

# **Delaware Student Testing Program**

**Technical Report - 2006**

Assessment and Analysis Group  
Assessment and Accountability Branch  
Delaware Department of Education

November 2007

## Officers of the Delaware Department of Education

**Valerie A. Woodruff**

*Secretary of Education*

**Nancy J. Wilson, Ph.D.**

*Deputy Secretary of Education*

**Kimberly Hoffman**

*Executive Assistant*

**Robin R. Taylor, M.Ed.**

*Associate Secretary, Assessment and Accountability Branch*

**Michael R. Owens, Ed.D.**

*Associate Secretary, Adult Education and Workforce Development*

**Martha Brooks, Ed.D**

*Associate Secretary, Curriculum and Instructional Improvement Branch*

**Dorcell Spence**

*Associate Secretary, Finance and Administrative Services Branch*

**Wendy B. Roberts, Ph.D.**

*Director, Assessment and Analysis Work Group*

**Lisa Alexander, M.S.**

**Darlene J. Bolig, Ed.D.**

**Helen C. Dennis, M.A.**

**Katia F.S. Foret, Ph.D.**

**James F. Hertzog, M.Ed.**

**Patsy G. Kersteter, Ph.D.**

**Ellen Mingione, M.Ed.**

**Joann F. Prewitt, M.A.**

**Liru Zhang, Ph.D.**

### *Support Staff:*

**Elaner M. Brown**

**Michelle L. Harris**

**Kimberly K. Rodriguez**

**Pearl Carrington**

**Melinda Rash**

**Ruth A. Uhey**

The Department of Education does not discriminate in employment or educational programs, services or activities, based on race, color, national origin, age or handicap in accordance with state and federal laws. Inquiries should be directed to the Department of Education, Human Resources and Quality Management, 401 Federal Street, Suite 2, Dover, DE 19901 or Telephone (302) 735-4000. For more information about the DSTP, write to the Department of Education, Assessment & Accountability Branch or telephone (302) 735-4090.

This report is available on the World Wide Web at <http://www.doe.k12.de.us>

Document Control No: 95-01/07/10/04

The 2006 Delaware Student Testing Program Technical Report was prepared by the Assessment and Analysis Group at the Department of Education, in collaboration with the contractor Harcourt Assessment, Inc. and the sub-contractor Beck Evaluation & Testing Associate, Inc. The draft of the report was reviewed by the staff from the Assessment and Analysis Group at the Department of Education and contractors.

Please contact Wendy Roberts, Director of Assessment and Analysis, at (302) 735-4090 or by e-mail: [wroberts@doe.k12.de.us](mailto:wroberts@doe.k12.de.us) if you have any questions concerning this report.

## Table of Contents

### Part One. Introduction

I. Delaware Student Testing Program (DSTP) .....	1
II. Organizations and Groups Involved.....	2
III. Information in this Report .....	3

### Part Two. Design and Validity of the DSTP

I. Overview of Test Development.....	4
<i>Ia. Delaware Content Standards and Grade Level Expectations</i> .....	4
<i>Ib. Developing Test Specifications</i> .....	4
<i>Ic. Item Development and Review</i> .....	11
<i>Id. Bias and Sensitivity Review</i> .....	12
<i>Ie. Field Testing</i> .....	13
<i>If. Test Construction</i> .....	14
II. Testing Conditions .....	15
<i>Iia. Test Administration and Security</i> .....	15
<i>Iib. Inclusion Guidelines and Exemptions</i> .....	1
<i>Iic. Accommodations and Test Modification</i> .....	16
III. Validity Evidence.....	17
<i>IIIa. Findings of the 2006 Student Survey</i> .....	17
<i>IIIb. Revisiting, Reviewing, and Establishing Performance Standards for Reading, Writing, and Mathematics</i> .....	21

### Part Three. Reporting DSTP Results

I. DSTP Scores.....	33
II. Scoring Process .....	33
III. Rescoring .....	34
IV. Results of the 2006 DSTP.....	35

### Part Four. Design and Application of Scaling and Equating

I. Design of DSTP Scale in Reading, Mathematics, Science, and Social Studies .....	51
<i>Ia. Vertical Scale for DSTP Reading and Mathematics</i> .....	56
<i>Ib. Scale for DSTP Science and Social Studies</i> .....	56

II. Equating .....	57
<i>Ia. Equating the DSTP Reading and Mathematics</i> .....	57
<i>Ib. Equating the DSTP Science and Social Studies</i> .....	58

III. 2006 Equating and Scaling Results.....	58
---	----

**Part Five. Technical Characteristics of the DSTP**

I. Reliability of DSTP Scores .....	59
<i>Ia. Estimate of Reliabilities and Standard Error of Measurement</i> .....	60
<i>Ib. Correlations</i> .....	60
<i>Ic. Rater Consistency</i> .....	73
<i>Id. Decision Accuracy and Consistency</i> .....	74
II. Item and Test Statistics .....	83

<b>Part Six. References</b> .....	84
-----------------------------------	----

**Appendix**

Appendix A. Test Development Committees by Test .....	85
Appendix B. Test Review Committees by Test.....	91
Appendix C. Bias and Sensitivity Review Committee .....	95
Appendix D. Technical Advisory Committee .....	97
Appendix E1. Test Specifications for Reading.....	99
Appendix E2. Test Specifications for Mathematics .....	104
Appendix E3. Test Specifications for Science.....	109
Appendix E4. Test Specifications for Social Studies .....	112
Appendix F1-F4. Frequency Distributions of Scale Scores for Reading, Mathematics, Science and Social Studies.....	114
Appendix G. Comparisons of Step-Values for Anchor Items by Grade and Test.....	158
Appendix H. Conversion Tables from Raw Scores to Scale Scores By Test and Grade .....	211

Appendix I. Item Statistics by Test and Grade .....	228
---	-----

### **List of Tables**

Table 1. Summary of Alignment Results for English Language Arts .....	24
Table 2. Summary of Alignment Results for Mathematics .....	25
Table 3. Recommended Cut Scores for Reading, Writing, and Mathematics .....	32
Table 4a. Descriptive Statistics for Reading by Grade .....	36
Table 4b. Descriptive Statistics for Mathematics by Grade .....	37
Table 4c. Descriptive Statistics for Writing by Grade.....	38
Table 4d. Descriptive Statistics for Science and Social Studies and Grade .....	39
Table 5. Frequency Distributions of Writing Scores by Grade and Type of Writing.....	40
Table 6a. Frequency Distributions of Performance Levels by Test and Grade (1) .....	48
Table 6b. Frequency Distributions of Performance Levels by Test and Grade (2) .....	50
Table 7. Reliability of Test Scores by Test and Grade .....	61
Table 8a. Cut Score and Equivalent Raw Scores and Scale Scores; and Standard Error of Measurement and Information Function for Performance Levels in Reading.....	62
Table 8b. Cut Score and Equivalent Raw Scores and Scale Scores; and Standard Error of Measurement and Information Function for Performance Levels in Mathematics .....	63
Table 8c. Cut Score and Equivalent Raw Scores and Scale Scores; and Standard Error of Measurement and Information Function for Performance Levels in Science and Social Studies .....	64
Table 9a. Matrix of Correlations for Reading.....	65
Table 9b. Matrix of Correlations for Writing .....	67
Table 9c. Matrix of Correlations for Mathematics .....	69
Table 10a. Matrix of Correlations for Science.....	71

Table 10b. Matrix of Correlations for Social Studies .....	72
Table 10b. Matrix of Correlations for 2006 Social Studies .....	73
Table 11. Raters' Consistency for Stand-Alone Writing .....	74
Table 12a. Decision Accuracy and Consistency for 2006 DSTP Reading .....	77
Table 12b. Decision Accuracy and Consistency for 2006 DSTP Mathematics .....	78
Table 12c. Decision Accuracy and Consistency for 2006 DSTP Science and Social Studies.....	79
Table 12d. Decision Accuracy and Consistency for Combined Performance Levels in Reading .....	80
Table 12e. Decision Accuracy and Consistency for Combined Performance Levels in Mathematics.....	81
Table 12f. Decision Accuracy and Consistency for Combined Performance Levels in Science and Social Studies.....	82
Table 13. Means of Item Statistics by Test and Grade .....	83

### **List of Figures**

Figure 1. Sample item characteristic curve.....	52
Figure 2. Sample category curves for one-step item.....	5
Figure 3. Sample category curves for two-step item .....	54
Figure 4. Four-fold table for possible relationships between students' test scores and estimated true scores .....	75

## **Part One. Introduction**

### **I. Delaware Student Testing Program (DSTP)**

The Delaware Student Testing Program (DSTP) is a statewide, mandated assessment program that measures four core content areas: English language arts (including reading and writing), mathematics, science, and social studies. Since 1998, Reading, Writing, and Mathematics have been given to students in grades 3, 5, 8, and 10; starting in 2000, Science and Social Studies have been administered to students in grades 4, 6, 8, and 11. The first two years' DSTP administrations of each test serve as the baseline for determining the performance levels and student progress toward the corresponding Content Standards. The implementation of the Senate Bill 260 in spring 2002 resulted in the expansion of the DSTP to students in grades 2, 4, 6, 7, and 9 for Reading, Writing, and Mathematics.

The DSTP scores are used as the primary indicator in Delaware accountability system for individual students and schools. Students in grades 3, 5, and 8, whose Reading scores at the lowest performance level of Well Below the Standard or students in grade 8 whose Mathematics scores at the performance level of Well Below the Standard are required to attend summer school unless they met other academic indicators. If the student's test score achieves to the next higher performance level of Below the Standard by the end of summer school from DSTP re-testing, an Individual Improvement Plan (IIP) is required; if the test score achieves to the level of Meet the Standard or higher, the student is promoted; if the test score remains in the lowest performance level, promotion is issued only if the student meets other academic indicators to demonstrate his/her readiness for the next grade. Students in grades 2 through 8 whose reading scores or students in grades 6 through 8 whose mathematics scores at the performance level of Below the Standard must have an IIP in order to improve their academic performance. Students who achieve the highest performance level of Distinguished in any single test are awarded a Distinguished Performance Certificate by the state. The 600 top students in grades 8 and 10 Reading, Writing or Mathematics are eligible for the Michael C. Ferguson Scholarship.

The DSTP Reading and Mathematics tests consisted of two parts: (1) items developed by Delaware educators that specifically measure the Content Standards and (2) the Stanford Achievement Series, 10<sup>th</sup> edition (SAT10) abbreviated version of Reading Comprehension, Mathematical Problem Solving for grades 2, 3, 4, 5, 6, 7, and 8, and Mathematics for grades 9 and 10. Three item formats are used: multiple-choice (MC), short answer (SA), and extended constructed-response (ECR) items. For the 2<sup>nd</sup> and 3<sup>rd</sup> grade mathematics tests, only MC and SA items are used. The standards-based score (SBS) or the scale score is a composite score of Delaware-developed items and selected SAT10 items that measure the Delaware Content Standard.

The DSTP Science and Social Studies items are developed by Delaware educators in the formats of MC and SA to derive the standards-based score (SBS). The four sub-

content areas measured in science are: inquiry, physical science, earth science, and life science. The four sub-content areas measured in social studies are: civics, economics, geography, and history.

The DSTP Writing is comprised of a stand-alone writing prompt and a text-based writing prompt for grade 3 through grade 10. For the stand-alone writing, students write an extended essay responding to a writing prompt; for the text-based writing, students write an essay responding to a prompt based on a reading passage. In 2006 students had approximately three hours for the stand-alone writing, which included directions, prewriting (about 20 minutes), first draft (about 30-45 minutes), and final draft (about 60 minutes); and a break. Like the stand-alone writing, students were encouraged to use prewriting for planning their writing. However, since no first draft is called for, the testing time was shorter for text-based writing.

Short answer items are scored on a 0-2 scale; extended constructed-response items are scored on a 0-4 scale. In 2006 all SA and ECR items used in DSTP tests were scored by one trained rater from the contractor. To examine the consistency and accuracy of scoring, the scoring Team Leaders checked about 10% of students' responses during the scoring process. Both stand-alone writing and text-based writing is scored using a 5-point holistic scoring rubric. In 2006, two raters were used to score the stand-alone writing and one rater for the text-based writing. The total writing score is a composite score of the stand-alone scores from two raters and the text-based writing score on a 1-15 scale.

For Reading and Mathematics, two scores are reported, the national percentile rank (PR) on the SAT10 tests and the SBS at the state, school district, school, and individual student levels. For Science and Social Studies, SBS are reported at the state, school district, school, and individual levels; raw scores for the four corresponding sub-content areas are also available for educators. In the summer of 2005, the state conducted a performance standards review for the grades 3, 5, 8, and 10 Reading, Writing, and Mathematics based on the corresponding Content Standards, newly developed Grade-Level-Expectations, and Performance Level Descriptors; and established five performance levels for grades 2, 4, 6, 7, and 9. It was the first year in 2006 that the DSTP results were reported in five performance levels (Well Below the Standard, Below the Standard, Meets the Standard, and Exceed the Standard, and Distinguished) for Reading, Writing, and Mathematics from grade 3 through grade 10. Three levels (Below the Standard, Meets the Standard, and Exceed the Standard) were used for grade 2 due to a narrower score scale. For Science and Social Studies, the performance standards remained without modifications for reporting student achievement in five performance levels.

## **II. Organizations and Groups Involved**

- *Harcourt Assessment, Inc.* has been the DSTP contractor since 1997. Their responsibilities include test development, training, test administration, scoring, data analysis, psychometric issues, and reporting.

- *Beck Evaluation & Testing Associate, Inc.*, a sub-contractor to *Harcourt Assessment, Inc.*, provides additional psychometric consultation.
- *Test Development Committees for grades 3, 5, 8, and 10* consisted of Delaware teachers and educators (Appendix A). The committee members sign an annual contract with the Department of Education for item development. All newly developed items are reviewed within the grade-cluster group or by another group of content specialists for content accuracy and Content Standards alignment. Each committee schedules regular meetings for development activities, such as training, reviewing/editing items, and other related activities. Based on the policy of the Department, 20% to 30% of the committee members are replaced periodically.
- *Test Review Committees for grades 2, 4, 6, 7, and 9* consisted of Delaware educators and content specialists (Appendix B). The committee members meet several times a year to review, edit, and revise reading passages, items, and scoring rubrics for constructed-response items that are developed by Harcourt Assessment, Inc.
- *The Bias and Sensitivity Review Committee* consists of educators who have diverse educational and cultural/ethnic backgrounds (Appendix C). The committee members meet once a month to review all newly developed items and reading passages before field test to identify any potential bias against under-represented groups. The committee also makes recommendations for revising or rewriting flagged items.
- *The Technical Advisory Committee (TAC)* consists of six national experts in educational measurement and testing; and assessments for students with disabilities (Appendix D). The role of this committee is to advise the Department of Education to ensure that the DSTP provides valid and reliable measures for all students. The committee members review the DSTP design, test development, and student data, identify psychometric issues, and make recommendations for improvement. Two committee meetings are scheduled each year.
- *Benchmark Committees* are responsible for establishing anchor papers and assigning score point(s) to each anchor paper. These anchor papers are used for scoring student responses to SA, ECR items, and essays to writing prompts. Each committee usually consists of 5 to 6 classroom teachers from all over the state and 1 to 2 members from the corresponding Test Development Committee.

### **III. Information in this Report**

This report documents the statistical/psychometric characteristics of the 2006 DSTP. Empirical validity evidence (e.g., the results of Student Questionnaire Survey, student performance, and external validity evidence), reliability of test scores (e.g., reliability coefficient, rater consistency, and consistency and accuracy of classifying students into performance levels), and the design and results of the 2006 equating are presented for each test.

## **Part Two. Design and Validity of the DSTP**

### **I. Overview of Test Development**

#### ***Ia. Delaware Content Standards and Grade-Level-Expectations***

The standards-based educational reform began in Delaware in 1991. With the adoption of the rigorous Content Standards in English language arts, Mathematics, Science, and Social Studies in 1995, Delaware educators have continued the efforts to implement standards-based curriculum and assessment in order to meet the goals of improving achievement for all Delaware students. In 1997, the State Legislature passed the laws (Delaware Code, Title 14) that made the Delaware Student Testing Program (DSTP) the official measures of student progress toward the Delaware Content Standards. Student test scores are used as primary indicators of the accountability system and provide feedback for classroom instruction. In spring of 2000, the passage of Senate Bill 260 resulted in the expansion of the DSTP from testing 4 grades to testing 9 grades for Reading, Writing, and Mathematics. To examine to what extent the DSTP tests measure the Delaware Content Standards, a series of alignment studies have been conducted from 2003 to 2005 using Norman Webb's procedure and criteria for the DSTP Reading/Writing, Mathematics, Science, and Social Studies.

The *No Child Left Behind Act* of 2001 requires that each state must measure student progress yearly for grades 3 through 8 and one grade in high school in reading and mathematics. The 2004 Standards and Assessments Peer Review Guidance released by the U. S. Department of Education clearly indicates that "Academic content standards must specify what all students are expected to know and be able to do; contain coherent and rigorous content; and encourage the teaching of advanced skills. A State's academic content standards may either be grade-specific or may cover more than one grade if grade-level content expectations are provided for each of grades 3 through 8. At the high school level, the academic content standards must define the knowledge and skills that all high school students are expected to have in at least reading/language arts, mathematics, and, beginning in the 2005-06 school year, science, irrespective of course titles or years completed" (p.2). To meet the federal requirements, in the spring of 2005 Delaware developed the Grade-Level-Expectations for grades K-12 in English language arts and for K-11 in Mathematics, primarily derived from the grade-cluster based Content Standards. In the fall of 2006, Delaware developed the Grade-Level-Expectations for Science as well as for Social Studies.

#### ***Ib. Developing Test Specifications***

The first step in test development is to develop the test specifications. The content and skills measured by a test and distributions of emphasis are described in the test specifications with percentage and/or number of items under each category. Every year, the test is developed based on the same test specifications so that the test forms are considered equivalent across years and student progress can be evaluated toward the standards. The test specifications were originally developed in 1997 by the

corresponding Test Development Committee in conjunction with the content specialists from the contractor based on the Delaware Content Standards. Minor modifications, however, have been made in recent years to reflect the current curriculum of a given content area and revision of the standards. Due to the development of Grade-Level-Expectations in English language arts and Mathematics, modifications on the test specifications for the DSTP Reading and Mathematics were considered and would be gradually implemented over a couple of years. Below is a brief list of components/issues that are considered in determining the content and skills measured by each test, item types used, and the distribution of emphasis in the test specifications:

- The importance of the content domain and skills specified in the Standards
- The expectations of student performance specified in the Standards and the Grade-Level Expectations
- The potential impact of the DSTP on teaching and learning
- The improvement of higher-level thinking
- The accessibility in large-scale testing environment

#### ***A. English language arts***

The English Language Arts Content Standards require that all students in Delaware public schools should become effective readers, writers, listeners, viewers, and speakers. Due to the limitations of large-scale testing, only reading and writing are assessed by the DSTP.

a. The Reading assessment is designed to measure Standard 2 that students “construct, examine, and extend the meaning of literary, informative, and technical texts through listening, reading, and writing” and Standard 4 that students “use literary knowledge accessed through print and visual media to connect self to society and culture.” Three types of reading passages, literary, informative, and technical, are used in the reading assessment. The depth of reading comprehension is measured by three stances, determining meaning, interpreting meaning, and extending meaning. The reading test specifications reflect the emphasis of types of reading passages and questions (stances) for each grade (Appendix E1).

- Questions in the stance of determining meaning require the reader to demonstrate an overall understanding of the passage. The focus is on how the reader begins to make meaning of the text.
- Questions in the stance of interpreting meaning require the reader to go beyond the initial understanding to develop an interpretation of the text. The reader goes beyond first impression to construct a more complete understanding of what has been read.
- Questions in the stance of extending meaning require the reader to stand apart from the text and critically consider it. This stance involves critical examination, evaluation, and analysis.

b. The writing assessment is designed to measure Standard 1 “Use written and oral English for various purposes and audiences.” For the stand-alone writing, students write an extended essay responding to a writing prompt; for the text-based writing, students write an essay responding to a prompt based on a reading passage. Three discourses of writing prompts are used in the DSTP writing assessment for stand-alone writing and two discourses for text-based writing (informative and persuasive):

- Expressive (author-oriented)
  - Reveal self-discovery and reflection;
  - Demonstrate techniques which could include dialogue;
  - Demonstrate appropriate modes, which could include narration and description.
- Informative (subject-oriented)
  - Address the needs of the audience;
  - Exhibit appropriate modes which could include description, narration, classification, simple process analysis, simple definition;
  - Conform to the appropriate formats, which could include letters, summaries, messages, and reports.
- Persuasive (audience-oriented)
  - Consider the needs of the audience;
  - Communicate a clear-cut position on an issue;
  - Support the position with relevant information, which could include personal opinions and examples;
  - Exhibit evidence of reasoning.

## ***B. Mathematics***

The Mathematics assessment is designed to measure the mathematics concepts and procedures specified in the Delaware Mathematics Standards using multiple item formats: MC, SA, and ECR. In 2005, the Mathematics Standards were rearranged from six content standards into four content standards labeled as: Numeric Reasoning; Algebraic Reasoning; Geometric Reasoning; and Quantitative Reasoning. The four process standards stayed similar as the previous version: Problem Solving; Reasoning and Proof; Communication; and Connections. Thus, the test specifications were adjusted accordingly.

Below is the conversion table from the previous six standards to the current four standards. The first change is to combine the old Standard 5 *Measurement* and Standard 8 *Spatial Sense and Geometry* into the new version *Geometric Reasoning 3*. The second change is the combination of the old Standard 7 *Algebra* with Standard 10 *Patterns and*

*Relationships* into *Algebraic Reasoning 2* of the new version. Adjustment of the test specifications was made accordingly across grades to reflect such changes, for example item coding and the distributions of test items under each content category. (Appendix E2). The actual emphasis of each content domain remained similar in the Mathematics test across years.

<u>Old Version</u>	<u>2005 Version</u>
Standard 6: Number Sense	<i>Numeric Reasoning 1:</i> Number Sense
Standard 5: Computation Estimation	Operation
Standard 10: Patterns, Relationships, and Functions	<i>Algebraic Reasoning 2:</i> Patterns and Change
Standard 7: Algebra	Representations Symbols
Standard 8: Spatial Sense and Geometry	<i>Geometric Reasoning 3:</i> Classification
Standard 5: Measurement	Location and Transformation Measurement
Standard 9: Statistics and Probability	<i>Quantitative Reasoning 4:</i> Collect, Represent, and Analyze Probability

Content Standards:

- a. Standard 1 – Numeric Reasoning: Students will develop Numeric Reasoning and an understanding of Number and Operations by solving problems in which there is a need to represent and model real numbers verbally, physically, and symbolically; to explain the relationship between numbers; to determine the relative magnitude of real numbers; to use operations with understanding; and to select appropriate methods of calculations from among mental math, paper-and-pencil, calculators or computers.
- b. Standard 2 – Algebraic Reasoning: students will develop Algebraic Reasoning and an understanding of Patterns and Functions by solving problems in which there is a need to recognize and extend a variety of patterns from the concrete to the abstract using physical models, equations, and graphics; to describe, represent, and analyze relationships among variable quantities; and to analyze, represent, model, and describe real-world functional relationships.
- c. Standard 3 – Geometric Reasoning: Students will develop Geometric Reasoning and an understanding of Geometry and Measurement by solving problems in

which there is a need to recognize, construct, transform, analyze properties of, and discover relationships among geometric figures; and to measure to a required degree of accuracy by selecting appropriate tools and units.

- d. Standard 4 – Quantitative Reasoning: Students will develop Quantitative Reasoning and an understanding of Data Analysis and Probability by solving problems in which there is a need to collect, appropriately represent, and interpret data; to make inferences and to present convincing arguments; and to model mathematical situations to determine the probability.

Process Standards:

- a. Standard 5 – Problem Solving: Students will develop their problem solving ability by engaging in developmentally appropriate problem-solving opportunities in which there is a need to use various approaches to investigate and understand mathematical concepts; to formulate their own problems; to find solutions to problems from everyday situations; to develop and apply strategies to solve variety of problems; and to integrate mathematical reasoning.
- b. Standard 6 – Reasoning and Proof: Students will develop their Reasoning and Proof ability by solving problems in which there is a need to investigate significant mathematical ideas in all content areas; to justify their thinking; to reinforce and extend their logical reasoning abilities; to reflect on and clarify their own thinking; to ask questions to extend their thinking; and to construct their own learning.
- c. Standard 7 – Communication: Students will develop their mathematical Communication ability by solving problems in which there is a need to obtain information from the real world through reading, listening, and observing; to translate this information into mathematical language and symbols; to process this information mathematically; and to present results in written, oral, and visual formats.
- d. Standard 8 – Connections: Students will develop Mathematical Connections by solving problems in which there is a need to view mathematics as an integrated whole and to integrate mathematics with other disciplines, while allowing the flexibility to approach problems, from within and outside mathematics, in a variety of ways.

***C. Science***

The Science assessment is designed to measure the Delaware Science Standards. Eight standards cover core scientific concepts and critical skills under four sub-content areas (inquiry, physical science, earth science, and life science). The sub-content areas reflect the increasing complexity of science education to develop the capacity for life-long learning. The test specifications that are developed based on the Standards show

varying emphasis of each sub-content area from grade to grade (Appendix E3). Multiple-choice and short answer items are used to measure students' knowledge and skills in science.

- a. **Science as Inquiry:** The practice of science and the development of technology are critical pursuits of our society. These pursuits have involved diverse people throughout history and have led to continuous improvement in the quality of life and in our understanding of nature. Students will study the process of scientific inquiry and technology development and the history and context within which these have been carried out. In the science assessment, students will demonstrate their understanding skills to observe, experiment, and analyze data in scientific settings.
- b. **Physical Science:**
  - **Materials and Their Properties:** Students will develop a basic understanding of the structure and properties of materials. They will also experience and learn the process by which materials are changed and how the uses of materials are related to their properties.
  - **Energy and Its Effects:** Students will study, discuss, and learn the factors that govern the flow of energy throughout the universe, the transformation of natural resources into useful energy forms, and the conservation of energy during interaction with materials.
- c. **Earth Science**
  - **Earth in Space:** Students will learn that even though the distributions and types of materials differ from planet to planet, the chemical composition of materials is identical and the same laws of science apply across the universe.
  - **Earth Dynamic Systems:** Students will study and learn to identify components of the various Earth systems and understand the changes and patterns that result from interactions within and between these systems.
- d. **Life Science**
  - **Life Processes:** Students will learn how living organisms use matter and energy to build their structures and conduct their life processes. They will learn the mechanisms and behaviors used by living organisms to regulate their internal environments and to respond to changes in their surroundings. Students will also study how knowledge about life processes can be applied to improving human health and well-being.
  - **Diversity and Continuity of Living Things:** Students will study how living things reproduce, develop, and transmit traits, and how theories of evolution explain the

unity and diversity of species found on earth. Student will also study how knowledge of genetics, reproduction, and development is being applied to improve agriculture and human health.

- **Ecology:** Students will acquire a basic understanding of the structure of ecosystems and how they function and change. They will also study how humans can apply scientific and technological knowledge about ecosystems in making informed decisions about the use of natural resources.

#### ***D. Social Studies***

There are four sub-content areas: civics, economics, geography, and history in the Delaware Social Studies Standards specified by grade-cluster. Under each sub-content area there are four standards. The complexity of performance expectations, however, increases at each succeeding grade-cluster. For example, Civics Standard One indicates “Students will examine the structure and purpose of government with specific emphasis on constitutional democracy.” It is required that “students will understand that governments have the power to make and enforce laws and regulations, levy taxes, conduct foreign policy, and make war” for the grade-cluster 4-5; while “students will analyze the ways in which the structure and purposes of different governments around the world reflect differing ideologies, culture, values, and histories” for the grade-cluster 9-12. The assessment is designed to measure the Delaware Content Standards in Social Studies. The Test Development Committee recognizes that all the four sub-content areas are equally important to all grade-clusters in Social Studies and that the integration of the four sub-content areas in is important for classroom instruction. Thus, all the standards are specified with equal emphasis in the test specifications across grades, except one in history that is very difficult to be measured in large-scale testing (Appendix E4).

- a. **Civics:** Students will examine the structure and purposes of governments with specific emphasis on constitutional democracy; understand the principles and ideas underlying the American political system; understand the responsibilities, rights, and privileges of United States citizens; and develop and employ the civic skills necessary for effective, participatory citizenship.
- b. **Economics:** Students will analyze the potential cost and benefits of personal economic choices in a market economy; examine the interaction of individuals, families, communities, businesses, and governments in a market economy; understand different types of economic systems and how they change; and examine the patterns and results of international trade.
- c. **Geography:** Students will develop a personal geographic framework, or “mental map”, and understand the uses of maps and other geo-graphics; develop a knowledge of the ways humans modify and respond to the natural environment; develop an understanding of the diversity of human culture and the unique nature of places; and develop an understanding of the characters and use of regions and the connections between and among them.

- d. History: Students will employ chronological concepts in analyzing historical phenomena; gather, examine, interpret, and analyze historical data; and develop historical knowledge of major events and phenomena in world, United States, and Delaware history.

### Ic. Item Development and Review

#### **A. Process for Item Development**

In this section, the general process for item development is described. Newly-developed items and scoring rubrics for short-answer and extended constructed-response items are first reviewed for content accuracy and standards alignment and edited by the grade-cluster group of the Test Development Committee and/or by the Advisory Committee. These items are also reviewed and edited by the Chair of the corresponding committee and the content specialists from the contractor. Comments and formal editorial reviews provide useful feedback for item writers. Accepted items from content review are then reviewed for fairness or potential bias against under-represented groups of students before going to the field test. The common criteria used for item review are listed below:

- a. Content accuracy
- b. Alignment to the Content Standards and Grade-Level-Expectations
- c. Appropriate content and cognitive expectation to grade level
- d. Appropriate scoring rubrics for short answer and extended-constructed items
- e. Correct answer for each multiple-choice item
- f. Appropriate item format to item content
- g. Avoid item ambiguity
- h. Appropriate readability to grade level
- i. Additional criteria were applied for Reading and Writing:
  - Interesting topic of reading passages and writing prompts
  - Appropriate number of attached items to each reading passage
  - Use of EDL Core Vocabulary to check the readability
  - Accuracy of wording
- j. Additional criteria were applied for Mathematics:
  - Accuracy of formula, figures, and graphics
  - Calculator-dependent or calculator-independent items are in the right session
- k. Additional criteria were applied for Science:
  - Developmental appropriateness of items
  - Important topics rather than only recalling detailed facts
  - Accuracy of tables and graphics

I. Additional criteria were applied for Social Studies:

- Accuracy of tables and graphics
- Alignment of graphics to the items

### ***B. Review Stanford Achievement Test Items***

As indicated earlier, the Stanford Achievement Test (SAT) is a component of the Delaware Student Testing Program. The national percentile ranks are reported based on all 30 items in the abbreviated version of SAT Reading Comprehension for grades 2 to 10, and Problem Solving in Mathematics for grades 2 to 8 and Mathematics for grades 9 and 10. Selected SAT items are combined with Delaware-developed items to derive the standards-based scores. In the fall of 1997, a Review Committee consisting of Delaware teachers and educators reviewed the Stanford Achievement Test (9th addition) for grades 3, 5, 8, and 10. The same review procedure was conducted in early 2001 for grades 2, 4, 6, 7, and 9.

In May of 2004 the Review Panels reviewed the 10<sup>th</sup> edition of SAT Reading Comprehension, Problem Solving in Mathematics or Mathematics for grades 2 to 10. They aligned item by item to the corresponding Delaware Content Standards. The alignment analyses resulted in 28, 27, 26, 27, 27, 27, 26, and 30 items out of the 30 items for grades 2 through 10, respectively, for Reading Comprehension; and resulted in 27, 25, 26, 28, 25, 27, 28, 28, and 28 items out of the 30 items, for grades 2 through 10, respectively, for Mathematics Problem Solving or Mathematics. In 2005, the SAT10 that was replaced SAT9 was administered to students in grades 2 through 10 under untimed testing condition proposed by Harcourt Assessment, Inc. Only selected SAT10 items through the alignment process were used, combining with Delaware-developed items, for the standard-based scores. More information can be found in *Section III. Validity Evidence*.

### ***Id. Bias and Sensitivity Review***

The bias review consists of two stages: subjective judgment by the Bias-Sensitivity Review Committee and statistical analysis by using the Mantel-Haenszel (MH) procedure. Regardless of the purpose of testing, fairness requires that all examinees be given a comparable opportunity to demonstrate their standing on the construct(s) the test is intended to measure (Standards for Educational and Psychological Testing, 1999, p.74). Judgmental methods for review of test items are often supplemented by statistical procedures for identifying items on tests that function differently across identifiable sub-groups of examinees in large-scale test settings (Standards for Educational and Psychological Testing, 1999). In Delaware, sensitivity to item fairness/bias has been built into the process of test development since 1997. Each newly developed item is reviewed by the Bias and Sensitivity Review Committee before field test. Using predetermined guidelines and criteria, the Bias and Sensitivity Review Committee members identify items that may contain stereotypes (e.g., sexism, racism), irrelevant constructs that pose particular difficulty for one sub-group (e.g., English Language

Learners), and/or biased content against different subgroups (e.g., gender, racial/ethnic, religion, socioeconomic status, geographic location).

Bias is the presence of some characteristic of an assessment item that results in the differential performance of two individuals of the same ability but from different subgroups or with different background. Statewide tests serve a very broad audience, every student in the state. This includes students and their parents with a diverse background, such as ethnic groups, nationalities, religions, conservatives or liberals, political factions; and family background, such as occupation, economic status, sexual preferences, physical capabilities. To be both fair and not offensive to all these populations, each test passage and every item have been carefully reviewed and considered by the Bias and Sensitivity Review Committee. This committee of well-trained professionals deliberates about each passage and item before they are field tested. Communication between the review committee and item writers and test producers is also critically important to ensure that all students have an equal opportunity to demonstrate their knowledge and skills without emotional consequences. Bias must be approached as an assessment issue as well as a cultural issue. A specific topic or feature of a passage or item that may disadvantage one or two otherwise equally matched groups of students would not make a fair test.

Bias and sensitivity review is not a literal process, such as just picking out words. The Committee must consider the context and the setting. There are some issues and topics that are appropriate for classroom discussion that may not be appropriate for a statewide assessment. In the classrooms, the teachers know their students and are able to explain topics in an appropriate context. During the statewide testing, the teacher is not permitted to intervene and make these explanations. Therefore, these topics must be avoided on the assessment. While the list of contexts that are to be considered for bias and sensitivity reasons seems to be lengthy and almost all-inclusive, there are still many contexts that are very acceptable. In addition, many contexts that are on the consideration list may be acceptable if the subject matter is historical in nature or a part of a specific state standard. Often it is not the material itself, but the way it is handled that is important.

The statistical procedure is based on the results of a pilot study conducted in 2001 to examine the Differential Item Functioning (DIF), particularly for multiple item formats, such as MC, SA, and ECR, using the Mantel-Haenszel (MH) and Simultaneous Item Bias (SIBTEST) procedures. Since 2002, the Mantel-Haenszel (MH) procedure has been applied to all core items, as well as to field test items, in Reading, Mathematics, Science, and Social Studies each year as supplement to the judgmental procedure for examining potential item bias. The DIF results have been used for item review, item selection, and improvement of item writing.

#### *Ie. Field Testing*

The purpose of field testing is to generate statistical characteristics of the items. To enlarge the item pool, in 2006 the field test forms increased from six to eight for

Reading and Mathematics; from four to six forms for Science and Social Studies. Field test items are embedded into the operational test forms for all grades except grade 2 and writing assessment. The test forms are spiraled within classroom and school in order to receive unbiased samples. The field test design has the following advantages:

- Minimize sampling errors;
- Minimize errors in item statistics due to student motivation;
- Minimize interruption of regular classroom instruction;
- Reduce the budget for testing; and
- Easy test administration.

A separate field test is held for grade 2 approximately every two years to minimize the burden of younger students. Writing field test was conducted in the fall of 2005 with six forms for the stand-alone writing and text-based writing, respectively. A small-scale benchmark process called “Mini Anchor Paper Pulling” (MAPP) is currently arranged for all content areas after the field test. The advantages of the small-scale benchmark process are:

- To improve the consistency of item statistics from field tests and operational;
- To improve the accuracy of item statistics from field test;
- To build a better understanding of student performance on each writing topic;
- To develop a general outline for the large-scale benchmark process; and
- To provide the contractor with general benchmarks for scoring the field tested writing prompts.

#### If. Test Construction

As designed, about 30% of Delaware-developed items are replaced each year from the previous year’s test forms for Reading, Mathematics, Science, and Social Studies for all tested grades. The objective data from the field tests are used primarily for evaluating the statistical characteristics of the new core items, such as item difficulty, item discrimination, and the strengths and weaknesses of distracters for multiple-choice items and scoring rubrics and student sample responses for short answer and extended constructed-response items. Professional judgments of item quality focus on the content balance, content accuracy, and grade level appropriateness. These newly-selected items, in conjunction with the remaining items from the previous year’s test form, must match the predetermined test specifications precisely to maintain the equivalency of test forms across years. The new test form is reviewed and approved by the Test Development Committee as well as by the Department of Education. The process of item selection and test assembly using the item statistics from the field test and the test specifications ensure that each newly developed test form demonstrates the desired psychometric characteristics and provides supportive construct validity evidence.

## II. Testing Conditions

In this section, testing conditions, such as test administration and training, test security, accommodations, and special test forms, are described.

### Ia. Test Administration and Security

The *2006 Test Coordinator's Handbook* provided the guidelines for planning and managing the DSTP administration for District and School Test Coordinators. The *Directions for Administering* by grade and test provided specific directions for test administrators from room arrangement, scheduling and timing for sessions, and preparing students to testing students of the special populations. A comprehensive training session for test coordinators jointly held by the Delaware Department of Education and Harcourt Assessment, Inc. was scheduled in the fall and the spring prior to the testing week.

In 2006, the SAT10 tests were administered under untimed testing conditions. Even though the SAT10 has no restriction of using a calculator for mathematics, the Department decided that calculators were only allowed for students with special needs and their SAT10 scores were considered valid for aggregation due to the Delaware Content Standards and curriculum. Three untimed sessions for Reading and two untimed sessions for Mathematics were given for the Delaware portion on separate days. Separate Reference Sheets containing commonly used mathematical formulas were provided for students at grades 6 through 10 for SAT10 and Delaware portion, respectively. Calculators (graphing calculators for grades 8 to 10) were allowed for one session of the Delaware portion. Two untimed sessions were scheduled for Science and Social Studies respectively.

In Writing, both stand-alone and text-based writings were untimed and were administered on separate days. It was recommended 3 hours for the stand-alone writing, including instruction, pre-writing, first draft, and final draft; and 2 hours for the text-based writing. Only the final draft was scored. A checklist was provided; and dictionaries and thesaurus were available for all students.

The Test Security Guidelines indicate that photocopying all or any part of a test booklet is **strictly prohibited** and all known violations of the Delaware Department of Education's regulations for test security should be reported immediately. As usual all test booklets were secured materials. Each test booklet was individually numbered with a unique bar code label. The District/School Test Coordinators were required to document the receipt of secured materials, check the lists of students, and return all test materials to Harcourt Assessment, Inc.

### Ib. Inclusion Guidelines and Exemptions

The DSTP intends to include all of the public school students in Delaware. However, students with significant cognitive disabilities are exempted from the DSTP under the Individuals with Disabilities Education Act (IDEA) or Section 504 of the

Rehabilitation ACT. These students are assessed by using the Delaware Alternate Portfolio Assessment (DAPA). In 2006, English Language Learners (ELL) students who have been in Delaware schools less than one year were allowed to be exempted from the DSTP Reading and Writing one-time only. The decision for exemption was made on the individual basis according to professional judgments from ELL teachers, principals, and/or ELL contact persons. Corresponding documentation for the exemption was required.

### *Iic. Accommodations and Test Modification*

A variety of accommodations and test modification strategies have been implemented for students with disabilities and for English Language Learners (ELL). It is important to ensure that accommodated testing conditions and test modifications do not change the construct nor affect the psychometric characteristics of the assessment.

In 2000, two Task Forces, the DSTP Disability Task Force consisting of special education teachers, administrators, school psychologists, speech therapists and the Language Minority Task Force consisting of ELL and bilingual teachers, reviewed and discussed related federal policies, Delaware regulations, and the existing accommodations for students with disabilities and ELL students. To include as many students as possible in the statewide assessment and meet the needs of students from special groups, the two Task Forces recommended the policies for exemption from the DSTP, eligibility for alternative assessment for students with disabilities, and corresponding accommodations for students with disabilities and ELL students. The Technical Advisory Committee reviewed proposed accommodations, which focused on whether modified testing conditions changed the test construct and thus, affected the comparability of test scores. Recommendations were made for aggregated and non-aggregated accommodations. For details, please see the 2006 Guidelines for Inclusion of Students with Disabilities and English language Learners.

A Braille form was available in 2006 for blind students. Modified forms excluded items with complicated graphics and those that were not appropriate for non-sighted students. Adjusted conversion tables from raw scores to scale scores were developed on the Braille form because of omitted items from the original test form.

The Spanish versions were provided for students with special needs under accommodated testing condition on Delaware-developed items in Mathematics, and the Science and Social Studies tests in 2006. The Spanish version was translated from English into Spanish by the professional translators from Harcourt Assessment, Inc. The draft translated version was reviewed by a group composed of bilingual teachers of English Language Learners (ELL) and teachers of Spanish. The Committee members were representatives from across the state at different grade levels with a variety of Spanish language backgrounds (e.g., Puerto Rico, Mexico, and Peru). The Committee members reviewed item by item with both English version and translated Spanish version. The discussion focused on the accuracy of the content and the language, and created a translation that can be read and understood by all test takers regardless of their

Spanish language background or economic background. Corrections and recommendations from the review process were used for Spanish-English editing to finalize the Spanish versions.

### **III. Validity Evidence**

It is indicated in the Standards for Educational and Psychological Testing (1999) that “validity refers to the degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests” (p. 9). Validity evidence as based on test content, response process, internal structure, and relations to other variables should be accumulated to support the intended interpretation of test scores. In this section, empirical validity evidence is presented: (1) the summary findings from the 2006 DSTP Administration Student Survey; (2) the summary of revisiting/establishing cut scores for DSTP Reading, Writing, and Mathematics; and (3) the relationships between the DSTP scores with ‘external’ measures (e.g., SAT10). The inter-correlations among sub-domain structure (e.g., reading and writing) that provide additional validity evidence can be found in *Part Five. Technical Characteristics of the DSTP* of this report.

