												
Econ. Disadvantaged	33,864	231	59	79	33,495	14,590	43.6	14,340	42.8	4,565	13.6	205.7
Non-Econ. Disadvantaged	69,496	437	74	69	68,916	13,097	19.0	32,181	46.7	23,638	34.3	231.9

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

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Table 6.5.17: Grade 5 Math - Descriptive Statistics - Performance by Demographic Group

MATHEMATICS												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	103,339	688	143	126	102,382	23,204	22.7	46,362	45.3	32,816	32.1	227.9
General Education [5]	83,744	0	80	52	83,612	13,911	16.6	39,323	47.0	30,378	36.3	233.9
Special Education	17,078	688	60	67	16,263	7,931	48.8	6,173	38.0	2,159	13.3	202.0
Limited English Proficient [6]	4,615	13	6	10	4,586	2,111	46.0	1,822	39.7	653	14.2	204.9
Current LEP	2,722	6	5	7	2,704	1,495	55.3	919	34.0	290	10.7	196.8
Former LEP	1,893	7	1	3	1,882	616	32.7	903	48.0	363	19.3	216.6
Gender [7]												
Female	49,960	214	50	33	49,663	11,147	22.4	23,523	47.4	14,993	30.2	227.1
Male	53,304	471	92	92	52,649	12,021	22.8	22,817	43.3	17,811	33.8	228.8
Migrant Status												
Migrant	12	0	0	0	12	5	41.7	5	41.7	2	16.7	206.8
Non-Migrant	103,327	688	143	126	102,370	23,199	22.7	46,357	45.3	32,814	32.1	227.9
Ethnicity [8]												
White	55,996	324	56	47	55,569	8,001	14.4	25,934	46.7	21,634	38.9	236.0
Black or African American	17,401	135	45	52	17,169	7,565	44.1	7,630	44.4	1,974	11.5	204.7
Asian	8,815	51	11	6	8,747	674	7.7	2,727	31.2	5,346	61.1	254.3
Pacific Islander	313	3	0	1	309	31	10.0	137	44.3	141	45.6	242.8
Hispanic or Latino	19,655	146	25	20	19,464	6,570	33.8	9,428	48.4	3,466	17.8	213.9
Amer. Indian/AK Native	94	1	0	0	93	29	31.2	47	50.5	17	18.3	215.3
Other	1,065	28	6	0	1,031	334	32.4	459	44.5	238	23.1	216.4
Economic Status												
Econ. Disadvantaged	32,958	234	71	65	32,588	12,506	38.4	15,196	46.6	4,886	15.0	209.8
Non-Econ. Disadvantaged	70,381	454	72	61	69,794	10,698	15.3	31,166	44.7	27,930	40.0	236.4

1 These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
2 Includes students coded Medical Emergency.
3 Percentages may not total 100 due to rounding.
4 Students are included in Total Students only once, but they appear in all other categories that apply.
5 Includes students coded Former LEP who are not Special Education.
6 Includes students coded Current and Former LEP.
7 Excludes students who did not have Gender coded.
8 Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

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Table 6.5.18: Grade 6 Math - Descriptive Statistics - Performance by Demographic Group

MATHEMATICS												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	103,584	596	199	146	102,643	29,869	29.1	46,773	45.6	26,001	25.3	220.6
General Education [5]	84,596	0	111	49	84,436	18,181	21.5	41,512	49.2	24,743	29.3	227.1
Special Education	16,707	596	81	94	15,936	10,183	63.9	4,684	29.4	1,069	6.7	190.6
Limited English Proficient [6]	3,970	11	7	6	3,946	2,331	59.1	1,241	31.4	374	9.5	194.4
Current LEP	2,451	3	7	5	2,436	1,646	67.6	599	24.6	191	7.8	187.7
Former LEP	1,519	8	0	1	1,510	685	45.4	642	42.5	183	12.1	205.3
Gender [7]												
Female	50,284	194	95	47	49,948	14,455	28.9	23,770	47.6	11,723	23.5	219.7
Male	53,234	400	103	99	52,632	15,375	29.2	22,984	43.7	14,273	27.1	221.5
Migrant Status												
Migrant	28	0	2	0	26	12	46.2	11	42.3	3	11.5	199.8
Non-Migrant	103,556	596	197	146	102,617	29,857	29.1	46,762	45.6	25,998	25.3	220.6
Ethnicity [8]												
White	56,505	311	66	58	56,070	10,815	19.3	28,142	50.2	17,113	30.5	228.4
Black or African American	17,494	99	69	49	17,277	9,324	54.0	6,547	37.9	1,406	8.1	197.9
Asian	8,569	45	5	7	8,512	857	10.1	2,933	34.5	4,722	55.5	249.0
Pacific Islander	284	1	0	1	282	45	16.0	109	38.7	128	45.4	240.5
Hispanic or Latino	19,548	120	42	27	19,359	8,360	43.2	8,566	44.2	2,433	12.6	206.2
Amer. Indian/AK Native	108	1	0	3	104	38	36.5	45	43.3	21	20.2	215.1
Other	1,076	19	17	1	1,039	430	41.4	431	41.5	178	17.1	208.9
Economic Status												
Econ. Disadvantaged	32,109	199	104	75	31,731	15,386	48.5	12,979	40.9	3,366	10.6	202.2
Non-Econ. Disadvantaged	71,475	397	95	71	70,912	14,483	20.4	33,794	47.7	22,635	31.9	228.9

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

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Table 6.5.19: Grade 7 Math - Descriptive Statistics - Performance by Demographic Group

MATHEMATICS												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	104,297	677	268	179	103,173	34,752	33.7	43,988	42.6	24,433	23.7	215.7
General Education [5]	84,748	0	156	76	84,516	21,440	25.4	39,534	46.8	23,542	27.9	223.4
Special Education	17,105	677	105	95	16,228	11,615	71.6	3,894	24.0	719	4.4	180.3
Limited English Proficient [6]	3,700	18	10	9	3,663	2,356	64.3	1,014	27.7	293	8.0	187.6
Current LEP	2,620	9	7	9	2,595	1,841	70.9	579	22.3	175	6.7	181.7
Former LEP	1,080	9	3	0	1,068	515	48.2	435	40.7	118	11.0	202.0
Gender [7]												
Female	50,771	268	113	65	50,325	16,841	33.5	22,283	44.3	11,201	22.3	215.3
Male	53,460	406	150	114	52,790	17,873	33.9	21,691	41.1	13,226	25.1	216.1
Migrant Status												
Migrant	15	0	0	0	15	13	86.7	2	13.3	0	0.0	174.5
Non-Migrant	104,282	677	268	179	103,158	34,739	33.7	43,986	42.6	24,433	23.7	215.7
Ethnicity [8]												
White	57,548	351	75	81	57,041	13,436	23.6	27,064	47.4	16,541	29.0	224.4
Black or African American	17,477	125	108	54	17,190	10,254	59.7	5,768	33.6	1,168	6.8	190.9
Asian	8,546	38	6	6	8,496	1,010	11.9	3,010	35.4	4,476	52.7	245.1
Pacific Islander	234	2	0	0	232	57	24.6	104	44.8	71	30.6	223.6
Hispanic or Latino	19,324	139	63	35	19,087	9,491	49.7	7,582	39.7	2,014	10.6	199.6
Amer. Indian/AK Native	103	1	0	0	102	40	39.2	41	40.2	21	20.6	210.9
Other	1,065	21	16	3	1,025	464	45.3	419	40.9	142	13.9	203.1
Economic Status												
Econ. Disadvantaged	31,163	253	148	78	30,684	16,648	54.3	11,271	36.7	2,765	9.0	195.6
Non-Econ. Disadvantaged	73,134	424	120	101	72,489	18,104	25.0	32,717	45.1	21,668	29.9	224.2

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

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Table 6.5.20: Grade 8 Math - Descriptive Statistics - Performance by Demographic Group

MATHEMATICS												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	105,808	675	458	224	104,451	30,039	28.8	43,561	41.7	30,851	29.5	221.2
General Education [5]	85,650	0	254	105	85,291	16,747	19.6	38,755	45.4	29,789	34.9	230.7
Special Education	17,553	675	188	117	16,573	11,534	69.6	4,178	25.2	861	5.2	179.0
Limited English Proficient [6]	3,741	9	22	6	3,704	2,308	62.3	1,039	28.1	357	9.6	186.4
Current LEP	2,749	4	19	2	2,724	1,876	68.9	645	23.7	203	7.5	180.0
Former LEP	992	5	3	4	980	432	44.1	394	40.2	154	15.7	204.3
Gender [7]												
Female	51,316	254	181	87	50,794	14,419	28.4	22,466	44.2	13,909	27.4	220.4
Male	54,407	418	269	136	53,584	15,572	29.1	21,075	39.3	16,937	31.6	222.1
Migrant Status												
Migrant	16	0	1	0	15	8	53.3	6	40.0	1	6.7	191.3
Non-Migrant	105,792	675	457	224	104,436	30,031	28.8	43,555	41.7	30,850	29.5	221.2
Ethnicity [8]												
White	58,659	357	162	98	58,042	10,599	18.3	26,367	45.4	21,076	36.3	231.6
Black or African American	17,972	133	170	74	17,595	9,772	55.5	6,123	34.8	1,700	9.7	192.3
Asian	8,359	32	14	5	8,308	826	9.9	2,655	32.0	4,827	58.1	251.8
Pacific Islander	251	0	0	0	251	45	17.9	116	46.2	90	35.9	233.7
Hispanic or Latino	19,464	135	94	44	19,191	8,361	43.6	7,885	41.1	2,945	15.3	203.7
Amer. Indian/AK Native	118	1	1	0	116	43	37.1	44	37.9	29	25.0	213.3
Other	985	17	17	3	948	393	41.5	371	39.1	184	19.4	207.7
Economic Status												
Econ. Disadvantaged	30,984	226	217	94	30,447	15,036	49.4	11,518	37.8	3,893	12.8	198.4
Non-Econ. Disadvantaged	74,824	449	241	130	74,004	15,003	20.3	32,043	43.3	26,958	36.4	230.6

1 These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
2 Includes students coded Medical Emergency.
3 Percentages may not total 100 due to rounding.
4 Students are included in Total Students only once, but they appear in all other categories that apply.
5 Includes students coded Former LEP who are not Special Education.
6 Includes students coded Current and Former LEP.
7 Excludes students who did not have Gender coded.
8 Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

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Table 6.5.21: Grade 4 Science Descriptive Statistics - Performance by Demographic Group

SCIENCE												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	103,360	624	320	122	102,294	9,268	9.1	44,963	44.0	48,063	47.0	239.5
General Education [5]	83,194	0	170	66	82,958	4,980	6.0	35,220	42.5	42,758	51.5	243.2
Special Education	17,073	624	136	47	16,266	3,269	20.1	8,129	50.0	4,868	29.9	226.0
Limited English Proficient [6]	5,591	6	22	13	5,550	1,497	27.0	3,012	54.3	1,041	18.8	217.6
Current LEP	3,397	4	18	9	3,366	1,155	34.3	1,747	51.9	464	13.8	211.4
Former LEP	2,194	2	4	4	2,184	342	15.7	1,265	57.9	577	26.4	227.2
Gender [7]												
Female	50,376	192	117	50	50,017	4,348	8.7	22,765	45.5	22,904	45.8	239.2
Male	52,935	432	200	72	52,231	4,909	9.4	22,172	42.4	25,150	48.2	239.9
Migrant Status												
Migrant	19	0	0	0	19	5	26.3	9	47.4	5	26.3	223.1
Non-Migrant	103,341	624	320	122	102,275	9,263	9.1	44,954	44.0	48,058	47.0	239.5
Ethnicity [8]												
White	55,268	303	124	44	54,797	1,969	3.6	20,632	37.7	32,196	58.8	247.4
Black or African American	17,771	144	90	46	17,491	3,608	20.6	9,888	56.5	3,995	22.8	222.8
Asian	8,748	41	23	9	8,675	369	4.3	2,669	30.8	5,637	65.0	250.6
Pacific Islander	269	0	0	0	269	9	3.3	100	37.2	160	59.5	248.8
Hispanic or Latino	20,221	127	72	22	20,000	3,180	15.9	11,180	55.9	5,640	28.2	227.8
Amer. Indian/AK Native	86	1	0	1	84	8	9.5	45	53.6	31	36.9	233.8
Other	997	8	11	0	978	125	12.8	449	45.9	404	41.3	234.9
Economic Status												
Econ. Disadvantaged	33,864	217	151	67	33,429	6,187	18.5	18,731	56.0	8,511	25.5	225.0
Non-Econ. Disadvantaged	69,496	407	169	55	68,865	3,081	4.5	26,232	38.1	39,552	57.4	246.6

1 These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
2 Includes students coded Medical Emergency.
3 Percentages may not total 100 due to rounding.
4 Students are included in Total Students only once, but they appear in all other categories that apply.
5 Includes students coded Former LEP who are not Special Education.
6 Includes students coded Current and Former LEP.
7 Excludes students who did not have Gender coded.
8 Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

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Table 6.5.22: Grade 8 Science Descriptive Statistics - Performance by Demographic Group

SCIENCE												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	105,808	600	686	224	104,298	16,535	15.9	56,095	53.8	31,668	30.4	231.3
General Education [5]	85,650	0	397	112	85,141	8,157	9.6	46,746	54.9	30,238	35.5	237.0
Special Education	17,553	600	264	108	16,581	6,933	41.8	8,281	49.9	1,367	8.2	207.2
Limited English Proficient [6]	3,741	9	36	6	3,690	1,837	49.8	1,708	46.3	145	3.9	201.6
Current LEP	2,749	4	29	4	2,712	1,539	56.7	1,107	40.8	66	2.4	198.0
Former LEP	992	5	7	2	978	298	30.5	601	61.5	79	8.1	211.8
Gender [7]												
Female	51,316	217	286	96	50,717	7,858	15.5	29,006	57.2	13,853	27.3	229.6
Male	54,407	380	388	127	53,512	8,647	16.2	27,061	50.6	17,804	33.3	232.9
Migrant Status												
Migrant	16	0	1	0	15	3	20.0	12	80.0	0	0.0	207.5
Non-Migrant	105,792	600	685	224	104,283	16,532	15.9	56,083	53.8	31,668	30.4	231.3
Ethnicity [8]												
White	58,659	318	241	113	57,987	4,184	7.2	30,925	53.3	22,878	39.5	240.3
Black or African American	17,972	115	246	61	17,550	6,209	35.4	9,665	55.1	1,676	9.5	210.6
Asian	8,359	33	21	6	8,299	538	6.5	3,441	41.5	4,320	52.1	248.2
Pacific Islander	251	0	1	0	250	19	7.6	141	56.4	90	36.0	238.3
Hispanic or Latino	19,464	117	149	40	19,158	5,340	27.9	11,365	59.3	2,453	12.8	216.0
Amer. Indian/AK Native	118	1	2	0	115	16	13.9	70	60.9	29	25.2	228.6
Other	985	16	26	4	939	229	24.4	488	52.0	222	23.6	223.1
Economic Status												
Econ. Disadvantaged	30,984	193	334	91	30,366	9,709	32.0	17,395	57.3	3,262	10.7	212.9
Non-Econ. Disadvantaged	74,824	407	352	133	73,932	6,826	9.2	38,700	52.3	28,406	38.4	238.9

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

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Scale Score Distributions by District Factor Groups (DFG)

New Jersey has an established history of applying District Factor Groups (DFGs)[29] 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 (e.g., charter schools).

Descriptive statistics of scale scores and percentage distributions of student performance by DFG for General Education group are summarized in Tables 6.5.23 through 6.5.25 by content area and grade. For each of the content areas, students who were flagged as "void" or "not present" were removed. Results are slightly different from the Cycle II reports. These descriptive statistics are based on data collected prior to record changes, automatic rescore, and Cycle I reporting. For an in-depth analysis of student performance by DFG, please see the Cycle II reports at: http://www.nj.gov/education/schools/achievement/2009/njask58/g8/demographic_reports.pdf

Table 6.5.23 Descriptive Statistics for LAL Performance Levels by DFG

Grade	DFG	N	Mean	StdDev	Min	Max	%PP	%P	%AP
3	A	18296	189.94	28.41	100	300	60.27	38.25	1.48
	B	10342	196.32	27.19	100	295	51.41	46.37	2.21
	CD	9535	200.57	26.60	100	300	44.34	52.36	3.29
	DE	12743	205.59	27.24	100	300	35.57	59.74	4.68
	FG	12232	207.42	26.46	100	300	32.67	62.07	5.26
	GH	13909	210.48	28.18	100	300	29.08	63.18	7.74
	I	19225	216.24	27.18	100	300	21.39	67.69	10.92
	J	4301	221.54	26.56	100	300	14.74	71.38	13.88
	N	450	186.05	26.76	100	256	67.11	32.22	0.67
	O	16	170.56	19.22	131	200	93.75	6.25	0.00
	R	1666	196.15	25.91	100	278	54.92	41.96	3.12

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

Table 6.5.23 Descriptive Statistics for LAL Performance Levels by DFG (con't)

Grade	DFG	N	Mean	StdDev	Min	Max	%PP	%P	%AP
4	A	17629	188.40	29.74	100	300	61.95	36.53	1.52
	B	10524	194.79	29.34	100	300	52.17	45.42	2.41
	CD	9430	200.83	27.96	100	300	43.69	52.70	3.61
	DE	13001	206.31	28.67	100	300	35.09	59.41	5.50
	FG	12674	209.03	28.43	100	300	31.76	61.26	6.98
	GH	14075	212.03	29.62	100	300	28.37	62.41	9.22
	I	19485	217.81	28.23	100	300	20.56	67.43	12.01
	J	4484	222.93	27.60	100	300	15.23	68.64	16.12
	N	398	186.84	32.25	100	277	64.57	32.91	2.51
	O	16	160.94	30.76	100	223	93.75	6.25	0.00
	R	1557	191.77	27.12	100	286	59.60	38.02	2.38
5	A	16807	190.33	27.49	100	300	61.18	36.98	1.84
	B	10267	197.67	27.93	100	299	49.48	47.38	3.14
	CD	9561	202.80	27.99	100	300	40.74	54.72	4.54
	DE	13206	208.40	27.41	100	300	32.58	60.26	7.16
	FG	12681	211.00	26.97	100	300	27.77	63.99	8.24
	GH	14403	214.57	28.06	100	300	24.97	62.92	12.12
	I	19611	219.81	27.19	100	300	18.12	66.48	15.40
	J	4329	226.58	26.70	100	300	12.20	64.82	22.98
	N	381	191.97	28.45	100	263	60.37	37.80	1.84
	O	20	152.45	25.49	109	209	95.00	5.00	0.00
	R	1915	195.12	26.21	100	299	55.98	41.41	2.61
6	A	16054	191.29	26.50	100	285	58.32	40.67	1.01
	B	10375	200.51	26.80	100	300	42.62	54.81	2.56
	CD	9618	205.05	25.74	100	300	36.10	60.07	3.83
	DE	13405	209.03	26.10	100	300	29.54	64.75	5.71
	FG	12958	211.90	25.71	100	300	24.85	68.57	6.58
	GH	14126	215.78	26.66	100	300	21.36	68.64	10.00
	I	19941	220.66	25.55	100	300	15.43	71.11	13.45
	J	4566	226.30	23.60	100	300	9.07	74.35	16.58
	N	376	194.34	29.76	100	265	47.87	51.06	1.06
	O	25	168.76	29.56	100	237	80.00	20.00	0.00
	R	2005	200.96	24.10	100	279	45.14	51.52	3.34
	V	21	218.38	29.62	164	290	23.81	61.90	14.29

Table 6.5.23 Descriptive Statistics for LAL Performance Levels by DFG (con't)

Grade	DFG	N	Mean	StdDev	Min	Max	%PP	%P	%AP
7	A	15854	191.30	32.04	100	300	56.14	39.79	4.07
	B	10354	202.75	32.76	100	300	39.90	51.43	8.67
	CD	9873	207.29	32.78	100	300	34.33	54.46	11.21
	DE	13458	212.52	31.52	100	300	28.38	57.40	14.21
	FG	13556	217.21	31.76	100	300	23.22	58.70	18.07
	GH	13931	222.42	33.47	100	300	19.02	56.94	24.04
	I	20511	229.00	32.31	100	300	13.51	55.53	30.96
	J	4364	237.92	31.24	100	300	7.54	50.48	41.98
	N	373	186.38	31.44	100	260	63.81	34.58	1.61
	O	55	154.20	30.96	100	222	90.91	9.09	0.00
	R	1875	202.72	29.87	100	300	43.09	48.91	8.00
	V	15	220.33	21.61	184	251	13.33	73.33	13.33
8	A	16366	200.91	25.78	100	293	44.03	54.04	1.92
	B	10600	210.10	25.99	100	300	28.04	67.79	4.17
	CD	10197	215.00	25.29	100	300	21.52	71.71	6.78
	DE	13864	218.61	24.76	100	300	15.90	76.22	7.88
	FG	14262	222.30	24.07	100	300	12.61	76.99	10.41
	GH	13938	225.39	25.41	100	300	11.12	74.08	14.80
	I	20106	231.09	23.92	100	300	6.66	72.57	20.77
	J	4323	236.02	23.66	100	300	4.44	67.68	27.87
	N	346	198.68	25.32	100	262	48.55	50.00	1.45
	O	82	176.15	19.76	100	212	86.59	13.41	0.00
	R	1587	208.90	22.33	100	300	32.51	64.02	3.47
	V	12	221.17	15.27	189	243	8.33	91.67	0.00

Table 6.5.24: Descriptive Statistics for Mathematics Performance Levels by DFG

Grade	DFG	N	Mean	StdDev	Min	Max	%PP	%P	%AP
3	A	18003	206.46	41.47	100	300	43.77	39.52	16.71
	B	10238	215.91	39.65	100	300	34.04	44.25	21.71
	CD	9454	219.93	38.74	100	300	29.60	46.13	24.28
	DE	12598	229.11	38.87	100	300	22.10	45.77	32.13
	FG	12140	230.10	37.68	100	300	20.40	46.44	33.15
	GH	13782	236.48	38.34	100	300	16.35	43.87	39.78
	I	19114	242.21	36.65	100	300	12.23	42.31	45.46
	J	4276	249.88	34.96	100	300	7.90	38.40	53.70
	N	442	209.52	38.85	121	300	38.91	45.25	15.84
	O	16	169.25	33.04	105	237	87.50	12.50	0.00
	R	1661	210.62	41.02	100	300	41.42	40.22	18.36
4	A	17430	204.94	39.52	100	300	44.44	41.18	14.38
	B	10422	211.58	38.02	100	300	37.34	45.70	16.95
	CD	9359	216.56	36.74	100	300	32.29	47.95	19.76
	DE	12849	224.82	37.28	100	300	24.28	48.82	26.90
	FG	12599	225.55	37.90	100	300	24.07	47.67	28.26
	GH	13969	231.60	38.18	100	300	20.24	45.11	34.64
	I	19362	238.10	36.15	100	300	13.83	46.14	40.04
	J	4467	245.79	35.85	100	300	9.92	40.54	49.54
	N	382	214.82	38.79	109	300	32.20	48.69	19.11
	O	16	169.5	34.40	131	255	75.00	18.75	6.25
	R	1554	201.15	38.13	100	300	50.84	37.19	11.97
5	A	16589	207.83	36.28	100	300	41.32	43.96	14.73
	B	10154	216.21	35.20	100	300	31.49	49.11	19.39
	CD	9462	220.23	35.57	100	300	27.98	48.82	23.21
	DE	13073	228.14	35.58	106	300	20.93	48.47	30.61
	FG	12585	229.80	35.19	106	300	18.91	49.19	31.90
	GH	14317	236.24	36.11	106	300	15.18	45.14	39.68
	I	19479	244.43	34.77	100	300	10.00	40.82	49.18
	J	4418	251.89	33.40	125	300	6.99	34.40	58.60
	N	371	213.43	32.10	116	300	30.46	57.14	12.40
	O	20	156.70	24.61	100	215	95.00	5.00	0.00
	R	1904	207.48	37.31	100	300	43.33	41.23	15.44

Table 6.5.24: Descriptive Statistics for Mathematics Performance Levels by DFG (con't)

Grade	DFG	N	Mean	StdDev	Min	Max	%PP	%P	%AP
6	A	15885	199.13	34.23	100	300	52.27	38.05	9.68
	B	10256	209.35	34.58	102	300	40.10	44.45	15.44
	CD	9547	213.80	34.03	100	300	34.83	46.94	18.24
	DE	13278	220.57	35.23	113	300	27.51	48.99	23.50
	FG	12872	222.29	34.45	113	300	25.02	50.47	24.51
	GH	14036	228.04	35.96	102	300	21.35	47.56	31.09
	I	19816	236.71	35.75	100	300	14.16	45.71	40.13
	J	4550	244.93	33.91	121	300	8.26	43.23	48.51
	N	361	209.22	31.58	113	300	38.23	49.31	12.47
	O	24	172.83	28.82	134	252	87.50	8.33	4.17
	R	1995	206.77	35.61	121	300	45.81	39.90	14.29
	V	21	233	40.58	168	300	23.81	38.10	38.10
7	A	15598	191.88	36.96	100	300	58.46	33.28	8.26
	B	10214	204.57	36.98	100	300	44.58	41.33	14.10
	CD	9773	208.70	37.03	100	300	39.65	43.77	16.58
	DE	13331	215.04	36.82	100	300	33.19	45.53	21.29
	FG	13445	217.93	36.78	100	300	29.75	46.92	23.32
	GH	13802	224.59	38.16	100	300	24.47	45.11	30.42
	I	20367	232.08	37.11	100	300	18.00	44.94	37.06
	J	4347	242.38	35.88	117	300	11.64	39.87	48.49
	N	356	191.43	31.28	100	287	61.24	32.87	5.90
	O	49	156.71	30.96	109	243	87.76	12.24	0.00
	R	1869	199.80	37.34	100	300	51.63	35.85	12.52
	V	15	228.07	21.64	181	251	13.33	66.67	20.00
8	A	16027	193.23	41.89	100	300	54.98	33.44	11.59
	B	10427	209.35	41.97	100	300	37.89	43.12	18.99
	CD	10065	214.76	41.21	100	300	32.86	44.60	22.54
	DE	13681	221.79	41.13	100	300	27.10	44.89	28.01
	FG	14135	224.91	40.07	100	300	23.16	46.93	29.91
	GH	13794	232.55	41.67	100	300	19.49	42.50	38.01
	I	19965	238.75	39.91	100	300	14.40	41.72	43.88
	J	4292	248.54	38.39	100	300	9.53	35.79	54.68
	N	337	193.22	37.87	108	300	55.79	34.72	9.50
	O	73	149.62	24.59	100	210	93.15	6.85	0.00
	R	1638	203.06	43.35	100	300	46.21	36.02	17.77
	V	12	265.08	47.39	128	300	8.33	8.33	83.33

Table 6.5.25: Descriptive Statistics for Science Performance Levels by DFG

Grade	DFG	N	Mean	StdDev	Min	Max	%PP	%P	%AP
4	A	17370	221.85	30.35	121	287	22.29	54.95	22.76
	B	10418	230.71	28.51	140	287	14.23	52.63	33.13
	CD	9357	236.09	26.32	134	286	9.35	51.34	39.31
	DE	12840	242.47	24.87	140	287	6.01	43.85	50.14
	FG	12584	244.64	24.25	127	287	5.11	41.33	53.56
	GH	13951	245.98	24.13	121	287	4.92	38.66	56.42
	I	19354	250.10	21.59	134	287	2.68	33.85	63.47
	J	4463	253.39	19.43	151	287	1.52	28.68	69.80
	N	381	224.55	28.02	151	278	19.95	55.64	24.41
	O	16	199.00	32.18	157	256	50.00	43.75	6.25
	R	1552	225.96	29.79	140	286	17.20	54.70	28.09
8	A	15965	208.34	26.34	114	300	38.91	53.15	7.94
	B	10421	220.04	27.82	125	300	23.53	60.11	16.36
	CD	10053	226.27	28.90	133	300	17.42	59.69	22.89
	DE	13656	231.92	28.49	141	300	12.31	58.86	28.83
	FG	14114	235.67	28.08	141	300	9.53	57.20	33.27
	GH	13785	239.01	29.58	114	300	9.01	52.64	38.35
	I	19954	246.28	28.75	133	300	5.24	46.14	48.62
	J	4289	252.95	27.87	152	300	3.22	39.40	57.38
	N	337	207.20	24.60	152	292	41.84	50.45	7.72
	O	71	187.83	18.52	147	240	74.65	25.35	0.00
	R	1637	218.29	30.04	147	300	28.83	53.63	17.53
	V	12	222.17	23.48	181	263	16.67	66.67	16.67

PART 7: SCALING AND EQUATING

This section details the equating, scaling, and linking procedures applied to the operational tests[30]. Scaling and equating procedures were applied to the 2009 NJ ASK Grades 5-8 LAL and Mathematics assessments in addition to the grades 4 and 8 Science assessments. As new standards were established for the grades 3 and 4 LAL and Mathematics assessments, only scaling and linking procedures were applied to those assessments. The linking of 2009 to 2008 scores was performed to allow the subsequent use of these scores by the NJDOE Title I Office for the determination of adequate yearly progress under the No Child Left Behind Act.

7.1 Descriptive Statistics for Equating/Linking Data

In 2008, data from approximately 35,000 students was used for impact data for standard setting. These data were used to establish new proficient and advanced proficient cut scores for LAL and mathematics in grades 5 through 8. Thus, 2008 is the new base year to which future LAL and mathematics grade 5-8 assessments will be equated. For 2009, an equating sample (grade 4 science and grades 5-8, all subjects) or a linking sample (grades 3 and 4 LAL and mathematics) composed of approximately 30% of the total student population in LAL, mathematics, and science was selected. The 2009 NJ ASK equating/linking samples are summarized in Table 7.1.1. Generally, less than 2% of the records were invalid and removed from analyses.

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

Test	Total	Percent	Valid	Invalid*
LAL 3	32040	31.45%	31651	389
LAL 4	30449	29.72%	30104	345
LAL 5	32735	32.27%	32382	353
LAL 6	32758	32.19%	32436	322
LAL 7	31878	31.21%	31406	472
LAL 8	30585	29.51%	30182	403
Math 3	32323	31.78%	31870	453
Math 4	31937	31.19%	31541	396
Math 5	30316	29.61%	30015	301
Math 6	32545	31.71%	32208	337
Math 7	31486	30.52%	30861	625
Math 8	31215	29.89%	30666	549
Science 4	32048	31.33%	31676	372
Science 8	31436	30.14%	30952	484

*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

[30] All equating results are verified by an external reviewer.

The 2009 equating/linking sample was selected to be representative of the total student population in terms of DFG and other demographic variables such as gender, ethnicity, economic status, and Current Limited English Proficiency (CLEP). A comparison between data from the 2009 form distribution plan and the sample data used for scaling and equating/linking is presented in Tables 7.1.2 to 7.1.7. These tables show the difference between the 2009 form distribution plan and the equating/linking sample to be no more than 2.94% for any DFG group across all tests.

Table 7.1.2: Comparison of the Linking Sample and the Statewide DFGs - Grade 3

DFG	Statewide Distribution	LAL		Math	
		Obs(%)	Diff	Obs(%)	Diff
A	17.43	17.53	0.10	18.00	0.56
B	10.28	8.41	-1.87	9.61	-0.67
CD	9.11	10.89	1.78	10.35	1.24
DE	12.41	13.26	0.85	13.20	0.79
FG	12.09	12.15	0.06	12.39	0.31
GH	13.00	10.89	-2.11*	10.93	-2.08*
I	18.14	19.14	1.00	19.21	1.06
J	4.08	4.86	0.78	4.89	0.81
N	0.42	1.32	0.90	1.32	0.90
O	0.99	0.00	-0.99	1.04	0.05
R	1.69	1.53	-0.16	1.75	0.07
S	0.33	0.00	-0.33	0.69	0.36
V	0.02	0.00	-0.02	1.00	0.99

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

Table 7.1.3: Comparison of the Equating/Linking Sample and the Statewide DFGs - Grade 4

DFG	Statewide Distribution	LAL (linking)		Math (linking)		Science (equating)	
		Obs(%)	Diff	Obs(%)	Diff	Obs(%)	Diff
A	16.91	16.21	-0.70	16.37	-0.54	16.81	-0.10
B	9.96	8.51	-1.45	8.94	-1.02	8.77	-1.19
CD	9.26	10.31	1.05	9.99	0.73	10.42	1.16
DE	12.47	13.79	1.32	13.88	1.41	13.82	1.35
FG	12.35	12.96	0.61	13.10	0.75	12.91	0.56
GH	13.43	10.95	-2.48*	11.59	-1.84*	10.54	-2.89*
I	18.11	19.53	1.42	19.30	1.19	18.90	0.79
J	4.05	5.17	1.12	4.37	0.32	5.03	0.98
N	0.41	1.09	0.68	0.92	0.51	1.20	0.79
O	1.05	0.00	-1.05	0.02	-1.03	0.05	-1.00
R	1.67	1.48	-0.19	1.53	-0.14	1.54	-0.13
S	0.31	0.00	-0.31	0.00	-0.31	0.01	-0.30

V	0.02	0.00	-0.02	0.01	-0.01	0.00	-0.02

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

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

DFG	Statewide Distribution	LAL		Math	
		Obs(%)	Diff	Obs(%)	Diff
A	15.61	17.08	1.47	12.67	-2.94*
B	9.79	8.46	-1.33	8.95	-0.84
CD	9.68	10.44	0.76	10.38	0.70
DE	12.57	13.33	0.76	14.22	1.65
FG	12.33	12.33	0.00	13.30	0.97
GH	13.25	11.07	-2.18*	11.95	-1.30
I	18.57	19.84	1.27	20.69	2.12
J	4.18	4.66	0.48	5.03	0.85
N	0.38	1.03	0.65	1.12	0.74
O	1.18	0.00	-1.18	0.00	-1.18
R	2.04	1.76	-0.28	1.68	-0.36
S	0.38	0.00	-0.38	0.00	-0.38
V	0.03	0.00	-0.03	0.00	-0.03

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

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

DFG	Statewide Distribution	LAL		Math	
		Obs(%)	Diff	Obs(%)	Diff
A	15.25	16.28	1.03	16.58	1.33
B	9.67	8.48	-1.19	8.49	-1.18
CD	9.36	10.40	1.04	10.17	0.81
DE	12.81	13.94	1.13	13.90	1.09
FG	12.35	12.97	0.62	13.03	0.68
GH	13.35	10.58	-2.77*	10.51	-2.84*
I	18.67	19.39	0.72	19.38	0.71
J	4.24	4.92	0.68	4.89	0.65
N	0.38	0.98	0.60	1.03	0.65
O	1.34	0.00	-1.34	0.00	-1.34
R	2.06	1.99	-0.07	1.93	-0.13
S	0.45	0.00	-0.45	0.00	-0.45
V	0.07	0.06	-0.01	0.07	0.00

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

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

DFG	Statewide Distribution	LAL		Math	
		Obs(%)	Diff	Obs(%)	Diff
A	15.18	15.23	0.05	15.46	0.28
B	9.76	7.88	-1.88*	8.11	-1.65
CD	9.33	9.66	0.33	9.97	0.64
DE	12.78	14.60	1.82	14.55	1.77
FG	13.02	13.30	0.28	13.74	0.72
GH	12.72	10.90	-1.82	11.09	-1.63
I	18.66	20.37	1.71	20.53	1.87*
J	4.15	4.86	0.71	3.52	-0.63
N	0.36	1.05	0.69	1.04	0.68
O	1.61	0.06	-1.55	0.05	-1.56
R	1.91	2.05	0.14	1.90	-0.01
S	0.46	0.00	-0.46	0.00	-0.46
V	0.06	0.05	-0.01	0.05	-0.01

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

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

DFG	Statewide Distribution	LAL		Math		Science	
		Obs(%)	Diff	Obs(%)	Diff	Obs(%)	Diff
A	15.12	15.32	0.20	15.40	0.28	15.43	0.31
B	9.87	8.27	-1.60	8.27	-1.60	8.37	-1.50
CD	9.23	10.10	0.87	10.08	0.85	10.06	0.83
DE	12.84	15.40	2.56*	15.32	2.48*	15.23	2.39*
FG	12.85	14.42	1.57	14.25	1.40	14.23	1.38
GH	12.76	11.26	-1.50	11.24	-1.52	11.25	-1.51
I	18.69	19.68	0.99	19.88	1.19	19.86	1.17
J	4.16	2.97	-1.19	2.94	-1.22	2.93	-1.23
N	0.34	0.94	0.60	0.99	0.65	1.02	0.68
O	1.77	0.00	-1.77	0.01	-1.76	0.01	-1.76
R	1.74	1.58	-0.16	1.58	-0.16	1.58	-0.16
S	0.55	0.00	-0.55	0.00	-0.55	0.00	-0.55
V	0.08	0.04	-0.04	0.04	-0.04	0.04	-0.04

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

Tables 7.1.8 through 7.1.10 present the N-counts for the 2009 scaling and equating/linking samples by DFG, gender, and ethnicity. Note that the sum for males and females will not equal the total in Table 7.1.1 as some examinees did not make a selection for gender. Similarly, some

examinees did not identify ethnicity or marked multiple ethnicities, therefore the sum over ethnic groups will 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\Linking Sample N-Counts by Gender and Ethnicity: LAL

Test Grade	DFG	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	EconDis	LEP[1]
LAL 3	A	2857	2665	48	2844	2020	8	12	533	4439	647
	B	1373	1285	97	356	755	5	7	1418	1304	185
	CD	1781	1652	284	666	619	7	9	1825	1216	124
	DE	2155	2040	480	346	804	3	9	2521	965	188
	FG	2025	1821	311	277	315	5	29	2891	467	107
	GH	1764	1678	404	247	300	2	2	2474	298	147
	I	3154	2897	775	170	249	0	106	4691	236	143
	J	777	758	175	16	51	0	2	1280	11	23
	N	213	206	1	120	246	1	4	47	322	45
	R	231	251	15	285	95	2	5	75	237	3
	Total	**16330**	**15253**	**2590**	**5327**	**5454**	**33**	**185**	**17755**	**9495**	**1612**
LAL 4	A	2386	2475	33	2530	1703	5	11	534	3956	514
	B	1290	1268	79	339	679	4	18	1426	1263	147
	CD	1562	1534	248	640	528	8	5	1646	1137	80
	DE	2137	2009	422	312	807	0	8	2569	990	130
	FG	1980	1918	330	288	299	4	28	2927	470	87
	GH	1664	1632	390	263	280	3	3	2347	301	87
	I	3016	2860	770	186	241	1	101	4549	198	102
	J	782	771	193	18	39	0	2	1297	9	21
	N	150	175	0	77	211	0	3	36	265	37
	R	222	224	23	278	84	1	3	56	249	6
	Total	**15189**	**14866**	**2488**	**4931**	**4871**	**26**	**182**	**17387**	**8838**	**1211**
LAL 5	A	2800	2706	53	2591	2157	6	11	620	4434	474
	B	1422	1315	102	344	732	4	10	1512	1287	133
	CD	1764	1611	226	649	569	4	8	1882	1208	77
	DE	2246	2063	461	392	855	6	9	2552	1025	111
	FG	2037	1955	322	318	331	3	28	2957	515	74
	GH	1767	1813	454	278	302	2	8	2509	363	83
	I	3297	3127	815	179	241	1	111	5027	226	72
	J	796	711	157	19	37	0	3	1286	7	16
	N	172	160	1	96	200	0	3	31	275	30
	R	277	291	9	376	101	1	2	71	284	6
	Total	**16578**	**15752**	**2600**	**5242**	**5525**	**27**	**193**	**18447**	**9624**	**1076**

[1]Students in current LEP status in 2009

Table 7.1.8: Equating\Linking Sample N-Counts by Gender and Ethnicity LAL (continued)

Test Grade	DFG	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific		White	EconDis	LEP[1]
LAL 6	A	2716	2552	32	2587	1982	2	11		579	4118	363
	B	1427	1314	93	349	735	2	14		1515	1311	132
	CD	1727	1644	217	614	597	5	8		1864	1175	61
	DE	2365	2150	451	398	899	7	4		2738	1048	99
	FG	2196	2009	318	335	326	1	25		3155	526	50
	GH	1765	1664	349	264	345	1	3		2445	295	45
	I	3208	3077	823	190	233	0	84		4896	248	68
	J	821	775	211	19	54	0	2		1306	9	22
	N	146	173	1	88	184	0	5		41	248	18
	R	302	344	12	378	133	1	4		102	342	2
	V	7	14	7	3	4	0	0		7	10	0
	Total	**16680**	**15716**	**2514**	**5225**	**5492**	**19**	**160**		**18648**	**9330**	**860**
LAL 7	A	2459	2300	37	2497	1557	1	12		604	3566	265
	B	1267	1206	85	330	679	2	17		1334	1085	97
	CD	1590	1442	223	599	583	4	14		1560	1004	48
	DE	2307	2272	477	395	855	3	8		2815	1074	80
	FG	2133	2041	290	313	338	2	24		3186	521	57
	GH	1734	1688	403	291	274	2	2		2434	292	64
	I	3261	3132	891	215	255	6	77		4900	212	60
	J	787	738	207	19	40	0	1		1253	11	15
	N	160	169	0	106	182	0	2		39	264	7
	O	16	3	0	15	2	0	0		0	16	0
	R	295	349	7	386	135	0	1		99	343	8
	V	8	7	5	4	5	0	0		1	5	0
	Total	**16017**	**15347**	**2625**	**5170**	**4905**	**20**	**158**		**18225**	**8393**	**701**
LAL 8	A	2287	2310	38	2348	1525	7	8		605	3374	282
	B	1255	1239	82	345	624	2	13		1415	1099	98
	CD	1525	1514	185	600	565	5	9		1621	967	44
	DE	2430	2216	402	429	861	3	11		2921	988	106
	FG	2220	2132	307	334	313	7	18		3348	465	43
	GH	1756	1640	382	262	284	4	6		2439	303	54
	I	3055	2885	831	194	218	3	81		4556	191	64
	J	472	423	87	7	25	1	2		771	7	8
	N	135	150	1	94	150	1	4		35	233	15
	O	0	1	0	0	0	0	0		1	1	0
	R	213	264	2	318	112	1	5		38	277	5
	V	6	6	5	3	3	0	0		1	7	0
	Total	**15354**	**14780**	**2322**	**4934**	**4680**	**34**	**157**		**17751**	**7912**	**719**

[1]Students in current LEP status in 2009

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

Test Grade	DFG	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	EconDis	LEP[1]
Math 3	A	2837	2657	47	2763	2022	7	13	544	4398	664
	B	1346	1274	96	340	729	4	7	1432	1263	177
	CD	1740	1614	283	632	568	8	9	1793	1200	108
	DE	2132	2019	474	337	799	3	9	2503	943	189
	FG	2018	1825	318	275	316	4	30	2878	458	106
	GH	1784	1667	413	243	297	1	2	2478	300	156
	I	3081	2866	753	160	239	0	127	4577	192	135
	J	744	711	160	16	52	0	1	1212	10	18
	N	216	206	1	115	255	1	4	46	325	59
	O	2	1	NR	NR	NR	NR	NR	NR	NR	NR
	R	240	260	17	290	98	2	5	82	241	3
	Total	**16140**	**15100**	**2562**	**5171**	**5375**	**30**	**207**	**17545**	**9330**	**1615**
Math 4	A	2545	2570	33	2626	1819	5	11	563	4156	548
	B	1354	1313	83	337	702	3	19	1501	1303	155
	CD	1625	1577	259	641	554	8	6	1712	1157	94
	DE	2209	2060	430	320	856	1	8	2634	1025	146
	FG	2054	1985	365	287	313	3	29	3017	476	108
	GH	1768	1713	407	272	295	3	2	2482	320	100
	I	3034	2865	754	174	244	0	129	4564	158	101
	J	762	744	181	17	37	0	2	1263	8	25
	N	169	190	0	86	235	0	3	35	291	49
	O	4	1	NR	NR	NR	NR	NR	1	NR	NR
	R	234	223	22	286	80	1	3	63	247	7
	Total	**15758**	**15241**	**2534**	**5046**	**5135**	**24**	**212**	**17835**	**9141**	**1333**
Math 5	A	1922	1862	24	1980	1233	3	11	478	2987	349
	B	1395	1290	101	338	708	4	9	1492	1251	137
	CD	1623	1484	189	624	541	4	8	1699	1118	86
	DE	2222	2039	458	388	856	6	9	2510	1018	125
	FG	2034	1958	330	321	329	3	28	2948	515	87
	GH	1765	1815	457	279	302	2	8	2504	368	91
	I	3177	3032	792	171	231	1	111	4845	212	92
	J	796	714	161	19	38	0	3	1281	7	23
	N	176	161	1	96	205	0	3	31	279	35
	R	247	255	8	311	101	1	2	71	237	5
	Total	**15357**	**14610**	**2521**	**4527**	**4544**	**24**	**192**	**17859**	**7992**	**1030**

*NR=Not reported

[1]Students in current LEP status in 2009

Table 7.1.9: Equating\Linking Sample N-Counts by Gender and Ethnicity: Mathematics (continued)

Test Grade	DFG	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	EconDis	LEP[1]
Math 6	A	2743	2578	33	2593	2021	2	11	582	4156	418
	B	1425	1304	93	348	731	2	15	1506	1305	139
	CD	1675	1600	218	608	594	4	8	1781	1147	74
	DE	2339	2130	451	392	901	7	4	2694	1043	111
	FG	2191	2004	323	333	325	1	25	3142	524	60
	GH	1739	1645	353	260	341	1	3	2403	296	53
	I	3175	3064	833	185	230	0	83	4849	244	84
	J	805	770	211	19	54	0	2	1282	9	23
	N	153	180	1	88	195	0	5	44	258	31
	R	288	334	12	351	134	1	4	101	318	2
	V	7	14	7	3	4	0	0	7	10	0
	Total	**16540**	**15623**	**2535**	**5180**	**5530**	**18**	**160**	**18391**	**9310**	**995**
Math 7	A	2465	2287	39	2434	1615	1	13	606	3582	330
	B	1278	1222	86	338	687	2	17	1344	1106	114
	CD	1619	1456	227	602	612	4	14	1566	1028	76
	DE	2260	2223	437	380	866	2	8	2762	1050	82
	FG	2166	2069	296	314	347	2	26	3230	534	65
	GH	1742	1679	402	283	275	2	2	2439	288	72
	I	3235	3099	893	210	253	6	78	4847	205	73
	J	560	527	139	8	23	0	0	912	7	10
	N	154	166	0	105	178	0	2	35	257	11
	O	4	12	0	12	2	0	0	0	14	0
	R	270	316	7	336	132	16	1	94	294	8
	V	7	8	5	4	5	0	0	1	5	0
	Total	**15760**	**15064**	**2531**	**5026**	**4995**	**35**	**161**	**17836**	**8370**	**841**
Math 8	**A**	2348	2340	38	2376	1580	7	8	608	3437	339
	B	1280	1255	83	349	648	2	15	1425	1122	117
	CD	1532	1550	188	602	592	5	9	1632	990	70
	DE	2453	2242	411	435	879	3	11	2937	1004	121
	FG	2231	2138	313	332	314	8	18	3358	463	51
	GH	1783	1661	393	266	287	4	6	2467	309	59
	I	3141	2954	857	202	228	3	81	4666	198	78
	J	475	424	88	7	25	1	2	774	8	9
	N	144	159	1	94	166	1	4	37	247	28
	O	1	1	0	0	1	0	0	1	1	0
	R	218	267	2	324	114	1	5	38	284	5
	S	1	0	0	0	0	0	0	1	0	0
	V	6	6	5	3	3	0	0	1	7	0
	Total	**15613**	**14997**	**2379**	**4990**	**4837**	**35**	**159**	**17945**	**8070**	**877**

[1]Students in current LEP status in 2009

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

Test Grade	DFG	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	EconDis	LEP[1]
Sci 4	A	2467	2524	34	2579	1762	6	13	550	4057	533
	B	1323	1292	82	338	691	4	19	1464	1283	152
	CD	1594	1552	250	637	542	8	6	1676	1147	88
	DE	2170	2035	426	317	832	1	9	2602	1005	139
	FG	2018	1952	348	288	308	4	29	2973	474	99
	GH	1717	1673	399	268	288	4	3	2415	311	93
	I	3023	2863	763	180	243	1	114	4557	179	101
	J	772	758	188	18	39	0	3	1279	9	22
	N	160	183	1	80	224	1	4	36	277	42
	R	228	224	23	282	81	0	3	59	248	6
	Total	**15472**	**15056**	**2514**	**4987**	**5010**	**29**	**203**	**17611**	**8990**	**1275**
Sci 8	A	2319	2326	38	2362	1550	7	8	607	3406	311
	B	1268	1248	83	348	636	3	14	1421	1111	108
	CD	1529	1532	188	602	579	5	10	1624	979	58
	DE	2439	2229	407	434	871	3	12	2930	993	111
	FG	2226	2136	310	333	315	8	19	3354	464	48
	GH	1770	1651	388	264	286	6	7	2454	306	57
	I	3097	2920	844	199	223	4	81	4611	195	71
	J	474	424	88	7	26	2	2	772	8	9
	N	140	155	2	93	158	1	4	36	239	22
	O	1	1	1	1	1	0	1	2	2	0
	R	216	266	2	321	111	2	5	39	280	5
	V	4	3	3	2	2	0	0	2	4	1
	Total	**15483**	**14891**	**2354**	**4966**	**4758**	**41**	**163**	**17852**	**7987**	**801**

[1]Students in current LEP status in 2009

Table 7.1.11 displays descriptive statistics for raw scores for the equating/linking 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 was not achieved in LAL at any grade level; 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
LAL 3	31651	26.25	6.53	0	46	50
LAL 4	30104	33.61	8.37	0	54	59
LAL 5	32382	39.10	8.64	0	60	63
LAL 6	32436	41.18	9.75	1	68	70
LAL 7	31406	41.26	10.2	0	67	70
LAL 8	30182	44.14	9.76	2	68	70
Math 3	31870	32.89	10.24	0	50	50
Math 4	31541	31.09	10.11	0	50	50
Math 5	30015	32.15	10.69	0	50	50
Math 6	32208	31.66	10.27	0	50	50
Math 7	30861	31.47	10.85	0	52	52
Math 8	30666	33.96	11.19	0	52	52
Sci 4	31676	24.15	6.59	0	39	39
Sci 8	30952	31.66	9.75	0	54	54