#### **IIIa. Findings of the 2006 Student Survey**

In 2006, students of all tested grades were given a survey along with the administration of the DSTP. The survey questions were generally classified into six categories: Opportunity to Learn, Reading, Writing, Mathematics, Science, and Social Studies. It is important to note that the survey was the first time given to students of grades 4, 6, 7, and 9, in addition to grades 3, 5, 8, and 10, in 2006 for the spring administration. Like previous years, the 2006 survey results show a strong connection between student performance on the DSTP with curriculum content, instruction strategies, and classroom activities; and student attitude toward school, learning, and assessment. The survey results indicated that family support; student motivation, and classroom instruction were indeed important aspects in preparing students for success on standards. Evidence supported their relationships with subsequent performance on the statewide assessment. Student reports regarding their family support were found quite consistent with their test performance. Below is a brief summary of the findings. More information about the survey and the survey results can be found in the Report of Student Survey Questionnaire – 2006 DSTP Administration for Grades 3, 4, 5, 6, 7, 8, 9, and 10 in Reading, Writing, and Mathematics; and Grades 4, 6, 8, and 11 in Science and Social Studies.

#### ***A. Opportunity to Learn***

a. Data show that more students in lower grades than their peers in high grades more frequently talked about what they had learned in school with someone at home. The percentage of students talking to their families almost every day about school learning dropped from 68% for grade 3 to 32% for grade 11 (64%, 60%, 54%, 47%, 42%, 38%, and 36% for grades 4, 5, 6, 7, 8, 9, and 10, respectively; 61% for grades 4 and 6 for the fall administration). More high-achieving than low-achieving students reported

frequently talked about their school learning at home, for example in grade 11 (27%, 32%, 33%, 35%, and 43% from Well Below the Standard to Distinguished in Science).

b. Over 80% of the students across grades reported that their parents or guardian had encouraged them to do their best in school. Among them, a higher percentage is found for students in grades 3 through 7 (between 89% and 93%) than students in grades 8 through 11 (between 80% and 87%).

c. Over 30% of the students of grades 3 to 8 (31-36%) and more than 20% of the students of grades 9 to 11 (20-29%) reported that they spent three hours or more watching television each school day. Among them, the percentage for males is slightly higher than females; the percentage is consistently higher for African American students than the other ethnic groups.

d. Of the students in grades 3 to 6, 79% to 86% reported that it is very important to do well in school; while the percentage dropped to 62 to 71% for grades 7, 8, 9, and 11. Interestingly, 85% of the students in grade 10 reported that it is very important to do well in school. More female than male students reported that it is very important to do well in school.

## ***B. Reading***

a. The percentage of students reading at home almost every day is 57% and 54% for grades 3 and 4, 49% for grade 5, 38% and 31% for grades 6 and 7, and 24 to 29% for grades 8 to 10. With a consistent higher percentage for females than males reading at home frequently, female students show a higher average reading score than male students across grades and across years. The data also suggest that more high-achieving students than low-achieving students read at home almost every day.

b. More students in lower grades (84-87% for grades 3 to 5) reported being well-prepared for the DSTP Reading test. The percentage dropped to 66 to 77% for grades 6 to 8 and 48% for grades 9 and 10. More high-achieving students constantly reported feeling well prepared than low-achieving students.

c. The majority of the students across grades (68-90%) tried very hard to do well on the DSTP reading test. Grade 9 had the lowest percentage of trying very hard to do well on the Reading test (68%). The data also show that more high-achieving students than low-achieving students tried very hard on the Reading test.

## ***C. Writing***

a. Over one-half of the students in grades 3 to 8 reported that their teachers spend time teaching them to be a good writer almost every day. The percentage dropped to 33 and 38% for grades 9 and 10, respectively.

b. About 73 to 83% of the students in grades 3 to 8 and 61 to 65% in grades 9 and 10 reported that they always or sometimes planned, drafted, and revised their writing. More high-achieving than low-achieving students in writing always used this writing process.

c. Over 80% of the students in grades 3 to 5, over 70% in grades 6 to 8, and over 50% in grades 9 and 10 felt well prepared for the DSTP Writing test. Grade 9 had the lowest percentage of 51% among the eight grades. More high-achieving than low-achieving students reported well prepared.

d. Over 90% of the students in grades 3 to 5, over 80% in grades 6, 7, and 8, and 72% in grade 10 tried very hard to do well on the DSTP Writing test, but only 67% of the students in grade 9 tried very hard. The data suggest that student motivation is positively associated with their writing performance.

### ***C. Mathematics***

a. Over 60% of the students in grades 3 and 4 reported that they had mathematics homework almost every day. The percentage declined to 28% and 30% for grades 5 and 6, but increased to 33% to 39% for grades 7 through 10. Furthermore, more low-achieving than high-achieving students reported rarely having math homework.

b. Only 9 to 10% of the students in grades 3 and 4 used a calculator almost every day in their mathematics class and the majority only used a calculator once or twice a week. The percentage of using a calculator increased to 12% in grade 5, 26% in grade 6, over 40% in grades 7 and 8, 59% in grade 9, and 64% in grade 10 in most classes. More low-achieving than high-achieving students from lower grades (grades 3-6) reported using a calculator every day; while more high-achieving than low-achieving students from higher grades (grades 9 and 10) using a calculator every class.

c. More low-achieving than high-achieving students reported that their teachers usually showed them how to solve the problem when they received a math assignment; while more high-achieving than low-achieving students reported that their teachers usually asked students to work individually or working in small groups to solve the problem and discuss the solution.

d. Ninety percent of the students in grade 3 and 4 reported being prepared to do well on the DSTP Mathematics test. The percentages dropped to 87% in grade 5, 79% in grade 6, 69% and 64% in grades 7 and 8, and only 48% and 38% of the students in grades 9 and 10. More high-achieving than low-achieving students reported that their math class had prepared them to do well on the test; while more low-achieving than high-achieving students felt not being prepared.

e. More than 89% of the students in grade 3, 4, and 5 reported that they tried very hard on the Mathematics test; the percentages declined to 87%, 83%, 82%, 70% and 70% from grade 6 through grade 10, respectively.

#### *D. Science*

a. The data show that more students in grades 4 and 6 actually used scientific equipment in their science class almost every day or once or twice a week than their peers in grades 8 and 11. The frequency of using scientific equipment obviously has positive impact on student learning. The results suggest that more high-achieving than low-achieving students usually used science equipment at least once or twice a week; however, more low-achieving than high-achieving students reported rarely using such equipment in their science class.

b. Over one third of the students in grades 8 (34%) and 11 (43%) reported that their teachers prepared the experiment/lab and asked students to operate it; among them more high-achieving than low-achieving students. About 10% of the students in grades 8 (12%) and 11 (8%) reported that their teachers usually operated the experiment/lab and asked students questions; among them more low-achieving than high-achieving students.

c. Based on students' responses, about 30% of the students in grades 4 and 6 shared their ideas and reports with other students almost every day in science class. Over 20% of the students in grades 8 and 11 reported that they discussed possible solutions, evidence or data in small groups almost every day. Over 40% of the students of grades 4 (43%), 6 (65%) and 8 (40%) wrote explanations in their journals/notebooks, lab reports or on tests almost every day, but only 23% in grade 11.

d. Over one-third of the students believed that the knowledge they had learned in science class helps them understand the world better; however, the percent declined from 76% for grade 4, 57% for grade 6, 44% for grade 8 to 35% for grade 11. More high-achieving than low-achieving students believed that the science class helps them understand the world better; while more low-achieving than high-achieving students did not believe so.

e. The percentage of students reported being prepared to do well on the DSTP Science test dropped from 84% for grade 4, 65% for grade 6, 47% for grade 8, and only 28% for grade 11. More high-achieving than low-achieving students felt being prepared to do well on the Science test; whereas more low-achieving than high-achieving students were felt not being prepared by their science class.

f. The majority of the students tried very hard to do well on the Science test with the highest percentage in grade 4 (90%) and the lowest percent in grade 11 (44%). The data suggest that student motivation has a positive relationship with their performance on the DSTP Science test; more high-achieving than low-achieving students tried very hard on the Science test; whereas, more low-achieving than high-achieving students did not try hard on the test.

## ***E. Social Studies***

a. Over one-third of the students across grades 4, 6, 8, and 11 reported that their social studies teacher asked them to use maps for more than just locating places, such as collect information from maps to support their answers and collect information from graphs or charts to explain or justify their answers every class or for most social studies classes. According to the results, 16% to 18% of the students applied the concepts and knowledge they had learned to solve real life problems in every social studies class, 25% to 30% in most classes, 29% to 34% in some classes, and 19% to 32% reported that their teachers never or hardly ever asked them to do these activities in social studies class. Over 30% of the students across the four grades reported that their social studies teacher asked them every class or in most classes to use primary sources, such as documents, diaries, and artifacts. For grades 6, 8, and 11, 14% to 16% of the students reported that their social studies teacher asked them to explain why there are often different interpretations of the same even in every class; among them more high-achieving than low-achieving students.

b. Based on students' responses, there are great variations of instructional time that social studies teachers spent on the four sub-content areas in classroom across the four grades: 37% to 58% for geography, 25% to 60% for civics and government, 36% to 53% for economics, and 45% to 82% for history. The data also indicate the variations that social studies teachers rarely or hardly ever taught the sub-content areas, 10% (grade 6) to 20% (grade 4) for geography, 8% (grade 8) to 28% (grade 11) for civics and government, 11% (grade 11) to 25% (grade 4) for economics, and 3% (grade 8) to 15% (grade 11) for history.

c. Eighty-four percent of the students in grade 4 felt their social studies class had prepared them to do well on the test, the percentage declined to 59% for grade 6, 40% for grade 8, and 30% for grade 11. More high-achieving than low-achieving students felt well-prepared in grade 11. About 16% to 20% of the students in grades 8 and 11 reported not being prepared to do well on the state test.

d. Ninety-two percent of the students in grade 4 tried very hard to do well on the DSTP Social Studies test, among them more girls (95%) than boys (89%). The percentage, however, declined to 87% for grade 6, 69% for grade 8, and 45% for grade 11. The data suggest that student motivation has a positive relationship with their performance on the Social Studies test; more high-achieving than low-achieving student tried very hard on the test; while more low-achieving than high-achieving students reported that they did not try hard on the test.

### ***IIIb. Revisiting, Reviewing, and Establishing Performance Standards for Reading, Writing, and Mathematics***

To meet the requirements of the *No Child Left Behind* regulations and implement recommendations of the Governor's Executive Order 54, the Department of Education proposed a plan to convene panels of educators and members of the community to review

the performance standards (cut scores) for both Reading and Mathematics at grades 3, 5, 8, and 10 in the summer of 2005 and to use performance levels based on the new cut scores in Spring 2006 for reporting at the student, school, district, and state levels and for school accountability (Woodruff, 2004). The project involved the following five steps:

- a. Conduct alignment studies in English language arts (Reading and Writing) and Mathematics for grades 2, 4, 6, 7, and 9; conduct vertical alignment studies for English language arts and Mathematics for grade 2 through grade 10;
- b. Develop Performance Level Descriptors (PLD) for Reading, Writing, and Mathematics;
- c. Revisit the cut scores in Reading and Mathematics for grades 3, 5, 8, and 10;
- d. Review proposed cut scores in Reading and Mathematics in five performance levels for grades 4, 6, 7, and 9 and in three levels for grade 2; and
- e. Revisit cut scores in Writing for grades 3, 5, 8, and 10 and establish cut scores for grades 4, 6, 7, and 9 in five performance levels.

From March through August 2005, over 280 classroom teachers, educators, administrators, and representatives from Delaware educational organizations and business community throughout the state participated in various development meetings and review workshops. Some of the participants were involved in more than one activity. These educators and community members have made great contributions to the development of the Performance Level Descriptors (PLD) for Reading, Writing, and Mathematics, reviewing the statewide assessments, and making recommendations on the adjusted cut scores in five performance levels for grades 3 through 10 and in three levels for grade 2.

#### ***A. Grade-by-Grade Alignment Studies***

The alignment studies were conducted in March to April, 2005 for Mathematics and English language arts at grades 2, 4, 6, 7, and 9. Webb's model was applied during the 2-day alignment session by using four criteria: *Categorical Concurrence*, *Depth of Knowledge Consistency*, *Range of Knowledge*, and *Balance of Representation*. The Alignment Committees reviewed the 2005 test form, item by item, to determine to what extent the DSTP measures the Content Standards and the newly developed Grade-Level-Expectations (GLE). Although the GLEs have few changes of expectations for students from the end of grade cluster, the goals and expectations are more specific by the end of each grade. The committees also made recommendations to improve the degree of alignment for English language arts (Reading and Writing), and Mathematics based on the expectations for students by grade, particularly in Mathematics.

The results of alignment studies for English language arts are summarized in the Table 1. The recommendations for the improvement of the Reading and Writing tests include:

a. For Grade 2, improvement in alignment between the DSTP and Standard 4 (Use literary knowledge) is recommended. Increasing the number of test items that correspond to performance indicators for this standard would improve *Categorical Concurrence* with this standard. If these test items are designed to assess the appropriate *Depth of Knowledge* (DOK) levels and cover a broad range of performance indicators, then they will also help to improve *Range of Knowledge Consistency* and *Balance of Representation* between the DSTP and Standard 4.

b. For Grade 4, improvement in alignment between the DSTP and Standards 1, 2, and 4 is recommended, particularly for *Range of Knowledge Consistency* and *Balance of Representation* criteria. Adding test items that assess appropriate DOK levels and cover a broad range of performance indicators will improve alignment for these criteria. Adding writing prompts in Grade 4 which requires higher DOK levels will improve *Depth of Knowledge Consistency* between the test and Standard 1 (Use oral and written language).

c. For Grades 6, 7, and 9, the results indicate a sufficient or approaching sufficient alignment between the DSTP and the English Language Arts Performance Indicators for Content Standards 1, 2, and 4. For Grades 7 and 9, the results indicate that some improvement is needed related to consistency in DOK levels between the test and ELA performance indicators. Adding test items that address higher DOK levels will improve consistency between the DSTP and performance indicators for Standard 1 (Use written and oral English) and Standard 2 (Construct, examine, and extend the meaning of literary, informative, and technical texts).

The results of alignment studies for Mathematics are summarized in the Table 2. The recommendations for the improvement of the mathematics tests include:

a. There is stronger alignment generally across the four content standards than for the four process standards. In order to improve alignment for the process standards, more items or score points are needed to measure Problem Solving, Mathematical Communication, Mathematical Reasoning, and Mathematical Connections, especially at grades 6, 7, and 9. These items also need to be at the appropriate DOK levels to match the expectations from the standards. In terms of improving the alignment to the four content standards, more attention should be paid to the specific objectives for the grade level. Items that measure Number Sense should reflect a broader range of objectives across all grades. In addition, Algebra items at grade 9 should measure the appropriate DOK level and cover a broader range of objectives to achieve better range and balance.

b. Since the Mathematics assessments at grades 2, 4, 6, 7, and 9 were originally developed based on the expectations by the end of each cluster (K-3, 4-5, 6-8, and 9-10) specified in the Content Standards, adjustment should be planned for test development to

achieve the expectations by the end of each grade described in the newly developed Grade Level Expectations.

**Table 1. Summary of Alignment Results for English Language Arts**

<b>Grade</b>	<b>Standard</b>	<b>Categorical Concurrence</b>	<b>Depth of Knowledge</b>	<b>Range of Knowledge</b>	<b>Balance of Representation</b>
Grade 2	1	<i>Not assessed</i>			
	2	Yes	Yes	Yes	<i>Weak</i>
	4	No	Yes	No	No
Grade 4	1	Yes	No	<i>Weak</i>	No
	2	Yes	Yes	Yes	No
	4	Yes	Yes	<i>Weak</i>	<i>Weak</i>
Grade 6	1	Yes	Yes	Yes	<i>Weak</i>
	2	Yes	Yes	Yes	<i>Weak</i>
	4	Yes	Yes	Yes	Yes
Grade 7	1	Yes	Yes	Yes	Yes
	2	Yes	Yes	Yes	<i>Weak</i>
	4	Yes	Yes	<i>Weak</i>	Yes
Grade 9	1	Yes	Yes	Yes	Yes
	2	Yes	<i>Weak</i>	Yes	<i>Weak</i>
	4	Yes	Yes	Yes	Yes

**Table 2. Summary of Alignment Results for Mathematics**

<b>Grade</b>	<b>Standard</b>	<b>Categorical Concurrency</b>	<b>Depth of Knowledge</b>	<b>Range of Knowledge</b>	<b>Balance of Representation</b>
Grade 2	1	Yes	No	No	No
	2	Yes	Yes	No	No
	3	No	Yes	No	No
	4	No	Yes	No	No
	6	Yes	Yes	Yes	Weak
	7	Yes	Yes	Yes	Yes
	8	Yes	Yes	Yes	Yes
	9	Yes	Weak	Yes	Yes
	1	Yes	No	No	No
Grade 4	2	Yes	Yes	Yes	Yes
	3	No	Yes	No	No
	4	No	Yes	No	No
	6	Yes	Yes	No	No
	7	Yes	Yes	Yes	Yes
	8	Yes	Weak	Weak	Weak
	9	Yes	Yes	Yes	Yes
	1	Yes	No	No	No
	2	No	Yes	No	No
Grade 6	3	No	No	No	No
	4	No	No	No	No
	6	Yes	Yes	No	No
	7	Yes	Weak	Yes	Yes
	8	Yes	Weak	Yes	Yes
	9	Yes	Yes	Yes	Yes
	1	No	No	No	No
	2	No	No	No	Weak
	3	No	No	No	Yes
Grade 7	4	No	Yes	No	No
	6	Yes	Yes	No	Weak
	7	Yes	Yes	Yes	Weak
	8	Yes	Yes	Weak	Weak
	9	Yes	Yes	Yes	Yes
	1	No	No	No	Weak
	2	No	Yes	No	No
	3	No	No	No	No
	4	No	No	No	No
Grade 9	6	Yes	Yes	Yes	Weak
	7	Yes	Weak	Weak	No
	8	Yes	Yes	Weak	Yes

## ***B. Vertical Alignment***

The vertical alignment study was conducted in English language arts and Mathematics on April, 2005 as a pilot study funded by the Council of Chief State School Officers (CCSSO) State Collaborative on Assessment and Student Standards (SCASS) Technical Issues in Large-Scale Assessment (TILSA). A total of 57 classroom teachers and curriculum specialists throughout the state participated in the Vertical Alignment workshop at the elementary, middle, and high school levels. The vertical alignment process that was applied examined the relationship of content standards and expectations from grade to grade. Through this process, panelists evaluated how the Content Standards and Grade-Level-Expectations (GLE) at one grade are related to the standards and the GLE at the next grade. In addition, they were asked to rate the clarity of increases in expectations from one grade to the next. A review of the consistency of expectations across grades provided validity evidence for content standards used for accountability under NCLB.

In addition to the recommendations for extending and improving the vertical alignment process; recommendations were provided to the Delaware Department of Education for clarifying their grade level expectations and for using the alignment results in developing performance level descriptors.

a. For Mathematics, the large percent of expectations judged to be new at grade 9 (40%) suggests a possible disconnection between the nature and wording of the expectations for middle school and high school levels. In addition, a significant proportion (33%) of the linkage from grade 9 to grade 10 mathematics was judged to be of low importance. Many of the linkages (29%) between mathematics expectations at the 3<sup>rd</sup> and 4<sup>th</sup> grade levels were also judged to be of low importance.

b. For English language arts, a significant number (36%) of the expectations for grades 9 and 10 were judged the same and a significant proportion (38%) of the linkages in expectations for these grades were judged to be of low clarity. Expectations for increases in knowledge and skill from the 8<sup>th</sup> to the 9<sup>th</sup> grade were also judged to be of lower clarity (28% were judged the same and 30% received low clarity ratings).

While the findings above have focused on areas where clarification of the grade-level expectations might be fruitful, it is important to keep in mind that most of the increases in grade-level expectations were judged to be clear and important. Overall, the results were fairly positive for the first exposure of these expectations. Nonetheless, the study offers some suggestions for further work in introducing and clarifying Delaware's grade-level expectations for Mathematics and English language arts.

Recommendation 1: Continue work to clarify the grade-level expectations, particularly as they are introduced to new teachers. One valuable outcome of this workshop was the identification of specific questions that the panelists had about the wording and meaning of some of the expectations. These questions should be helpful in

preparing additional explanatory material to clarify questions that teachers new to the grade-level expectations may have.

Recommendation 2: Some version of this process might also provide effective professional development for introducing the grade-level expectations to the teachers who must help students meet them.

### ***C. Performance Level Descriptors***

The Performance Level Descriptors (PLD) clearly depict what students are expected to know and be able to do for each grade, differentiate among the performance levels, and reflect developmental skill progression across grades. From May to June 2005, about 70 Delaware teachers and content experts participated in the development of the PLD for Reading, Writing, and Mathematics. Consistency of the descriptions for a subject area is accomplished across grades, across performance levels within a grade, and across grades for the same performance level. Certain level of consistency of the PLD between subject areas is also attained. These content-based descriptions along with the Grade-Level-Expectations (GLE) were used as the base in the review process of performance standards for the panelists to adjust cut scores.

### ***D. Methodology and Review Process for Reading and Mathematics***

a. The review workshop was a two-day session beginning with general training and content-related training on the Grade-Level-Expectations (GLE) and Performance Level Descriptors (PLD). The workshop was conducted according to the detailed plan and agenda to refine the existing cut scores or proposed preliminary cut scores as necessary to achieve alignment with Delaware Content Standards, GLE, and PLD. In each grade and content area the participants were to recommend four cut scores that defined five performance levels: *Well Below the Standard*, *Below the Standard*, *Meets the Standard*, *Exceeds the Standard*, and *Distinguished*. The review of performance standards (cut scores) was conducted using a modification of the Bookmark Standard Setting Procedure (Lewis, Mitzel, & Green; 1996, Mitzel, Lewis, Mitzel, Patz, & Green, 2000).

b. There were four panels, one for each grade of 3, 5, 8, and 10 for the first workshop; there were five panels, one for each grade of 2, 4, 6, 7, and 9 in each content area for the second workshop. Each panel was composed mainly of teachers or content experts from the target grade, and teachers and content experts from adjacent grades. Unlike the traditional standard setting, participants were encouraged to discuss and communicate with their fellow panelists during the review and rating process.

c. The ordered item booklets were organized using the 2005 DSTP test forms with one item per page, sorted by item difficulty, from the easiest item first to the most difficult item last. Panelists were also provided with Item Maps to support their review of the ordered item booklets. The Item Map presented additional information about each item including the sequence item number on the operational test, the order of item difficulty, the highest obtainable score points for each item, item type (multiple-choice, short answer or extended constructed response), the content standard each item measured,

and the correct response (for multiple-choice items) or score point (for constructed-response items). The performance level associated with each item was also identified by either the existing cut scores for grades 3, 5, 8, and 10 or proposed preliminary cut scores for grades 2, 4, 6, 7, and 9 in reading and mathematics. An item was associated with the highest performance level for which a student at the cut score would have at least a two-thirds likelihood of knowing the correct response for multiple-choice items or of obtaining at least that score point for constructed-response items. Scoring rubrics and anchor papers for constructed-response items were available for review by grade and content area.

d. Participants studied the ordered test booklets individually and then engaged in group discussion which focused on three key questions: (1) What does this item measure? (2) Why is this item more difficult than preceding items in the ordered test booklet? (3) Is the item aligned to the PLD for the corresponding performance level? Participants were asked to identify corresponding knowledge and skills in the PLD that were inconsistent with the content seen in the ordered item booklet. Following the review workshop, the PLD may be adjusted to achieve the appropriate expectations if necessary. Then, the participants articulated and recorded their perspective as to the appropriateness of the existing cut scores relative to the content in the Content Standards and the Performance Level Descriptors. Discussion by the content area provided another opportunity for participants to share thoughts/ideas across grade levels. Recommended cut scores for each test were calculated using the median of individual adjustments; total group agreement was not expected.

### ***E. Revisit Cut Scores in Reading and Mathematics for Grades 3, 5, 8, and 10***

The training consisted of two stages: a general training (background, objective, and methodology) and content-related training (Grade Level Expectations, Performance Level Descriptors, and sample test items and scoring rubrics). An orientation was given to all participants on how to review the ordered item booklets and how to use the Item Map for the review process. Following this session, it was expected that participants would be able to articulate their professional expertise as to the appropriateness of the existing cut scores relative to the corresponding performance descriptions.

After the review of ordered test booklets, participants were trained on how to identify the across-grade performance pattern for each content area. The impact data provided participants with the information about the percent of students at or above the cut score for *Meets the Standard* and the content expected to be mastered. Specifically, for each percentile rank the associated scale score, number of items in the ordered item booklet, and the number correct score are included. Using highlighted existing cut scores for grades 3, 5, 8, and 10, participants could visualize the cross-grade trend of the percentage of students meeting the standard in both Reading and Mathematics. The following discussion occurred by grade level first and then by the content area to identify the appropriate cross-grade performance pattern. As the across-grade performance patterns were identified in both Reading and Mathematics, participants started reviewing the existing cut scores individually. Using the Item Map, participants considered if the

items attributed to the performance level were appropriate and if the current cut scores were well aligned to the expectations specified in the Content Standards, GLE, and PLD for the target grade. In general, recommended new cut scores by the panels were accepted. Adjustments were made only if necessary due to psychometric and policy concerns. An important rule followed during the “smoothing” process was that any adjustment should be in the same direction, raise or lower the cut score, as the panels’ recommendation.

#### ***F. Interpolate Cut Scores in Reading and Mathematics for Grades 2, 4, 6, 7, and 9***

The recommended cut scores for grades 3, 5, 8 and 10 Reading and Mathematics were used to interpolate the cut scores for grades 2, 4, 6, 7, and 9 for panels’ deliberations. The process was performed in two steps:

a. For each grade, the appropriate two grades on which to base the interpolations (e.g., grades 3 and 5 for the grade 4 interpolations) and the percentiles for the cut scores were used in a standard, linear interpolation in order to determine a target percentile of the cut score.

b. Once the percentile cut score was interpolated, this percentile was “walked back” to the score scale by using a second linear interpolation. For instance in grade 4 Mathematics: the interpolated percentile cut score for *Meets the Standard* was 23.7 and the spanned percentiles were 22.8 to 24.6 from the frequency distribution with the corresponding scale scores of 431 and 434, respectively. To estimate the cut score, a standard, linear interpolation was performed using the scale scores 431 and 434 and the percentiles 22.8 and 24.6; which yielded a cut score of 432.

The interpolation was conducted by using two adjacent grades to estimate the cut scores, one grade above and one grade below, for the target grade. There were a few exceptions. The extrapolation for grade 2 used the slope and intercept developed to estimate the cut scores for grade 4. Since there was only one adjacent grade for grade 6 and grade 7, a single interpolation was performed by using the slope for grade 5 and intercept for grade 6; and using the slope for grade 8 and intercept for grade 7. Double interpolation was applied for these cases if necessary. A “smoothing” process was applied based on (1) the across-grade performance patterns identified by the panels in July for reading and mathematics and (2) the consistency of cut scores across grade levels.

#### ***G. Review Preliminary Cut Scores in Reading and Mathematics for Grades 2, 4, 6, 7, and 9***

The preliminary cut scores through interpolation in Reading and Mathematics for grades 2, 4, 6, 7, and 9 were reviewed in August of 2005 by panels. Similar process was applied, including general training, content-related training, review the Across-Grade Performance Patterns identified by the July panels, and review the preliminary cut scores.

The same “smoothing” procedure was applied to foster across-grade consistency from grade 2 through grade 10 for both Reading and Mathematics. The Department staff and the consultants worked together to check, record, and review the panels’ recommendations and made minor adjustment as necessary.

#### ***H. Revisit/Establish Cut Scores in Writing for Grades 3 to 10***

a. Review Panel: The majority of the panelists were classroom teachers, educators, and writing specialists from school districts and higher education. Participants were assigned to four tables defined by grade levels:

Table 1: Grades 3 and 4

Table 2: Grades 5 and 6

Table 3: Grades 7 and 8

Table 4: Grades 9 and 10

b. Review Materials: As described in the Body of Work procedure for standard setting, samples of students’ writing were randomly selected to represent each obtained combination of stand-alone writing (SAW) and text-based writing (TBW) scores. Attention was also given to include differing combinations of scores, e.g., a total score of 7 could be a 5-point for SAW and a 2-point for TBW, a 4 and a 3, a 6 and an 1, etc. Writing samples were arranged from the lowest score to the highest score for each grade. The total writing score as well as the scores on SAW and TBW were provided. To ensure the validity of the review process, writing samples were used on both the 2005 and 2004 Writing assessments. The writing prompt for the SAW, the reading passage and the prompt for the TBW, and the anchor papers used for scoring were also available as references by grade.

c. Training: Participants were provided with an overview of the application of the scoring rubric and content-related training on the Performance Level Descriptors (PLD), and the Grade-Level-Expectations (GLE). The general training included the overall procedure, methodology, sample of student writing and other review materials, and review process.

d. Review Process: Participants started with reviewing sample writing and making notes on the samples concerning what performance level description best matched the sample and what salient features of the sample led to that judgment. Panelists were advised that their judgments should ultimately be based on the answers to two questions: (1) How well do the writing skills in evidence in the writing samples match the requirements of the PLD, GLE, and the Content Standards for writing? (2) What are the differences in skills evidenced by writing samples awarded higher total point values? Panelists continued by matching each total score point to a PLD for grades 3, 5, 8, and 10 through discussion by group and across grades and began their judgments at the existing cut score from performance level to performance level. Then, a similar process was applied to establish cut scores for grades 4, 6, 7, and 9 for five performance levels. After reviewing samples of student work, participants were instructed to consider the two

overarching questions of how well the skills in evidence in the student writing samples matched the content standards and the PLD, and what were the salient features of the writing samples that distinguished it from earlier writing samples.

### *I. New Cut Scores*

Table 3 presents the final cut scores in reading, writing, and mathematics that functioned in 2006 for reporting the results of the DSTP and used for accountability purpose.

**Table 3. Recommended Cut Scores for Reading, Writing, and Mathematics**

<b>Reading Grade</b>	<b>Below the Standard</b>	<b>Meets the Standard</b>	<b>Exceeds the Standard</b>	<b>Distinguished</b>
2	n/a	361	419	n/a
3	387	415	466	482
4	414	440	483	503
5	427	453	502	529
6	435	460	504	542
7	438	465	523	557
8	466	495	553	584
9	468	498	558	586
10	470	501	562	588

<b>Writing Grade</b>	<b>Below the Standard</b>	<b>Meets the Standard</b>	<b>Exceeds the Standard</b>	<b>Distinguished</b>
3	4	7	10	12
4	5	7	10	12
5	5	8	10	12
6	5	8	10	12
7	5	8	10	12
8	5	8	10	12
9	5	8	10	12
10	5	8	10	12

<b>Mathematics Grade</b>	<b>Below the Standard</b>	<b>Meets the Standard</b>	<b>Exceeds the Standard</b>	<b>Distinguished</b>
2	n/a	351	404	n/a
3	381	407	461	499
4	408	432	477	505
5	433	451	505	528
6	451	466	518	539
7	459	472	520	543
8	469	487	527	549
9	486	514	554	570
10	506	523	559	578

## Part Three. Reporting DSTP Results

### I. DSTP Scores

In 2006, the following scores were reported for the DSTP Reading, Writing, Mathematics, Science, and Social Studies. Five performance levels were used to report student achievement for all grades except grade 2. Instructional comments were provided in Reading, Mathematics, and Writing as a reference for classroom instruction.

- Percentile rank (PR) was reported on SAT10 Reading Comprehension for grades 2 through 10 and Mathematical Problem Solving for grades 2 through 8 and Mathematics for grades 9 and 10;
- Standards-based score (SBS), a composite scale score of selected SAT10 items and Delaware-developed items, was reported for grades 2 through 10 Reading and Mathematics;
- A writing raw score was reported for grades 3 through 10. In addition, the scores on text-based writing and stand-alone writing were also available for educators;
- Standard-based score (SBS) was reported for grades 4, 6, 8, and 11 Science and Social Studies. The raw scores of inquiry, physical science, earth science, and life science in science; and the raw scores of civics, geography, economics, and history in social studies were available for educators; and
- Student performance was reported in five levels (*Well Below the Standard, Below the Standard, Meets the Standard, Exceeds the Standard, and Distinguished*) for grades 3 through 10 in Reading, Writing, and Mathematics and for grades 4, 6, 8, and 11 in Science, and Social Studies. Student performance was reported in three levels for grade 2 (*Below the Standard, Meets the Standard, and Exceeds the Standard*) in Reading and Mathematics.

### II. Scoring Process

Multiple-choice items are scored electronically; short answer, extended constructed-response items, and students' writing are scored by trained raters using scoring rubrics and anchor papers by the Performance Assessment Scoring Center (PASC) at the Harcourt Assessment, Inc. Two raters score students' essays on the stand-alone writing and one rater score the text-based writing using the 5-point holistic rubric. Students' responses to the constructed response items are scored by one rater only. About 10% of students' scores are examined by the team leader of scoring to determine the accuracy of scoring.

The PASC was established in 1988. The preliminary criteria for recruiting and screening raters require a four-year college education and a writing sample, followed by an intensive introductory training workshop. In order to join the general pool of raters,

the candidates must complete a one-day general workshop for each subject area. All raters and team leaders who scored DSTP Writing and constructed response items in participate in a project-specific training before working on the actual project. In the scoring process, the Scoring Director provides a training to ensure that raters become familiar with the specific test of a given grade level. The Scoring Director also works closely with Team Leaders and raters to monitor the process to achieve the accuracy and consistency of scoring.

Before anchor papers pulling took place, PASC Scoring Directors and Team Leaders studied the DSTP writing prompts, constructed response items, and scoring rubrics thoroughly. They review students' responses and pulled out papers that represent the full range of quality as described in the rubric. Range papers are then sorted from low, medium, to high of each score point. They also identified papers such as off-topic and invalid responses. Started in 2006, Mini Anchor Paper Pulling (MAPP) was conducted to score field test items for all tests to facilitate the benchmark process for the DSTP administration.

The Benchmark Committee consisted of 5-6 Delaware teachers and 1-2 Test Development Committee members by grade and test for the 2006 DSTP administration. The responsibilities of the committee members were to (1) establish anchor papers that would be used for scoring; (2) assign score point to each anchor paper; and (3) establish training sets for scoring. Each selected paper was scored by all the committee members individually followed by a group discussion. The iterative process of reading, charting, and discussing was designed to achieve three goals: (1) to establish virtual agreement on each paper; (2) to identify papers that were on the line between two adjacent scores and force the clarification of that line; and (3) to allow committee members to justify their scores. Complete agreement on the score assigned to each anchor paper was expected. The content experts from Harcourt reviewed the anchor papers and practice sets across all items in a test and across grades in a subject area to ensure consistent decisions and consistent application of scoring rubrics for adjustment. Training materials for scoring were prepared as well from the results of anchor paper pulling during the process. Approval was made by the Department of Education to finalize the anchor papers and training materials for scoring each test.

### **III. Rescoring**

In 2006, requests for test score review were generally accepted for grades 3, 5, 8, and 10 Reading; grades 8 and 10 Mathematics; and grade 10 Writing if the test score was within one standard error of measurement to the next highest cut score and the evidence was provided to support the expectations that a student ought to have a higher score. For example, the student may have a good GPA in a related subject area or scores on other tests with similar construct. The request can be made either by the parents or by the school district. Rescoring is usually part of the request of test score review. Upon request, students' responses to each test question were re-scored by the scoring professionals from the contractor. The report of rescoring is delivered to the parents and/or to the school district. Four waves of test score review are offered each year.

#### IV. Results of the 2006 DSTP

The 2006 DSTP results were reported at the individual, school, school district, and state levels according to predetermined aggregation rules. A separate summary was reported for Intensive Learning Centers (ILC) schools following the same aggregation rules. With the increasing uses of technology, the DSTP Online Report provided the great opportunities for educators, administrators, and general public to review the DSTP results at various levels and generate their own reports. Teachers may also track their students' previous records even from different schools.

The descriptive statistics include the Normal Curve Equivalent scores (NCE) based on SAT10 and the standard-based scores (SBS) for the 2006 DSTP Reading and Mathematics, raw scores for Writing, and SBS for Science and Social Studies. Means and standard deviations as well as the minimum, maximum, and range of test scores are summarized in Tables 4a-4d by test and grade. Since only raw score is reported for Writing, the frequency distributions for the total writing scores, and stand-alone writing and text-based writing scores are also provided by grade in Table 5. The writing data suggest that 70% or over 70% of the students in grades 4, 8, 9, and 10 achieved the performance level of *Meets the Standard* in 2006; 60% in grade 3; over 50% in grades 5 and 7. However, only 29% of the 6<sup>th</sup> graders achieved the same performance level. The results of the stand-alone writing suggest a similar trend as the total writing scores, where over 80% of the students in grades 8, 9, and 10 received a score of 5, but only 40% of the students in grade 6 received a score of 5. Sixty-nine percent of the 9<sup>th</sup> graders had a score of 3 on the text-based writing; whereas only 20% of the 6<sup>th</sup> graders had a score of 3.

The percentages of students in each performance level are presented in Tables 6a and 6b by test and grade. Since the quality control was an ongoing activity, slight discrepancies of statistics between this report and the state summary report are expected. The frequency distributions of scale scores can be found in Attachment F1-F4 for Reading, Mathematics, Science, and Social Studies, respectively.

**Table 4a. Descriptive Statistics for Reading by Grade**

GR	Score	N	Minimum	Maximum	Mean	SD
2	Scale Score	7829	214	551	402.94	43.85
	NCE	7830	1	99	59.49	17.18
3	Scale Score	7788	298	584	448.34	35.45
	NCE	7788	1	99	62.72	15.78
4	Scale Score	7761	335	591	467.70	33.07
	NCE	n/a				
5	Scale Score	7863	347	637	484.80	33.54
	NCE	7863	1	99	64.95	16.30
6	Scale Score	8427	355	650	485.35	30.15
	NCE	8429	1	99	58.28	14.53
7	Scale Score	8840	375	656	498.74	35.29
	NCE	8841	1	99	63.48	16.28
8	Scale Score	9389	313	686	524.63	34.89
	NCE	9392	1	99	60.91	15.62
9	Scale Score	10097	364	714	520.76	40.81
	NCE	10103	1	99	62.39	20.06
10	Scale Score	7829	358	699	518.96	36.87
	NCE	7830	1	99	62.67	16.54

**Table 4b. Descriptive Statistics for Mathematics by Grade**

GR	Score	N	Minimum	Maximum	Mean	SD
2	Scale Score	8499	239	552	401.62	44.52
	NCE	8405	1	99	56.52	20.92
3	Scale Score	8669	295	605	442.88	46.16
	NCE	8607	1	99	62.81	20.45
4	Scale Score	8623	335	629	460.82	38.43
	NCE	8578	1	99	64.20	17.26
5	Scale Score	8763	372	657	478.40	36.25
	NCE	8720	1	99	63.05	17.30
6	Scale Score	9248	374	675	488.36	38.14
	NCE	9179	1	99	56.93	17.24
7	Scale Score	9548	362	686	490.66	43.61
	NCE	9420	1	99	57.77	19.62
8	Scale Score	10019	361	699	502.09	44.60
	NCE	9956	1	99	59.21	20.03
9	Scale Score	10520	396	719	516.44	41.20
	NCE	10350	1	99	64.81	17.03
10	Scale Score	8035	410	757	535.18	39.50
	NCE	8001	1	99	62.39	18.13

**Table 4c. Descriptive Statistics for Writing by Grade**

GR	N	Minimum	Maximum	Mean	SD
3	8627	1	14	6.63	1.73
4	8591	1	14	7.15	1.69
5	8726	1	12	7.29	1.56
6	9188	1	14	6.23	1.80
7	9483	1	15	7.37	1.92
8	9952	1	15	8.11	1.53
9	10474	1	14	7.90	1.85
10	7998	1	15	8.14	1.70

**Table 4d. Descriptive Statistics for Science and Social Studies by Grade**

GR	N	Minimum	Science		
			Maximum	Mean	SD
4	8629	229	379	307.38	17.71
6	9039	232	368	304.55	13.83
8	9784	194	385	300.24	21.27
11	6690	167	397	298.70	28.24

GR	N	Minimum	Social Studies		
			Maximum	Mean	SD
4	8629	229	379	307.38	17.71
6	9039	232	368	304.55	13.83
8	9784	194	385	300.24	21.27
11	6690	167	397	298.70	28.24

**Table 5. Frequency Distributions of Writing Scores by Grade and Type of Writing**

Grade	Score	Writing Raw Score			Stand-Alone Writing Score				Text-Based Writing Score			
		N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
3	1	15	0.17	0.17	2	609	6.85	6.85	1	1563	18.36	18.36
	2	109	1.22	1.39	3	841	9.45	16.30	2	3619	42.51	60.86
	3	355	3.98	5.37	4	3233	36.34	52.64	3	3261	38.30	99.17
	4	638	7.15	12.51	5	2143	24.09	76.73	4	70	0.82	99.99
	5	1409	15.79	28.30	6	1982	22.28	99.01	5	1	0.01	100.00
	6	1085	12.16	40.45	7	73	0.82	99.83	Total	8514	100.00	
	7	2499	28.00	68.45	8	12	0.13	99.97				
	8	1612	18.06	86.51	10	3	0.03	100.00				
	9	1079	12.09	98.60	Total	8896	100.00					
	10	104	1.17	99.76								
	11	15	0.17	99.93								
	12	4	0.04	99.98								
	14	2	0.02	100.00								
	Total		8926	100.00								

The N-count for the total writing, stand-alone, and text-based writing scores may vary due to the number of invalid scores.

Grade	Score	Writing Raw Score			Stand-Alone Writing Score				Text-Based Writing Score			
		N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
4	1	17	0.19	0.19	2	349	3.99	3.99	1	863	9.90	9.90
	2	34	0.39	0.58	3	776	8.87	12.86	2	3885	44.59	54.49
	3	169	1.92	2.50	4	2547	29.12	41.98	3	3608	41.41	95.90
	4	373	4.24	6.75	5	2447	27.97	69.95	4	351	4.03	99.93
	5	1000	11.38	18.13	6	2199	25.14	95.08	5	6	0.07	100.00
	6	1024	11.65	29.78	7	361	4.13	99.21	Total	8713	100.00	
	7	2507	28.53	58.31	8	61	0.70	99.91				
	8	1820	20.71	79.02	9	4	0.05	99.95				
	9	1339	15.24	94.25	10	4	0.05	100.00				
	10	361	4.11	98.36	Total	8748	100.00					
	11	108	1.23	99.59								
	12	30	0.34	99.93								
	13	5	0.06	99.99								
	14	1	0.01	100.00								
Total		8788	100.00									

Grade	Score	Writing Raw Score			Stand-Alone Writing Score				Text-Based Writing Score			
		N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
5	1	6	0.07	0.07	2	385	4.33	4.33	1	466	5.25	5.25
	2	19	0.21	0.28	3	521	5.86	10.19	2	3093	34.82	40.07
	3	132	1.48	1.76	4	3315	37.27	47.45	3	5025	56.58	96.64
	4	252	2.83	4.59	5	1837	20.65	68.11	4	297	3.34	99.99
	5	546	6.12	10.71	6	2758	31.01	99.11	5	1	0.01	100.00
	6	2211	24.80	35.51	7	62	0.70	99.81	Total	8882	100.00	
	7	1268	14.22	49.73	8	17	0.19	100.00				
	8	2147	24.08	73.81	Total	8895	100.00					
	9	2075	23.27	97.08								
	10	223	2.50	99.59								
	11	29	0.33	99.91								
	12	8	0.09	100.00								
	Total	8916	100.00									

Grade	Score	Writing Raw Score			Stand-Alone Writing Score				Text-Based Writing Score			
		N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
6	1	23	0.25	0.25	2	817	8.75	8.75	1	3314	35.59	35.59
	2	43	0.46	0.70	3	1094	11.71	20.46	2	4174	44.83	80.42
	3	611	6.52	7.22	4	3757	40.23	60.69	3	1647	17.69	98.11
	4	757	8.07	15.29	5	1543	16.52	77.21	4	171	1.84	99.95
	5	1924	20.52	35.81	6	1840	19.70	96.92	5	5	0.05	100.00
	6	2758	29.41	65.22	7	231	2.47	99.39	Total	9311	100.00	
	7	573	6.11	71.33	8	52	0.56	99.95				
	8	1625	17.33	88.66	9	3	0.03	99.98				
	9	787	8.39	97.06	10	2	0.02	100.00				
	10	204	2.18	99.23	Total	9339	100.00					
	11	54	0.58	99.81								
	12	12	0.13	99.94								
	13	3	0.03	99.97								
	14	3	0.03	100.00								
Total		9377	100.00									

Grade	Score	Writing Raw Score			Stand-Alone Writing Score				Text-Based Writing Score			
		N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
7	1	22	0.23	0.23	2	416	4.35	4.35	1	1478	15.49	15.49
	2	51	0.53	0.76	3	544	5.68	10.03	2	4898	51.34	66.83
	3	271	2.81	3.57	4	2303	24.06	34.09	3	2439	25.57	92.40
	4	383	3.98	7.55	5	1339	13.99	48.08	4	683	7.16	99.56
	5	898	9.33	16.88	6	4237	44.26	92.34	5	42	0.44	100.00
	6	1927	20.01	36.89	7	524	5.47	97.82	Total	9540	100.00	
	7	513	5.33	42.22	8	204	2.13	99.95				
	8	2928	30.41	72.63	9	2	0.02	99.97				
	9	1704	17.70	90.33	10	3	0.03	100.00				
	10	590	6.13	96.46	Total	9572	100.00					
	11	213	2.21	98.67								
	12	108	1.12	99.79								
	13	18	0.19	99.98								
	14	1	0.01	99.99								
	15	1	0.01	100.00								
Total		9628	100.00									

Grade	Score	Writing Raw Score			Stand-Alone Writing Score				Text-Based Writing Score			
		N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
8	1	22	0.22	0.22	2	77	0.76	0.76	1	741	7.35	7.35
	2	38	0.37	0.59	3	166	1.65	2.41	2	4041	40.09	47.44
	3	69	0.68	1.27	4	1402	13.89	16.30	3	4576	45.40	92.84
	4	113	1.11	2.38	5	1257	12.46	28.76	4	715	7.09	99.93
	5	412	4.06	6.44	6	6495	64.37	93.13	5	7	0.07	100.00
	6	1172	11.55	17.99	7	526	5.21	98.34	Total	10080	100.00	
	7	455	4.48	22.48	8	148	1.47	99.81				
	8	3299	32.51	54.98	9	12	0.12	99.93				
	9	3515	34.63	89.61	10	7	0.07	100.00				
	10	759	7.48	97.09	Total	10090	100.00					
	11	212	2.09	99.18								
	12	66	0.65	99.83								
	13	10	0.10	99.93								
	14	5	0.05	99.98								
	15	2	0.02	100.00								
Total		10149	100.00									

Grade	Score	Writing Raw Score			Stand-Alone Writing Score				Text-Based Writing Score			
		N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
9	1	47	0.44	0.44	2	282	2.69	2.69	1	609	5.78	5.78
	2	91	0.86	1.30	3	453	4.33	7.02	2	2675	25.41	31.19
	3	213	2.00	3.30	4	2032	19.42	26.44	3	6281	59.66	90.85
	4	251	2.36	5.66	5	2137	20.42	46.87	4	952	9.04	99.90
	5	484	4.55	10.20	6	4745	45.35	92.21	5	11	0.10	100.00
	6	1486	13.96	24.17	7	597	5.71	97.92	Total	10528	100.00	
	7	633	5.95	30.12	8	207	1.98	99.89				
	8	2583	24.27	54.39	9	6	0.06	99.95				
	9	3552	33.38	87.77	10	5	0.05	100.00				
	10	897	8.43	96.19	Total	10464	100.00					
	11	305	2.87	99.06								
	12	89	0.84	99.90								
	13	8	0.08	99.97								
	14	3	0.03	100.00								
Total		10642	100.00									

Grade	Score	Writing Raw Score			Stand-Alone Writing Score				Text-Based Writing Score			
		N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
10	1	20	0.25	0.25	2	81	1.00	1.00	1	325	4.03	4.03
	2	63	0.77	1.02	3	111	1.38	2.38	2	3562	44.19	48.22
	3	66	0.81	1.83	4	1431	17.73	20.11	3	3910	48.51	96.72
	4	104	1.28	3.10	5	1014	12.57	32.68	4	263	3.26	99.99
	5	206	2.53	5.63	6	3991	49.46	82.14	5	1	0.01	100.00
	6	1244	15.26	20.89	7	948	11.75	93.89	Total	8061	100.00	
	7	351	4.31	25.19	8	477	5.91	99.80				
	8	2400	29.44	54.63	9	12	0.15	99.95				
	9	2429	29.79	84.42	10	4	0.05	100.00				
	10	778	9.54	93.97	Total	8069	100.00					
	11	394	4.83	98.80								
	12	92	1.13	99.93								
	13	4	0.05	99.98								
	14	1	0.01	99.99								
	15	1	0.01	100.00								
Total		8153	100.00									

**Table 6a. Frequency Distributions of Performance Levels by Test and Grade (1)**

Grade	Performance Level	Reading		Mathematics		Writing	
		N.	%	N.	%	N.	%
2	Below the Standard	1283	16.4	1031	12.1	n/a	
	Meets the Standard	3406	43.5	3314	39.0		
	Exceeds the Standard	3140	40.1	4154	48.9		
	Total	7829	100.0	8499	100.0		
3	Well Below the Standard	440	5.6	723	8.3	441	5.1
	Below the Standard	811	10.4	1167	13.5	2964	34.4
	Meets the Standard	3954	50.8	3921	45.2	5097	59.1
	Exceeds the Standard	1337	17.2	1913	22.1	119	1.4
	Distinguished	1246	16.0	945	10.9	6	0.1
	Total	7788	100.0	8669	100.0	8627	100.0
4	Well Below the Standard	409	5.3	703	8.2	544	6.3
	Below the Standard	1006	13.0	1185	13.7	1963	22.8
	Meets the Standard	3753	48.4	3971	46.1	5582	65.0
	Exceeds the Standard	1563	20.1	1672	19.4	464	5.4
	Distinguished	1030	13.3	1092	12.7	36	0.4
	Total	7761	100.0	8623	100.0	8589	100.0
5	Well Below the Standard	331	4.2	813	9.3	385	4.4
	Below the Standard	881	11.2	1205	13.8	3908	44.8
	Meets the Standard	4210	53.5	4805	54.8	4174	47.8
	Exceeds the Standard	1669	21.2	1199	13.7	251	2.9
	Distinguished	772	9.8	741	8.5	8	0.1
	Total	7863	100.0	8763	100.0	8726	100.0
6	Well Below the Standard	377	4.5	1532	16.6	1343	14.6
	Below the Standard	1148	13.6	1093	11.8	5164	56.2
	Meets the Standard	4692	55.7	4709	50.9	2407	26.2
	Exceeds the Standard	1951	23.2	1090	11.8	256	2.8
	Distinguished	259	3.1	824	8.9	18	0.2
	Total	8427	100.0	9248	100.0	9188	100.0

Grade	Performance Level	Reading		Mathematics		Writing	
		N.	%	N.	%	N.	%
7	Well Below the Standard	431	4.9	2227	23.3	676	7.1
	Below the Standard	1053	11.9	1125	11.8	3264	34.4
	Meets the Standard	5128	58.0	3975	41.6	4614	48.7
	Exceeds the Standard	1806	20.4	1042	10.9	801	8.4
	Distinguished	422	4.8	1179	12.3	128	1.3
	Total	8840	100.0	9548	100.0	9483	100.0
8	Well Below the Standard	505	5.4	2395	23.9	210	2.1
	Below the Standard	1049	11.2	1395	13.9	1957	19.7
	Meets the Standard	5908	62.9	3542	35.4	6733	67.7
	Exceeds the Standard	1563	16.6	1262	12.6	969	9.7
	Distinguished	364	3.9	1425	14.2	83	0.8
	Total	9389	100.0	10019	100.0	9952	100.0
9	Well Below the Standard	998	9.9	2464	23.4	556	5.3
	Below the Standard	1541	15.3	2677	25.4	2542	24.3
	Meets the Standard	5835	57.8	3507	33.3	6077	58.0
	Exceeds the Standard	1196	11.8	681	6.5	1199	11.4
	Distinguished	527	5.2	1191	11.3	100	1.0
	Total	10097	100.0	10520	100.0	10474	100.0
10	Well Below the Standard	724	9.2	1867	23.2	223	2.8
	Below the Standard	1562	20.0	1413	17.6	1721	21.5
	Meets the Standard	4748	60.6	2798	34.8	4790	59.9
	Exceeds the Standard	590	7.5	856	10.7	1166	14.6
	Distinguished	205	2.6	1101	13.7	98	1.2
	Total	7829	100.0	8035	100.0	7998	100.0

**Table 6b. Frequency Distributions of Performance Levels by Test and Grade (2)**

Grade	Performance Level	Science		Social Studies	
		N.	%	N.	%
4	Well Below the Standard	856	9.9	856	9.9
	Below the Standard	1725	20.0	1725	20.0
	Meets the Standard	4716	54.7	4716	54.7
	Exceeds the Standard	913	10.6	913	10.6
	Distinguished	419	4.9	419	4.9
	Total	8629	100.0	8629	100.0
6	Well Below the Standard	720	8.0	720	8.0
	Below the Standard	2422	26.8	2422	26.8
	Meets the Standard	5240	58.0	5240	58.0
	Exceeds the Standard	473	5.2	473	5.2
	Distinguished	184	2.0	184	2.0
	Total	9039	100.0	9039	100.0
8	Well Below the Standard	1903	19.5	1903	19.5
	Below the Standard	2926	29.9	2926	29.9
	Meets the Standard	3692	37.7	3692	37.7
	Exceeds the Standard	733	7.5	733	7.5
	Distinguished	530	5.4	530	5.4
	Total	9784	100.0	9784	100.0
11	Well Below the Standard	1466	21.9	1466	21.9
	Below the Standard	1819	27.2	1819	27.2
	Meets the Standard	2197	32.8	2197	32.8
	Exceeds the Standard	586	8.8	586	8.8
	Distinguished	622	9.3	622	9.3
	Total	6690	100.0	6690	100.0

## **Part Four. Design and Application of Scaling and Equating**

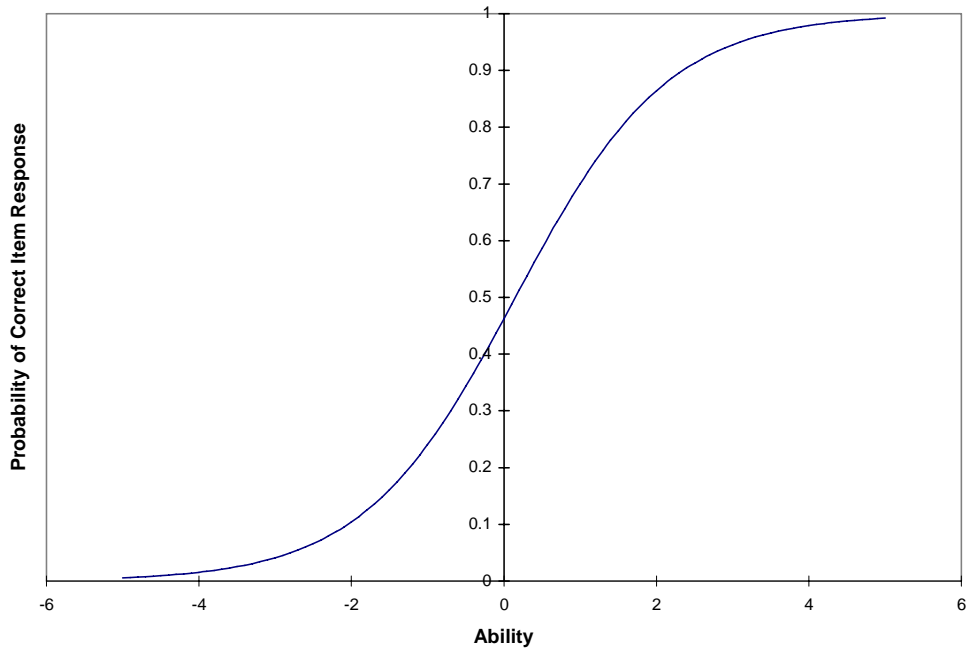
### **I. Design of DSTP Scale for Reading, Mathematics, Science, and Social Studies**

The Rasch measurement model is used to develop the scale for the DSTP Reading, Mathematics, Science, and Social Studies. This model has proven to be robust and sufficient for meeting the measurement requirements for large-scale, high stakes assessment programs. In general, the Rasch model assumes that the probability that a student answers an item correctly is the function of the latent trait that underlies performance on the assessment and the difficulty level of an item. The underlying trait, usually referred to as ability, is nothing more than what the assessment is designed to measure. The Rasch model is a mathematical function that relates the item score to the student performance or ability. Only item difficulty and person ability are used to define this mathematical function. It is the only Item Response Theory (IRT) model in which the student's raw score, the number of items answered correctly, is a sufficient statistic - the information relevant for judging the rank order of a student on the ability continuum.

The most basic expression of the Rasch model is the Item Characteristic Curve (ICC). A sample ICC is given in Figure 1. An ICC is a mathematical function that relates the probability of a correct response to an item across the ability continuum. The probability of getting a correct answer is bounded by 1 for certainty of a correct response and an incorrect answer is bounded by 0 for certainty of an incorrect response. The ability scale is, in theory, unbounded and the scale ranges from  $-\infty$  to  $+\infty$ . In practice, the ability scale ranges from approximately  $-4.00$  to  $+4.00$  logit for heterogeneous ability groups. The logit of zero, the natural log odds of a correct response, typically represents an "average" ability.

Figure 1

Sample Item Characteristic Curve



In Figure 1, a person whose ability falls at -1 on the ability (horizontal) scale has a probability of about 24% of answering the item correctly. Another way to demonstrate this is that if we have a group of 100 students, all of who have an ability of -1, we would expect about 24% of them to answer this item correctly. Similarly, a person whose ability is at +1 would have about a 70% chance of getting the item right. Thus, a person whose ability is above the average is more likely to answer the item correctly than a person whose ability is below the average. This makes intuitive sense as the basic formulation of Rasch measurement for test items having only 2 possible categories (i.e., right or wrong).

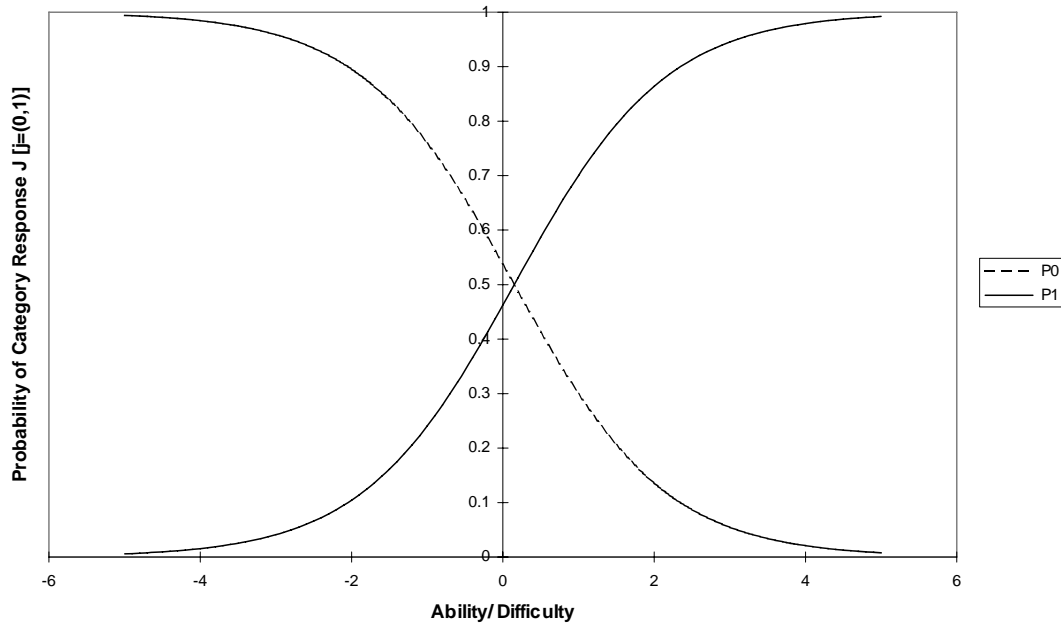
To extend the formulation, consider that the ICC shown above represents the Rasch expression that relates a person's ability to the probability of a correct response to an item. One might wonder what sort of curve would represent the other possible condition to answering the item incorrectly. Intuitively, it would seem that if one has a probability of 70% of getting the answer right at an ability level of 1, then the probability of getting it wrong is 30%; while at an ability level of -1, the probability of answering the item incorrectly is 76%. Thus, the lower the ability one possesses, the more likely he or she answers an item incorrectly. This relationship, the probability of an incorrect response, is depicted by adding the second curve shown in Figure 2.

The point at which the two curves cross represents the ability level at which a person is just as likely to answer the item incorrectly. In other words, the probability of a correct or an incorrect answer is 50%. This corresponds to the Rasch (logit) difficulty for a dichotomously scored item (e.g., multiple-choice item). The Rasch difficulty of a

dichotomous item can also be referred to as the step-value from a score of 0 to a score of 1.

Figure 2

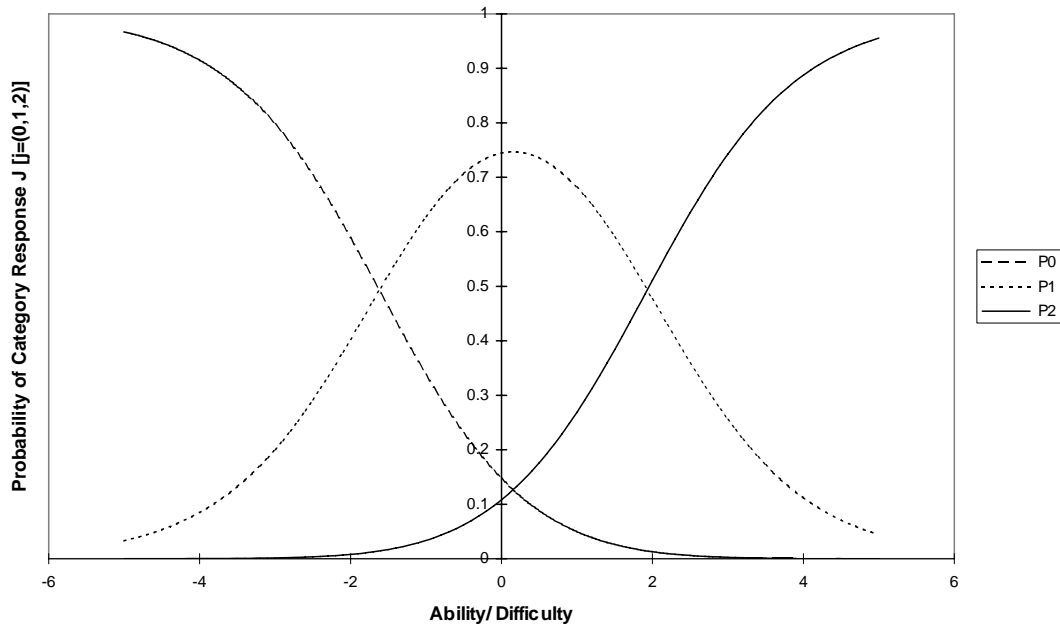
Sample Category Curves for One-Step Item



The DSTP contains both multiple-choice and constructed-response items for all tests. With constructed-response items, students write their responses to the question. Students' responses are scored with predetermined scoring rubric in more than two (right/wrong) categories. The Rasch dichotomous model merges for MC items with the Partial Credit Model (PCM) using additional response categories. Suppose that a student's response to an item with three scoring categories is not completely wrong and not completely right. It is assumed that scoring category 1 represents an incorrect response with a score of 0-point, category 3 represents a correct response with 2-point; and category 2 represents a partially correct response with a score of 1-point. The curves for a three-category item are shown in Figure 3.

Figure 3

Sample Category Curves for Two-Step Item



The left-most curve in Figure 3 represents the probability function for all examinees scoring in category 1 for an incorrect response to the item. Those who have very low ability (e.g., -3 to -2) are very likely to be in this category receiving a score of 0-point and more likely to be in this category than the other students. Those who have medium ability are in category 2 (partially correct) to get a score of 1 (the middle curve). The right-most curve represents the probability function for examinees scoring in category 3 for a correct response to the item. Those who have very high ability (e.g., +3 to +2) are very likely to be in the third category receiving a score of 2-point and are more likely to be in this category than the other two groups. However, there are still some examinees with average or low abilities could get full credit for this item.

Although the actual computations are somewhat complex, the points at which curves cross each other provides a similar interpretation as for the dichotomous case. Consider the crossing point between the curve for the score of 0-point and the curve for the score of 1-point. For abilities that are lower than this point on the ability continuum have the greatest possibility to answer the item incorrectly. Similarly, for abilities that are higher than the crossing point between the curve for the score of 1-point and the curve for the score of 2-point have the greatest possibility to answer the item correctly. For those whose abilities fall between the two-crossing points are most likely to have a response for a score of 1-point. Note that the likelihood of a category 2 response (1-point) declines in both directions as the ability level decreases to the low extreme or increases to the high extreme. These points can be thought of as the difficulties of crossing the “steps” between categories.

Simultaneous calibration of different types of items necessitates the use of a polytomous model that allows various score categories or score points. The Partial Credit Model (PCM) is one of commonly used polytomous models to handle mixed item types.

The Rasch PCM is a direct extension of the dichotomous one-parameter IRT model developed by Rasch in the 1950s (Rasch, 1980). For an item involving  $m$  score categories, the general expression for the probability of scoring  $x$  on item  $i$  is given by

$$P_{ik}(x = k - 1|\theta) = \frac{e^{\sum_{j=0}^{k-1}(\theta - B_{ij})}}{\sum_{k=1}^m e^{\sum_{j=0}^{k-1}(\theta - B_{ij})}}, \text{ where } k=1, \dots, m \text{ (i.e., } x=0, \dots, m-1)$$

and by definition,  $\sum_{j=0}^0(\theta - B_{i0}) = 0$

$B_{ij}$  : the  $j$ th step difficulty parameter of item  $i$

The equation gives the probability of an examinee scored in a particular category (score =  $x$ ) on an item, where  $i$  as a function of the person's position  $\theta$  on the variable being measured and the step difficulties of the item. Specifically, the numerator involves only the particular category the examinee scored in and is equal to the logit (natural log-odds) of the sum of the differences between  $\theta$  and  $B_{ij}$  for the completed steps associated with that category. The denominator is the sum of the numerator value for each category on the item.

With PCM, both MC and CR items are scaled together to obtain conversions from raw scores to scale scores for each test. The scaling process places item-step difficulties on the same scale as student abilities. The common scale allows the item difficulties for MC items (or the step-values of 0 and 1) to be compared relative to the step-values for CR items. Note that the dichotomous one-parameter Rasch model is simply a special case of the Rasch PCM because dichotomous items can be treated as one-step items.

One important property of the Rasch PCM is the separability of estimation for item parameters and person parameters. Because of this property, the total score given by the sum of responses to a set of items is a sufficient statistic for estimating a person's ability without additional information. Moreover, the total number of examinees in a particular response category of an item is a sufficient statistic for estimating the step difficulty for the item. The equations for estimations are described in *Rating Scale Analysis* by Masters and Wright (1982); the computer program of BIGSTEPS is used to perform the Rasch Partial Credit Model analyses (Linacre and Wright, 1995).

### Ia. Vertical Scale for DSTP Reading and Mathematics

For the DSTP, ECR items have a 4-point scale and SA items have a 2-point scale. The scaling procedures for the DSTP Reading and Mathematics involve the calibration of MC and ECR items. MC items are scored dichotomously; OE items are scored polytomously. The Rasch approach utilizes the PCM for analyzing both polytomously and dichotomously scored items simultaneously. For ECR items, the Rasch estimates a step difficulty for each score point.

To make the same scale, the mean differences of Rasch difficulties between the nationally standardized SAT9 results and Delaware SAT9 results are computed and these mean difficulties are added to the Rasch difficulties to estimate the scale scores. In 1998, The Delaware SAT9 Rasch difficulties were compared with standardized SAT9 to compute mean differences for grades 3, 5, 8, and 10 in 1998; the Delaware SAT9 Rasch difficulties were compared with standardized SAT9 to compute mean differences for grades 2, 4, 6, 7, and 9 in 2000. This approach enables the Delaware SAT9 scale to be the same as the scale of the standardized SAT9. In other words, on average, SAT9 Rasch difficulties that are estimated from Delaware students are the same as standardized SAT9 Rasch difficulties.

The vertical scaling is conducted to make connections across grades by using the SAT9 scaling constants. These constants range from -1.509 for Grade 2 Mathematic Problem Solving to 2.971 for Grade 10 Mathematics; from -1.110 for Grade 2 to 1.671 for Grade 10 in Reading Comprehension. For equating, the SAT9 constant of each grade is added to the Rasch ability measures (theta scores) for the corresponding grade. This approach enables to make all grades vertically linked, and accordingly, the scale scores of all grades from 2 through 10 are supposed to be monotonically increasing. For example, the percentile rank 1 for Grade 2 Mathematic Problem Solving corresponds to a scale score of 176, while the percentile rank 1 for Grade 3 Mathematic Problem Solving corresponds to a scale score of 206. To equate the current year DSTP Reading and Mathematics to the previous year test forms and at the same time keep the connection across different grades, three procedures are applied:

- Make the Delaware scale the same as the standardized SAT9 scale;
- Conduct vertical scaling across grades; and
- Perform equating across test forms.

### Ib. Scale for DSTP Science and Social Studies

Unlike Reading and Mathematics, the horizontal scale is used for the DSTP Science and Social Studies with the score range approximately from 150 to 500. The scaling procedures for the DSTP Science and Social Studies involve the calibration of MC and SA items. MC items are scored dichotomously; SA items are scored polytomously on a 2-point scale. The Partial Credit Model (Masters, 1982) is utilized for analyzing both polytomously and dichotomously scored items simultaneously.

## II. Equating

New test forms are continually constructed each year for the DSTP administration. Test forms are equated so that the scores derived from different forms can be used interchangeably after conversion will be directly equivalent. Different forms of the test are designed to have comparable content and similar distributions of item statistics based on field testing. The equating procedure adjusts for unintended differences in difficulty between forms. Typically, and with the DSTP, equating adjusts raw scores from different forms to a common scale so that identical scale scores earned this year and previous year reflect the same level of student achievement, even though the corresponding raw scores may differ.

### Iia. Equating the DSTP Reading and Mathematics

The anchor item design is used in equating for the DSTP Reading and Mathematics by using the Rasch PCM approach. Over two-thirds of test items are in common between the two forms in adjacent years. The anchor items are used to develop a linking constant that places the item step-values from the first year on the same logit scale as the second year. The description of equating for grades 3, 5, 8, and 10 was based on the forms of 1998 and 1999 but applies to all future forms. Anchor items were the same items that appeared in both the 1998 form and the 1999 form. The equating constant was computed as the difference of the average step-value for anchor items between the two forms. Adding the linking constant to the step-values of all items on the 1999 form would place the 1999 step-values (and log ability estimates) on the same Rasch logit scale as the 1998 form. The same equating design was applied for grades 2, 4, 6, 7, and 9. All future forms are equated based on the 2000 test form using anchor items to develop linking constants.

The DSTP Reading is linked to the scaled scores of the *Stanford Achievement Test Series, Ninth Edition* (SAT9) Reading Comprehension by grade; the DSTP Mathematics is linked to the scaled scores of the SAT9 Problem Solving for grades 2 to 8, and to the SAT9 Mathematics for grades 9 and 10. The linkage is accomplished by computing the SAT9 linking constant as the difference between the average step-value for the Delaware SAT9 items from the SAT9 standardization, minus the average step value from the 1998 DSTP administration for grades 3, 5, 8, and 10 and from the 2000 DSTP administration for grades 2, 4, 6, 7, and 9.

For each grade level of the DSTP Reading and Mathematics, the SAT9 linking constant plus the SAT9 standardization equating constant are added to the step-values for each of the items in the first year DSTP. Both the SAT9 linking constant and the SAT9 standardization equating constant are added to the step-values of all items of the future forms. For example, for the 1999 form, the SAT9 linking constant, the SAT9 standardization equating constant, and the 1999 form's linking constant (the linking constant that equates the 1999 form to the 1998 form) were all added to the step-values for the 1999 analysis.

Because the ability scale contains negative and decimal values, the estimated ability is converted to a different metric through scaling procedure. In the process of scaling, a linear transformation is applied, multiplying by 40 and adding 400 to these Rasch log ability estimates. This linear transformation produces 3-digit, unit interval scale scores that range from approximately 150 to 800 for Reading and Mathematics across grades. Since the multiplicative constant of 40 and the additive constant of 400 are different from the SAT9 linear transformation constants, the DSTP scale scores are not the same as the SAT9 scaled scores. The DSTP scale scores are only within a linear transformation of the SAT9 scale scores. One of the benefits for creating the DSTP scale is to avoid misinterpretation or over-interpretation between scaled scores from SAT and scale scores from the DSTP.

### *Iib. Equating the DSTP Science and Social Studies*

The same design is used for the equating of the DSTP Science and Social Studies. The description of equating is based on the first two forms, 2000 and 2001, but applies to all future forms. For each test, about two-thirds of the items are common between the two forms from adjacent years. The anchor items were used to develop a linking constant that placed the step-values from the 2001 form on the same logit scale as the 2000 form. The linking constant was computed as the difference between the average step-values of the anchor items for the 2000 form, minus the average step value from the 2001 form. Adding the linking constant to the step-values of each of the items in the 2001 form placed the 2001 step-values (and log ability estimates) on the same Rasch logit scale as the 2000 form.

Again, because the ability scale contains negative and decimal values, the estimated ability is converted to a different metric through scaling procedures. The linear transformation of Rasch log ability estimates is associated with the standard setting for both assessments. (For a complete description, see the *Report and Recommendations to the Delaware State Board of Education for Establishing Proficiency Levels for the Delaware Student Testing Program in Science and Social Studies*). The cut-score for Meets the Standard and Exceeds the Standard were predetermined as 300 and 325, respectively, with a linear transformation for grades 4, 6, 8, and 11. Thus, a scale score of 300 is the minimum scale score for the level of Meets the Standard; and a scaled score of 325 is the minimum scale score for the level of Exceeds the Standard. The cut scores for Distinguished and Below the Standard were set during the standard setting process because only two cut scores can be set with predetermined values through a linear transformation. The resulting linear transformation produced 3-digit, unit interval scale scores that range approximately from 150 to 500.

### III. 2006 Equating and Scaling Results

Equating involves comparing the step-values (or threshold) for the anchor items on the current test form with those from the test form used in previous year. Appendix G contains plots between raw scores and scale scores by test and grade with the raw score cut points for each. The ultimate result of equating and scaling is the conversion from raw scores to scale scores to enable the comparison of test scores across test forms of a

given content and grade level. The plot of the 2006 step-values versus the 2005 step values for the anchor items can also be found in Appendix G by test and grade. The 45-degree straight line of each plot passes through the mean of the 2006 step values and the mean of the 2005 step values. The plots show that the step values generally fall along the 45-degree line as the model requires. Of course, not all points are on or right next to the line due to the inherent error that is in all measurement, and occasionally, a point is relatively far from the line. The correlation coefficient between the 2006 step values and the 2005 step values is another indicator to examine the sufficiency of equating. The maximum value for the coefficient is 1.000 indicates the perfect linear relationship between the step values of two forms; a value of 0.000 indicates no linear relationship. The correlation coefficient ( $r$ ) is given in the upper right-hand corner of each plot, which range from .988 (grade 9) to .996 (grade 2) for reading and from .980 (grade 2) to .992 (grade 5) for mathematics. The correlations range from .974 (grade 6) to .988 (grade 11) for science and from .981 (grade 8) to .987 (grade 11) for social studies. The plot for grade 6 science with the lowest correction of .974 shows that at least two SA items are relatively away from the 45-degree straight line. The conversion tables for all tests are given in Appendix H.

## **Part Five. Technical Characteristics of the DSTP**

This section describes the technical characteristics of the 2006 DSTP tests. Statistics are presented including reliability of test scores, standard error of measurement, rater consistency by test and grade, and correlation matrix among sub-content domains or with norm-referenced measures.

### **I. Reliability of DSTP Scores**

Test reliability refers to the accuracy and consistency of scores. Tests with high reliability coefficients provide scores that are stable over time and across test forms. Reliability is a necessary condition for the quality of assessment. It is important to establish test reliabilities through empirical studies so that sound judgments can be made. The reliability of test scores is a function of the test content, length of the test, item difficulty, standard deviation, and the procedure for test development, test administration, and other factors. The standard error of measurement provides an indicator of the accuracy of test scores using the observed score scale. The magnitude of standard error of measurement depends on the standard deviation and the reliability of the tests.

#### ***Cronbach's alpha***

$$\alpha_k = \frac{k}{k-1} \left( 1 - \frac{\sum \text{var}(Y_i)}{\text{var}(Y_{tot})} \right)$$

Where

k = number of items on the test

var. ( $Y_i$ ) = variance of item i

var. ( $Y_{tot}$ ) = total test variance

### ***Standard Error***

$$SEM = SD(Y_{tot})\sqrt{1 - reliability}$$

Where

SD ( $Y_{tot}$ ) = Standard deviation of the test

#### ***Ia. Estimate of Reliabilities and Standard Error of Measurement***

Table 7 shows reliability coefficients (Cronback's alpha) and standard errors of measurement based on the scale scores by grade and test for the 2006 DSTP administration. Across the 26 tests, the reliability coefficients of test scores range from .85 for grade 2 Reading to .95 for grade 3 Mathematics. For a given test, the reliability coefficients range from .85 to .92 across grades for Reading with the standard error of measurement of 9.8 – 16.7; range from .90 to .95 for Mathematics with the standard error of measurement of 10.1 – 12.8; range from .88 to .92 for Science with the standard error of measurement of 5.2 – 8.3; range from .88 to .92 across grades for Social Studies with the standard error of measurement 5.0 – 8.0. Tables 8a through 8c show the cut scores (scale scores) used to classify student performance into five levels; and the equivalent raw scores, standard error of measurement, and the IRT Information Function (IF) at the cut points for the 2006 DSTP.

#### ***Ib. Correlations***

The correlations for the DSTP Reading are presented in Table 9a by item format and grade. The correlation coefficients between the SAT10 Reading Comprehension and Delaware-developed items range from .60 to .76; the correlations between SAT10 items (multiple-choice items) and Delaware-developed constructed-response items (including short-answer and extended constructed-response items) range from .50 to .66. The correlations for Writing are presented in Table 9b by the type of writing and grade. Across grades, the correlation coefficients between text-based writing and stand-alone writing are moderately low or moderate, ranging from .40 to .56. The total writing scores are moderately associated with the reading scores from .54 to .68; and moderately low or moderately associated with the SAT10 reading scaled scores ranging from .47 to .58 across grades. The correlations between the SAT10 Mathematics Problem Solving for grades 2 through 8 and Mathematics for grades 9 and 10 and Delaware-developed items are presented in Table 9c by item format and grade. The correlation coefficients are moderately high, ranging from .80 to .87. The correlations between SAT10 items (multiple-choice items) and Delaware-developed constructed-response items (including short-answer and extended constructed-response items) range from .71 to .83.

**Table 7. Reliability of Test Scores by Test and Grade**

Grade	Reading		Math		Science		Social Studies	
	Alpha	SEM	Alpha	SEM	Alpha	SEM	Alpha	SEM
2	0.85	16.7	0.92	12.8				
3	0.90	10.4	0.95	10.1				
4	0.89	11.0	0.90	12.0	0.88	5.2	0.88	5.8
5	0.92	9.8	0.91	11.1				
6	0.86	11.3	0.92	11.0	0.89	5.7	0.90	5.0
7	0.91	10.8	0.93	11.6				
8	0.89	11.5	0.93	11.5	0.91	8.3	0.90	6.6
9	0.92	11.3	0.93	11.2				
10	0.91	11.0	0.92	11.0				
11					0.92	6.4	0.92	8.0

SEM: Standard error of measurement that was calculated using scale scores.

Table 10a presents the correlation matrix among the four sub-content areas for Science (inquiry, physical science, earth science, and life science) and Table 10b shows the correlation matrix among the four sub-content areas for Social Studies (civics, economics, geography, and history) by grade. For Science, moderately low to moderately high correlations are observed among the sub-content areas, ranging from .58 to .76. The correlations between multiple-choice items and short answer items range from .75 for grade 4 to .81 for grade 11. For Social Studies, moderate to moderately high correlations are also observed among the sub-content areas, ranging from .60 to .79. Across grades, the correlations between multiple-choice and short answer items range from .65 for grade 4 to .76 for grade 11.

**Table 8a. Cut Score and Equivalent Raw Scores and Scale Scores; and Standard Error of Measurement (SEM) and Information Function for Performance Levels in Reading**

<i>Performance level</i>	<i>Cut Score</i>	<i>Raw Score</i>	<i>Scale Score</i>	<i>SEM</i>	<i>Information Function</i>	<i>Cut Score</i>	<i>Raw Score</i>	<i>Scale Score</i>	<i>SEM</i>	<i>Information Function</i>
<b>Grade 2</b>										
Exceeds the Standard	419	31	419	17	.003					
Meets the Standard	361	22	364	15	.004					
<b>Grade 3</b>										
Distinguished	482	67	484	12	.007	557	71	557	13	.006
Exceeds the Standard	466	62	467	11	.008	523	62	524	11	.008
Meets the Standard	415	44	416	10	.010	465	40	467	10	.010
Below the Standard	387	33	387	10	.010	438	29	439	10	.010
<b>Grade 4</b>										
Distinguished	503	72	506	13	.006	584	70	585	14	.005
Exceeds the Standard	483	66	484	11	.008	553	62	553	12	.007
Meets the Standard	440	49	440	10	.010	495	43	495	11	.008
Below the Standard	414	38	415	10	.010	466	33	467	11	.008
<b>Grade 5</b>										
Distinguished	529	68	529	13	.006	586	78	587	15	.004
Exceeds the Standard	502	61	502	12	.007	558	72	559	12	.007
Meets the Standard	453	44	453	10	.010	498	51	498	10	.010
Below the Standard	427	34	427	10	.010	468	39	470	10	.010
<b>Grade 6</b>										
Distinguished	542	69	543	14	.005	588	76	590	14	.005
Exceeds the Standard	504	59	505	11	.008	562	70	585	12	.007
Meets the Standard	460	44	461	11	.008	501	48	503	10	.010
Below the Standard	436	35	436	11	.008	470	35	471	10	.010
<b>Grade 7</b>										
<b>Grade 8</b>										
<b>Grade 9</b>										
<b>Grade 10</b>										

**Table 8b. Cut Score and Equivalent Raw Scores and Scale Scores; and Standard Error of Measurement and Information Function for Performance Levels in Mathematics**

<i>Performance level</i>	<i>Cut Score</i>	<i>Raw Score</i>	<i>Scale Score</i>	<i>SEM</i>	<i>Information Function</i>	<i>Cut Score</i>	<i>Raw Score</i>	<i>Scale Score</i>	<i>SEM</i>	<i>Information Function</i>
<b>Grade 2</b>										
Exceeds the Standard	404	47	405	12	.007					
Meets the Standard	351	29	352	10	.010					
<b>Grade 3</b>										
Distinguished	499	67	502	19	.003	543	59	544	11	.008
Exceeds the Standard	461	59	463	12	.007	520	51	521	10	.010
Meets the Standard	407	39	409	10	.010	472	31	473	10	.010
Below the Standard	381	28	381	10	.010	459	26	460	10	.010
<b>Grade 4</b>										
Distinguished	505	65	505	13	.006	549	60	549	11	.008
Exceeds the Standard	477	58	480	11	.008	527	52	527	10	.010
Meets the Standard	432	41	433	10	.010	587	34	487	9	.012
Below the Standard	408	32	410	10	.010	469	27	471	10	.010
<b>Grade 5</b>										
Distinguished	528	65	530	13	.006	570	60	570	11	.008
Exceeds the Standard	505	58	507	11	.008	554	55	556	10	.010
Meets the Standard	451	34	452	10	.010	514	38	514	10	.010
Below the Standard	433	26	433	10	.010	486	27	488	10	.010
<b>Grade 6</b>										
Distinguished	539	62	541	12	.007	578	52	579	10	.010
Exceeds the Standard	518	55	519	10	.010	559	44	560	10	.010
Meets the Standard	466	32	467	10	.010	523	28	523	10	.010
Below the Standard	451	26	453	10	.010	506	22	507	10	.010
<b>Grade 7</b>										
<b>Grade 8</b>										
<b>Grade 9</b>										
<b>Grade 10</b>										

**Table 8c. Cut Score and Equivalent Raw Scores and Scale Scores; and Standard Error of Measurement and Information Function for Performance Levels in Science and Social Studies**

<i>Performance level</i>	<i>Cut Score</i>	<i>Raw Score</i>	<i>Scale Score</i>	<i>SEM</i>	<i>Information Function</i>	<i>Cut Score</i>	<i>Raw Score</i>	<i>Scale Score</i>	<i>SEM</i>	<i>Information Function</i>	
			<b>Science</b>					<b>Social Studies</b>			
			<b>Grade 4</b>					<b>Grade 4</b>			
Distinguished	336	55	336	6	.028	337	55	336	6	.028	
Exceeds the Standard	325	49	326	5	.040	325	49	325	6	.028	
Meets the Standard	300	30	301	5	.040	300	31	300	5	.040	
Below the Standard	286	20	287	5	.040	285	20	285	6	.028	
			<b>Grade 6</b>					<b>Grade 6</b>			
Distinguished	335	56	337	6	.028	335	55	335	6	.028	
Exceeds the Standard	325	50	325	6	.028	325	49	325	5	.040	
Meets the Standard	300	34	300	5	.040	300	30	301	5	.040	
Below the Standard	285	24	285	6	.028	286	19	286	5	.040	
			<b>Grade 8</b>					<b>Grade 8</b>			
Distinguished	338	53	340	9	.012	335	47	335	6	.028	
Exceeds the Standard	325	47	325	8	.016	325	41	325	6	.028	
Meets the Standard	300	35	301	7	.020	300	26	301	6	.028	
Below the Standard	280	25	281	8	.016	282	16	283	7	.020	
			<b>Grade 11</b>					<b>Grade 11</b>			
Distinguished	335	53	336	7	.020	337	46	337	8	.016	
Exceeds the Standard	325	47	325	6	.028	325	41	325	8	.016	
Meets the Standard	300	31	300	6	.028	300	29	300	7	.020	
Below the Standard	282	20	283	6	.028	276	19	278	8	.016	

**Table 9a. Matrix of Correlations for Reading**

Grade	Score	SAT 10 Reading	Delaware Items				Delaware Total
			MC	SA	ECR	CR	
2	SAT Reading	1	n/a	0.52	0.53	0.60	0.60
	DE MC				n/a		
	DE SA			1	0.48	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
3	SAT Reading	1	0.76	0.62	0.54	0.65	0.76
	DE MC		1	0.66	0.56	0.69	*
	DE SA			1	0.58	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
4	SAT Reading	1	0.74	0.59	0.57	0.66	0.75
	DE MC		1	0.62	0.59	0.69	*
	DE SA			1	0.57	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
5	SAT Reading	1	0.71	0.51	0.5	0.56	0.71
	DE MC		1	0.52	0.53	0.58	*
	DE SA			1	0.62	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
6	SAT Reading	1	0.67	0.44	0.43	0.50	0.66
	DE MC		1	0.47	0.47	0.54	*
	DE SA			1	0.56	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1

\* Due to confound effect, the correlation coefficient is not shown.