Table 7.1.12: Descriptive Statistics for Raw Scores by Gender

Test	Gender	N	Mean	STD	Min	Max
LAL 3	Male	16330	25.33	6.49	0	45
LAL 4	Male	15189	32.94	8.58	0	54
LAL 5	Male	16578	38.00	8.82	0	59
LAL 6	Male	16680	40.10	9.93	1	68
LAL 7	Male	16017	40.26	10.45	0	67
LAL 8	Male	15354	42.70	9.96	2	67
Math 3	Male	16140	32.94	10.37	0	50
Math 4	Male	15758	31.28	10.33	2	50
Math 5	Male	15357	32.28	11.07	1	50
Math 6	Male	16540	31.81	10.60	0	50
Math 7	Male	15760	31.57	11.26	0	52
Math 8	Male	15613	34.10	9.81	0	52
Sci 4	Male	15472	24.29	6.74	1	39
Sci 8	Male	15483	31.76	9.75	2	54
LAL 3	Female	15253	27.26	6.42	0	46
LAL 4	Female	14866	34.31	8.08	0	54
LAL 5	Female	15752	40.26	8.27	0	60
LAL 6	Female	15716	42.34	9.42	4	66
LAL 7	Female	15347	42.32	9.80	0	67
LAL 8	Female	14780	45.66	9.28	3	68
Math 3	Female	15100	32.84	10.11	2	50
Math 4	Female	15241	30.90	9.87	1	50
Math 5	Female	14610	32.01	10.52	1	50
Math 6	Female	15623	31.50	9.98	1	50
Math 7	Female	15064	31.35	10.54	0	52
Math 8	Female	14997	33.80	9.42	3	54
Sci 4	Female	15056	24.02	6.44	1	39
Sci 8	Female	14891	31.55	10.22	3	54

Table 7.1.13: Descriptive Statistics for Raw Score by District Factor Group: LAL

Test	DFG	N	Mean	STD	Min	Max
LAL 3	A	5550	22.54	6.75	0	42
	B	2661	25.01	6.20	0	42
	CD	3448	25.24	6.15	2	46
	DE	4197	26.40	6.11	0	43
	FG	3847	26.83	5.92	3	45
	GH	3448	27.64	5.99	5	45
	I	6058	29.04	5.76	0	46
	J	1539	30.02	5.23	9	44
	N	419	21.82	6.14	5	37
	R	484	24.17	6.26	7	38

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

Test	DFG	N	Mean	STD	Min	Max
LAL 4	A	4879	28.67	8.84	0	52
	B	2561	32.04	8.07	0	51
	CD	3105	31.90	8.02	0	52
	DE	4152	33.89	7.56	0	54
	FG	3900	34.40	7.66	0	54
	GH	3297	35.11	7.76	0	53
	I	5878	36.99	7.22	0	54
	J	1557	38.58	6.57	12	54
	N	328	29.10	8.43	0	49
	R	447	29.25	8.68	0	50
LAL 5	A	5531	33.62	9.10	0	56
	B	2739	37.47	8.04	4	54
	CD	3382	37.55	8.35	0	58
	DE	4315	39.56	7.95	0	58
	FG	3993	40.27	7.62	0	59
	GH	3586	41.12	7.71	0	59
	I	6425	42.52	7.38	0	60
	J	1508	44.80	6.47	14	60
	N	332	34.86	7.91	11	52
	R	571	33.61	8.62	10	54
LAL 6	A	5282	34.24	9.91	1	62
	B	2749	39.86	9.21	4	64
	CD	3373	39.65	9.15	4	63
	DE	4523	41.27	9.26	7	65
	FG	4206	42.51	8.74	4	64
	GH	3431	43.86	8.75	4	65
	I	6288	45.11	8.43	4	68
	J	1597	46.96	7.28	15	65
	N	319	36.88	9.22	4	58
	O	647	37.33	8.98	8	60
	R	21	43.33	10.07	22	63

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

Test	DFG	N	Mean	STD	Min	Max
LAL 7	A	4784	34.01	10.14	1	63
	B	2475	39.58	9.55	3	64
	CD	3034	38.66	9.53	4	64
	DE	4585	40.72	9.30	3	65
	FG	4177	42.58	8.96	5	67
	GH	3423	44.43	9.07	7	66
	I	6396	45.58	8.98	0	67
	J	1525	48.51	8.03	2	67
	N	329	33.61	8.61	4	54
	O	19	21.68	10.34	9	43
	R	644	36.44	9.32	9	57
	V	15	42.73	6.79	31	52
LAL 8	A	4624	36.88	10.32	4	64
	B	2495	42.31	9.58	4	66
	CD	3048	42.27	9.45	4	64
	DE	4649	44.10	8.68	2	65
	FG	4353	45.33	8.64	3	67
	GH	3400	47.20	8.30	4	68
	I	5941	48.77	7.79	3	66
	J	897	50.43	7.55	7	67
	N	285	36.02	9.92	7	58
	O	1	42.00	.	42	42
	R	477	39.01	8.90	11	62
	V	12	44.58	6.73	29	53

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

Test	DFG	N	Mean	STD	Min	Max
Math 3	A	5494	27.6	10.82	0	50
	B	2620	30.11	10.26	3	50
	CD	3354	31.18	9.96	4	50
	DE	4151	33.48	9.66	2	50
	FG	3843	33.79	9.4	3	50
	GH	3451	35.30	9.31	2	50
	I	5947	36.72	8.68	0	50
	J	1455	38.53	7.97	4	50
	N	422	28.53	10.29	7	49
	O	3	17.94	8.12	5	37
	R	500	28.60	10.61	4	50

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

Test	DFG	N	Mean	STD	Min	Max
Math 4	A	5115	26.32	10.35	2	50
	B	2667	28.07	9.94	3	50
	CD	3202	29.40	9.61	2	50
	DE	4269	31.53	9.53	3	50
	FG	4039	31.70	9.65	1	50
	GH	3481	33.18	9.55	2	50
	I	5899	34.86	8.83	4	50
	J	1506	36.70	8.52	3	50
	N	359	28.95	10.03	5	49
	O	5	17.00	8.89	8	40
	R	457	25.20	10.06	4	50
Math 5	A	3784	25.81	10.69	1	50
	B	2685	28.31	10.38	1	50
	CD	3107	29.48	10.43	1	50
	DE	4261	31.76	10.23	3	50
	FG	3992	32.25	10.08	3	50
	GH	3580	34.00	10.08	3	50
	I	6209	36.29	9.43	2	50
	J	1510	38.29	8.79	5	50
	N	337	27.63	9.59	4	50
	R	502	25.66	10.95	2	50
Math 6	A	5321	25.25	10.12	0	50
	B	2729	28.28	10.02	3	50
	CD	3275	29.60	9.74	2	50
	DE	4469	31.50	9.79	4	50
	FG	4195	32.01	9.50	4	50
	GH	3384	33.48	9.59	3	50
	I	6239	35.76	9.15	2	50
	J	1575	37.91	8.23	5	50
	N	333	28.44	9.27	4	48
	R	622	27.36	10.25	5	50
	V	21	34.43	10.85	15	49

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

Test	DFG	N	Mean	STD	Min	Max
Math 7	A	4752	24.64	10.50	0	52
	B	2500	28.26	10.47	0	52
	CD	3075	29.44	10.41	1	52
	DE	4483	31.21	10.26	2	52
	FG	4235	32.02	10.15	1	52
	GH	3421	33.78	10.29	2	52
	I	6334	35.79	9.76	3	52
	J	1087	38.42	9.05	6	52
	N	320	24.48	9.13	4	48
	O	16	14.98	8.37	5	40
	R	586	26.80	10.53	2	52
	V	15	35.53	6.46	21	42
Math 8	A	4688	25.99	11.71	0	52
	B	2535	30.52	11.42	2	52
	CD	3082	32.00	11.05	3	52
	DE	4695	33.84	10.75	3	52
	FG	4369	34.72	10.37	2	52
	GH	3444	36.50	10.42	3	52
	I	6095	38.08	9.72	2	52
	J	899	40.37	8.92	4	52
	N	303	26.04	10.92	5	50
	O	2	13.62	6.46	3	32
	R	485	28.61	11.87	3	52
	V	12	43.42	11.54	8	51

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

Test	DFG	N	Mean	STD	Min	Max
Sci 4	A	4991	20.05	6.76	1	39
	B	2615	22.04	6.58	4	39
	CD	3146	23.26	6.22	3	38
	DE	4205	24.84	6.08	4	39
	FG	3970	25.38	5.99	2	39
	GH	3390	25.74	6.01	1	39
	I	5886	26.76	5.54	3	39
	J	1530	27.60	5.14	6	39
	N	346	20.56	6.25	6	35
	O	452	15.19	6.56	7	28
	R	4991	21.00	6.83	4	38
Sci 8	A	4655	24.05	8.57	3	54
	B	2517	27.89	9.03	4	54
	CD	3061	29.89	9.29	5	54
	DE	4668	31.72	9.07	6	54
	FG	4362	32.93	8.86	6	54
	GH	3421	33.93	9.20	3	54
	I	6017	36.19	8.73	5	54
	J	898	38.20	8.23	8	54
	N	295	23.60	8.08	8	48
	O	6	17.42	5.74	7	35
	R	482	27.25	9.66	7	53
	V	9	28.75	7.85	15	42

7.2 Scaling and Equating Procedures

Item Calibration

In order to accomplish scaling and equating for LAL and mathematics in grades 5-8 and science in grades 4 and 8, the 2009 NJ ASK operational tests were calibrated with Winsteps (Linacre, 2006)[31]. 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[32], Wright & Stone, 1979[33]; Anderich, 1978[34]), while the partial credit model (Masters, 1982)[35] was used for open-ended items.

[31] Linacre, J. M. (2006). A *User's Guide to WINSTEPS MINISTEP Rasch-Model Computer Programs*. Chicago
[32] Rasch, G. (1960). *Probabilistic models for some intelligence and attainment tests*. Copenhagen: Danish Institute for Educational Research.
[33] Wright, B. D., & Stone, M. H. (1979). *Best test design*. Chicago: MESA Press.
[34] Anderich, D. (1978). A rating formulation for ordered response categories. *Psychometrika*, 43, 561-573.
[35] Masters, G. N. (1982). A Rasch model for partial credit scoring. *Psychometrika*, *47*, 149-174.

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[36]; Hambleton & Swaminathan, 1985[37]), the Rasch model requires an assumption of unidimensionality (Smith, Jr., 2004)[38]. 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[39]; van der Linden & Hambleton, 1997[40]). 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 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 2009 NJ ASK to the 2008 NJ ASK in grades 5-8 LAL and mathematics.

(1) Calibrate the 2009 assessment without constraint

The first step in equating the 2009 NJ ASK to the 2008 NJ ASK 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 2009 Rasch values based strictly on how the examinees and items performed without regard to previous performance.

[36] 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.
[37] Hambleton, R. K., & Swaminathan, H. (1985). *Item Response Theory. Principles and Applications*. Boston: Kluwer.
[38] 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.
[39] Hambleton, R. K., Swaminathan, H. & Rogers, H. J. (1991). Fundamentals of Items Response Theory. Newbury Park, CA: Sage Publications.
[40] van der Linden, W. J. & Hambleton, R. K. (1997). Handbook of Modern Item Response Theory. New York: Springer-verlagVerlag.

(2) Examine the stability of the common items

As new standards were set in 2008 for LAL and mathematics in grades 5-8, 2008 became the new base year for these content areas within these grade levels. A set of base test items from the 2008 NJ ASK Operational tests were used as the potential anchor items on the 2009 NJ ASK Operational tests in LAL, mathematics, and science. Given that these tests were not released, these anchors can still be considered secure. For these 2009 NJ ASK tests, the potential anchor items 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.

Assessing the stability of the common items is accomplished through comparing the unconstrained 2008 Rasch values with the unconstrained 2009 Rasch values. Typically, the unconstrained Rasch values from the current operational test would be compared with the constrained values from the previous year. However, given that a new scale was established for LAL and mathematics in 2008, there were no constrained values in 2008 for equating purposes. The typical anchor evaluation process (i.e., constrained values from 2008) was used for science at grades 4 and 8, as new scales were not established in this content area in 2008.

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)[41]. For example, scatter plots can be used to check visually for outlier common items. For NJ ASK, Rasch measures for the common items from the "base" calibrations and from the 2009 unconstrained or "free" calibrations were plotted against each other. The scatter points for items that function the same should line-up as a straight line. Outlier items will not fall on the straight line and thus can be seen visually.

In addition to visual examination, the stability of common items should be studied analytically. It is recommended that a 0.30-logistic unit be applied as a cut criterion for removing "unstable" common items (Miller, Rotou, & Twing. 2004)[42]. That is, any common item that has a difference greater than 0.30 logits (after adjustments) between the two equating groups should be removed from the common item set and treated as a unique item.

In the 2009 NJ ASK anchor evaluation, both visual and analytical methods were applied. Figures 7.2.1 to 7.2.10 present scatter plots by content area and grade that were used for visual examination. Adjusted differences in Rasch logits for anchor items between the 2008 "base" calibrations and the 2009 "free" calibrations are summarized in Tables 7.2.1 through 7.2.10. Note that no items were removed in grade 5LAL and grade 8 mathematics and science. The maximum number of items removed was three in grade 5 mathematics.

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

[42] 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.

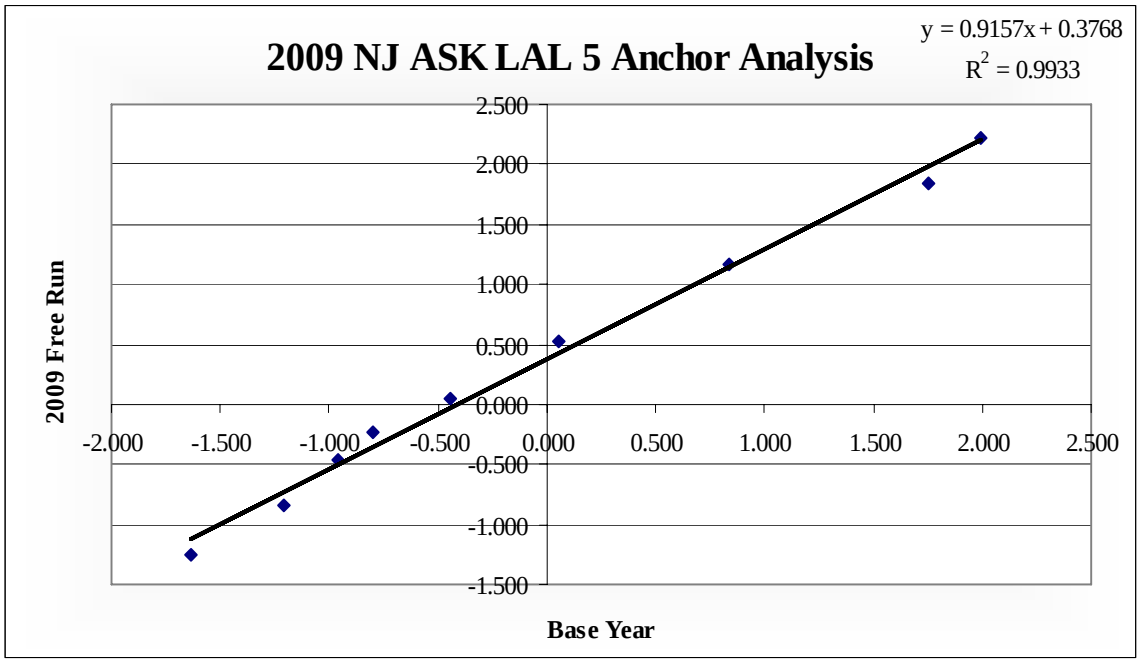

Figure 7.2.1: Scatter Plot for Anchor Items for LAL Grade 5

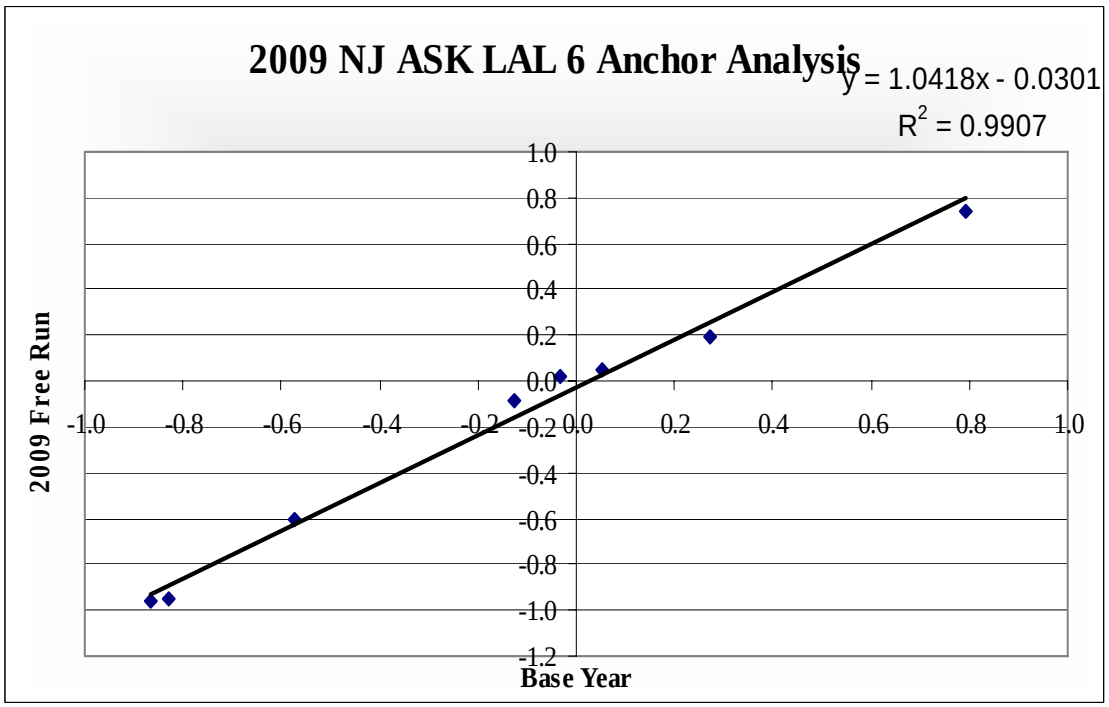

Figure 7.2.2: Scatter Plot for Anchor Items for LAL Grade 6

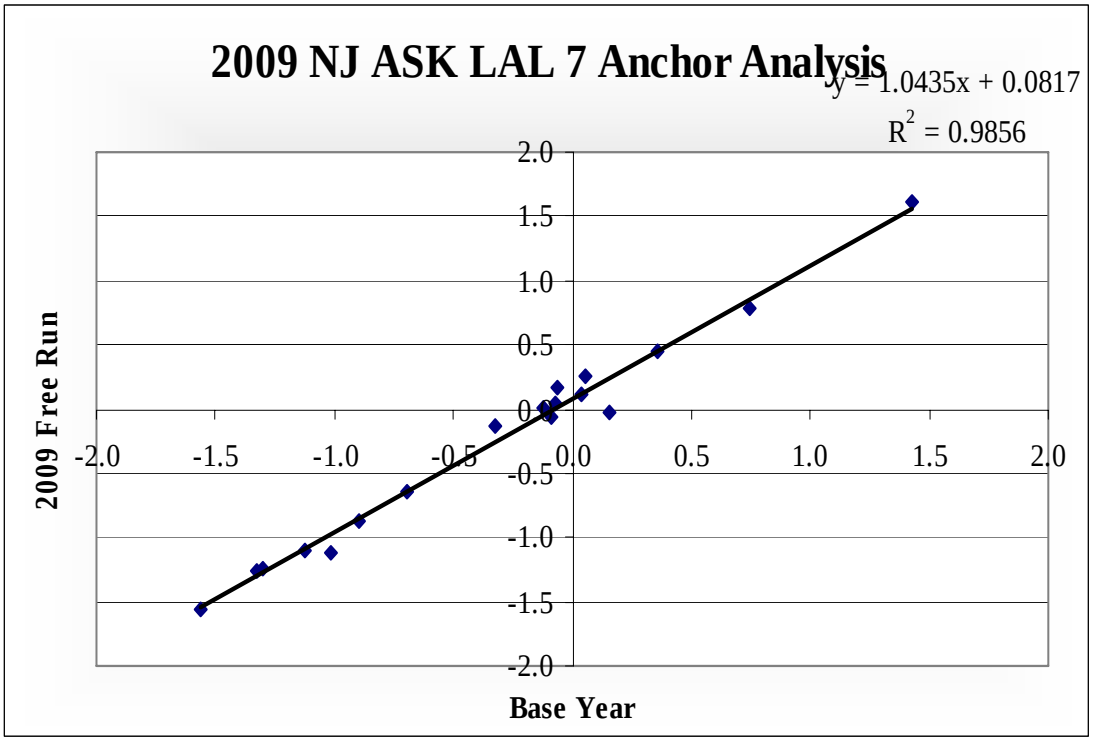

Figure 7.2.3: Scatter Plot for Anchor Items for LAL Grade 7

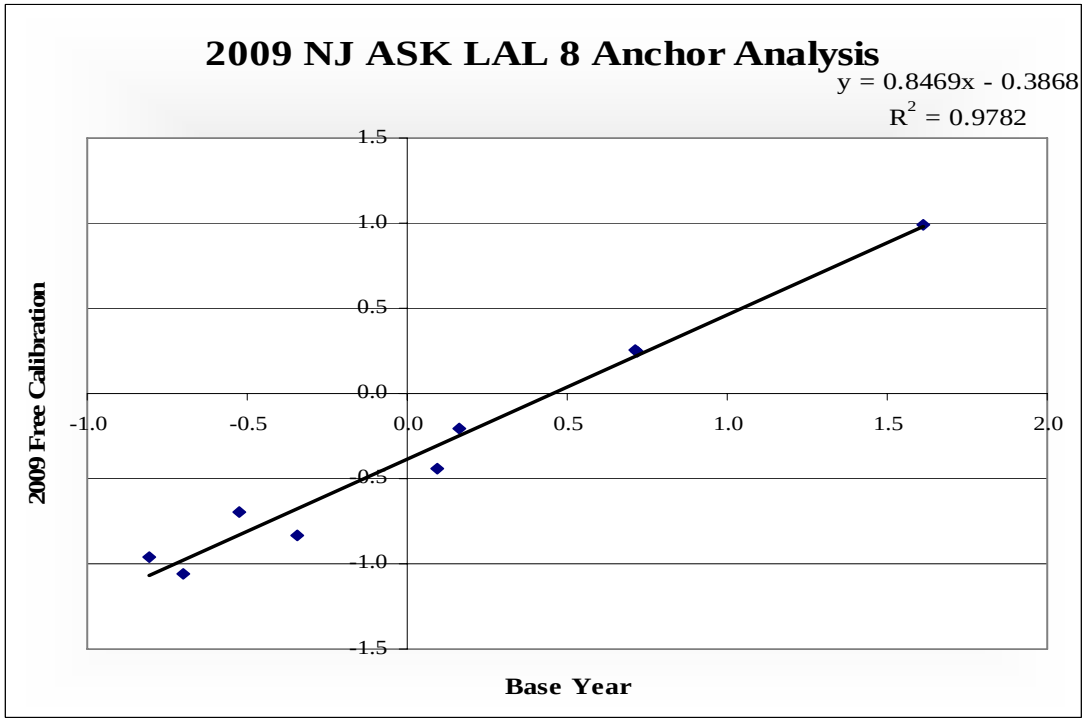

Figure 7.2.4: Scatter Plot for Anchor Items for LAL Grade 8

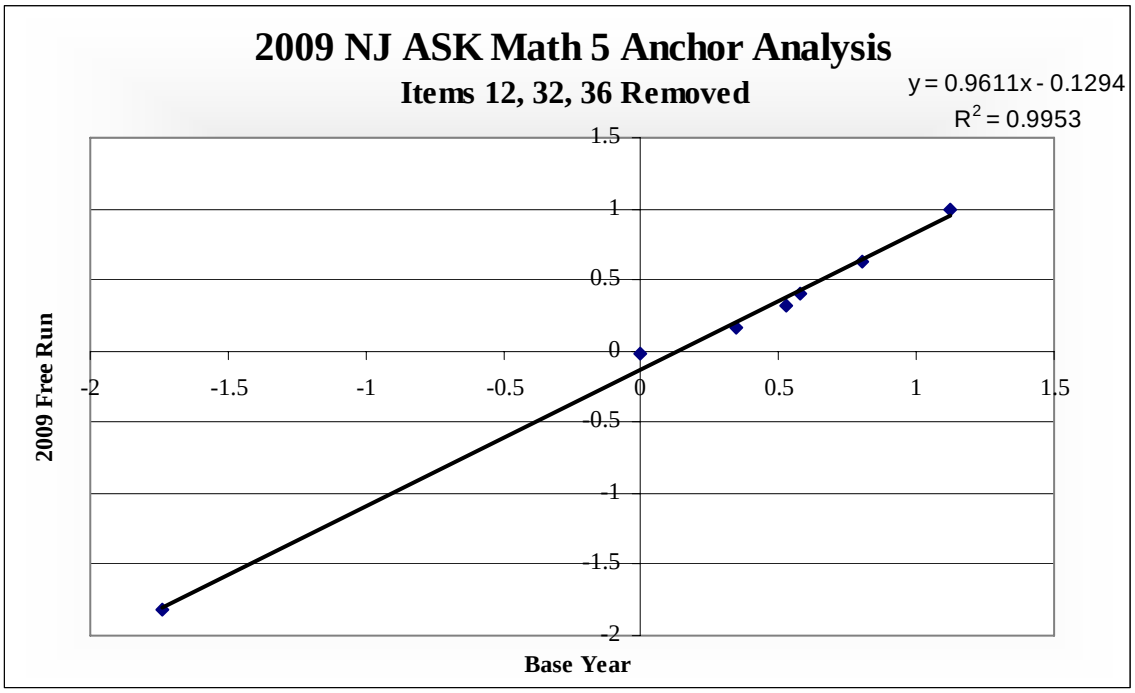

Figure 7.2.5: Scatter Plot for Anchor Items for Mathematics Grade 5

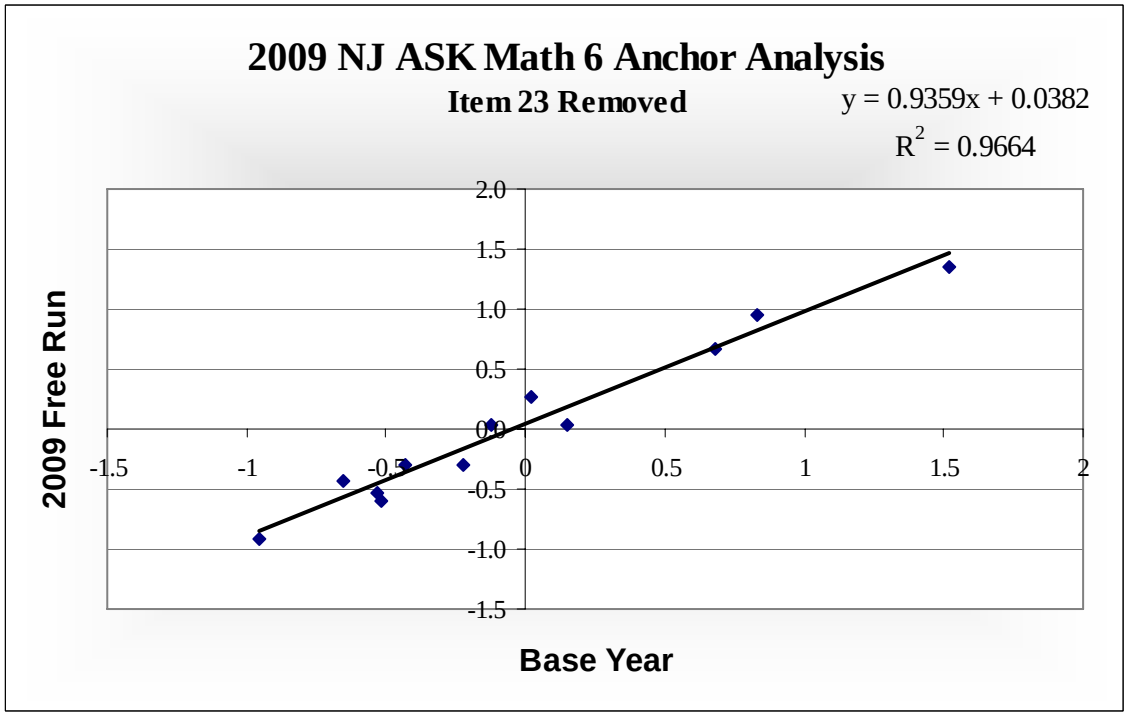

Figure 7.2.6: Scatter Plot for Anchor Items for Mathematics Grade 6

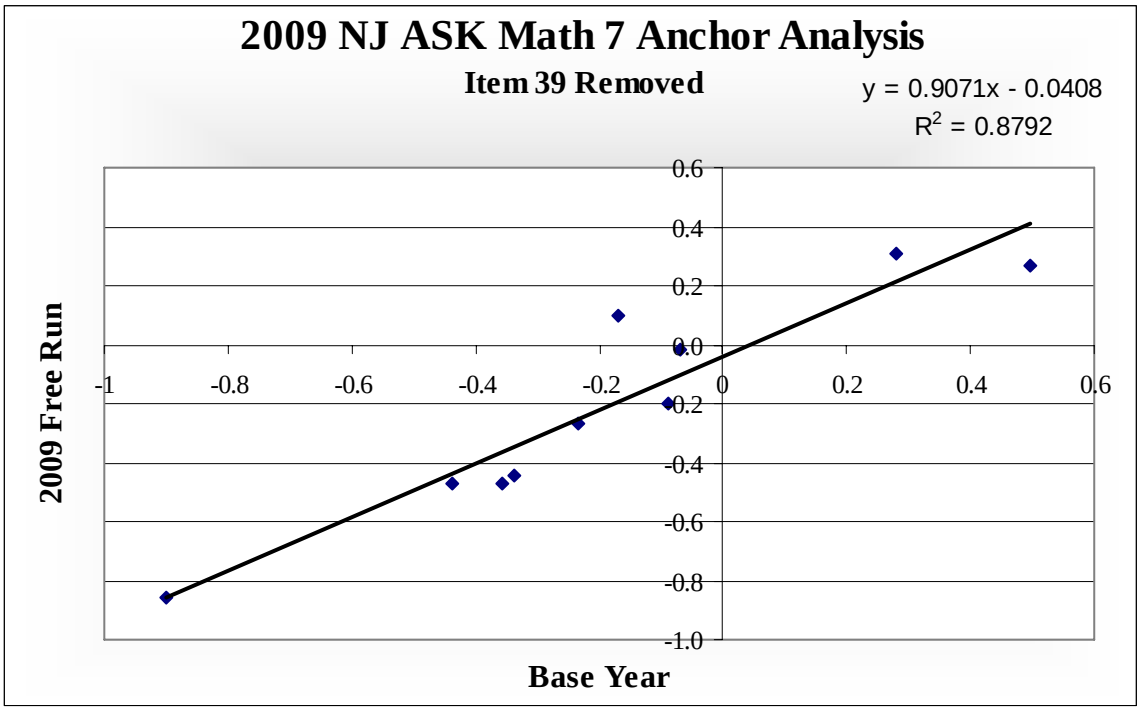

Figure 7.2.7: Scatter Plot for Anchor Items for Mathematics Grade 7

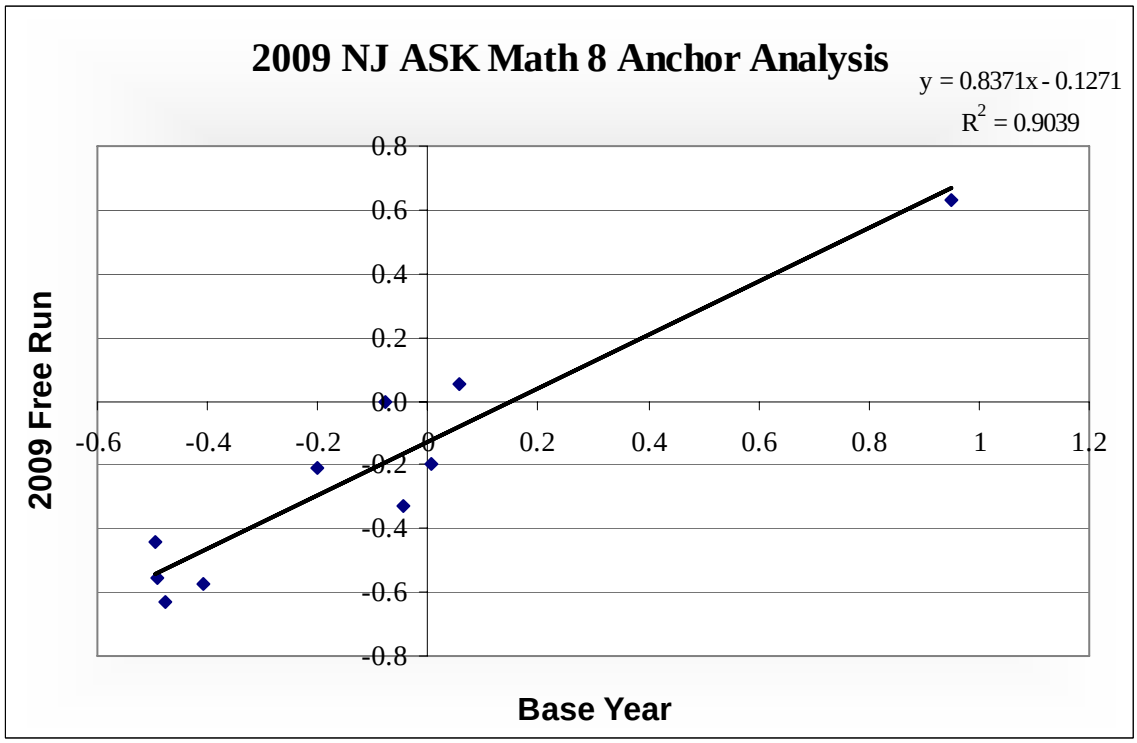

Figure 7.2.8: Scatter Plot for Anchor Items for Mathematics Grade 8

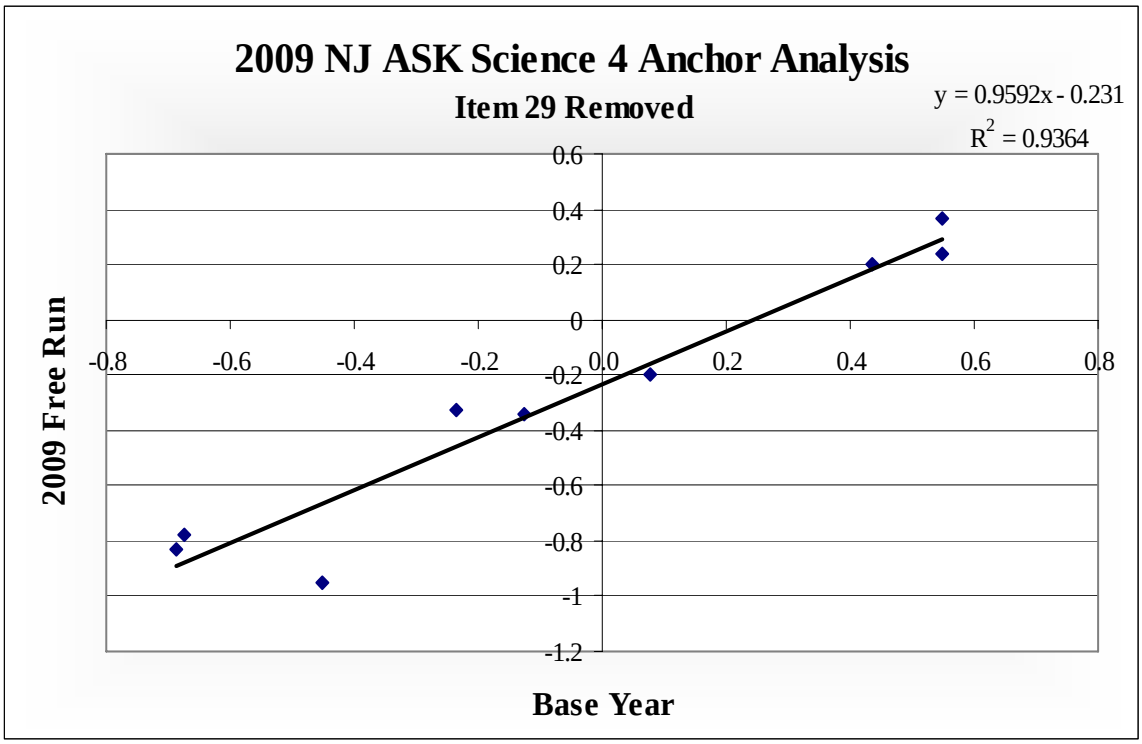

Figure 7.2.9: Scatter Plot for Anchor Items for Science Grade 4

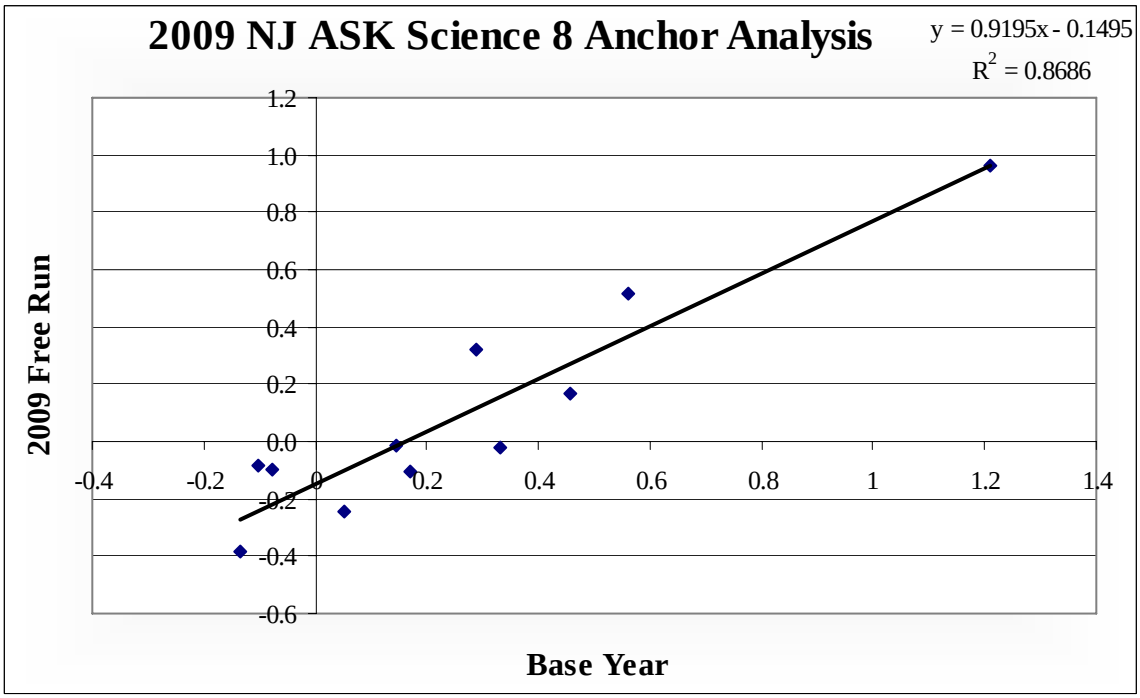

Figure 7.2.10: Scatter Plot for Anchor Items for Science Grade 8

Table 7.2.1: LAL Grade 5 - Adjusted Difference in Rasch Logits for Anchor Items

Position	Type	Base Year	2009 Free Run	Adjusted	Difference	Abs-Diff	Decision
14	MC	-0.960	-0.470	-0.850	-0.109	0.109	
15	MC	1.995	2.226	1.846	0.149	0.149	
16	MC	-0.797	-0.231	-0.612	-0.185	0.185	
17	MC	-1.207	-0.834	-1.214	0.008	0.008	
18	MC	-0.447	0.049	-0.332	-0.115	0.115	
19	MC	-1.635	-1.248	-1.628	-0.006	0.006	
20	MC	0.841	1.164	0.783	0.058	0.058	
21	MC	0.051	0.517	0.136	-0.085	0.085	
35	OE	1.753	1.848	1.467	0.286	0.286	
AVERAGES		-0.045	0.336	-0.045	0.000	0.111	
	EQK =	-0.381		Greatest Difference in Absolute Value =		0.286	

Table 7.2.2: LAL Grade 6 - Adjusted Difference in Rasch Logits for Anchor Items

Position	Type	Base Year	2009 Free Run	Adjusted	Difference	Abs-Diff	Decision
1	MC	-0.865	-0.960	-0.923	0.058	0.058	
2	MC	-0.828	-0.955	-0.918	0.090	0.090	
3	MC	0.273	0.196	0.233	0.040	0.040	
4	MC	0.053	0.051	0.088	-0.035	0.035	
5	MC	-0.125	-0.089	-0.052	-0.073	0.073	
6	MC	-0.031	0.019	0.055	-0.086	0.086	
7	MC	1.014	1.498	1.477	-0.463	0.463	Drop
8	MC	-0.573	-0.607	-0.570	-0.003	0.003	
9	MC	0.791	0.745	0.782	0.009	0.009	
39	OE	1.771	1.059	1.111	0.660	0.660	Drop
AVERAGES		-0.163	-0.200	-0.163	0.000	0.049	
	EQK =	0.037		Greatest Difference in Absolute Value =		0.090	

Table 7.2.3: LAL Grade 7 - Adjusted Difference in Rasch Logits for Anchor Items

Position	Type	Base Year	2009 Free Run	Adjusted	Difference	Abs-Diff	Decision
1	MC	-0.125	0.014	-0.054	-0.071	0.071	
2	MC	-0.896	-0.870	-0.938	0.042	0.042	
3	MC	-0.322	-0.134	-0.201	-0.120	0.120	
4	MC	0.160	-0.029	-0.097	0.257	0.257	
5	MC	-1.559	-1.552	-1.620	0.061	0.061	
6	MC	-0.069	0.041	-0.026	-0.043	0.043	
7	MC	-0.697	-0.649	-0.717	0.019	0.019	
8	MC	0.039	0.118	0.050	-0.012	0.012	
9	MC	-0.060	0.166	0.098	-0.158	0.158	
10	MC	-1.019	-1.126	-1.194	0.175	0.175	
11	MC	-0.090	-0.061	-0.129	0.039	0.039	
12	MC	0.056	0.253	0.186	-0.130	0.130	
13	MC	0.747	0.783	0.715	0.032	0.032	
14	MC	0.362	0.442	0.375	-0.013	0.013	
15	MC	-1.299	-1.240	-1.308	0.009	0.009	
16	MC	-1.124	-1.093	-1.160	0.036	0.036	
17	MC	-1.324	-1.261	-1.328	0.004	0.004	
39	OE	1.424	1.620	1.552	-0.128	0.128	
40	OE	1.516	0.954	0.920	0.596	0.596	Drop
AVERAGES		-0.322	-0.254	-0.322	0.000	0.075	
	EQK =	-0.068		Greatest Difference in Absolute Value =		0.257	

Table 7.2.4: LAL Grade 8 - Adjusted Difference in Rasch Logits for Anchor Items

Position	Type	Base Year	2009 Free Run	Adjusted	Difference	Abs-Diff	Decision
10	MC	0.713	0.250	0.652	0.061	0.061	
11	MC	0.092	-0.444	-0.041	0.133	0.133	
12	MC	1.611	0.990	1.392	0.219	0.219	
13	MC	-0.346	-0.831	-0.429	0.082	0.082	
14	MC	-0.808	-0.958	-0.555	-0.253	0.253	
15	MC	0.717	0.250	0.652	0.065	0.065	
16	MC	-0.703	-1.058	-0.656	-0.047	0.047	
17	MC	-0.528	-0.698	-0.296	-0.232	0.232	
18	MC	0.165	-0.209	0.194	-0.028	0.028	
40	OE	1.903	0.899	1.452	0.450	0.450	Drop
AVERAGES		0.101	-0.301	0.101	0.000	0.124	
	EQK =	0.402		Greatest Difference in Absolute Value =		0.253	

Table 7.2.5: Mathematics Grade 5 - Adjusted Difference in Rasch Logits for Anchor Items

Test Position	Type	Base Year	2009 Free Run	Adjusted	Difference	Abs-Diff	Decision
10	MC	0.531	0.321	0.460	0.071	0.071	
12	MC	-0.371	-0.874	-0.736	0.364	0.364	Drop
14	MC	-1.739	-1.818	-1.679	-0.059	0.059	
30	MC	-0.006	-0.013	0.126	-0.131	0.131	
32	MC	1.254	1.713	1.851	-0.597	0.597	Drop
33	MC	0.581	0.405	0.544	0.038	0.038	
36	MC	-1.492	-1.278	-1.139	-0.352	0.352	Drop
38	MC	0.348	0.161	0.299	0.049	0.049	
6	SCR	0.800	0.624	0.763	0.037	0.037	
24	ECR	1.125	0.990	1.129	-0.004	0.004	
AVERAGES		0.234	0.096	0.234	0.000	0.055	
	EQK =	0.139		Greatest Difference in Absolute Value =		0.131	

Table 7.2.6: Mathematics Grade 6 - Adjusted Difference in Rasch Logits for Anchor Items

Test Position	Type	Base Year	2009 Free Run	Adjusted	Difference	Abs-Diff	Decision
13	MC	-0.125	0.035	-0.005	-0.120	0.120	
16	MC	0.681	0.662	0.622	0.058	0.058	
17	MC	1.520	1.358	1.319	0.201	0.201	
20	MC	0.022	0.267	0.228	-0.205	0.205	
22	MC	-0.429	-0.296	-0.335	-0.094	0.094	
23	MC	-1.092	-0.709	-0.748	-0.343	0.343	Drop
26	MC	-0.654	-0.440	-0.480	-0.175	0.175	
30	MC	0.147	0.040	0.001	0.146	0.146	
36	MC	-0.518	-0.599	-0.638	0.120	0.120	
41	MC	-0.532	-0.529	-0.568	0.036	0.036	
1	SCR	-0.954	-0.915	-0.955	0.001	0.001	
6	SCR	-0.222	-0.292	-0.331	0.109	0.109	
24	ECR	0.832	0.948	0.909	-0.077	0.077	
AVERAGES		-0.019	0.020	-0.019	0.000	0.112	
	EQK =	-0.039		Greatest Difference in Absolute Value =		0.205	

Table 7.2.7: Mathematics Grade 7 - Adjusted Difference in Rasch Logits for Anchor Items

Test Position	Type	Base Year	2009 Free Run	Adjusted	Difference	Abs-Diff	Decision
17	MC	-0.168	0.101	0.125	-0.293	0.293	
19	MC	-0.438	-0.469	-0.445	0.006	0.006	
21	MC	-0.088	-0.197	-0.173	0.085	0.085	
23	MC	-0.068	-0.015	0.009	-0.077	0.077	
30	MC	-0.338	-0.447	-0.423	0.085	0.085	
38	MC	-0.234	-0.269	-0.245	0.011	0.011	
39	MC	-0.367	0.150	0.174	-0.541	0.541	Drop
43	MC	-0.356	-0.472	-0.448	0.092	0.092	
44	MC	-0.899	-0.860	-0.836	-0.063	0.063	
1	SCR	0.281	0.306	0.330	-0.049	0.049	
37	ECR	0.497	0.270	0.294	0.203	0.203	
	AVERAGES	-0.181	-0.205	-0.181	0.000	0.096	
	EQK =	0.024		Greatest Difference in Absolute Value =			0.293

Table 7.2.8: Mathematics Grade 8 - Adjusted Difference in Rasch Logits for Anchor Items

Test Position	Type	Base Year	2009 Free Run	Adjusted	Difference	Abs-Diff	Decision
12	MC	0.05682	0.054	0.162	-0.105	0.105	
13	MC	-0.47608	-0.633	-0.525	0.049	0.049	
16	MC	-0.49227	-0.554	-0.446	-0.046	0.046	
27	MC	-0.07722	-0.003	0.105	-0.182	0.182	
30	MC	0.94857	0.629	0.737	0.211	0.211	
33	MC	0.00687	-0.197	-0.089	0.096	0.096	
40	MC	-0.20132	-0.212	-0.105	-0.097	0.097	
46	MC	-0.4937	-0.444	-0.336	-0.158	0.158	
2	SCR	-0.4076	-0.571	-0.463	0.056	0.056	
37	ECR	-0.04419	-0.328	-0.220	0.176	0.176	
	AVERAGES	-0.118	-0.226	-0.118	0.000	0.118	
	EQK =	0.108		Greatest Difference in Absolute Value =			0.211

Table 7.2.9: Science Grade 4 - Adjusted Difference in Rasch Logits for Anchor Items

Test Position	Type	Base Year	2009 Free Run	Adjusted	Difference	Abs-Diff	Decision
1	MC	-0.451	-0.950	-0.721	0.270	0.270	
2	MC	0.548	0.369	0.597	-0.050	0.050	
6	MC	-0.234	-0.325	-0.097	-0.137	0.137	
7	MC	0.077	-0.195	0.033	0.044	0.044	
14	MC	0.437	0.198	0.426	0.010	0.010	
29	MC	0.495	0.61522	0.844	-0.349	0.349	Drop
32	MC	-0.675	-0.776	-0.547	-0.128	0.128	
33	MC	-0.688	-0.834	-0.606	-0.082	0.082	
34	MC	-0.125	-0.344	-0.115	-0.010	0.010	
24	CR	0.547	0.236	0.464	0.083	0.083	
AVERAGES		-0.063	-0.291	-0.063	0.000	0.090	
EQK =		0.228		Greatest Difference in Absolute Value =			0.270

Table 7.2.10: Science Grade 8 - Adjusted Difference in Rasch Logits for Anchor Items

Test Position	Type	Base Year	2009 Free Run	Adjusted	Difference	Abs-Diff	Decision
2	MC	0.331	-0.023	0.147	0.184	0.184	
5	MC	0.169	-0.104	0.067	0.102	0.102	
8	MC	0.145	-0.014	0.157	-0.012	0.012	
11	MC	0.051	-0.243	-0.072	0.123	0.123	
19	MC	-0.134	-0.383	-0.212	0.078	0.078	
21	MC	0.562	0.514	0.684	-0.122	0.122	
33	MC	-0.079	-0.096	0.075	-0.154	0.154	
40	MC	0.457	0.165	0.335	0.122	0.122	
47	MC	0.289	0.321	0.492	-0.203	0.203	
49	MC	-0.102	-0.081	0.090	-0.191	0.191	
50	CR	1.210	0.966	1.136	0.073	0.073	
AVERAGES		0.264	0.093	0.264	0.000	0.124	
EQK =		0.171		Greatest Difference in Absolute Value =			0.203

(3) Equate the 2009 assessments to the 2008 "base" scale

It was assumed that the latent trait measured by the 2009 operational tests and the 2008 "base" tests was the same. Given the fact that common anchor items were used across the two years, and that 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. Thus this third step, equating through anchor items was done in order to place the 2009 NJ ASK Operational tests on the same scale as the 2008 NJ ASK Operational tests. To equate the 2009 assessment to the 2008 "base" scale, the Rasch values (difficulties and Rasch-Anderich thresholds for the open-ended items) of the common items were fixed to the 2008 "base" calibrations. This resulted in a raw score to theta conversion on the "base" scale for the 2009 assessment (i.e., the 2009 assessment was scaled on to the 2008 "base" metric).