MC = Multiple-choice; SA = Short answer; ECR = Extended constructed-response item

CR = Constructed-response items, including short answer and extended constructed-response items.

Grade	Score	SAT 10 Reading	Delaware Items				Delaware Total
			MC	SA	ECR	CR	
7	SAT Reading	1	0.73	0.6	0.57	0.64	0.75
	DE MC		1	0.64	0.61	0.69	*
	DE SA			1	0.64	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
8	SAT Reading	1	0.7	0.56	0.52	0.60	0.72
	DE MC		1	0.59	0.54	0.63	*
	DE SA			1	0.63	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
9	SAT Reading	1	0.75	0.61	0.62	0.66	0.76
	DE MC		1	0.66	0.66	0.71	*
	DE SA			1	0.73	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
10	SAT Reading	1	0.72	0.63	0.59	0.65	0.73
	DE MC		1	0.7	0.66	0.73	*
	DE SA			1	0.75	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1

**Table 9b. Matrix of Correlation for Writing**

Grade	Score	Writing Scores			Reading Scores	
		Writing Total	Text-Based	Stand-Alone	Total	SAT10
3	Writing Total	1	0.75	0.89	0.60	0.51
	Text-Based		1	0.40	0.47	0.39
	Stand-Alone			1	0.51	0.44
	Reading Total				1	0.87
	SAT10 Reading					1
4	Writing Total	1	0.74	0.91	0.54	
	Text-Based		1	0.42	0.50	
	Stand-Alone			1	0.43	n/a
	Reading Total				1	
	SAT10 Reading					
5	Writing Total	1	0.76	0.93	0.60	0.47
	Text-Based		1	0.47	0.50	0.41
	Stand-Alone			1	0.53	0.41
	Reading Total				1	0.85
	SAT10 Reading					1
6	Writing Total	1	0.78	0.93	0.65	0.55
	Text-Based		1	0.49	0.53	0.45
	Stand-Alone			1	0.58	0.49
	Reading Total				1	0.86
	SAT10 Reading					1

\* Due to confound effect, the correlation coefficient is not shown.

Grade	Score	Writing Scores			Reading Scores	
		Writing Total	Text-Based	Stand-Alone	Total	SAT10
7	Writing Total	1	0.80	0.93	0.68	0.58
	Text-Based		1	0.53	0.60	0.52
	Stand-Alone			1	0.61	0.51
	Reading Total				1	0.87
	SAT10 Reading					1
8	Writing Total	1	0.80	0.90	0.63	0.50
	Text-Based		1	0.48	0.54	0.42
	Stand-Alone			1	0.56	0.45
	Reading Total				1	0.86
	SAT10 Reading					1
9	Writing Total	1	0.78	0.93	0.64	0.53
	Text-Based		1	0.56	0.56	0.46
	Stand-Alone			1	0.59	0.49
	Reading Total				1	0.87
	SAT10 Reading					1
10	Writing Total	1	0.72	0.93	0.68	0.54
	Text-Based		1	0.47	0.49	0.38
	Stand-Alone			1	0.66	0.53
	Reading Total				1	0.86
	SAT10 Reading					1

**Table 9c. Matrix of Correlations for Mathematics**

Grade	Score	SAT 10 Math	Delaware Items				Delaware Total
			MC	SA	ECR	CR	
2	SAT Math	1	n/a	0.83	n/a	0.83	0.83
	DE MC		1		n/a		*
	DE SA			1	n/a	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
3	SAT Math	1	0.79	0.77	n/a	0.77	0.82
	DE MC		1	0.78	n/a		*
	DE SA			1	n/a	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
4	SAT Math	1	0.79	0.67	0.6	0.71	0.80
	DE MC		1	0.67	0.61	0.71	*
	DE SA			1	0.61	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
5	SAT Math	1	0.77	0.69	0.64	0.73	0.80
	DE MC		1	0.68	0.65	0.73	*
	DE SA			1	0.66	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
6	SAT Math	1	0.79	0.75	0.65	0.78	0.83
	DE MC		1	0.73	0.65	0.76	*
	DE SA			1	0.66	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1

\* Due to confound effect, the correlation coefficient is not shown.

MC = Multiple-choice; SA = Short answer; ECR = Extended constructed-response item

CR = Constructed-response items, including short answer and extended constructed-response items

Grade	Score	SAT 10 Reading	Delaware Items				Delaware Total
			MC	SA	ECR	CR	
7	SAT Math	1	0.78	0.80	0.72	0.82	0.85
	DE MC		1	0.75	0.68	0.77	*
	DE SA			1	0.75	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
8	SAT Math	1	0.82	0.80	0.73	0.82	0.87
	DE MC		1	0.76	0.69	0.77	*
	DE SA			1	0.76	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
9	SAT Math	1	0.80	0.79	0.69	0.81	0.85
	DE MC		1	0.78	0.69	0.79	*
	DE SA			1	0.74	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1
10	SAT Math	1	0.71	0.78	0.75	0.81	0.83
	DE MC		1	0.71	0.66	0.72	*
	DE SA			1	0.80	*	*
	DE ECR				1	*	*
	DE CR					1	*
	DE Total						1

**Table 10a. Matrix of Correlations for Science**

<b>Grade 4</b>	Sub-Content Domain				Item Format	
	Inquiry	Physical S.	Earth S.	Life S.	MC	SA
Inquiry	1	0.67	0.63	0.65	*	*
Physical Science		1	0.58	0.63	*	*
Earth Science			1	0.59	*	*
Life Science				1	*	*
Multiple-choice					1	0.75
Short Answer						1
<b>Grade 6</b>	Inquiry	Physical S.	Earth S.	Life S.	MC	SA
Inquiry	1	0.68	0.63	0.70	*	*
Physical Science		1	0.59	0.63	*	*
Earth Science			1	0.64	*	*
Life Science				1	*	*
Multiple-choice					1	0.77
Short Answer						1
<b>Grade 8</b>	Inquiry	Physical S.	Earth S.	Life S.	MC	SA
Inquiry	1	0.71	0.69	0.73	*	*
Physical Science		1	0.73	0.74	*	*
Earth Science			1	0.72	*	*
Life Science				1	*	*
Multiple-choice					1	0.80
Short Answer						1
<b>Grade 11</b>	Inquiry	Physical S.	Earth S.	Life S.	MC	SA
Inquiry	1	0.68	0.63	0.72	*	*
Physical Science		1	0.73	0.76	*	*
Earth Science			1	0.74	*	*
Life Science				1	*	*
Multiple-choice					1	0.81
Short Answer						1

MC = Multiple-choice item

SA = Short answer item

\* Due to confound effect, the correlation coefficient is not shown.

**Table 10b. Matrix of Correlations for Social Studies**

<b>Grade 4</b>	Sub-Content Domain				Item Format	
	Civics	Economics	Geography	History	MC	SA
Civics	1	0.65	0.60	0.65	*	*
Economics		1	0.64	0.68	*	*
Geography			1	0.65	*	*
History				1	*	*
Multiple-choice					1	0.65
Short Answer						1
<b>Grade 6</b>	Civics	Economics	Geography	History	MC	SA
Civics	1	0.68	0.65	0.69	*	*
Economics		1	0.69	0.70	*	*
Geography			1	0.71	*	*
History				1	*	*
Multiple-choice					1	0.71
Short Answer						1
<b>Grade 8</b>	Civics	Economics	Geography	History	MC	SA
Civics	1	0.67	0.69	0.69	*	*
Economics		1	0.72	0.69	*	*
Geography			1	0.72	*	*
History				1	*	*
Multiple-choice					1	0.73
Short Answer						1
<b>Grade 11</b>	Civics	Economics	Geography	History	MC	SA
Civics	1	0.75	0.75	0.79	*	*
Economics		1	0.72	0.73	*	*
Geography			1	0.73	*	*
History				1	*	*
Multiple-choice					1	0.76
Short Answer						1

MC = Multiple-choice item

SA = Short answer item

\* Due to confound effect, the correlation coefficient is not shown.

### Ic. Rater Consistency

Students' responses to the stand-alone writing prompt were scored by two raters using a 5-point holistic scoring rubric. The sum of the two writing scores, one for stand-alone and one for text-based writing, is reported as the writing score. Table 11 shows the correlations of the stand alone writing scores assigned by two raters for each grade for the 2006 DSTP. The rater's consistency includes the percentage of perfect agreement and the percentage of plus/minus one-point agreement between the two raters' scores. The correlations between the two raters' scores are moderately low to moderate ranging from .52 to .73 across grades. The average percentage of perfect agreement between the two raters is about 66% to 75% for most grades. Grade 8 has the highest perfect agreement of 81%, while grade 4 has the lowest perfect agreement of 58%. The percentage of agreement within plus or minus one score point is nearly perfect for every grade.

Students' essays on the text-based writing as well as constructed-response items (including short-answer and extended construct-response items) for Reading, Mathematics, Science, and Social Studies were scored by one rater in 2006. To ensure the accuracy of scoring and continuing quality, the Performance Assessment Scoring Center (PASC) at Harcourt Assessment, Inc. established a system of Rater Monitoring and Quality Assurance Checks to refine scoring after training. The ongoing process included:

- **Read-Behind:** Team Leader and/or Room Director spot-check individual raters' scored papers. Typically, these master raters review about 10% of student responses in the initial stages of the project. In the later stage, the leaders might randomly check different raters scoring.
- **Calibrations:** Pre-selected sets of 5 papers or items with clear-cut score points are distributed to raters on a daily basis for the purpose of keeping them on the track and preventing rater drift. Three out of 5 scores must be perfect matches to the set scores to be acceptable and other scores must be adjacent. If a rater fell below the 60% on two consecutive days, the PASC requires a formal re-training with accompanying documentation.
- **Resolution:** Non-adjacent scores require a third "resolution" reading. The percentage of papers requiring resolution is closely monitored for every holistic scoring rater.
- **Monitoring Reports:** Daily reports and cumulative reports are prepared during scoring about the project and rater performance.

**Table 11. Raters' Consistency for Stand-Alone Writing**

<b>Grade</b>	<b>Rater Correlation (r)</b>	<b>Perfect Agreement (%)</b>	<b>Plus/Minus 1-Point Agreement (%)</b>
3	0.59	66	100
4	0.52	58	99
5	0.64	73	100
6	0.65	69	99
7	0.73	75	100
8	0.65	81	100
9	0.63	69	100
10	0.67	74	100

*Id. Decision Accuracy and Consistency*

In 2006, student achievement on all the DSTP tests was reported in five performance levels, in three performance levels for grade 2. Since the test results were used for high-stakes accountability purposes for school and individual students (e.g., grades 3, 5, and 8 reading scores and grade 8 mathematics scores were used for decisions on summer school and promotion/retention), it is important to report the accuracy and consistency of classifying student performance into categories. Particularly, most high-stakes decisions are attached to the classification as being above or below the cut score for “Meets the Standard”. The appropriate methodology for examining misclassification involves analyses of the degree to which test scores correspond to the estimated true scores.

In educational setting, test scores fall into one of the four categories: (1) True Positive; (2) True Negative; (3) False Positive; or (4) False Negative. False positive means that a student’s true score is less than the cut-score, but the test score is equal to or greater than the cut-score; false negative means that a student’s true score is equal to or greater than the cut-score, but the test score is less than the cut-score. Ideally, the proportion of instances in the true positive and true negative cells, where a student’s test score and his/her true score would fall into the same performance level, would far outweigh the instances where actual test scores and estimated true test scores fall into different performance category. That is, more instances should fall into the shaded cells than in the white cells (Figure 4).

Using the Livingston and Lewis (1995) approach, two types of indices are generated: (1) the overall accuracy is the agreement between the actual classifications (e.g., meeting the standard or not meeting the standard) and the estimated true classifications; and (2) the overall consistency is the agreement between the actual classifications and the classifications would be made on a parallel test form. The results

of analyses for misclassifications are presented in Tables 12a through 12f for the 2006 DSTP administrations by test and grade.

**Figure 4. Four-fold Table for Possible Relationships between Students' Test Scores and Estimated True Scores**

	Test score is below standard	Test score is above standard
Actual ability is above standard	False negative	True positive
Actual ability is below standard	True negative	False positive

Table 12a presents the decision accuracy and consistency for Reading in grade 2 through grade 10. The statistics show that the overall accuracy of classifications ranged from .71 to .82 across grades; the overall consistency of classifications rang from .62 to .74. The decision accuracy associated with performance levels suggests a higher probability for Well Below the Standard (.80-.88) and Meets the Standards (.78- .86) than the other three levels. The empty cell indicates no accuracy can be estimated because the true score becomes zero. Table 12b presents the decision accuracy and consistency for Mathematics in grade 2 through grade 10. The statistics show that the overall accuracy of classifications ranged from .73 to .86; the overall consistency of classifications rang from .63 to .80 across grades. The decision accuracy associated with performance levels suggests a higher probability for Well Below the Standard (.79-.88) and Meets the Standard (.77-.86) than the other three performance levels. Table 12c shows the decision accuracy and consistency for Science and Social Studies at grades 4, 6, 8, and 11. The overall accuracy range from .74 to .77 for Science and .75 to .77 for Social Studies; the overall consistency range from .64 to .70 for Science and .66 to .76 for Social Studies. The probability of decision accuracy related to the five performance levels suggests a lower probability for Below the Standard (.69-.71 for Science; .62-.74 for Social Studies); and Exceeds the Standard (.51-.66 for Science; .51-.62 for Social Studies); a higher probability is found for Well Below the Standard (.73-.84 for Science; .70-.85 for Social Studies), Meets the Standard (.75-.86 for Science and .76-.85 for Social Studies), and Distinguished (.74-.84 for Science; .71-.81 for Social Studies).

Tables 12d to 12f show the results of decision accuracy and consistency when combining the performance levels by test and grade. The probabilities of decision accuracy between meeting the standard (including Meet the Standard, Exceed the Standard, and Distinguished) and not meeting the standard (including Below the Standard and Well Below the Standard) are in the range of .92 to .95 for Reading with the probability of .05 or less for possible misclassification; in a range of .91 to .96 for Mathematics with the probability of 4% or less for possible misclassifications; in a range

of .91 to .96 for Science with the probability of 5% or less for possible misclassifications; and in a range of .89 to .91 for Social Studies with the probability of 6% or less for possible misclassifications. Overall, the maximum probability for possible misclassifying student between exceed the standard (including Exceed the Standard, and Distinguished) and not exceed the standard (including Meets the Standard, Below the Standard, and Well Below the Standard) range from 2% to 8% for Reading, from 2% to 5% for Mathematics, from 3% to 5% for Science, and from 1% to 4% for Social Studies.

**Table 12a. Decision Accuracy and Consistency for 2006 DSTP Reading**

Grade	Overall		Accuracy Conditional on Performance Level				
	Accuracy	Consistency	Well Below	Below	Meets	Exceeds	Distinguished
2	.80	.72	-	.82	.78	.80	-
3	.71	.62	.85	.67	.81	.55	.62
4	.72	.62	.81	.70	.79	.57	.67
5	.74	.65	.80	.88	.82	.63	.66
6	.76	.67	.81	.69	.78	.76	.58
7	.80	.72	.80	.71	.86	.69	.54
8	.80	.72	.81	.68	.85	.72	.54
9	.79	.71	.88	.69	.85	.59	-
10	.82	.74	.86	.72	.87	.62	-

**Table 12b. Decision Accuracy and Consistency for 2006 DSTP Mathematics**

Grade	Overall		Accuracy Conditional on Performance Level				
	Accuracy	Consistency	Well Below	Below	Meets	Exceeds	Distinguished
2	.86	.80	-	.88	.82	.89	-
3	.78	.70	.84	.70	.84	.68	.78
4	.74	.65	.84	.64	.81	.59	.77
5	.78	.70	.83	.56	.86	.62	.77
6	.76	.69	.85	.41	.85	.61	.78
7	.76	.69	.88	.39	.81	.61	.88
8	.75	.67	.86	.55	.79	.56	.87
9	.75	.67	.87	.60	.78	.41	.87
10	.73	.63	.79	.54	.77	.57	.88

**Table 12c. Decision Accuracy and Consistency for 2006 DSTP Science and Social Studies**

<b>Grade</b>	Test	Overall		Accuracy Conditional on Level				
		Accuracy	Consistency	Well Below	Below	Meets	Exceeds	Distinguished
4	Science	.78	.70	.73	.70	.86	.66	.74
6	Science	.76	.67	.83	.69	.84	.51	.74
8	Science	.74	.64	.84	.70	.75	.52	.84
11	Science	.77	.68	.84	.71	.82	.54	.84
4	Social Studies	.76	.68	.83	.62	.85	.58	.71
6	Social Studies	.77	.69	.70	.71	.84	.62	.76
8	Social Studies	.75	.66	.83	.72	.77	.54	.81
11	Social Studies	.75	.76	.85	.74	.76	.51	.81

**Table 12d. Decision Accuracy and Consistency for Combined Performance Levels in Reading**

<b>Grade</b>	<b>WB vs. (B + M + E + D)</b>			<b>(WB + B) vs. (M + E + D)</b>			<b>(WB + B + M) vs. (E + D)</b>			<b>(WB + B + M + E) vs. D</b>		
	<i>Accuracy</i>	<i>False Positives</i>	<i>False Negatives</i>	<i>Accuracy</i>	<i>False Positives</i>	<i>False Negatives</i>	<i>Accuracy</i>	<i>False Positives</i>	<i>False Negatives</i>	<i>Accuracy</i>	<i>False Positives</i>	<i>False Negatives</i>
2		-		<b>.94</b>	.03	.03	.86	.06	.08		-	
3	.98	.01	.01	<b>.95</b>	.02	.03	.89	.06	.05	.89	.06	.05
4	.97	.01	.01	<b>.94</b>	.03	.04	.89	.06	.05	.91	.06	.03
5	.98	.01	.01	<b>.94</b>	.03	.03	.89	.06	.05	.93	.05	.02
6	.97	.01	.02	<b>.92</b>	.03	.05	.89	.07	.04	.98	.02	.00
7	.98	.01	.01	<b>.94</b>	.02	.03	.91	.05	.05	.97	.03	.03
8	.98	.01	.01	<b>.94</b>	.03	.03	.90	.06	.04	.98	.02	.00
9	.97	.01	.02	<b>.94</b>	.03	.03	.90	.05	.04	.98	.02	.00
10	.96	.01	.02	<b>.94</b>	.04	.04	.94	.04	.02	.99	.01	.00

**Table 12e. Decision Accuracy and Consistency for Combined Performance Levels in Mathematics**

<b>Grade</b>	<b>WB vs. (B + M + E + D)</b>			<b>(WB + B) vs. (M + E + D)</b>			<b>(WB + B + M) vs. (E + D)</b>			<b>(WB + B + M + E) vs. D</b>		
	<i>Accuracy</i>	<i>False Positives</i>	<i>False Negatives</i>	<i>Accuracy</i>	<i>False Positives</i>	<i>False Negatives</i>	<i>Accuracy</i>	<i>False Positives</i>	<i>False Negatives</i>	<i>Accuracy</i>	<i>False Positives</i>	<i>False Negatives</i>
2		-		<b>.96</b>	.01	.03	.90	.04	.05		-	
3	.97	.01	.02	<b>.94</b>	.03	.03	.92	.04	.04	.94	.04	.02
4	.96	.01	.03	<b>.93</b>	.03	.04	.91	.05	.05	.94	.04	.02
5	.96	.02	.03	<b>.93</b>	.03	.04	.93	.05	.03	.96	.03	.02
6	.94	.02	.04	<b>.92</b>	.04	.04	.93	.04	.03	.96	.02	.02
7	.93	.03	.04	<b>.92</b>	.04	.04	.94	.04	.02	.96	.03	.01
8	.93	.03	.03	<b>.92</b>	.03	.04	.94	.03	.03	.95	.03	.02
9	.93	.03	.04	<b>.91</b>	.04	.04	.94	.04	.02	.96	.03	.01
10	.90	.05	.04	<b>.91</b>	.04	.05	.94	.03	.03	.96	.02	.02

**Table 12f. Decision Accuracy and Consistency for Combined Performance Levels in  
Science and Social Studies**

<b>Grade</b>	<b>WB vs. (B + M + E + D)</b>			<b>(WB + B) vs. (M + E + D)</b>			<b>(WB + B + M) vs. (E + D)</b>			<b>(WB + B + M + E) vs. D</b>		
	<i>Accuracy</i>	<i>False Positives</i>	<i>False Negatives</i>	<i>Accuracy</i>	<i>False Positives</i>	<i>False Negatives</i>	<i>Accuracy</i>	<i>False Positives</i>	<i>False Negatives</i>	<i>Accuracy</i>	<i>False Positives</i>	<i>False Negatives</i>
<i>Science</i>												
4	.99	.00	.01	<b>.96</b>	.01	.03	.89	.05	.05	.94	.04	.03
6	.97	.01	.02	<b>.93</b>	.03	.04	.91	.05	.04	.95	.04	.02
8	.93	.03	.04	<b>.91</b>	.05	.05	.93	.04	.03	.96	.03	.01
11	.95	.02	.03	<b>.92</b>	.05	.04	.94	.03	.03	.96	.02	.01
<i>Social Studies</i>												
4	.95	.02	.03	<b>.91</b>	.05	.05	.93	.04	.03	.97	.02	.01
6	.93	.02	.05	<b>.89</b>	.05	.06	.97	.02	.01	.99	.01	.00
8	.92	.03	.05	<b>.90</b>	.04	.05	.95	.03	.02	.97	.02	.01
11	.93	.03	.03	<b>.91</b>	.04	.04	.94	.03	.03	.96	.02	.02

WB = Well Below, B = Below, M = Meets, E = Exceeds, and D = Distinguished

## II. Item and Test Statistics

Table 13 presents the summary of the conventional test statistics for the 2006 DSTP by test and grade: the average item difficulty (p-value) and item discrimination (point-biserial correlation) for all operational items. Using the classical approach, the relative mean was calculated for short answer and extended constructed-response items for the test difficulty by test and grade. The results show that average p-values are .64, .66, .68, .65, .62, .61, .63, .68 and .61 for Reading grades 2 through 10, respectively; .72, .69, .66, .60, .55, .52, .53, .50 and .44 for Mathematics grade 2 through grade 10, respectively. The average p-values are .63, .63, .53 and .51 for Science grades 4, 6, 8, and 11, respectively; and .54, .39, .39 and .43 for Social Studies grades 4, 6, 8, and 11, respectively. The average point-biserial correlations by grade range from .32 to .42 for Reading; .39 to .46 for Mathematics; .34 to .41 for Science; and .31 to .45 for Social Studies. Item statistics (mean and point-biserial correlation) by test and grade can be found in Appendix I. DIF statistics (Black students vs. White student; Females vs. Males) are also available.

**Table 13. Means of Item Statistics by Test and Grade**

Grade	Reading		Mathematics		Science		Social Studies	
	<i>p-value</i>	<i>p-biserial</i>	<i>p-value</i>	<i>p-biserial</i>	<i>p-value</i>	<i>p-biserial</i>	<i>p-value</i>	<i>p-biserial</i>
2	0.638	0.419	0.717	0.455				
3	0.658	0.382	0.688	0.442				
4	0.679	0.358	0.664	0.387	0.633	0.341	0.541	0.343
5	0.649	0.346	0.597	0.401				
6	0.620	0.315	0.551	0.413	0.631	0.340	0.387	0.313
7	0.612	0.376	0.521	0.445				
8	0.627	0.351	0.528	0.452	0.525	0.385	0.392	0.380
9	0.675	0.407	0.501	0.428				
10	0.614	0.381	0.437	0.408				
11					0.510	0.413	0.431	0.446

## Part Six. References

Delaware Student Testing Program: State Summary Report – 2006 Administration

Delaware Student Testing Program: Guidelines for Inclusion of Students with Disabilities and English Language Learners (2006)

Delaware Student Testing Program: 2006 State Report of Student Questionnaire Survey

Delaware Student Testing Program: Technical Report 2005

Delaware Department of Education (2005). A Summary and Recommendations to the Delaware Board of Education for Revisiting, Reviewing, and Establishing Performance Standards for the Delaware Student Testing Program Reading, Writing, and Mathematics; October 20, 2005.

Holland, P. W. & Wainer, H. (Eds.), Differential Item Functioning (pp. 3-23). Hillsdale, NJ: Erlbaum.

Livingston, S. A. and Lewis, C. Estimating the consistency and accuracy of classifications based on test scores. *Journal of Educational Measurement*, Summer 1995, Vol. 32, No. 2, pp. 179-197

Shealy, R. & Strout, W.F. (1993a). An item response theory model for test bias. In P.W. Holland & H. Wainer (Eds.), *Differential Item Functioning* (pp. 197-239). Hillsdale, NJ: Erlbaum.

Shealy, R. & Strout, W.F. (1993b). A model-based standardization approach that separates true bias/DIF from group ability differences and detects test bias/DTF as well as Item bias/DIF. *Psychometrika*, 58, 159-194.

Standards for Educational and Psychological Testing, 1999

State of Delaware – English Language Arts Curriculum Framework

State of Delaware – Mathematics Curriculum Framework

State of Delaware – Science Curriculum Framework

State of Delaware – Social Studies Curriculum Framework

## **Appendix A**

### **Test Development Committees by Test**

## 2006 Test Development Committee for English Language Arts

---

<b>Name</b>	<b>Affiliation</b>
Marty Hodgkins	Appoquinimink School District
Denise Weiner	Brandywine School District
Mary MacPherson	Caesar Rodney School District
Jackie Shockley	Cape Henlopen School District
Aleta Thompson	Cape Henlopen School District
Deanne McCredie	Cape Henlopen School District
Jane Ragains	Capital School District
Deidra Aikens	Christina School District
Dawn Downes	Christina School District
Sherrie Goldyn	Colonial School District
Darlene Bolig	Department of Education
Mike Boyd	Lake Forest School District
Sara McCraw	Milford School District
Sharon Biss	Red Clay School District
Karen Willey	Sussex Academy of Arts & Science
Bonnie Albertson	University of Delaware
Christine Evans	University of Delaware

---

## 2006 Test Development Committee for Mathematics

---

<b>Name</b>	<b>Affiliation</b>
Valerie Maxwell	Appoquinimink School District
Eric Shane	Caesar Rodney School District
Jan Shetzler	Caesar Rodney School District
Maureen LeClerc	Cape Henlopen School District
Susan Hall	Cape Henlopen School District
Melissa White	Capital School District
Jennifer Burlew	Christina School District
Susan Williams	Christina School District
Margaret Byrem	Colonial School District
Roberta Jacobs	Colonial School District
Kathleen McAneny	Colonial School District
Sally Caldwell	Department of Education
Katia Foret	Department of Education
Jan Parsons	Indian River School District - Retired
Vickie Pendleton	Indian River School District
Michael Streck	Milford School District
Diana Roscoe	Polytech School District
Shirley Ellison	Red Clay School District
Jane Gillis	Red Clay School District
Kathleen Gormley	Red Clay School District

---

---

<b>Name</b>	<b>Affiliation</b>
Janice McCarthy	Red Clay School District
Jon Manon	University of Delaware

---

## 2006 Test Development Committee for Science

---

<b>Name</b>	<b>Affiliation</b>
Jane H. Carey	Brandywine School District
Ann Wallace	Caesar Rodney School District
Karen Wallace	Caesar Rodney School District
Tonyea Mead	Cape Henlopen School District
Gwyneth Sharp	Cape Henlopen School District
April McCrae	Capital School District
Faye Markowitz	Christina School District
Caitlin Minch	Christina School District
Janice Trainer	Christina School District
Lisa Machado	Colonial School District
Ellen Mingione	Department of Education
Penny Hall	Indian River School District
Susan Frampton	Milford School District
Robert Karcha	Red Clay School District
Julie A. Hanenfeld	Seaford School District
Helen Gieske	Woodbridge School District
Valerie J. Bergeron	Delaware Technical & Community College
William J. McIntosh	Delaware State University
Patrick F. Gleeson	Delaware State University
Deborah Allen	University of Delaware

---

## 2006 Test Development Committee for Social Studies

---

<b>Name</b>	<b>Affiliation</b>
Dr. John Crum	Brandywine School District, Retired
Shay Eli	Cape Henlopen School District
Preston Shockley	Cape Henlopen School District
Barbara Emery	Christina School District, Retired
Susan E. Miller	Colonial School District
Joann F. Prewitt	Department of Education
Cynthia A. Baker	Indian River School District
Patrick Foley	Indian River School District
Terry Kansak	Indian River School District
Judy Purcell	Milford School District
Dawn Willis	Milford School District
Jason Jeandell	Seaford School District
Melissa Buchanan	Smyrna School District
Dr. Bonnie Meszaros	University of Delaware
Dr. James O'Neill	University of Delaware
Dr. Peter Reese	University of Delaware
Dr. Tony Armstrong	Wesley College

---

## **Appendix B**

### **Test Review Committees by Test**

**2006 Test Review Committee for English Language Arts**

---

<b>Name</b>	<b>Affiliation</b>
Marty Hodgkins	Appoquinimink School District
Daniel Bradley	Brandywine School District
Denise Weiner	Brandywine School District
Stephanie Dewitt	Cape Henlopen School District
Carole Roy	Cape Henlopen School District
Denise Parks	Colonial School District
Susan Sewell	Colonial School District
Jennifer Wisowaty	Colonial School District
Ellen Dysart	Delmar School District
Michelle Erskine	Indian River School District
Melissa Michaels	Laurel School District
Greer Stangl	Milford School District
Jessica Browne	Newark Charter School
Anne Slease	Newark Charter School
Karen Chaffee	Polytech School District
Rebecca Sharp	Polytech School District

---

---

<b>Name</b>	<b>Affiliation</b>
Barbara Jacobs	Red Clay School District
Marjorie Chappel	Smyrna School District
Marc Cooke	Sussex Academy
Margaret Dillner	University of Delaware

---

## 2006 Test Review Committee for Mathematics

---

<b>Name</b>	<b>Affiliation</b>
Laura Conner	Appoquinimink School District
Valerie Maxwell	Appoquinimink School District
Sabrina Fitzhugh	Brandywine School District
Michelle Fields	Caesar Rodney School District
Amy Weissenfluh	Caesar Rodney School District
Kelly Wutka	Caesar Rodney School District
Lacey Zelinski	Caesar Rodney School District
Maureen Baron	Cape Henlopen School District
Elaine Lewis	Christina School District
Susan Yeager	Christina School District
Jennifer Bonham	Colonial School District
Margaret Byrem	Colonial School District
Dawn Freebery	Colonial School District
Tara Backus	Seaford School District
Steve Halter	Seaford School District
Jose Oyola	Woodbridge School District
Katia Foret	Department of Education
Diana Roscoe	Department of Education

---

## **Appendix C**

### **Bias and Sensitivity Review Committee**

---

<b>Name</b>	<b>Affiliation</b>
Judy Goldbaum	Brandywine School District
Wendy Balakhani	Christina School District
Hilda Delgado	Christina School District
Armando Caro	Colonial School District
Ann Lofting	Delaware School for the Deaf
H. M. Tommy Lu	Delaware Tech Community College
James Hertzog	Department of Education
Dorothe Mumford	DVI Education Unit – MSSCA
Arlene Scanlon	Delaware Technical Community College
Cathy Williams	Retired Teacher of Visually Handicapped
Mark Abbott	Sussex Tech School District
Terrance Moore	Woodbridge School District

---

**Appendix D**  
**Technical Advisory Committee**

---

<b>Name</b>	<b>Affiliation</b>	<b>Year(s) of Service</b>
Robert Calfee	University of California Riverside	1998-2006
Steve Dunbar	University of Iowa	1996-2006
Ronald Hambleton	University of Massachusetts	2000-2006
Suzanne Lane	University of Pittsburgh	2000-2006
Martha Thurlow	University of Minnesota	1996-2006
Richard Patz	Independent Consultant	2006

---

**Appendix E1**  
**Test Specifications for Reading**

**Target Test Specifications for DSTP Reading by Grade and Passage Type**

<b>Grade</b>	<b>Informative</b>		<b>Literary</b>		<b>Technical</b>		<b>Total</b>
	<i>N. of Passages</i>	<i>%</i>	<i>N. of Passages</i>	<i>%</i>	<i>N. of Passages</i>	<i>%</i>	
<b>2</b>	3	40	3	40	2	20	8
<b>3</b>	4	35	5-6	50	1-2	15	11
<b>4</b>	4	35	5-6	50	1-2	15	11
<b>5</b>	4	40	5-6	45	1-2	15	11
<b>6</b>	4	40	5-6	45	1-2	15	11
<b>7</b>	4	40	5-6	45	1-2	15	11
<b>8</b>	4	40	5-6	45	1-2	15	11
<b>9</b>	4	45	4	40	1	15	9
<b>10</b>	4	45	4	40	1	15	9

The number of passages is estimated based on the target percentage by passage type.

**Actual Percentage of Reading Passages for the 2006 DSTP Reading by Grade and Passage Type**

<b>Grade</b>	<b>Informative</b>		<b>Literary</b>		<b>Technical</b>		<b>Informative/Technical</b>		<b>Literary/Informative</b>		<b>Total</b>
	<i>Number of Passages</i>	<i>%</i>	<i>Number of Passages</i>	<i>%</i>	<i>Number of Passages</i>	<i>%</i>	<i>Number of Passages</i>	<i>%</i>	<i>Number of Passages</i>	<i>%</i>	
<b>2</b>	3	38	3	38	2	25	0	0	0	0	8
<b>3</b>	3	27	5	45	2	18	1	9	0	0	11
<b>4</b>	3	27	5	45	3	27	0	0	0	0	11
<b>5</b>	4	36	4	36	2	18	1	9	0	0	11
<b>6</b>	4	36	4	36	2	18	0	0	1	9	11
<b>7</b>	4	36	4	36	2	18	1	9	0	0	11
<b>8</b>	4	36	3	27	2	18	1	9	1	9	11
<b>9</b>	4	44	3	33	2	22	0	0	0	0	9
<b>10</b>	4	44	4	44	1	11	0	0	0	0	9

**Target Item Distributions for DSTP Reading by Grade and Stance**

<b>Grade</b>	<b>Determining Meaning</b>		<b>Interpreting Meaning</b>		<b>Extending Meaning</b>		<b>Total</b>	
	<i>N. of Items*</i>	<i>%</i>	<i>N. of Items</i>	<i>%</i>	<i>N. of Items</i>	<i>%</i>	<i>N. of Items</i>	<i>Max. Point</i>
<b>2</b>	8	25	17	50	8	25	33	44
<b>3</b>	26	40	22	35	16	25	64	84
<b>4</b>	23	35	27	40	17	25	67	87
<b>5</b>	19	30	29	45	16	25	64	84
<b>6</b>	16	25	29	45	19	30	64	84
<b>7</b>	16	25	29	45	20	30	65	85
<b>8</b>	13	20	29	45	22	35	64	84
<b>9</b>	13	20	27	40	27	40	67	87
<b>10</b>	13	20	27	40	27	40	67	87

\*The number of items is estimated based on the target percentage by stance.

**Actual Item Distributions for the 2006 DSTP Reading by Grade and Stance**

<b>Grade</b>	<b>Determining Meaning</b>		<b>Interpreting Meaning</b>		<b>Extending Meaning</b>		<b>Total</b>	
	<i>N. of Items</i>	<i>%</i>	<i>N. of Items</i>	<i>%</i>	<i>N. of Items</i>	<i>%</i>	<i>N. of Items</i>	<i>Max. Point</i>
<b>2</b>	8	24	16	48	9	27	33	44
<b>3</b>	27	42	21	33	16	25	64	84
<b>4</b>	23	34	26	39	18	27	67	87
<b>5</b>	21	33	26	41	17	27	64	84
<b>6</b>	18	28	28	44	18	28	64	84
<b>7</b>	18	28	29	45	18	28	65	85
<b>8</b>	14	22	29	45	21	33	64	84
<b>9</b>	15	22	27	40	25	37	67	87
<b>10</b>	15	22	26	39	26	39	67	87

**Appendix E2**  
**Test Specifications for Mathematics**

**Target Percentages of Item Distributions for DSTP Mathematics by Grade and Standards**

Grade	Item	Standard 1	Standard 2	Standard 3	Standard 4	Total
		Numeric Reasoning	Algebraic Reasoning	Geometric Reasoning	Quantitative Reasoning	
2	N.*	22	13	4	4	44
	%	0.50	0.30	0.10	0.10	
3	N.	30	12	9	9	59
	%	0.50	0.20	0.15	0.15	
4	N.	27	12	12	9	59
	%	0.45	0.20	0.20	0.15	
5	N.	24	12	12	12	59
	%	0.40	0.20	0.20	0.20	
6	N.	20	15	12	12	58
	%	0.35	0.25	0.20	0.20	
7	N.	17	15	15	12	58
	%	0.30	0.25	0.25	0.20	
8	N.	15	18	15	12	59
	%	0.25	0.30	0.25	0.20	
9	N.	9	24	15	12	61
	%	0.15	0.40	0.25	0.20	
10	N.	6	24	18	12	59
	%	0.10	0.40	0.30	0.20	

\* The number of items is estimated based on the target percentage for each content category.

### Target Percentages of Item Distributions for DSTP Mathematics by Cognitive Level

Grade	Conceptual Knowledge	Cognitive Level		Total
		Procedural Knowledge	Problem Solving	
2 - 10	0.45	0.35	0.20	1.00

### Actual Item Distributions for the 2006 DSTP Mathematics by Grade and Standards

Grade	Item	Standard 1	Standard 2	Standard 3	Standard 4	Total
		Numeric Reasoning	Algebraic Reasoning	Geometric Reasoning	Quant. Reasoning	
2	<i>N. of Items</i>	21	11	7	5	44
	<i>%</i>	48	25	16	11	100
	<i>Max. Pt.</i>	28	17	10	6	61
3	<i>N. of Items</i>	26	12	13	8	59
	<i>%</i>	44	20	22	14	100
	<i>Max. Pt.</i>	33	15	15	10	73
4	<i>N. of Items</i>	24	11	15	9	59
	<i>%</i>	41	19	25	15	100
	<i>Max. Pt.</i>	29	16	17	14	76
5	<i>N. of Items</i>	23	15	13	8	59
	<i>%</i>	39	25	22	14	100
	<i>Max. Pt.</i>	28	18	18	12	76
6	<i>N. of Items</i>	17	15	14	12	58
	<i>%</i>	29	26	24	21	100
	<i>Max. Pt.</i>	22	20	16	17	75
7	<i>N. of Items</i>	11	18	16	13	58
	<i>%</i>	19	31	28	22	100
	<i>Max. Pt.</i>	17	24	17	17	75
8	<i>N. of Items</i>	16	17	16	10	59
	<i>%</i>	27	29	27	17	100
	<i>Max. Pt.</i>	17	25	20	14	76
9	<i>N. of Items</i>	9	25	15	12	61
	<i>%</i>	15	41	25	20	100
	<i>Max. Pt.</i>	9	32	20	17	78
10	<i>N. of Items</i>	9	22	16	12	59
	<i>%</i>	15	37	27	20	100
	<i>Max. Pt.</i>	10	27	22	17	76

### Actual Item Distributions for the 2006 DSTP Mathematics by Grade and Cognitive Level

Grade	Item	Cognitive Level			Total
		Conceptual Knowledge	Procedural Knowledge	Problem Solving	
2	<i>N. of Items</i>	20	15	9	44
	<i>%</i>	45	34	20	100
	<i>Max. Points</i>	26	20	15	61
3	<i>N. of Items</i>	22	26	11	59
	<i>%</i>	37	44	19	100
	<i>Max. Points</i>	24	31	18	73
4	<i>N. of Items</i>	31	13	15	59
	<i>%</i>	53	22	25	100
	<i>Max. Points</i>	36	14	26	76
5	<i>N. of Items</i>	25	26	8	59
	<i>%</i>	42	44	14	100
	<i>Max. Points</i>	30	28	18	76
6	<i>N. of Items</i>	31	19	8	58
	<i>%</i>	53	33	14	100
	<i>Max. Points</i>	34	24	17	75
7	<i>N. of Items</i>	26	23	9	58
	<i>%</i>	45	40	16	100
	<i>Max. Points</i>	28	26	21	75
8	<i>N. of Items</i>	37	16	6	59
	<i>%</i>	63	27	10	100
	<i>Max. Points</i>	42	22	12	76
9	<i>N. of Items</i>	19	27	15	61
	<i>%</i>	31	44	25	100
	<i>Max. Points</i>	24	28	26	78
10	<i>N. of Items</i>	26	26	7	59
	<i>%</i>	44	44	12	100
	<i>Max. Points</i>	28	31	17	76

**Appendix E3**  
**Test Specifications for Science**

**Target Test Specifications for DSTP Science**

<b>Grade</b>	<b>Inquiry</b>		<b>Life Science</b>		<b>Earth Science</b>		<b>Physical Science</b>		<b>Total Item (Pt)</b>
	<i>N. of Items</i>	<i>%</i>	<i>N. of Items</i>	<i>%</i>	<i>N. of Items</i>	<i>%</i>	<i>N. of Items</i>	<i>%</i>	
<b>4</b>	15	30	15	30	10	20	10	20	<b>50 (68)</b>
<b>6</b>	12-13	25	12-13	25	12-13	25	12-13	25	<b>50 (68)</b>
<b>8</b>	7-8	15	15	30	12-13	25	15	30	<b>50 (68)</b>
<b>11</b>	7-8	15	15	30	12-13	25	15	30	<b>50 (68)</b>

The number of items is estimated based on the target percentage for each sub-content area.