The same procedure was applied to grades 4 and 8 science data. Though new standards were not set for science in 2008, the 2009 science assessments in grades 4 and 8 were fixed to their respective 2008 anchor items nonetheless. This link was entirely appropriate as the 2008 science anchor items were calibrated to their respective base year scales (i.e., grade 4 – 2005, grade 8 – 2000) in 2008.

(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 LAL, mathematics, and science. Table 7.1.1 shows the number of examinees used for the calibrations by grade and content area.

Tables 7.2.11 – 7.2.13 summarizes Infit and Outfit statistics for the 2009 NJ ASK 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. Grades 5 through 7 in LAL fall just above the 1.30 upper limit; whereas, grades 3 and 5 in mathematics fall a bit higher still at 1.5 and 1.4, respectively. With the exception noted above the Rasch model fit the data very well with an average Infit of 1.0.

Table 7.2.11: LAL - Summary of the Infit and Outfit Statistics by Grade

				INFIT		OUTFIT	
		Measure	Model Error	MNSQ	ZSTD	MNSQ	ZSTD
LAL 3	**Mean**	-0.05	0.01	1.00	-0.71	1.04	0.40
	SD	1.30	0.00	0.09	7.65	0.19	7.46
	Min	-1.94	0.01	0.85	-9.90	0.79	-9.90
	Max	2.99	0.02	1.27	9.90	1.61	9.90
LAL 4	**Mean**	-0.01	0.01	1.00	-0.79	1.01	-0.34
	SD	1.06	0.00	0.09	8.12	0.15	8.42
	Min	-1.45	0.01	0.89	-9.90	0.79	-9.90
	Max	3.29	0.02	1.30	9.90	1.47	9.90
LAL 5	**Mean**	-0.33	0.01	0.99	-1.73	0.97	-2.42
	SD	1.11	0.00	0.12	7.48	0.18	7.90
	Min	-3.04	0.00	0.71	-9.90	0.63	-9.90
	Max	2.00	0.03	1.33	9.90	1.43	9.90
LAL 6	**Mean**	0.02	0.01	0.99	-0.30	0.99	-0.09
	SD	0.94	0.00	0.11	8.33	0.18	9.07
	Min	-1.80	0.00	0.77	-9.90	0.66	-9.90
	Max	1.64	0.02	1.31	9.90	1.52	9.90
LAL 7	**Mean**	0.02	0.01	0.99	-0.30	0.99	-0.09
	SD	0.94	0.00	0.11	8.33	0.18	9.07
	Min	-1.80	0.00	0.77	-9.90	0.66	-9.90
	Max	1.64	0.02	1.31	9.90	1.52	9.90
LAL 8	**Mean**	0.41	0.01	1.01	0.99	1.03	1.53
	SD	0.72	0.00	0.09	7.65	0.14	7.69
	Min	-0.81	0.01	0.84	-9.90	0.72	-9.90
	Max	1.82	0.02	1.24	9.90	1.37	9.90

Table 7.2.12 Mathematics - Summary of the Infit and Outfit Statistics by Grade

				INFIT		OUTFIT	
		Measure	**Model Error**	**MNSQ**	**ZSTD**	**MNSQ**	**ZSTD**
Math 3	**Mean**	0.00	0.01	1.00	-1.16	1.00	-1.57
	SD	0.66	0.00	0.13	8.22	0.19	8.10
	Min	-1.79	0.01	0.80	-9.90	0.70	-9.90
	Max	0.88	0.02	1.50	9.90	1.80	9.90
Math 4	Mean	0.73	0.00	1.01	0.36	1.03	0.11
	SD	0.45	0.00	0.11	8.40	0.18	8.44
	Min	-0.33	0.00	0.80	-9.90	0.70	-9.90
	Max	1.63	0.01	1.30	9.90	1.70	9.90
Math 5	Mean	0.15	0.01	1.00	-0.20	1.00	-0.54
	SD	0.84	0.00	0.12	8.07	0.20	7.88
	Min	-1.74	0.01	0.80	-9.90	0.70	-9.90
	Max	1.86	0.02	1.40	9.90	1.70	9.90
Math 6	Mean	-0.05	0.01	1.00	-0.65	1.02	-0.41
	SD	0.80	0.00	0.10	7.93	0.21	7.60
	Min	-1.83	0.01	0.80	-9.90	0.70	-9.90
	Max	1.70	0.02	1.30	9.90	1.80	9.90
Math 7	Mean	0.06	0.01	1.00	-0.76	1.01	-0.83
	SD	0.84	0.00	0.11	8.41	0.23	8.62
	Min	-2.16	0.01	0.80	-9.90	0.60	-9.90
	Max	1.82	0.02	1.30	9.90	1.60	9.90
Math 8	Mean	0.15	0.01	1.00	-0.82	0.99	-0.80
	SD	0.60	0.00	0.10	8.35	0.16	8.60
	Min	-1.10	0.01	0.80	-9.90	0.70	-9.90
	Max	1.43	0.02	1.30	9.90	1.40	9.90

Table 7.2.13: Science - Summary of the Infit and Outfit Statistics by Grade

				INFIT		OUTFIT	
		Measure	**Model Error**	**MNSQ**	**ZSTD**	**MNSQ**	**ZSTD**
Science 4	**Mean**	0.24	0.01	1.02	0.68	0.99	0.00
	SD	0.51	0.00	0.11	8.27	0.16	8.44
	Min	-1.10	0.00	0.70	-9.90	0.50	-9.90
	Max	1.43	0.02	1.30	9.90	1.40	9.90
Science 8	**Mean**	0.09	0.01	1.00	-1.36	1.01	-1.14
	SD	0.62	0.00	0.09	8.29	0.13	8.19
	Min	-0.96	0.01	0.90	-9.90	0.80	-9.90
	Max	1.27	0.02	1.20	9.90	1.40	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) [43]. The tables in 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 2009 NJ ASK 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)[44]. 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.

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

[44] 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		
LAL	3	25	0.1668	200	36	2.47551	250	21.66	196.39
	4	32	0.26506	200	45	2.15894	250	26.40	193.00
	5	37	0.2955	200	50	1.9261	250	28.41	191.97
	6	37	0.428	200	54	2.2553	250	25.91	188.59
	7	36	0.0545	200	51	1.5729	250	33.07	198.38
	8	35	0.3366	200	55	2.5964	250	22.35	192.36
Math	3	26	0.19977	200	40	1.48982	250	38.76	192.26
	4	25	0.08401	200	39	1.43606	250	36.98	196.89
	5	23	0.1395	200	39	1.6554	250	32.12	195.32
	6	26	0.1054	200	40	1.5958	250	31.54	196.96
	7	27	0.2778	200	41	1.6626	250	33.84	190.37
	8	28	0.3031	200	42	1.6702	250	36.45	187.18
Science	4	15	0.0196	200	27	0.6831	250	4.55	113.64
	8	21	-0.207	200	38	1.186	250	33.51	205.16

LAL and Mathematics – Grades 5-8

After calibrating the 2009 LAL and mathematics assessments in grade 5-8 to the 2008 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 LAL and mathematics scaled scores for grades 5-8.

Science – Grades 4 and 8

Rather than using the theta to scale score conversion described above, a slightly different procedure utilizing raw score to scale score conversions was used for the science conversion tables. A conversion table from the earlier Grade Eight Proficiency Assessment (GEPA) "reported" scale to the GEPA "base" scale was established so the 2009 equated scale could be re-centered to the GEPA "reported" scale. This was accomplished through number correct raw score because the test is exactly the same for the GEPA "reported" and "base" scales. For example, assume the scales resembled the following:

---Reported---		-----Base-----	
RS	**Theta**	**RS**	**Theta**
1	-2.0	1	-2.5
2	-1.5	2	-2.0
3	-1.0	3	-1.5
4	-0.5	4	-1.0
5	0.0	5	-0.5
6	0.5	6	0.0
7	1.0	7	0.5
8	1.5	8	1.0
9	2.0	9	1.5
10	2.5	10	2.0

Using the above conversion table, a "base" theta of 1.0 (raw score 8) equates to a "reported" theta of 1.5 (also a raw score of 8). While the 2009 assessment was placed on the GEPA "base" scale, raw scores had to be used to re-center the 2009 assessment onto the GEPA "reported" scale. This final step of re-centering the 2009 equated scale to the GEPA "reported" scale was necessary because the GEPA "reported" scale must be maintained over multiple years. The interpolation required to re-center the equated 2009 scale is described in more detail below.

Because the raw scores between 2009 and GEPA do not match as they did between the GEPA "reported" and GEPA "base" scales, interpolation between raw scores and between scale scores on both scales had to be performed to allow raw scores from 2009 to be translated from the "base" scale to the "reported" scale.

An example below shows how this was accomplished:

----------2008----------			-----2009----	
Reported		**Base**	**Base**	
Theta	**RS**	**Theta**	**Theta**	**RS**
-2.0	1	-2.5	-2.3	1
-1.5	2	-2.0	-1.8	2
-1.0	3	-1.5	-1.3	3
-0.5	4	-1.0	-0.8	4
0.0	5	-0.5	-0.3	5
0.5	6	0.0	0.2	6
1.0	7	0.5	0.7	7
1.5	8	1.0	1.2	8
2.0	9	1.5	1.7	9
2.5	10	2.0	2.2	10

In the previous example, a 2009 theta of 1.7 is 40% of the way between 1.5 and 2.0 on the "base" scale. In raw score units, 40% of the way between raw scores 9 and 10 is 9.4. A raw score of 9.4 translates into a "reported" theta of 2.2, which is also 40% of the way between 2.0 and 2.5 on the

"reported" scale. A raw score of 9 in 2009 would therefore be equated (or re-centered) to a theta value of 2.2 on the GEPA "reported" scale.

The interpolations were accomplished using an MS Excel calculator that was developed for the purpose of this project and verified through an independent SAS program. The main task was to link the "base" thetas from the 2009 operational tests to the GEPA "reported" scale.

LAL and Mathematics – Grades 3 and 4

The 2009 NJ ASK operational tests in LAL and mathematics at grades 3 and 4 differ from the 2008 NJ ASK operational tests as follows:

- more reading passages
- more diverse content
- shorter reading passage lengths
- more test items overall
- more score points overall
- two days of testing in mathematics
- more constructed response items in mathematics
- new item type in mathematics –short constructed response.

Due to these changes in the operational tests, a Standard Setting meeting was held in June of 2009 to establish new standards for designating test performance as Partially Proficient, Proficient, and Advance Proficient. With the implementation of the new standards and new test design, the 2009 operational scores in LAL and mathematics have been established as the new "base" year. Consequently, the 2009 NJ ASK 3-4 in LAL and mathematics were not equated to the 2008 operational tests. However, the 2009 NJ ASK scale scores for LAL and mathematics in grades 3 and 4 are linearly related to the theta metric calibrated with Winsteps. The following steps were used to produce the scoring tables:

- Determine cut score points on the raw metric through standard setting;
- Calibrate Rasch parameters estimates for the LAL Grades 3-4 sample;
- Calibrate Rasch parameters estimates for the mathematics Grades 3-4 sample;
- Find cut score points on the theta metric;
- Calculate intercept and slope of theta-to-scale-score transformation function; and
- Create raw score to scale score conversion tables.

Standard setting procedures were described in Part 5 of this Technical Report and in greater detail in the Standard Setting Report. Cut scores established through the standard setting are shown in Table 7.3.2.

Table 7.3.2: 2008 and 2009 Standard Setting Cut Scores

	Year of Standard Setting	Proficient	Advanced Proficient	Total Points Possible
		Raw Score	Raw Score	
LAL 3	2009	25	36	50
LAL 4	2009	32	45	59
LAL 5	2008*	40.0	57.5	75
LAL 6	2008*	41.5	59.0	78
LAL 7	2008*	39.0	55.0	78
LAL 8	2008*	42.5	60.0	78
Math 3	2009	26	40	50
Math 4	2009	25	39	50
Math 5	2008*	25	40	50
Math 6	2008*	25	41	50
Math 7	2008*	27	42	52
Math 8	2008*	29	43	52
Science 4	2005	19	30	39
Science 8	2000	23	41	54

*Cut scores were approved by the New Jersey State Board of Education on July 16, 2008.

In addition to the above scaling transformation, NJ DOE policy requires that scaled scores below 100 are rounded up to 100 and scaled scores above 300 are rounded down to 300. NJDOE also requires that the following rules apply:

1. If a scale score falls at a point greater than 199.499 and less than 201.000, it will serve as the proficient cut score. Otherwise, the next lowest scale score will serve as the cut score.
2. If a scale score falls at a point greater than 249.499 and less than 251.000, it will serve as the advanced proficient cut score. Otherwise, the next lowest scale score will serve as the cut score.
3. In the unlikely event that two scores fall >199.499 and <201.000 or >249.999 and <251.000, the lower of these two scores would become the cut score.

7.4 Scaling and Equating 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 2009 NJ ASK. Items that representatives from 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 items from the corresponding regular test forms. Items that were removed from the regular test forms are summarized in Table 7.4.1. No items were removed form the LAL test in grades 4 and 6 through 8, therefore no special equating was required for these forms. Results from these "special equatings" appear in Appendix H.

Table 7.4.1: Special Equatings

	Total Items	Items Removed or Modified	Raw Score Range
LAL Grade 3			
Braille	22	29	0-50
LAL Grade 5			
Braille	35	WT 2	0 - 53
Large Print	35	WT 2	0 - 53
Mathematics Grade 5			
Braille	42	4, 46	0 - 38
Mathematics Grade 6			
Braille	43	46	0 - 47
Alternate	44	SCRs replaced with 2008 SCRs	0 - 50
Mathematics Grade 7			
Braille	45	26	0 - 49
Alternate	46	SCRs replaced with 2008 SCRs	0 - 52
Mathematics Grade 8			
Braille	43	26, 42, 46	0 - 47
Alternate	46	SCRs replaced with 2008 SCRs	0 - 52
Science Grade 4			
Braille	32	4, 12, 30	0 - 36
Science Grade 8			
Braille	50	NA	0 – 54
Alternate	50	Modified 2008 form – 3 MC items replace 1 CR item	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/Large Print 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 and Large Print 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 LAL assessment measures language arts and the mathematics assessment measures mathematics, the following steps for equating the Braille and Large Print 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 and Large Print 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 and Large Print test scores.

- Create raw score to scale score look-up tables for each Braille and Large Print 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

The Braille/Large Print tests for LAL grade 3 and 5 did not included the Picture Prompt task. A Winsteps analysis was used to produce a raw to Rasch table with the Picture Prompt writing task omitted. The Picture Prompt task is worth a possible 10 points. Thus, there was a total of 53 possible points (63 - 10 = 53). All item parameters, including Rasch measure and Rasch-Anderich step statistics, were fixed to the 2009 operational test calibrations for all Braille and Large Print equatings in LAL, mathematics, and science.

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 is administered to all students affected when a breach occurs. Equating of the alternate forms was conducted in a manner similar to that used with the Braille and Large Print tests**.** Due to multiple breaches, part of the LAL alternate form and mathematics alternate form were administered to small groups of students. Before the LAL incidents, the students had already taken the persuasive writing prompt of the regular LAL Spring 2009 administration. Ultimately, the students took the picture prompt and reading MC and CR items from the Alternate form for the LAL test. For LAL, for multiple reasons, the alternate LAL was equated. A total of 770 general education students took the LAL alternate form. The multiple-choice reading items served as anchors.

For the breaches involving the mathematics test, the alternate form which is a scrambled version of the 2009 NJ ASK Operational test was used. As they are the same items, no special conversion table was required. However, additional alternate forms of the mathematics test were developed for grades 6 through 8. Students were allowed to use calculators for the SCR items in these grades when calculator should not have been used. Thus, these SCR items were replaced with the SCR items from the 2008 NJ ASK Operational mathematics tests. The Rasch values for these SCR items were fixed to the values from their respective 2008 tests. The remaining Rasch and step values were fixed to the 2009 NJ ASK Operational values from the respective mathematics tests

and theta to raw score to scale score tables were produce.

There were also two alternate forms for grade 8 science. The first alternate form was a scrambled version of the 2009 NJ ASK Operational Science test. Sixty Grade 8 Science students were given information about two items on the science test. As these students were exposed to all items on the operational and scrambled alternate forms of the test, a new alternate form was developed from the 2008 NJ ASK Operational Grade 8 Science test. To match the format and point values of the current operational test, the 2008 Science test was modified by removing one CR item and replacing it with 3 MC items from the item bank. The Rasch and step values were fixed to the 2008 NJ ASK Operational values and the 3 additional MC items were fixed to the banked Rasch values.

7.5 AYP Link to 2008 - LAL and Mathematics Grades 3 and 4

In order to meet the Adequate Yearly Progress (AYP) reporting requirements for this transition year in grades 3 and 4, linking the 2009 NJ ASK performance to the 2008 NJ ASK in LAL and mathematics at grades 3 and 4 was required. This link provided a standard by which achievement of proficiency goals for AYP purposes could be assessed (e.g., old scale, new scale, and a safe-harbor provision).

The linking was accomplished via a common item approach. Item parameter values were fixed to their known values from 2008. This in effect shifts the calibrated difficulty of the 2009 items to the same scale as the 2008 tests. Thus, the difficulty of the 2008 and 2009 tests can be said to be linked or related, despite some content differences between the years. An example of an anchored Winsteps control file with similar specifications to those which were used operationally is displayed below in Figure 7.5.1.

```
&INST
NI=44
TITLE='NJ ASK Grade 3 Math Spring 09, ANCHORED RUN for AYP only'
ITEM1=1
MODELS=R
GROUPS=0
xwide=1
CODES=0123
DATA=Mathbase.dat
STKEEP=Y
PTBIS=Y
PVALUE=Y
TOTALSCORE=Y
SCOREFILE=NJASK_2009_MATH3_ANC.sco  ;SCORE FILE
SFILE=NJASK_2009_MATH3_ANC.san
IFILE=NJASK_2009_MATH3_ANC.itm  ;ITEM FILE NAME
ISFILE=NJASK_2009_MATH3_ANC.isf  ;ITEM FILE NAME
DISFILE=NJASK_2009_MATH3_ANC.dis
IAFILE=NJASK_2009_MATH3_ANC.iaf
SAFILE=NJASK_2009_MATH3_ANC.saf
UDECIM=5
LCONV=0.000001
MUCON=50
ASCII=Y
TABLES='1010000001011100000100'
&END
```

Figure 7.5.1: Example Control File—Anchored Calibration.

Scaling was accomplished in the same manner as described in Section 7.2 except the slopes and intercepts of the 2008 NJ ASK LAL and mathematics assessments at grades 3 and 4 were applied to the 2009 tests. This resulted in theta values or ability estimates anchored to the 2008 scale. As the 2008 and 2009 NJ ASK for LAL and mathematics in grades 3 and 4 differ significantly in terms of item type, passage length, and testing time it is **inappropriate** to make direct comparisons of student performance across these tests.

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 2009 NJ ASK 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

Reliable student test scores, like other reliable measurements, are consistent. More specifically, measurement components are consistent with each other. Results of the components vary, but they do so within tolerable limits. In general, measurement error and reliability are inversely related. When measurement error is large, reliability is small. Increasing reliability by minimizing measurement error is an important goal in the construction of any test.

The NJ ASK assessments, like many other standardized achievement tests, were designed under the assumptions of Classical Test Theory (CTT). This approach builds on the notion of an ideal, error-free or true measurement score. Any observed measurement, such as a test score, X, is defined as a composite of true score, T, and its associated error:

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

Estimating the size of the measurement error associated with the true score is the key to estimating reliability. Errors in measurement can result from any of a multitude of factors, including environmental factors (e.g., testing conditions) and examinee factors (e.g., fatigue, stress). CTT provides a means for this quantification of examinee inconsistency (i.e., measurement error).

The definitions or assumptions in CTT lead to several important properties. For example, it can be demonstrated that

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

or observed score variance equals the sum of true score variance plus error variance. The relationships among variance terms (i.e., $\sigma_x^2, \sigma_t^2, \sigma_e^2$) are critical to a more thorough understanding of important CTT concepts, including reliability and the standard error of measurement. For example, CTT reliability is defined as the correlation between observed scores on parallel forms which is equal to

$$\rho_{x_1 x_2} = \sigma_t^2 \big/ \sigma_x^2 .$$

Reliability in CTT is thus conceptualized as true score variance divided by observed score variance. With just a few algebraic steps, the CTT definition of the standard error of measurement (SEM) can be shown as

$$\sigma_e = \sigma_x \sqrt{1 - \rho_{x_1 x_2}}.$$

Although the conceptualization of reliability and SEM is relatively straightforward, issues underlying the estimation of reliability are not. Reliability can be estimated via the correlation of scores on parallel forms or from test-retest data, or it can be estimated from a single test administration using any one of a variety of techniques (e.g., Brown, 1910[45]; Cronbach, 1951[46]; Kuder & Richardson, 1937[47]). A very popular technique for estimating reliability from a single test administration is Cronbach's coefficient alpha.

Test Metrics and Units of Analysis

The NJ ASK quantifies student achievement on three different metrics: number correct or raw score, IRT scale, and performance score. While it is the knowledge and skills of individual students that are measured, student scores are aggregated and disaggregated into various units (e.g., school by grade, student group by grade, school, district, and state). Measurement error specific to each metric and each unit of analysis is taken into account when results are reported and accountability decisions are made. It is the responsibility of test developers to maximize reliability and minimize error by (1) identifying likely sources of error; (2) controlling the conditions of error; (3) estimating the size of error and/or level of reliability; and (4) reporting the estimates by metric and unit of analysis.

Raw Score Internal Consistency

Consistency of individual student performance was estimated using coefficient alpha. As previously noted, 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:

[45] Brown, W. (1910). Some experimental results in the correlation of mental abilities. *British Journal of Psychology*, *3*, 296–322.
[46] Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*, 297–334.
[47] Kuder, G. F., & Richardson, M. W. (1937). The theory of the estimation of test reliability. *Psychometrika*, *2*, 151–160.

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

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. 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 [48].

(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.* Madison, WI: National Council on Measurement and Education 176-177. Also available at: www.ncme.org/pubs/items/15.pdf).[48]

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

Test	Form*	Grade	N-count	Cronbach Alpha	SEM
LAL	OP	3	101878	0.84	2.78
	OP	4	102438	0.86	3.38
	OP	5	101431	0.85	3.32
	OP	6	101765	0.88	3.35
	OP	7	102138	0.88	3.54
	OP	8	103648	0.89	3.33
Spanish LAL	SP	3	580	0.81	2.81
	SP	4	606	0.82	3.52
	SP	5	647	0.78	3.27
	SP	6	666	0.81	3.49
	SP	7	762	0.83	3.36
	SP	8	790	0.83	3.17
Math	OP	3	101154	0.89	3.40
	OP	4	101807	0.89	3.35
	OP	5	101730	0.91	3.24
	OP	6	101979	0.91	3.09
	OP	7	102408	0.91	3.27
	OP	8	103668	0.92	3.25
Spanish Math	SP	3	570	0.86	3.44
	SP	4	602	0.86	3.39
	SP	5	642	0.84	3.19
	SP	6	662	0.84	3.22
	SP	7	758	0.86	3.10
	SP	8	778	0.87	3.03
Science	OP	4	101683	0.82	2.79
	OP	8	103518	0.87	3.55
Spanish Science	SP	4	603	0.76	2.98
	SP	8	776	0.66	3.44

* OP: Operational Test; SP: Spanish Version; N-counts were insufficient to produce values for Braille and Large Print.

Table 8.1.2: Grade 3 Coefficient Alpha and Standard Error Measurement for Clusters

	Number of Items			Number of Possible Points	Alpha	SEM
	MC	CR/ECR	SCR			
LAL	**18**	**5**		**50**	**0.84**	**2.78**
Writing		2		20	0.70	1.42
Reading	18	3		30	0.85	2.04
Working with Text	12	0		12	0.78	1.36
Analyzing Text	6	3		18	0.71	1.49
Math	**35**	**3**	**6**	**50**	**0.89**	**3.40**
Number & Numerical Operations	14	1	3	20	0.84	1.90
Geometry & Measurement	7	1	1	11	0.52	1.62
Patterns & Algebra	7	1	1	11	0.64	1.60
Data Analysis, Probability, & Discrete Mathematics	7	0	1	8	0.69	1.15
Problem Solving	*18*	*3*	*2*	*29*	*0.85*	*2.54*

Table 8.1.2.a: Grade 3 Coefficient Alpha and Standard Error Measurement for Multiple Choice Clusters and Short-Constructed Responses*

Subject/Cluster	Number of Items	Alpha	SEM
LAL MC	18	0.82	1.74
Working with Text	12	0.78	1.36
Analyzing Text	6	0.54	1.07
Math MC	35	0.88	2.46
Number & Numerical Operations	14	0.80	1.49
Geometry & Measurement	7	0.45	1.12
Patterns & Algebra	7	0.60	1.10
Data Analysis, Probability, & Discrete Mathematics	7	0.66	1.09
Problem Solving	18	0.82	1.74
Math SCR	6	0.61	1.02

*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 Standard Error Measurement for Clusters

	Number of Items			Number of Possible Points	Alpha	SEM
	MC	CR/ECR	SCR			
LAL	**27**	**5**		**59**	**0.86**	**3.38**
Writing		2		20	0.68	1.75
Reading	27	3		39	0.88	2.41
Working with Text	14	0		14	0.78	1.53
Analyzing Text	13	3		25	0.78	1.92
Math	**35**	**3**	**6**	**50**	**0.89**	**3.35**
Number & Numerical Operations	14	1	3	20	0.78	2.01
Geometry & Measurement	7	1	1	11	0.60	1.57
Patterns & Algebra	7	1	1	11	0.69	1.56
Data Analysis, Probability, & Discrete Mathematics	7	0	1	8	0.65	1.11
Problem Solving	*19*	*3*	*4*	*32*	*0.83*	*2.67*
Science	**33**	**6**		**39**	**0.82**	**2.79**
Life Science	12	1		15	0.62	1.76
Physical Science	12	0		12	0.56	1.52
Earth Science	9	1		12	0.64	1.51
Knowledge	*6*	*0*		*6*	*0.43*	*1.10*
Application	*27*	*2*		*33*	*0.80*	*2.51*

Table 8.1.3.a: Grade 4 Coefficient Alpha and Standard Error Measurement for Multiple Choice Clusters and Short-Constructed Responses*

Subject/Cluster	Number of Items	Alpha	SEM
LAL MC	27	0.86	2.20
Working with Text	14	0.78	1.53
Analyzing Text	13	0.73	1.55
Math MC	35	0.88	2.49
Number & Numerical Operations	14	0.74	1.59
Geometry & Measurement	7	0.55	1.13
Patterns & Algebra	7	0.61	1.13
Data Analysis, Probability, & Discrete Mathematics	7	0.64	1.06
Problem Solving	18	0.78	1.81
Math SCR	6	0.47	1.02
Science MC	33	0.80	2.51
Life Science	12	0.58	1.51
Physical Science	12	0.56	1.52
Earth Science	9	0.61	1.27
Knowledge	6	0.43	1.10
Application	27	0.77	2.23

*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 Standard Error Measurement for Clusters

	Number of Items			Number of Possible Points	Alpha	SEM
	MC	CR/ECR	SCR			
LAL	**31**	**5**		**63**	**0.85**	**3.32**
Writing		2		20	0.68	1.66
Reading	31	3		43	0.73	3.45
Working with Text	18	0		18	0.76	1.66
Analyzing Text	13	3		25	0.72	1.97
Math	**35**	**3**	**6**	**50**	**0.91**	**3.24**
Number & Numerical Operations	11	0	3	14	0.82	1.52
Geometry & Measurement	8	1	1	12	0.70	1.67
Patterns & Algebra	8	1	1	12	0.63	1.67
Data Analysis, Probability, & Discrete Mathematics	8	1	1	12	0.69	1.56
Problem Solving	*14*	*3*	*2*	*25*	*0.81*	*2.45*

Table 8.1.4.a: Grade 5 Coefficient Alpha and Standard Error Measurement for Multiple Choice Clusters and Short-Constructed Responses*

Subject/Cluster	Number of MC Items	Alpha	SEM
LAL MC	31	0.85	2.20
Working with Text	18	0.76	1.66
Analyzing Text	13	0.71	1.46
Math MC	35	0.90	2.35
Number & Numerical Operations	11	0.79	1.31
Geometry & Measurement	8	0.65	1.17
Patterns & Algebra	8	0.61	1.12
Data Analysis, Probability, & Discrete Mathematics	8	0.66	1.13
Problem Solving	14	0.76	1.48
Math SCR	6	0.61	1.04

*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 Standard Error Measurement for Clusters

	Number of Items			Number of Possible Points	Alpha	SEM
	MC	CR/ECR	SCR			
LAL	**36**	**6**		**70**	**0.88**	**3.35**
Writing		2		18	0.50	1.61
Reading	36	4		52	0.88	2.80
Working with Text	19	0		19	0.75	1.74
Analyzing Text	17	4		33	0.80	2.28
Math	**35**	**3**	**6**	**50**	**0.91**	**3.09**
Number & Numerical Operations	8	1	2	13	0.75	1.63
Geometry & Measurement	8	1	2	13	0.71	1.54
Patterns & Algebra	8	1	1	12	0.68	1.57
Data Analysis, Probability, & Discrete Mathematics	11	0	1	12	0.74	1.41
Problem Solving	*14*	*3*	*3*	*26*	*0.84*	*2.30*

Table 8.1.5.a: Grade 6 Coefficient Alpha and Standard Error Measurement for Multiple Choice Clusters and Short-Constructed Responses*

Subject/Cluster	Number of MC Items	Alpha	SEM
LAL MC	36	0.84	2.47
Working with Text	19	0.75	1.74
Analyzing Text	17	0.69	1.69
Math MC	35	0.89	2.42
Number & Numerical Operations	8	0.66	1.16
Geometry & Measurement	8	0.63	1.19
Patterns & Algebra	8	0.64	1.18
Data Analysis, Probability, & Discrete Mathematics	11	0.72	1.36
Problem Solving	14	0.79	1.48
Math SCR	6	0.59	1.01

*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 Standard Error Measurement for Clusters

	Number of Items			Number of Possible Points	Alpha	SEM
	MC	CR/ECR	SCR			
LAL	**36**	**6**		**70**	**0.88**	**3.54**
Writing		2		18	0.50	1.94
Reading	36	4		52	0.88	2.85
Working with Text	21	0		21	0.78	1.96
Analyzing Text	15	4		31	0.80	2.04
Math	**35**	**3**	**8**	**52**	**0.91**	**3.27**
Number & Numerical Operations	8	1	2	13	0.72	1.55
Geometry & Measurement	8	1	2	13	0.73	1.71
Patterns & Algebra	11	0	2	13	0.74	1.50
Data Analysis, Probability, & Discrete Mathematics	8	1	2	13	0.71	1.63
Problem Solving	*15*	*3*	*6*	*30*	*0.87*	*2.59*

Table 8.1.6.a: Grade 7 Coefficient Alpha and Standard Error Measurement for Multiple Choice Clusters and Short-Constructed Responses*

Subject/Cluster	Number of Items	Alpha	SEM
LAL MC	36	0.86	2.52
Working with Text	21	0.78	1.96
Analyzing Text	15	0.71	1.63
Math MC	35	0.89	2.39
Number & Numerical Operations	8	0.62	1.16
Geometry & Measurement	8	0.66	1.19
Patterns & Algebra	11	0.72	1.36
Data Analysis, Probability, & Discrete Mathematics	8	0.64	1.14
Problem Solving	16	0.80	1.70
Math SCR	8	0.68	1.22

*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.

Table 8.1.7: Grade 8 Coefficient Alpha and Standard Error Measurement for Clusters

	Number of Items			Number of Possible Points	Alpha	SEM
	MC	CR/ECR	SCR			
LAL	**36**	**6**		**70**	**0.89**	**3.33**
Writing		2		18	0.50	1.61
Reading	36	4		52	0.89	2.78
Working with Text	19	0		19	0.79	1.75
Analyzing Text	17	4		33	0.82	2.13
Math	**35**	**3**	**8**	**52**	**0.92**	**3.25**
Number & Numerical Operations	11	0	2	13	0.78	1.45
Geometry & Measurement	8	1	2	13	0.75	1.58
Patterns & Algebra	8	1	2	13	0.78	1.54
Data Analysis, Probability, & Discrete Mathematics	8	1	2	13	0.72	1.67
Problem Solving	*18*	*3*	*3*	*30*	*0.82*	*2.80*
Science	**48**	**6**		**54**	**0.87**	**3.55**
Life Science	21	0		21	0.75	2.02
Physical Science	13	1		16	0.61	2.02
Earth Science	14	1		17	0.74	1.90
Knowledge	*9*	*0*		*9*	*0.56*	*1.35*
Application	*39*	*2*		*45*	*0.86*	*3.12*

Table 8.1.7.a: Grade 8 Coefficient Alpha and Standard Error Measurement for Multiple Choice Clusters and Short-Constructed Responses*

Subject/Cluster	Number of Items	Alpha	SEM
LAL MC	36	0.86	2.53
Working with Text	19	0.79	1.75
Analyzing Text	17	0.73	1.77
Math MC	35	0.89	2.53
Number & Numerical Operations	11	0.74	1.35
Geometry & Measurement	8	0.65	1.22
Patterns & Algebra	8	0.71	1.14
Data Analysis, Probability, & Discrete Mathematics	8	0.60	1.26
Problem Solving	18	0.84	1.73
Math SCR	8	0.76	1.10
Science MC	48	0.87	3.05
Life Science	21	0.75	2.02
Physical Science	13	0.58	1.62
Earth Science	14	0.71	1.64
Knowledge	9	0.56	1.35
Application	39	0.84	2.79

*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:

$$\text{Stratified } \alpha = 1 - \frac{\sum \sigma_i^2 \left(1 - \rho_{ii'}\right)}{\sigma_t^2}$$ [49]

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*.

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)[50] 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. These classification accuracy values were generally in the mid- to upper-eighties.

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.

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[49] 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

[50] 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.

Table 8.2.1: Consistency Indices for Performance Levels

Test	Grade	Stratified Alpha		Cut Score	Kappa	φ
		Coefficient	SEM			
LAL	3	0.88	2.43	25, 36	0.57	77%
	4	0.88	3.41	32, 45	0.57	77%
	5	0.87	3.11	37, 50	0.54	75%
	6	0.89	3.14	37, 54	0.59	79%
	7	0.90	3.28	36, 51	0.58	75%
	8	0.91	3.02	35, 55	0.54	79%
Math	3	0.91	3.09	26, 40	0.63	76%
	4	0.91	3.10	25, 39	0.62	76%
	5	0.92	3.06	23, 39	0.67	79%
	6	0.91	3.02	26, 40	0.66	78%
	7	0.92	3.09	27, 41	0.66	78%
	8	0.93	3.02	28, 42	0.67	79%
Science	4	0.83	2.72	15, 26	0.55	74%
	8	0.88	3.35	21, 38	0.63	78%

Item Maps and Test Information Functions

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

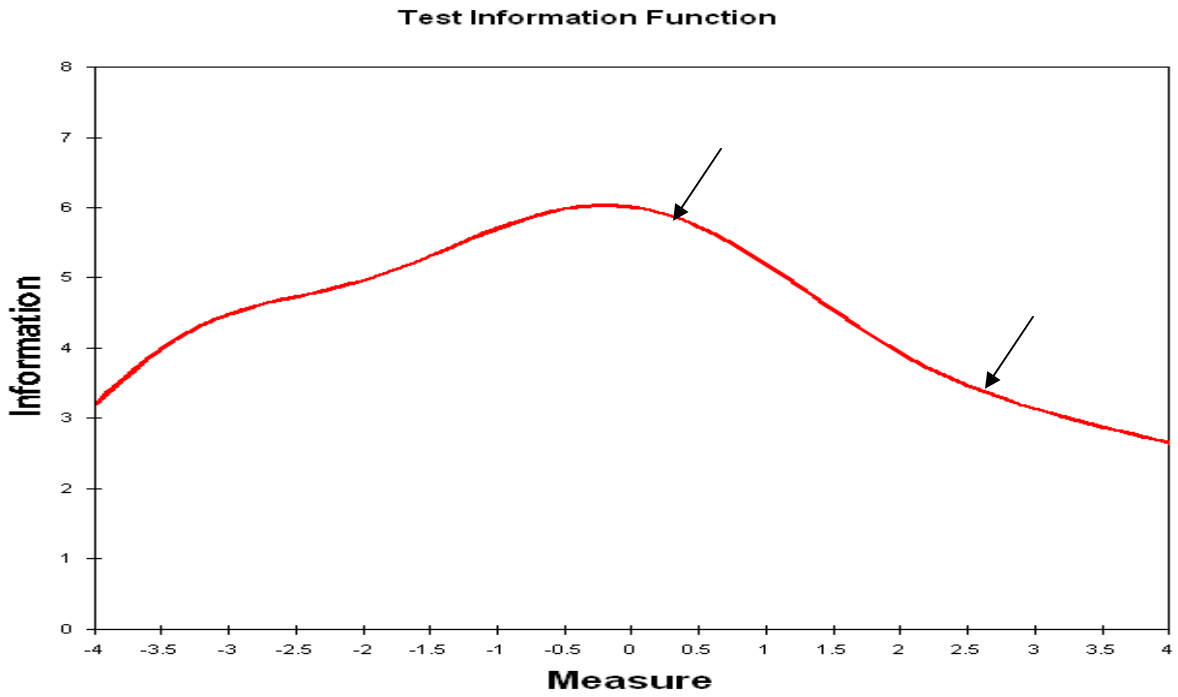
The test information function is another method of assessing the reliability or the precision of a test. The reliability of a test, however, is not uniform across the entire range of test scores. The highest and lowest scores typically have more measurement error than do scores in the middle of the range 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[51]; Hambleton, 1989[52]). 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).

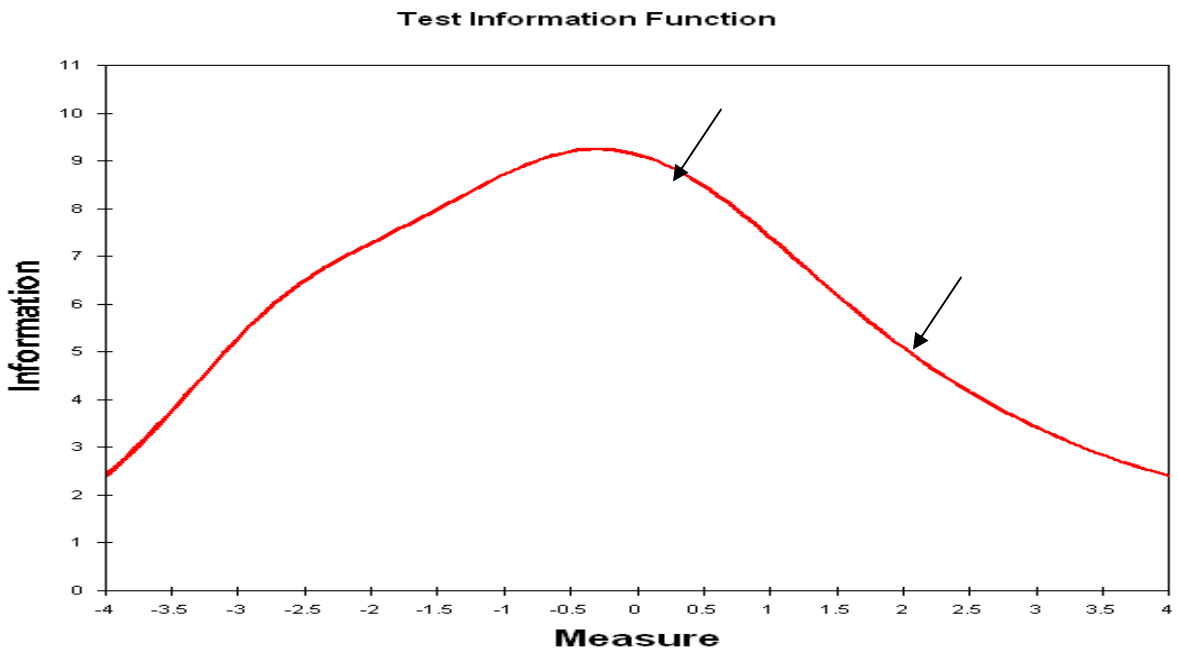
These figures illustrate the level of information at theta values ranging from −4 to +4. As shown, the information or reliability of the test scores are lower at the extremes and higher in the middle. More information implies less measurement error. Ideally, the Proficient cut score would occur at the peak of the information function where the most information and the least measurement error occurs. 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 LAL, mathematics, and science all occur near the peak of information.

[51] Lord, F. M., & Novick, M. R. (1968). *Statistical theories of mental test scores*. Reading MA: Addison-Welsley.
[52] 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.



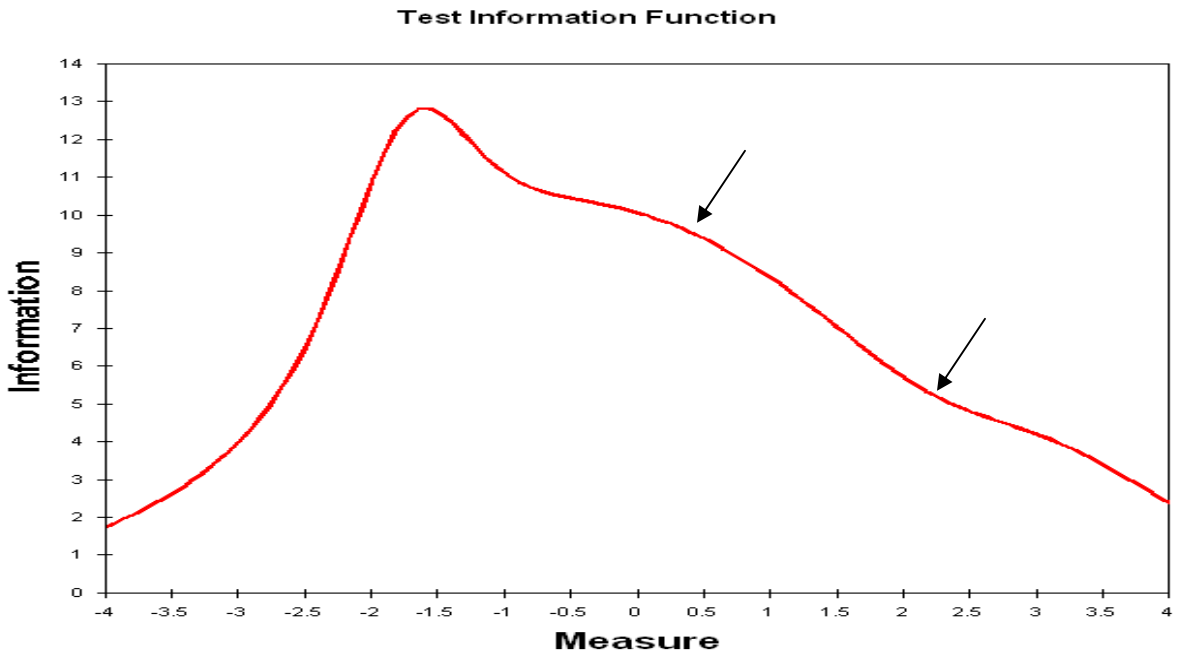
*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.2: TIF LAL Grade 3



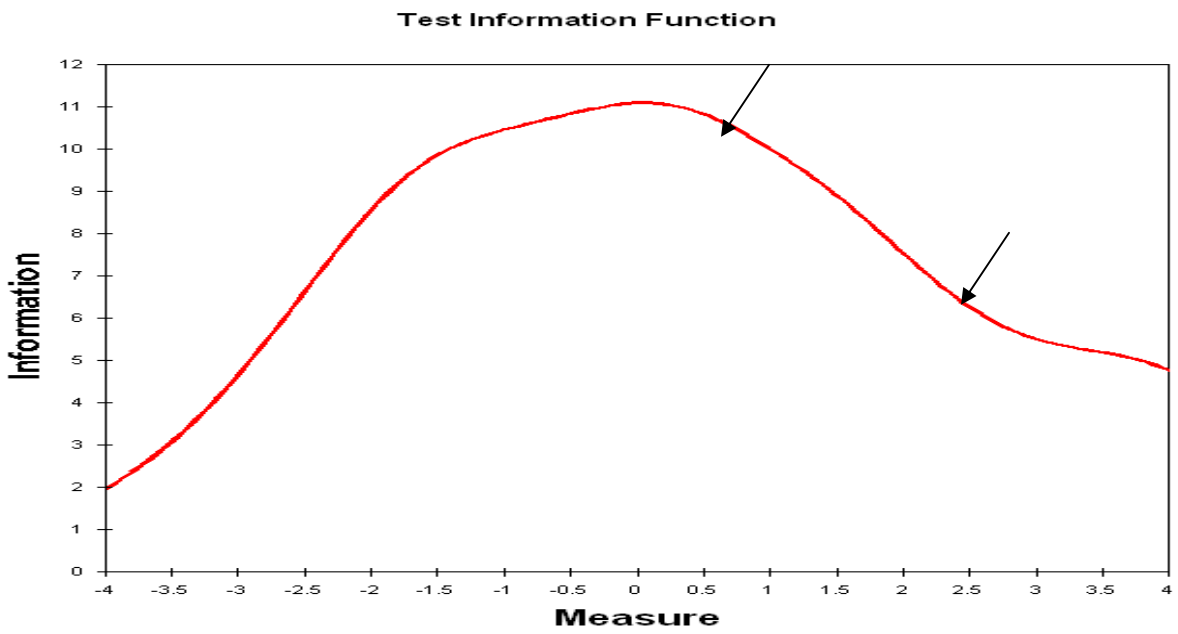
*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.3: TIF LAL Grade 4



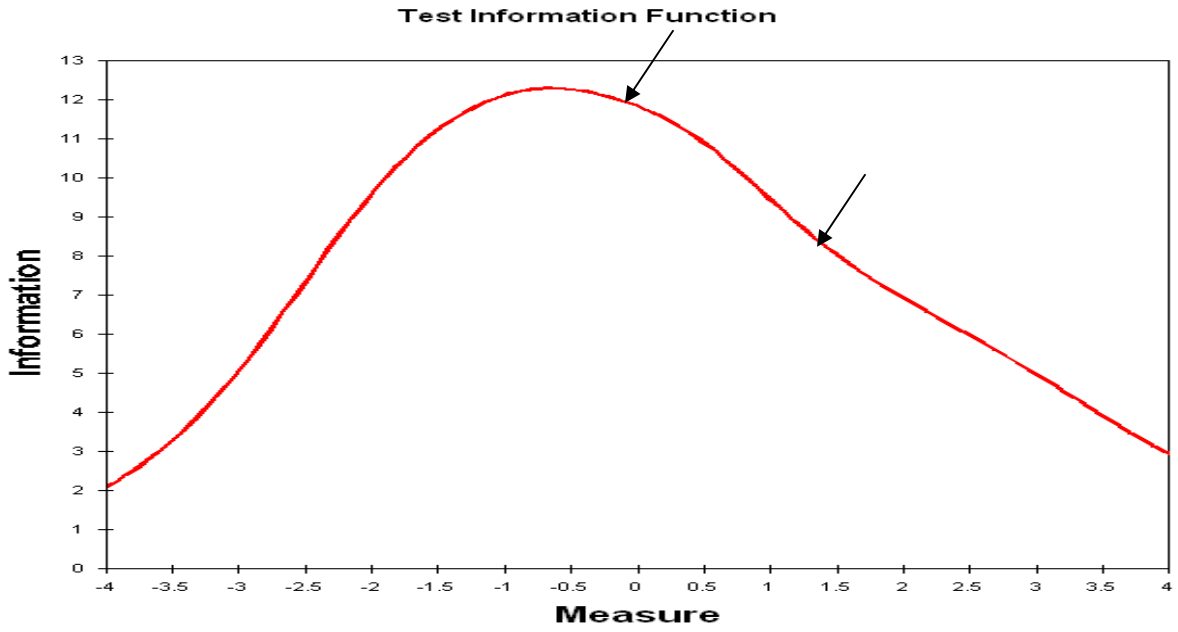
*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.4: TIF LAL Grade 5



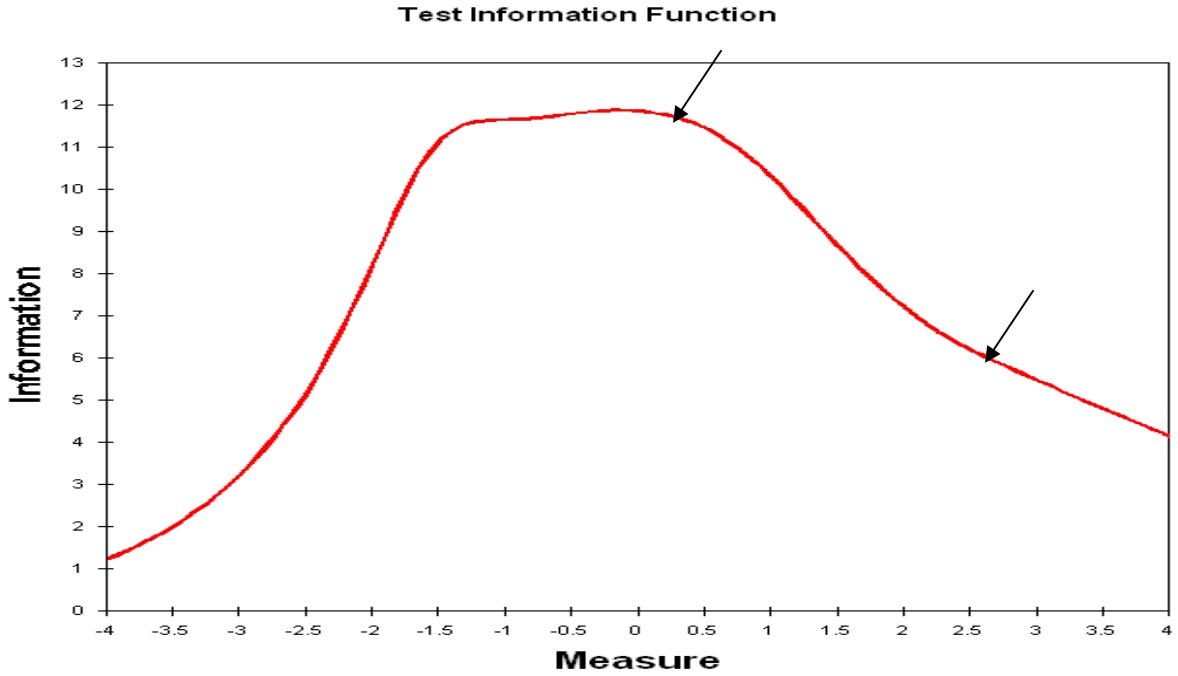
*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.5: TIF LAL Grade 6