**Actual Item Distributions for the 2006 DSTP Science**

<b>Grade</b>	<b>Inquiry</b>		<b>Life Science</b>		<b>Earth Science</b>		<b>Physical Science</b>		<b>Total</b>
	<i>N. of Items</i>	<i>Max. Points</i>	<i>N. of Items</i>	<i>Max. Points</i>	<i>N. of Items</i>	<i>Max. Points</i>	<i>N. of Items</i>	<i>Max. Points</i>	
<b>4</b>	16	21	17	24	9	12	8	11	<b>50 (68)</b>
%	32		32		18		18		100
MC (SA)	11 (5)	11 (10)	10 (7)	10 (14)	6 (3)	6 (6)	5 (3)	5 (6)	
<b>6</b>	13	18	13	18	11	14	13	18	<b>50 (68)</b>
%	26		26		24		24		100
MC (SA)	8 (5)	8 (10)	8 (5)	8 (10)	8 (3)	8 (6)	8 (5)	8 (10)	
<b>8</b>	9	13	15	21	12	15	14	19	<b>50 (68)</b>
%	16		32		24		28		100
MC (SA)	5 (4)	5 (8)	9 (6)	9 (12)	9 (3)	9 (6)	9 (5)	9 (10)	
<b>11</b>	8	11	15	21	13	17	14	19	<b>50 (68)</b>
%	16		32		24		28		100
MC (SA)	5 (3)	5 (6)	9 (6)	9 (12)	9 (4)	9 (8)	9 (5)	9 (10)	

MC- multiple-choice; SA - Short answer item

## **Appendix E4**

### **Test Specifications for Social Studies**

**Target Test Specifications for DSTP Social Studies\***

<b>Grade</b>	<b>Civics</b>		<b>Economics</b>		<b>Geography</b>		<b>History</b>		<b>Total</b>
	<i>N. of Items</i>	<i>Max. Points</i>	<i>N. of Items</i>	<i>Max. Points</i>	<i>N. of Items</i>	<i>Max. Points</i>	<i>N. of Items</i>	<i>Max. Points</i>	
<b>4</b>	12	17	12	17	12	17	12	17	<b>48 (68)</b>
%	25		25		25		25		100
<b>6</b>	12	17	12	17	12	17	12	17	<b>48 (68)</b>
%	25		25		25		25		100
<b>8</b>	12	17	12	17	12	17	12	17	<b>48 (68)</b>
%	25		25		25		25		100
<b>11</b>	12	17	12	17	12	17	12	17	<b>48 (68)</b>
%	25		25		25		25		100
MC	7	7	7	7	7	7	7	7	28 (28)
SA	5	10	5	10	5	10	5	10	20 (40)

In social studies, the actual item distributions match the target test specification precisely.

## **Appendix F1 – F4**

### **Frequency Distributions of Scale Scores for Reading, Mathematics, Science, and Social Studies**

**Appendix F1. Frequency Distributions of Reading Scale Scores**

Grade	Reading Score	N.	%	c%
2	214	2	0.03	0.03
	232	1	0.01	0.04
	246	3	0.04	0.08
	257	3	0.04	0.11
	267	12	0.15	0.27
	275	17	0.22	0.49
	283	22	0.28	0.77
	290	32	0.41	1.18
	297	49	0.63	1.80
	303	41	0.52	2.32
	309	48	0.61	2.94
	315	71	0.91	3.84
	321	78	1.00	4.84
	327	79	1.01	5.85
	332	70	0.89	6.74
	337	103	1.32	8.06
	343	121	1.55	9.61
	348	163	2.08	11.69
	353	160	2.04	13.73
	359	208	2.66	16.39
	364	251	3.21	19.59
	369	253	3.23	22.83
	375	306	3.91	26.73
	381	335	4.28	31.01
	387	381	4.87	35.88
	393	398	5.08	40.96
	399	440	5.62	46.58
	405	517	6.60	53.19
	412	525	6.71	59.89
	419	536	6.85	66.74
	427	531	6.78	73.52
	435	507	6.48	80.00
444	479	6.12	86.12	
453	376	4.80	90.92	
463	279	3.56	94.48	
474	200	2.55	97.04	
486	103	1.32	98.35	
499	79	1.01	99.36	
514	29	0.37	99.73	
530	17	0.22	99.95	
551	4	0.05	100.00	
	<b>Total</b>	<b>7829</b>	<b>100.00</b>	

Grade	Reading Score	N.	%	c%
3	298	1	0.01	0.01
	304	2	0.03	0.04
	314	1	0.01	0.05
	324	4	0.05	0.10
	328	8	0.10	0.21
	332	9	0.12	0.32
	336	9	0.12	0.44
	339	8	0.10	0.54
	343	14	0.18	0.72
	346	9	0.12	0.83
	350	10	0.13	0.96
	353	17	0.22	1.18
	356	15	0.19	1.37
	359	18	0.23	1.61
	362	21	0.27	1.87
	365	31	0.40	2.27
	368	38	0.49	2.76
	371	32	0.41	3.17
	374	36	0.46	3.63
	377	34	0.44	4.07
	379	37	0.48	4.55
	382	45	0.58	5.12
	385	41	0.53	5.65
	387	39	0.50	6.15
	390	49	0.63	6.78
	393	45	0.58	7.36
	395	50	0.64	8.00
	398	69	0.89	8.89
	400	75	0.96	9.85
	403	82	1.05	10.90
	406	87	1.12	12.02
	408	84	1.08	13.10
	411	112	1.44	14.54
	413	119	1.53	16.06
	416	121	1.55	17.62
	418	129	1.66	19.27
	421	139	1.78	21.06
424	149	1.91	22.97	
426	154	1.98	24.95	
429	187	2.40	27.35	
432	189	2.43	29.78	
434	173	2.22	32.00	
437	199	2.56	34.55	
440	246	3.16	37.71	

Grade	Reading Score	N.	%	c%
3	443	281	3.61	41.32
	445	290	3.72	45.04
	448	258	3.31	48.36
	451	282	3.62	51.98
	454	278	3.57	55.55
	457	300	3.85	59.40
	460	282	3.62	63.02
	463	297	3.81	66.83
	467	277	3.56	70.39
	470	276	3.54	73.93
	473	272	3.49	77.43
	477	266	3.42	80.84
	480	246	3.16	84.00
	484	216	2.77	86.77
	488	207	2.66	89.43
	492	178	2.29	91.72
	496	159	2.04	93.76
	501	148	1.90	95.66
	506	115	1.48	97.14
	511	74	0.95	98.09
	517	53	0.68	98.77
	523	45	0.58	99.35
	530	31	0.40	99.74
	537	12	0.15	99.90
	546	6	0.08	99.97
	556	1	0.01	99.99
584	1	0.01	100.00	
	Total	7788	100.00	

Grade	Reading Score	N.	%	c%
4	335	1	0.01	0.01
	340	1	0.01	0.03
	348	4	0.05	0.08
	352	4	0.05	0.13
	355	2	0.03	0.15
	359	8	0.10	0.26
	362	4	0.05	0.31
	365	8	0.10	0.41
	368	5	0.06	0.48
	371	6	0.08	0.55
	374	9	0.12	0.67
	377	9	0.12	0.79
	380	5	0.06	0.85
	383	9	0.12	0.97

Grade	Reading Score	N.	%	c%
4	385	10	0.13	1.10
	388	16	0.21	1.30
	390	17	0.22	1.52
	393	23	0.30	1.82
	395	20	0.26	2.07
	398	28	0.36	2.44
	400	24	0.31	2.74
	403	27	0.35	3.09
	405	34	0.44	3.53
	407	32	0.41	3.94
	410	47	0.61	4.55
	412	56	0.72	5.27
	415	46	0.59	5.86
	417	75	0.97	6.83
	419	72	0.93	7.76
	421	85	1.10	8.85
	424	67	0.86	9.72
	426	98	1.26	10.98
	428	78	1.01	11.98
	431	103	1.33	13.31
	433	119	1.53	14.84
	435	129	1.66	16.51
	437	134	1.73	18.23
	440	149	1.92	20.15
	442	157	2.02	22.17
	444	171	2.20	24.38
	447	186	2.40	26.77
	449	170	2.19	28.97
	452	206	2.65	31.62
	454	230	2.96	34.58
	456	215	2.77	37.35
	459	200	2.58	39.93
462	246	3.17	43.10	
464	213	2.74	45.84	
467	235	3.03	48.87	
469	257	3.31	52.18	
472	269	3.47	55.65	
475	308	3.97	59.62	
478	271	3.49	63.11	
481	270	3.48	66.59	
484	285	3.67	70.26	
487	268	3.45	73.71	
491	265	3.41	77.13	
494	274	3.53	80.66	

Grade	Reading Score	N.	%	c%
4	498	240	3.09	83.75
	502	231	2.98	86.73
	506	213	2.74	89.47
	510	216	2.78	92.26
	514	129	1.66	93.92
	519	127	1.64	95.55
	524	109	1.40	96.96
	530	83	1.07	98.03
	536	50	0.64	98.67
	542	43	0.55	99.23
	549	31	0.40	99.63
	557	11	0.14	99.77
	567	11	0.14	99.91
	578	6	0.08	99.99
	591	1	0.01	100.00
		Total	7761	100.00

Grade	Reading Score	N.	%	c%
5	347	1	0.01	0.01
	352	1	0.01	0.03
	356	3	0.04	0.06
	365	1	0.01	0.08
	369	1	0.01	0.09
	373	6	0.08	0.17
	377	5	0.06	0.23
	380	5	0.06	0.29
	384	6	0.08	0.37
	387	8	0.10	0.47
	390	15	0.19	0.66
	393	6	0.08	0.74
	396	9	0.11	0.85
	399	17	0.22	1.07
	402	16	0.20	1.27
	405	20	0.25	1.53
	408	21	0.27	1.79
	411	26	0.33	2.12
	414	23	0.29	2.42
	417	26	0.33	2.75
	419	38	0.48	3.23
	422	30	0.38	3.61
	425	47	0.60	4.21
427	53	0.67	4.88	
430	56	0.71	5.60	
433	68	0.86	6.46	

Grade	Reading Score	N.	%	c%
5	435	65	0.83	7.29
	438	85	1.08	8.37
	440	80	1.02	9.39
	443	108	1.37	10.76
	446	129	1.64	12.40
	448	112	1.42	13.82
	451	125	1.59	15.41
	453	149	1.89	17.31
	456	174	2.21	19.52
	459	189	2.40	21.93
	461	182	2.31	24.24
	464	176	2.24	26.48
	467	229	2.91	29.39
	469	246	3.13	32.52
	472	256	3.26	35.78
	475	253	3.22	38.99
	478	279	3.55	42.54
	481	269	3.42	45.96
	484	289	3.68	49.64
	487	293	3.73	53.36
	490	297	3.78	57.14
	493	311	3.96	61.10
	496	323	4.11	65.20
	499	295	3.75	68.96
	502	299	3.80	72.76
	506	268	3.41	76.17
	509	241	3.06	79.23
	513	244	3.10	82.33
	517	230	2.93	85.26
	520	209	2.66	87.92
	524	178	2.26	90.18
	529	173	2.20	92.38
	533	117	1.49	93.87
537	118	1.50	95.37	
542	97	1.23	96.60	
547	69	0.88	97.48	
552	59	0.75	98.23	
558	45	0.57	98.80	
564	23	0.29	99.10	
571	23	0.29	99.39	
578	24	0.31	99.69	
586	10	0.13	99.82	
595	7	0.09	99.91	
606	2	0.03	99.94	

Grade	Reading Score	N.	%	c%
5	619	4	0.05	99.99
	637	1	0.01	100.00
	Total	7863	100.00	

Grade	Reading Score	N.	%	c%
6	355	1	0.01	0.01
	360	3	0.04	0.05
	369	2	0.02	0.07
	373	3	0.04	0.11
	377	3	0.04	0.14
	381	8	0.09	0.24
	385	8	0.09	0.33
	388	6	0.07	0.40
	392	6	0.07	0.47
	396	9	0.11	0.58
	399	11	0.13	0.71
	402	12	0.14	0.85
	406	16	0.19	1.04
	409	19	0.23	1.27
	412	14	0.17	1.44
	415	18	0.21	1.65
	418	25	0.30	1.95
	421	30	0.36	2.30
	424	38	0.45	2.75
	427	41	0.49	3.24
	430	44	0.52	3.76
	433	60	0.71	4.47
	436	70	0.83	5.30
	439	84	1.00	6.30
	442	84	1.00	7.30
	444	118	1.40	8.70
447	115	1.36	10.06	
450	146	1.73	11.80	
453	153	1.82	13.61	
455	171	2.03	15.64	
458	207	2.46	18.10	
461	215	2.55	20.65	
464	251	2.98	23.63	
467	240	2.85	26.47	
469	295	3.50	29.98	
472	303	3.60	33.57	
475	312	3.70	37.27	
478	336	3.99	41.26	
481	352	4.18	45.44	

Grade	Reading Score	N.	%	c%
6	484	337	4.00	49.44
	487	354	4.20	53.64
	490	359	4.26	57.90
	493	343	4.07	61.97
	496	328	3.89	65.86
	499	371	4.40	70.26
	502	296	3.51	73.77
	505	300	3.56	77.33
	508	274	3.25	80.59
	512	260	3.09	83.67
	515	249	2.95	86.63
	519	212	2.52	89.14
	523	205	2.43	91.57
	526	150	1.78	93.35
	530	121	1.44	94.79
	534	103	1.22	96.01
	539	77	0.91	96.93
	543	63	0.75	97.67
	548	64	0.76	98.43
	553	44	0.52	98.96
	558	30	0.36	99.31
	564	14	0.17	99.48
	571	10	0.12	99.60
	577	15	0.18	99.77
	585	5	0.06	99.83
	594	6	0.07	99.91
604	3	0.04	99.94	
616	2	0.02	99.96	
631	2	0.02	99.99	
650	1	0.01	100.00	
	Total	8427	100.00	

Grade	Reading Score	N.	%	c%
7	375	2	0.02	0.02
	384	2	0.02	0.05
	389	5	0.06	0.10
	393	10	0.11	0.21
	397	14	0.16	0.37
	400	12	0.14	0.51
	404	13	0.15	0.66
	407	14	0.16	0.81
	411	16	0.18	1.00
	414	23	0.26	1.26
	417	38	0.43	1.69

Grade	Reading Score	N.	%	c%
7	420	36	0.41	2.09
	423	23	0.26	2.35
	426	34	0.38	2.74
	429	40	0.45	3.19
	431	54	0.61	3.80
	434	47	0.53	4.33
	437	48	0.54	4.88
	439	64	0.72	5.60
	442	58	0.66	6.26
	445	75	0.85	7.10
	447	81	0.92	8.02
	450	97	1.10	9.12
	452	92	1.04	10.16
	455	104	1.18	11.33
	457	114	1.29	12.62
	459	114	1.29	13.91
	462	124	1.40	15.32
	464	130	1.47	16.79
	467	123	1.39	18.18
	469	166	1.88	20.06
	471	168	1.90	21.96
	474	197	2.23	24.19
	476	188	2.13	26.31
	479	190	2.15	28.46
	481	225	2.55	31.01
	484	224	2.53	33.54
	486	236	2.67	36.21
	488	242	2.74	38.95
	491	225	2.55	41.49
	493	264	2.99	44.48
	496	269	3.04	47.52
	499	266	3.01	50.53
501	257	2.91	53.44	
504	271	3.07	56.50	
507	238	2.69	59.20	
509	254	2.87	62.07	
512	272	3.08	65.15	
515	275	3.11	68.26	
518	290	3.28	71.54	
521	288	3.26	74.80	
524	252	2.85	77.65	
527	267	3.02	80.67	
530	241	2.73	83.39	
534	205	2.32	85.71	

Grade	Reading Score	N.	%	c%
7	537	210	2.38	88.09
	541	180	2.04	90.12
	545	173	1.96	92.08
	549	149	1.69	93.77
	553	129	1.46	95.23
	557	101	1.14	96.37
	562	90	1.02	97.39
	566	64	0.72	98.11
	572	53	0.60	98.71
	577	36	0.41	99.12
	583	19	0.21	99.33
	589	25	0.28	99.62
	597	12	0.14	99.75
	605	12	0.14	99.89
	614	5	0.06	99.94
	625	2	0.02	99.97
	638	1	0.01	99.98
	656	2	0.02	100.00
	Total	8840	100.00	

Grade	Reading Score	N.	%	c%
8	313	1	0.01	0.01
	343	1	0.01	0.02
	370	1	0.01	0.03
	382	1	0.01	0.04
	388	2	0.02	0.06
	393	4	0.04	0.11
	398	5	0.05	0.16
	402	5	0.05	0.21
	406	6	0.06	0.28
	411	9	0.10	0.37
	414	7	0.07	0.45
	418	7	0.07	0.52
	422	9	0.10	0.62
	425	16	0.17	0.79
	429	12	0.13	0.92
	432	14	0.15	1.07
	435	16	0.17	1.24
	438	31	0.33	1.57
	442	14	0.15	1.71
	445	20	0.21	1.93
	448	34	0.36	2.29
450	42	0.45	2.74	
453	52	0.55	3.29	

Grade	Reading Score	N.	%	c%
8	456	43	0.46	3.75
	459	56	0.60	4.35
	462	44	0.47	4.81
	465	53	0.56	5.38
	467	57	0.61	5.99
	470	67	0.71	6.70
	473	68	0.72	7.42
	476	95	1.01	8.44
	478	91	0.97	9.40
	481	97	1.03	10.44
	484	123	1.31	11.75
	487	141	1.50	13.25
	489	148	1.58	14.83
	492	162	1.73	16.55
	495	186	1.98	18.53
	498	209	2.23	20.76
	500	229	2.44	23.20
	503	244	2.60	25.80
	506	257	2.74	28.53
	509	306	3.26	31.79
	512	271	2.89	34.68
	515	306	3.26	37.94
	518	338	3.60	41.54
	521	315	3.35	44.89
	524	374	3.98	48.88
	527	346	3.69	52.56
	530	379	4.04	56.60
	533	405	4.31	60.91
	536	400	4.26	65.17
	539	378	4.03	69.20
	543	334	3.56	72.76
	546	316	3.37	76.12
550	315	3.35	79.48	
553	293	3.12	82.60	
557	248	2.64	85.24	
560	240	2.56	87.79	
564	216	2.30	90.09	
568	154	1.64	91.74	
572	167	1.78	93.51	
576	146	1.56	95.07	
581	99	1.05	96.12	
585	81	0.86	96.99	
590	79	0.84	97.83	
595	52	0.55	98.38	

Grade	Reading Score	N.	%	c%
8	600	33	0.35	98.73
	606	28	0.30	99.03
	612	25	0.27	99.30
	619	21	0.22	99.52
	626	15	0.16	99.68
	634	15	0.16	99.84
	643	9	0.10	99.94
	654	3	0.03	99.97
	667	2	0.02	99.99
	686	1	0.01	100.00
		Total	9389	100.00

Grade	Reading Score	N.	%	c%
9	364	2	0.02	0.02
	371	1	0.01	0.03
	377	2	0.02	0.05
	382	4	0.04	0.09
	387	6	0.06	0.15
	391	3	0.03	0.18
	396	13	0.13	0.31
	400	10	0.10	0.41
	404	14	0.14	0.54
	407	13	0.13	0.67
	411	18	0.18	0.85
	414	20	0.20	1.05
	417	24	0.24	1.29
	421	19	0.19	1.48
	424	28	0.28	1.75
	427	31	0.31	2.06
	429	32	0.32	2.38
	432	28	0.28	2.65
	435	39	0.39	3.04
	438	37	0.37	3.41
	440	33	0.33	3.73
	443	46	0.46	4.19
	446	52	0.52	4.70
	448	50	0.50	5.20
	451	38	0.38	5.58
	453	50	0.50	6.07
455	70	0.69	6.76	
458	61	0.60	7.37	
460	38	0.38	7.74	
463	69	0.68	8.43	
465	74	0.73	9.16	

Grade	Reading Score	N.	%	c%
9	467	73	0.72	9.88
	470	90	0.89	10.78
	472	96	0.95	11.73
	474	103	1.02	12.75
	477	101	1.00	13.75
	479	98	0.97	14.72
	481	139	1.38	16.09
	484	116	1.15	17.24
	486	149	1.48	18.72
	488	143	1.42	20.13
	491	137	1.36	21.49
	493	168	1.66	23.16
	496	201	1.99	25.15
	498	197	1.95	27.10
	500	212	2.10	29.20
	503	235	2.33	31.52
	505	204	2.02	33.54
	508	227	2.25	35.79
	510	237	2.35	38.14
	513	257	2.55	40.69
	516	290	2.87	43.56
	518	292	2.89	46.45
	521	335	3.32	49.77
	524	297	2.94	52.71
	526	324	3.21	55.92
	529	298	2.95	58.87
	532	277	2.74	61.61
	535	385	3.81	65.43
	538	319	3.16	68.58
	541	288	2.85	71.44
	545	318	3.15	74.59
	548	312	3.09	77.68
	551	278	2.75	80.43
	555	253	2.51	82.94
	559	285	2.82	85.76
	563	232	2.30	88.06
	567	197	1.95	90.01
	571	179	1.77	91.78
	576	157	1.55	93.33
	581	146	1.45	94.78
587	116	1.15	95.93	
593	106	1.05	96.98	
599	84	0.83	97.81	
607	84	0.83	98.64	

Grade	Reading Score	N.	%	c%
9	615	49	0.49	99.13
	626	48	0.48	99.60
	639	20	0.20	99.80
	656	12	0.12	99.92
	686	6	0.06	99.98
	714	2	0.02	100.00
	Total		10097	100.00

Grade	Reading Score	N.	%	c%
10	358	1	0.01	0.01
	367	1	0.01	0.03
	380	1	0.01	0.04
	386	2	0.03	0.06
	392	1	0.01	0.08
	396	4	0.05	0.13
	401	5	0.06	0.19
	405	7	0.09	0.28
	409	12	0.15	0.43
	413	12	0.15	0.59
	417	16	0.20	0.79
	421	16	0.20	1.00
	424	14	0.18	1.18
	427	11	0.14	1.32
	431	27	0.34	1.66
	434	30	0.38	2.04
	437	32	0.41	2.45
	440	23	0.29	2.75
	443	35	0.45	3.19
	445	32	0.41	3.60
	448	33	0.42	4.02
	451	32	0.41	4.43
	454	48	0.61	5.05
	456	40	0.51	5.56
	459	48	0.61	6.17
	461	62	0.79	6.96
	464	54	0.69	7.65
	466	53	0.68	8.33
	469	72	0.92	9.25
	471	88	1.12	10.37
474	90	1.15	11.52	
476	92	1.18	12.70	
479	86	1.10	13.79	
481	103	1.32	15.11	
484	96	1.23	16.34	

Grade	Reading Score	N.	%	c%
10	486	109	1.39	17.73
	488	122	1.56	19.29
	491	141	1.80	21.09
	493	139	1.78	22.86
	496	175	2.24	25.10
	498	171	2.18	27.28
	500	150	1.92	29.20
	503	204	2.61	31.80
	505	217	2.77	34.58
	508	209	2.67	37.25
	510	191	2.44	39.69
	513	207	2.64	42.33
	515	234	2.99	45.32
	518	229	2.93	48.24
	520	224	2.86	51.10
	523	261	3.33	54.44
	526	244	3.12	57.56
	528	232	2.96	60.52
	531	250	3.19	63.71
	534	269	3.44	67.15
	536	222	2.84	69.98
	539	250	3.19	73.18
	542	230	2.94	76.11
	545	185	2.36	78.48
	548	186	2.38	80.85
	551	189	2.41	83.27
	555	187	2.39	85.66
	558	170	2.17	87.83
	561	158	2.02	89.85
	565	122	1.56	91.40
	569	116	1.48	92.89
	572	116	1.48	94.37
	576	84	1.07	95.44
	581	75	0.96	96.40
	585	77	0.98	97.38
	590	46	0.59	97.97
	595	42	0.54	98.51
	601	37	0.47	98.98
	607	22	0.28	99.26
	613	21	0.27	99.53
621	15	0.19	99.72	
629	10	0.13	99.85	
639	8	0.10	99.95	
652	3	0.04	99.99	

---

Grade	Reading Score	N.	%	c%
10	699	1	0.01	100.00
	Total	7829	100.00	

---

**Appendix F2. Frequency Distributions of Mathematics Scale Scores**

Grade	Math Score	N.	%	c%
2	239	1.00	0.01	0.01
	250	4.00	0.05	0.06
	259	2.00	0.02	0.08
	266	3.00	0.04	0.12
	273	5.00	0.06	0.18
	279	13.00	0.15	0.33
	285	11.00	0.13	0.46
	290	22.00	0.26	0.72
	295	29.00	0.34	1.06
	300	32.00	0.38	1.44
	304	23.00	0.27	1.71
	308	36.00	0.42	2.13
	312	35.00	0.41	2.54
	316	41.00	0.48	3.02
	319	50.00	0.59	3.61
	323	59.00	0.69	4.31
	326	59.00	0.69	5.00
	329	55.00	0.65	5.65
	332	48.00	0.56	6.21
	335	51.00	0.60	6.81
	338	85.00	1.00	7.81
	341	86.00	1.01	8.82
	344	80.00	0.94	9.77
	346	103.00	1.21	10.98
	349	98.00	1.15	12.13
	352	114.00	1.34	13.47
	355	106.00	1.25	14.72
	357	133.00	1.56	16.28
	360	132.00	1.55	17.84
	363	129.00	1.52	19.36
	365	132.00	1.55	20.91
	368	161.00	1.89	22.80
	371	146.00	1.72	24.52
	373	174.00	2.05	26.57
	376	189.00	2.22	28.79
	379	192.00	2.26	31.05
	382	196.00	2.31	33.36
	385	216.00	2.54	35.90
	388	221.00	2.60	38.50
	391	264.00	3.11	41.60
394	266.00	3.13	44.73	
397	241.00	2.84	47.57	
401	302.00	3.55	51.12	

405	295.00	3.47	54.59
408	313.00	3.68	58.28
412	335.00	3.94	62.22
417	336.00	3.95	66.17
422	324.00	3.81	69.98
427	346.00	4.07	74.06
432	392.00	4.61	78.67
439	373.00	4.39	83.06
446	339.00	3.99	87.05
454	329.00	3.87	90.92
464	283.00	3.33	94.25
477	216.00	2.54	96.79
494	154.00	1.81	98.60
523	91.00	1.07	99.67
552	28.00	0.33	100.00
Total	8499.00	100.00	

Grade	Math Score	N.	%	c%
3	295	2.00	0.02	0.02
	302	1.00	0.01	0.03
	308	3.00	0.03	0.07
	314	7.00	0.08	0.15
	319	7.00	0.08	0.23
	324	14.00	0.16	0.39
	329	10.00	0.12	0.51
	334	25.00	0.29	0.80
	338	17.00	0.20	0.99
	342	32.00	0.37	1.36
	346	27.00	0.31	1.67
	350	36.00	0.42	2.09
	353	37.00	0.43	2.51
	357	52.00	0.60	3.11
	360	54.00	0.62	3.74
	363	49.00	0.57	4.30
	366	55.00	0.63	4.94
	369	66.00	0.76	5.70
	372	71.00	0.82	6.52
	375	70.00	0.81	7.32
	378	88.00	1.02	8.34
	381	72.00	0.83	9.17
	384	87.00	1.00	10.17
	386	82.00	0.95	11.12
	389	86.00	0.99	12.11
	391	103.00	1.19	13.30
	394	124.00	1.43	14.73

Grade	Math Score	N.	%	c%
3	397	118.00	1.36	16.09
	399	117.00	1.35	17.44
	402	130.00	1.50	18.94
	404	114.00	1.32	20.26
	406	134.00	1.55	21.80
	409	121.00	1.40	23.20
	411	151.00	1.74	24.94
	414	154.00	1.78	26.72
	416	174.00	2.01	28.72
	419	136.00	1.57	30.29
	421	177.00	2.04	32.33
	424	223.00	2.57	34.91
	426	167.00	1.93	36.83
	429	207.00	2.39	39.22
	431	193.00	2.23	41.45
	434	186.00	2.15	43.59
	436	195.00	2.25	45.84
	439	207.00	2.39	48.23
	442	227.00	2.62	50.85
	444	201.00	2.32	53.17
	447	226.00	2.61	55.77
	450	245.00	2.83	58.60
	453	249.00	2.87	61.47
	456	232.00	2.68	64.15
	460	250.00	2.88	67.03
	463	236.00	2.72	69.75
	467	264.00	3.05	72.80
	471	269.00	3.10	75.90
	475	218.00	2.51	78.42
	479	246.00	2.84	81.26
	484	241.00	2.78	84.04
	489	222.00	2.56	86.60
	495	217.00	2.50	89.10
	502	217.00	2.50	91.60
510	201.00	2.32	93.92	
519	174.00	2.01	95.93	
531	151.00	1.74	97.67	
548	104.00	1.20	98.87	
577	62.00	0.72	99.58	
605	36.00	0.42	100.00	
	Total	8669.00	100.00	

Grade	Math Score	N.	%	c%
4	335	1.00	0.01	0.01
	345	4.00	0.05	0.06
	349	7.00	0.08	0.14
	353	5.00	0.06	0.20
	357	7.00	0.08	0.28
	361	12.00	0.14	0.42
	365	17.00	0.20	0.61
	368	10.00	0.12	0.73
	372	28.00	0.32	1.06
	375	27.00	0.31	1.37
	378	27.00	0.31	1.68
	382	33.00	0.38	2.06
	385	23.00	0.27	2.33
	388	43.00	0.50	2.83
	391	57.00	0.66	3.49
	393	63.00	0.73	4.22
	396	57.00	0.66	4.88
	399	73.00	0.85	5.73
	402	61.00	0.71	6.44
	404	80.00	0.93	7.36
	407	68.00	0.79	8.15
	410	93.00	1.08	9.23
	412	112.00	1.30	10.53
	415	99.00	1.15	11.68
	417	114.00	1.32	13.00
	420	132.00	1.53	14.53
	423	139.00	1.61	16.14
	425	155.00	1.80	17.94
	428	173.00	2.01	19.95
	429	1.00	0.01	19.96
	430	167.00	1.94	21.89
	433	159.00	1.84	23.74
	435	191.00	2.22	25.95
438	194.00	2.25	28.20	
440	206.00	2.39	30.59	
443	232.00	2.69	33.28	
446	229.00	2.66	35.94	
448	219.00	2.54	38.48	
451	240.00	2.78	41.26	
454	268.00	3.11	44.37	
456	249.00	2.89	47.26	
459	270.00	3.13	50.39	
462	240.00	2.78	53.17	
465	249.00	2.89	56.06	

Grade	Math Score	N.	%	c%
4	467	272.00	3.15	59.21
	470	254.00	2.95	62.16
	473	246.00	2.85	65.01
	476	253.00	2.93	67.95
	480	275.00	3.19	71.14
	483	245.00	2.84	73.98
	486	267.00	3.10	77.07
	490	248.00	2.88	79.95
	493	240.00	2.78	82.73
	497	208.00	2.41	85.14
	501	189.00	2.19	87.34
	505	179.00	2.08	89.41
	509	151.00	1.75	91.16
	514	148.00	1.72	92.88
	519	119.00	1.38	94.26
	525	133.00	1.54	95.80
	531	93.00	1.08	96.88
	538	79.00	0.92	97.80
	547	78.00	0.90	98.70
	558	56.00	0.65	99.35
574	28.00	0.32	99.68	
602	24.00	0.28	99.95	
629	4.00	0.05	100.00	
	Total	8623.00	100.00	

Grade	Math Score	N.	%	c%
5	372	3.00	0.03	0.03
	377	7.00	0.08	0.11
	382	6.00	0.07	0.18
	387	8.00	0.09	0.27
	391	14.00	0.16	0.43
	395	36.00	0.41	0.84
	399	48.00	0.55	1.39
	403	35.00	0.40	1.79
	406	34.00	0.39	2.18
	410	43.00	0.49	2.67
	413	50.00	0.57	3.24
	416	80.00	0.91	4.15
	419	79.00	0.90	5.06
	422	89.00	1.02	6.07
	425	94.00	1.07	7.14
	427	87.00	0.99	8.14
	430	100.00	1.14	9.28
	433	120.00	1.37	10.65

Grade	Math Score	N.	%	c%
5	435	125.00	1.43	12.07
	438	143.00	1.63	13.71
	440	150.00	1.71	15.42
	443	163.00	1.86	17.28
	445	173.00	1.97	19.25
	448	163.00	1.86	21.11
	450	168.00	1.92	23.03
	452	170.00	1.94	24.97
	454	176.00	2.01	26.98
	457	186.00	2.12	29.10
	459	169.00	1.93	31.03
	461	210.00	2.40	33.42
	463	179.00	2.04	35.47
	465	170.00	1.94	37.41
	467	193.00	2.20	39.61
	470	192.00	2.19	41.80
	472	221.00	2.52	44.32
	474	221.00	2.52	46.84
	476	204.00	2.33	49.17
	478	211.00	2.41	51.58
	480	234.00	2.67	54.25
	482	192.00	2.19	56.44
	485	223.00	2.54	58.99
	487	228.00	2.60	61.59
	489	216.00	2.46	64.05
	492	200.00	2.28	66.34
	494	212.00	2.42	68.75
	496	207.00	2.36	71.12
	499	191.00	2.18	73.30
	501	216.00	2.46	75.76
	504	184.00	2.10	77.86
	507	189.00	2.16	80.02
510	188.00	2.15	82.16	
512	181.00	2.07	84.23	
516	170.00	1.94	86.17	
519	166.00	1.89	88.06	
522	141.00	1.61	89.67	
526	164.00	1.87	91.54	
530	122.00	1.39	92.94	
534	115.00	1.31	94.25	
539	108.00	1.23	95.48	
544	107.00	1.22	96.70	
549	68.00	0.78	97.48	
556	75.00	0.86	98.33	

Grade	Math Score	N.	%	c%
5	564	56.00	0.64	98.97
	573	45.00	0.51	99.49
	585	20.00	0.23	99.71
	601	18.00	0.21	99.92
	630	4.00	0.05	99.97
	657	3.00	0.03	100.00
	Total	8763.00	100.00	

Grade	Math Score	N.	%	c%
6	374	1.00	0.01	0.01
	381	3.00	0.03	0.04
	387	3.00	0.03	0.08
	393	12.00	0.13	0.21
	399	10.00	0.11	0.31
	404	21.00	0.23	0.54
	408	45.00	0.49	1.03
	412	54.00	0.58	1.61
	416	62.00	0.67	2.28
	420	68.00	0.74	3.02
	424	84.00	0.91	3.93
	427	89.00	0.96	4.89
	430	103.00	1.11	6.00
	433	122.00	1.32	7.32
	436	103.00	1.11	8.43
	439	146.00	1.58	10.01
	442	137.00	1.48	11.49
	445	154.00	1.67	13.16
	448	158.00	1.71	14.87
	450	157.00	1.70	16.57
	453	165.00	1.78	18.35
	455	171.00	1.85	20.20
	458	209.00	2.26	22.46
	460	201.00	2.17	24.63
	462	166.00	1.79	26.43
	465	181.00	1.96	28.38
	467	197.00	2.13	30.51
	469	212.00	2.29	32.81
	471	215.00	2.32	35.13
	474	232.00	2.51	37.64
	476	197.00	2.13	39.77
478	191.00	2.07	41.84	
480	250.00	2.70	44.54	
482	186.00	2.01	46.55	
485	217.00	2.35	48.90	

Grade	Math Score	N.	%	c%
6	487	203.00	2.20	51.09
	489	223.00	2.41	53.50
	491	188.00	2.03	55.54
	493	224.00	2.42	57.96
	495	182.00	1.97	59.93
	498	211.00	2.28	62.21
	500	219.00	2.37	64.58
	502	221.00	2.39	66.97
	504	182.00	1.97	68.93
	507	191.00	2.07	71.00
	509	197.00	2.13	73.13
	512	192.00	2.08	75.21
	514	189.00	2.04	77.25
	517	190.00	2.05	79.30
	519	177.00	1.91	81.22
	522	156.00	1.69	82.90
	525	158.00	1.71	84.61
	528	168.00	1.82	86.43
	531	167.00	1.81	88.24
	534	135.00	1.46	89.70
	537	129.00	1.39	91.09
	541	126.00	1.36	92.45
	544	118.00	1.28	93.73
	548	89.00	0.96	94.69
	553	83.00	0.90	95.59
	557	78.00	0.84	96.43
	562	57.00	0.62	97.05
	568	59.00	0.64	97.69
	575	47.00	0.51	98.19
	582	48.00	0.52	98.71
	591	50.00	0.54	99.25
	603	34.00	0.37	99.62
	619	17.00	0.18	99.81
647	15.00	0.16	99.97	
675	3.00	0.03	100.00	
	Total	9248.00	100.00	

Grade	Math Score	N.	%	c%
7	362	1.00	0.01	0.01
	372	4.00	0.04	0.05
	380	4.00	0.04	0.09
	387	16.00	0.17	0.26
	393	20.00	0.21	0.47
	399	36.00	0.38	0.85

Grade	Math Score	N.	%	c%
7	404	47.00	0.49	1.34
	409	67.00	0.70	2.04
	413	72.00	0.75	2.80
	418	92.00	0.96	3.76
	422	93.00	0.97	4.73
	425	90.00	0.94	5.68
	429	117.00	1.23	6.90
	432	118.00	1.24	8.14
	436	159.00	1.67	9.80
	439	143.00	1.50	11.30
	442	178.00	1.86	13.17
	445	190.00	1.99	15.16
	448	182.00	1.91	17.06
	451	190.00	1.99	19.05
	454	213.00	2.23	21.28
	457	195.00	2.04	23.32
	460	229.00	2.40	25.72
	462	211.00	2.21	27.93
	465	239.00	2.50	30.44
	468	227.00	2.38	32.81
	470	219.00	2.29	35.11
	473	214.00	2.24	37.35
	475	220.00	2.30	39.65
	478	224.00	2.35	42.00
	480	224.00	2.35	44.34
	483	232.00	2.43	46.77
	485	235.00	2.46	49.24
	488	213.00	2.23	51.47
	490	203.00	2.13	53.59
	492	195.00	2.04	55.63
	495	204.00	2.14	57.77
	497	230.00	2.41	60.18
	499	184.00	1.93	62.11
	502	188.00	1.97	64.08
	504	188.00	1.97	66.05
	506	194.00	2.03	68.08
	509	167.00	1.75	69.83
	511	167.00	1.75	71.58
	514	165.00	1.73	73.30
	516	166.00	1.74	75.04
	519	162.00	1.70	76.74
	521	140.00	1.47	78.20
	524	134.00	1.40	79.61
	526	152.00	1.59	81.20

Grade	Math Score	N.	%	c%
7	529	137.00	1.43	82.64
	532	121.00	1.27	83.90
	535	113.00	1.18	85.09
	538	125.00	1.31	86.40
	541	120.00	1.26	87.65
	544	112.00	1.17	88.82
	547	140.00	1.47	90.29
	551	121.00	1.27	91.56
	555	108.00	1.13	92.69
	559	80.00	0.84	93.53
	563	83.00	0.87	94.40
	568	104.00	1.09	95.49
	573	86.00	0.90	96.39
	578	84.00	0.88	97.27
	585	58.00	0.61	97.87
	593	53.00	0.56	98.43
	602	58.00	0.61	99.04
	614	41.00	0.43	99.47
	630	29.00	0.30	99.77
	658	18.00	0.19	99.96
686	4.00	0.04	100.00	
	Total	9548.00	100.00	

Grade	Math Score	N.	%	c%
8	361	1.00	0.01	0.01
	383	2.00	0.02	0.03
	392	6.00	0.06	0.09
	399	11.00	0.11	0.20
	405	19.00	0.19	0.39
	411	37.00	0.37	0.76
	416	47.00	0.47	1.23
	421	74.00	0.74	1.97
	425	93.00	0.93	2.89
	429	88.00	0.88	3.77
	433	117.00	1.17	4.94
	437	126.00	1.26	6.20
	440	122.00	1.22	7.42
	444	158.00	1.58	8.99
	447	155.00	1.55	10.54
	450	141.00	1.41	11.95
	453	153.00	1.53	13.47
	455	159.00	1.59	15.06
	458	180.00	1.80	16.86
	461	173.00	1.73	18.58