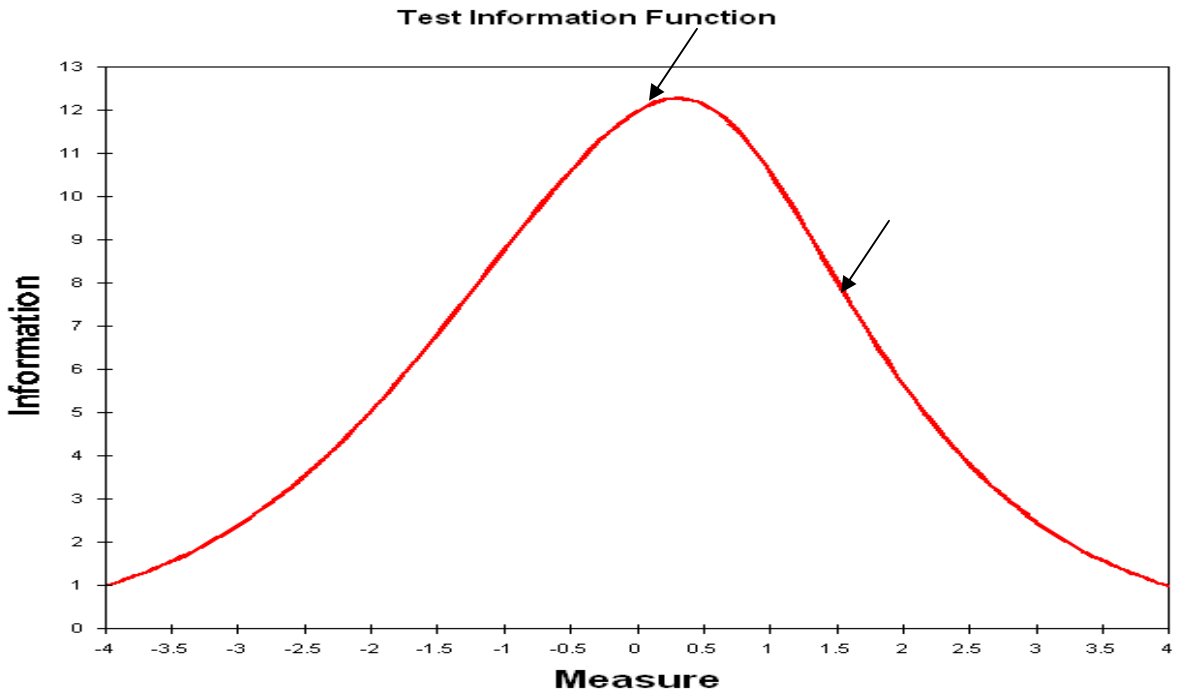
*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.6: TIF LAL Grade 7



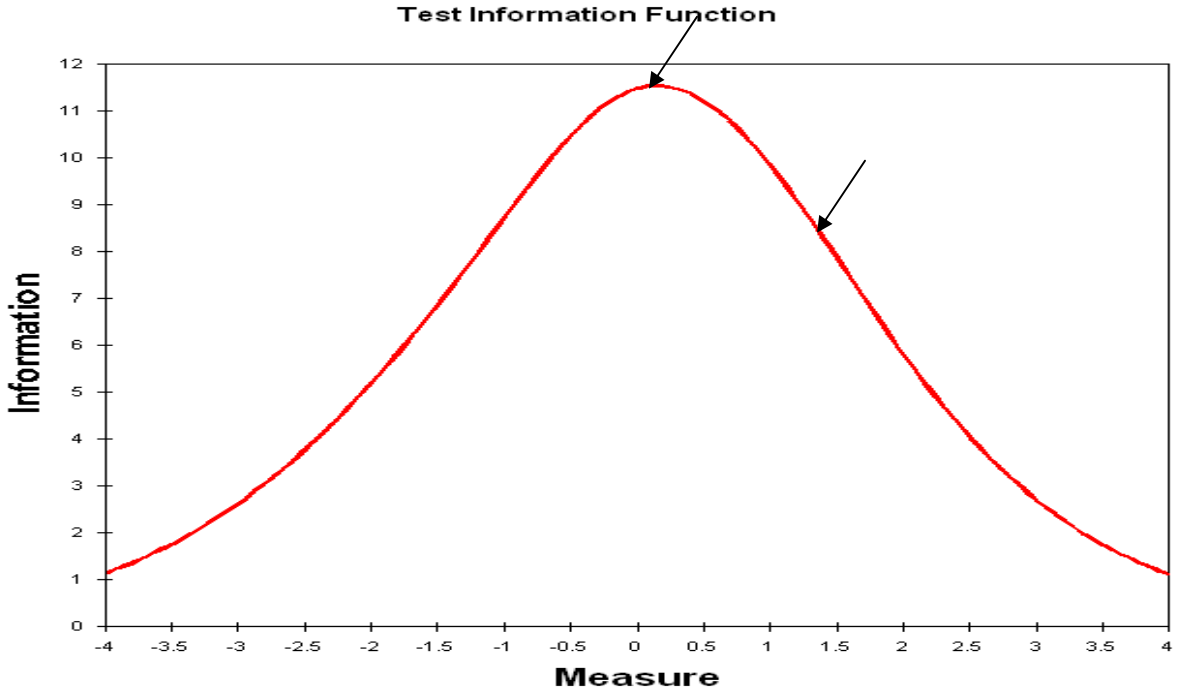
*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.7: TIF LAL Grade 8



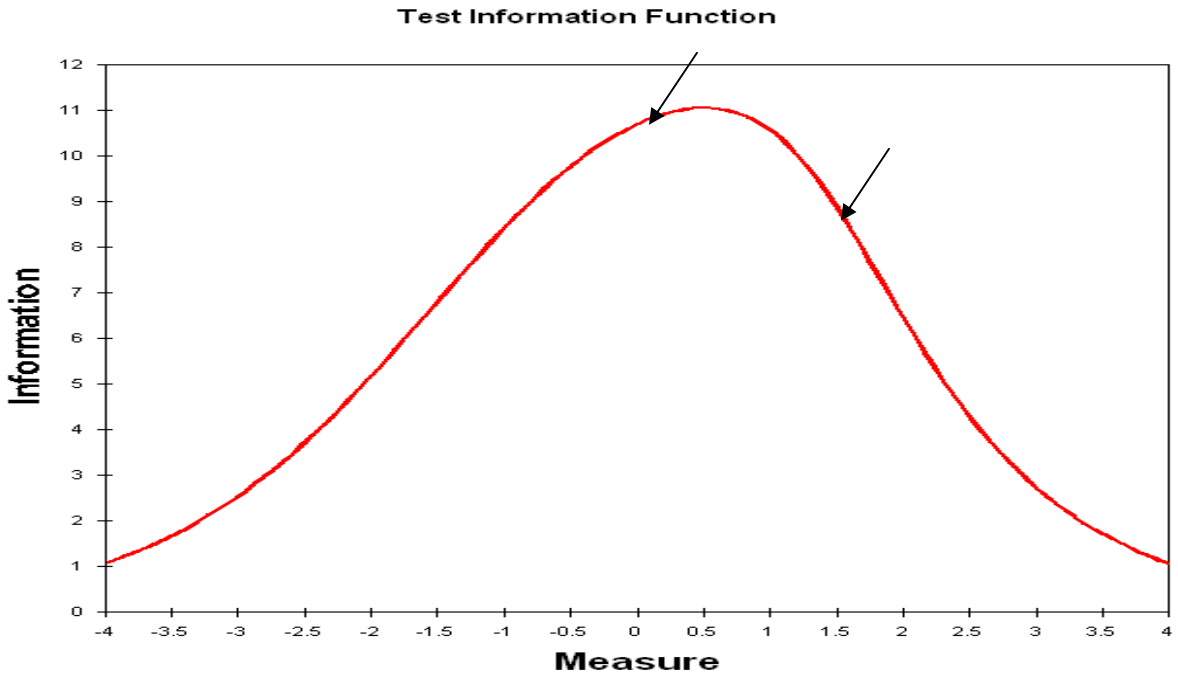
*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.8: TIF Mathematics Grade 3



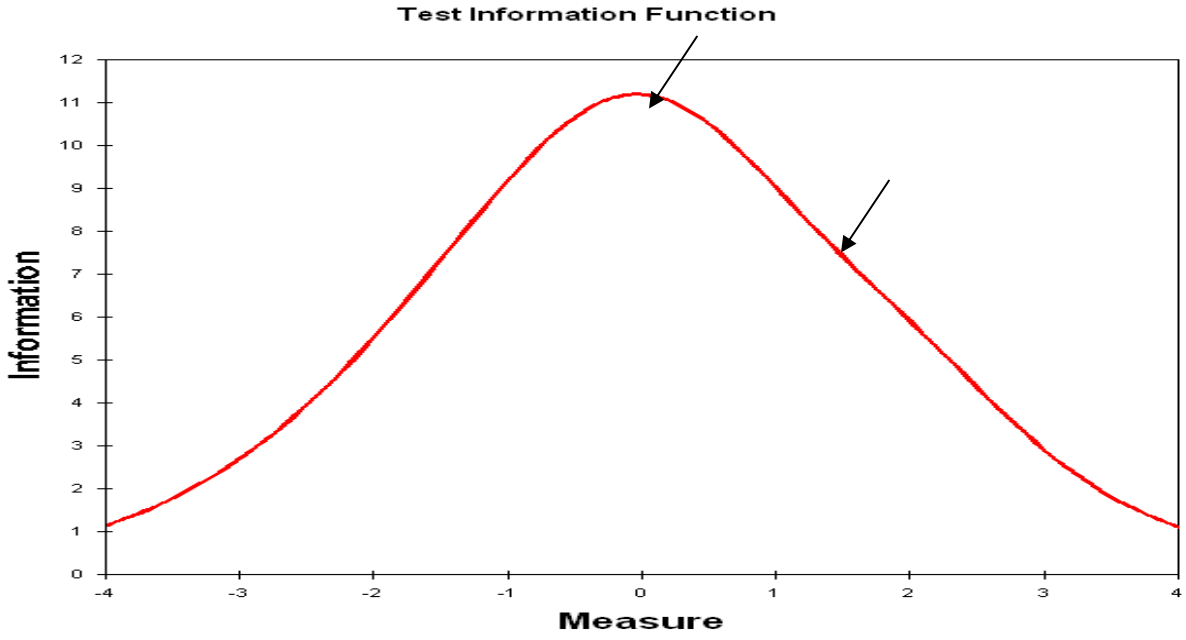
*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.9: TIF Mathematics Grade 4



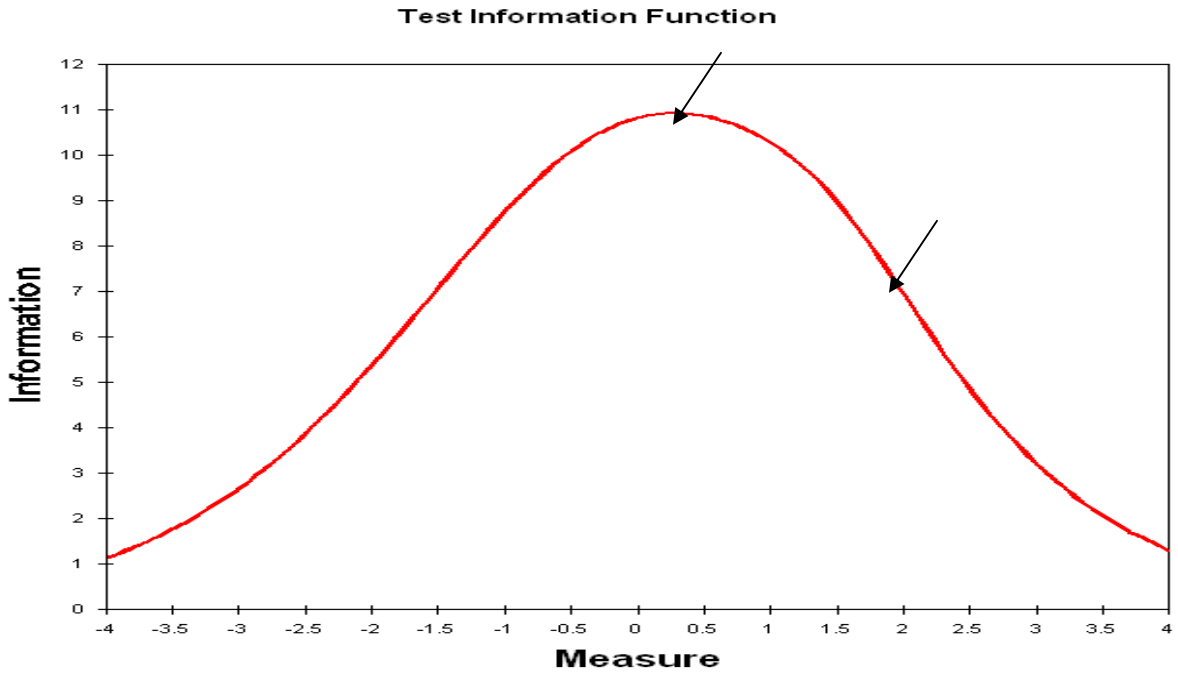
*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.10: TIF Mathematics Grade 5



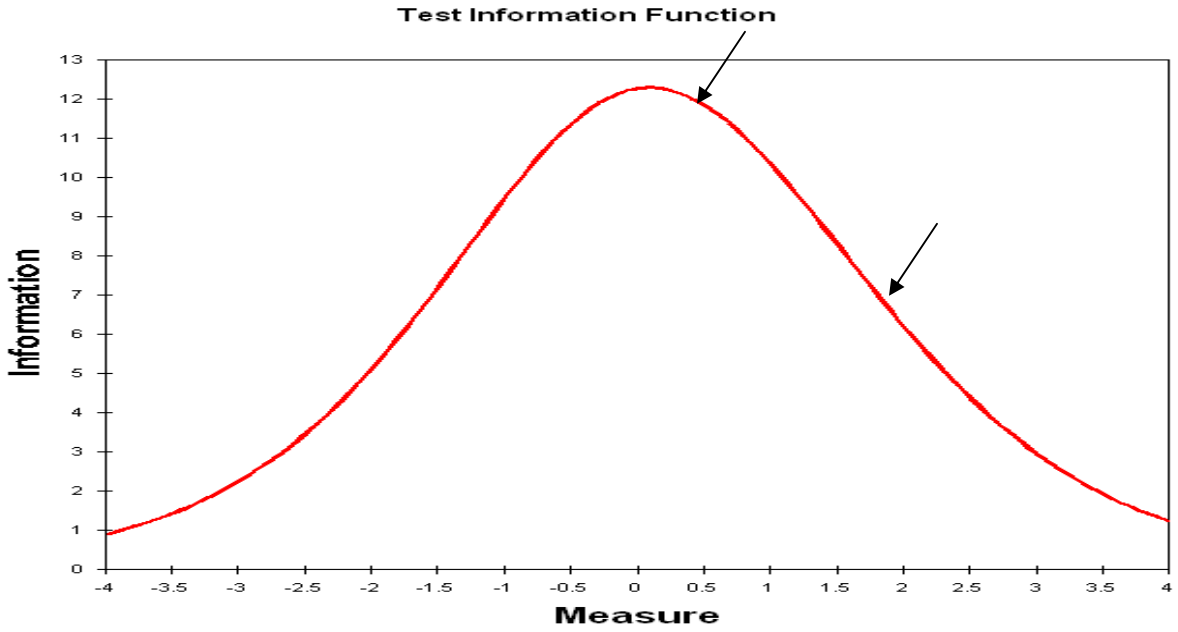
*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.11: TIF Mathematics Grade 6



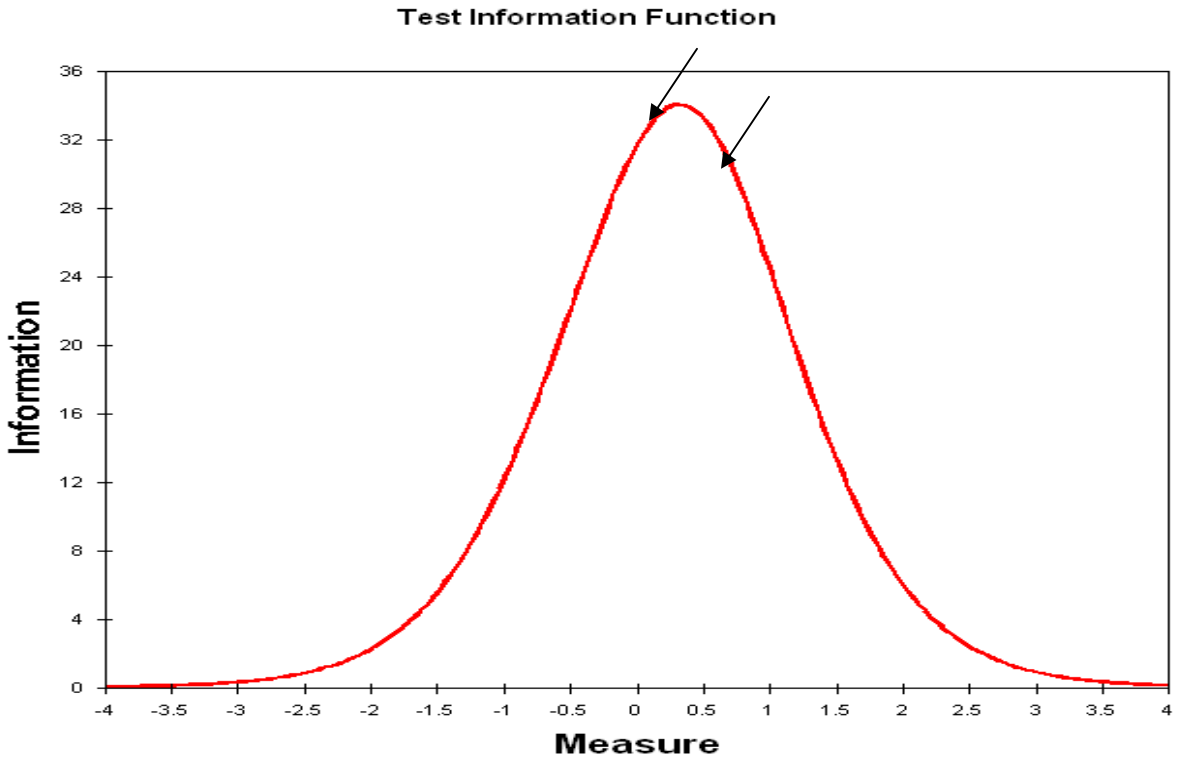
*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.12: TIF Mathematics Grade 7



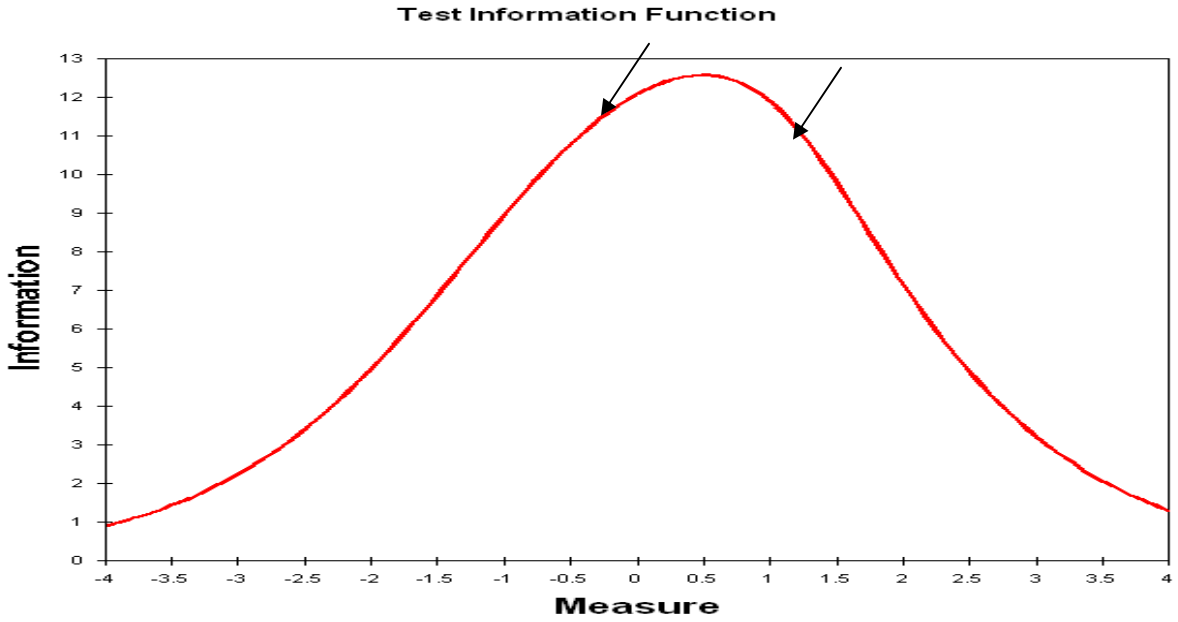
*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.13: TIF Mathematics Grade 8



*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.14: TIF Science Grade 4



*Arrows indicate the location of the Proficient and Advance Proficient cut points.

Figure 8.2.15: TIF Science Grade 8

8.3 Conditional Estimate of Error at Each Cut-Score

The 2009 NJ ASK 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

		LAL		Mathematics		Science	
		Proficient	Advanced Proficient	Proficient	Advanced Proficient	Proficient	Advanced Proficient
Grade 3	Cut score	25	36	26	40	N/A	N/A
	(CSEM)	(2.42)	(1.88)	(3.47)	(2.85)		
Grade 4	Cut score	32	45	25	39	15	26
	(CSEM)	(2.96)	(2.20)	(3.37)	(2.84)	(2.81)	(2.76)
Grade 5	Cut score	37	51	23	39	N/A	N/A
	(CSEM)	(3.11)	(2.33)	(3.25)	(2.96)		
Grade 6	Cut score	37	54	26	40	N/A	N/A
	(CSEM)	(3.29)	(2.61)	(3.20)	(2.68)		
Grade 7	Cut score	36	51	27	41	N/A	N/A
	(CSEM)	(3.43)	(2.51)	(3.33)	(2.87)		
Grade 8	Cut score	35	55	28	42	21	39
	(CSEM)	(3.40)	(2.30)	(3.47)	(2.75)	(3.46)	(3.29)

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 both writing prompts were doubled; whereas, in grades 6–8 the *Persuasive* writing prompt scores were doubled, and the *Explanatory* writing prompt scores were not doubled in data analyses and score reporting. The rubrics had score points that ranged from 0 to 4 for the LAL CR 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 or the writing prompts.

Ten percent (10%) of the writing prompts and 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 2009 NJ ASK. As shown in the tables below, the exact agreement rates ranged from approximately 57% to slightly less than 94%. 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 4% to 40%. In no case did more than 3% 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
LAL All	**70.59**	**28.76**	**0.66**
Writing All	**71.7**	**27.76**	**0.54**
Writing Task 1	70.49	29.06	0.45
Writing Task 2	72.91	26.46	0.63
Reading All	**69.47**	**29.76**	**0.77**
CR 1	78.09	21.72	0.18
CR 2	70.21	29.15	0.64
CR 3	60.11	38.41	1.49
Math All	**89.99**	**8.42**	**1.58**
ECR 1	86.37	11.69	1.93
ECR 2	92.79	4.94	2.26
ECR 3	90.82	8.63	0.55

* 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
LAL All	**68.85**	**29.98**	**1.17**
Writing All	**63.66**	**34.73**	**1.61**
Writing Task 1	58.56	38.89	2.55
Writing Task 2	68.76	30.57	0.67
Reading All	**74.04**	**25.22**	**0.73**
CR 1	72.06	27.65	0.28
CR 2	79.7	19.51	0.79
CR 3	70.37	28.5	1.13
Math All	**92.97**	**6.29**	**0.75**
ECR 1	92.13	7.45	0.43
ECR 2	93.31	5.48	1.22
ECR 3	93.46	5.94	0.60
Science All	**80.21**	**18.22**	**1.57**
CR 1	70.17	27.05	2.78
CR 2	90.24	9.39	0.36

* 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
LAL All	**68.89**	**30.31**	**0.80**
Writing All	**71.27**	**28.47**	**0.27**
Writing Task 1	72.03	27.73	0.24
Writing Task 2	70.51	29.20	0.29
Reading All	**66.50**	**32.16**	**1.34**
CR 1	57.07	40.09	2.83
CR 2	69.47	29.74	0.79
CR 3	72.97	26.64	0.39
Math All	**90.35**	**8.71**	**0.94**
ECR 1	88.98	10.14	0.87
ECR 2	91.10	8.19	0.70
ECR 3	90.97	7.79	1.24

* 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
LAL All	**67.25**	**31.43**	**1.32**
Writing All	**62.82**	**35.63**	**1.56**
Writing Task 1	63.4	35.44	1.16
Writing Task 2	62.23	35.82	1.95
Reading All	**71.69**	**27.23**	**1.08**
CR 1	69.89	29.74	0.38
CR 2	66.79	31.99	1.21
CR 3	71.01	28.46	0.54
CR 4	77.27	21.25	1.48
Math All	**90.21**	**8.20**	**1.59**
ECR 1	89.04	9.21	1.74
ECR 2	88.21	9.65	2.15
ECR 3	93.38	5.73	0.89

* 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
LAL All	**62.02**	**36.11**	**1.87**
Writing All	58.82	38.86	2.33
Writing Task 1	58.14	39.12	2.73
Writing Task 2	59.49	38.59	1.92
Reading All	**65.23**	**33.36**	**1.42**
CR 1	66.68	32.46	0.86
CR 2	63.53	34.47	1.99
CR 3	60.68	37.01	2.31
CR 4	70.01	29.48	0.51
Math All	**84.14**	**14.55**	**1.31**
ECR 1	86.71	11.5	1.79
ECR 2	93.29	6.55	0.16
ECR 3	72.42	25.61	1.97

* 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
LAL All	**69.48**	**29.78**	**0.74**
Writing All	**70.16**	**29.14**	**0.72**
Writing Task 1	68.81	30.24	0.95
Writing Task 2	71.50	28.03	0.48
Reading All	**68.81**	**30.42**	**0.76**
CR 1	72.29	27.07	0.63
CR 2	67.48	31.9	0.62
CR 3	67.09	31.47	1.44
CR 4	68.39	31.25	0.36
Math All	**83.02**	**15.69**	**1.28**
ECR 1	79.08	18.87	2.05
ECR 2	88.17	11.05	0.78
ECR 3	81.82	17.16	1.02
Science All	**86.09**	**12.75**	**1.17**
CR 1	82.62	16.39	0.99
CR 2	89.55	9.11	1.35

* 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).[53] 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 begins with a review of important federal statutes requiring the NJ ASK 3–8 and goes on to explain 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[54]

Baker and Linn (2002)[55] 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

[53] American Educational Research Association, American Psychological Association, and National Council on Measurement in Education. (1999). *Standards for Educational and Psychological Testing*. Washington: APA.
[54] 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).
[55] 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 will better prepare 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

Adequacy of the content representation of the NJ ASK is critically important 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 was given in Part 2, Test Development Process, and Part 6, Item and Test Statistics. Tables 2.1.3 through 2.1.21 in Part 2 provide a comparison of target test construction maps to actual test maps for LAL, mathematics, and science. Inspection of these tables confirms that the target number of items for each sub-domain was achieved.

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.

9.2 Construct Validity[56]

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.

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.

[56] 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.

9.3 Criterion-Related Validity

Validity evidence related to other Standards is listed below:

Standard 1.5[57]

- 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 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[58]

- Standard setting procedures, including the selection process and the characteristics of judges, is described in detail in Part 5.
- The 2009 NJ ASK 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[59]

- 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 2009 Test Coordinator Manual Grades 3–8*.

[57] 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.

[58] 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.

[59] 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

Scores are reported in two cycles. Data for Cycle I reporting are produced after districts submit record changes. Data for Cycle II reporting are produced after the completion of automatic rescoring of the constructed-response items and writing tasks. Cycle I data are considered preliminary.

10.1 Cycle I Reports

The Cycle I reports included the following, separate 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 – Language Arts Literacy
- All Sections Roster
- Preliminary Performance by Demographic Group –School
- Preliminary Performance by Demographic Group –District
- Preliminary Cluster Means Report

Each Cycle I report is briefly described below.

Student Stickers

The Student Stickers (Figure 10.1.1) are sorted and printed by grade and alphabetically by last name. Stickers for students who are designated Out-of-District or Out-of-Residence, however, appear at the end of each grade. For these students, a sticker is sent to both the sending and the receiving school. One sticker for each student within the school is provided. It is a peel off label, designed to be easily attached to the student's permanent record.

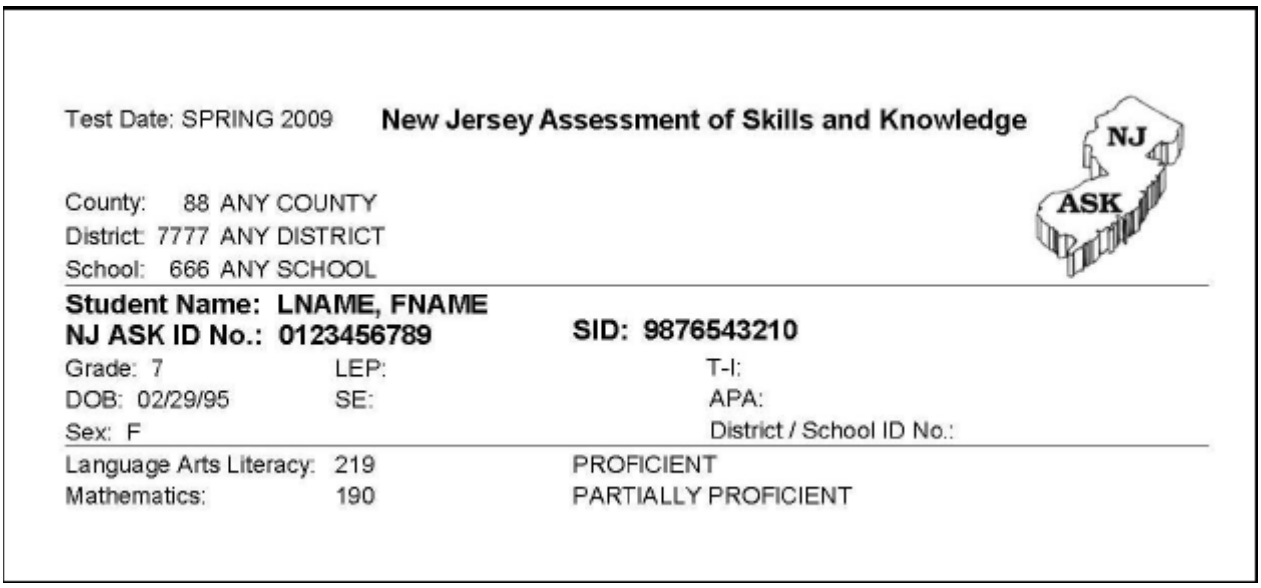
Each sticker is divided into three sections:

1. The top section includes the names and codes of the county, district, and school.

2. The middle section contains student-specific identifying information, including:

• Name	• NJ ASK ID number	• State student ID (SSID)
• Grade	• Date of birth (DOB)	• Gender (Sex)
• LEP status	• Special education (SE) status	• Title I (T-I) status
• APA classification	• District/School ID number	

3. The bottom section displays the student's scale score in each of the content areas, along with the associated proficiency level. If a student did not receive a scale score for any reason, such reason will be noted here.



Test Date: SPRING 2009 **New Jersey Assessment of Skills and Knowledge**

NJ ASK

County: 88 ANY COUNTY
District: 7777 ANY DISTRICT
School: 666 ANY SCHOOL

Student Name: LNAME, FNAME
NJ ASK ID No.: 0123456789 **SID: 9876543210**

Grade: 7 LEP: T-I:
DOB: 02/29/95 SE: APA:
Sex: F District / School ID No.:

Language Arts Literacy: 219 PROFICIENT
Mathematics: 190 PARTIALLY PROFICIENT

Figure 10.1.1: Sample Student Sticker

Individual Student Report

The Individual Student Report (ISR) is a two-sided report, produced in grade and alphabetical sequence for students within the school. The ISR is divided into three sections; with demographic information appearing in the first section, followed by a summary of the student's overall performance in the second section. The third section, appearing on page two, provides the cluster scores. A sample ISR is show in Figure 10.1.2 (front page) and Figure 10.1.3 (back page). Two copies of this report are produced for every student tested, one for the student's permanent folder, and the other for the student's parent/guardian to be shared in a manner determined by the local district.

The second section, Overall Performance, provides a summary explanation of the scale score and proficiency level meaning as well as a table indicating the student's scale score and proficiency level for each applicable content area. For comparison purposes, the table also offers the statewide scale score mean (i.e., the average scale score for all New Jersey students taking the NJ ASK) for each content area. In addition, the table presents a brief description of the skills each content area test measures.

On the back of the ISR is the third section, "Cluster Scores." Here the ISR provides a skill-specific view of a student's performance in each content area. This section presents a breakdown of raw score points earned and total points possible for each content area cluster and by item type (i.e., multiple-choice and constructed response questions). Note that not all clusters can be assumed to be of equal difficulty level; consequently, comparing one cluster score to another is not a meaningful analysis.

1

New Jersey Assessment of Skills and Knowledge
Individual Student Report

TEST DATE: SPRING 2009

REPORT PRINTED: 7/31/2009

Student/School Information

LNAME, FNAME

State Student ID: 0123456789

NJ ASK ID Number: 9876543210
Local District/School ID Number: 135791
Answer Folder Number: 2468024
Date of Birth: 02/29/95
Grade: 8 Sex: F

Your child attends:
COUNTY: 88 ANY COUNTY
DISTRICT: 7777 ANY DISTRICT
SCHOOL: 666 ANY SCHOOL

Overall Performance

This report contains information from the Spring 2009 administration of the New Jersey Assessment of Skills and Knowledge (NJ ASK) Grade 8. This test is designed to measure achievement of the New Jersey Core Curriculum Content Standards (CCCS) for Language Arts Literacy, Mathematics, and Science.

The New Jersey State Board of Education has established higher expectations for student achievement at all grade levels on NJ ASK 3-8. Higher standards in the earlier grades will ensure that students enter 9th grade better prepared for the demands of high school, postsecondary education, and careers.

In this report, you will find:
- Your child's overall score and overall proficiency level in Language Arts Literacy, Mathematics, and Science
- Your child's performance in each of the clusters on the tests: A cluster is a set of knowledge and skills within each subject.

About Scale Scores and Proficiency Levels
A scale score is a common measure of achievement in a subject area at a grade level across years, districts, and schools. Your child's scale scores on the NJ ASK are presented below. The scale scores are based on the number of correct answers to multiple-choice questions and the number of points earned for responses to constructed response items and the writing tasks.

The possible scale scores for each subject are 100 to 300. If the scale score is below 200, your child scored "Partially Proficient" in that subject. If the scale score is between 200 and 249, your child scored "Proficient" in that subject. If the scale score is at or above 250, your child scored "Advanced Proficient" in that subject. The Scale Score Mean allows you to compare your child's score with that of other children throughout the state.

For more information about state assessments, including sample test questions, writing tasks, and proficiency level definitions, consult the New Jersey Department of Education web site: http://www.nj.gov/education/assessment/.

Subject	Your Child's Scale Score	Your Child's Proficiency Level			Description	Statewide Scale Score Mean
		Partially Proficient (100 - 199)	Proficient (200 - 249)	Advanced Proficient (250 - 300)		
Language Arts Literacy	237		✔		The Language Arts Literacy test measures reading comprehension and writing skills.	216.8
Mathematics	288			✔	The Mathematics test measures knowledge and skills in areas such as numerical operations, geometry, probability, data analysis, and patterns and algebra.	221.9
Science	252			✔	The Science test measures the student's ability to recall information and solve problems by applying science concepts in the Life, Physical, and Earth Sciences.	228.9

Figure 10.1.2: Individual Student Report (front)

1

Cluster Information

About Cluster Information
The tables on this page show how your child performed on each cluster in Language Arts Literacy, Mathematics, and Science. For each cluster, the tables show the number of points earned by your child out of the total number of points possible. The points needed to be proficient and the points needed to be advanced proficient are also shown for each test. The tables also show subtotals in each subject for multiple-choice questions and questions requiring a written response (constructed response). Your child's total raw scores for each subject are converted to the scale scores shown on the previous page. If your child did not receive a scale score in a subject, no data will appear in that table.

Language Arts Literacy

Cluster	Your Child's Points	Total Points Possible	Points Needed to be Proficient	Points Needed to be Adv. Proficient
Writing	12.0	18.0		
Persuasive Task	*8.0*	*12.0*		
Explanatory Task	*4.0*	*6.0*		
Reading	39.0	52.0		
Working with Text	*17.0*	*19.0*		
Analyzing Text	*22.0*	*33.0*		
Total Points	**51.0**	**70.0**	**35.0**	**55.0**
Multiple Choice	34.0	36.0		
Constructed Response *	17.0	34.0		

Mathematics

Cluster	Your Child's Points	Total Points Possible	Points Needed to be Proficient	Points Needed to be Adv. Proficient
Number & Numerical Operations	11.0	13.0		
Geometry & Measurement	12.0	13.0		
Patterns & Algebra	13.0	13.0		
Data Analysis, Probability & Discrete Mathematics	12.0	13.0		
Problem Solving	*28.0*	*30.0*		
Total Points	**48.0**	**52.0**	**28.0**	**42.0**
Multiple Choice	32.0	35.0		
Constructed Response	16.0	17.0		

Science

Cluster	Your Child's Points	Total Points Possible	Points Needed to be Proficient	Points Needed to be Adv. Proficient
Life Science	13.0	21.0		
Physical Science	12.0	16.0		
Earth Science	14.0	17.0		
Knowledge	*5.0*	*9.0*		
Application	*34.0*	*45.0*		
Total Points	**39.0**	**54.0**	**21.0**	**38.0**
Multiple Choice	34.0	48.0		
Constructed Response	5.0	6.0		

The Language Arts Literacy Writing cluster consists of two types of writing tasks or prompts. The persuasive prompt requires the student to compose an essay that develops a point of view about the topic presented. An explanatory writing task presents the student with an essay prompt based on a quotation or adage, or based on a topic accessible to all students. Each is a springboard for the student to write an essay that informs the reader.

The Reading cluster targets two skill areas, Working with Text and Analyzing Text. Working with Text involves interpretive strategies such as recognizing the central theme, recognizing supporting details, and paraphrasing or retelling. Analyzing Text involves evaluative strategies such as critiquing text, forming judgments, drawing conclusions, and understanding textual conventions used by the author. There are two types of reading passages, narrative and informational.

The Mathematics test measures knowledge and skills in four clusters. Some mathematics questions are also classified as Problem Solving because they require multiple steps and reasoning.

Science consists of three clusters: Life, Physical, and Earth science. In addition, Knowledge focuses on comprehension, society, and technology. Science questions may also be classified as Application when they assess the student's inquiry skills, habits of mind, and mathematics skills.

* Includes Writing Tasks

88-7777-666
LNAME, FNAME

Figure 10.1.3: Individual Student Report (back)

Student Roster

Depending on grade level, either two (LAL and mathematics) or three (LAL, mathematics, and science) content area-specific student rosters are produced and distributed. These reports provide a means of reviewing the test results of all students within a given school. For each content area, the Student Roster lists the names of the students (last name first), arranged by scale score in descending order. Thus, the first students listed on a student roster are those students with the highest scale scores in that content area. Students are listed alphabetically by last name when more than one student has achieved the same score. Students whose test booklets were voided, students coded APA or LEP-exempt, and students who were not present for a test due to medical emergency are listed alphabetically by last name at the end of the roster.

The Student Roster (Figure 10.1.4) provides a convenient method for reviewing students' test results by content area. The report displays student names in alphabetical order (last name first).

TEST DATE: SPRING 2009
REPORT PRINTED: 8/3/2009
CYCLE I

New Jersey Assessment of Skills and Knowledge
Student Roster - Language Arts Literacy
Grade 6

COUNTY: 88 ANY COUNTY
DISTRICT: 7777 ANY DISTRICT
SCHOOL: 666 ANY SCHOOL

STUDENTS PROCESSED: 330

STUDENT NAME NJ ASK ID NUMBER / SID	DOB	SEX	LEP	SE	TITLE I	504	ACCOM	OUT OF DIST	OUT OF RES	SPEC. FORM	SCALE SCORE	POINTS EARNED BY CLUSTER[3] WRITING	PERSUASIVE TASK	EXPLANATORY TASK	READING	WORKING WITH TEXT	ANALYZING TEXT	TOTAL
												18.0[1]	12.0	6.0	52.0	19.0	33.0	70.0
												7.9[2]	5.4	2.5	29.1	12.5	16.6	37.0
	02/29/97	M		17							265	9.0	6.0	3.0	49.0	17.0	32.0	58.0
	02/29/97	F									265	12.0	8.0	4.0	46.0	18.0	28.0	58.0
	02/29/96	F									258	12.0	8.0	4.0	44.0	19.0	25.0	56.0
	02/29/97	M									258	11.0	8.0	3.0	45.0	19.0	26.0	56.0
	02/29/97	F									252	11.0	6.0	3.0	44.0	18.0	26.0	55.0
	02/29/97	M									252	9.0	6.0	3.0	46.0	18.0	28.0	55.0
	02/29/97	M	F1								252	10.0	6.0	4.0	45.0	19.0	26.0	55.0
	02/29/97	F									252	12.0	8.0	4.0	43.0	18.0	25.0	55.0
	02/29/96	M			Y						250	11.0	8.0	3.0	43.0	16.0	27.0	54.0
	02/29/97	M									250	10.0	6.0	4.0	44.0	19.0	25.0	54.0

[1] The numbers in this row are the number of possible raw score points for students who were scored on the full set of regular items.

[2] The numbers in this row are the statewide raw score means for students whose scale score is 200 and who were scored on the full set of regular items.

[3] A letter code appears for writing tasks that could not be scored for one of the following reasons:
FR = Fragment, WF = Wrong Format, NE = Not English, NR = No Response, OT = Off Topic.

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Figure 10.1.4: Student Roster

All Sections Roster

The All Sections Roster (Figure 10.1.5) provides a convenient method for reviewing students' complete test results. The report displays student names in alphabetical order (last name first). Users of this report can quickly determine how a particular student performed in both LAL and mathematics in grades 5 through 7. Science is also included for eighth grade students. Following a student's identification information, the student's Scale Score and Proficiency Level (Partially Proficient, Proficient, or Advanced Proficient) are printed for each content area. If the student's test booklet was coded void, the reason code appears in this space.

TEST DATE: SPRING 2009
REPORT PRINTED: 8/3/2009
CYCLE I

New Jersey Assessment of Skills and Knowledge
All Sections Roster
Grade 8

COUNTY: 88 ANY COUNTY
DISTRICT: 7777 ANY DISTRICT
SCHOOL: 666 ANY SCHOOL

STUDENTS PROCESSED: 337

STUDENT NAME NJ ASK ID NUMBER / SID	DOB	SEX	ETHNIC CODES	LEP	SE	TITLE I	ED	MI	OUT OF DIST	OUT OF RES	TID <1	TIS <1	APA	SCIENCE SCALE SCORE	SCIENCE PROF. LEVEL	MATHEMATICS SCALE SCORE	MATHEMATICS PROF. LEVEL	LANGUAGE ARTS LITERACY SCALE SCORE	LANGUAGE ARTS LITERACY PROF. LEVEL
	02/29/95	F	W											252	ADV. PROF.	288	ADV. PROF.	237	PROF.
	02/29/93		A	<							Y	Y		200	PROF.	253	ADV. PROF.	LEP EXEMPT	
	02/29/95	M	W											220	PROF.	224	PROF.	216	PROF.
	02/29/94	M	W											300	ADV. PROF.	300	ADV. PROF.	254	ADV. PROF.
	02/29/95	F	W			ML								220	PROF.	201	PROF.	200	PROF.
	02/29/95	M	W											243	PROF.	243	PROF.	228	PROF.
	02/29/94	F	W											226	PROF.	189	PART. PROF.	221	PROF.
	02/29/95	M	W											256	ADV. PROF.	300	ADV. PROF.	243	PROF.
	02/29/94	M	W			L								226	PROF.	227	PROF.	192	PART. PROF.
	02/29/95	M	W											299	ADV. PROF.	264	ADV. PROF.	240	PROF.

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Figure 10.1.5: All Sections Roster

Performance by Demographic Group Reports – School, District

The Performance by Demographic Group (PDG) report summarizes student performance by total students, education program, and student demographic subgroups:

Total,
General Education (GE),
Special Education (SE),
Limited English Proficient status (LEP),
Gender,
Migrant status,
Ethnicity, and
Economic status (disadvantaged vs. not disadvantaged).

The PDG reports provide additional summary views of student performance that can be used to make adjustments to curricula that may better serve these student subgroups.

The PDG is a multiple page report, one content area per page. Students may receive a scale score in one content area but not in others. The PDG reports are produced at the district and school levels.

For each grade and content area, the PDG provides the following information in tabular form, by demographic group:

- Number of students enrolled
- Number of students taking the APA instead of NJ ASK in this content area
- Number of students not present for the NJ ASK in this content area
- Number of students receiving voids
- Number of students with valid scale scores for this content area
- Number and percentage of students at each proficiency level
- Scale score mean for this content area

TEST DATE: SPRING 2009
REPORT PRINTED: 8/4/2009
CYCLE I

COUNTY: 88 ANY COUNTY
DISTRICT: 7777 ANY DISTRICT
SCHOOL: 666 ANY SCHOOL

New Jersey Assessment of Skills and Knowledge
Preliminary Performance By Demographic Group
School - Grade 8

NJ ASK

MATHEMATICS

Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Performance Data for Students with Valid Scale Scores [3]						
						Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	75	0	0	0	75	9	12.0	27	36.0	39	52.0	241.2
General Education [5]	54	0	0	0	54	1	1.9	19	35.2	34	63.0	255.2
Special Education	13	0	0	0	13	5	38.5	7	53.8	1	7.7	200.2
Limited English Proficient [6]	10	0	0	0	10	3	30.0	1	10.0	6	60.0	222.1
Current LEP	8	0	0	0	8	3	37.5	1	12.5	4	50.0	213.4
Former LEP	2	0	0	0	2	0	0.0	0	0.0	2	100.0	257.0
Gender [7]												
Female	26	0	0	0	26	2	7.7	12	46.2	12	46.2	237.4
Male	49	0	0	0	49	7	14.3	15	30.6	27	55.1	243.3
Migrant Status												
Migrant	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0.0
Non-Migrant	75	0	0	0	75	9	12.0	27	36.0	39	52.0	241.2
Ethnicity [8]												
White	48	0	0	0	48	6	12.5	17	35.4	25	52.1	240.9
Black or African American	1	0	0	0	1	0	0.0	1	100.0	0	0.0	207.0
Asian	20	0	0	0	20	0	0.0	7	35.0	13	65.0	259.1
Pacific Islander	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0.0
Hispanic or Latino	6	0	0	0	6	3	50.0	2	33.3	1	16.7	190.0
Amer. Indian/AK Native	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0.0
Other	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0.0
Economic Status												
Econ. Disadvantaged	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0.0
Non-Econ. Disadvantaged	75	0	0	0	75	9	12.0	27	36.0	39	52.0	241.2

1 These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
2 Includes students coded Medical Emergency.
3 Percentages may not total 100 due to rounding.
4 Students are included in Total Students only once, but they appear in all other categories that apply.
5 Includes students coded Former LEP who are not Special Education.
6 Includes students coded Current and Former LEP.
7 Excludes students who did not have Gender coded.
8 Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

88-7777-666

Page 1 of 1

Figure 10.1.6: Sample Performance by Demographic Group Report

Cluster Means Report

The Cluster Means for Students with Valid Scale Scores reports provide a way to look at the content cluster performance of a particular school as compared to the district, DFG, and state means, as well as to the Just Proficient Mean (the statewide raw score means for students with a scale score of 200). Where the PDGs offer scale score summary information, the Cluster Means reports provide raw score data.

The Cluster Means reports are provided at the school level, by grade and content area. The Cluster Means Report consists of multiple pages, one content area per page.

TEST DATE: SPRING 2009
REPORT PRINTED: 8/4/2009
CYCLE I

COUNTY: 88 ANY COUNTY
DISTRICT: 7777 ANY DISTRICT
SCHOOL: 666 ANY SCHOOL

New Jersey Assessment of Skills and Knowledge
Preliminary Cluster Means
for Students with Valid Scale Scores [1]
Grade 5 - Mathematics

	SCHOOL MEAN	DISTRICT MEAN	SPECIAL NEEDS MEAN	NON-SPECIAL NEEDS MEAN	DFG A MEAN	STATE MEAN	TOTAL POINTS POSSIBLE	JUST PROFICIENT MEAN [2]
Number & Numerical Operations							14	6.6
Total Students [3]	9.6	9.6	7.4	9.7	7.4	9.3		
General Education [4]	10.7	10.7	8.0	10.3	8.0	9.9		
Special Education	2.9	2.9	5.3	7.1	5.3	6.8		
Limited English Proficient [5]	13.0	13.0	6.6	7.8	6.6	7.1		
Current LEP	12.0	12.0	5.7	7.2	5.7	6.4		
Former LEP	14.0	14.0	7.8	8.7	7.8	8.2		
Geometry & Measurement							12	4.8
Total Students [3]	7.0	7.0	5.7	7.4	5.7	7.1		
General Education [4]	7.7	7.7	6.1	7.8	6.1	7.5		
Special Education	3.0	3.0	4.1	5.6	4.1	5.3		
Limited English Proficient [5]	6.5	6.5	5.2	6.0	5.3	5.6		
Current LEP	7.0	7.0	4.7	5.6	4.8	5.1		
Former LEP	6.0	6.0	6.0	6.8	6.1	6.3		
Patterns & Algebra							12	5.9
Total Students [3]	8.0	8.0	6.4	7.9	6.4	7.6		
General Education [4]	8.8	8.8	6.8	8.1	6.7	7.9		
Special Education	2.5	2.5	5.1	6.6	5.1	6.3		
Limited English Proficient [5]	11.0	11.0	6.0	6.8	6.1	6.4		
Current LEP	11.0	11.0	5.6	6.6	5.6	6.0		
Former LEP	11.0	11.0	6.7	7.2	6.7	6.9		
Data Analysis, Probability & Discrete Mathematics							12	5.8
Total Students [3]	7.4	7.4	6.4	7.9	6.3	7.6		
General Education [4]	8.2	8.2	6.9	8.3	6.9	8.1		
Special Education	2.4	2.4	4.6	6.0	4.5	5.7		
Limited English Proficient [5]	9.5	9.5	5.5	6.2	5.5	5.8		
Current LEP	9.0	9.0	4.7	5.5	4.7	5.1		
Former LEP	10.0	10.0	6.6	7.3	6.6	6.9		
Problem Solving							25	11.2
Total Students [3]	15.7	15.7	12.7	16.1	12.6	15.4		
General Education [4]	17.3	17.3	13.6	16.8	13.6	16.2		
Special Education	4.9	4.9	9.4	12.5	9.3	11.9		
Limited English Proficient [5]	20.0	20.0	11.4	13.0	11.5	12.1		
Current LEP	20.0	20.0	10.0	11.9	10.0	10.8		
Former LEP	20.0	20.0	13.4	14.6	13.5	13.9		

[1] Excludes students who did not receive a scale score based on the full set of regular items in this content area.
[2] The numbers in this column are the statewide raw score means for students whose scale score is 200.
[3] Students are included in Total Students only once, but they appear in all other categories that apply.
[4] Includes students coded Former LEP who are not Special Education.
[5] Includes students coded Current and Former LEP.