Grade	Math Score	N.	%	c%
8	463	158.00	1.58	20.16
	466	197.00	1.97	22.13
	468	178.00	1.78	23.90
	471	198.00	1.98	25.88
	473	205.00	2.05	27.93
	476	181.00	1.81	29.73
	478	197.00	1.97	31.70
	480	213.00	2.13	33.83
	482	209.00	2.09	35.91
	485	192.00	1.92	37.83
	487	190.00	1.90	39.72
	489	204.00	2.04	41.76
	491	204.00	2.04	43.80
	493	191.00	1.91	45.70
	496	206.00	2.06	47.76
	498	188.00	1.88	49.64
	500	214.00	2.14	51.77
	502	216.00	2.16	53.93
	504	188.00	1.88	55.80
	506	189.00	1.89	57.69
	509	206.00	2.06	59.75
	511	217.00	2.17	61.91
	513	201.00	2.01	63.92
	515	189.00	1.89	65.80
	518	187.00	1.87	67.67
	520	182.00	1.82	69.49
	523	187.00	1.87	71.35
	525	183.00	1.83	73.18
	527	164.00	1.64	74.82
	530	156.00	1.56	76.37
	532	156.00	1.56	77.93
	535	155.00	1.55	79.48
	538	185.00	1.85	81.33
	541	136.00	1.36	82.68
	543	148.00	1.48	84.16
	546	162.00	1.62	85.78
	549	141.00	1.41	87.18
	553	125.00	1.25	88.43
	556	115.00	1.15	89.58
	560	130.00	1.30	90.88
	563	105.00	1.05	91.93
	567	87.00	0.87	92.79
	572	100.00	1.00	93.79
	577	104.00	1.04	94.83

Grade	Math Score	N.	%	c%
8	582	103.00	1.03	95.86
	588	73.00	0.73	96.59
	595	78.00	0.78	97.37
	603	71.00	0.71	98.07
	613	63.00	0.63	98.70
	625	47.00	0.47	99.17
	642	43.00	0.43	99.60
	671	25.00	0.25	99.85
	699	15.00	0.15	100.00
	Total		10019.00	100.00

Grade	Math Score	N.	%	c%
9	396	4.00	0.04	0.04
	405	3.00	0.03	0.07
	412	5.00	0.05	0.11
	419	15.00	0.14	0.26
	425	25.00	0.24	0.49
	430	51.00	0.48	0.98
	435	64.00	0.61	1.59
	440	86.00	0.82	2.40
	444	107.00	1.02	3.42
	448	125.00	1.19	4.61
	452	130.00	1.24	5.85
	456	142.00	1.35	7.20
	459	128.00	1.22	8.41
	462	166.00	1.58	9.99
	466	131.00	1.25	11.24
	469	173.00	1.64	12.88
	472	174.00	1.65	14.53
	475	176.00	1.67	16.21
	477	183.00	1.74	17.95
	480	160.00	1.52	19.47
	483	216.00	2.05	21.52
	485	200.00	1.90	23.42
	488	215.00	2.04	25.47
	490	216.00	2.05	27.52
	493	217.00	2.06	29.58
	495	265.00	2.52	32.10
	498	239.00	2.27	34.37
	500	269.00	2.56	36.93
	502	230.00	2.19	39.12
	505	274.00	2.60	41.72
507	265.00	2.52	44.24	
509	271.00	2.58	46.82	

Grade	Math Score	N.	%	c%
9	512	216.00	2.05	48.87
	514	266.00	2.53	51.40
	516	246.00	2.34	53.74
	519	235.00	2.23	55.97
	521	252.00	2.40	58.37
	523	256.00	2.43	60.80
	526	255.00	2.42	63.22
	528	210.00	2.00	65.22
	531	213.00	2.02	67.24
	533	230.00	2.19	69.43
	535	196.00	1.86	71.29
	538	206.00	1.96	73.25
	540	158.00	1.50	74.75
	543	162.00	1.54	76.29
	545	185.00	1.76	78.05
	548	146.00	1.39	79.44
	551	137.00	1.30	80.74
	553	154.00	1.46	82.21
	556	146.00	1.39	83.59
	559	154.00	1.46	85.06
	562	135.00	1.28	86.34
	564	118.00	1.12	87.46
	567	128.00	1.22	88.68
	570	105.00	1.00	89.68
	573	124.00	1.18	90.86
	577	106.00	1.01	91.86
	580	113.00	1.07	92.94
	583	105.00	1.00	93.94
	587	107.00	1.02	94.95
	591	99.00	0.94	95.89
	595	82.00	0.78	96.67
	599	75.00	0.71	97.39
	604	69.00	0.66	98.04
	609	55.00	0.52	98.56
	615	47.00	0.45	99.01
	621	27.00	0.26	99.27
	629	26.00	0.25	99.52
	638	19.00	0.18	99.70
	649	14.00	0.13	99.83
	665	14.00	0.13	99.96
692	1.00	0.01	99.97	
719	3.00	0.03	100.00	
	Total	10520.00	100.00	

Grade	Math Score	N.	%	c%
10	410	1.00	0.01	0.01
	433	2.00	0.02	0.04
	441	3.00	0.04	0.07
	448	6.00	0.07	0.15
	454	18.00	0.22	0.37
	460	36.00	0.45	0.82
	465	45.00	0.56	1.38
	470	66.00	0.82	2.20
	474	97.00	1.21	3.41
	478	119.00	1.48	4.89
	482	135.00	1.68	6.57
	486	150.00	1.87	8.44
	489	197.00	2.45	10.89
	493	169.00	2.10	12.99
	496	191.00	2.38	15.37
	499	205.00	2.55	17.92
	502	208.00	2.59	20.51
	505	219.00	2.73	23.24
	507	238.00	2.96	26.20
	510	257.00	3.20	29.40
	513	231.00	2.87	32.27
	515	220.00	2.74	35.01
	518	233.00	2.90	37.91
	520	234.00	2.91	40.82
	523	229.00	2.85	43.67
	525	219.00	2.73	46.40
	528	213.00	2.65	49.05
	530	217.00	2.70	51.75
	532	187.00	2.33	54.08
	535	173.00	2.15	56.23
	537	191.00	2.38	58.61
	539	190.00	2.36	60.97
	541	178.00	2.22	63.19
	544	152.00	1.89	65.08
	546	168.00	2.09	67.17
	548	145.00	1.80	68.97
	551	148.00	1.84	70.82
	553	147.00	1.83	72.64
	555	121.00	1.51	74.15
	557	120.00	1.49	75.64
	560	108.00	1.34	76.99
	562	138.00	1.72	78.71
	565	145.00	1.80	80.51
	567	109.00	1.36	81.87

Grade	Math Score	N.	%	c%
10	569	98.00	1.22	83.09
	572	99.00	1.23	84.32
	574	86.00	1.07	85.39
	577	73.00	0.91	86.30
	579	114.00	1.42	87.72
	582	91.00	1.13	88.85
	585	75.00	0.93	89.78
	588	86.00	1.07	90.85
	591	76.00	0.95	91.80
	594	66.00	0.82	92.62
	597	63.00	0.78	93.40
	600	43.00	0.54	93.94
	603	47.00	0.58	94.52
	607	48.00	0.60	95.12
	610	43.00	0.54	95.66
	614	39.00	0.49	96.14
	618	36.00	0.45	96.59
	622	36.00	0.45	97.04
	627	52.00	0.65	97.69
	632	32.00	0.40	98.08
	638	26.00	0.32	98.41
	644	33.00	0.41	98.82
	651	25.00	0.31	99.13
	660	26.00	0.32	99.45
	670	14.00	0.17	99.63
	682	11.00	0.14	99.76
700	11.00	0.14	99.90	
728	4.00	0.05	99.95	
757	4.00	0.05	100.00	
	Total	8035.00	100.00	

**Appendix F3. Frequency Distributions of Science Scale Scores**

Grade	Science Score	N.	%	c%
4	248	1	0.01	0.01
	262	2	0.02	0.03
	265	3	0.03	0.07
	268	5	0.06	0.13
	271	5	0.06	0.19
	273	7	0.08	0.27
	276	11	0.13	0.39
	278	9	0.10	0.50
	280	10	0.12	0.61
	282	21	0.24	0.86
	284	19	0.22	1.08
	285	21	0.24	1.32
	287	23	0.27	1.59
	288	31	0.36	1.95
	290	41	0.47	2.42
	291	37	0.43	2.85
	293	55	0.64	3.49
	294	67	0.78	4.26
	296	72	0.83	5.10
	297	89	1.03	6.13
	298	99	1.15	7.27
	299	106	1.23	8.50
	301	104	1.20	9.70
	302	138	1.60	11.30
	303	134	1.55	12.85
	304	144	1.67	14.52
	306	163	1.89	16.41
	307	145	1.68	18.09
	308	221	2.56	20.65
	309	180	2.08	22.73
	310	216	2.50	25.23
	311	227	2.63	27.86
	313	227	2.63	30.49
	314	231	2.68	33.17
	315	276	3.20	36.36
	316	262	3.03	39.40
	317	295	3.42	42.81
	318	283	3.28	46.09
	320	300	3.47	49.57
	321	289	3.35	52.91
	322	311	3.60	56.51
	323	297	3.44	59.95
	325	319	3.69	63.65
	326	289	3.35	66.99
	328	295	3.42	70.41
	329	293	3.39	73.80
	330	280	3.24	77.05
	332	288	3.34	80.38
	334	244	2.83	83.21
	335	239	2.77	85.98

Grade	Science Score	N.	%	c%
4	337	225	2.61	88.58
	339	224	2.59	91.18
	341	200	2.32	93.49
	343	140	1.62	95.11
	345	140	1.62	96.73
	348	110	1.27	98.01
	351	52	0.60	98.61
	354	59	0.68	99.29
	358	28	0.32	99.62
	362	22	0.25	99.87
	368	8	0.09	99.97
	375	1	0.01	99.98
	388	2	0.02	100.00
		Total	8635	100.00

Grade	Science Score	N.	%	c%
6	223	1	0.01	0.01
	247	3	0.03	0.04
	251	4	0.04	0.09
	254	5	0.06	0.14
	257	8	0.09	0.23
	259	8	0.09	0.32
	262	11	0.12	0.44
	264	9	0.10	0.54
	266	15	0.17	0.71
	268	16	0.18	0.88
	270	25	0.28	1.16
	272	26	0.29	1.45
	274	29	0.32	1.77
	276	36	0.40	2.17
	277	49	0.54	2.71
	279	37	0.41	3.12
	281	50	0.55	3.67
	282	47	0.52	4.19
	284	55	0.61	4.79
	285	85	0.94	5.73
	287	91	1.01	6.74
	288	88	0.97	7.71
	289	86	0.95	8.66
	291	126	1.39	10.05
	292	152	1.68	11.73
	293	156	1.72	13.46
	295	186	2.05	15.51
	296	180	1.99	17.50
	297	179	1.98	19.48
	299	188	2.08	21.55
	300	214	2.36	23.92
	301	238	2.63	26.55
	303	252	2.78	29.33
304	244	2.70	32.03	

Grade	Science Score	N.	%	c%
6	305	247	2.73	34.75
	307	295	3.26	38.01
	308	284	3.14	41.15
	310	308	3.40	44.55
	311	290	3.20	47.76
	312	331	3.66	51.41
	314	308	3.40	54.82
	315	313	3.46	58.27
	317	336	3.71	61.99
	318	324	3.58	65.57
	320	332	3.67	69.23
	322	294	3.25	72.48
	323	297	3.28	75.76
	325	309	3.41	79.18
	327	276	3.05	82.22
	329	261	2.88	85.11
	331	236	2.61	87.72
	333	231	2.55	90.27
	335	212	2.34	92.61
	338	178	1.97	94.58
	340	151	1.67	96.24
	343	116	1.28	97.53
	346	82	0.91	98.43
	350	50	0.55	98.98
	354	41	0.45	99.44
	359	23	0.25	99.69
	366	19	0.21	99.90
374	8	0.09	99.99	
389	1	0.01	100.00	
	Total	9052	100.00	

Grade	Science Score	N.	%	c%
8	146	1	0.01	0.01
	166	2	0.02	0.03
	187	1	0.01	0.04
	199	3	0.03	0.07
	208	2	0.02	0.09
	215	6	0.06	0.15
	222	11	0.11	0.26
	227	12	0.12	0.39
	232	24	0.24	0.63
	236	40	0.41	1.04
	240	52	0.53	1.57
	244	56	0.57	2.14
	247	71	0.72	2.86
	251	76	0.77	3.64
	254	88	0.90	4.53
	257	101	1.03	5.56
	259	114	1.16	6.73
	262	129	1.31	8.04

Grade	Science Score	N.	%	c%
8	265	135	1.38	9.42
	267	160	1.63	11.05
	270	148	1.51	12.55
	272	174	1.77	14.33
	274	181	1.84	16.17
	277	232	2.36	18.54
	279	220	2.24	20.78
	281	211	2.15	22.93
	283	238	2.43	25.35
	285	241	2.46	27.81
	287	263	2.68	30.49
	289	254	2.59	33.08
	291	236	2.40	35.48
	293	249	2.54	38.02
	295	267	2.72	40.74
	297	296	3.02	43.76
	299	237	2.42	46.17
	301	293	2.99	49.16
	303	262	2.67	51.83
	305	306	3.12	54.95
	307	314	3.20	58.15
	309	291	2.97	61.11
	311	269	2.74	63.85
	313	295	3.01	66.86
	315	262	2.67	69.53
	317	247	2.52	72.05
	319	260	2.65	74.70
	321	224	2.28	76.98
	323	240	2.45	79.43
	325	231	2.35	81.78
	328	186	1.90	83.67
	330	224	2.28	85.96
	332	160	1.63	87.59
	335	183	1.86	89.45
	337	158	1.61	91.06
	340	121	1.23	92.30
	342	112	1.14	93.44
	345	118	1.20	94.64
	348	99	1.01	95.65
	352	101	1.03	96.68
	355	74	0.75	97.43
	359	59	0.60	98.03
	363	55	0.56	98.59
	368	48	0.49	99.08
	373	37	0.38	99.46
379	25	0.25	99.71	
387	19	0.19	99.91	
396	7	0.07	99.98	
409	1	0.01	99.99	
451	1	0.01	100.00	
	Total	9813	100.00	

Grade	Science Score	N.	%	c%
11	190	3	0.04	0.04
	205	1	0.01	0.06
	221	4	0.06	0.12
	231	5	0.07	0.19
	237	2	0.03	0.22
	243	5	0.07	0.30
	248	16	0.24	0.53
	252	18	0.27	0.80
	255	36	0.53	1.34
	258	50	0.74	2.08
	261	56	0.83	2.91
	264	63	0.94	3.85
	267	55	0.82	4.67
	269	72	1.07	5.74
	271	95	1.41	7.15
	273	96	1.43	8.57
	275	92	1.37	9.94
	277	87	1.29	11.23
	279	118	1.75	12.99
	281	128	1.90	14.89
	283	114	1.69	16.58
	285	127	1.89	18.47
	286	165	2.45	20.92
	288	118	1.75	22.68
	290	131	1.95	24.62
	291	156	2.32	26.94
	293	167	2.48	29.42
	294	150	2.23	31.65
	296	155	2.30	33.96
	297	181	2.69	36.65
	298	1	0.01	36.66
	299	185	2.75	39.41
	300	178	2.65	42.06
302	192	2.85	44.91	
303	184	2.73	47.64	
305	166	2.47	50.11	
306	182	2.70	52.82	
308	190	2.82	55.64	
309	189	2.81	58.45	
311	184	2.73	61.18	
312	191	2.84	64.02	
314	184	2.73	66.76	
315	168	2.50	69.25	
317	159	2.36	71.62	
318	154	2.29	73.90	
320	161	2.39	76.30	
322	132	1.96	78.26	
323	144	2.14	80.40	
325	132	1.96	82.36	
327	112	1.66	84.02	
328	114	1.69	85.72	
330	112	1.66	87.38	

Grade	Science Score	N.	%	c%
11	332	101	1.50	88.88
	334	90	1.34	90.22
	336	97	1.44	91.66
	338	94	1.40	93.06
	340	77	1.14	94.20
	342	67	1.00	95.20
	344	71	1.06	96.26
	347	45	0.67	96.92
	349	48	0.71	97.64
	352	47	0.70	98.34
	355	31	0.46	98.80
	359	30	0.45	99.24
	363	19	0.28	99.52
	368	12	0.18	99.70
	375	13	0.19	99.90
	384	3	0.04	99.94
	399	4	0.06	100.00
	Total	6729	100.00	

**Appendix F4. Frequency Distributions of Social Studies Scale Scores**

Grade	Social Studies Score	N.	%	c%
4	229	1	0.01	0.01
	235	2	0.02	0.03
	239	2	0.02	0.06
	244	7	0.08	0.14
	247	8	0.09	0.23
	251	14	0.16	0.39
	254	5	0.06	0.45
	257	18	0.21	0.66
	260	19	0.22	0.88
	262	23	0.27	1.15
	265	40	0.46	1.61
	267	36	0.42	2.03
	270	41	0.48	2.50
	272	49	0.57	3.07
	274	71	0.82	3.89
	276	82	0.95	4.84
	278	82	0.95	5.79
	280	103	1.19	6.99
	282	116	1.34	8.33
	284	137	1.59	9.92
	286	162	1.88	11.80
	288	190	2.20	14.00
	289	169	1.96	15.96
	291	191	2.21	18.17
	293	251	2.91	21.08
	295	237	2.75	23.83
	296	245	2.84	26.67
	298	280	3.24	29.91
	300	290	3.36	33.27
	301	305	3.53	36.81
	303	301	3.49	40.29
	305	320	3.71	44.00
	306	364	4.22	48.22
	308	357	4.14	52.36
	310	333	3.86	56.22
	311	375	4.35	60.56
	313	310	3.59	64.16
	315	304	3.52	67.68
	317	346	4.01	71.69
	318	301	3.49	75.18
	320	280	3.24	78.42
	322	280	3.24	81.67
	324	250	2.90	84.56
	325	203	2.35	86.92
	327	193	2.24	89.15
	329	151	1.75	90.90
	331	144	1.67	92.57

Grade	Social Studies Score	N.	%	c%
4	333	124	1.44	94.01
	335	98	1.14	95.14
	337	100	1.16	96.30
	340	82	0.95	97.25
	342	74	0.86	98.11
	344	49	0.57	98.68
	347	33	0.38	99.06
	350	29	0.34	99.40
	353	15	0.17	99.57
	356	18	0.21	99.78
	359	7	0.08	99.86
	363	6	0.07	99.93
	368	4	0.05	99.98
	373	1	0.01	99.99
	379	1	0.01	100.00
		Total	8629	100.00

Grade	Social Studies Score	N.	%	c%
6	232	1	0.01	0.01
	245	1	0.01	0.02
	252	1	0.01	0.03
	258	3	0.03	0.07
	263	8	0.09	0.15
	267	23	0.25	0.41
	270	26	0.29	0.70
	273	46	0.51	1.21
	276	77	0.85	2.06
	278	84	0.93	2.99
	280	123	1.36	4.35
	283	148	1.64	5.99
	285	179	1.98	7.97
	287	202	2.23	10.20
	288	263	2.91	13.11
	290	264	2.92	16.03
	292	292	3.23	19.26
	293	332	3.67	22.93
	295	353	3.91	26.84
	297	367	4.06	30.90
	298	349	3.86	34.76
	300	377	4.17	38.93
	301	375	4.15	43.08
	302	332	3.67	46.75
	304	382	4.23	50.98
	305	338	3.74	54.72
307	358	3.96	58.68	
308	337	3.73	62.41	
309	306	3.39	65.79	
311	297	3.29	69.08	

Grade	Social Studies Score	N.	%	c%
6	312	282	3.12	72.2
	313	250	2.77	74.96
	314	262	2.90	77.86
	316	242	2.68	80.54
	317	223	2.47	83.01
	318	187	2.07	85.08
	319	153	1.69	86.77
	321	160	1.77	88.54
	322	124	1.37	89.91
	323	142	1.57	91.48
	324	113	1.25	92.73
	325	100	1.11	93.84
	327	99	1.10	94.93
	328	85	0.94	95.87
	329	70	0.77	96.65
	331	49	0.54	97.19
	332	45	0.50	97.69
	333	25	0.28	97.96
	335	39	0.43	98.40
	336	33	0.37	98.76
	338	20	0.22	98.98
	339	12	0.13	99.11
	341	21	0.23	99.35
	342	17	0.19	99.54
	344	12	0.13	99.67
	346	12	0.13	99.80
	348	4	0.04	99.85
	350	9	0.10	99.94
	352	2	0.02	99.97
	355	1	0.01	99.98
357	1	0.01	99.99	
368	1	0.01	100.00	
	Total	9039	100.00	

Grade	Social Studies Score	N.	%	c%
8	194	1	0.01	0.01
	210	3	0.03	0.04
	226	11	0.11	0.15
	236	16	0.16	0.32
	243	28	0.29	0.60
	249	39	0.40	1.00
	253	59	0.60	1.60
	258	96	0.98	2.59
	261	126	1.29	3.87
	265	154	1.57	5.45
	268	203	2.07	7.52
	271	210	2.15	9.67
	273	200	2.04	11.71

Grade	Social Studies Score	N.	%	c%
8	276	244	2.49	14.21
	278	253	2.59	16.79
	280	260	2.66	19.45
	283	262	2.68	22.13
	285	267	2.73	24.86
	287	312	3.19	28.05
	289	291	2.97	31.02
	291	295	3.02	34.04
	292	279	2.85	36.89
	294	287	2.93	39.82
	296	343	3.51	43.33
	298	285	2.91	46.24
	299	305	3.12	49.36
	301	288	2.94	52.30
	303	290	2.96	55.26
	304	283	2.89	58.16
	306	293	2.99	61.15
	308	276	2.82	63.97
	309	270	2.76	66.73
	311	286	2.92	69.65
	312	285	2.91	72.57
	314	227	2.32	74.89
	315	217	2.22	77.11
	317	236	2.41	79.52
	318	201	2.05	81.57
	320	179	1.83	83.40
	322	196	2.00	85.40
	323	165	1.69	87.09
	325	142	1.45	88.54
	326	139	1.42	89.96
	328	142	1.45	91.41
	330	118	1.21	92.62
	331	88	0.90	93.52
	333	104	1.06	94.58
	335	96	0.98	95.56
	336	57	0.58	96.15
	338	68	0.70	96.84
	340	75	0.77	97.61
	342	38	0.39	98.00
	344	41	0.42	98.42
	346	32	0.33	98.74
	348	28	0.29	99.03
	350	20	0.20	99.23
	352	27	0.28	99.51
	355	11	0.11	99.62
	357	9	0.09	99.71
	360	6	0.06	99.78
	363	5	0.05	99.83
	366	7	0.07	99.90

Grade	Social Studies Score	N.	%	c%
8	370	3	0.03	99.93
	374	5	0.05	99.98
	379	1	0.01	99.99
	385	1	0.01	100.00
	Total	9784	100.00	

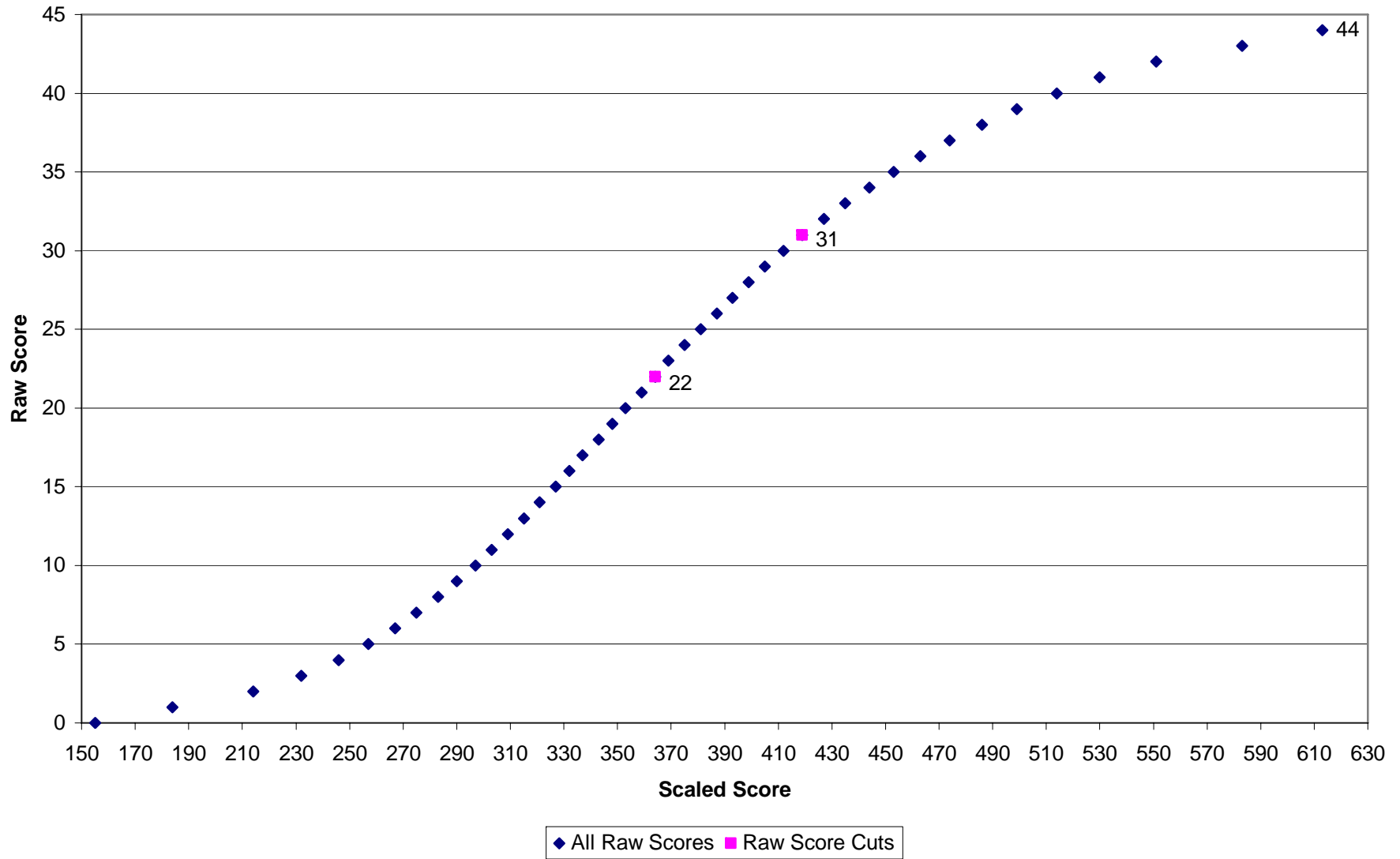
Grade	Social Studies Score	N.	%	c%
11	167	2	0.03	0.03
	185	4	0.06	0.09
	204	4	0.06	0.15
	215	6	0.09	0.24
	223	13	0.19	0.43
	230	20	0.30	0.73
	236	37	0.55	1.29
	241	44	0.66	1.94
	245	75	1.12	3.06
	249	107	1.60	4.66
	252	106	1.58	6.25
	256	111	1.66	7.91
	259	120	1.79	9.70
	262	107	1.60	11.30
	265	142	2.12	13.42
	268	145	2.17	15.59
	270	133	1.99	17.58
	273	148	2.21	19.79
	275	143	2.14	21.93
	278	159	2.38	24.30
	280	149	2.23	26.53
	282	155	2.32	28.85
	285	182	2.72	31.57
	287	176	2.63	34.20
	288	1	0.01	34.22
	289	199	2.97	37.19
	291	213	3.18	40.37
	293	207	3.09	43.47
	295	186	2.78	46.25
	298	192	2.87	49.12
	300	190	2.84	51.96
	302	203	3.03	54.99
304	200	2.99	57.98	
306	176	2.63	60.61	
308	204	3.05	63.66	
310	177	2.65	66.31	
312	189	2.83	69.13	
314	173	2.59	71.72	
316	179	2.68	74.39	
319	172	2.57	76.97	
321	173	2.59	79.55	

Grade	Social Studies Score	N.	%	c%
11	323	160	2.39	81.94
	325	144	2.15	84.10
	327	126	1.88	85.98
	330	118	1.76	87.74
	332	108	1.61	89.36
	334	90	1.35	90.70
	337	76	1.14	91.84
	339	75	1.12	92.96
	341	78	1.17	94.13
	344	70	1.05	95.17
	346	56	0.84	96.01
	349	52	0.78	96.79
	352	46	0.69	97.47
	354	31	0.46	97.94
	357	29	0.43	98.37
	360	23	0.34	98.71
	363	20	0.30	99.01
	366	14	0.21	99.22
	369	23	0.34	99.57
	373	11	0.16	99.73
	377	8	0.12	99.85
	381	4	0.06	99.91
	385	2	0.03	99.94
391	3	0.04	99.99	
397	1	0.01	100.00	
	Total	6690	100.00	