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Figure 10.1.7: Sample Cluster Means Report

10.2 Cycle II Reports

Cycle II reports are produced after the completion of automatic rescoring of the constructed-response items and writing tasks. Any change of scores, as the result of the automatic rescoring, will be reflected in the Cycle II reports. Districts will receive new ISRs and stickers for students whose scores are affected by the automatic rescoring process. The Cycle II reports, produced separately for each grade, include the following:

- Performance by Demographic Group – School
- Performance by Demographic Group – District
- Performance by Demographic Group – DFG
- Performance by Demographic Group – Statewide
- Cluster Means Report

In Cycle II reporting, the Performance by Demographic Group Reports are also generated at the state and District Factor Group (DFG) levels.

10.3 State Summary Reporting

The state summary data file contains the same type of test results based on the Cycle II 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: 2009 NJ ASK Grade 3 Test Form Distribution Plan

Form	DFG[1]													
	A	B	CD	DE	FG	GH	I	J	N	O	R	S	V	Grand Total
A	1072	751	950	940	720	640	380	40			40	20		5553
B	1318	90	100	380	550	660	2619	140			130	20		6007
C	440	1767	1031	461	580	419	520	180			90	20		5508
D	501	1415	150	386	690	810	1998	120			140	0		6210
E	1976	180	330	690	180	630	1791	120	30		90	20	0	6037
F	1923	110	80	30	100	1250	2080	50			60	0		5683
G	910	460	780	480	608	1098	1110	90			0	20		5556
H	640	648	410	711	960	870	730	420			110	0		5499
J	450	839	621	531	620	1310	830	429			410	52		6092
K	861	420	500	550	710	640	1271	789			70	30		5841
L	671	660	700	920	909	731	160	520			120	20		5411
M	1041	110	440	740	1151	830	1291	120			70	30		5823
N	1561	380	491	1070	820	681	670	130			60	20		5883
O	899	681	440	951	820	709	822	100			300	20		5742
P	641	1140	1170	400	591	899	390	70	509		110			5920
R	1270	560	590	1179	920	490	799	210		71	40	51		6180
S	690	420	550	690	749	790	750	190		320	120	30	0	5299
T	559	500	370	540	801	1060	1140	380		260	50			5660
U	1848	300	50	1389	640	679	620	200		250	0			5976
V	941	440	609	511	732	580	971	520		190	90	40	20	5644
W	1102	590	710	920	770	0	930	271		80	40	20		5433
X	801	580	480	1277	712	720	1140	90		90	0			5890
Grand Total	22115	13041	11552	15746	15333	16496	23012	5179	539	1261	2140	413	20	126847

[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: 2009 NJ ASK Grade 4 Test Form Distribution Plan

Form	DFG[1]													
	A	B	CD	DE	FG	GH	I	J	N	O	R	S	V	Grand Total
A	1052	791	1011	940	719	660	360	70			40	20		5663
B	1340	90	100	330	550	740	2630	110			130	20		6040
C	450	1671	1101	461	540	452	581	190			90	20		5556
D	430	1267	150	387	610	760	2151	100			140	0		5995
E	1789	170	320	690	190	609	1740	110	20		100	20	0	5758
F	1819	120	70	30	90	1310	2123	50			60	0		5672
G	920	490	709	580	591	1109	981	80			30	0		5490
H	649	619	420	730	979	899	800	480			110	0		5686
J	450	858	650	530	650	1281	890	422			370	20		6121
K	799	420	520	560	761	679	1211	810			70	40		5870
L	690	610	719	920	951	749	150	520			110	20		5439
M	1050	170	409	710	1241	841	1310	110			110	30		5981
N	1542	330	500	1099	870	731	680	120			60	20		5952
O	789	640	400	769	810	780	801	100			280	30		5399
P	621	1060	1110	450	630	939	361	50	491		100			5812
R	1160	530	609	1171	960	470	340	211		60	0	51		5562
S	661	431	601	691	730	800	850	160		310	120	40	0	5394
T	589	430	439	511	910	1020	1120	330		260	50			5659
U	1761	310	60	1420	651	692	649	210		250	0			6003
V	941	420	569	490	672	691	950	530		210	90	40	20	5623
W	1061	589	740	940	731	0	1000	240		100	40	20		5461
X	760	550	470	1318	740	730	1160	100		140	0			5968
Grand Total	21323	12566	11677	15727	15576	16942	22838	5103	511	1330	2100	391	20	126104

[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: 2009 NJ ASK Grade 5 Test Form Distribution Plan

Form	DFG[1]													
	A	B	CD	DE	FG	GH	I	J	N	O	R	S	V	Grand Total
A	1229	661	939	931	751	630	390	50			100	20		5701
B	1033	80	100	391	550	709	2510	130			100	20		5623
C	410	1724	1071	420	620	440	550	210			80	20		5545
D	450	1168	140	397	640	700	2100	120			100	0		5815
E	1639	160	320	640	160	570	1651	0	30		70	20	0	5260
F	1794	120	70	30	90	1310	2111	50			50	0		5625
G	791	500	759	500	640	950	1081	90			50	20		5381
H	529	530	420	670	980	851	771	510			110	0		5371
J	401	780	500	490	700	1239	891	440			230	52		5723
K	740	350	510	590	750	630	1290	890			110	30		5890
L	631	569	690	950	930	680	190	521			110	20		5291
M	981	130	390	580	1110	920	1269	110			120	40		5650
N	1209	340	519	989	800	680	720	110			160	20		5547
O	690	610	440	899	841	809	820	120			200	20		5449
P	530	1080	1149	440	592	940	390	60	440		100			5721
R	949	500	550	1161	890	470	551	211		39	150	72		5543
S	510	430	541	660	781	770	850	190		340	120	40	20	5252
T	450	470	421	520	670	1000	1130	330		250	50			5291
U	1642	310	60	1508	610	659	640	200		240	210			6079
V	952	450	490	501	649	650	1011	491		270	120	50	20	5654
W	1021	540	1410	980	690	0	1010	230		170	110	20		6181
X	661	571	450	1248	760	730	970	90		150	60			5690
Grand Total	19242	12073	11939	15495	15204	16337	22896	5153	470	1459	2510	464	40	123282

[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: 2009 NJ ASK Grade 6 Test Form Distribution Plan

Form	DFG[1]													
	A	B	CD	DE	FG	GH	I	J	N	O	R	S	V	Grand Total
A	1198	670	840	940	770	690	400	70			100	20		5698
B	1012	90	110	370	580	710	2510	130			100	20		5632
C	410	1716	1042	400	630	440	480	170			100	20		5408
D	421	1106	140	397	700	740	2060	100			110	0		5774
E	1691	150	330	620	200	600	1650	140	30		190	20	30	5651
F	1660	140	80	30	80	1250	2050	0			40	0		5330
G	780	490	821	540	659	941	1090	90			100	20		5531
H	490	500	400	691	870	810	780	530			110	50		5231
J	420	820	500	560	640	1119	860	420			100	52		5491
K	740	330	480	600	760	670	1270	870			130	40		5890
L	570	609	760	940	841	750	190	510			110	20		5300
M	881	130	420	620	1110	810	1240	120			110	30		5471
N	1089	360	480	960	820	700	780	130			130	20		5469
O	821	480	420	899	810	780	820	110			140	20		5300
P	591	1020	1120	410	501	1000	360	40	430		100			5572
R	1030	530	561	1220	820	480	580	210		72	150	79		5732
S	529	420	590	640	780	730	830	180		370	100	50	20	5239
T	439	420	430	510	670	1000	1170	300		280	50			5269
U	1509	300	70	1480	650	650	680	180		270	200			5989
V	820	410	550	550	670	590	970	500		270	120	70	30	5550
W	930	580	810	960	769	0	930	250		150	110	20		5509
X	510	490	430	1241	690	770	1000	100		220	100			5551
Grand Total	18541	11761	11384	15578	15020	16230	22700	5150	460	1632	2500	551	80	121587

[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: 2009 NJ ASK Grade 7 Test Form Distribution Plan

Form	DFG[1]													
	A	B	CD	DE	FG	GH	I	J	N	O	R	S	V	Grand Total
A	1177	700	1120	530	760	560	380	50			40	40		5357
B	1103	110	100	250	740	670	2370	140			120	20		5623
C	390	1927	970	400	670	410	520	220			100	20		5627
D	330	1070	140	410	950	660	2080	90			60	0		5790
E	1670	160	300	660	190	580	1510	140	30		190	20	30	5480
F	1762	130	70	30	90	1240	2161	0			40	0		5523
G	810	520	831	510	490	1010	1330	90			90	20		5701
H	540	890	310	440	910	840	740	480			100	50		5300
J	460	1210	540	320	700	1200	870	430			70	39		5839
K	770	360	460	530	780	600	1220	890			140	40		5790
L	690	590	480	1610	961	700	160	490			110	30		5821
M	860	140	420	650	1100	860	1300	120			110	30		5590
N	1050	330	490	1010	810	700	750	150			130	20		5440
O	780	500	470	950	1140	780	850	110			150	30		5760
P	511	990	1100	790	870	740	360	0	410		100			5871
R	980	180	920	1160	870	490	580	190		88	130	51		5639
S	530	390	620	680	830	809	820	180		530	100	50	20	5559
T	500	430	460	540	610	940	1170	290		280	50			5270
U	1592	250	50	1530	671	660	670	90		330	110			5953
V	760	410	580	641	510	460	930	480		270	120	90	30	5281
W	880	270	810	930	760	70	1320	420		160	110	20		5750
X	620	510	290	1229	680	750	981	80		330	190			5660
Grand Total	18765	12067	11531	15800	16092	15729	23072	5130	440	1988	2360	570	80	123624

[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: 2009 NJ ASK Grade 8 Test Form Distribution Plan

Form	DFG[1]													
	A	B	CD	DE	FG	GH	I	J	N	O	R	S	V	Grand Total
A	1238	670	1030	550	770	570	400	60			40	30		5358
B	1092	90	110	240	700	660	2730	150			110	20		5902
C	450	1957	980	430	660	440	500	180			110	71		5778
D	340	1113	150	380	970	680	2050	90			50	0		5823
E	1649	150	290	620	190	550	1450	110	20		200	20	40	5289
F	1772	130	80	40	80	1250	2080	0			40	0		5472
G	820	490	851	530	500	930	1340	90			90	0		5641
H	560	930	290	460	1020	820	820	480			110	50		5540
J	460	1240	500	350	710	1160	860	390			70	39		5779
K	780	390	520	490	720	640	1240	910			140	51		5881
L	670	600	500	1610	931	710	170	480			30	30		5731
M	920	140	450	650	1129	1040	1290	120			100	30		5869
N	989	360	440	1000	840	690	710	140			110	51		5330
O	810	510	440	1000	1160	810	860	110			130	30		5860
P	570	1050	1180	790	970	750	370	0	400		80			6160
R	960	220	900	1230	810	460	540	200		132	60	90		5602
S	410	390	600	890	860	799	870	190		560	110	60	20	5759
T	479	430	420	500	620	950	1090	330		310	50			5179
U	1628	260	60	1510	530	660	730	90		330	100			5898
V	819	400	570	621	500	460	960	500		320	130	99	40	5419
W	838	300	840	900	690	70	1280	470		200	120	20		5728
X	590	490	300	1220	660	810	960	100		350	190			5670
Grand Total	18844	12310	11501	16011	16020	15909	23300	5190	420	2202	2170	691	100	124668

[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
Target average p-value of .6
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.

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 will depend 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 so it will not interfere 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. Follow packaging instructions in this manual or the student's responses cannot be linked to their responses on the other sections of the test and they will receive

incomplete scores**.** 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 Language Arts Literacy 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

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

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

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Table D.2: 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.2: 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	NR =	No Response	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, or the student attempted to copy the prompt.
	NE =	Not English	Student wrote in a language other than English.
	WF =	Wrong Format	Student did not respond in the format (or mode) designated in the prompt.

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

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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-1
DEMOGRAPHICS OF STANDARD SETTING PARTICIPANTS

Table E1-1: Demographic Background of PLD Panelists by Content /Grade

		2008				2009	
		LAL 5 - 6	**LAL 7 - 8**	**MATH 5 - 6**	**MATH 7 - 8**	**LAL 3 - 4**	**MATH 3 - 4**
Sex	F	11	11	7	15	16	17
	M	0	2	2	3	0	3
	N/A	0	1	0	0	0	0
Race	AA	1	0	0	2	3	2
	A	0	0	0	0	0	1
	H/L	0	1	1	0	0	1
	W	10	12	7	16	13	15
	N/A	0	1	1	0	0	1
DFG	A	2	2	2	2	2	2
	B	1	2	0	2	4	5
	CD	1	1	2	2	3	3
	DE	1	0	1	3	0	2
	FG	2	2	2	1	3	2
	GH	0	2	1	1	0	1
	I	1	3	1	3	1	1
	J	2	1	0	2	1	1
	N	0	0	0	0	0	1
	R	0	1	0	2	2	2
	N/A	1	0	0	0	0	0

N/A – Not Available

Table E1-2: Demographic Background of Standard Setting Panelists by Content/ Grade

		2008 Grade/Content Area						
		Math 5-6	Math 7-8	LAL 5-6	LAL 7-8	SLAL 5-6	SLAL 7-8	TOTAL
TOTAL		22	22	18	16	4	4	86
Sex	Females	18	17	16	15	4	3	73
	Males	4	5	2	1	0	1	13
Race	White	21	20	16	12	0	0	69
	African American	0	1	1	2	0	0	4
	Hispanic	1	1	1	1	0	0	4
	Other/Not Indicated	0	0	0	1	4	4	9
DFG	A	5	5	6	3	1	3	23
	B	5	2	3	3	0	0	13
	CD	3	1	1	0	1	1	7
	DE	2	2	0	1	0	0	5
	FG	4	1	1	4	1	0	11
	GH	0	4	3	3	0	0	10
	I	2	6	3	2	1	0	14
	J	1	1	1	0	0	0	3

		2009 Grade/Content Area			
		Math 3-4	LAL 3-4	SLAL 3-4	TOTAL
TOTAL		26	25	15	66
Sex	Females	22	24	15	61
	Males	4	1	0	5
Race	White	15	19	5	39
	African American	6	4	0	10
	Hispanic	4	2	8	14
	Asian	0	0	2	2
	Other/Not Indicated	1	0	0	1
DFG	A	6	2	4	12
	B	5	7	4	16
	CD	2	3	0	5
	DE	4	4	1	9
	FG	2	2	2	6
	GH	2	2	2	6
	I	2	2	1	5
	J	2	0	0	2
	N	0	0	1	1
	R	1	3	0	4

APPENDIX E-2
PERFORMANCE LEVEL DESCRIPTORS

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

Language Arts Literacy Grade 3								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
0	100	1226	1.2	0.9	1.5	1.4	1.2	0.9
3	102	1258	1.2	0.9	1.5	1.5	1.2	0.9
4	109	1332	1.3	0.9	1.6	1.7	1.4	0.9
5	116	1395	1.4	1.0	1.7	1.9	1.4	1.0
6	121	1502	1.5	1.0	1.9	2.0	1.6	1.0
7	126	1669	1.6	1.1	2.1	2.5	1.9	1.1
8	131	1859	1.8	1.2	2.4	2.9	2.2	1.1
9	136	2138	2.1	1.4	2.7	3.5	2.7	1.3
10	141	2488	2.4	1.6	3.2	4.2	3.2	1.4
11	145	2993	2.9	1.9	3.9	5.3	3.9	1.7
12	150	3675	3.6	2.3	4.7	6.9	4.9	2.0
13	154	4636	4.5	3.1	5.9	8.9	6.4	2.5
14	158	5926	5.8	4.0	7.4	11.5	8.6	3.0
15	163	7498	7.3	5.2	9.3	14.7	11.0	3.8
16	167	9361	9.1	6.6	11.5	18.4	13.9	4.8
17	171	11749	11.4	8.5	14.2	22.5	17.8	6.2
18	174	14532	14.2	10.8	17.3	27.1	21.9	8.0
19	178	17608	17.1	13.3	20.8	31.8	26.2	10.0
20	182	21147	20.6	16.2	24.7	37.1	31.1	12.6
21	186	25124	24.5	19.8	28.9	42.5	36.6	15.6
22	189	29516	28.7	23.7	33.5	48.3	42.4	19.0
23	193	34127	33.2	27.9	38.2	53.7	48.0	23.0
24	196	39128	38.1	32.6	43.2	59.2	53.6	27.6
25	200	44612	43.4	37.6	48.9	64.4	60.1	32.7
26	204	50306	49.0	43.0	54.6	69.7	65.7	38.4
27	207	56227	54.7	48.6	60.5	74.8	71.2	44.6
28	211	62302	60.7	54.5	66.5	79.3	76.4	51.2
29	215	68522	66.7	60.6	72.4	83.6	81.3	58.1
30	219	74608	72.6	66.9	78.0	87.5	85.8	65.1
31	224	80256	78.1	73.0	83.0	90.8	89.4	71.9
32	228	85446	83.2	78.7	87.4	93.4	92.5	78.3
33	233	89955	87.6	83.8	91.1	95.6	95.0	83.8
34	238	93827	91.3	88.5	94.0	97.1	96.8	88.7
35	244	96840	94.3	92.1	96.3	98.3	98.0	92.5
36	250	98964	96.3	94.9	97.8	99.0	98.8	95.3
37	256	100464	97.8	96.8	98.7	99.4	99.4	97.1
38	263	101418	98.7	98.1	99.3	99.7	99.7	98.4
39	270	101989	99.3	98.9	99.7	99.8	99.9	99.1
40	278	102320	99.6	99.4	99.8	99.9	99.9	99.5

Language Arts Literacy Grade 3								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
41	**286**	102518	99.8	99.7	99.9	100.0	100.0	99.8
42	**295**	102636	99.9	99.9	100.0	100.0	100.0	99.9
43	**300**	102721	100	100	100	100	100	100

Table F.2: LAL Grade 4

Language Arts Literacy Grade 4								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
0	**100**	1185	1.2	0.9	1.4	1.5	1.0	0.9
4	**102**	1225	1.2	0.9	1.5	1.6	1.1	0.9
5	**108**	1273	1.2	0.9	1.5	1.8	1.2	0.9
6	**113**	1365	1.3	1.0	1.6	1.9	1.3	0.9
7	**118**	1456	1.4	1.0	1.8	2.1	1.5	1.0
8	**123**	1603	1.6	1.1	2.0	2.5	1.7	1.0
9	**127**	1812	1.8	1.2	2.3	2.9	2.1	1.1
10	**131**	2051	2.0	1.3	2.6	3.4	2.5	1.2
11	**135**	2367	2.3	1.5	3.1	4.2	3.0	1.3
12	**138**	2758	2.7	1.8	3.5	5.1	3.6	1.5
13	**142**	3198	3.1	2.1	4.1	6.0	4.4	1.6
14	**145**	3727	3.6	2.4	4.7	7.1	5.3	1.9
15	**149**	4427	4.3	2.9	5.6	8.6	6.5	2.2
16	**152**	5261	5.1	3.6	6.5	10.4	7.8	2.5
17	**156**	6250	6.1	4.4	7.6	12.3	9.5	3.0
18	**159**	7380	7.1	5.3	8.9	14.6	11.4	3.6
19	**162**	8703	8.4	6.3	10.4	17.2	13.5	4.2
20	**165**	10221	9.9	7.7	12.0	20.1	15.9	5.0
21	**168**	11849	11.5	9.1	13.7	23.0	18.6	5.9
22	**171**	13690	13.3	10.7	15.6	26.4	21.3	7.0
23	**174**	15650	15.2	12.5	17.7	29.8	24.1	8.2
24	**177**	17903	17.3	14.6	19.9	33.4	27.4	9.7
25	**180**	20259	19.6	16.8	22.3	37.2	30.8	11.3
26	**183**	22863	22.1	19.3	24.8	40.9	34.3	13.3
27	**186**	25660	24.8	22.0	27.6	44.9	38.2	15.3
28	**188**	28692	27.8	24.9	30.5	48.8	42.2	17.7
29	**191**	31962	30.9	28.1	33.6	52.9	46.4	20.3
30	**194**	35367	34.2	31.4	36.9	57.0	50.6	23.2
31	**197**	39016	37.8	34.8	40.5	61.0	54.9	26.4

Language Arts Literacy Grade 4

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
32	200	43087	41.7	38.9	44.4	65.1	59.4	30.3
33	203	47333	45.8	42.9	48.6	69.3	63.8	34.3
34	206	51820	50.2	47.3	52.9	73.2	68.2	38.9
35	209	56618	54.8	51.9	57.6	77.1	72.7	43.9
36	212	61461	59.5	56.7	62.1	80.6	77.0	49.1
37	216	66435	64.3	61.4	67.0	84.0	80.8	54.7
38	219	71544	69.3	66.4	72.0	86.9	84.4	60.7
39	223	76546	74.1	71.3	76.7	89.8	87.7	66.7
40	227	81313	78.7	76.0	81.3	92.3	90.6	72.4
41	231	85914	83.2	80.6	85.6	94.3	93.2	78.1
42	235	90002	87.1	84.9	89.2	96.1	95.4	83.2
43	240	93505	90.5	88.6	92.3	97.3	96.7	87.7
44	245	96440	93.4	91.9	94.8	98.2	98.0	91.5
45	250	98728	95.6	94.4	96.6	98.9	98.8	94.4
46	256	100406	97.2	96.4	97.9	99.3	99.3	96.5
47	262	101552	98.3	97.7	98.9	99.7	99.6	97.9
48	269	102338	99.1	98.7	99.4	99.9	99.8	98.8
49	277	102788	99.5	99.3	99.7	99.9	99.9	99.4
50	286	103074	99.8	99.7	99.9	100	100	99.7
51	296	103213	99.9	99.9	99.9	100	100	99.9
52	300	103312	100	100	100	100	100	100

Table F.3: LAL Grade 5

Language Arts Literacy Grade 5

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
0	100	1173	1.1	0.9	1.4	1.4	1.0	0.8
4	102	1194	1.2	0.9	1.4	1.5	1.0	0.8
5	109	1206	1.2	0.9	1.4	1.5	1.0	0.9
6	115	1231	1.2	0.9	1.5	1.5	1.1	0.9
7	120	1270	1.2	0.9	1.5	1.7	1.1	0.9
8	124	1321	1.3	0.9	1.6	1.8	1.2	0.9
9	128	1379	1.3	1.0	1.7	1.9	1.3	0.9
10	131	1454	1.4	1.0	1.8	2.1	1.4	0.9
11	134	1555	1.5	1.1	1.9	2.4	1.6	1.0
12	137	1661	1.6	1.1	2.1	2.6	1.8	1.0
13	139	1825	1.8	1.2	2.3	3.0	2.0	1.1

Language Arts Literacy Grade 5

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
14	141	2052	2.0	1.3	2.6	3.5	2.4	1.2
15	144	2276	2.2	1.5	2.9	4.1	2.7	1.3
16	146	2600	2.5	1.7	3.3	4.8	3.3	1.4
17	148	2946	2.9	1.9	3.7	5.6	3.8	1.6
18	150	3374	3.3	2.1	4.3	6.6	4.4	1.8
19	152	3915	3.8	2.5	5.0	7.9	5.3	2.0
20	155	4517	4.4	2.8	5.8	9.2	6.3	2.2
21	157	5149	5.0	3.3	6.6	10.6	7.4	2.5
22	160	5979	5.8	3.9	7.5	12.3	8.8	2.9
23	162	6879	6.7	4.6	8.6	14.2	10.3	3.3
24	165	7941	7.7	5.4	9.8	16.3	12.2	3.8
25	167	9175	8.9	6.3	11.3	18.8	14.1	4.4
26	170	10619	10.3	7.4	12.9	21.8	16.5	5.1
27	173	12150	11.8	8.7	14.6	24.6	19.0	6.0
28	175	13956	13.5	10.2	16.6	27.8	21.9	7.0
29	178	15899	15.4	11.9	18.7	31.1	25.0	8.2
30	181	17994	17.4	13.6	20.9	34.7	28.2	9.5
31	183	20440	19.8	15.8	23.5	38.4	31.8	11.2
32	186	23056	22.3	18.1	26.3	42.1	35.7	13.1
33	189	25990	25.2	20.7	29.3	46.2	39.7	15.3
34	192	29067	28.1	23.5	32.4	50.0	44.0	17.7
35	195	32387	31.4	26.5	35.9	54.1	48.2	20.5
36	197	36105	34.9	29.9	39.6	58.5	52.8	23.7
37	200	40166	38.9	33.7	43.7	62.9	57.8	27.3
38	203	44371	42.9	37.7	47.8	67.1	62.4	31.3
39	206	48812	47.2	41.9	52.2	71.1	66.9	35.8
40	209	53438	51.7	46.3	56.7	75.2	71.1	40.6
41	213	58364	56.5	51.0	61.6	79.1	75.5	45.9
42	216	63333	61.3	56.0	66.3	82.8	79.4	51.5
43	219	68360	66.2	61.0	71.0	85.9	83.2	57.2
44	222	73341	71.0	66.1	75.5	88.8	86.6	63.0
45	226	78150	75.6	71.1	79.9	91.2	89.7	68.8
46	230	82869	80.2	76.1	84.0	93.5	92.3	74.6
47	234	87289	84.5	80.9	87.8	95.5	94.4	80.1
48	238	91109	88.2	85.3	90.9	96.8	96.1	84.8
49	242	94429	91.4	89.1	93.6	97.9	97.4	89.0
50	250	97235	94.1	92.2	95.9	98.8	98.3	92.5
51	252	99408	96.2	94.9	97.5	99.3	99.1	95.2
52	257	100941	97.7	96.8	98.6	99.7	99.5	97.1
53	263	101951	98.7	98.1	99.3	99.8	99.8	98.4

Language Arts Literacy Grade 5								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
54	**269**	102590	99.3	98.9	99.6	99.9	99.9	99.1
55	**275**	102940	99.6	99.5	99.8	100	99.9	99.6
56	**282**	103126	99.8	99.7	99.9	100	100	99.8
57	**290**	103231	99.9	99.9	100	100	100	99.9
58	**299**	103291	100	100	100	100	100	100
59	**300**	103322	100	100	100	100	100	100

Table F.4: LAL Grade 6

Language Arts Literacy Grade 6								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
0	**100**	1034	1.0	0.8	1.2	1.1	1.1	0.8
4	**104**	1070	1.0	0.8	1.3	1.2	1.1	0.8
5	**110**	1085	1.1	0.8	1.3	1.2	1.1	0.8
6	**115**	1111	1.1	0.8	1.3	1.3	1.1	0.8
7	**120**	1156	1.1	0.8	1.4	1.4	1.2	0.8
8	**124**	1211	1.2	0.9	1.5	1.6	1.3	0.9
9	**128**	1259	1.2	0.9	1.5	1.7	1.4	0.9
10	**131**	1337	1.3	0.9	1.6	1.9	1.5	0.9
11	**134**	1461	1.4	1.0	1.8	2.2	1.7	0.9
12	**137**	1605	1.6	1.0	2.0	2.5	1.9	1.0
13	**140**	1801	1.7	1.1	2.3	3.0	2.2	1.1
14	**143**	1993	1.9	1.3	2.5	3.4	2.5	1.1
15	**146**	2301	2.2	1.5	2.9	4.0	3.1	1.3
16	**149**	2607	2.5	1.7	3.3	4.7	3.6	1.4
17	**151**	2991	2.9	2.0	3.8	5.6	4.2	1.6
18	**154**	3423	3.3	2.2	4.3	6.6	4.9	1.7
19	**156**	3944	3.8	2.6	5.0	7.7	5.9	1.9
20	**159**	4560	4.4	3.0	5.7	9.2	6.8	2.2
21	**161**	5306	5.1	3.6	6.6	10.8	8.2	2.5
22	**164**	6118	5.9	4.2	7.5	12.6	9.5	2.8
23	**166**	7018	6.8	4.9	8.5	14.6	10.9	3.2
24	**169**	7965	7.7	5.6	9.6	16.4	12.6	3.7
25	**171**	9095	8.8	6.6	10.8	18.6	14.4	4.3
26	**174**	10307	10.0	7.6	12.1	20.8	16.4	5.0
27	**176**	11737	11.3	8.8	13.7	23.5	18.7	5.7
28	**178**	13291	12.8	10.1	15.4	26.2	21.2	6.6

Language Arts Literacy Grade 6

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
29	181	15007	14.5	11.6	17.2	29.3	23.8	7.7
30	183	16860	16.3	13.3	19.1	32.4	26.3	8.9
31	185	18986	18.3	15.2	21.3	35.9	29.6	10.3
32	188	21250	20.5	17.1	23.7	39.3	33.0	11.8
33	190	23666	22.9	19.3	26.1	42.9	36.5	13.6
34	192	26198	25.3	21.7	28.7	46.3	40.0	15.5
35	195	28952	28.0	24.1	31.5	49.9	43.7	17.7
36	197	32087	31.0	26.9	34.8	53.9	47.6	20.3
37	200	35449	34.2	30.0	38.1	58.0	51.9	23.2
38	202	39026	37.7	33.4	41.7	62.3	56.1	26.4
39	204	42633	41.2	36.8	45.2	65.9	60.0	29.8
40	207	46485	44.9	40.5	49.0	69.7	63.9	33.6
41	209	50571	48.8	44.4	53.0	73.4	67.8	37.7
42	212	54813	52.9	48.5	57.1	76.8	71.7	42.3
43	214	59117	57.1	52.5	61.4	80.2	75.4	47.0
44	217	63556	61.4	56.8	65.7	83.1	79.2	51.9
45	220	67953	65.6	61.2	69.7	86.2	82.6	56.8
46	222	72373	69.9	65.6	73.9	88.7	85.9	61.9
47	225	76496	73.9	69.8	77.7	90.9	88.6	66.8
48	228	80485	77.7	73.8	81.4	92.7	90.9	71.6
49	231	84244	81.4	77.8	84.7	94.3	92.8	76.3
50	234	87772	84.8	81.6	87.7	95.8	94.5	80.7
51	237	90904	87.8	85.0	90.4	96.9	95.9	84.6
52	241	93781	90.6	88.3	92.7	97.8	97.2	88.3
53	244	96210	92.9	91.1	94.7	98.4	98.0	91.3
54	250	98222	94.9	93.4	96.2	99.0	98.7	93.8
55	252	99798	96.4	95.3	97.4	99.3	99.1	95.7
56	256	101045	97.6	96.9	98.3	99.6	99.5	97.2
57	260	101889	98.4	97.9	98.9	99.8	99.7	98.2
58	265	102516	99.0	98.7	99.3	99.9	99.8	98.9
59	270	102928	99.4	99.2	99.6	100	99.9	99.4
60	275	103186	99.7	99.5	99.8	100	100	99.7
61	279	103367	99.8	99.8	99.9	100	100	99.8
62	285	103452	99.9	99.9	99.9	100	100	99.9
63	290	103497	100	100	100	100	100	100
64	295	103522	100	100	100	100	100	100
65	300	103552	100	100	100	100	100	100

Table F.5: LAL Grade 7

Language Arts Literacy Grade 7

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
0	**100**	1301	1.3	1.1	1.4	1.8	1.3	0.9
6	**102**	38	1.3	1.1	1.5	1.9	1.4	0.9
7	**108**	41	1.3	1.1	1.5	2.0	1.4	1.0
8	**113**	68	1.4	1.1	1.6	2.1	1.6	1.0
9	**118**	92	1.5	1.2	1.8	2.3	1.8	1.0
10	**122**	101	1.6	1.2	1.9	2.6	1.9	1.0
11	**126**	137	1.7	1.3	2.1	2.9	2.1	1.1
12	**129**	178	1.9	1.4	2.3	3.2	2.5	1.2
13	**133**	222	2.1	1.5	2.6	3.7	2.8	1.3
14	**136**	274	2.4	1.7	3.0	4.3	3.3	1.4
15	**139**	294	2.6	1.8	3.4	4.9	3.8	1.5
16	**143**	379	3.0	2.0	3.9	5.8	4.4	1.7
17	**146**	390	3.4	2.3	4.4	6.7	5.1	1.8
18	**149**	474	3.8	2.6	5.0	7.7	5.8	2.0
19	**151**	537	4.3	2.9	5.6	8.9	6.6	2.3
20	**154**	603	4.9	3.4	6.4	10.2	7.6	2.6
21	**157**	720	5.6	3.9	7.2	11.8	8.7	2.9
22	**160**	803	6.4	4.5	8.1	13.5	9.9	3.3
23	**163**	903	7.3	5.1	9.2	15.3	11.3	3.8
24	**165**	1066	8.3	6.0	10.4	17.3	13.0	4.4
25	**168**	1111	9.3	6.8	11.7	19.4	14.7	5.0
26	**171**	1373	10.7	7.9	13.2	21.9	16.9	5.8
27	**174**	1498	12.1	9.2	14.8	24.7	19.3	6.7
28	**176**	1582	13.6	10.5	16.5	27.4	21.7	7.7
29	**179**	1864	15.4	12.1	18.5	30.5	24.6	8.8
30	**182**	1899	17.2	13.6	20.6	33.8	27.6	10.0
31	**184**	2065	19.2	15.4	22.7	36.9	30.7	11.4
32	**187**	2277	21.4	17.5	25.0	40.5	33.9	13.0
33	**190**	2452	23.7	19.8	27.4	44.0	37.3	14.8
34	**193**	2641	26.3	22.1	30.2	47.8	40.8	16.8
35	**195**	2865	29.0	24.7	33.0	51.6	44.7	19.1
36	**200**	3209	32.1	27.7	36.3	55.7	48.8	21.7
37	**201**	3276	35.2	30.8	39.4	59.7	52.7	24.5
38	**204**	3340	38.4	33.9	42.7	63.5	56.7	27.5
39	**207**	3648	41.9	37.5	46.1	67.0	60.9	30.8
40	**209**	3678	45.5	41.1	49.5	70.5	64.8	34.4
41	**212**	3808	49.1	44.8	53.1	74.0	68.5	38.2
42	**215**	3886	52.8	48.5	56.9	77.3	72.1	42.2

Language Arts Literacy Grade 7

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
43	**219**	3958	56.6	52.4	60.6	80.1	75.8	46.5
44	**222**	4068	60.5	56.5	64.3	83.1	78.9	51.0
45	**225**	3910	64.3	60.4	67.9	85.6	81.9	55.4
46	**228**	3966	68.1	64.4	71.6	87.9	84.9	59.9
47	**232**	3952	71.9	68.4	75.2	89.9	87.7	64.5
48	**235**	3750	75.5	72.2	78.5	91.9	89.8	68.9
49	**239**	3545	78.9	75.9	81.7	93.5	92.0	73.1
50	**243**	3323	82.1	79.3	84.6	95.0	93.7	77.1
51	**250**	3146	85.1	82.6	87.4	96.2	95.1	81.0
52	**251**	2950	87.9	85.8	89.9	97.2	96.3	84.7
53	**255**	2626	90.4	88.7	92.1	97.9	97.3	87.9
54	**260**	2191	92.5	91.0	94.0	98.5	98.0	90.7
55	**265**	1974	94.4	93.3	95.5	99.1	98.7	93.1
56	**269**	1625	96.0	95.1	96.8	99.4	99.2	95.1
57	**274**	1270	97.2	96.6	97.8	99.6	99.5	96.7
58	**280**	926	98.1	97.7	98.5	99.7	99.7	97.8
59	**285**	708	98.8	98.5	99.0	99.9	99.8	98.6
60	**291**	498	99.2	99.1	99.4	99.9	99.9	99.2
61	**298**	317	99.5	99.5	99.6	100	100	99.5
62	**300**	475	100	100	100	100	100	100

Table F.6: LAL Grade 8

Language Arts Literacy Grade 8

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
0	**100**	1224	1.2	1.0	1.3	1.5	1.1	0.9
2	**114**	10	1.2	1.0	1.3	1.5	1.1	0.9
3	**123**	10	1.2	1.0	1.3	1.5	1.2	0.9
4	**130**	32	1.2	1.0	1.4	1.6	1.2	0.9
5	**135**	27	1.2	1.0	1.4	1.7	1.2	0.9
6	**139**	31	1.3	1.1	1.4	1.8	1.3	0.9
7	**143**	48	1.3	1.1	1.5	1.9	1.3	1.0
8	**146**	63	1.4	1.1	1.6	2.0	1.4	1.0
9	**149**	70	1.4	1.1	1.7	2.2	1.5	1.0
10	**151**	102	1.5	1.2	1.8	2.5	1.7	1.0
11	**154**	118	1.6	1.2	2.0	2.8	1.8	1.1
12	**156**	164	1.8	1.3	2.2	3.2	2.1	1.1

Language Arts Literacy Grade 8

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
13	158	169	2.0	1.4	2.4	3.6	2.4	1.2
14	160	226	2.2	1.6	2.7	4.1	2.7	1.3
15	162	251	2.4	1.7	3.0	4.6	3.2	1.4
16	164	291	2.7	1.9	3.4	5.4	3.7	1.5
17	166	321	3.0	2.0	3.9	6.2	4.3	1.6
18	168	355	3.3	2.2	4.3	7.0	4.8	1.7
19	170	423	3.7	2.5	4.9	8.0	5.5	1.9
20	171	484	4.2	2.8	5.5	9.1	6.3	2.1
21	173	514	4.7	3.1	6.1	10.1	7.1	2.3
22	175	623	5.3	3.5	6.9	11.5	8.2	2.5
23	177	672	5.9	3.9	7.7	13.0	9.3	2.8
24	179	753	6.6	4.4	8.6	14.6	10.6	3.1
25	181	893	7.4	5.0	9.7	16.6	12.1	3.4
26	183	946	8.3	5.7	10.8	18.5	13.7	3.9
27	185	976	9.3	6.4	12.0	20.7	15.2	4.3
28	187	1098	10.3	7.1	13.3	22.8	17.0	4.8
29	189	1251	11.5	8.1	14.6	25.1	19.1	5.4
30	190	1404	12.8	9.2	16.2	27.8	21.4	6.1
31	192	1444	14.2	10.3	17.8	30.4	23.8	6.8
32	194	1622	15.7	11.6	19.5	33.3	26.5	7.7
33	196	1741	17.4	13.1	21.3	36.4	29.1	8.7
34	198	1865	19.1	14.5	23.4	39.3	32.0	9.9
35	200	2101	21.1	16.3	25.5	42.5	35.3	11.2
36	202	2252	23.2	18.3	27.8	46.1	38.4	12.7
37	204	2418	25.5	20.4	30.3	49.5	41.7	14.5
38	206	2606	28.0	22.7	32.9	53.1	45.2	16.4
39	208	2905	30.7	25.2	35.9	56.7	48.9	18.7
40	210	3006	33.6	27.8	38.9	60.1	52.7	21.2
41	212	3369	36.8	30.8	42.3	63.8	56.4	24.1
42	214	3422	40.0	33.8	45.8	67.1	60.1	27.4
43	216	3770	43.6	37.1	49.6	70.7	64.1	30.9
44	218	4035	47.4	40.7	53.6	74.2	68.1	34.9
45	221	4221	51.4	44.6	57.6	77.6	72.1	39.2
46	223	4398	55.5	48.7	61.9	80.8	75.8	43.8
47	226	4431	59.7	52.9	66.1	83.9	79.3	48.7
48	228	4902	64.3	57.7	70.5	86.7	82.8	54.2
49	231	4857	68.9	62.6	74.8	89.3	86.1	59.9
50	234	4729	73.4	67.4	79.0	91.5	88.8	65.6
51	237	4590	77.7	72.4	82.8	93.6	91.3	71.0
52	240	4332	81.8	77.0	86.4	95.2	93.4	76.4

Language Arts Literacy Grade 8

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
53	**243**	4071	85.7	81.5	89.6	96.6	95.2	81.5
54	**247**	3601	89.1	85.6	92.3	97.6	96.7	86.0
55	**250**	3058	92.0	89.3	94.5	98.4	97.8	89.8
56	**254**	2486	94.3	92.3	96.3	99.0	98.6	92.8
57	**258**	1922	96.1	94.6	97.6	99.4	99.1	95.2
58	**262**	1453	97.5	96.5	98.5	99.6	99.5	97.0
59	**266**	1027	98.5	97.9	99.1	99.8	99.7	98.2
60	**271**	691	99.1	98.8	99.5	99.9	99.9	99.0
61	**276**	410	99.5	99.3	99.7	100	100	99.4
62	**281**	237	99.8	99.6	99.9	100	100	99.7
63	**287**	118	99.9	99.8	99.9	100	100	99.9
64	**293**	86	99.9	99.9	100.0	100	100	99.9
65	**300**	59	100	100	100	100	100	100

Table F.7: Mathematics Grade 3

Mathematics Grade 3								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
0	**100**	45	0.0	0.0	0.1	0.1	0.0	0.0
5	**105**	112	0.1	0.1	0.1	0.3	0.1	0.1
6	**113**	207	0.2	0.2	0.2	0.6	0.2	0.1
7	**121**	416	0.4	0.3	0.5	1.1	0.6	0.2
8	**127**	762	0.8	0.7	0.8	2.0	1.1	0.3
9	**133**	1239	1.2	1.1	1.4	3.3	1.8	0.4
10	**139**	1846	1.8	1.6	2.0	4.8	2.8	0.7
11	**144**	2586	2.5	2.3	2.7	6.6	3.9	1.0
12	**149**	3537	3.5	3.2	3.7	8.8	5.3	1.4
13	**153**	4587	4.5	4.1	4.9	11.4	6.7	1.9
14	**158**	5734	5.6	5.2	6.0	13.9	8.6	2.5
15	**162**	6960	6.8	6.4	7.2	16.6	10.5	3.1
16	**166**	8389	8.3	7.8	8.6	19.6	12.6	3.8
17	**170**	9896	9.7	9.3	10.1	22.6	14.9	4.7
18	**173**	11507	11.3	11.0	11.6	25.4	17.4	5.6
19	**177**	13242	13.0	12.8	13.2	28.4	19.8	6.8
20	**180**	15003	14.8	14.5	14.9	31.4	22.4	8.0
21	**184**	16843	16.6	16.4	16.7	34.2	25.1	9.3
22	**187**	18785	18.5	18.2	18.6	37.2	27.7	10.8
23	**190**	20827	20.5	20.3	20.6	40.3	30.3	12.3
24	**194**	22962	22.6	22.5	22.6	43.3	33.3	14.0
25	**197**	25228	24.8	24.7	24.9	46.3	36.2	15.9
26	**200**	27634	27.2	27.1	27.2	49.3	39.2	17.9
27	**203**	30150	29.6	29.7	29.5	52.4	42.4	20.2
28	**206**	32809	32.3	32.3	32.2	55.6	45.5	22.6
29	**209**	35466	34.9	35.1	34.7	58.6	48.6	25.1
30	**213**	38241	37.6	37.8	37.4	61.4	51.6	27.8
31	**216**	41244	40.6	40.9	40.2	64.5	55.0	30.7
32	**219**	44252	43.5	43.9	43.1	67.3	58.3	33.8
33	**223**	47479	46.7	47.1	46.3	70.1	61.6	37.2
34	**226**	50822	50.0	50.3	49.6	73.0	64.9	40.7
35	**229**	54208	53.3	53.9	52.7	75.6	68.1	44.4
36	**233**	57871	56.9	57.5	56.3	78.1	71.4	48.6
37	**237**	61552	60.5	61.2	59.9	80.5	74.6	52.8
38	**241**	65392	64.3	65.0	63.6	83.1	77.7	57.3
39	**245**	69282	68.1	68.8	67.5	85.5	80.8	61.9
40	**250**	73284	72.0	72.7	71.4	87.8	83.7	66.6
41	**255**	77298	76.0	76.7	75.3	90.1	86.3	71.4

Mathematics Grade 3

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
42	**260**	81378	80.0	80.6	79.4	92.0	89.1	76.4
43	**267**	85339	83.9	84.5	83.3	93.9	91.5	81.2
44	**273**	89049	87.5	88.0	87.1	95.5	93.8	85.7
45	**281**	92431	90.9	91.3	90.4	96.9	95.6	89.7
46	**291**	95519	93.9	94.3	93.5	98.1	97.3	93.3
47	**300**	101724	100	100	100	100	100	100

Table F.8: Mathematics Grade 4

Mathematics Grade 4

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
0	**100**	72	0.1	0.1	0.1	0.2	0.1	0.0
5	**109**	164	0.2	0.1	0.2	0.5	0.2	0.1
6	**117**	345	0.3	0.3	0.4	0.9	0.5	0.1
7	**124**	639	0.6	0.5	0.7	1.6	1.0	0.2
8	**131**	1052	1.0	0.9	1.2	2.5	1.7	0.4
9	**137**	1657	1.6	1.4	1.9	4.0	2.6	0.7
10	**142**	2387	2.3	2.0	2.6	5.8	3.7	1.0
11	**148**	3268	3.2	2.8	3.5	7.8	5.0	1.4
12	**152**	4344	4.2	3.8	4.7	10.2	6.7	1.8
13	**157**	5529	5.4	4.9	5.9	13.0	8.2	2.5
14	**161**	6848	6.7	6.2	7.2	15.8	10.1	3.1
15	**165**	8300	8.1	7.5	8.6	18.9	12.3	3.9
16	**169**	9962	9.7	9.2	10.3	22.4	14.6	4.9
17	**173**	11766	11.5	11.0	12.0	25.7	17.0	6.0
18	**177**	13619	13.3	12.9	13.7	29.1	19.7	7.2
19	**180**	15664	15.3	15.0	15.6	32.5	22.6	8.6
20	**184**	17813	17.4	17.1	17.6	35.9	25.4	10.2
21	**187**	20122	19.7	19.4	19.8	39.3	28.5	12.0
22	**190**	22604	22.1	21.9	22.2	42.8	32.0	13.8
23	**194**	25049	24.5	24.5	24.4	46.1	35.1	15.8
24	**197**	27685	27.0	27.1	26.9	49.5	38.5	18.0
25	**200**	30635	29.9	30.3	29.5	53.0	42.4	20.5
26	**203**	33518	32.7	33.2	32.3	56.5	46.0	23.0
27	**206**	36552	35.7	36.3	35.1	59.8	49.4	25.9
28	**210**	39712	38.8	39.5	38.1	63.1	52.9	28.9
29	**213**	42861	41.9	42.6	41.2	66.1	56.6	32.0

Mathematics Grade 4

Raw Score	Scale Score	All Students Cumulative #	All Students Cumulative %	Female Cumul. %	Male Cumul. %	Afr.-A Cumul. %	Hisp. Cumul. %	White Cumul. %
30	**216**	46078	45.0	45.9	44.1	69.0	60.0	35.2
31	**220**	49420	48.3	49.4	47.2	71.9	63.6	38.7
32	**223**	52822	51.6	52.9	50.3	75.0	66.8	42.2
33	**226**	56270	55.0	56.4	53.5	77.7	70.0	46.0
34	**230**	59789	58.4	59.9	56.9	80.3	73.0	49.9
35	**234**	63391	61.9	63.5	60.4	82.8	76.0	54.0
36	**237**	67050	65.5	67.1	63.9	85.3	79.2	58.1
37	**241**	70664	69.0	70.6	67.4	87.6	81.8	62.4
38	**246**	74206	72.5	74.1	70.8	89.4	84.5	66.5
39	**250**	77677	75.9	77.5	74.3	91.2	86.9	70.7
40	**255**	81166	79.3	80.8	77.8	93.0	89.1	74.9
41	**260**	84481	82.5	83.8	81.2	94.5	91.2	78.9
42	**265**	87739	85.7	86.9	84.5	95.9	93.1	82.8
43	**271**	90942	88.8	89.8	87.8	96.9	94.9	86.7
44	**278**	93767	91.6	92.4	90.7	97.9	96.4	90.1
45	**286**	96354	94.1	94.7	93.5	98.8	97.6	93.1
46	**295**	98480	96.2	96.6	95.8	99.3	98.5	95.6
47	**300**	102409	100	100	100	100	100	100

Table F.9: Mathematics Grade 5

Mathematics Grade 5

Raw Score	Scale Score	All Students Cumulative #	All Students Cumulative %	Female Cumul. %	Male Cumul. %	Afr.-A Cumul. %	Hisp. Cumul. %	White Cumul. %
0	**100**	17	0.0	0.0	0.0	0.1	0.0	0.0
3	**106**	51	0.1	0.0	0.1	0.2	0.1	0.0
4	**116**	110	0.1	0.1	0.1	0.3	0.2	0.1
5	**125**	260	0.3	0.2	0.3	0.7	0.3	0.1
6	**132**	526	0.5	0.4	0.6	1.3	0.8	0.2
7	**138**	934	0.9	0.8	1.0	2.4	1.3	0.4
8	**144**	1507	1.5	1.2	1.7	3.9	2.1	0.6
9	**149**	2177	2.1	1.8	2.4	5.5	3.2	0.9
10	**154**	3026	3.0	2.5	3.3	7.6	4.4	1.3
11	**158**	3974	3.9	3.4	4.4	9.8	5.8	1.8
12	**162**	5124	5.0	4.4	5.6	12.4	7.6	2.3
13	**166**	6378	6.2	5.5	6.9	15.0	9.4	3.0
14	**170**	7754	7.6	6.8	8.3	17.9	11.5	3.8
15	**174**	9300	9.1	8.3	9.8	20.9	13.7	4.7