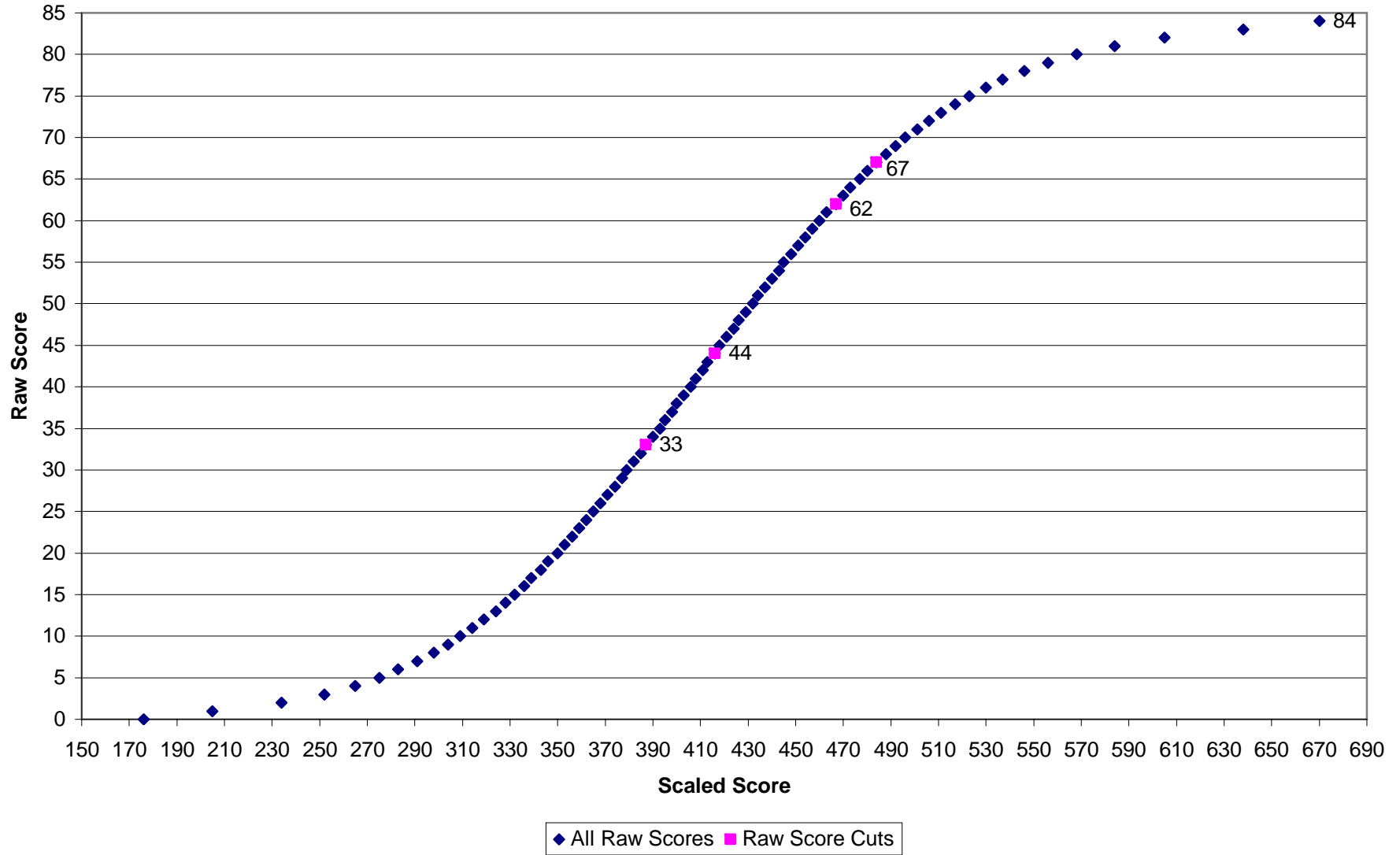
## **Appendix G**

### **Comparisons of Step-Values for Anchor Items by Grade and Test**

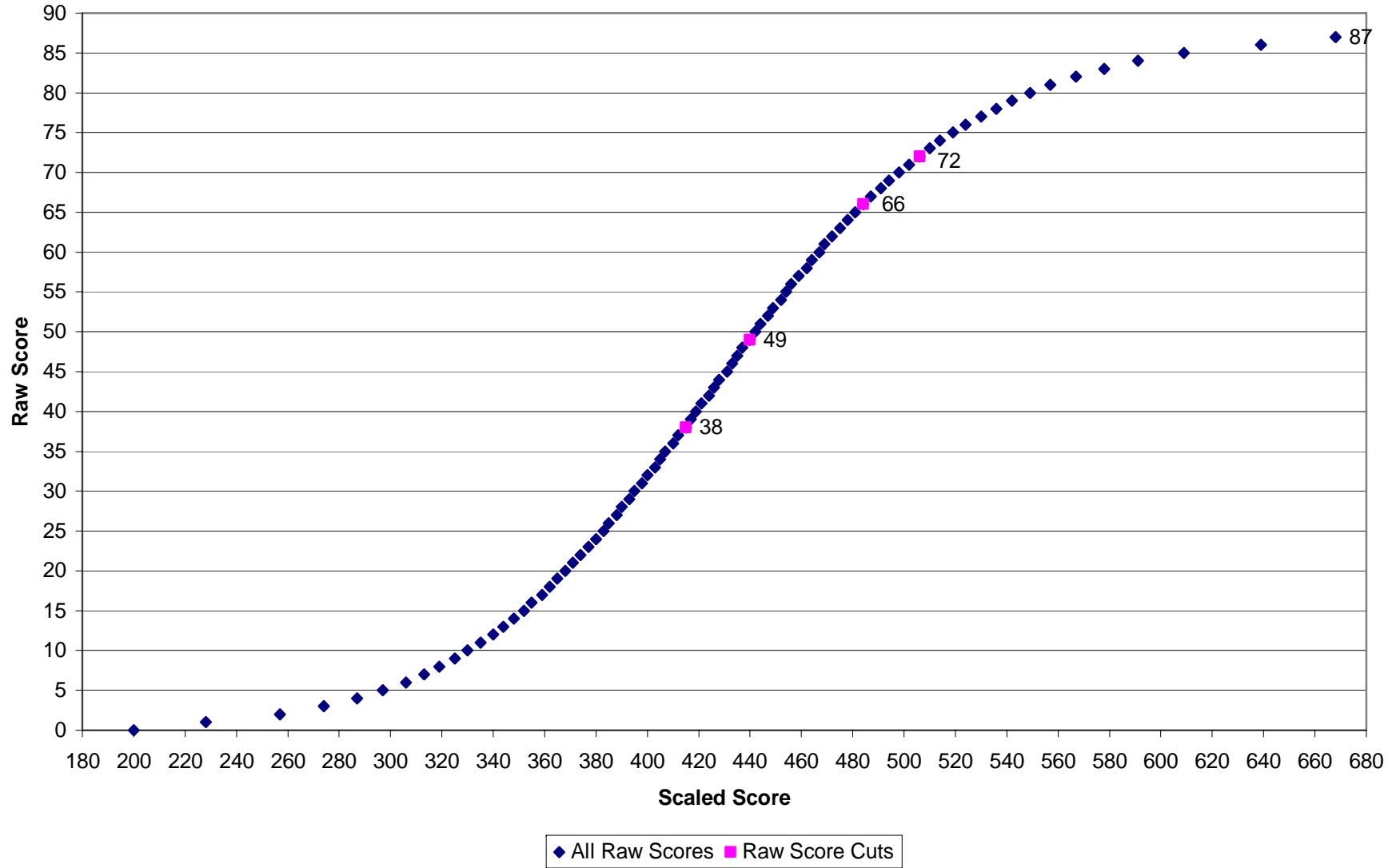
### Spring 2006 Grade 2 Reading



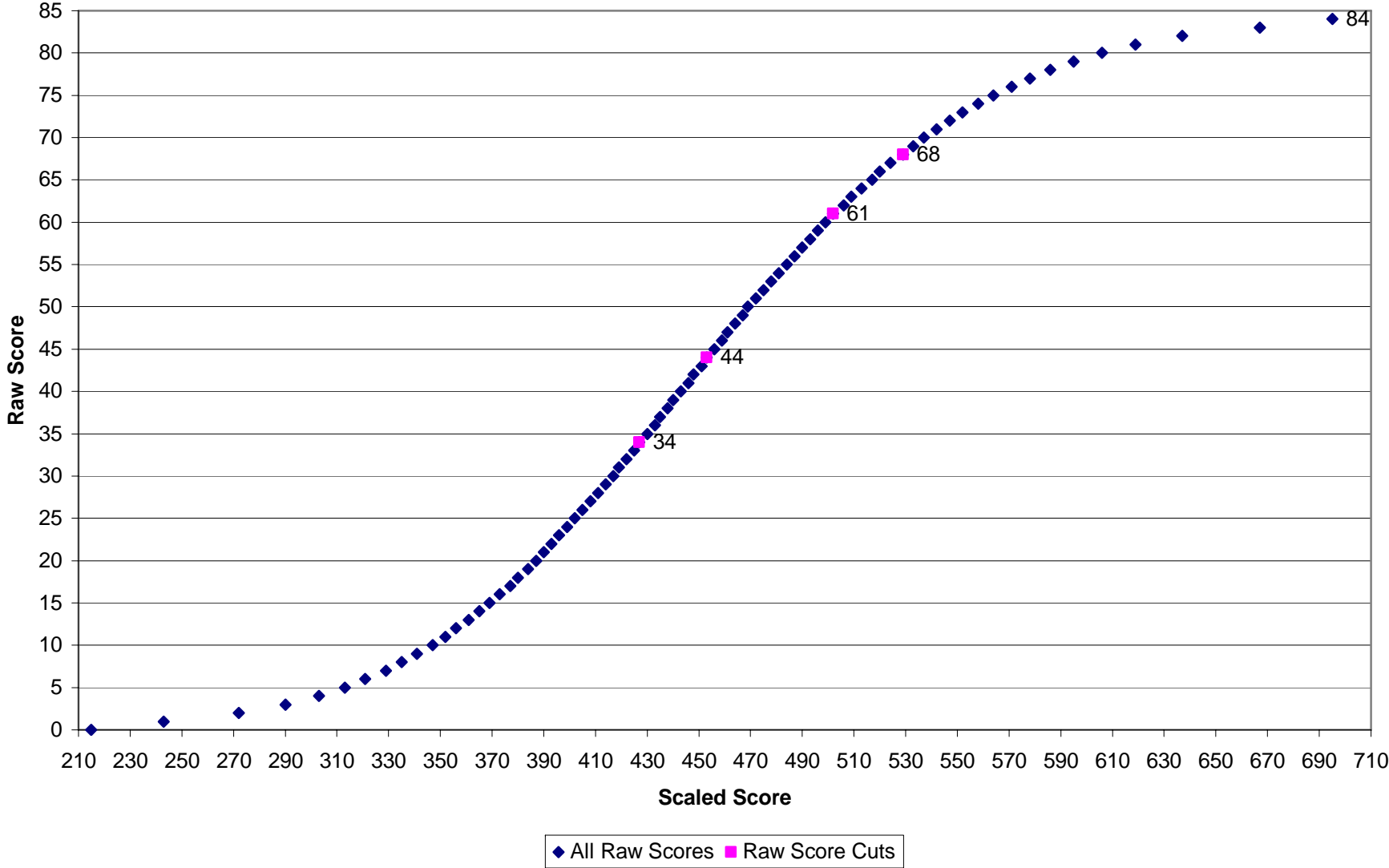
### Spring 2006 Grade 3 Reading



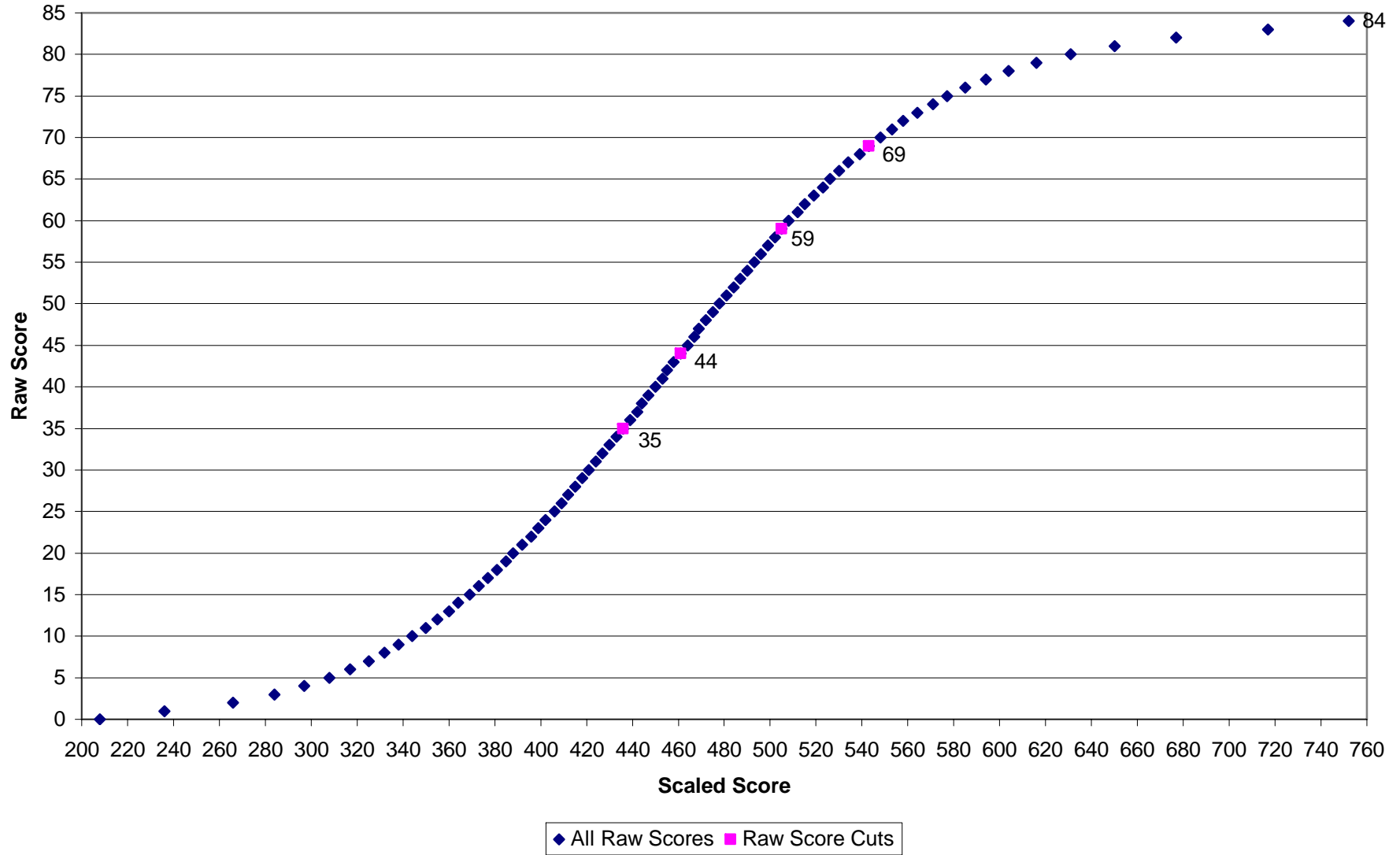
### Spring 2006 Grade 4 Reading



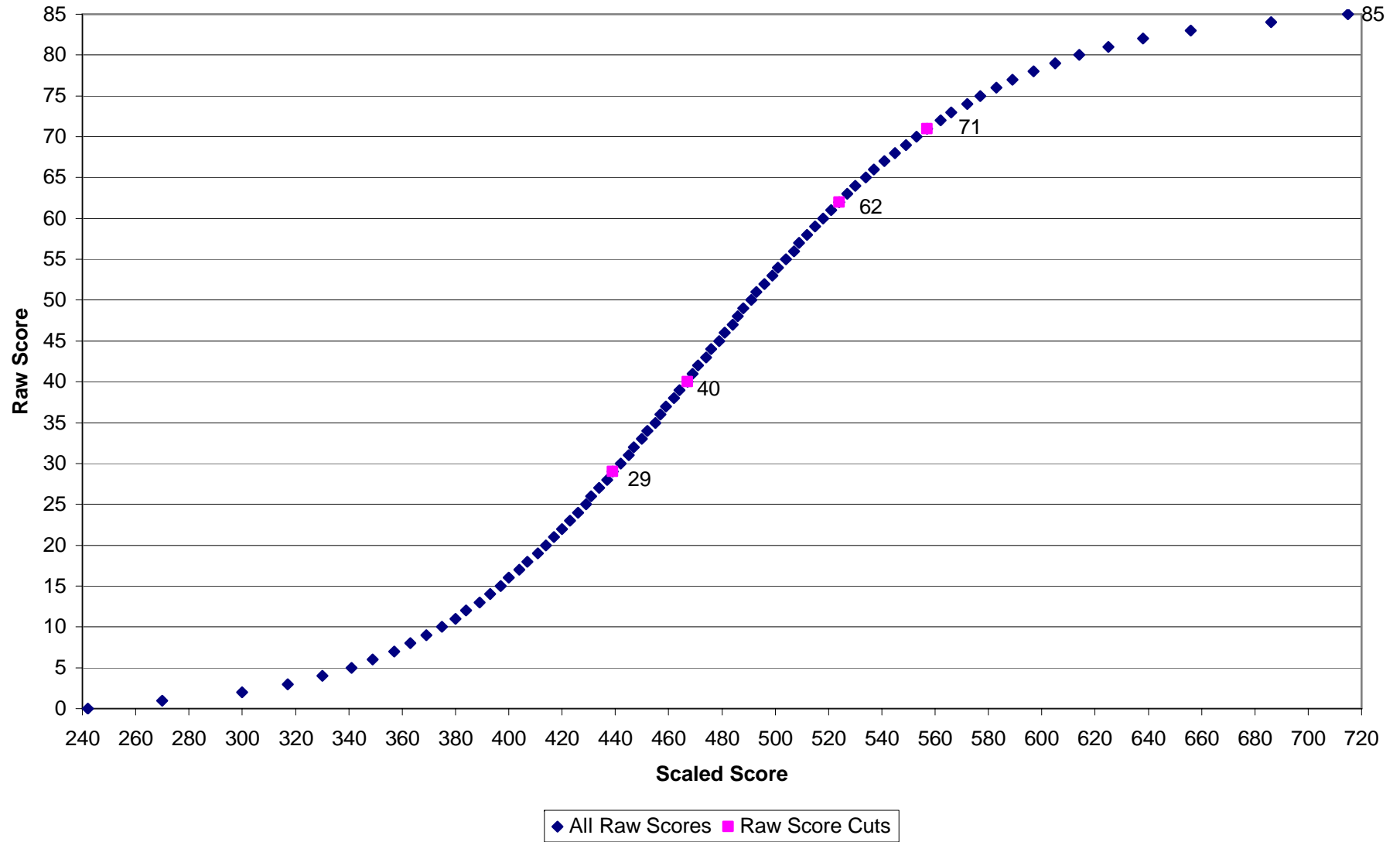
### Spring 2006 Grade 5 Reading



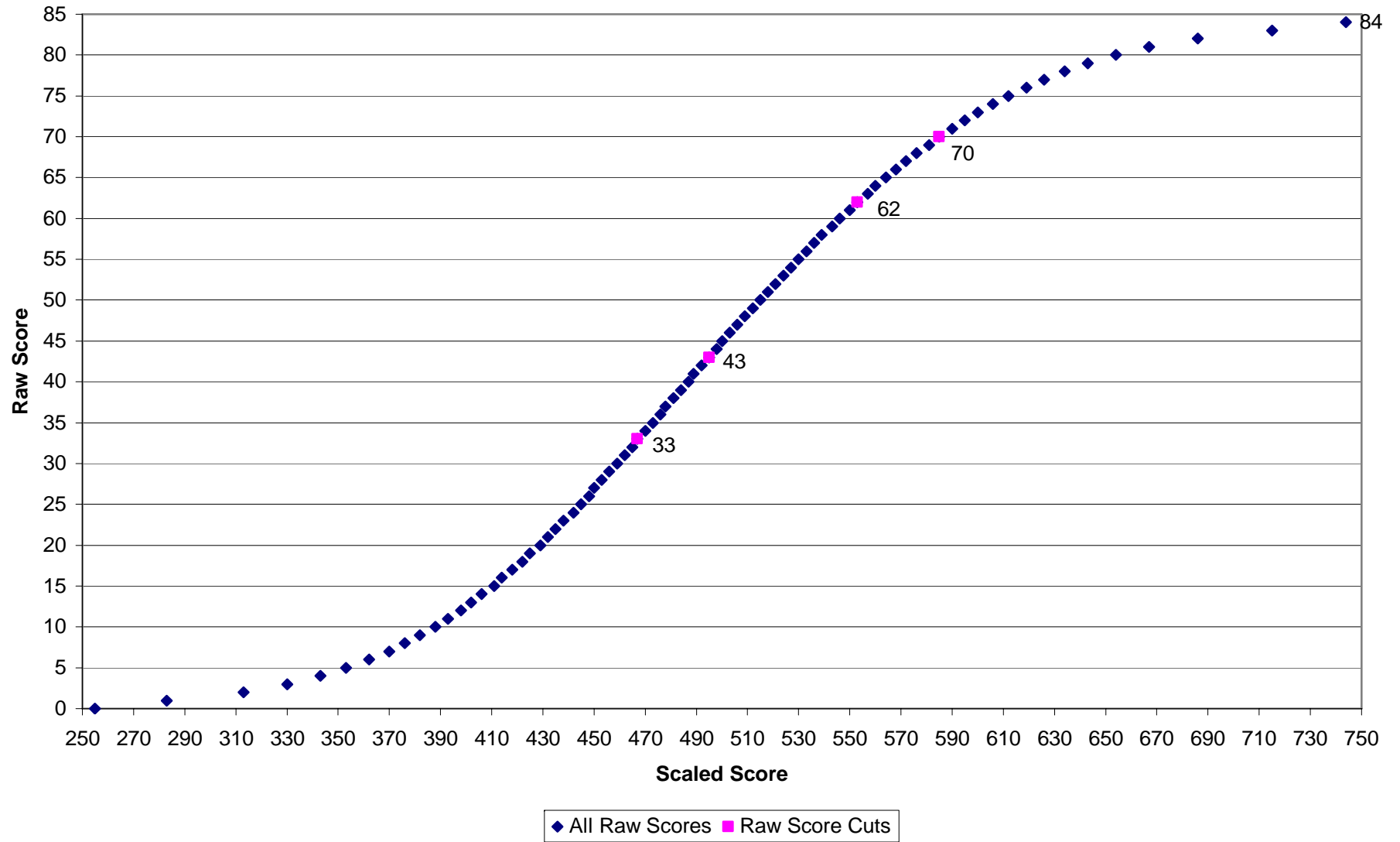
### Spring 2006 Grade 6 Reading



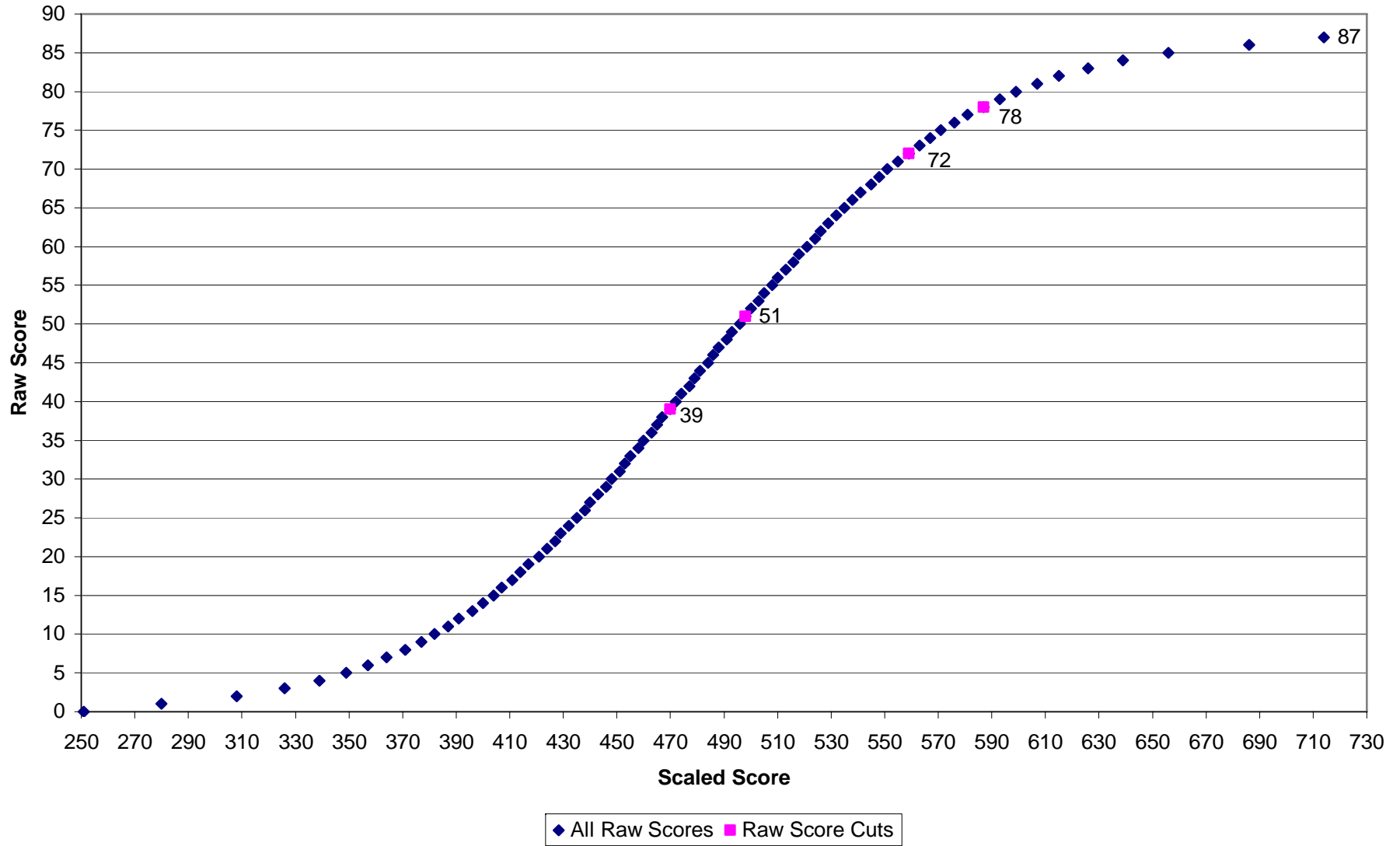
### Spring 2006 Grade 7 Reading



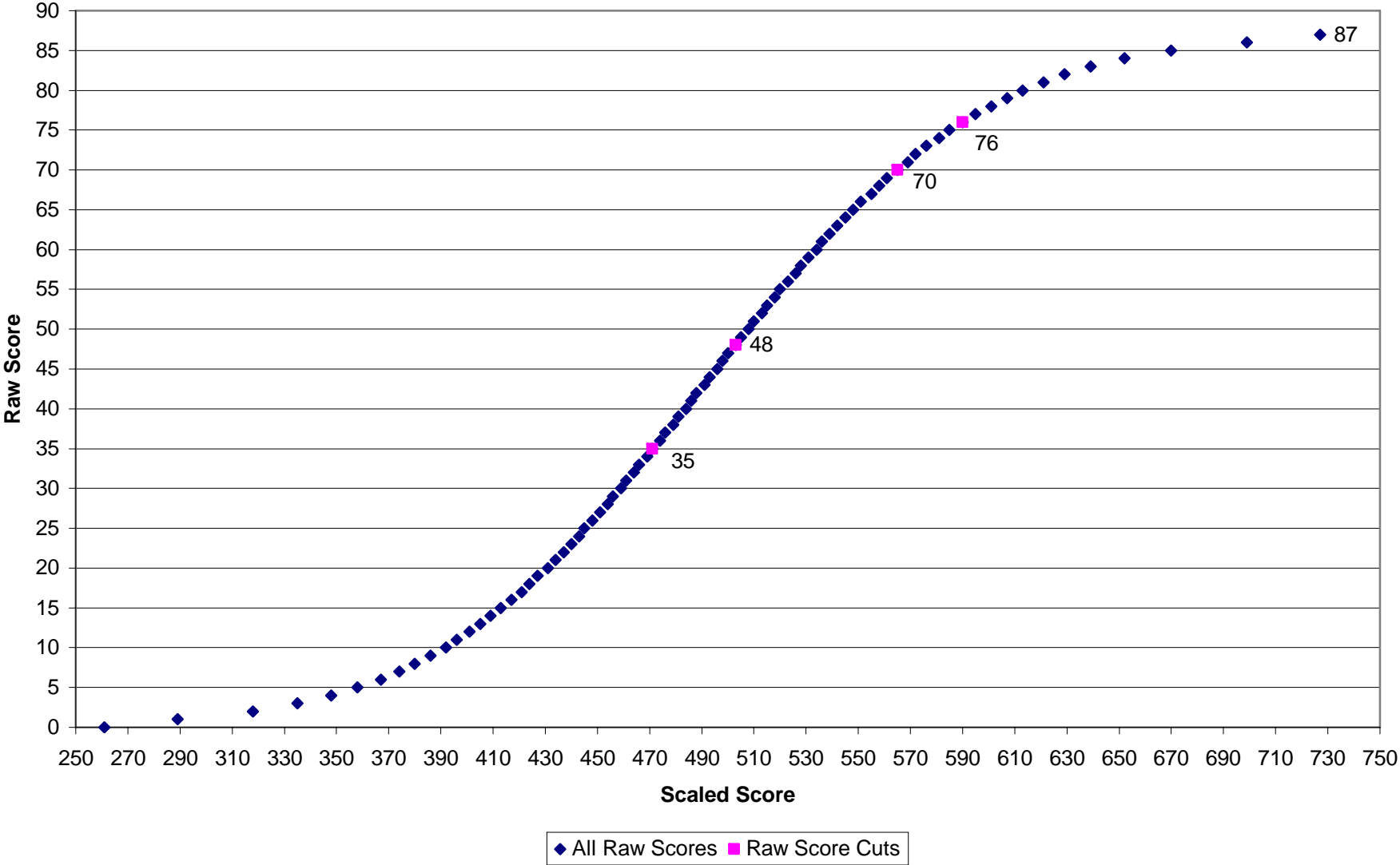
### Spring 2006 Grade 8 Reading



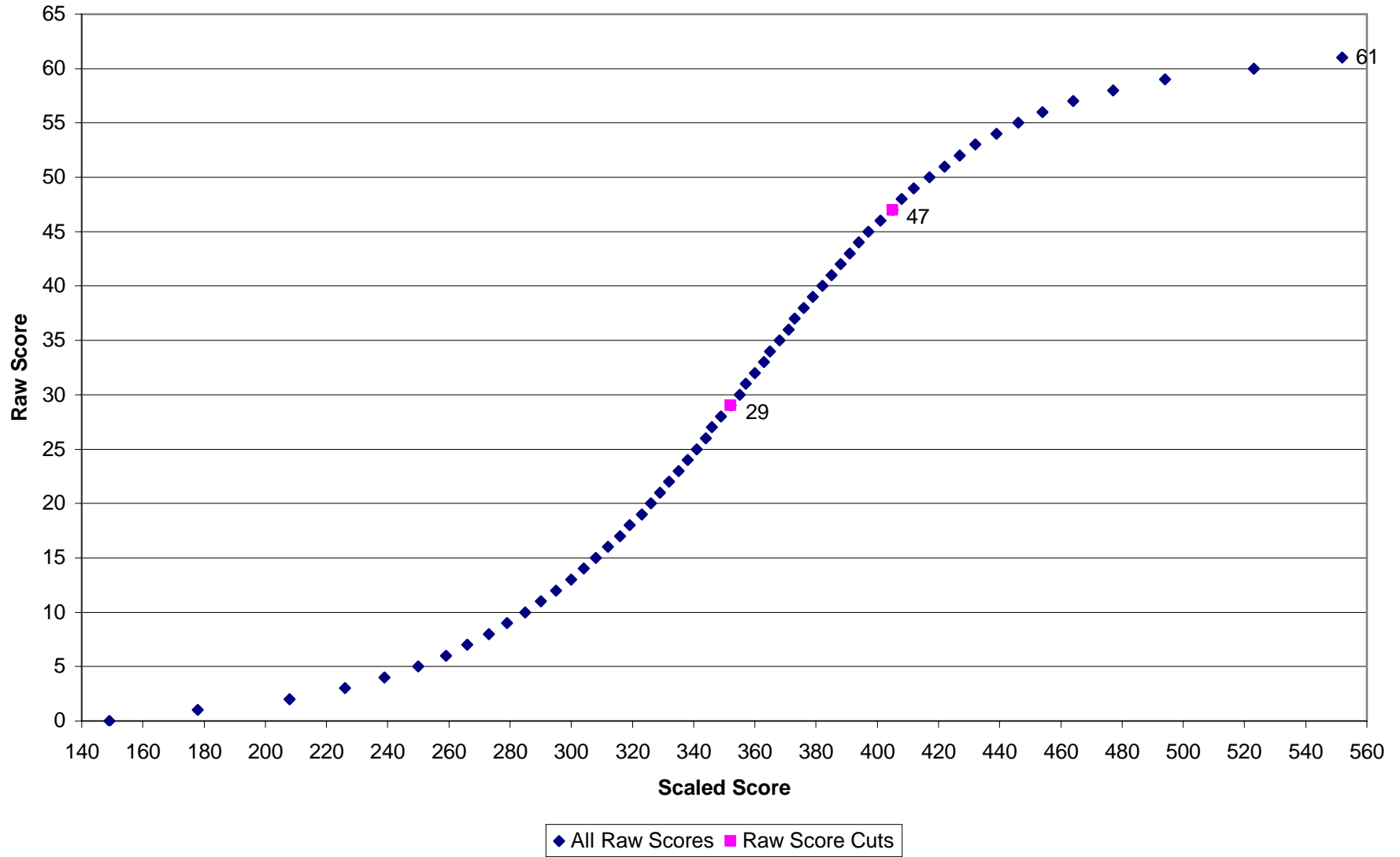
### Spring 2006 Grade 9 Reading



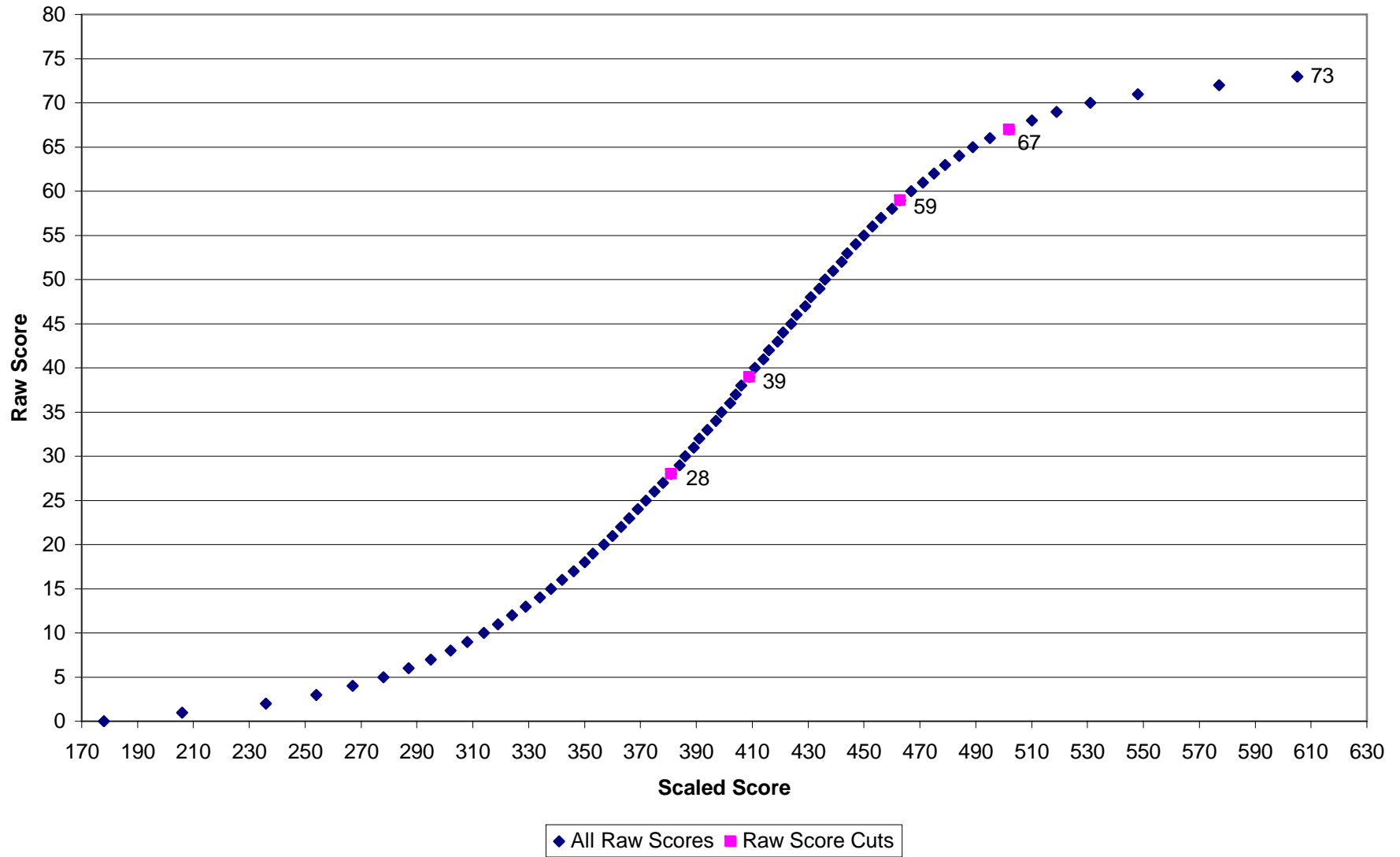
### Spring 2006 Grade 10 Reading



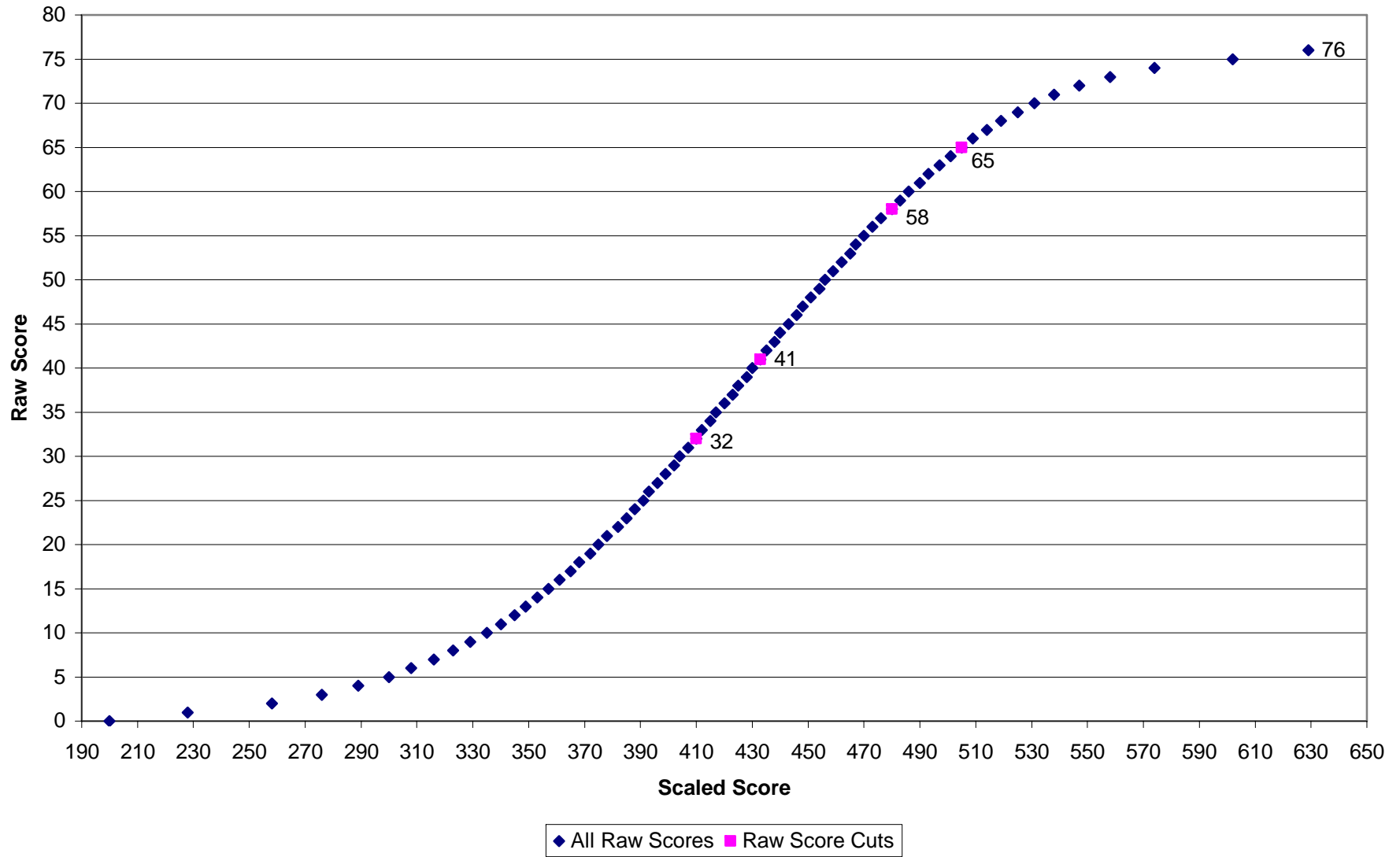
### Spring 2006 Grade 2 Mathematics



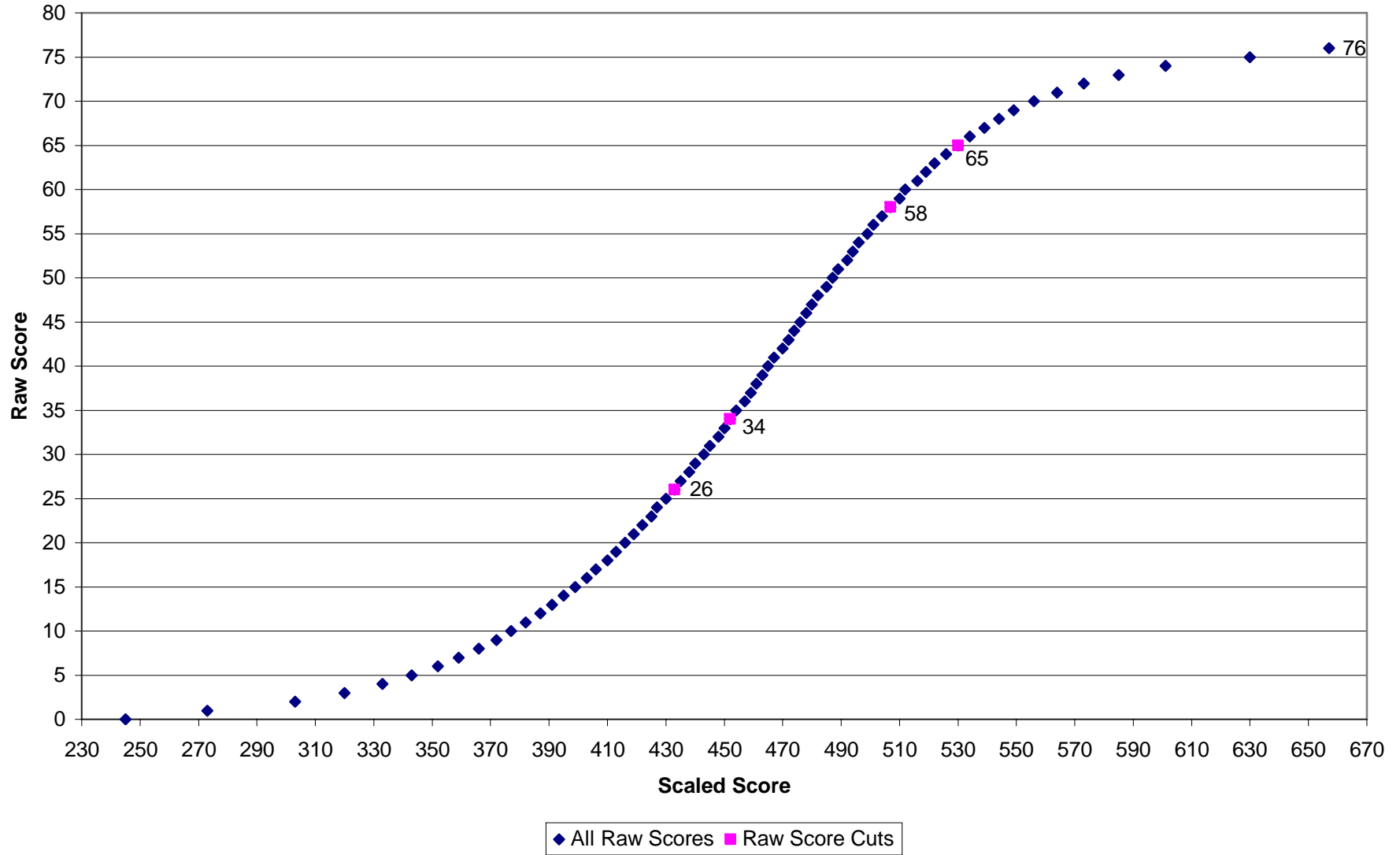
### Spring 2006 Grade 3 Mathematics



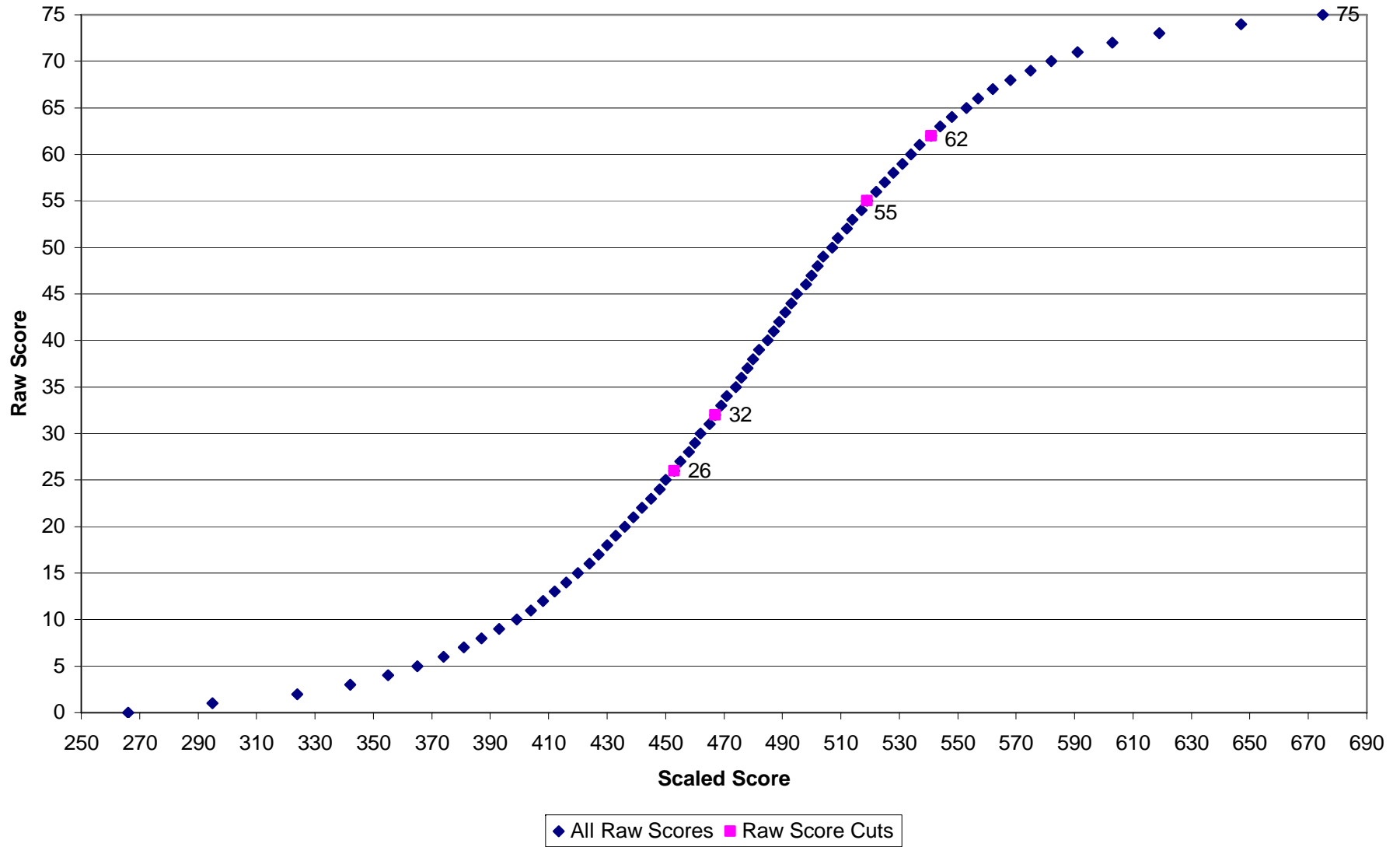