Mathematics Grade 5

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
16	**177**	10932	10.7	9.9	11.4	24.1	16.2	5.7
17	**181**	12692	12.4	11.7	13.1	27.4	18.8	6.8
18	**184**	14562	14.2	13.6	14.8	30.6	21.5	8.1
19	**187**	16671	16.3	15.7	16.8	34.2	24.7	9.5
20	**191**	18779	18.3	17.8	18.9	37.6	27.7	11.0
21	**194**	20906	20.4	20.0	20.8	40.9	30.5	12.6
22	**197**	23202	22.7	22.5	22.8	44.1	33.7	14.4
23	**200**	25705	25.1	25.1	25.1	47.8	36.8	16.5
24	**203**	28252	27.6	27.8	27.4	51.2	40.1	18.6
25	**206**	30693	30.0	30.4	29.5	54.1	43.3	20.7
26	**209**	33355	32.6	33.2	32.0	57.1	46.8	23.1
27	**212**	36006	35.2	36.0	34.4	60.1	50.1	25.5
28	**215**	38707	37.8	38.8	36.8	63.0	53.3	28.1
29	**217**	41497	40.5	41.7	39.4	65.9	56.7	30.7
30	**220**	44324	43.3	44.5	42.1	68.9	59.7	33.5
31	**223**	47285	46.2	47.5	44.9	71.8	62.7	36.5
32	**226**	50357	49.2	50.7	47.7	74.6	65.9	39.6
33	**229**	53360	52.1	53.7	50.6	77.2	68.6	42.8
34	**232**	56466	55.2	56.9	53.5	79.6	71.4	46.2
35	**235**	59585	58.2	60.0	56.5	81.9	74.1	49.8
36	**238**	62851	61.4	63.3	59.6	84.3	76.9	53.4
37	**242**	66149	64.6	66.5	62.8	86.5	79.5	57.1
38	**245**	69558	68.0	69.8	66.2	88.5	82.2	61.1
39	**250**	72960	71.3	73.1	69.6	90.3	84.6	65.1
40	**252**	76326	74.6	76.3	72.9	92.1	87.2	69.0
41	**256**	79621	77.8	79.5	76.2	93.5	89.4	73.0
42	**261**	83067	81.1	82.6	79.7	94.9	91.7	77.2
43	**265**	86573	84.6	85.9	83.3	96.3	93.6	81.5
44	**271**	89825	87.7	88.9	86.6	97.3	95.2	85.5
45	**277**	92967	90.8	91.7	89.9	98.1	96.7	89.3
46	**285**	95844	93.6	94.5	92.8	98.8	98.0	92.8
47	**294**	98357	96.1	96.7	95.5	99.4	99.0	95.7
48	**300**	102372	100	100	100	100	100	100

Table F.10: Mathematics Grade 6

Mathematics Grade 6								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
0	**100**	10	0.0	0.0	0.0	0.0	0.0	**0.0**
3	**102**	27	0.0	0.0	0.0	0.1	0.1	**0.0**
4	**113**	86	0.1	0.1	0.1	0.2	0.1	0.0
5	**121**	176	0.2	0.1	0.2	0.5	0.3	0.0
6	**128**	342	0.3	0.3	0.4	0.8	0.6	0.1
7	**134**	627	0.6	0.5	0.7	1.5	1.0	0.2
8	**139**	1076	1.1	0.9	1.2	2.6	1.7	0.4
9	**144**	1661	1.6	1.4	1.9	4.0	2.7	0.6
10	**149**	2375	2.3	2.0	2.6	5.7	3.7	1.0
11	**153**	3322	3.2	2.8	3.6	7.9	5.4	1.3
12	**157**	4434	4.3	3.8	4.8	10.6	7.0	1.8
13	**161**	5618	5.5	4.9	6.0	13.5	8.6	2.4
14	**164**	6881	6.7	6.0	7.3	16.2	10.6	3.0
15	**168**	8276	8.1	7.3	8.8	19.1	12.9	3.7
16	**171**	9856	9.6	8.8	10.3	22.1	15.3	4.6
17	**174**	11611	11.3	10.5	12.0	25.3	18.1	5.7
18	**177**	13455	13.1	12.4	13.8	28.9	20.7	6.8
19	**180**	15429	15.0	14.3	15.7	32.4	23.8	8.1
20	**183**	17502	17.1	16.4	17.6	36.0	26.7	9.5
21	**186**	19709	19.2	18.5	19.8	39.5	29.9	11.1
22	**189**	22145	21.6	21.0	22.1	43.3	33.3	12.9
23	**192**	24598	24.0	23.5	24.3	46.6	36.5	14.9
24	**195**	27138	26.4	26.2	26.7	50.3	39.7	17.0
25	**197**	29870	29.1	28.9	29.2	54.0	43.2	19.3
26	**200**	32906	32.1	32.1	32.0	57.5	46.8	22.1
27	**203**	35911	35.0	35.2	34.8	61.1	50.3	24.8
28	**206**	39111	38.1	38.5	37.7	64.7	53.7	27.9
29	**209**	42258	41.2	41.8	40.5	67.8	57.2	31.0
30	**212**	45548	44.4	45.2	43.5	70.8	60.9	34.3
31	**215**	49008	47.8	48.9	46.6	73.8	64.2	37.9
32	**218**	52491	51.1	52.5	49.8	76.6	67.7	41.6
33	**221**	55943	54.5	56.1	53.0	79.2	70.8	45.4
34	**224**	59466	57.9	59.7	56.2	81.9	74.0	49.4
35	**228**	62903	61.3	63.2	59.5	84.2	77.1	53.2
36	**231**	66442	64.7	66.7	62.9	86.3	79.9	57.4
37	**235**	69963	68.2	70.1	66.3	88.3	82.6	61.5
38	**239**	73330	71.4	73.5	69.5	90.2	85.1	65.5
39	**243**	76640	74.7	76.5	72.9	91.9	87.4	69.5

Mathematics Grade 6								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
40	**250**	79851	77.8	79.7	76.0	93.4	89.5	73.4
41	**252**	83094	81.0	82.7	79.2	94.8	91.4	77.3
42	**257**	86192	84.0	85.6	82.4	95.9	93.2	81.1
43	**262**	89124	86.8	88.3	85.4	96.8	94.8	84.7
44	**268**	91782	89.4	90.7	88.2	97.6	96.1	88.0
45	**274**	94471	92.0	93.1	91.1	98.4	97.2	91.2
46	**282**	96833	94.3	95.1	93.6	99.1	98.2	93.9
47	**291**	98879	96.3	96.9	95.8	99.4	98.9	96.2
48	**300**	102641	100	100	100	100	100	100

Table F.11: Mathematics Grade 7

Mathematics Grade 7								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
0	**100**	136	0.1	0.1	0.2	0.4	0.1	0.1
5	**109**	260	0.3	0.2	0.3	0.7	0.3	0.1
6	**117**	498	0.5	0.4	0.6	1.3	0.7	0.2
7	**123**	863	0.8	0.6	1.0	2.1	1.3	0.4
8	**129**	1364	1.3	1.0	1.6	3.3	2.2	0.6
9	**135**	2081	2.0	1.6	2.4	4.8	3.4	0.9
10	**140**	3004	2.9	2.4	3.4	6.8	4.8	1.4
11	**144**	4079	4.0	3.3	4.6	9.1	6.4	2.0
12	**149**	5336	5.2	4.4	5.9	12.0	8.3	2.6
13	**153**	6690	6.5	5.6	7.3	15.1	10.2	3.3
14	**157**	8225	8.0	7.0	8.8	18.4	12.5	4.1
15	**160**	9853	9.6	8.5	10.5	21.7	15.0	5.0
16	**164**	11623	11.3	10.2	12.2	25.1	17.7	6.0
17	**168**	13508	13.1	12.0	14.1	28.8	20.5	7.2
18	**171**	15467	15.0	13.9	16.0	32.0	23.5	8.4
19	**174**	17491	17.0	15.9	17.9	35.5	26.5	9.8
20	**178**	19631	19.0	18.0	20.0	38.9	29.6	11.3
21	**181**	21929	21.3	20.3	22.1	42.3	32.8	13.0
22	**184**	24350	23.6	22.8	24.3	45.8	36.3	14.8
23	**187**	26834	26.0	25.3	26.6	49.3	39.7	16.8
24	**190**	29408	28.5	27.9	29.0	52.8	43.0	19.0
25	**194**	31942	31.0	30.5	31.3	56.0	46.3	21.1
26	**197**	34749	33.7	33.5	33.9	59.6	49.6	23.6

Mathematics Grade 7								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
27	**200**	37583	36.4	36.3	36.5	62.8	52.7	26.2
28	**203**	40510	39.3	39.3	39.2	66.1	56.1	29.0
29	**206**	43507	42.2	42.4	41.9	69.1	59.3	31.8
30	**209**	46486	45.1	45.5	44.6	72.0	62.3	34.9
31	**212**	49582	48.1	48.5	47.6	74.8	65.5	38.1
32	**215**	52757	51.1	51.7	50.6	77.5	68.3	41.4
33	**219**	55890	54.2	54.9	53.5	79.8	71.5	44.8
34	**222**	59199	57.4	58.2	56.6	82.4	74.4	48.3
35	**225**	62528	60.6	61.5	59.7	84.6	77.4	52.0
36	**228**	65777	63.8	64.8	62.7	86.7	80.1	55.7
37	**232**	69115	67.0	68.1	65.9	88.7	82.6	59.6
38	**235**	72389	70.2	71.5	68.9	90.4	85.0	63.4
39	**239**	75588	73.3	74.6	71.9	91.9	87.3	67.2
40	**243**	78732	76.3	77.7	74.9	93.2	89.4	71.0
41	**250**	81768	79.3	80.7	77.9	94.7	91.3	74.6
42	**251**	84750	82.2	83.6	80.8	95.8	93.0	78.2
43	**255**	87656	85.0	86.4	83.6	96.8	94.4	81.8
44	**260**	90457	87.7	89.1	86.4	97.6	95.8	85.2
45	**265**	93010	90.2	91.4	89.0	98.3	96.9	88.4
46	**271**	95420	92.5	93.6	91.5	98.8	97.8	91.3
47	**278**	97632	94.6	95.5	93.8	99.3	98.7	93.9
48	**287**	99475	96.4	97.1	95.8	99.6	99.3	96.1
49	**297**	101012	97.9	98.4	97.5	99.8	99.6	97.9
50	**300**	103166	100	100	100	100	100	100

Table F.12: Mathematics Grade 8

Mathematics Grade 8								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
0	**100**	123	0.1	0.1	0.1	0.3	0.2	0.1
5	**108**	277	0.3	0.2	0.3	0.8	0.4	0.1
6	**115**	597	0.6	0.4	0.7	1.5	0.9	0.2
7	**122**	1096	1.1	0.8	1.3	2.8	1.6	0.4
8	**128**	1777	1.7	1.4	2.0	4.5	2.6	0.7
9	**133**	2637	2.5	2.0	3.0	6.7	3.9	1.0
10	**138**	3682	3.5	2.9	4.1	9.1	5.6	1.5

Mathematics Grade 8

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
11	**142**	4835	4.6	3.9	5.3	11.8	7.5	1.9
12	**146**	6038	5.8	4.9	6.6	14.6	9.4	2.5
13	**150**	7206	6.9	5.9	7.8	17.3	11.1	3.0
14	**154**	8483	8.1	7.0	9.2	20.1	13.1	3.6
15	**158**	9771	9.4	8.2	10.5	22.8	15.0	4.3
16	**161**	11146	10.7	9.5	11.8	25.8	17.2	5.0
17	**165**	12517	12.0	10.8	13.1	28.4	19.2	5.8
18	**168**	13896	13.3	12.1	14.5	31.1	21.2	6.5
19	**171**	15394	14.7	13.5	15.9	33.8	23.3	7.5
20	**174**	16963	16.2	15.1	17.3	36.6	25.7	8.4
21	**177**	18594	17.8	16.7	18.8	39.3	28.0	9.5
22	**180**	20327	19.5	18.5	20.4	42.0	30.4	10.7
23	**183**	22115	21.2	20.3	22.0	44.7	33.0	12.0
24	**186**	23931	22.9	22.1	23.7	47.4	35.6	13.3
25	**189**	25887	24.8	24.1	25.4	50.2	38.2	14.8
26	**192**	27878	26.7	26.1	27.2	52.9	40.7	16.4
27	**195**	30038	28.8	28.4	29.1	55.5	43.4	18.3
28	**200**	32473	31.1	30.9	31.3	58.3	46.4	20.4
29	**201**	34925	33.4	33.3	33.5	60.9	49.4	22.6
30	**204**	37450	35.9	35.9	35.8	63.7	52.2	25.0
31	**207**	40114	38.4	38.6	38.1	66.3	55.3	27.5
32	**210**	42977	41.2	41.6	40.7	69.3	58.2	30.2
33	**214**	45990	44.0	44.7	43.3	72.0	61.2	33.3
34	**217**	49080	47.0	48.0	46.0	74.6	64.1	36.5
35	**220**	52378	50.2	51.3	49.0	77.2	67.3	40.0
36	**224**	55697	53.3	54.7	52.0	79.8	70.2	43.5
37	**227**	59094	56.6	58.1	55.1	82.1	73.2	47.2
38	**231**	62721	60.1	61.8	58.4	84.3	76.3	51.3
39	**235**	66269	63.5	65.4	61.6	86.5	79.3	55.2
40	**239**	69907	66.9	69.0	64.9	88.5	82.0	59.4
41	**243**	73597	70.5	72.6	68.4	90.3	84.6	63.7
42	**250**	77234	74.0	76.1	71.9	91.9	87.1	68.1
43	**253**	80870	77.4	79.6	75.3	93.4	89.6	72.4
44	**258**	84317	80.7	82.9	78.6	94.8	91.6	76.5
45	**264**	87775	84.0	86.1	82.1	96.1	93.5	80.7
46	**271**	91170	87.3	89.2	85.4	97.2	95.2	84.7
47	**279**	94339	90.3	92.0	88.7	98.1	96.7	88.6
48	**288**	97263	93.1	94.5	91.8	98.8	97.9	92.1
49	**300**	104446	100	100	100	100	100	100

Table F.13: Science Grade 4

Science Grade 4								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
1	121	2	0.0	0.0	0.0	0.0	0.0	0.0
2	127	4	0.0	0.0	0.0	0.0	0.0	0.0
3	134	14	0.0	0.0	0.0	0.0	0.0	0.0
4	140	59	0.1	0.1	0.1	0.2	0.1	0.0
5	145	134	0.2	0.2	0.2	0.6	0.3	0.1
6	151	218	0.4	0.4	0.5	1.1	0.6	0.1
7	157	336	0.8	0.7	0.8	1.9	1.2	0.2
8	162	483	1.2	1.1	1.4	3.1	2.1	0.4
9	168	694	1.9	1.7	2.1	4.8	3.3	0.6
10	173	961	2.8	2.6	3.0	7.1	4.9	0.9
11	179	1261	4.1	3.8	4.3	9.9	7.2	1.4
12	184	1471	5.5	5.2	5.8	13.2	9.6	2.0
13	190	1640	7.1	6.8	7.4	16.7	12.4	2.7
14	195	1991	9.1	8.7	9.4	20.6	15.8	3.6
15	200	2601	11.6	11.3	11.9	25.8	19.7	5.0
16	205	2679	14.2	13.9	14.5	30.6	24.0	6.5
17	210	3122	17.3	17.0	17.5	35.7	28.9	8.4
18	215	3350	20.6	20.4	20.7	41.1	33.9	10.6
19	220	3644	24.1	24.1	24.1	46.3	39.1	13.3
20	224	4162	28.2	28.3	28.1	51.6	44.4	16.7
21	229	4462	32.5	32.8	32.2	57.1	49.9	20.5
22	233	4688	37.1	37.6	36.6	62.4	55.4	24.7
23	238	5145	42.2	43.0	41.4	67.8	60.8	29.6
24	242	5382	47.4	48.5	46.4	72.5	66.4	35.1
25	246	5721	53.0	54.2	51.9	77.2	71.5	41.2
26	250	6044	58.9	60.2	57.7	81.5	76.2	48.1
27	253	6031	64.8	66.2	63.5	85.2	80.8	55.3
28	256	6021	70.7	72.1	69.4	88.6	85.0	62.4
29	260	5947	76.5	78.0	75.1	91.5	88.7	69.9
30	263	5630	82.0	83.4	80.7	94.1	91.9	76.9
31	266	4971	86.9	88.2	85.7	96.1	94.2	83.4
32	269	4209	91.0	92.0	90.0	97.6	96.2	88.7
33	272	3438	94.4	95.2	93.6	98.6	97.8	93.0
34	275	2439	96.7	97.3	96.2	99.3	98.8	96.1
35	278	1654	98.4	98.6	98.1	99.7	99.4	98.1
36	281	975	99.3	99.5	99.2	99.8	99.8	99.2
37	284	490	99.8	99.9	99.7	100	99.9	99.8
38	286	169	100	100	99.9	100	100	100

Science Grade 4								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
39	287	44	100	100	100	100	100	100

Table F.14: Science Grade 8

Science Grade 8								
		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
3	114	3	0.0	0.0	0.0	0.0	0.0	0.0
4	125	4	0.0	0.0	0.0	0.0	0.0	0.0
5	133	10	0.0	0.0	0.0	0.1	0.0	0.0
6	141	28	0.0	0.0	0.1	0.2	0.1	0.0
7	147	73	0.1	0.1	0.2	0.4	0.1	0.0
8	152	118	0.2	0.1	0.3	0.7	0.3	0.1
9	157	215	0.4	0.3	0.6	1.3	0.7	0.1
10	162	409	0.8	0.6	1.1	2.4	1.3	0.3
11	166	549	1.4	1.1	1.6	3.7	2.2	0.4
12	170	762	2.1	1.7	2.5	5.5	3.7	0.7
13	174	1058	3.1	2.6	3.6	8.1	5.4	1.1
14	178	1293	4.3	3.8	4.9	11.1	7.7	1.5
15	181	1466	5.7	5.1	6.3	14.4	10.1	2.1
16	184	1779	7.5	6.8	8.1	18.3	13.3	2.8
17	188	1946	9.3	8.6	9.9	22.3	16.5	3.7
18	191	2201	11.4	10.8	12.0	26.7	20.2	4.7
19	194	2181	13.5	13.0	14.0	30.9	23.9	5.8
20	197	2440	15.9	15.5	16.2	35.4	27.7	7.2
21	200	2569	18.3	18.2	18.4	39.9	31.6	8.7
22	203	2755	21.0	21.1	20.8	44.5	35.8	10.4
23	206	2800	23.6	24.1	23.2	48.6	40.1	12.4
24	209	2994	26.5	27.3	25.7	52.9	44.2	14.5
25	212	3056	29.4	30.5	28.4	56.9	48.4	16.9
26	215	3088	32.4	33.7	31.2	60.8	52.2	19.4
27	217	3353	35.6	37.3	34.0	64.5	56.2	22.4
28	220	3391	38.9	40.7	37.1	68.2	60.1	25.5
29	223	3466	42.2	44.2	40.2	71.4	63.8	28.8
30	226	3471	45.5	47.7	43.4	74.5	67.3	32.3
31	229	3562	48.9	51.3	46.7	77.3	70.6	36.0
32	231	3583	52.4	54.9	49.9	80.1	73.6	39.9
33	234	3718	55.9	58.7	53.3	82.5	76.9	44.0

Science Grade 8

		All Students		Female	Male	Afr.-A	Hisp.	White
	Scale	Cumulative		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
Raw Score	Score	#	%	%	%	%	%	%
34	**237**	3637	59.4	62.3	56.7	84.8	79.7	48.1
35	**240**	3488	62.8	65.7	60.0	86.9	82.3	52.1
36	**243**	3555	66.2	69.2	63.3	88.8	84.7	56.2
37	**246**	3603	69.6	72.7	66.7	90.4	87.0	60.6
38	**250**	3462	73.0	76.0	70.1	92.1	89.1	64.7
39	**252**	3317	76.1	79.1	73.3	93.5	91.0	68.7
40	**256**	3265	79.3	82.2	76.5	94.6	92.7	72.7
41	**259**	3172	82.3	85.1	79.6	95.7	94.1	76.8
42	**263**	2982	85.2	87.7	82.8	96.7	95.4	80.5
43	**267**	2765	87.8	90.1	85.6	97.5	96.5	84.1
44	**271**	2562	90.3	92.3	88.3	98.2	97.4	87.3
45	**275**	2213	92.4	94.2	90.7	98.7	98.1	90.1
46	**280**	1922	94.2	95.7	92.8	99.1	98.7	92.6
47	**286**	1611	95.8	97.0	94.7	99.4	99.1	94.6
48	**292**	1357	97.1	98.0	96.2	99.6	99.4	96.3
49	**299**	1099	98.1	98.8	97.5	99.7	99.7	97.6
50	**300**	1943	100	100	100	100	100	100

APPENDIX G
ITEM PARAMETERS TABLES

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

				INFIT		OUTFIT			
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	-0.5695	No	0.0137	0.9	-9.9	0.9	-8.0	0.0	0.5
2	-1.4325	No	0.0161	1.1	5.7	1.1	5.2	0.0	0.3
3	-1.8460	No	0.0179	0.9	-4.9	0.8	-9.1	0.0	0.4
4	-0.0500	No	0.0130	1.1	9.9	1.3	9.9	0.0	0.3
5	-1.2647	No	0.0155	1.0	-0.9	1.0	1.7	0.0	0.4
6	-0.1724	No	0.0132	1.0	-1.8	1.0	3.3	0.0	0.4
7	0.2469	No	0.0128	1.1	9.9	1.2	9.9	0.0	0.3
8	-1.9391	No	0.0183	0.9	-8.3	0.8	-8.5	0.0	0.4
9	-0.4032	No	0.0135	1.3	9.9	1.6	9.9	0.0	0.2
10	0.1124	No	0.0129	1.1	9.9	1.2	9.9	0.0	0.4
11	-1.3591	No	0.0158	0.9	-9.7	0.8	-9.5	0.0	0.4
12	-0.6713	No	0.0139	1.0	3.0	1.1	6.3	0.0	0.4
13	-0.3015	No	0.0133	1.0	-3.6	1.0	-0.3	0.0	0.4
14	0.0154	No	0.0130	1.0	-7.6	1.0	-1.4	0.0	0.4
15	-0.5213	No	0.0137	0.9	-9.9	0.9	-9.9	0.0	0.5
16	-0.6572	No	0.0139	1.1	9.9	1.1	9.4	0.0	0.3
17	0.0554	No	0.0129	1.0	-4.8	1.0	0.0	0.0	0.4
18	0.7489	No	0.0129	1.1	9.9	1.3	9.9	0.0	0.3
19	0.6069	No	0.0097	0.9	-9.9	0.9	-9.9	0.0	0.5
20	0.4524	No	0.0097	1.0	-4.5	1.0	-2.1	0.0	0.4
21	2.9869	No	0.0112	1.0	-6.0	1.0	-5.4	0.0	0.5
22	1.9467	No	0.0098	1.0	2.7	1.0	2.6	0.0	0.5
23	2.9568	No	0.0089	1.0	-5.2	1.0	-4.7	0.0	0.6

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

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

				INFIT		OUTFIT			
ITEM[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	-0.0129	No	0.0131	0.9	-9.9	0.9	-9.9	0.0	0.5
2	-0.8496	No	0.0148	0.9	-9.4	0.9	-9.9	0.0	0.4
3	-1.4397	No	0.0169	1.0	-3.2	0.9	-6.2	0.0	0.4
4	0.2293	No	0.0129	1.1	9.9	1.1	9.9	0.0	0.3
5	0.4094	No	0.0128	1.1	9.9	1.2	9.9	0.0	0.3
6	-0.8195	No	0.0147	1.0	-6.1	0.9	-6.5	0.0	0.4
7	0.2700	No	0.0129	1.0	-7.1	1.0	-3.9	0.0	0.4
8	-1.0456	No	0.0154	0.9	-9.9	0.8	-9.9	0.0	0.5
9	0.0171	No	0.0131	1.0	6.8	1.1	9.4	0.0	0.3
10	0.5196	No	0.0128	1.3	9.9	1.5	9.9	0.0	0.1
11	-0.0681	No	0.0132	1.0	-3.4	1.0	-2.0	0.0	0.4
12	-1.4506	No	0.0170	0.9	-8.5	0.8	-9.9	0.0	0.4
13	0.2420	No	0.0129	1.1	9.9	1.2	9.9	0.0	0.3
14	-1.0582	No	0.0154	0.9	-9.9	0.8	-9.9	0.0	0.5
15	-0.1694	No	0.0133	1.0	-2.3	1.0	-2.7	0.0	0.4
16	-0.0267	No	0.0131	0.9	-9.9	0.9	-9.9	0.0	0.5
17	-0.4615	No	0.0138	0.9	-9.9	0.9	-9.0	0.0	0.4
18	-0.1172	No	0.0133	1.0	-8.7	0.9	-8.7	0.0	0.4
19	0.4354	No	0.0128	1.1	9.9	1.2	9.9	0.0	0.3
20	-0.8241	No	0.0147	1.0	0.4	1.1	8.4	0.0	0.4
21	0.0513	No	0.0131	1.1	9.9	1.1	9.9	0.0	0.3
22	-0.0788	No	0.0132	1.1	9.9	1.1	9.9	0.0	0.3
23	-0.4936	No	0.0139	1.1	9.9	1.1	9.9	0.0	0.3
24	-0.6822	No	0.0143	1.0	-4.1	0.9	-5.1	0.0	0.4
25	0.0085	No	0.0131	1.0	4.5	1.1	5.5	0.0	0.4
26	-1.0093	No	0.0153	1.0	-2.9	1.0	-1.9	0.0	0.4
27	-0.4464	No	0.0138	1.0	-0.9	1.0	1.4	0.0	0.4
28	-0.2396	No	0.0079	0.9	-9.9	0.9	-9.9	0.0	0.5
29	0.5390	No	0.0093	0.9	-9.9	0.9	-9.9	0.0	0.5
30	2.3973	No	0.0097	1.0	-5.4	1.0	-4.7	0.0	0.5
31	3.2881	No	0.0094	1.2	9.9	1.2	9.9	0.0	0.4
32	2.5869	No	0.0098	1.0	5.1	1.0	5.4	0.0	0.5

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

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

				INFIT		OUTFIT			
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	0.3319	No	0.0122	1.0	-2.6	1.0	-0.4	0.0	0.4
2	-1.0669	No	0.0151	0.9	-8.7	0.9	-7.5	0.0	0.4
3	-0.3868	No	0.0132	1.0	-3.9	1.0	-5.0	0.0	0.4
4	-0.6026	No	0.0137	0.9	-9.9	0.8	-9.9	0.0	0.4
5	-1.6504	No	0.0177	0.9	-9.9	0.7	-9.9	0.0	0.4
6	-1.1632	No	0.0155	1.0	-5.0	1.0	-0.2	0.0	0.4
7	0.7296	No	0.0121	1.2	9.9	1.2	9.9	0.0	0.2
8	-0.5750	No	0.0136	0.9	-9.9	0.8	-9.9	0.0	0.5
9	-1.3857	No	0.0164	0.9	-7.4	0.9	-8.2	0.0	0.4
10	-0.8452	No	0.0143	0.9	-9.4	0.9	-9.9	0.0	0.4
11	-0.8840	No	0.0145	0.9	-9.9	0.8	-9.9	0.0	0.4
12	-3.0357	No	0.0297	0.9	-3.2	0.6	-9.9	0.0	0.3
13	-1.7353	No	0.0182	1.0	-2.2	0.9	-6.1	0.0	0.3
14	-0.9595	Yes	0.0147	1.0	-0.4	0.9	-6.6	0.2	0.4
15	1.9950	Yes	0.0140	1.2	9.9	1.4	9.9	-0.1	0.2
16	-0.7970	Yes	0.0142	1.2	9.9	1.3	9.9	0.3	0.3
17	-1.2070	Yes	0.0156	1.0	-2.9	0.9	-6.7	0.1	0.4
18	-0.4470	Yes	0.0133	1.0	3.9	1.0	3.0	0.2	0.4
19	-1.6350	Yes	0.0177	1.0	-1.7	0.9	-5.1	0.1	0.4
20	0.8410	Yes	0.0122	1.0	3.6	1.1	8.2	0.0	0.3
21	0.0510	Yes	0.0125	1.2	9.9	1.3	9.9	0.2	0.1
22	-1.3708	No	0.0163	0.9	-7.0	0.8	-9.9	0.0	0.4
23	-1.6674	No	0.0178	0.9	-7.7	0.8	-9.9	0.0	0.4
24	-0.4311	No	0.0133	0.9	-9.9	0.9	-9.9	0.0	0.4
25	-0.0413	No	0.0126	1.0	4.1	1.0	1.1	0.0	0.3
26	-0.4674	No	0.0133	0.9	-9.9	0.8	-9.9	0.0	0.5
27	0.3575	No	0.0122	1.0	3.3	1.0	3.5	0.0	0.3
28	0.6865	No	0.0121	0.9	-9.9	0.9	-9.3	0.0	0.4
29	-0.1156	No	0.0127	0.9	-9.9	0.9	-9.9	0.0	0.4
30	0.2052	No	0.0123	1.0	7.8	1.0	6.2	0.0	0.3
31	0.0083	No	0.0125	1.0	-4.0	1.0	-6.1	0.0	0.4
32	0.3616	No	0.0048	1.3	9.9	1.4	9.9	0.0	0.5
33	-0.1106	No	0.0049	1.2	9.9	1.2	9.9	0.0	0.6
34	1.5539	No	0.0082	1.0	3.5	1.0	4.0	0.0	0.5
35	1.7530	Yes	0.0079	0.7	-9.9	0.7	-9.9	-0.3	0.5
36	1.7618	No	0.0090	1.1	7.2	1.1	7.8	0.0	0.4

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

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

				INFIT		OUTFIT			
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	-0.8650	Yes	0.0154	0.8	-9.9	0.7	-9.9	-0.1	0.5
2	-0.8280	Yes	0.0152	0.9	-9.9	0.8	-9.9	-0.1	0.4
3	0.2730	Yes	0.0126	1.3	9.9	1.5	9.9	-0.1	0.0
4	0.0530	Yes	0.0129	1.2	9.9	1.2	9.9	0.0	0.2
5	-0.1253	Yes	0.0133	1.1	9.9	1.1	8.9	0.1	0.3
6	-0.0309	Yes	0.0131	1.1	9.9	1.1	9.9	0.1	0.3
7	1.5098	No	0.0125	1.1	9.9	1.2	9.9	0.0	0.2
8	-0.5728	Yes	0.0144	0.9	-9.8	0.8	-9.9	0.0	0.4
9	0.7909	Yes	0.0122	1.0	7.7	1.1	9.9	0.0	0.3
10	-1.7592	No	0.0200	0.9	-6.0	0.7	-9.9	0.0	0.4
11	-0.8609	No	0.0154	0.9	-8.5	0.8	-9.9	0.0	0.4
12	-0.3506	No	0.0138	0.9	-9.9	0.8	-9.9	0.0	0.5
13	0.9968	No	0.0122	1.0	6.6	1.1	9.9	0.0	0.3
14	0.1880	No	0.0127	1.1	9.8	1.1	8.4	0.0	0.3
15	-0.6752	No	0.0147	1.0	-3.2	1.0	-2.9	0.0	0.4
16	0.6978	No	0.0122	1.0	7.1	1.1	9.4	0.0	0.3
17	-0.0071	No	0.0130	1.0	-5.5	1.0	-5.7	0.0	0.4
18	0.6028	No	0.0123	1.1	9.9	1.1	9.9	0.0	0.3
19	-1.8039	No	0.0203	0.9	-4.7	0.9	-4.9	0.0	0.3
20	-1.5176	No	0.0185	0.9	-6.5	0.7	-9.9	0.0	0.4
21	-1.1572	No	0.0166	1.0	-3.5	1.0	-1.6	0.0	0.4
22	-0.6249	No	0.0145	1.0	2.0	1.0	1.6	0.0	0.3
23	-1.7769	No	0.0202	0.9	-7.5	0.7	-9.9	0.0	0.4
24	-0.6381	No	0.0146	1.0	-4.0	0.9	-6.5	0.0	0.4
25	-0.4379	No	0.0140	0.9	-8.3	0.9	-9.4	0.0	0.4
26	0.4126	No	0.0124	1.1	9.8	1.1	9.9	0.0	0.3
27	1.4934	No	0.0125	1.0	1.1	1.1	9.9	0.0	0.3
28	-0.7278	No	0.0149	0.9	-9.9	0.8	-9.9	0.0	0.5
29	-0.6199	No	0.0145	1.0	2.1	1.1	7.1	0.0	0.3
30	-0.4134	No	0.0139	1.0	-7.5	0.9	-9.9	0.0	0.4
31	1.3435	No	0.0124	1.2	9.9	1.4	9.9	0.0	0.2
32	0.1764	No	0.0127	0.9	-9.9	0.9	-9.9	0.0	0.4
33	0.8720	No	0.0122	1.1	9.9	1.2	9.9	0.0	0.2
34	0.4830	No	0.0124	1.0	7.5	1.1	8.2	0.0	0.3
35	1.0018	No	0.0122	1.1	9.9	1.2	9.9	0.0	0.3
36	-0.1319	No	0.0133	1.0	4.5	1.1	8.0	0.0	0.3
37	1.0566	No	0.0048	1.2	9.9	1.2	9.9	0.0	0.6
38	1.0844	No	0.0078	1.0	-5.8	1.0	-5.8	0.0	0.5
39	1.0712	No	0.0087	0.8	-9.9	0.8	-9.9	0.0	0.6
40	0.3962	No	0.0076	0.8	-9.9	0.8	-9.9	0.0	0.7
41	0.4923	No	0.0095	0.9	-9.9	0.9	-9.9	0.0	0.6
42	1.6448	No	0.0075	0.9	-9.9	0.9	-8.5	0.0	0.6

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

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

				INFIT		OUTFIT			
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	-0.1246	Yes	0.0128	1.1	9.9	1.1	9.1	0.0	0.3
2	-0.8960	Yes	0.0145	0.9	-8.2	0.9	-9.0	-0.1	0.4
3	-0.3220	Yes	0.0131	1.1	9.9	1.1	9.9	0.1	0.3
4	0.1600	Yes	0.0125	1.0	0.8	1.0	-0.3	-0.3	0.3
5	-1.5590	Yes	0.0171	0.9	-9.9	0.8	-9.9	-0.1	0.3
6	-0.0690	Yes	0.0128	1.0	4.3	1.1	5.9	0.0	0.3
7	-0.6970	Yes	0.0139	0.9	-9.9	0.8	-9.9	-0.1	0.4
8	0.0390	Yes	0.0126	1.0	-7.3	1.0	-6.8	-0.1	0.4
9	-0.0600	Yes	0.0127	1.1	9.9	1.2	9.9	0.1	0.3
10	-1.0188	Yes	0.0149	0.8	-9.9	0.7	-9.9	-0.2	0.5
11	-0.0902	Yes	0.0128	1.0	-9.9	0.9	-9.9	-0.1	0.4
12	0.0556	Yes	0.0126	1.3	9.9	1.5	9.9	0.1	0.1
13	0.7474	Yes	0.0124	1.1	9.9	1.1	9.9	-0.1	0.3
14	0.3620	Yes	0.0124	1.0	2.1	1.0	4.1	-0.1	0.3
15	-1.2985	Yes	0.0159	0.9	-9.9	0.8	-9.9	-0.1	0.4
16	-1.1244	Yes	0.0152	0.9	-9.9	0.7	-9.9	-0.1	0.4
17	-1.3240	Yes	0.0160	0.8	-9.9	0.7	-9.9	-0.1	0.5
18	-1.4228	No	0.0164	0.9	-6.3	0.8	-9.2	0.0	0.4
19	0.0766	No	0.0126	1.0	-4.0	1.0	-3.8	0.0	0.4
20	-0.7684	No	0.0141	1.0	-3.5	1.0	-4.5	0.0	0.4
21	0.0808	No	0.0126	1.1	9.9	1.1	9.7	0.0	0.3
22	-0.0012	No	0.0127	1.0	2.4	1.0	4.4	0.0	0.4
23	0.6853	No	0.0124	0.9	-9.9	1.0	-8.2	0.0	0.4
24	-0.6275	No	0.0137	1.0	2.1	1.1	9.8	0.0	0.3
25	0.3623	No	0.0124	1.1	9.9	1.1	9.9	0.0	0.3
26	0.9075	No	0.0125	1.1	9.9	1.2	9.9	0.0	0.3
27	0.7112	No	0.0124	1.1	9.9	1.1	9.9	0.0	0.3
28	0.7496	No	0.0124	1.1	9.9	1.1	9.9	0.0	0.3
29	-1.0864	No	0.0151	1.0	-4.8	0.9	-5.8	0.0	0.4
30	-0.5281	No	0.0135	0.9	-9.9	0.9	-9.9	0.0	0.4
31	-1.1479	No	0.0153	0.9	-9.9	0.8	-9.9	0.0	0.4
32	-0.3983	No	0.0133	1.0	3.1	1.0	4.3	0.0	0.3
33	-0.2458	No	0.0130	1.0	-8.5	0.9	-9.9	0.0	0.4
34	0.3497	No	0.0124	1.0	9.0	1.1	9.9	0.0	0.3
35	0.2231	No	0.0125	0.9	-9.9	0.9	-9.9	0.0	0.5
36	0.7831	No	0.0125	1.0	-4.3	1.0	-0.2	0.0	0.4
37	0.1834	No	0.0045	1.2	9.9	1.2	9.9	0.0	0.6
38	0.6595	No	0.0074	0.9	-7.3	0.9	-7.1	0.0	0.6
39	1.4241	Yes	0.0095	0.9	-8.3	1.0	-4.8	0.5	0.5
40	0.8199	No	0.0087	0.9	-9.9	0.9	-9.9	0.0	0.6
41	1.0739	No	0.0084	0.9	-9.9	0.9	-9.9	0.0	0.6
42	0.0357	No	0.0099	0.9	-9.9	0.9	-9.9	0.0	0.5

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

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

				INFIT		OUTFIT			
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	-0.3231	No	0.0155	1.0	4.5	1.1	3.9	0.0	0.3
2	-0.6029	No	0.0166	1.0	1.5	1.1	5.9	0.0	0.3
3	0.9571	No	0.0129	1.1	9.9	1.2	9.9	0.0	0.3
4	-0.3595	No	0.0157	1.0	3.3	1.1	5.6	0.0	0.3
5	0.2308	No	0.0140	1.0	4.5	1.0	3.6	0.0	0.3
6	0.3372	No	0.0137	1.1	9.9	1.2	9.9	0.0	0.3
7	0.2801	No	0.0138	1.0	6.5	1.1	5.3	0.0	0.3
8	0.4229	No	0.0136	1.0	1.8	1.0	1.5	0.0	0.4
9	0.1784	No	0.0141	0.9	-9.9	0.8	-9.9	0.0	0.5
10	0.7134	Yes	0.0131	1.0	1.0	1.0	3.0	0.0	0.4
11	0.0916	Yes	0.0143	1.0	5.4	1.2	9.9	-0.1	0.3
12	1.6108	Yes	0.0128	1.1	9.9	1.1	9.9	-0.2	0.3
13	-0.3463	Yes	0.0156	0.8	-9.9	0.7	-9.9	-0.1	0.5
14	-0.8085	Yes	0.0176	1.2	9.9	1.2	7.8	0.3	0.4
15	0.7171	Yes	0.0131	0.9	-9.9	0.8	-9.9	-0.1	0.5
16	-0.7025	Yes	0.0171	1.0	-2.6	0.9	-5.4	0.1	0.4
17	-0.5280	Yes	0.0163	1.1	9.9	1.1	6.8	0.3	0.4
18	0.1654	Yes	0.0141	1.1	9.9	1.2	9.9	0.0	0.3
19	1.5074	No	0.0128	1.0	-5.1	1.0	-1.5	0.0	0.4
20	0.0065	No	0.0145	0.9	-9.9	0.8	-9.9	0.0	0.5
21	-0.1602	No	0.0150	1.1	9.9	1.4	9.9	0.0	0.2
22	0.3415	No	0.0137	1.0	5.5	1.1	6.1	0.0	0.3
23	-0.0397	No	0.0146	0.9	-9.9	0.8	-9.9	0.0	0.5
24	-0.3240	No	0.0155	1.0	-0.1	1.0	2.7	0.0	0.4
25	1.5839	No	0.0128	1.2	9.9	1.4	9.9	0.0	0.2
26	0.8121	No	0.0130	1.0	7.4	1.0	5.3	0.0	0.3
27	0.6734	No	0.0132	1.0	7.5	1.1	9.9	0.0	0.3
28	0.1925	No	0.0140	1.0	1.9	1.0	1.3	0.0	0.4
29	0.9628	No	0.0129	1.1	9.9	1.1	9.9	0.0	0.3
30	1.2935	No	0.0128	1.0	-5.3	1.0	-1.6	0.0	0.4
31	-0.2377	No	0.0152	1.0	0.4	1.1	4.6	0.0	0.4
32	0.9352	No	0.0129	1.1	9.9	1.2	9.9	0.0	0.3
33	-0.7233	No	0.0172	1.0	-0.7	1.2	7.5	0.0	0.3
34	0.2318	No	0.0140	1.0	-6.8	0.9	-5.5	0.0	0.4
35	0.0497	No	0.0144	1.0	2.2	1.0	0.7	0.0	0.4
36	0.7623	No	0.0131	1.0	-1.4	1.0	-4.1	0.0	0.4
37	0.6571	No	0.0054	1.1	9.9	1.1	9.9	0.0	0.6
38	0.7922	No	0.0087	0.9	-9.9	0.9	-9.9	0.0	0.6
39	1.2394	No	0.0102	0.9	-9.9	0.9	-9.9	0.0	0.6
40	1.3161	No	0.0092	0.9	-9.9	0.9	-9.9	0.0	0.6
41	1.8223	No	0.0088	0.9	-9.8	0.9	-9.3	0.0	0.6
42	1.6763	No	0.0102	0.9	-9.9	0.9	-9.9	0.0	0.6

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

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

				INFIT		OUTFIT			
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	-1.7935	No	0.0203	1.0	-2.7	0.9	-3.1	0.0	0.3
2	-0.1688	No	0.0136	0.9	-9.9	0.9	-9.9	0.0	0.5
3	0.8751	No	0.0126	0.9	-9.9	0.9	-9.9	0.0	0.5
4	-0.1913	No	0.0136	1.1	7.6	1.1	8.5	0.0	0.3
5	0.2555	No	0.0129	1.0	7.3	1.0	1.5	0.0	0.4
6	0.6420	No	0.0126	1.1	9.9	1.1	9.9	0.0	0.3
7	-0.2231	No	0.0137	1.1	9.9	1.1	7.8	0.0	0.3
8	0.0424	No	0.0132	0.9	-9.9	0.8	-9.9	0.0	0.5
9	0.6687	No	0.0126	1.0	-0.3	1.0	0.2	0.0	0.4
10	0.0449	No	0.0132	1.1	9.9	1.2	9.9	0.0	0.3
11	0.6576	No	0.0126	1.1	9.9	1.1	9.9	0.0	0.4
12	-0.5695	No	0.0146	0.9	-9.9	0.8	-9.9	0.0	0.5
13	-0.7132	No	0.0150	0.8	-9.9	0.7	-9.9	0.0	0.5
14	0.7985	No	0.0126	1.1	9.9	1.2	9.9	0.0	0.3
15	-0.6290	No	0.0148	0.9	-8.9	0.8	-9.9	0.0	0.4
16	0.1808	No	0.0130	0.9	-9.9	0.8	-9.9	0.0	0.5
17	-0.7686	No	0.0152	1.0	2.2	1.0	-1.1	0.0	0.3
18	-0.4347	No	0.0142	1.0	-0.5	1.0	-1.8	0.0	0.4
19	0.0099	No	0.0133	0.9	-9.9	0.9	-9.9	0.0	0.5
20	-0.9593	No	0.0159	1.0	-2.1	1.0	-2.6	0.0	0.4
21	-0.2737	No	0.0138	0.9	-9.9	0.9	-7.7	0.0	0.5
22	-1.5653	No	0.0188	1.0	-0.1	0.9	-2.5	0.0	0.3
23	0.6409	No	0.0126	0.9	-9.9	0.9	-9.9	0.0	0.5
24	-0.1009	No	0.0135	0.9	-9.9	0.9	-9.9	0.0	0.5
25	0.7279	No	0.0126	1.0	5.5	1.0	5.9	0.0	0.4
26	0.4758	No	0.0127	1.0	3.2	1.0	1.6	0.0	0.4
27	-1.4840	No	0.0184	1.0	-0.1	1.0	-0.5	0.0	0.3
28	-0.0281	No	0.0133	1.0	-2.4	1.0	-4.5	0.0	0.4
29	0.0199	No	0.0133	0.9	-9.9	0.8	-9.9	0.0	0.5
30	0.3283	No	0.0128	1.2	9.9	1.3	9.9	0.0	0.2
31	0.4407	No	0.0127	1.2	9.9	1.2	9.9	0.0	0.3
32	0.7117	No	0.0126	1.1	9.9	1.1	9.9	0.0	0.3
33	0.8048	No	0.0126	0.9	-9.9	0.9	-9.9	0.0	0.5
34	0.2640	No	0.0129	0.9	-9.9	0.9	-9.9	0.0	0.5
35	-0.5394	No	0.0145	1.0	-3.3	0.9	-9.7	0.0	0.4
36	-0.3995	No	0.0141	1.0	-5.7	1.0	-0.3	0.0	0.4
37	-0.3373	No	0.0140	1.1	9.9	1.1	9.5	0.0	0.3
38	-0.0514	No	0.0134	1.0	2.4	1.0	2.4	0.0	0.4
39	0.1001	No	0.0131	0.9	-9.9	0.9	-9.9	0.0	0.5
40	0.4523	No	0.0127	0.9	-9.9	0.8	-9.9	0.0	0.5
41	0.4820	No	0.0127	0.9	-9.9	0.9	-9.9	0.0	0.5
42	0.8050	No	0.0066	1.3	9.9	1.4	9.9	0.0	0.5
43	0.0940	No	0.0067	1.5	9.9	1.8	9.9	0.0	0.4
44	0.7081	No	0.0070	1.0	-3.5	1.0	-3.5	0.0	0.6

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

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

				INFIT		OUTFIT			
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	-2.0243	No	0.0208	0.9	-4.2	0.9	-4.8	0	0.3
2	1.0483	No	0.0127	1.0	6.1	1.1	6.9	0	0.4
3	0.9585	No	0.0127	1.1	9.9	1.2	9.9	0	0.3
4	-0.6026	No	0.0143	1.0	-0.1	1.0	-3.2	0	0.4
5	0.4612	No	0.0127	1.0	-4.7	1.0	-6.0	0	0.4
6	0.5421	No	0.0126	0.9	-9.9	0.8	-9.9	0	0.5
7	0.3335	No	0.0128	1.1	9.9	1.2	9.9	0	0.3
8	0.1554	No	0.0129	1.0	3.0	1.0	4.6	0	0.4
9	0.0731	No	0.0130	1.0	-3.4	1.0	-5.8	0	0.4
10	0.2873	No	0.0128	1.0	1.2	1.0	-1.8	0	0.4
11	1.7615	No	0.0136	1.1	9.9	1.3	9.9	0	0.2
12	-1.6914	No	0.0187	1.0	-4.3	1.0	-0.7	0	0.3
13	0.1012	No	0.0130	1.0	5.1	1.1	5.8	0	0.4
14	1.0148	No	0.0127	1.1	9.9	1.2	9.9	0	0.3
15	-0.2171	No	0.0134	1.1	9.9	1.1	9.4	0	0.3
16	0.3925	No	0.0127	0.9	-9.9	0.9	-9.9	0	0.5
17	-1.0781	No	0.0158	0.9	-9.9	0.7	-9.9	0	0.5
18	0.3625	No	0.0127	0.9	-9.9	0.9	-9.6	0	0.5
19	-1.1982	No	0.0163	0.8	-9.9	0.7	-9.9	0	0.5
20	-0.4686	No	0.0139	1.0	-1.1	1.0	1.7	0	0.4
21	0.6157	No	0.0126	1.0	-9.9	0.9	-8.8	0	0.5
22	0.4796	No	0.0127	0.9	-9.9	0.9	-9.9	0	0.5
23	-0.0776	No	0.0132	1.0	-2.6	1.0	-4.8	0	0.4
24	0.9399	No	0.0127	0.9	-9.9	0.9	-9.9	0	0.5
25	0.1688	No	0.0129	1.0	-1.2	1.0	-3.3	0	0.4
26	-1.7636	No	0.0191	1.0	-2.8	0.9	-3.8	0	0.3
27	0.5189	No	0.0127	0.8	-9.9	0.8	-9.9	0	0.6
28	0.2019	No	0.0129	1.0	1.6	1.0	3.2	0	0.4
29	-1.2695	No	0.0166	1.1	6.6	1.2	6.9	0	0.3
30	0.2429	No	0.0128	1.1	9.0	1.1	5.6	0	0.4
31	0.5286	No	0.0127	1.0	-9.9	0.9	-8.5	0	0.5
32	-0.5440	No	0.0141	1.0	-3.4	0.9	-5.5	0	0.4
33	-0.1459	No	0.0133	0.9	-9.9	0.9	-9.9	0	0.5
34	-0.0314	No	0.0131	1.0	1.8	1.0	0.2	0	0.4
35	-0.2694	No	0.0135	1.1	8.0	1.1	9.7	0	0.3
36	-1.7071	No	0.0188	1.0	-0.5	1.2	6.3	0	0.3
37	-1.5084	No	0.0177	1.0	0.5	1.0	0.2	0	0.3
38	0.1759	No	0.0129	1.0	-0.1	1.0	1.4	0	0.4
39	1.1706	No	0.0128	1.3	9.9	1.6	9.9	0	0.1
40	0.7082	No	0.0126	0.9	-9.9	0.9	-9.9	0	0.5
41	0.1776	No	0.0129	0.9	-9.9	0.9	-9.9	0	0.5
42	0.5005	No	0.0070	1.2	9.9	1.2	9.9	0	0.5
43	0.3605	No	0.0070	1.0	0.4	1.0	0.7	0	0.6
44	0.3161	No	0.0070	1.1	9.9	1.1	9.9	0	0.6

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

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

				INFIT		OUTFIT			
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	-0.1473	No	0.0145	1.1	6.7	1.0	2.2	0.0	0.4
2	0.5306	Yes	0.0134	1.0	-7.7	0.9	-8.7	-0.1	0.5
3	-1.1303	No	0.0178	1.0	-0.2	1.1	3.4	0.0	0.3
4	-0.7277	No	0.0161	1.0	-3.5	0.9	-4.7	0.0	0.4
5	0.6656	No	0.0133	0.8	-9.9	0.8	-9.9	0.0	0.6
6	-1.7385	Yes	0.0213	1.0	0.6	1.0	-0.6	0.1	0.3
7	0.8195	No	0.0132	1.2	9.9	1.2	9.9	0.0	0.3
8	-0.8789	No	0.0167	0.9	-9.9	0.8	-9.9	0.0	0.5
9	-0.2114	No	0.0146	0.8	-9.9	0.7	-9.9	0.0	0.6
10	0.8954	No	0.0132	0.9	-9.9	0.9	-9.9	0.0	0.5
11	0.4261	No	0.0135	1.1	9.9	1.1	7.4	0.0	0.4
12	0.3646	No	0.0136	1.0	7.2	1.1	5.3	0.0	0.4
13	0.0407	No	0.0141	0.9	-9.9	0.8	-9.9	0.0	0.6
14	0.0028	No	0.0142	0.8	-9.9	0.7	-9.9	0.0	0.6
15	-1.1252	No	0.0178	0.9	-7.1	0.9	-5.8	0.0	0.4
16	-0.1542	No	0.0145	1.2	9.9	1.3	9.9	0.0	0.3
17	0.3399	No	0.0136	1.0	2.6	1.0	-0.6	0.0	0.4
18	0.1015	No	0.0140	1.0	0.2	1.0	0.4	0.0	0.4
19	0.1572	No	0.0139	0.9	-9.9	0.8	-9.9	0.0	0.6
20	-0.5526	No	0.0156	1.0	-1.1	0.9	-3.3	0.0	0.4
21	-0.0056	Yes	0.0142	1.1	9.9	1.3	9.9	0.1	0.4
22	-1.3002	No	0.0187	1.0	-1.0	1.0	0.0	0.0	0.3
23	1.8583	No	0.0137	1.1	9.9	1.3	9.9	0.0	0.3
24	0.5814	Yes	0.0134	0.8	-9.9	0.7	-9.9	0.0	0.6
25	-0.1391	No	0.0145	1.0	-5.1	0.9	-5.1	0.0	0.5
26	-1.1316	No	0.0178	0.9	-6.3	0.9	-4.7	0.0	0.4
27	-0.4330	No	0.0152	0.9	-8.6	0.8	-9.9	0.0	0.5
28	0.3480	Yes	0.0136	0.9	-9.9	0.9	-9.9	0.0	0.5
29	1.3063	No	0.0132	1.0	3.2	1.1	5.8	0.0	0.4
30	0.4807	No	0.0135	1.1	9.9	1.1	9.9	0.0	0.4
31	-1.2911	No	0.0186	0.9	-6.8	0.9	-6.0	0.0	0.4
32	0.4897	No	0.0135	1.1	9.9	1.1	7.9	0.0	0.4
33	0.0740	No	0.0140	1.0	-0.1	1.0	-4.1	0.0	0.4
34	1.3799	No	0.0132	1.1	9.9	1.2	9.9	0.0	0.4
35	-0.2705	No	0.0148	0.9	-9.9	0.7	-9.9	0.0	0.5
36	-0.5192	No	0.0155	1.1	9.1	1.2	9.3	0.0	0.3
37	0.1667	No	0.0139	1.1	9.9	1.2	9.9	0.0	0.3
38	0.6725	No	0.0133	1.1	9.9	1.1	7.6	0.0	0.4
39	1.6470	No	0.0134	1.0	-1.9	1.0	-3.3	0.0	0.4
40	1.0030	No	0.0132	0.9	-9.9	0.8	-9.9	0.0	0.6
41	0.7997	Yes	0.0132	1.0	-3.5	1.0	-1.6	0.0	0.5
42	1.1249	Yes	0.0069	1.0	4.7	1.1	5.1	0.0	0.6
43	0.5973	No	0.0073	1.2	9.9	1.3	9.9	0.0	0.6
44	1.2721	No	0.0069	1.4	9.9	1.7	9.9	0.0	0.5

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

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

				INFIT		OUTFIT			
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	-1.3837	No	0.0169	1.1	7.1	1.2	9.6	0.0	0.3
2	-0.2665	No	0.0135	1.1	9.3	1.0	2.8	0.0	0.4
3	-0.3708	No	0.0137	0.9	-9.9	0.9	-9.9	0.0	0.5
4	0.4169	No	0.0128	0.9	-9.9	0.9	-9.9	0.0	0.5
5	-0.1247	Yes	0.0133	1.2	9.9	1.4	9.9	0.1	0.3
6	-0.0077	No	0.0131	0.8	-9.9	0.7	-9.9	0.0	0.6
7	-0.0289	No	0.0131	1.0	0.3	1.0	-1.4	0.0	0.4
8	0.6806	Yes	0.0127	1.1	9.9	1.2	9.9	-0.1	0.3
9	1.5197	Yes	0.0132	1.1	9.9	1.3	9.9	-0.2	0.4
10	-1.7603	No	0.0188	0.9	-9.9	0.7	-9.9	0.0	0.4
11	1.0037	No	0.0128	1.0	-0.5	1.0	3.3	0.0	0.4
12	0.0223	Yes	0.0131	1.1	9.7	1.0	3.2	0.2	0.4
13	-0.2769	No	0.0135	1.0	-8.8	0.9	-8.2	0.0	0.5
14	-0.4293	Yes	0.0138	1.0	-4.5	1.0	0.8	0.1	0.5
15	-0.7623	No	0.0146	1.1	9.9	1.1	8.3	0.0	0.3
16	-0.8548	No	0.0149	1.0	3.0	1.1	3.0	0.0	0.4
17	-0.6542	Yes	0.0143	1.0	-3.8	0.9	-9.9	0.2	0.5
18	0.3188	No	0.0128	1.0	-5.7	0.9	-7.0	0.0	0.5
19	1.3418	No	0.0130	1.1	9.9	1.3	9.9	0.0	0.3
20	-0.6464	No	0.0143	0.9	-9.9	0.7	-9.9	0.0	0.5
21	0.1467	Yes	0.0129	1.0	-9.3	0.9	-6.3	-0.2	0.4
22	0.7115	No	0.0127	1.0	-5.1	1.0	-1.8	0.0	0.4
23	0.7237	No	0.0127	1.0	-6.0	1.0	-2.7	0.0	0.5
24	-0.2517	No	0.0135	1.0	-2.7	0.9	-4.9	0.0	0.4
25	0.6885	No	0.0127	1.1	9.9	1.1	9.8	0.0	0.4
26	-0.5181	Yes	0.0140	1.0	-7.1	1.0	-2.5	-0.1	0.4
27	-0.4051	No	0.0138	0.9	-9.9	0.8	-9.9	0.0	0.5
28	0.2464	No	0.0129	1.1	9.9	1.2	9.9	0.0	0.3
29	-0.2813	No	0.0135	0.9	-9.9	1.0	-0.9	0.0	0.5
30	0.4850	No	0.0127	1.0	-2.1	1.0	-1.2	0.0	0.4
31	-0.5319	Yes	0.0140	1.0	3.3	1.0	-3.0	-0.1	0.4
32	-0.2159	No	0.0134	1.0	-6.4	0.9	-8.8	0.0	0.5
33	-0.9403	No	0.0152	0.8	-9.9	0.7	-9.9	0.0	0.5
34	-1.8341	No	0.0193	0.9	-5.4	0.9	-5.4	0.0	0.4
35	-0.3740	No	0.0137	1.1	9.9	1.2	9.9	0.0	0.3
36	-0.9539	Yes	0.0152	0.9	-9.8	0.8	-9.9	0.0	0.4
37	-0.5320	No	0.0140	1.0	-3.9	1.1	6.6	0.0	0.4
38	-0.0877	No	0.0132	1.0	-3.7	1.0	-3.6	0.0	0.4
39	1.0017	No	0.0128	1.0	5.0	1.0	5.3	0.0	0.4
40	1.6951	No	0.0135	0.8	-9.9	0.8	-9.9	0.0	0.5
41	-0.2221	Yes	0.0134	1.1	9.9	1.3	9.9	-0.1	0.3
42	0.8321	Yes	0.0069	1.0	4.3	1.1	5.0	0.1	0.6
43	-0.2035	No	0.0071	1.3	9.9	1.8	9.9	0.0	0.5
44	0.9008	No	0.0086	1.0	4.3	1.0	1.9	0.0	0.5

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

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

				INFIT		OUTFIT			
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	0.9018	No	0.0129	1.0	2.5	1.0	0.9	0.0	0.4
2	-1.5875	No	0.0182	0.9	-9.9	0.7	-9.9	0.0	0.4
3	-0.5220	No	0.0143	0.8	-9.9	0.7	-9.9	0.0	0.5
4	-0.4642	No	0.0142	1.0	2.5	1.0	1.2	0.0	0.4
5	0.3285	No	0.0131	1.1	9.9	1.1	9.7	0.0	0.4
6	1.8131	No	0.0139	1.1	9.9	1.4	9.9	0.0	0.3
7	-0.1683	Yes	0.0136	1.3	9.9	1.6	9.9	0.3	0.3
8	-0.1958	No	0.0137	0.9	-9.9	0.9	-9.9	0.0	0.5
9	-0.4385	Yes	0.0142	1.0	-4.0	0.9	-9.5	0.0	0.4
10	0.0173	No	0.0134	1.1	9.9	1.1	9.9	0.0	0.3
11	-0.0878	Yes	0.0135	0.9	-9.9	0.8	-9.9	-0.1	0.5
12	-0.9510	No	0.0156	0.9	-7.3	0.9	-8.2	0.0	0.4
13	-0.0681	Yes	0.0135	1.0	-6.2	0.9	-8.9	0.1	0.5
14	-0.6770	No	0.0147	0.9	-9.9	0.7	-9.9	0.0	0.5
15	-0.3379	No	0.0140	0.9	-9.9	0.8	-9.9	0.0	0.5
16	-2.1647	No	0.0219	0.9	-8.4	0.6	-9.9	0.0	0.4
17	-0.0520	No	0.0135	1.0	-9.5	0.9	-9.9	0.0	0.5
18	-1.3721	No	0.0172	1.0	-0.1	1.0	0.7	0.0	0.3
19	-0.3385	Yes	0.0140	0.9	-9.6	0.9	-9.4	-0.1	0.5
20	-0.1879	No	0.0137	1.0	2.2	1.0	3.7	0.0	0.4
21	-0.2419	No	0.0138	0.9	-9.9	0.8	-9.9	0.0	0.5
22	0.1755	No	0.0132	0.9	-9.9	0.8	-9.9	0.0	0.5
23	1.8153	No	0.0139	1.2	9.9	1.6	9.9	0.0	0.2
24	-1.3490	No	0.0171	1.0	3.2	1.1	5.7	0.0	0.3
25	0.7431	No	0.0129	1.0	-6.5	1.0	-4.2	0.0	0.5
26	-0.2339	Yes	0.0138	1.2	9.9	1.2	9.9	0.0	0.3
27	0.2022	No	0.0132	0.9	-9.9	0.8	-9.9	0.0	0.5
28	0.4605	No	0.0130	1.1	9.9	1.1	9.9	0.0	0.4
29	-0.4336	No	0.0141	0.9	-9.5	0.8	-9.9	0.0	0.5
30	0.6174	No	0.0129	0.9	-9.9	0.9	-9.9	0.0	0.5
31	-0.3560	Yes	0.0140	1.0	-2.9	1.0	-2.0	-0.1	0.4
32	-0.8989	Yes	0.0154	1.0	4.8	1.0	1.7	0.1	0.4
33	1.6560	No	0.0136	1.2	9.9	1.5	9.9	0.0	0.2
34	0.2827	No	0.0131	1.1	9.9	1.1	9.9	0.0	0.3
35	1.3748	No	0.0133	1.0	5.1	1.1	9.1	0.0	0.4
36	0.2808	Yes	0.0131	1.0	5.5	1.1	7.4	0.1	0.4
37	0.1703	No	0.0132	1.0	5.0	1.0	2.1	0.0	0.4
38	-0.4095	No	0.0141	0.9	-9.9	0.9	-9.0	0.0	0.5
39	1.2101	No	0.0131	1.0	-9.1	0.9	-9.5	0.0	0.5
40	0.1396	No	0.0132	1.0	7.6	1.1	6.5	0.0	0.4
41	-0.5568	No	0.0144	1.1	9.9	1.4	9.9	0.0	0.3
42	0.7060	No	0.0129	0.8	-9.9	0.8	-9.9	0.0	0.6
43	0.6177	No	0.0129	1.0	0.6	1.0	1.0	0.0	0.4
44	1.4481	No	0.0070	0.9	-6.9	0.9	-4.6	0.0	0.6
45	0.4967	Yes	0.0080	1.2	9.9	1.2	9.9	-0.2	0.5
46	0.7632	No	0.0073	1.1	9.9	1.2	9.9	0.0	0.6

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

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

				INFIT		OUTFIT			
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	-0.4962	No	0.0149	0.9	-7.3	1.0	-1.9	0.0	0.5
2	0.0568	Yes	0.0138	1.1	9.9	1.1	8.6	0.1	0.4
3	-0.4761	Yes	0.0149	0.9	-9.9	0.8	-9.9	0.0	0.5
4	0.2313	No	0.0135	1.0	0.5	1.0	4.0	0.0	0.4
5	0.5552	No	0.0132	1.1	9.9	1.1	9.9	0.0	0.4
6	-0.4923	Yes	0.0149	0.9	-9.9	0.8	-9.9	0.1	0.5
7	1.1765	No	0.0131	1.1	9.9	1.1	9.9	0.0	0.4
8	-0.1518	No	0.0141	0.9	-9.9	0.8	-9.9	0.0	0.5
9	-0.2389	No	0.0143	1.0	-8.0	0.9	-9.9	0.0	0.5
10	0.4127	No	0.0133	0.9	-9.9	0.8	-9.9	0.0	0.5
11	1.1216	No	0.0131	1.1	9.3	1.1	9.3	0.0	0.4
12	-0.3815	No	0.0146	0.9	-9.9	0.8	-9.9	0.0	0.5
13	-0.4982	No	0.0150	0.9	-9.9	0.8	-9.9	0.0	0.5
14	0.8685	No	0.0131	1.0	-5.7	1.0	-3.1	0.0	0.5
15	0.1109	No	0.0137	1.1	9.9	1.2	9.9	0.0	0.3
16	-0.0772	Yes	0.0140	1.2	9.9	1.3	9.9	0.2	0.3
17	-1.0983	No	0.0170	0.9	-9.9	0.7	-9.9	0.0	0.5
18	-0.2936	No	0.0144	1.1	9.9	1.2	9.9	0.0	0.3
19	0.9486	Yes	0.0131	1.2	9.9	1.3	9.9	-0.2	0.3
20	0.4274	No	0.0133	1.0	-5.9	0.9	-7.3	0.0	0.5
21	-0.7778	No	0.0158	1.0	-1.3	1.0	-0.9	0.0	0.4
22	0.0069	Yes	0.0138	1.0	6.5	1.2	9.9	-0.1	0.4
23	0.5786	No	0.0132	0.9	-9.9	0.9	-9.9	0.0	0.5
24	0.7246	No	0.0131	1.1	9.9	1.2	9.9	0.0	0.3
25	-0.3662	No	0.0146	1.0	-1.4	0.9	-6.8	0.0	0.4
26	0.2734	No	0.0135	0.9	-9.9	0.9	-9.9	0.0	0.5
27	0.7739	No	0.0131	1.1	9.9	1.2	9.9	0.0	0.3
28	-0.2013	Yes	0.0142	0.9	-9.9	0.8	-9.9	0.1	0.6
29	0.7725	No	0.0131	1.3	9.9	1.4	9.9	0.0	0.2
30	0.0064	No	0.0138	1.0	2.6	1.0	-0.2	0.0	0.4
31	-0.2616	No	0.0144	1.0	-0.6	1.0	1.8	0.0	0.4
32	0.0511	No	0.0138	1.0	-4.5	0.9	-6.5	0.0	0.5
33	0.7394	No	0.0131	1.1	9.9	1.1	9.9	0.0	0.4
34	-0.4937	Yes	0.0149	1.1	6.1	1.0	1.5	0.2	0.4
35	0.6504	No	0.0131	1.0	4.1	1.0	3.2	0.0	0.4
36	-0.3748	No	0.0146	1.0	-3.4	1.0	-1.1	0.0	0.4
37	-0.4076	Yes	0.0147	0.9	-8.1	0.9	-8.7	0.0	0.5
38	0.3258	No	0.0134	0.9	-9.9	0.9	-9.9	0.0	0.5
39	-0.6357	No	0.0153	0.9	-9.9	0.8	-9.9	0.0	0.5
40	-0.0665	No	0.0140	0.8	-9.9	0.8	-9.9	0.0	0.6
41	1.4320	No	0.0133	1.0	4.9	1.0	3.9	0.0	0.4
42	-0.5619	No	0.0151	0.9	-9.9	0.9	-9.3	0.0	0.5
43	1.0980	No	0.0131	0.9	-9.9	0.9	-9.9	0.0	0.5
44	0.8272	No	0.0077	1.1	9.5	1.1	8.7	0.0	0.6
45	-0.0442	Yes	0.0079	1.0	4.3	1.1	9.9	-0.1	0.6
46	0.2217	No	0.0076	1.0	4.6	1.1	6.2	0.0	0.6

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

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

				INFIT		OUTFIT			
Item[1]	Measure	Anchor	Error	MNSQ	ZSTD	MNSQ	ZSTD	Displace	Score Corr.
1	-0.4510	Yes	0.0086	0.7	-9.9	0.5	-9.9	-0.3	0.3
2	0.5480	Yes	0.0061	1.1	9.9	1.1	9.9	0.1	0.3
3	0.8027	No	0.0062	1.1	9.9	1.1	9.9	0.0	0.2
4	0.5865	No	0.0061	1.1	9.9	1.2	9.9	0.0	0.2
5	0.4359	No	0.0062	1.0	-9.9	0.9	-9.9	0.0	0.4
6	-0.2340	Yes	0.0076	1.2	9.9	1.1	9.5	0.2	0.3
7	0.0770	Yes	0.0067	0.9	-9.9	0.9	-9.9	0.0	0.4
8	-0.4200	No	0.0084	0.9	-6.3	0.9	-7.9	0.0	0.3
9	0.2064	No	0.0064	1.0	-3.4	1.0	-5.5	0.0	0.3
10	0.5272	No	0.0061	1.1	9.9	1.1	9.9	0.0	0.2
11	0.3579	No	0.0062	1.0	8.3	1.1	9.7	0.0	0.3
12	0.4557	No	0.0061	1.0	-9.9	0.9	-9.6	0.0	0.4
13	0.2584	No	0.0063	1.0	5.4	1.0	4.2	0.0	0.3
14	0.4370	Yes	0.0062	1.0	-9.9	0.9	-9.9	0.0	0.4
15	0.2073	No	0.0064	1.1	9.9	1.1	9.9	0.0	0.2
16	0.2776	No	0.0063	0.9	-9.9	0.9	-9.9	0.0	0.4
17	0.3569	No	0.0062	1.0	1.0	1.0	4.4	0.0	0.3
18	0.5409	No	0.0061	1.0	6.8	1.0	7.4	0.0	0.3
19	0.4074	No	0.0062	1.1	9.9	1.1	9.9	0.0	0.2
20	-0.0882	No	0.0071	1.0	-0.6	1.0	0.0	0.0	0.3
21	0.0931	No	0.0066	0.9	-9.9	0.8	-9.9	0.0	0.5
22	0.3303	No	0.0063	1.0	-8.6	1.0	-8.0	0.0	0.4
23	0.4406	No	0.0062	1.0	-4.2	1.0	-3.9	0.0	0.3
24	-0.4484	No	0.0086	0.9	-8.4	0.8	-9.9	0.0	0.4
25	0.3262	No	0.0063	1.0	5.2	1.0	4.5	0.0	0.3
26	0.5680	No	0.0061	1.1	9.9	1.2	9.9	0.0	0.2
27	0.9771	No	0.0064	1.1	9.9	1.1	9.9	0.0	0.2
28	0.8711	No	0.0062	1.1	9.9	1.2	9.9	0.0	0.2
29	0.0011	No	0.0069	1.0	-5.8	0.9	-6.9	0.0	0.4
30	0.5846	No	0.0061	1.0	-4.9	1.0	-4.6	0.0	0.3
31	-0.6750	Yes	0.0099	1.1	7.6	0.9	-6.1	0.2	0.4
32	-0.6880	Yes	0.0100	1.1	6.6	1.0	1.6	0.1	0.3
33	-0.1250	Yes	0.0072	1.0	-5.7	0.9	-9.9	0.0	0.4
34	0.5468	Yes	0.0035	1.0	5.5	1.0	4.8	-0.1	0.5
35	0.5969	No	0.0038	1.0	-3.0	1.0	-3.5	0.0	0.5

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

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

Item[1]	Measure	Anchor	Error	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	Displace	Score Corr
1	-0.9634	No	0.0153	0.9	-8.1	0.8	-9.9	0.0	0.4
2	0.3313	Yes	0.0125	0.9	-9.9	0.9	-9.9	-0.2	0.4
3	-0.8477	No	0.0148	1.0	-3.5	1.0	-4.0	0.0	0.3
4	0.4777	No	0.0124	1.1	9.9	1.1	9.9	0.0	0.3
5	0.1687	Yes	0.0126	1.0	5.0	1.0	-1.5	-0.1	0.3
6	-0.4597	No	0.0137	0.9	-9.9	0.8	-9.9	0.0	0.4
7	-0.3407	No	0.0134	0.9	-9.9	0.9	-9.9	0.0	0.4
8	0.1446	Yes	0.0126	1.0	-5.8	1.0	-3.5	0.0	0.4
9	1.0856	No	0.0125	1.0	-7.9	1.0	-2.8	0.0	0.4
10	0.4546	No	0.0124	1.0	-3.9	1.0	-1.9	0.0	0.4
11	0.0509	Yes	0.0127	0.9	-9.9	0.9	-9.9	-0.1	0.4
12	0.3898	No	0.0124	1.2	9.9	1.3	9.9	0.0	0.2
13	1.0255	No	0.0125	1.0	9.0	1.1	9.9	0.0	0.3
14	-0.8045	No	0.0147	1.1	9.9	1.4	9.9	0.0	0.1
15	-0.1761	No	0.0131	0.9	-9.9	0.9	-9.9	0.0	0.4
16	0.4953	No	0.0124	1.0	-6.8	1.0	-7.2	0.0	0.4
17	-0.7727	No	0.0146	1.0	-3.1	1.0	-3.4	0.0	0.3
18	-0.7203	No	0.0144	1.0	-0.7	1.0	-2.2	0.0	0.3
19	-0.1341	Yes	0.0130	1.1	9.8	1.1	8.5	-0.1	0.2
20	-0.3035	No	0.0133	0.9	-9.9	0.9	-9.9	0.0	0.4
21	0.5622	Yes	0.0123	1.1	9.9	1.1	8.8	0.1	0.3
22	0.1894	No	0.0126	1.0	-9.0	0.9	-9.9	0.0	0.4
23	0.1941	No	0.0126	1.1	9.9	1.1	9.9	0.0	0.3
24	1.2555	No	0.0127	1.2	9.9	1.2	9.9	0.0	0.2
25	-0.6981	No	0.0143	1.0	-1.4	1.0	2.8	0.0	0.3
26	-0.5428	No	0.0139	1.0	-4.2	1.0	3.5	0.0	0.3
27	1.0737	No	0.0125	1.0	0.5	1.0	4.3	0.0	0.3
28	0.1100	No	0.0127	0.9	-9.9	0.9	-9.9	0.0	0.4
29	0.4146	No	0.0124	1.0	7.9	1.0	6.6	0.0	0.3
30	-0.1019	No	0.0130	0.9	-9.9	0.9	-9.9	0.0	0.4
31	-0.4673	No	0.0137	0.9	-9.9	0.8	-9.9	0.0	0.5
32	1.0065	No	0.0124	1.2	9.9	1.2	9.9	0.0	0.2
33	-0.0787	Yes	0.0129	1.0	-9.9	0.9	-9.7	0.2	0.4
34	-0.1708	No	0.0131	0.9	-9.9	0.9	-9.9	0.0	0.4
35	-0.1612	No	0.0131	1.0	6.6	1.1	5.4	0.0	0.3
36	1.2661	No	0.0127	1.1	9.9	1.2	9.9	0.0	0.2
37	0.5087	No	0.0124	1.0	-5.2	1.0	-6.1	0.0	0.4
38	1.1330	No	0.0125	1.2	9.9	1.2	9.9	0.0	0.1
39	0.4573	Yes	0.0124	1.0	-7.1	1.0	-8.2	-0.1	0.4
40	0.4700	No	0.0124	1.0	-0.9	1.0	-0.3	0.0	0.3
41	0.3512	No	0.0124	0.9	-9.9	0.9	-9.9	0.0	0.4
42	0.6504	No	0.0123	0.9	-9.9	0.9	-9.9	0.0	0.4
43	1.1021	No	0.0125	1.1	9.9	1.2	9.9	0.0	0.2
44	-1.2470	No	0.0165	0.9	-9.9	0.7	-9.9	0.0	0.4
45	-0.1822	No	0.0131	0.9	-9.9	0.9	-9.9	0.0	0.4
46	0.2893	Yes	0.0125	1.0	8.5	1.1	6.8	0.2	0.3
47	0.3842	No	0.0124	1.1	9.9	1.2	9.9	0.0	0.2
48	-0.1020	Yes	0.0130	1.0	5.8	1.0	3.2	0.2	0.4
49	0.9617	No	0.0067	0.9	-9.9	0.9	-9.9	0.0	0.6
50	1.2100	Yes	0.0062	1.2	9.9	1.3	9.9	0.0	0.5

APPENDIX H
RAW SCORE TO SCALE SCORE CONVERSION TABLES

Language Arts Literacy

Table H.1: LAL Grade 3

LAL Grade 3 2009 Operational							
Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-6.834	1.840	26	204	0.336	0.413
1	100	-5.593	1.026	27	207	0.509	0.418
2	100	-4.845	0.746	28	211	0.686	0.424
3	102	-4.380	0.629	29	215	0.870	0.432
4	109	-4.027	0.564	30	219	1.061	0.442
5	116	-3.733	0.524	31	224	1.261	0.454
6	121	-3.472	0.499	32	228	1.473	0.467
7	126	-3.232	0.483	33	233	1.699	0.483
8	131	-3.004	0.473	34	238	1.940	0.500
9	136	-2.785	0.466	35	244	2.199	0.517
10	141	-2.570	0.461	36	250	2.476	0.535
11	145	-2.359	0.457	37	256	2.771	0.552
12	150	-2.152	0.453	38	263	3.085	0.569
13	154	-1.950	0.447	39	270	3.418	0.585
14	158	-1.752	0.442	40	278	3.770	0.602
15	163	-1.559	0.436	41	286	4.144	0.621
16	167	-1.372	0.430	42	295	4.542	0.641
17	171	-1.190	0.424	43	300	4.968	0.665
18	174	-1.012	0.419	44	300	5.429	0.695
19	178	-0.838	0.415	45	300	5.941	0.739
20	182	-0.667	0.411	46	300	6.534	0.803
21	186	-0.499	0.409	47	300	7.239	0.876
22	189	-0.332	0.408	48	300	8.075	0.957
23	193	-0.167	0.407	49	300	9.153	1.162
24	196	0.000	0.408	50	300	10.585	1.907
25	200	0.167	0.410				

Table H.2: LAL Grade 4

LAL Grade 4 2009 Operational							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.977	1.809	30	194	0.043	0.331
1	100	-4.808	0.980	31	197	0.153	0.333
2	100	-4.143	0.694	32	200	0.265	0.336
3	100	-3.748	0.574	33	203	0.379	0.339
4	102	-3.459	0.507	34	206	0.496	0.343
5	108	-3.223	0.465	35	209	0.615	0.348
6	113	-3.020	0.437	36	212	0.738	0.354
7	118	-2.838	0.418	37	216	0.866	0.360
8	123	-2.670	0.404	38	219	0.998	0.368
9	127	-2.511	0.393	39	223	1.137	0.376
10	131	-2.360	0.385	40	227	1.282	0.386
11	135	-2.214	0.379	41	231	1.435	0.397
12	138	-2.073	0.373	42	235	1.598	0.410
13	142	-1.935	0.368	43	240	1.772	0.424
14	145	-1.801	0.364	44	245	1.958	0.440
15	149	-1.670	0.360	45	250	2.159	0.458
16	152	-1.542	0.355	46	256	2.378	0.478
17	156	-1.417	0.351	47	262	2.617	0.501
18	159	-1.295	0.347	48	269	2.882	0.528
19	162	-1.176	0.344	49	277	3.177	0.559
20	165	-1.059	0.340	50	286	3.509	0.595
21	168	-0.944	0.337	51	296	3.886	0.633
22	171	-0.831	0.335	52	300	4.311	0.670
23	174	-0.720	0.333	53	300	4.784	0.706
24	177	-0.610	0.331	54	300	5.310	0.747
25	180	-0.500	0.330	55	300	5.913	0.812
26	183	-0.392	0.329	56	300	6.664	0.932
27	186	-0.284	0.329	57	300	7.710	1.116
28	188	-0.175	0.329	58	300	9.177	1.321
29	191	-0.067	0.330	59	300	10.860	1.988

Table H.3: LAL Grade 4: Braille

LAL Grade 4 2009 Braille							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.964	1.808	30	196	0.113	0.337
1	100	-4.796	0.980	31	200	0.227	0.339
2	100	-4.131	0.694	32	202	0.343	0.343
3	100	-3.736	0.574	33	205	0.462	0.346
4	102	-3.446	0.508	34	208	0.583	0.351
5	108	-3.211	0.466	35	212	0.708	0.356
6	114	-3.007	0.438	36	215	0.838	0.363
7	118	-2.823	0.419	37	219	0.972	0.370
8	123	-2.654	0.405	38	222	1.112	0.379
9	127	-2.493	0.395	39	226	1.259	0.388
10	131	-2.340	0.387	40	230	1.414	0.399
11	135	-2.193	0.381	41	235	1.579	0.412
12	139	-2.049	0.376	42	239	1.754	0.426
13	143	-1.910	0.371	43	244	1.942	0.442
14	146	-1.773	0.367	44	250	2.144	0.459
15	150	-1.640	0.363	45	255	2.365	0.480
16	153	-1.510	0.359	46	262	2.606	0.503
17	156	-1.383	0.355	47	269	2.872	0.530
18	160	-1.258	0.351	48	277	3.169	0.561
19	163	-1.137	0.347	49	285	3.503	0.596
20	166	-1.017	0.344	50	295	3.881	0.634
21	169	-0.900	0.341	51	300	4.307	0.671
22	172	-0.784	0.339	52	300	4.782	0.706
23	175	-0.671	0.337	53	300	5.308	0.747
24	178	-0.558	0.335	54	300	5.911	0.812
25	181	-0.446	0.334	55	300	6.663	0.932
26	184	-0.335	0.333	56	300	7.710	1.117
27	187	-0.224	0.333	57	300	9.177	1.321
28	190	-0.112	0.334	58	300	10.860	1.988
29	193	0.000	0.335				

Table H.4: LAL Grade 5

LAL Grade 5 2009 Operational							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.998	1.848	32	186	-0.204	0.312
1	100	-4.740	1.036	33	189	-0.106	0.314
2	100	-3.978	0.751	34	192	-0.008	0.315
3	100	-3.513	0.622	35	195	0.092	0.317
4	102	-3.177	0.542	36	197	0.193	0.319
5	109	-2.916	0.483	37	200	0.296	0.321
6	115	-2.705	0.437	38	203	0.399	0.324
7	120	-2.531	0.399	39	206	0.505	0.327
8	124	-2.384	0.369	40	209	0.613	0.330
9	128	-2.257	0.344	41	213	0.723	0.334
10	131	-2.145	0.325	42	216	0.837	0.339
11	134	-2.045	0.310	43	219	0.953	0.344
12	137	-1.952	0.298	44	222	1.073	0.350
13	139	-1.866	0.290	45	226	1.198	0.357
14	141	-1.784	0.284	46	230	1.328	0.365
15	144	-1.704	0.281	47	234	1.465	0.374
16	146	-1.626	0.279	48	238	1.609	0.385
17	148	-1.548	0.279	49	242	1.762	0.398
18	150	-1.469	0.281	50	250	1.926	0.412
19	152	-1.390	0.283	51	252	2.102	0.427
20	155	-1.308	0.287	52	257	2.291	0.442
21	157	-1.225	0.290	53	263	2.492	0.455
22	160	-1.140	0.294	54	269	2.705	0.468
23	162	-1.052	0.298	55	275	2.931	0.483
24	165	-0.962	0.301	56	282	3.173	0.502
25	167	-0.871	0.304	57	290	3.440	0.533
26	170	-0.778	0.306	58	299	3.752	0.588
27	173	-0.684	0.307	59	300	4.155	0.691
28	175	-0.590	0.308	60	300	4.765	0.885
29	178	-0.494	0.309	61	300	5.781	1.118
30	181	-0.398	0.310	62	300	7.269	1.340
31	183	-0.302	0.311	63	300	8.995	2.004

Table H.5: LAL Grade 5: Braille

LAL Grade 5 2009 Braille							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.997	1.849	27	188	-0.136	0.335
1	100	-4.734	1.040	28	191	-0.023	0.336
2	100	-3.964	0.757	29	195	0.090	0.338
3	100	-3.489	0.632	30	200	0.205	0.341
4	103	-3.138	0.556	31	201	0.323	0.344
5	111	-2.859	0.502	32	205	0.443	0.348
6	117	-2.629	0.460	33	208	0.566	0.353
7	123	-2.434	0.425	34	212	0.692	0.359
8	128	-2.266	0.396	35	215	0.823	0.365
9	132	-2.118	0.372	36	219	0.959	0.372
10	136	-1.987	0.353	37	223	1.101	0.380
11	139	-1.868	0.339	38	227	1.248	0.388
12	142	-1.756	0.329	39	232	1.403	0.399
13	145	-1.650	0.323	40	236	1.567	0.411
14	148	-1.547	0.320	41	241	1.742	0.427
15	151	-1.444	0.320	42	250	1.932	0.447
16	154	-1.341	0.321	43	253	2.143	0.471
17	157	-1.237	0.324	44	260	2.378	0.500
18	160	-1.131	0.327	45	267	2.643	0.529
19	163	-1.024	0.329	46	275	2.938	0.557
20	166	-0.915	0.331	47	285	3.264	0.585
21	169	-0.804	0.333	48	295	3.629	0.628
22	172	-0.693	0.333	49	300	4.076	0.721
23	175	-0.582	0.334	50	300	4.727	0.907
24	179	-0.471	0.334	51	300	5.774	1.125
25	182	-0.359	0.334	52	300	7.268	1.340
26	185	-0.248	0.334	53	300	8.995	2.004

Table H.6: LAL Grade 5 : Alternate

LAL Grade 5 2009 Alternate							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.838	1.854	27	187	-0.188	0.354
1	100	-4.564	1.047	28	190	-0.062	0.356
2	100	-3.783	0.761	29	194	0.066	0.359
3	100	-3.307	0.628	30	200	0.196	0.361
4	108	-2.967	0.542	31	201	0.327	0.365
5	115	-2.708	0.477	32	205	0.462	0.368
6	121	-2.505	0.427	33	209	0.599	0.373
7	126	-2.339	0.388	34	213	0.739	0.377
8	129	-2.200	0.358	35	217	0.884	0.383
9	133	-2.080	0.336	36	221	1.033	0.390
10	136	-1.973	0.321	37	226	1.188	0.398
11	139	-1.873	0.310	38	230	1.350	0.407
12	141	-1.780	0.303	39	235	1.521	0.419
13	144	-1.690	0.299	40	240	1.702	0.433
14	147	-1.600	0.298	41	250	1.896	0.449
15	149	-1.511	0.300	42	252	2.105	0.465
16	152	-1.420	0.304	43	258	2.329	0.480
17	154	-1.325	0.310	44	265	2.565	0.492
18	157	-1.227	0.316	45	272	2.813	0.503
19	160	-1.125	0.323	46	279	3.073	0.518
20	163	-1.019	0.330	47	287	3.354	0.544
21	166	-0.908	0.336	48	296	3.675	0.595
22	169	-0.793	0.341	49	300	4.084	0.695
23	173	-0.676	0.344	50	300	4.702	0.893
24	176	-0.556	0.347	51	300	5.745	1.133
25	180	-0.435	0.350	52	300	7.257	1.345
26	183	-0.312	0.352	53	300	8.990	2.005

Table H.7: LAL Grade 6

LAL Grade 6 2009 Operational							
Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.935	1.830	36	197	0.329	0.302
1	100	-4.720	1.008	37	200	0.421	0.303
2	100	-4.011	0.719	38	202	0.513	0.304
3	100	-3.588	0.593	39	204	0.606	0.306
4	104	-3.282	0.519	40	207	0.700	0.308
5	110	-3.038	0.470	41	209	0.795	0.310
6	115	-2.834	0.435	42	212	0.892	0.313
7	120	-2.656	0.409	43	214	0.991	0.316
8	124	-2.498	0.388	44	217	1.092	0.319
9	128	-2.354	0.372	45	220	1.195	0.323
10	131	-2.220	0.359	46	222	1.300	0.327
11	134	-2.095	0.349	47	225	1.408	0.331
12	137	-1.977	0.340	48	228	1.519	0.336
13	140	-1.863	0.333	49	231	1.634	0.342
14	143	-1.754	0.328	50	234	1.753	0.349
15	146	-1.648	0.323	51	237	1.878	0.356
16	149	-1.545	0.320	52	241	2.008	0.365
17	151	-1.443	0.317	53	244	2.144	0.374
18	154	-1.344	0.315	54	250	2.288	0.385
19	156	-1.245	0.313	55	252	2.441	0.396
20	159	-1.148	0.311	56	256	2.601	0.406
21	161	-1.051	0.310	57	260	2.770	0.416
22	164	-0.956	0.309	58	265	2.947	0.424
23	166	-0.861	0.308	59	270	3.129	0.430
24	169	-0.766	0.307	60	275	3.317	0.435
25	171	-0.673	0.306	61	279	3.508	0.439
26	174	-0.580	0.305	62	285	3.703	0.444
27	176	-0.487	0.304	63	290	3.903	0.453
28	178	-0.395	0.303	64	295	4.114	0.467
29	181	-0.304	0.302	65	300	4.342	0.490
30	183	-0.213	0.301	66	300	4.600	0.529
31	185	-0.122	0.301	67	300	4.913	0.596
32	188	-0.032	0.300	68	300	5.338	0.721
33	190	0.058	0.300	69	300	6.056	1.018
34	192	0.148	0.300	70	300	7.297	1.845
35	195	0.239	0.301				

Table H.8: LAL Grade 7

LAL Grade 7 2009 Operational							
Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.987	1.830	36	200	-0.010	0.290
1	100	-4.773	1.007	37	201	0.075	0.292
2	100	-4.065	0.717	38	204	0.160	0.294
3	100	-3.644	0.590	39	207	0.247	0.296
4	100	-3.342	0.515	40	209	0.335	0.298
5	100	-3.104	0.464	41	212	0.425	0.301
6	102	-2.905	0.428	42	215	0.516	0.304
7	108	-2.734	0.401	43	219	0.609	0.307
8	113	-2.583	0.379	44	222	0.705	0.311
9	118	-2.445	0.363	45	225	0.803	0.315
10	122	-2.318	0.349	46	228	0.904	0.320
11	126	-2.200	0.338	47	232	1.008	0.326
12	129	-2.089	0.329	48	235	1.116	0.332
13	133	-1.983	0.322	49	239	1.228	0.338
14	136	-1.882	0.316	50	243	1.345	0.345
15	139	-1.784	0.310	51	250	1.466	0.351
16	143	-1.689	0.306	52	251	1.592	0.358
17	146	-1.597	0.302	53	255	1.722	0.365
18	149	-1.507	0.299	54	260	1.858	0.372
19	151	-1.418	0.296	55	265	2.000	0.380
20	154	-1.332	0.293	56	269	2.147	0.388
21	157	-1.246	0.291	57	274	2.301	0.397
22	160	-1.162	0.290	58	280	2.462	0.407
23	163	-1.078	0.288	59	285	2.632	0.418
24	165	-0.995	0.287	60	291	2.813	0.432
25	168	-0.913	0.286	61	298	3.007	0.449
26	171	-0.831	0.286	62	300	3.218	0.471
27	174	-0.750	0.285	63	300	3.453	0.500
28	176	-0.669	0.285	64	300	3.721	0.539
29	179	-0.587	0.285	65	300	4.039	0.590
30	182	-0.506	0.285	66	300	4.427	0.658
31	184	-0.424	0.286	67	300	4.920	0.749
32	187	-0.342	0.286	68	300	5.582	0.887
33	190	-0.260	0.287	69	300	6.597	1.165
34	193	-0.177	0.288	70	300	8.063	1.928
35	195	-0.094	0.289				

Table H.9: LAL Grade 8

LAL Grade 8 2009 Operational							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.422	1.829	36	202	0.423	0.294
1	100	-4.210	1.005	37	204	0.510	0.296
2	114	-3.507	0.714	38	206	0.597	0.297
3	123	-3.093	0.585	39	208	0.687	0.300
4	130	-2.797	0.508	40	210	0.777	0.303
5	135	-2.566	0.455	41	212	0.870	0.306
6	139	-2.377	0.416	42	214	0.965	0.310
7	143	-2.216	0.386	43	216	1.062	0.314
8	146	-2.077	0.362	44	218	1.163	0.319
9	149	-1.952	0.343	45	221	1.266	0.325
10	151	-1.840	0.328	46	223	1.374	0.332
11	154	-1.736	0.317	47	226	1.486	0.339
12	156	-1.638	0.308	48	228	1.604	0.346
13	158	-1.545	0.302	49	231	1.726	0.354
14	160	-1.455	0.298	50	234	1.855	0.363
15	162	-1.367	0.296	51	237	1.990	0.372
16	164	-1.280	0.294	52	240	2.131	0.381
17	166	-1.194	0.293	53	243	2.280	0.389
18	168	-1.108	0.293	54	247	2.435	0.398
19	170	-1.022	0.293	55	250	2.596	0.406
20	171	-0.936	0.293	56	254	2.765	0.415
21	173	-0.850	0.293	57	258	2.941	0.424
22	175	-0.765	0.292	58	262	3.125	0.434
23	177	-0.679	0.292	59	266	3.318	0.445
24	179	-0.594	0.292	60	271	3.522	0.458
25	181	-0.509	0.291	61	276	3.738	0.472
26	183	-0.425	0.291	62	281	3.968	0.488
27	185	-0.340	0.291	63	287	4.216	0.510
28	187	-0.256	0.290	64	293	4.491	0.541
29	189	-0.171	0.290	65	300	4.807	0.585
30	190	-0.087	0.290	66	300	5.185	0.646
31	192	-0.003	0.290	67	300	5.654	0.726
32	194	0.082	0.291	68	300	6.262	0.843
33	196	0.166	0.291	69	300	7.168	1.101
34	198	0.251	0.292	70	300	8.519	1.881
35	200	0.337	0.293				

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Table H.10: Mathematics Grade 3

Mathematics Grade 3 2009							
Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.257	1.836	26	200	0.200	0.286
1	100	-4.025	1.019	27	203	0.281	0.285
2	100	-3.293	0.734	28	206	0.363	0.286
3	100	-2.849	0.610	29	209	0.444	0.286
4	100	-2.523	0.537	30	213	0.527	0.287
5	105	-2.262	0.488	31	216	0.610	0.289
6	113	-2.042	0.452	32	219	0.694	0.292
7	121	-1.850	0.425	33	223	0.781	0.296
8	127	-1.679	0.403	34	226	0.869	0.300
9	133	-1.524	0.385	35	229	0.961	0.305
10	139	-1.381	0.371	36	233	1.056	0.312
11	144	-1.248	0.358	37	237	1.155	0.319
12	149	-1.124	0.348	38	241	1.260	0.328
13	153	-1.006	0.338	39	245	1.371	0.339
14	158	-0.894	0.330	40	250	1.490	0.351
15	162	-0.788	0.323	41	255	1.619	0.367
16	166	-0.685	0.317	42	260	1.760	0.385
17	170	-0.586	0.312	43	267	1.916	0.407
18	173	-0.491	0.307	44	273	2.093	0.436
19	177	-0.398	0.302	45	281	2.299	0.473
20	180	-0.308	0.299	46	291	2.546	0.523
21	184	-0.220	0.295	47	300	2.857	0.598
22	187	-0.133	0.292	48	300	3.286	0.724
23	190	-0.048	0.290	49	300	4.003	1.012
24	194	0.035	0.288	50	300	5.224	1.832
25	197	0.118	0.287				

Table H.11: Mathematics Grade 4

Mathematics Grade 4 2009 Operational							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.427	1.839	26	203	0.171	0.294
1	100	-4.189	1.024	27	206	0.257	0.295
2	100	-3.448	0.740	28	210	0.345	0.296
3	100	-2.995	0.617	29	213	0.432	0.297
4	100	-2.660	0.545	30	216	0.521	0.299
5	109	-2.390	0.497	31	220	0.611	0.302
6	117	-2.161	0.461	32	223	0.703	0.305
7	124	-1.961	0.434	33	226	0.797	0.308
8	131	-1.783	0.412	34	230	0.894	0.313
9	137	-1.621	0.394	35	234	0.993	0.318
10	142	-1.471	0.379	36	237	1.096	0.324
11	148	-1.333	0.366	37	241	1.204	0.332
12	152	-1.203	0.355	38	246	1.317	0.340
13	157	-1.081	0.345	39	250	1.436	0.350
14	161	-0.965	0.336	40	255	1.563	0.363
15	165	-0.854	0.329	41	260	1.700	0.377
16	169	-0.749	0.322	42	265	1.848	0.395
17	173	-0.647	0.316	43	271	2.012	0.416
18	177	-0.548	0.311	44	278	2.197	0.444
19	180	-0.453	0.307	45	286	2.410	0.480
20	184	-0.360	0.303	46	295	2.663	0.529
21	187	-0.268	0.301	47	300	2.981	0.603
22	190	-0.179	0.298	48	300	3.417	0.728
23	194	-0.090	0.296	49	300	4.141	1.015
24	197	-0.003	0.295	50	300	5.367	1.834
25	200	0.084	0.295				

Table H.12: Mathematics Grade 5

Mathematics Grade 5 2009 Operational							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.205	1.837	26	209	0.417	0.302
1	100	-3.973	1.020	27	212	0.508	0.302
2	100	-3.238	0.736	28	215	0.599	0.301
3	106	-2.792	0.612	29	217	0.690	0.301
4	116	-2.463	0.540	30	220	0.780	0.301
5	125	-2.198	0.491	31	223	0.871	0.302
6	132	-1.974	0.457	32	226	0.963	0.303
7	138	-1.778	0.430	33	229	1.055	0.305
8	144	-1.603	0.409	34	232	1.148	0.307
9	149	-1.442	0.392	35	235	1.244	0.310
10	154	-1.294	0.378	36	238	1.341	0.314
11	158	-1.156	0.366	37	242	1.442	0.320
12	162	-1.025	0.356	38	245	1.546	0.327
13	166	-0.901	0.348	39	250	1.655	0.335
14	170	-0.783	0.341	40	252	1.771	0.346
15	174	-0.669	0.334	41	256	1.895	0.359
16	177	-0.559	0.329	42	261	2.030	0.376
17	181	-0.452	0.324	43	265	2.180	0.398
18	184	-0.349	0.320	44	271	2.349	0.426
19	187	-0.247	0.317	45	277	2.546	0.463
20	191	-0.148	0.313	46	285	2.783	0.514
21	194	-0.051	0.311	47	294	3.085	0.590
22	197	0.045	0.308	48	300	3.506	0.718
23	200	0.139	0.306	49	300	4.215	1.009
24	203	0.233	0.305	50	300	5.432	1.831
25	206	0.325	0.303				

Table H.13: Mathematics Grade 5: Braille

Mathematics Grade 5 2009 Braille							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.194	1.837	24	205	0.304	0.315
1	100	-3.961	1.021	25	208	0.403	0.314
2	100	-3.226	0.736	26	211	0.502	0.315
3	106	-2.778	0.613	27	215	0.601	0.315
4	117	-2.448	0.541	28	218	0.701	0.316
5	125	-2.182	0.493	29	221	0.801	0.318
6	132	-1.957	0.458	30	224	0.903	0.320
7	139	-1.760	0.432	31	228	1.007	0.323
8	144	-1.582	0.411	32	231	1.113	0.327
9	150	-1.421	0.394	33	235	1.221	0.332
10	155	-1.271	0.380	34	238	1.334	0.339
11	159	-1.131	0.369	35	242	1.451	0.347
12	163	-0.998	0.359	36	246	1.575	0.357
13	167	-0.872	0.351	37	250	1.707	0.370
14	171	-0.751	0.344	38	255	1.849	0.386
15	175	-0.635	0.338	39	260	2.006	0.407
16	179	-0.522	0.333	40	265	2.182	0.434
17	182	-0.412	0.329	41	272	2.385	0.470
18	186	-0.305	0.325	42	280	2.629	0.520
19	189	-0.201	0.322	43	290	2.938	0.595
20	192	-0.097	0.320	44	300	3.365	0.723
21	195	0.004	0.318	45	300	4.081	1.012
22	200	0.105	0.316	46	300	5.302	1.833
23	202	0.205	0.315				

Table H.14: Mathematics Grade 6

Mathematics Grade 6 2009 Operational							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.408	1.836	26	200	0.105	0.299
1	100	-4.176	1.019	27	203	0.195	0.301
2	100	-3.444	0.734	28	206	0.286	0.302
3	102	-3.000	0.610	29	209	0.378	0.305
4	113	-2.674	0.537	30	212	0.472	0.307
5	121	-2.412	0.488	31	215	0.568	0.311
6	128	-2.192	0.453	32	218	0.665	0.315
7	134	-1.999	0.426	33	221	0.766	0.320
8	139	-1.827	0.404	34	224	0.870	0.325
9	144	-1.671	0.387	35	228	0.978	0.332
10	149	-1.527	0.372	36	231	1.090	0.338
11	153	-1.394	0.360	37	235	1.207	0.346
12	157	-1.268	0.349	38	239	1.330	0.355
13	161	-1.149	0.340	39	243	1.459	0.364
14	164	-1.036	0.333	40	250	1.596	0.375
15	168	-0.928	0.326	41	252	1.741	0.387
16	171	-0.823	0.320	42	257	1.896	0.401
17	174	-0.723	0.315	43	262	2.063	0.418
18	177	-0.625	0.311	44	268	2.247	0.441
19	180	-0.529	0.307	45	274	2.454	0.471
20	183	-0.436	0.304	46	282	2.697	0.516
21	186	-0.344	0.302	47	291	2.997	0.586
22	189	-0.253	0.301	48	300	3.409	0.710
23	192	-0.163	0.299	49	300	4.105	1.000
24	195	-0.073	0.299	50	300	5.309	1.826
25	197	0.016	0.299				

Table H.15: Mathematics Grade 6: Braille

Mathematics Grade 6 2009 Braille							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.331	1.836	24	197	0.005	0.302
1	100	-4.100	1.019	25	200	0.096	0.302
2	100	-3.368	0.734	26	203	0.188	0.303
3	105	-2.924	0.610	27	206	0.280	0.305
4	115	-2.598	0.537	28	209	0.374	0.308
5	123	-2.336	0.488	29	212	0.470	0.311
6	130	-2.116	0.452	30	215	0.568	0.315
7	136	-1.924	0.425	31	218	0.669	0.320
8	142	-1.752	0.404	32	221	0.773	0.326
9	147	-1.597	0.386	33	225	0.881	0.332
10	151	-1.454	0.371	34	228	0.994	0.340
11	155	-1.320	0.359	35	232	1.112	0.349
12	159	-1.195	0.349	36	236	1.238	0.360
13	163	-1.076	0.340	37	240	1.372	0.373
14	167	-0.963	0.332	38	245	1.516	0.387
15	170	-0.855	0.326	39	250	1.673	0.405
16	173	-0.751	0.320	40	255	1.846	0.427
17	176	-0.650	0.315	41	261	2.040	0.455
18	180	-0.552	0.311	42	268	2.263	0.490
19	183	-0.456	0.308	43	277	2.527	0.540
20	186	-0.362	0.306	44	287	2.856	0.612
21	188	-0.269	0.304	45	300	3.303	0.736
22	191	-0.177	0.302	46	300	4.039	1.021
23	194	-0.086	0.302	47	300	5.273	1.837

Table H.16: Mathematics Grade 6: Alternate

Mathematics Grade 6 2009 Alternate							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.441	1.836	26	200	0.044	0.297
1	100	-4.211	1.019	27	201	0.132	0.298
2	100	-3.481	0.733	28	204	0.222	0.300
3	101	-3.038	0.609	29	207	0.312	0.302
4	111	-2.713	0.536	30	210	0.404	0.305
5	120	-2.453	0.487	31	213	0.498	0.308
6	127	-2.233	0.451	32	216	0.594	0.312
7	133	-2.042	0.424	33	219	0.693	0.317
8	138	-1.871	0.403	34	222	0.796	0.323
9	143	-1.716	0.385	35	225	0.902	0.329
10	147	-1.574	0.371	36	229	1.012	0.336
11	152	-1.441	0.358	37	233	1.128	0.344
12	155	-1.316	0.348	38	236	1.249	0.353
13	159	-1.198	0.339	39	240	1.377	0.363
14	163	-1.086	0.331	40	245	1.513	0.374
15	166	-0.979	0.325	41	250	1.657	0.386
16	169	-0.875	0.319	42	254	1.812	0.401
17	172	-0.775	0.314	43	259	1.980	0.418
18	176	-0.678	0.309	44	265	2.164	0.441
19	179	-0.584	0.306	45	272	2.371	0.470
20	181	-0.491	0.303	46	279	2.612	0.514
21	184	-0.400	0.301	47	289	2.909	0.583
22	187	-0.310	0.299	48	300	3.317	0.706
23	190	-0.221	0.298	49	300	4.004	0.996
24	193	-0.133	0.297	50	300	5.201	1.823
25	196	-0.045	0.297				

Table H.17: Mathematics Grade 7

Mathematics Grade 7 2009 Operational							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.413	1.838	27	200	0.278	0.302
1	100	-4.179	1.021	28	203	0.369	0.303
2	100	-3.443	0.737	29	206	0.461	0.303
3	100	-2.995	0.613	30	209	0.553	0.304
4	100	-2.666	0.540	31	212	0.646	0.305
5	109	-2.401	0.491	32	215	0.739	0.306
6	117	-2.178	0.456	33	219	0.833	0.308
7	123	-1.983	0.429	34	222	0.929	0.310
8	129	-1.808	0.408	35	225	1.026	0.313
9	135	-1.649	0.390	36	228	1.124	0.316
10	140	-1.502	0.376	37	232	1.225	0.319
11	144	-1.366	0.364	38	235	1.328	0.324
12	149	-1.237	0.354	39	239	1.435	0.330
13	153	-1.115	0.345	40	243	1.546	0.337
14	157	-0.998	0.338	41	250	1.663	0.346
15	160	-0.886	0.332	42	251	1.786	0.356
16	164	-0.778	0.326	43	255	1.917	0.370
17	168	-0.673	0.321	44	260	2.060	0.387
18	171	-0.571	0.317	45	265	2.218	0.408
19	174	-0.472	0.314	46	271	2.396	0.436
20	178	-0.374	0.311	47	278	2.601	0.472
21	181	-0.278	0.309	48	287	2.847	0.523
22	184	-0.184	0.307	49	297	3.158	0.597
23	187	-0.090	0.305	50	300	3.588	0.724
24	190	0.002	0.304	51	300	4.306	1.013
25	194	0.095	0.303	52	300	5.528	1.833
26	197	0.186	0.303				

Table H.18: Mathematics Grade 7: Braille

Mathematics Grade 7 2009 Braille							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.410	1.838	25	195	0.124	0.309
1	100	-4.175	1.022	26	200	0.220	0.309
2	100	-3.439	0.737	27	201	0.315	0.310
3	100	-2.991	0.613	28	204	0.412	0.311
4	100	-2.661	0.540	29	208	0.509	0.313
5	109	-2.396	0.492	30	211	0.607	0.315
6	117	-2.172	0.456	31	214	0.708	0.318
7	123	-1.977	0.429	32	218	0.810	0.321
8	129	-1.802	0.408	33	221	0.914	0.326
9	135	-1.642	0.391	34	225	1.022	0.331
10	140	-1.495	0.377	35	229	1.133	0.336
11	144	-1.358	0.365	36	233	1.248	0.343
12	149	-1.228	0.355	37	237	1.369	0.351
13	153	-1.105	0.346	38	241	1.495	0.361
14	157	-0.988	0.339	39	246	1.629	0.372
15	161	-0.875	0.333	40	250	1.773	0.386
16	164	-0.766	0.328	41	256	1.928	0.402
17	168	-0.660	0.323	42	261	2.097	0.423
18	172	-0.557	0.319	43	268	2.287	0.450
19	175	-0.456	0.316	44	275	2.505	0.485
20	178	-0.357	0.314	45	284	2.762	0.533
21	182	-0.259	0.312	46	295	3.084	0.606
22	185	-0.162	0.310	47	300	3.523	0.730
23	188	-0.066	0.309	48	300	4.250	1.017
24	191	0.029	0.309	49	300	5.477	1.835

Table H.19: Mathematics Grade 7: Alternate

Mathematics Grade 7 Alternate							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.467	1.837	27	200	0.235	0.304
1	100	-4.233	1.021	28	201	0.328	0.305
2	100	-3.498	0.736	29	205	0.421	0.305
3	100	-3.051	0.612	30	208	0.514	0.306
4	100	-2.722	0.540	31	211	0.608	0.307
5	107	-2.458	0.491	32	214	0.703	0.309
6	115	-2.235	0.456	33	217	0.799	0.310
7	121	-2.039	0.429	34	221	0.895	0.312
8	127	-1.865	0.408	35	224	0.994	0.315
9	133	-1.706	0.391	36	227	1.094	0.318
10	138	-1.559	0.376	37	231	1.196	0.322
11	142	-1.422	0.365	38	234	1.301	0.326
12	147	-1.292	0.355	39	238	1.409	0.332
13	151	-1.170	0.346	40	242	1.522	0.339
14	155	-1.053	0.339	41	246	1.639	0.347
15	159	-0.940	0.332	42	250	1.764	0.358
16	162	-0.831	0.327	43	255	1.897	0.371
17	166	-0.726	0.322	44	259	2.041	0.388
18	169	-0.623	0.319	45	265	2.199	0.410
19	173	-0.523	0.315	46	271	2.378	0.437
20	176	-0.425	0.312	47	278	2.585	0.473
21	179	-0.328	0.310	48	286	2.832	0.524
22	183	-0.232	0.308	49	297	3.144	0.599
23	186	-0.138	0.307	50	300	3.575	0.725
24	189	-0.044	0.306	51	300	4.295	1.013
25	192	0.049	0.305	52	300	5.518	1.833
26	195	0.142	0.305				

Table H.20: Mathematics Grade 8

Mathematics Grade 8 2009 Operational							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.116	1.832	27	195	0.221	0.286
1	100	-3.895	1.012	28	200	0.303	0.287
2	100	-3.177	0.724	29	201	0.386	0.288
3	100	-2.746	0.599	30	204	0.469	0.290
4	100	-2.433	0.525	31	207	0.553	0.292
5	108	-2.185	0.475	32	210	0.639	0.294
6	115	-1.977	0.439	33	214	0.727	0.298
7	122	-1.796	0.411	34	217	0.817	0.301
8	128	-1.636	0.390	35	220	0.909	0.306
9	133	-1.491	0.372	36	224	1.004	0.311
10	138	-1.358	0.357	37	227	1.102	0.317
11	142	-1.235	0.345	38	231	1.204	0.323
12	146	-1.119	0.335	39	235	1.311	0.331
13	150	-1.010	0.326	40	239	1.424	0.340
14	154	-0.906	0.319	41	243	1.543	0.351
15	158	-0.807	0.312	42	250	1.670	0.363
16	161	-0.711	0.307	43	253	1.807	0.378
17	165	-0.619	0.302	44	258	1.956	0.395
18	168	-0.529	0.298	45	264	2.121	0.417
19	171	-0.441	0.295	46	271	2.306	0.445
20	174	-0.355	0.292	47	279	2.519	0.481
21	177	-0.271	0.290	48	288	2.773	0.530
22	180	-0.187	0.288	49	300	3.092	0.604
23	183	-0.105	0.286	50	300	3.528	0.729
24	186	-0.023	0.286	51	300	4.253	1.015
25	189	0.058	0.285	52	300	5.478	1.834
26	192	0.140	0.285				

Table H.21: Mathematics Grade 8: Braille

Mathematics Grade 8 2009 Braille							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.031	1.833	24	193	0.163	0.300
1	100	-3.809	1.013	25	196	0.253	0.300
2	100	-3.088	0.726	26	200	0.343	0.302
3	100	-2.655	0.601	27	203	0.435	0.304
4	102	-2.340	0.527	28	206	0.528	0.306
5	111	-2.088	0.478	29	210	0.622	0.309
6	119	-1.877	0.442	30	213	0.719	0.313
7	125	-1.694	0.415	31	217	0.818	0.317
8	131	-1.530	0.394	32	221	0.920	0.322
9	137	-1.382	0.376	33	225	1.026	0.329
10	142	-1.246	0.362	34	229	1.136	0.336
11	146	-1.119	0.350	35	233	1.252	0.344
12	151	-1.000	0.340	36	237	1.374	0.354
13	155	-0.887	0.332	37	242	1.503	0.366
14	159	-0.779	0.325	38	250	1.643	0.380
15	163	-0.675	0.319	39	253	1.794	0.398
16	166	-0.575	0.314	40	259	1.960	0.419
17	170	-0.478	0.310	41	265	2.147	0.446
18	173	-0.383	0.307	42	273	2.361	0.481
19	177	-0.289	0.304	43	283	2.615	0.530
20	180	-0.198	0.302	44	294	2.934	0.604
21	183	-0.107	0.301	45	300	3.371	0.728
22	187	-0.017	0.300	46	300	4.094	1.015
23	190	0.073	0.299	47	300	5.319	1.834

Table H.22: Mathematics Grade 8: Alternate

Mathematics Grade 8 2009 Alternate							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.144	1.833	27	195	0.225	0.287
1	100	-3.922	1.013	28	200	0.308	0.288
2	100	-3.202	0.726	29	201	0.391	0.289
3	100	-2.770	0.600	30	204	0.475	0.291
4	100	-2.456	0.526	31	208	0.560	0.293
5	107	-2.206	0.477	32	211	0.647	0.296
6	114	-1.996	0.441	33	214	0.735	0.299
7	121	-1.814	0.413	34	217	0.826	0.303
8	127	-1.653	0.391	35	221	0.919	0.307
9	132	-1.506	0.374	36	224	1.014	0.312
10	137	-1.372	0.359	37	228	1.114	0.318
11	142	-1.248	0.347	38	232	1.217	0.324
12	146	-1.131	0.337	39	235	1.324	0.332
13	150	-1.020	0.328	40	240	1.438	0.341
14	154	-0.915	0.320	41	244	1.557	0.352
15	157	-0.815	0.314	42	250	1.685	0.364
16	161	-0.718	0.308	43	254	1.823	0.378
17	164	-0.624	0.304	44	259	1.972	0.396
18	168	-0.533	0.300	45	265	2.138	0.418
19	171	-0.445	0.296	46	272	2.323	0.445
20	174	-0.358	0.293	47	280	2.537	0.481
21	177	-0.272	0.291	48	289	2.792	0.530
22	180	-0.188	0.289	49	300	3.111	0.604
23	183	-0.105	0.288	50	300	3.547	0.729
24	186	-0.022	0.287	51	300	4.272	1.016
25	189	0.060	0.287	52	300	5.498	1.834
26	192	0.143	0.287				

SCIENCE

Table H.23: Science Grade 4:

Science Grade 4 2009 Operational							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	115	-2.6923	1.2964	20	224	0.3193	0.1713
1	121	-1.7200	0.5137	21	229	0.3780	0.1715
2	127	-1.3458	0.3726	22	233	0.4371	0.1722
3	134	-1.1155	0.3115	23	238	0.4968	0.1734
4	140	-0.9443	0.2759	24	242	0.5574	0.1750
5	145	-0.8055	0.2522	25	246	0.6194	0.1772
6	151	-0.6872	0.2350	26	250	0.6831	0.1800
7	157	-0.5831	0.2219	27	253	0.7491	0.1835
8	162	-0.4893	0.2116	28	256	0.8180	0.1878
9	168	-0.4033	0.2033	29	260	0.8904	0.1931
10	173	-0.3234	0.1966	30	263	0.9675	0.1997
11	179	-0.2484	0.1910	31	266	1.0504	0.2078
12	184	-0.1772	0.1864	32	269	1.1409	0.2180
13	190	-0.1092	0.1825	33	272	1.2416	0.2312
14	195	-0.0438	0.1794	34	275	1.3563	0.2486
15	200	0.0196	0.1768	35	278	1.4915	0.2727
16	205	0.0814	0.1748	36	281	1.6592	0.3088
17	210	0.1419	0.1732	37	284	1.8862	0.3705
18	215	0.2015	0.1722	38	286	2.2577	0.5125
19	220	0.2605	0.1715	39	287	3.2281	1.2960

Table H.24: Science Grade 4: Braille

Science Grade 4 2009 Braille							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	115	-2.6653	1.2969	19	227	0.3484	0.1789
1	121	-1.6909	0.5150	20	232	0.4126	0.1795
2	128	-1.3141	0.3743	21	236	0.4774	0.1806
3	135	-1.0812	0.3137	22	241	0.5433	0.1824
4	141	-0.9073	0.2784	23	245	0.6106	0.1847
5	147	-0.7658	0.2548	24	250	0.6800	0.1879
6	153	-0.6448	0.2379	25	253	0.7520	0.1919
7	159	-0.5379	0.2250	26	257	0.8275	0.1969
8	165	-0.4413	0.2149	27	260	0.9074	0.2031
9	171	-0.3525	0.2069	28	264	0.9930	0.2110
10	177	-0.2697	0.2003	29	267	1.0862	0.2210
11	183	-0.1916	0.1950	30	271	1.1894	0.2339
12	189	-0.1174	0.1906	31	274	1.3067	0.2511
13	195	-0.0461	0.1871	32	275	1.4444	0.2750
14	200	0.0228	0.1842	33	278	1.6147	0.3109
15	206	0.0898	0.1821	34	281	1.8443	0.3723
16	211	0.1555	0.1805	35	284	2.2185	0.5139
17	217	0.2202	0.1794	36	297	3.1914	1.2966
18	222	0.2844	0.1789				

Table H.25: Science Grade 8:

Science Grade 8 2009 Operational							
Raw Sc.	**Scale Sc.**	**Theta**	**S.E.**	**Raw Sc.**	**Scale Sc.**	**Theta**	**S.E.**
0	100	-5.1359	1.8336	28	220	0.3678	0.2824
1	100	-3.9118	1.0144	29	223	0.4474	0.2821
2	100	-3.1896	0.7275	30	226	0.5270	0.2820
3	114	-2.7547	0.6024	31	229	0.6065	0.2823
4	125	-2.4374	0.5290	32	231	0.6864	0.2829
5	133	-2.1842	0.4798	33	234	0.7667	0.2840
6	141	-1.9715	0.4441	34	237	0.8478	0.2856
7	147	-1.7866	0.4169	35	240	0.9299	0.2877
8	152	-1.6219	0.3954	36	243	1.0134	0.2904
9	157	-1.4726	0.3780	37	246	1.0987	0.2938
10	162	-1.3352	0.3636	38	250	1.1863	0.2981
11	166	-1.2075	0.3515	39	252	1.2766	0.3032
12	170	-1.0876	0.3413	40	256	1.3704	0.3095
13	174	-0.9741	0.3325	41	259	1.4685	0.3170
14	178	-0.8661	0.3250	42	263	1.5717	0.3259
15	181	-0.7627	0.3184	43	267	1.6813	0.3366
16	184	-0.6632	0.3127	44	271	1.7988	0.3492
17	188	-0.5670	0.3077	45	275	1.9260	0.3645
18	191	-0.4737	0.3033	46	280	2.0654	0.3829
19	194	-0.3829	0.2995	47	286	2.2205	0.4055
20	197	-0.2942	0.2962	48	292	2.3963	0.4340
21	200	-0.2073	0.2933	49	299	2.6004	0.4710
22	203	-0.1221	0.2908	50	300	2.8454	0.5216
23	206	-0.0381	0.2886	51	300	3.1553	0.5964
24	209	0.0446	0.2868	52	300	3.5832	0.7229
25	212	0.1264	0.2853	53	300	4.2991	1.0114
26	215	0.2075	0.2840	54	300	5.5192	1.8320
27	217	0.2878	0.2831				

Table H.26: Science Grade 8: Alternate

Science Grade 8 2009 Alternate							
Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.0775	1.8320	28	218	0.3108	0.2786
1	100	-3.8573	1.0116	29	221	0.3884	0.2786
2	102	-3.1406	0.7237	30	224	0.4660	0.2788
3	116	-2.7113	0.5979	31	226	0.5439	0.2794
4	126	-2.3993	0.5240	32	229	0.6222	0.2804
5	135	-2.1514	0.4743	33	232	0.7012	0.2817
6	141	-1.9438	0.4383	34	235	0.7810	0.2835
7	147	-1.7640	0.4108	35	238	0.8620	0.2858
8	153	-1.6043	0.3891	36	241	0.9445	0.2886
9	158	-1.4599	0.3715	37	244	1.0288	0.2922
10	162	-1.3273	0.3570	38	247	1.1153	0.2965
11	166	-1.2042	0.3449	39	250	1.2048	0.3017
12	170	-1.0889	0.3346	40	253	1.2976	0.3080
13	174	-0.9800	0.3258	41	256	1.3948	0.3155
14	177	-0.8763	0.3182	42	260	1.4971	0.3245
15	181	-0.7772	0.3117	43	264	1.6058	0.3353
16	184	-0.6818	0.3061	44	268	1.7225	0.3481
17	187	-0.5897	0.3012	45	272	1.8490	0.3636
18	190	-0.5003	0.2969	46	277	1.9879	0.3823
19	193	-0.4132	0.2933	47	283	2.1427	0.4054
20	196	-0.3281	0.2901	48	289	2.3185	0.4343
21	200	-0.2448	0.2874	49	296	2.5232	0.4719
22	202	-0.1628	0.2852	50	300	2.7694	0.5230
23	204	-0.0821	0.2833	51	300	3.0812	0.5983
24	207	-0.0023	0.2817	52	300	3.5119	0.7253
25	210	0.0767	0.2805	53	300	4.2319	1.0137
26	213	0.1551	0.2796	54	300	5.4556	1.8336
27	215	0.2331	0.2789				

APPENDIX I
ITEM MAPS

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      MAP OF ITEMS
              <more>|<rare>
   4             .  +
                 .  |
                 .  |
   3             # T+  3LA3-0013O1-N41     3LA4-0014O1-E37
                .#  |
            .#####  |T
   2          .###  +  3LA4-0014O1-E30
             .#### S|
       .###########  |S
   1 .###########  +
      .###########  |  3LA4-0010B-E37      3LGT-0001*-W02-V21
       .########### M|  3LGT-0001*-W02-C08  3LW3-0005B-E30
   0    .##########  +M 3LA2-0009A-E30      3LA4-0008D-E37   1668 Proficient
                        3LW3-0003D-E37      3LW5-0007B-N41
         .########  |  3LA4-0009C-N41      3LA4-0011A-E30
                        3LW1-0001A-E37
              .### S|  3LW2-0002B-E37      3LW3-0003B-N41
                        3LW4-0004C-E37      3LW5-0008D-E30
  -1        .#####  +
             .####  |S 3LA5-0011D-N41      3LW2-0004C-E30
                        3LW3-0004A-N41
               .##  |
  -2            .# T+  3LW2-0002C-N41      3LW5-0007D-E30
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  -3             .  +
                 .  |
                 .  |
  -4             .  +
              <less>|<frequ>
EACH '#' IS 298.
```

Figure I.1: Item Map LAL Grade 3

```
      MAP OF ITEMS
              <more>|<rare>
   4             .  +
                 .  |
                 .  |  4LA3-0014O-E28
   3             .  +
                .# T|  4LA3-0017O1-E43
                .#  |  4LA3-0019O1-N43
   2          .####  +T
            .###### S|
           .#######  |
   1 .############  +S
         .######## M|  4LA4-0011B-N43      4LGT-0002*-W02-C08
       .##########  |  4LA4-0009C-E28      4LA5-0015C-N43
                       4LA5-0016C-N43      4LW3-0004B-E28 .2651 Proficient Cut
                       4LW4-0005A-N43
   0     .########  +M 4LA4-0010B-N43      4LA4-0010C-E28
                       4LA4-0012B-E43      4LA5-0016B-E43
                       4LW1-0001A-N43      4LW2-0002A-E43
                       4LW2-0003D-E28      4LW3-0003D-N43
            .######  |  4LA5-0012A-E28      4LGT-0001*-W01-V25
                       4LW3-0004D-E43      4LW5-0007B-E28
                       4LW5-0008D-E43
            .###### S|  4LA5-0014C-N43      4LW1-0001C-E43
                       4LW2-0003A-E43
  -1           .##  +S 4LA2-0009D-N43      4LA4-0012B-N43
                       4LA4-0014C-E43      4LW4-0005C-E28
               .##  |  4LW1-0001A-E28      4LW4-0004A-N43
                .# T|
  -2             .  +T
                 .  |
                 .  |
  -3             .  +
                 .  |
                 .  |
  -4             .  +
              <less>|<frequ>
EACH '#' IS 354.
```

Figure I.2: Item Map LAL Grade 4

```
MAP OF ITEMS
             <more>|<rare>
  4             .  +
                .  |
                .  |
  3             .  +
                . T|
              .##  |
  2         .####  +T 5LW3-0006D-EX1
          .###### S|  4LA5-0020O1-N45     5LA3-0011O1-EX1
                      5LA3-0018O1-E42
      .###########  |
  1 .############  +  5LW3-0009B-EX1
      .########### M|S 4LA5-0013C-N45      5LA4-0012A-E42
       .##########  |  07LAL1-XXXX-WT5     4LW1-0001A-N45  .2955 P
                      5LW2-0002D-E42      5LW4-0006D-E42
  0      .#######  +  5LA4-0010C-EX1      5LA4-0011A-E42
                      5LGT-0002*-W02-V24  5LW2-0003D-E42
                      5LW5-0009C-E42
         .####### S|M 4LA5-0012C-N45      5LA5-0015B-E42
                      5LA5-0016B-E42      5LW3-0008C-EX1
             .###  |  4LA5-0016B-N45      4LW4-0003C-N45
                      5LW3-0007B-EX1
 -1          .###  +  4LA4-0010D-N45      4LA5-0014C-N45
                      4LA5-0015B-N45      4LW5-0006A-N45
                      5LW2-0003C-EX1
               .# T|S 4LA4-0011D-N45      5LW1-0001C-E42
                      5LW2-0004C-EX1
                .  |  4LA2-0008B-N45      5LW2-0002D-EX1
                      5LW2-0005A-EX1      5LW5-0008C-E42
 -2             .  +
                .  |
                .  |T
 -3             .  +  5LW2-0001A-EX1
                .  |
                .  |
 -4             .  +
             <less>|<frequ>
EACH '#' IS 372.
```

Figure I.3: Item Map LAL Grade 5

```
      MAP OF ITEMS
                <more>|<rare>
    4             .  +
                  .  |
                  .  |
    3            .# T+
                .##  |
               .###  |
    2       .####### S+T
        .##########  |  100023009C      R100023462O
       .###########  |  6LW5-0012B-I03  R100023456B
    1  .########### M+S 1000230250      6LA4-0012C-I02  C014
                         P002            R100023442C     R100023459B
      .############  |  100023008A      6LW3-0003C-I02  6LW4-0017C-I02 .4205 P
          .########  |  100023047C      6LA3-0019O-I02  6LA3-0019O-I03
                         6LA4-0018C-I03  6LW4-0007C-I02  R100023446D
                         R100023448C
    0       ####### S+M 100023012D      100023017A      100023021B
                         6LA4-0006D-I02  R100023452A
             .#####  |  6LW2-0005D-I02  6LW2-0015C-I03  R100023457D
                .##  |  100023011D      100023022C      6LA4-0013A-I03
                         6LA5-0009A-I02  6LW2-0001B-I03  R100023447A
                         R100023450C
   -1            .## T+S 100023020A      6LW2-0014C-I03  6LW5-0001B-I02
                 .#  |
                  .  |  6LA4-0021D-I03  6LW3-0004A-I02  6LW4-0007D-I03
                         6LW5-0004B-I03
   -2             .  +T
                  .  |
                  .  |
   -3             .  +
                  .  |
                  .  |
   -4             .  +
                <less>|<frequ>
EACH '#' IS 360.
```

Figure I.4: Item Map LAL Grade 6

```
MAP OF ITEMS
               <more>|<rare>
    4             .  +
                  .  |
                  .  |
    3             .  +
                 .# T|
                .##  |
    2          .####  +
               .#### S|
           .########  |T 100023256A3O
    1    .#########  +  7LA3-0013O-I05          7LA5-0006C-I05
       .############ M|S 07 EWT 06              07LAL1-XXXX-N12-C1-10
                           07LAL1-XXXX-OE13-C1    7LW1-0018D-I04
                           7LW3-0019C-I05         7LW4-0005B-I05
                           7LW5-0008B-I04
         .#########  |  07 PWT 08               07LAL1-XXXX-N11-C1-9
                           7LA4-0011B-I04         7LA5-0011D-I05
                           7LW2-0001C-I04
    0    .#########  +M 07LAL1-XXXX-N4-C1-3     07LAL2-XXXX-N2-C2-2 -.0101 P
                           100023239A2D           100023242A5C
                           100023243A5A           100023245W6A
                           100023251W5C           7LA3-0019O-I04
                           7LW2-0007D-I05         7LW2-0012D-I05
                           7LW3-0020D-I05
           .####### S|  100023252W2B           7LA4-0016A-I04
                           7LW4-0007C-I04
            .######  |  100023247W4C           7LA2-0016A-I05
                           7LA4-0017A-I05         7LA5-0002C-I04
   -1          .###  +S 07LAL1-XXXX-N1-C1-1    07LAL1-XXXX-N8-C1-7
                           100023237A3B           7LW2-0004A-I04
                           7LW2-0010A-I04
                 .# T|  07LAL1-XXXX-N6-C1-5    07LAL1-XXXX-N7-C1-6
                           07LAL1-XXXX-N9-C1-8
                 .#  |T 100023238A5B
   -2             .  +
                  .  |
                  .  |
   -3             .  +
                  .  |
                  .  |
   -4             .  +
               <less>|<frequ>
 EACH '#' IS 375.
```

Figure I.5: Item Map LAL Grade 7

```
MAP OF ITEMS
               <more>|<rare>
    4             .  +
                 .#  |
                 .# T|
    3          .###  +
             .#####  |
            .###### S|
    2  .###########  +T
          .########  |  8LA3-0015O-I06  8LA3-1861O-P23  8LA4-0014C-I06
                        8LW1-0017C-N02  8LW5-0011B-I06
       .########### M|  8LA2-1642C-P23  8LA3-0017O-I04  8LA4-0018O-N02
    1 .############  +S 8LW1-0001D-I04  8LW2-1562B-P23  8LW5-1565B-P23
         .#########  |  08 EWT 02       08 PWT 09       8LA4-0010D-I06
                        8LA4-0021B-N02  8LW3-0018A-I06  8LW4-0013A-N02
                        8LW4-1638D-P23
             .##### S|M 8LA2-0005C-I04  8LA2-0012C-I06  8LA2-1576C-P23.3366 P
                        8LW2-0002B-I04  8LW3-0003B-I04  8LW3-0006C-I04
                        8LW3-1636B-P23  8LW6-0010D-I04
    0        .#####  +  8LA2-0016D-N02  8LA4-0008D-I06  8LA5-0020A-N02
                        8LW3-0004B-I06  8LW3-0005A-I06  8LW3-1637A-P23
               .###  |S 8LA2-0013A-I04  8LA4-0013B-I06  8LA4-1571A-P23
                        8LA5-0007C-I04  8LA5-0016D-N02
                .## T|  8LA2-0015A-N02  8LA2-1640B-P23  8LW2-0011C-N02
                        8LW5-0012B-N02  8LW6-0014A-I04
   -1            .#  +T
                  .  |
                  .  |
   -2             .  +
                  .  |
                  .  |
   -3             .  +
                     |
                  .  |
   -4                +
               <less>|<frequ>
 EACH '#' IS 336.
```

Figure I.6: Item Map LAL Grade 8

```
      MAP OF ITEMS
              <more>|<rare>
   3        .#####  +
              .###  |
             .####  |
             .####  |
   2  .########### S+
           .#####  |
           .#####  |
     .###########  |T
     .###########  |
   1   .########## M+
       .#########  |  11 03M3-03A1-A**DE***-6026C
                      22 03M2-03D2-***D****-5315D
                      28 03M3-03C2-ABCD****-6220O1
                      34 03M1.03B3-***D****-4022C
                      42 03M2-03A2-****E***-5114A
                      43 03M1-03A1-A*CD****-7052C
                      46 03M1.03B1-AB*D****-7037O
    .############  |S 14 03M3.03A1-A**D****-0222D
                      17 03M1-03B3-A*CD****-0176B
                      19 03M4-03C1-***D****-6069A
                      32 03M4-03B2-A**D****-6064D
          .#######  |  35 03M3-03D2-***DE***-7094D
                      40 03M1.03B2-A***E***-0171A
                      41 03M2-03B1-***D****-6018B
                      5 03M1-03B04-AXXDXX-XX0015S
                      6 03M3-03B01-AXXDEX-XX0010S          .1998 Proficient Cut
       .##########  |  13 03M3-03D1-***D****-7091A
                      24 03M1.03C2-********-4069C
                      4 03M1-03A01-XXCDEX-XX0033S
                      44 03M3-03B1-A*CD****-7090D
   0       .######  +M 16 03M4-03B2-A**D****-6061D
                      18 03M2-03E2-***DE**R-7066A
                      27 03M4-03C2-A**DE***-5095C
                      3 03M1-03A02-XXXDXX-XX0017S
                      37 03M2-03A5-AB*D**M*-4146O
                      38 03M1.03A6-****E***-0154A
                      39 03M1.03C2-A**D****-4024C
           .##### S|  10 03M1-03C4-A**D****-7050C
                      12 03M4-03D1-A**DE***-6074B
                      15 03M2-03C1-***DE***-5309B
                      30 03M1-03B5-A**D****-5143C
                      33 03M1.03A3-A*******-0158A
          .#######  |  1 03M4-03A02-XXCDEX-XG0007S
                      2 03M2-03C01-XXXDEX-XG0003S
                      26 03M4-03D1-A**D****-6162A
             .####  |S 20 03M1-03C2-**CD****-6012B
                      23 03M4-03A2-A**D****-6051B
                      45 03M1.03A2-***D****-7023C
              .###  |  21 03M1-03B4-A**D****-6005A
                      25 03M3-03C2-A*CD****-6037B
  -1            .#  +  29 03M2-03A4-***D****-6158C
               .## T|
                .  |T 36 03M2-03D1-**CD****-6021A
               .#  |  31 03M3-03B1-***D****-6030D
                .  |  09 03M1-03A6-A**D****-6222B
  -2            .  +
                .  |
                   |
                .  |
  -3            .  +
              <less>|<frequ>
EACH '#' IS 214.
```

Figure I.7: Item Map Math Grade 3

```
 MAP OF ITEMS
              <more>|<rare>
   3        .##### T+
               .##  |
              .###  |
              .###  |
   2         .####  +
             .#### S|T 1904M1.04B6-A*C*****-0290C
          .########  |
          .########  |
             .####  |  404M2-04A03-AXXDXX-MX0028S
   1    .#########  +  1004M3-04A1-***DE**R-0329D
                       1104M1-04C2-A*******-4126C
                       2204M1-04B8-A*C*****-4123D
                       3304M1.04A1-A*CDE***-7104A
      .############ M|S 504M3-04C02-AXXDXX-XX0011S
          .########  |  1404M1.04A5-****E***-3400D
                       2804M1-04A1-ABCDE***-7148O1
                       3004M2-04E3-***DE***-7133B
                       3604M1-04A1-****E***-3414B
                       4104M1-04B1-***D****-6126C
           .#######  |  1304M4.04C1-A**DE***-7152B
                       1504M2-04C2-***D****-6108B
                       2404M3-04C1-A**D****-6121A
                       2604M4-04B3-***D****-5206C
                       3104M3.04D2-***D****-0347A
                       3704M3-04B1-A**DE***-6202O1
                       4604M2-04C2-ABCDE***-7175O1
           .#######  |  1604M2-04B1-A**DE***-6105A
                       1804M3-04B1-A*CDE***-5158B
                       2104M3-04A1-A*CDE***-7158B
                       304M1-04B06-AXCDXX-XX0026S
                       3404M3-04C2-A*CD****-6088D
                       3804M4-04B2-***DE***-7134C
                       4004M1.04A4-A*C*****-4093A
                       604M1-04B04-XXXDXX-XX0003S    .0840 Proficient Cut
   0   .##########  +M 1704M1.04B2-A*******-4012A
                       3204M2-04A4-******M*-0308D
                       4404M2.04E2-A**DE***-0324D
             .#####  |  2304M1-04C2-A**D****-7105B
                       4304M4.04D1-A*******-4103C
                       4504M1-04B9-A**D**M*-7094B
              .#### S|  2904M1-04A2-***D****-4081C
              .####  |  1204M2-04D2-**C****R-3725C
                       4204M4-04D1-***D****-6154B
               .###  |S
  -1           .###  +  2504M4-04C2-A*CD****-6140D
                 .#  |  2704M1-04B4-A*******-6237A
                       3904M2-04C1-****E***-3734A
                .## T|
                  .  |  2004M1-04C2-A**D****-7005B
                       204M4-04A02-AXXDXX-XX0031S
                  .  |T 104M1-04B05-XXXDXX-XX0024S
                       3504M3-04D2-***D****-6095C
  -2              .  +  904M4-04A2-**CD****-6101A
                  .  |
                  .  |
                  .  |
                     |
  -3              .  +
              <less>|<frequ>
 EACH '#' IS 246.
```

Figure I.8: Item Map Math Grade 4

```
MAP OF ITEMS
              <more>|<rare>
```

```
   3    .#########  +
                    |
             .####  |
             .####  |
             .#### S|
   2         .#####  +
        .#########  |  32 R100022851A
       .##########  |T 4 05M2-05E01-XXXDEX-MG0112S
            .#####  |
        .#########  |  39 05M3-05A01-AXXDXX-XX0144C
                        44 05M4-05A02-AXCDEX-XG0134B
                        46 R100027990O
   1 .############ M+  24 05M2-05E03-ABCDXX-XX0056O
         .########  |S 18 05M2-05D02-XXCDXX-XX0130C
                        5 05M1-05B02-AXCDXX-XX0021S
          .#######  |  13 05M4-05B02-XXCDXX-XX0164A
                        15 05M2-05A02-XXXDXX-XG0066A
                        3 05M3-05D01-XXXDXX-XX0108S
                        6 05M1-05A01-XXXXXX-XX0004S
          .#######  |  10 05M2-05A02-XXXDXX-XX0024B
                        33 05M4-05B02-AXCDXX-XX0002B
                        35 05M4-05A02-ABCDXX-XX0113O
                        40 05M4-05D01-AXCDXX-XX0170B
                        42 05M1-05A06-XXCDXX-XX0006B
           .######  |  19 05M2-05B01-XXXDEX-XG0129A
                        20 05M3-05A01-XXCDXX-XX0131C
                        26 05M2-05D03-XXCDXX-XX0025B .1395 Proficient Cut
                        38 05M1-05C01-AXCDXX-XX0022B
   0       .######  +M 2 05M1-05C04-XXCDXX-XX0041S
                        27 05M1-05C01-XXCDXX-XX0127B
                        28 05M1-05A03-XXXDXX-XX0042C
                        30 R100001362C
                        43 05M3-05C01-XXCDXX-XX0133A
         .######## S|  21 05M1-05A01-XXCDXX-XX0138B
                        22 05M1-05A04-XXXDXX-XX0063D
                        34 R100001363B
                        9 05M3-05A01-AXCDXX-XX0132D
            .#####  |  17 05M1-05A01-XXCDXX-XX0001B
                        25 05M3-05C01-AXCDXX-XX0076A
                        45 05M1-05B02-XXCDXX-XX0141C
                .##  |  1 05M4-05A02-AXCDEX-XG0031S
                        29 05M2-05C01-XXXDEX-XG0089D
                        37 05M2-05E02-AXCDXX-XX0026C
             .####  |S 12 05M3-05D01-XXXDXX-XX0029A
  -1          .###  +  16 05M4-05C01-AXCDXX-XX0166C
                .##  |  11 05M1-05C01-XXCDXX-XX0150C
                        23 05M3-05C01-AXCDEX-XX0013D
                        36 R100022470D
                 .# T|  31 05M3-05B02-XXXXEX-XG0075A
                        41 R100022710A
                  .  |T
                  .  |  14 05M4-05A02-AXCDEX-XG0030D
  -2              .  +
                  .  |
                  .  |
                  .  |
                     |
  -3              .  +
              <less>|<frequ>
EACH '#' IS 209.
```

Figure I.9: Item Map Math Grade 5

```
MAP OF ITEMS
            <more>|<rare>
 3     .########  +
            .###  |
           .####  |
           .####  |
 2         .#### S+
      .#########  |
           .####  |T 17 100022681B
                     5 06M1-06A05-AXCDXX-XX0042S
      .#########  |  28 06M3-06C01-XXCDXX-XX0130A
          .#####  |
 1   .##########  +  19 06M3-06A01-XXXDXX-XX0158C
                     4 06M1-06B08-XXXDXX-XX0097S
                     46 1000279870
     .########## M|S 24 06M1-06A07-ABCDEX-XX0053O
                     31 06M2-06E02-XXXDXX-XG0016A
                     32 100022580B
     .##########  |  16 06M2-06D03-XXCDXX-XX0005A
                     34 06M1-06B02-XXCDXX-XX0150B
      .#########  |  12 06M3-06D01-XXXDXX-XX0157B
                     27 06M2-06D01-XXCDXX-XX0151D
                     40 06M1-06A05-AXCDXX-XX0084C
    .############  |  30 06M4-06C02-AXCDXX-XX0013D                .1048 Proficient Cut
                     38 06M3-06A01-XXXDXX-XX0083A
 0      .#######  +M 14 06M4-06B01-AXCDXX-XX0156D
                     15 100022645B
                     20 06M1-06C01-AXCDXX-XX0028B
                     3 06M2-06E02-AXXDXX-XG0094S
         .######  |  10 06M1-06A05-AXCDXX-XX0030C
                     13 100022683B
                     21 06M4-06A02-AXCDXX-XX0149B
                     33 06M3-06D02-XXXXXX-XX0136C
                     35 06M3-06A01-ABCDXX-XX0056O
                     39 06M2-06D03-XXCDXX-XX0128D
                     42 06M3-06A01-XXXDXX-XX0068B
                     6 06M2-06B01-XXXDXX-XG0044S
           .##### S|  11 06M2-06E02-XXXXXX-XG0171A
                     22 100022466D
                     37 06M4-06C02-AXCDXX-XX0012D
                     45 06M4-04A02-XXCDXX-XX0126A
           .#####  |  2 06M4-06B02-XXCDXX-XX0096S
                     26 06M3-06C01-AXCDXX-XX0028C
                     29 06M4-06B02-AXCDXX-XX0092B
                     36 100022832B
                     41 06M4-06A02-AXCDXX-XX0015C
            .####  |S 23 06M4-06A02-AXCDEX-XG0026A
                     25 06M2-06A02-AXCDXX-XG0063C
-1           .###  +  1 06M3-06C02-AXCDEX-XG0038S
                     43 06M1-06B01-AXCDXX-XX0069D
             .###  |
               .#  |  9 06M2-06A08-XXXDEX-XG0082C
               .# T|T
                .  |  18 06M1-06B01-AXCDXX-XX0002B
                     44 06M3-06D01-XXXDXX-XX0071A
-2              .  +
                .  |
                .  |
                   |
-3              .  +
             <less>|<frequ>
EACH '#' IS 215.
```

Figure I.10: Item Map Math Grade 6

```
MAP OF ITEMS
                <more>|<rare>
    3         .#####  +
                .###  |
                .###  |
               .####  |
               .####  |
    2     .######### S+
             .#####  |T 16 07M3-07D01-AXXDEX-XG0028D
                        34 100002222B
          .#########  |  45 07M1-07A04-AXXDXX-XX0020A
         .##########  |  26 07M2-07C02-ABCDEX-XG0114O
                        47 07M1-07C01-AXCDXX-XX0005D
        .###########  |  4 07M4-07C01-AXCDXX-XX0166S
    1   .###########  +S 11 07M3-07A01-AXCDXX-XX0125D
         .########## M|  36 07M3-07B01-AXCDEX-XG0127C
                        48 100022897O
                        7 07M1-07A03-AXCDXX-XX0032S
          .#########  |  42 07M4-07B01-AXCDXX-XX0075A
                        8 07M2-07A02-AXXDXX-XX0102S
          .#########  |  15 07M2-07E01-XXXDXX-XX0072B
                        37 07M1-07B03-ABCDXX-XX0051O
                        40 07M2-07C01-XXXDXX-XX0079A
          .#########  |  1 07M3-07A01-AXXDXX-XX0041S
                        2 07M2-07C01-AXXDEX-XG0038S
-------------------------33 07M4-07B03-AXCDXX-XX0074B----------------> .2778 Proficient Cut
                        39 07M1-07A03-AXCDXX-XX0017C
                        46 07M3-07D03-XXXDXX-XX0022B
                        5 07M4-07D01-AXCDEX-XG0048S
    0 .############  +M 20 07M3-07C01-XXXDXX-XX0144B
                        21 100002314C
                        23 100023201D
                        28 07M4-07B03-AXCDXX-XX0063C
            .#######  |  17 100022577D
                        18 07M2-07D01-AXCDXX-XX0069A
                        31 07M2-07B01-XXCDEX-XG0002D
                        32 07M3-07C02-AXXDXX-XX0060C
                        38 100022758B
             .###### S|  14 100023205C
                        19 07M2-07A02-AXCDXX-XG0006C
                        25 07M3-07C02-XXCDXX-XX0059D
                        3 07M1-07B03-XXXDXX-XX0100S
                        30 100022804A
                        41 07M3-07C02-AXCDXX-XX0147D
                        43 100022760B
             .######  |  13 07M1-07A04-XXXDXX-XX0136D
                        24 07M2-07A01-XXXDXX-XX0070C
                        6 07M3-07D03-XXCDXX-XX0096S
              .#####  |S 44 07M3-07C02-AXCDXX-XX0012C
   -1            .##  +  22 07M4-07A02-XXCDEX-XG0130A
               .####  |
                  .#  |  29 07M4-07C01-XXCDXX-XX0138B
                        35 07M4-07A01-XXCDXX-XX0024A
                 .## T|T 12 07M3-07D02-XXXDXX-XX0145A
   -2              .  +
                   .  |  27 07M1-07B02-XXCDXX-XX0133C
                   .  |
                   .  |
                      |
   -3              .  +
                <less>|<frequ>
 EACH '#' IS 182.
```

Figure I.11: Item Map Math Grade 7

```
MAP OF ITEMS
                 <more>|<rare>
    3 ############  +
            .#####  |
            .#####  |
           .######  |
           .###### S|
    2       ######  +
           .######  |
      ############  |
      ############  |T 6 08M1-08B03-XXXDXX-XX0092S
      ############  |  17 08M4-08B02-AXCDXX-XX0074C
                       21 08M4-08C01-AXCDXX-XX0037D
    1  ########### M+  30 8M4A02-3010D
                       8 08M4-08A03-AXCDEX-XG0013S
       ###########  |S 24 8M1B04-5967B
                       26 08M2-08B01-ABCDEX-XG0120O
                       35 08M3-08B01-XXXDEX-XG0123C
                       39 8M2C01-6165C
                       41 8M4C03-3105D
                       45 08M1-08C01-XXXDXX-XX0088B
        ##########  |  15 08M1-08C01-XXCDXX-XX0042B
                       34 08M2-08D01-AXCDXX-XX0045B
                       47 8M2C01-6228A
      ############  |  20 08M3-08D02-XXXDXX-XX0080A
                       3 08M3-08A01-XXXDXX-XX0106S
                       31 08M2-08E01-XXCDXX-XG0116B  ---------->  .3031 Proficient Cut
            .#######  |M 14 8M1A07-1086A
                       25 8M3B02-6255A
                       38 8M4A02-6001C
                       48 8M4B03-6062O
    0       .######  +  12 8M2D06-6266C
                       27 8M4D01-5191B
                       33 8M1A03-6099A
                       37 8M3A01-6034O
                       42 08M2-08C02-XXXDXX-XX0044A
                       44 08M3-08D04-XXXDXX-XX0117C
                       5 08M3-08D02-XXXDXX-XX0124S
          .######## S|  18 8M4B02-3095C
                       19 8M1B05-5715D
                       29 08M2-08B01-XXXDEX-XG0065B
                       40 8M3C02-5726A
                       43 8M4D01-6313D
            .#####  |S 1 08M4-08D01-AXCDEX-XG0012S
                       11 08M1-08A02-XXXDXX-XX0070C
                       13 8M3D02-6243A
                       16 8M1C02-1102B
                       2 08M1-08C02-XXXDXX-XX0021S
                       22 8M3C01-4045C
                       23 08M1-08A02-XXCDXX-XX0083D
                       36 08M3-08C02-AXCDXX-XX0126C
                       46 8M2A04-2249D
             .####  |  4 08M2-08A01-XXXDXX-XG0094S
                       7 08M2-08E03-AXCDXX-XX0008S
             .####  |  32 8M1B01-1175C
   -1         .###  +T 28 8M1B01-6105D
              .###  |
               .## T|
                 .  |
   -2            .  +
                 .  |
                 .  |
                    |
                 .  |
   -3            .  +
                <less>|<frequ>
 EACH '#' IS 168.
```

Figure I.12: Item Map Math Grade 8

```
MAP OF ITEMS
               <more>|<rare>
    4             .  +
                     |
                     |
    3                +
                     |
                  .  |
    2             .  +
                  . T|
               .###  |
    1     .######## S+T 28 4SD04-0052D   29 4SA08-0477B
      .############ M|S 10 4SLAID-0066D  18 4SC4-5075B    2 4SC06-0158D
                       24 4SC01-0482O1  27 4SPAIM-0181D  3 4SC01-0003B
                       31 4SC03-5190D   35 4SC9-5272O    4 4SC08-0330D
       .###########  |M 11 4SC06-0165C   12 4SEAIU-4264A  13 4SC07-0008D
                       14 4SA04-0085C   15 4SA10-5038B   16 4SC07-0407C
                       17 4SC08-0434A   19 4SC01-0449C   22 4SD09-0384A
                       23 4SB09-0209C   26 4SEAIU-0165C  5 4SLAIR-0211B
                       9 4SB5-5083C
    0        ##### S+S 20 4SLAID-2052D  21 4SEAIG-4219C  30 4SEAIG-4221C
                       34 4SB04-4148C   7 4SC10-0264D
               .## T|  1 4SC04-0113A    25 4SC5-5088B    6 4SC07-0121B
-----------------------8 4SLAIR-2111A-----------------------.0196 Proficient Cut
                  .  |T 32 4SC09-0172D   33 4SD07-1989A
   -1             .  +
                  .  |
                     |
   -2                +
                     |
                     |
   -3                +
                     |
                     |
   -4             .  +
               <less>|<frequ>
 EACH '#' IS 710.
```

Figure I.13: Item Map Science Grade 4

```
MAP OF ITEMS
               <more>|<rare>
    3            .#  +
                  .  |
                 .# T|
                 .#  |
                 .#  |
    2          .####  +
                 .##  |
             .###### S|
            .#######  |T
          .########  |  24 8SC10GXXX-7078B  37 8SB02GXXX-7016A
                        39 8SC01GXXX-7009D  44 8SC05GXXX-7113A
                        50 8SPAIM-5386O
    1 .############  +  13 8SLAIE-5127C     27 8SC09GXXX-7128B
                        32 8SC07GXXX-7120B  34 8SC09GXXX-7094O
                        9 8SC09GXXX-7123A
         .######### M|S
       .############  |  21 8SLAIR-5424C     38 8SC10GXXX-7076C
                        43 8SD03GXXX-7029A
          .########  |  10 8SEKSG-4831C     12 8SC09GXXX-7124B
                        16 8SC01GXXX-7100B  2 8SEAIG-5335B
                        29 8SLAIL-5491C     4 8SA01GXXX-7010C
                        40 8SPAIM-5506B     41 8SC06GXXX-7052C
                        42 8SLAIE-5434D     48 8SPKCF-5159D
        .###########  |M 22 8SPAIF-4984B     23 8SPAIN-5270A
                        28 8SLKCD-4480D     47 8SLAID-5241C
                        5 8SPAMM-2148C      8 8SLKSE-5428D
    0       .######  +  11 8SEAIU-5208C     33 8SEKCG-5176D
         .######### S|  15 8SLAID-5638C     19 8SLAIL-5392A -.2073 Proficient
                        30 8SD01GXXX-7102A  35 8SEKSU-5101B
                        36 8SLAIE-5128C     46 8SC09GXXX-7129C
                        49 8SPAIN-4817D
              .####  |S 20 8SC09GXXX-7127B  31 8SPAIM-2254A
                        6 8SEAMG-5479A      7 8SC03GXXX-7026A
              .####  |  25 8SB05GXXX-7035C  26 8SLAID-4411A
                .##  |  14 8SD06GXXX-7044D  17 8SC10GXXX-7131D
                        18 8SLAIR-5423B     3 8SPAIC-5366D
   -1            .#  +  1 8SLAIL-5393C
                  . T|T 45 8SC03GXXX-7025A
                  .  |
                  .  |
                  .  |
   -2             .  +
                  .  |
                     |
                  .  |
   -3             .  +
               <less>|<frequ>
 EACH '#' IS 252.
```

Figure I.14: Item Map Science Grade 8