### Spring 2006 Grade 4 Mathematics



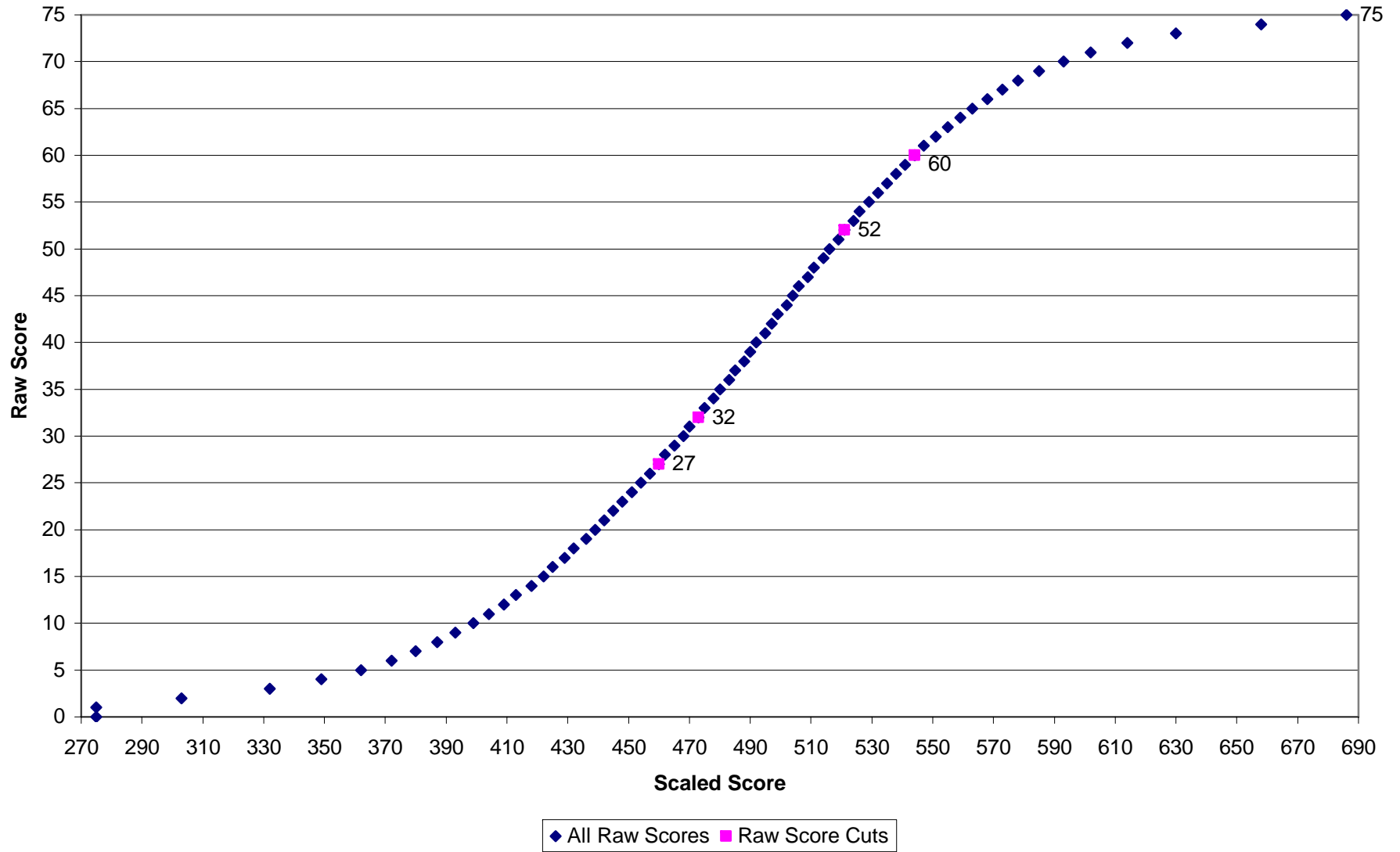
### Spring 2006 Grade 5 Mathematics



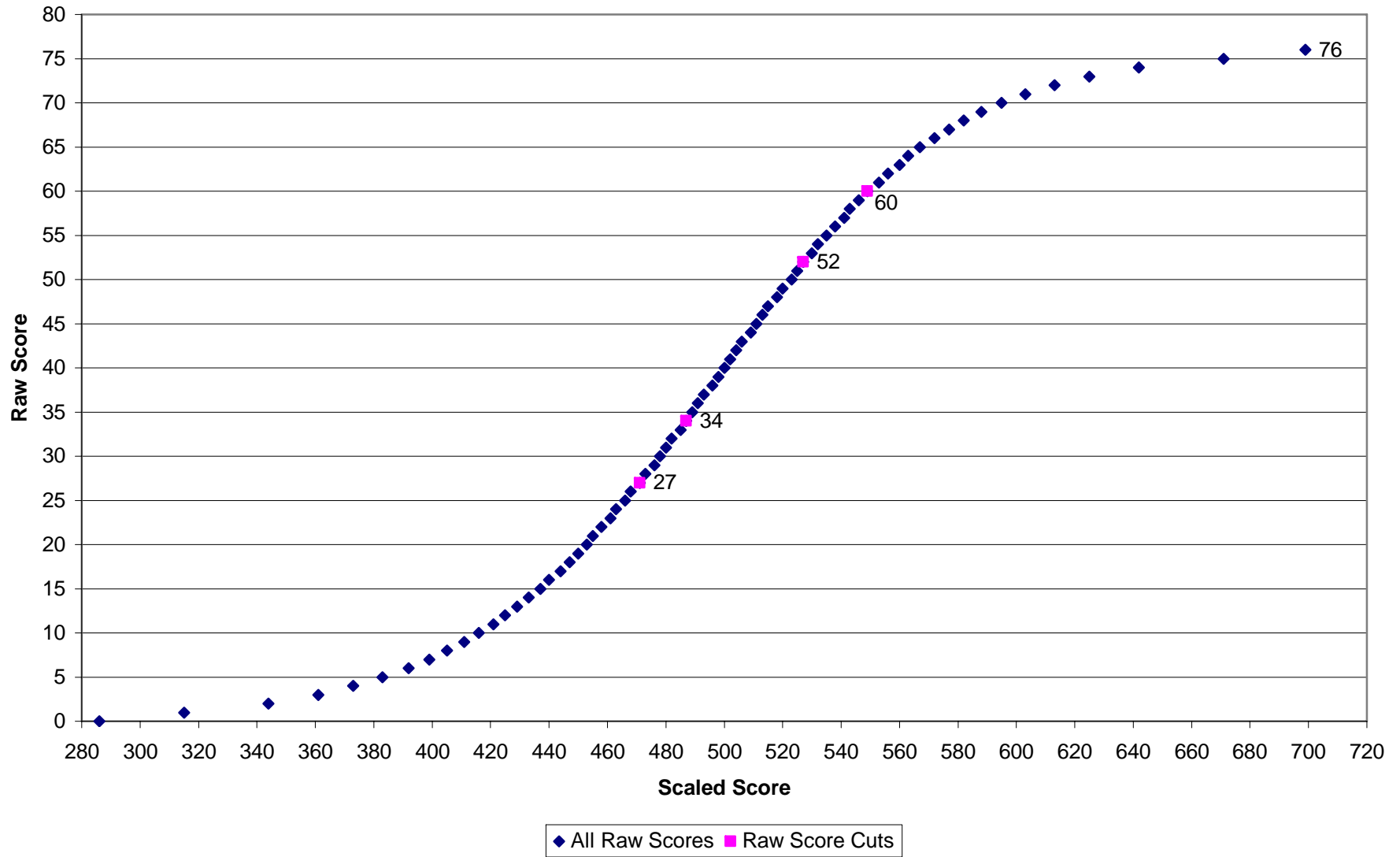
### Spring 2006 Grade 6 Mathematics



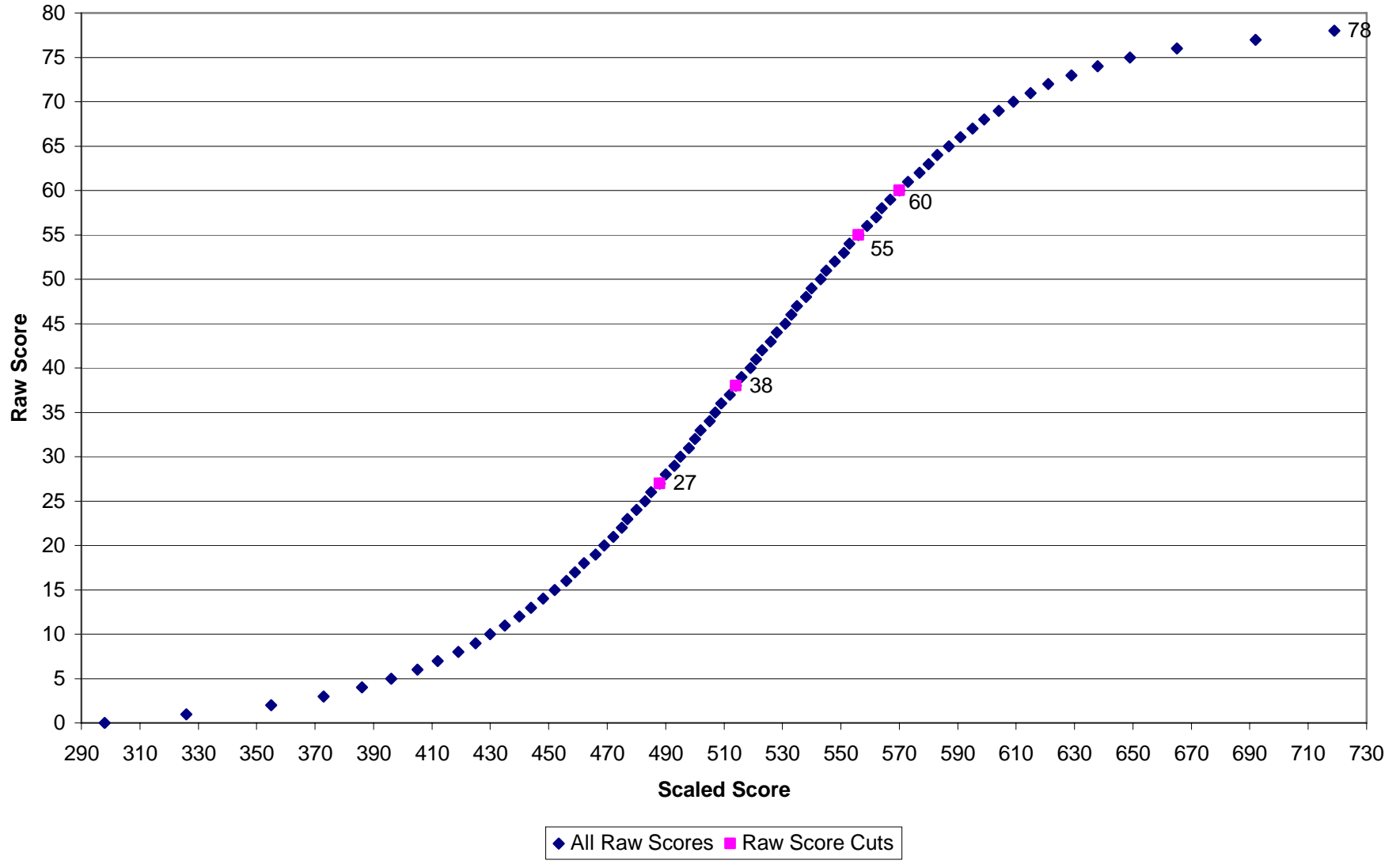
### Spring 2006 Grade 7 Mathematics



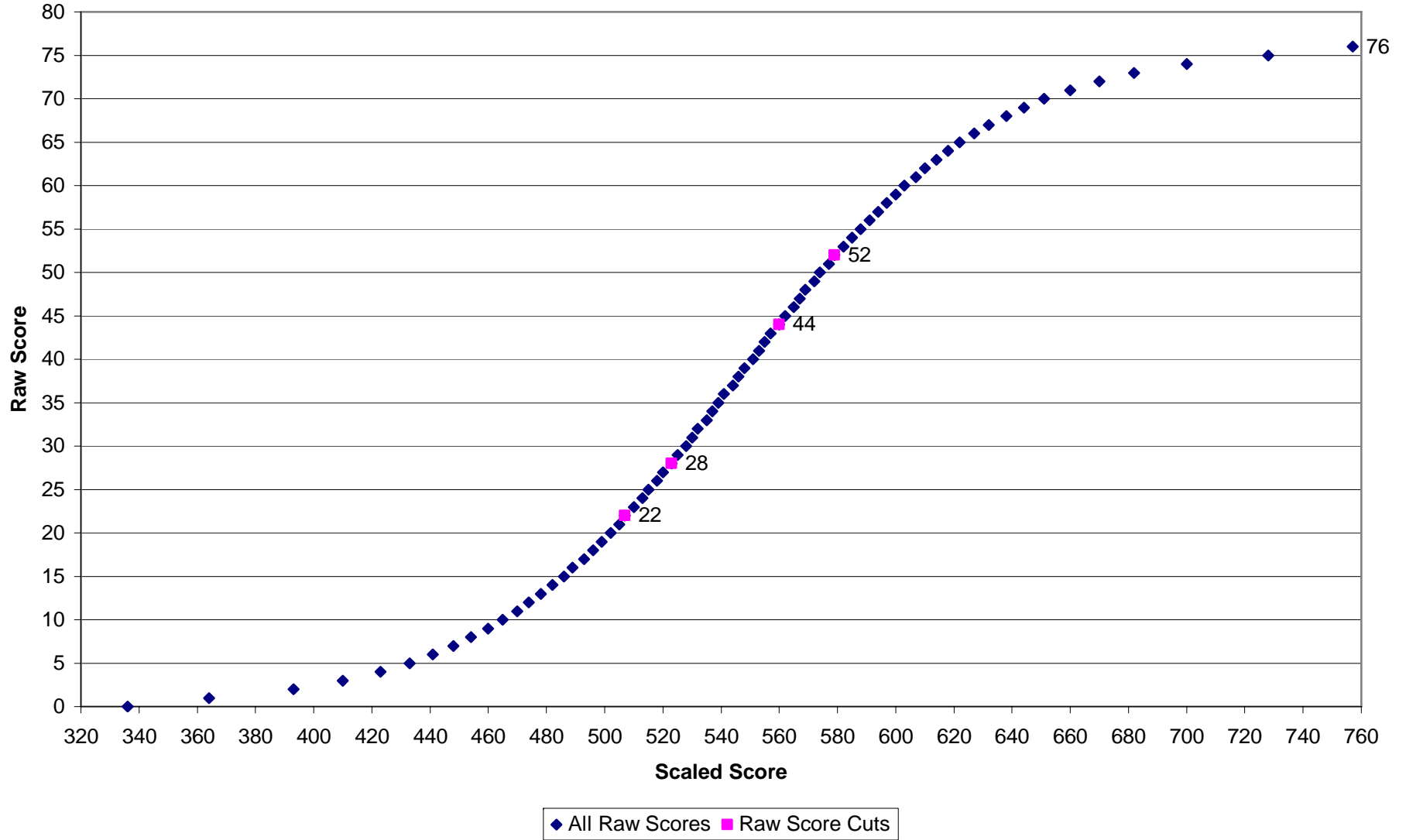
### Spring 2006 Grade 8 Mathematics



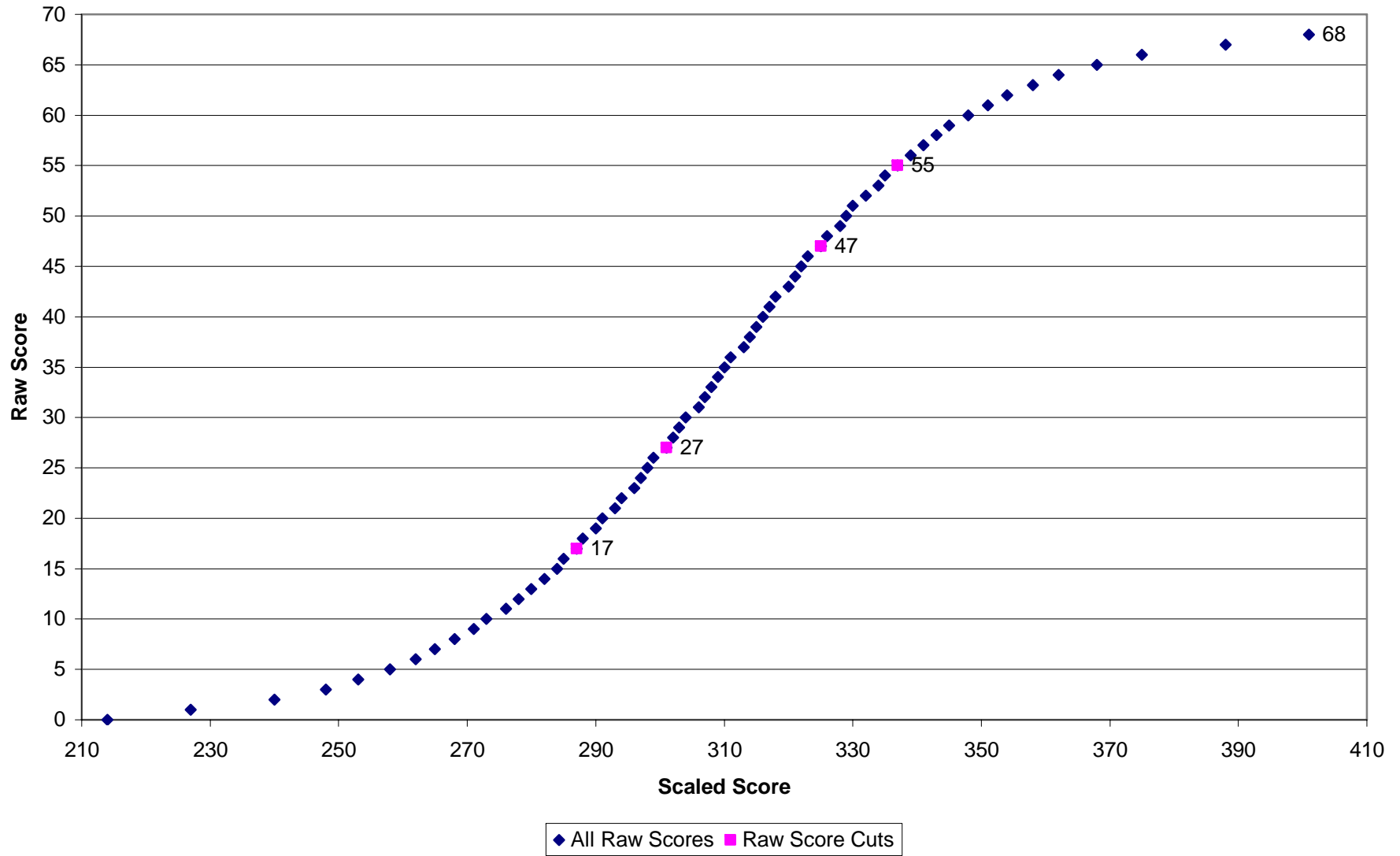
### Spring 2006 Grade 9 Mathematics



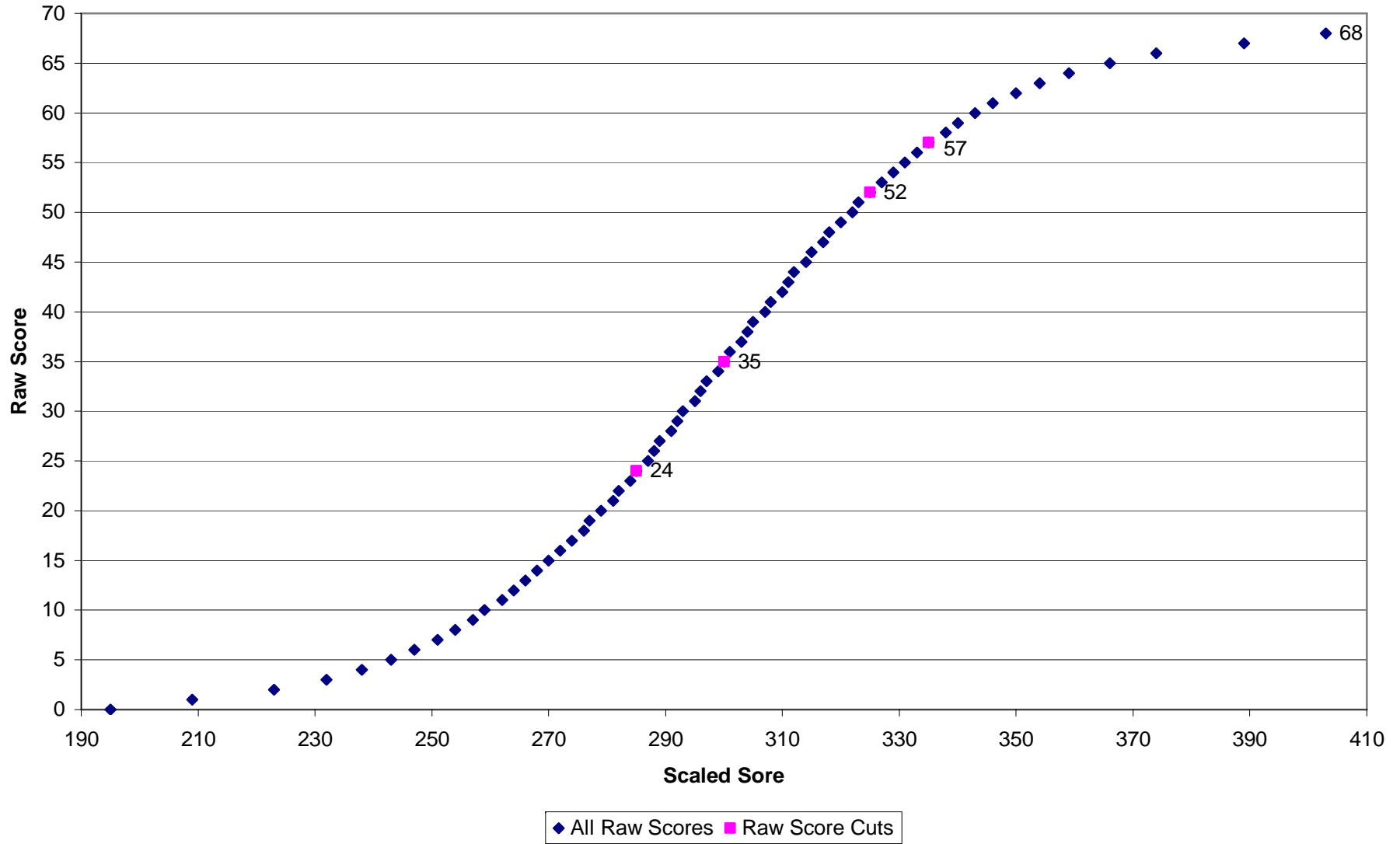
### Spring 2006 Grade 10 Mathematics



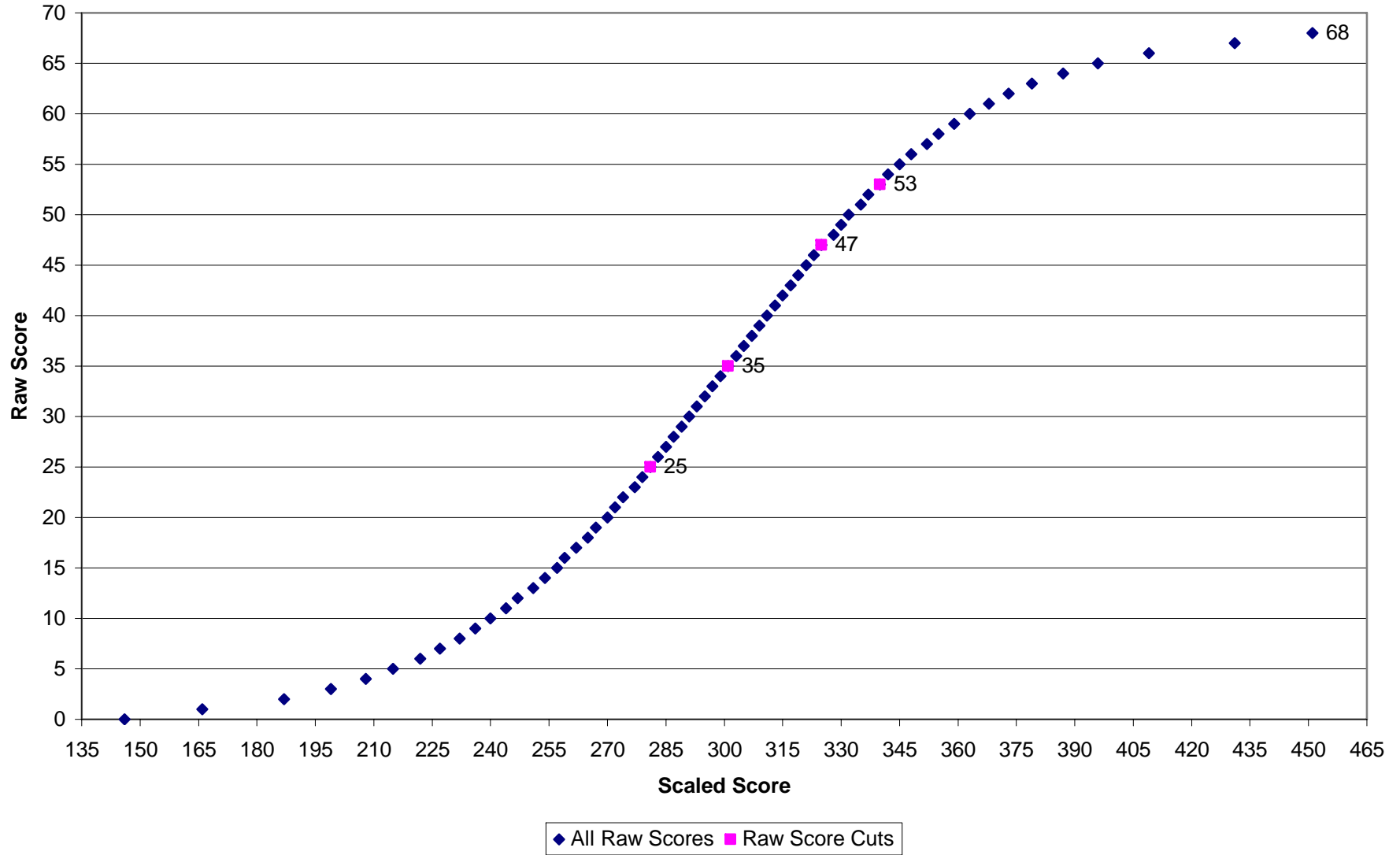
### Fall 2006 Grade 4 Science



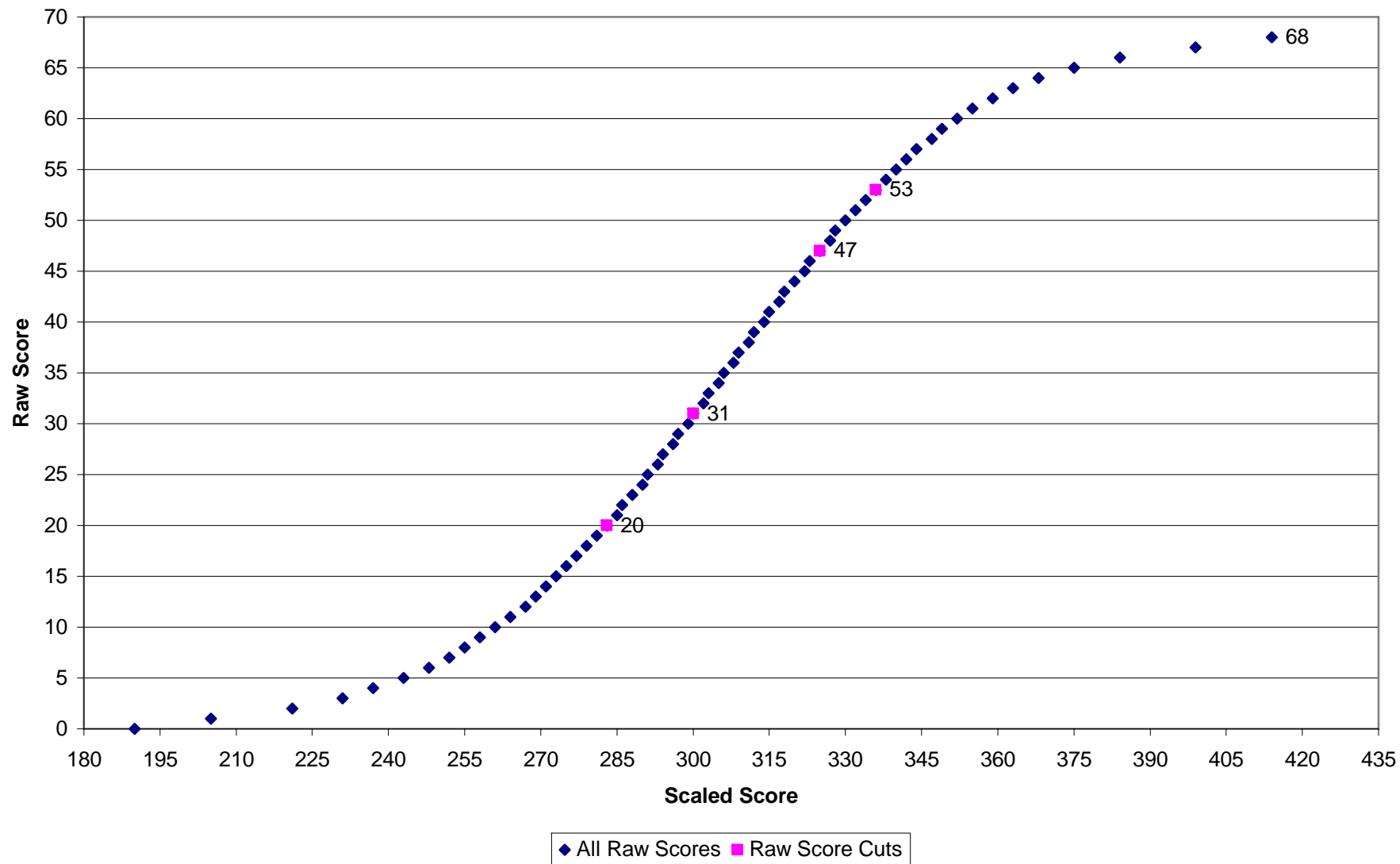
### Fall 2006 Grade 6 Science



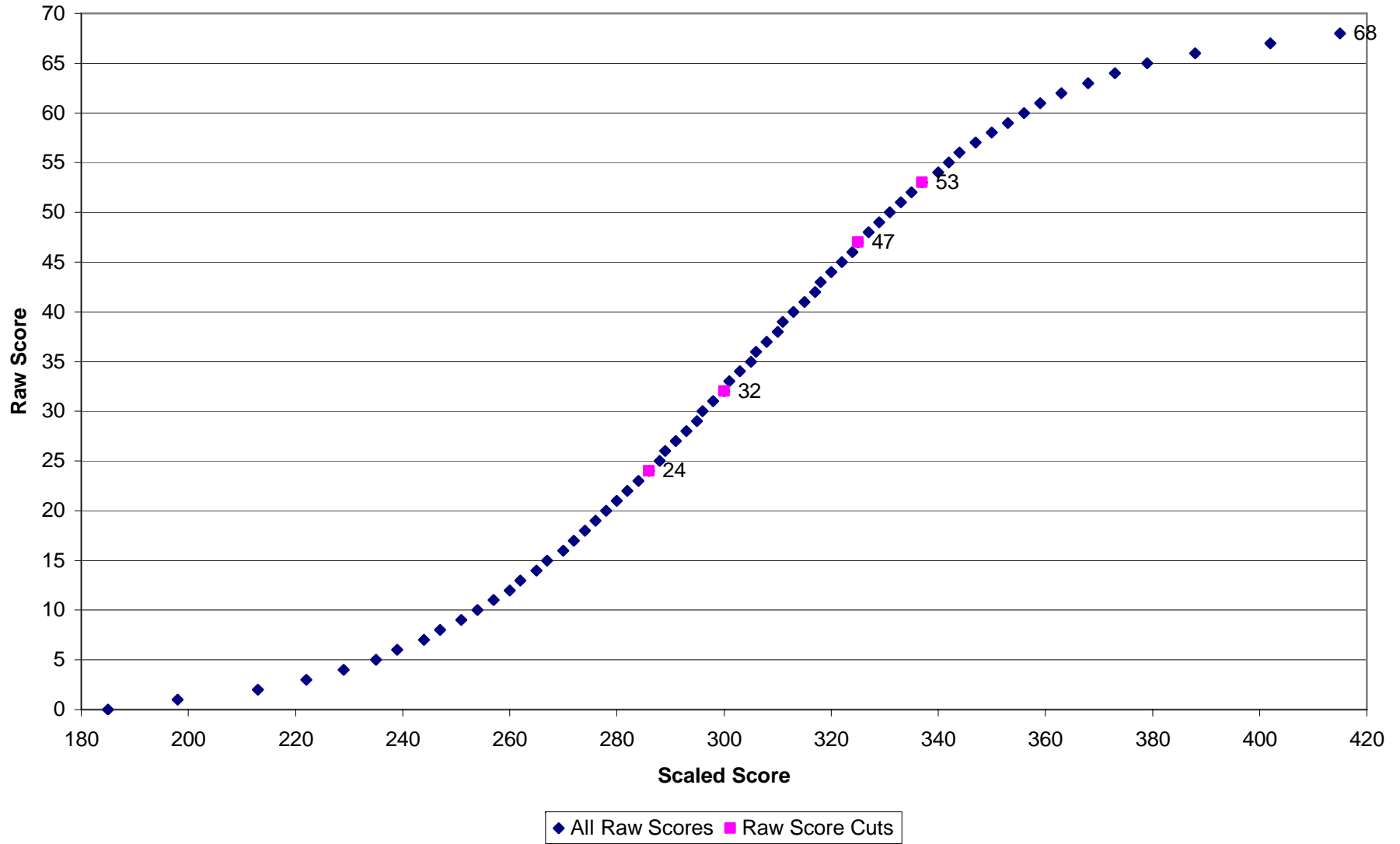
### Spring 2006 Grade 8 Science



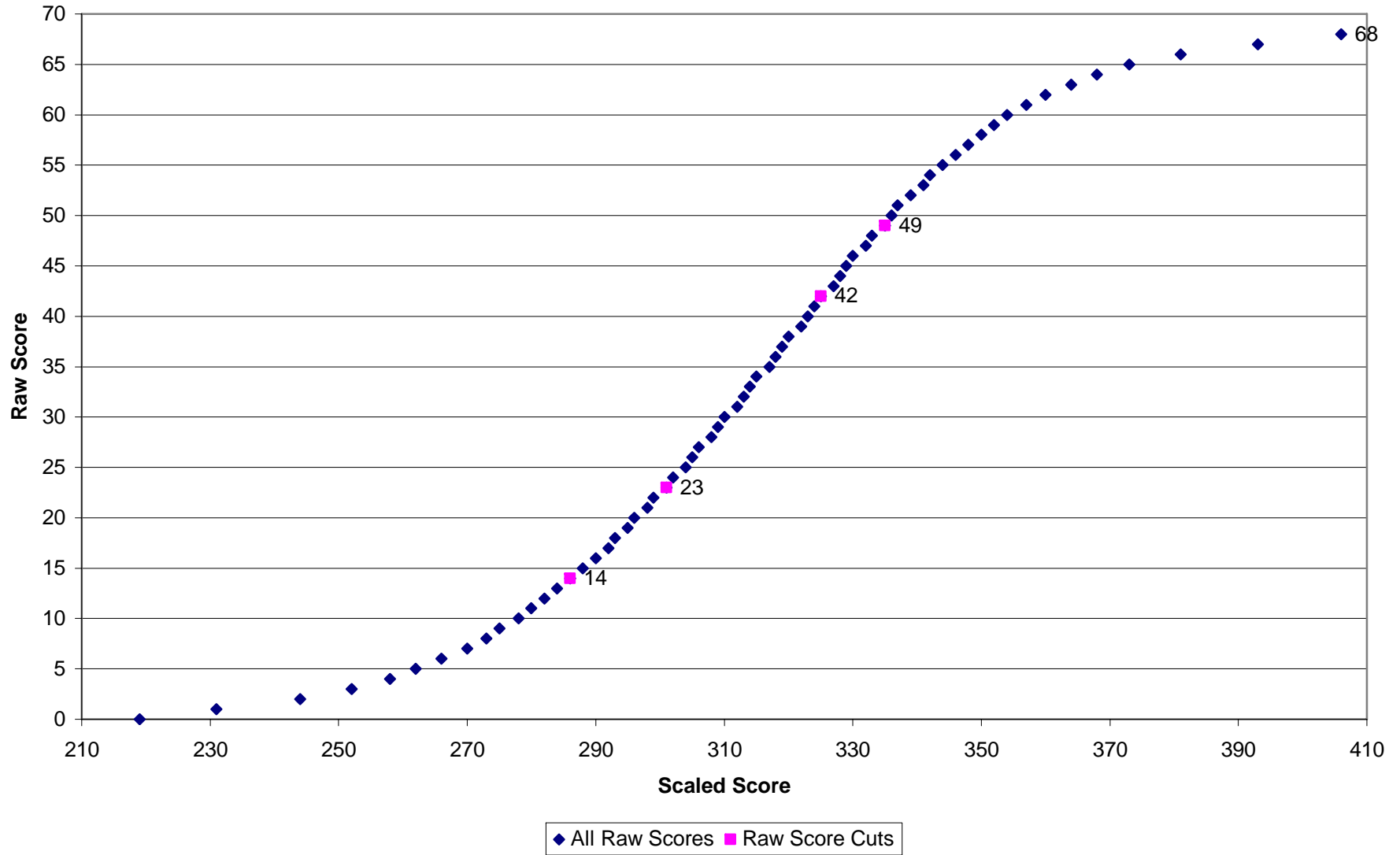
### Spring 2006 Grade 11 Science



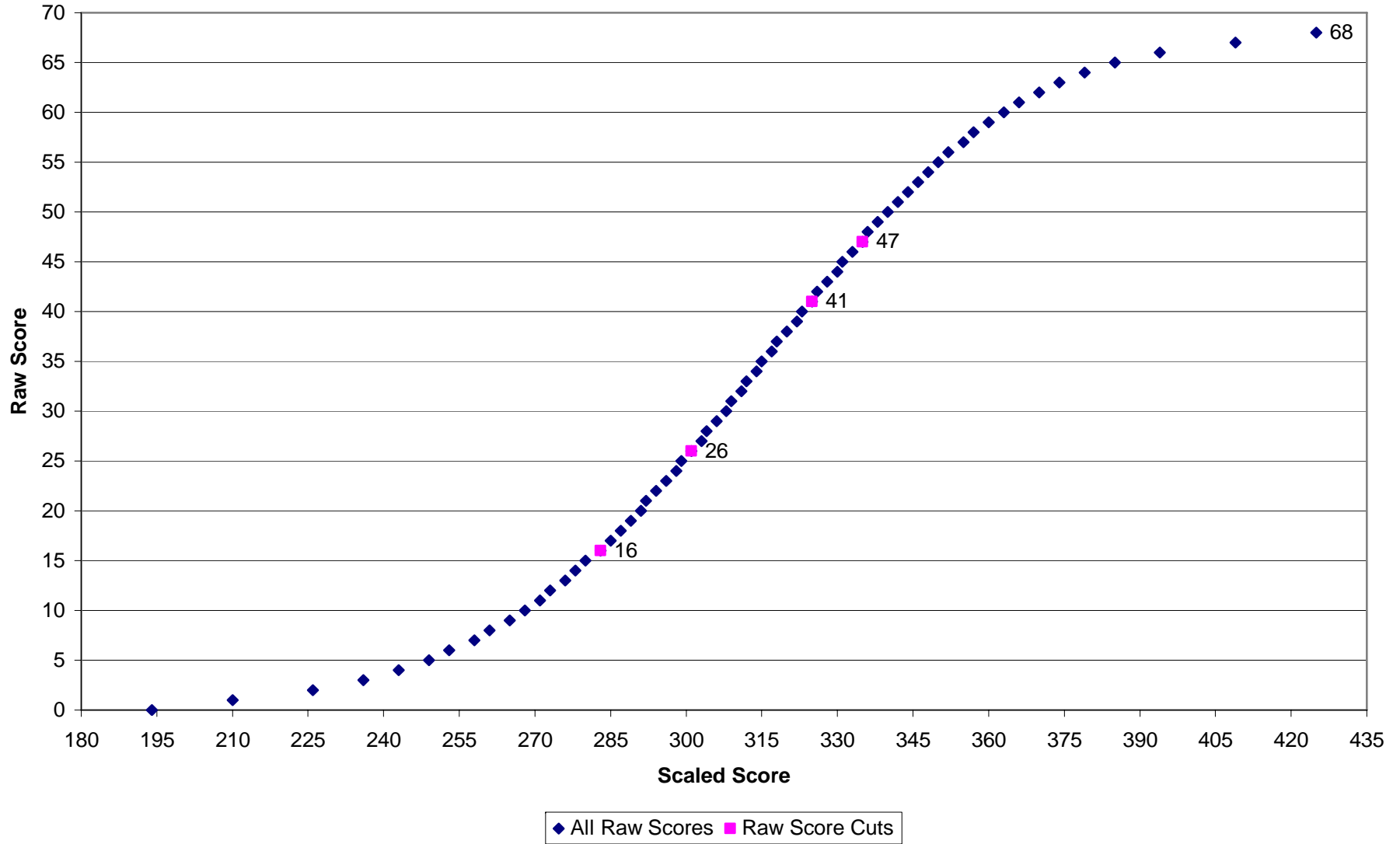
### Fall 2006 Grade 4 Social Studies



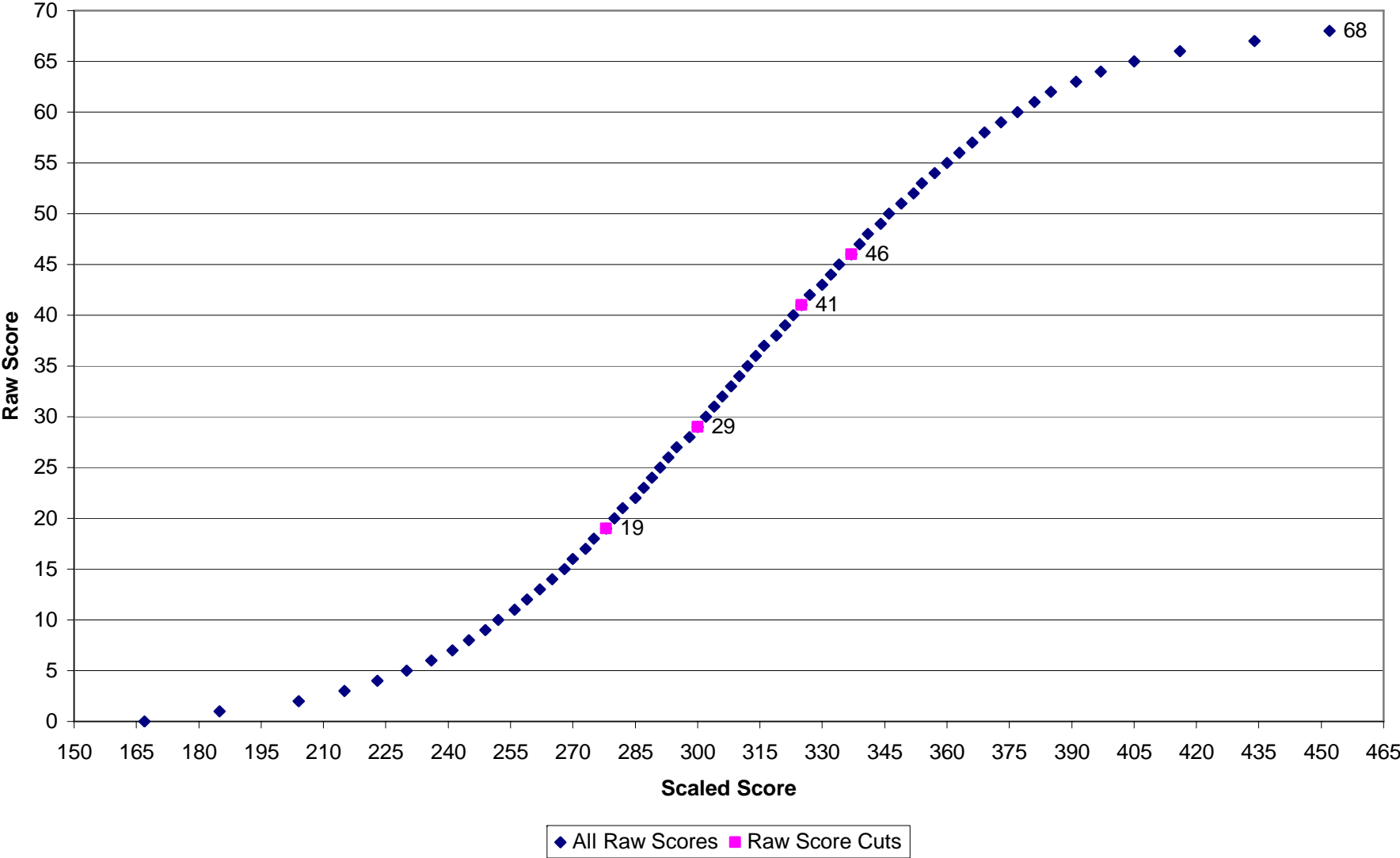
### Fall 2006 Grade 6 Social Studies



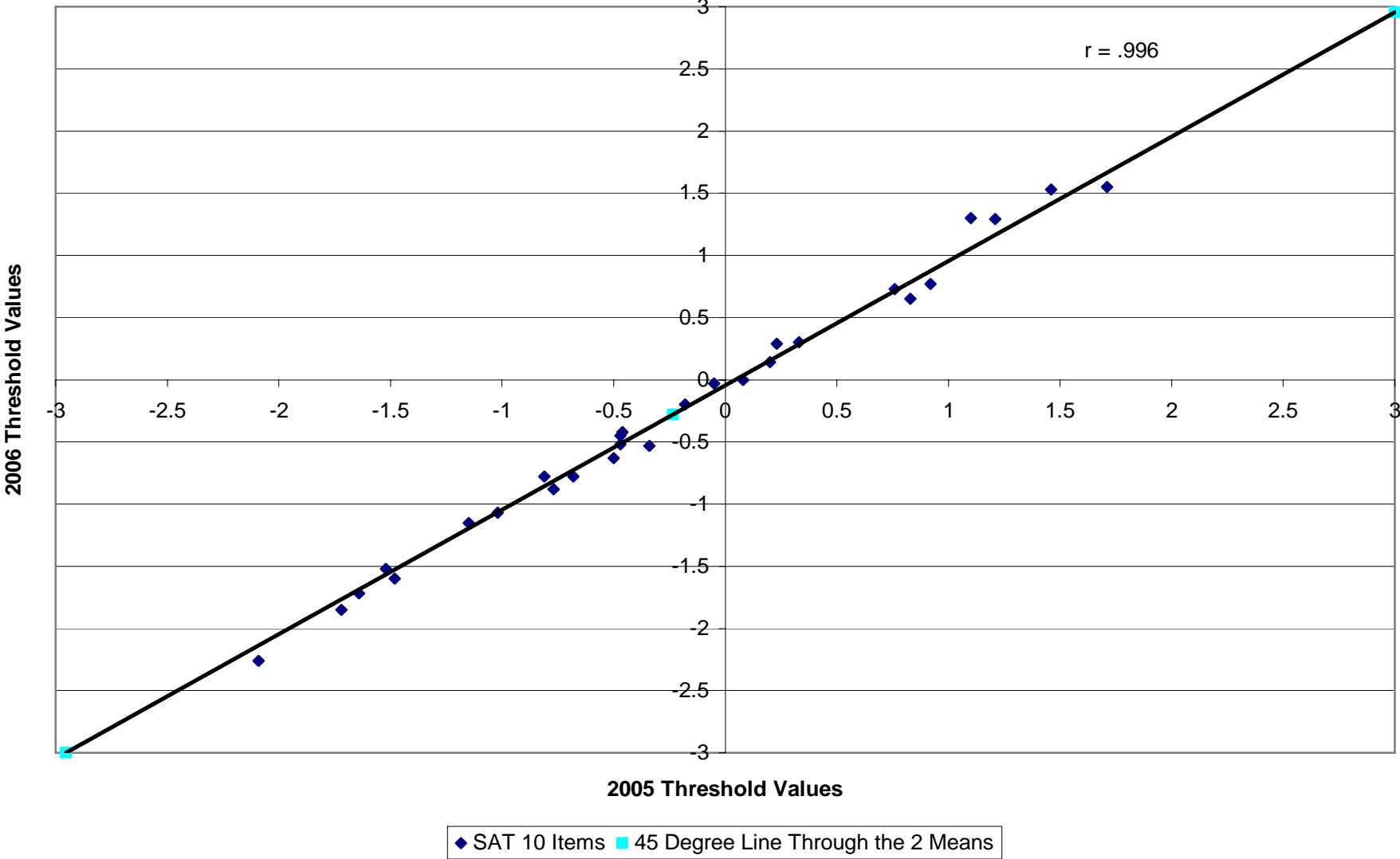
### Spring 2006 Grade 8 Social Studies



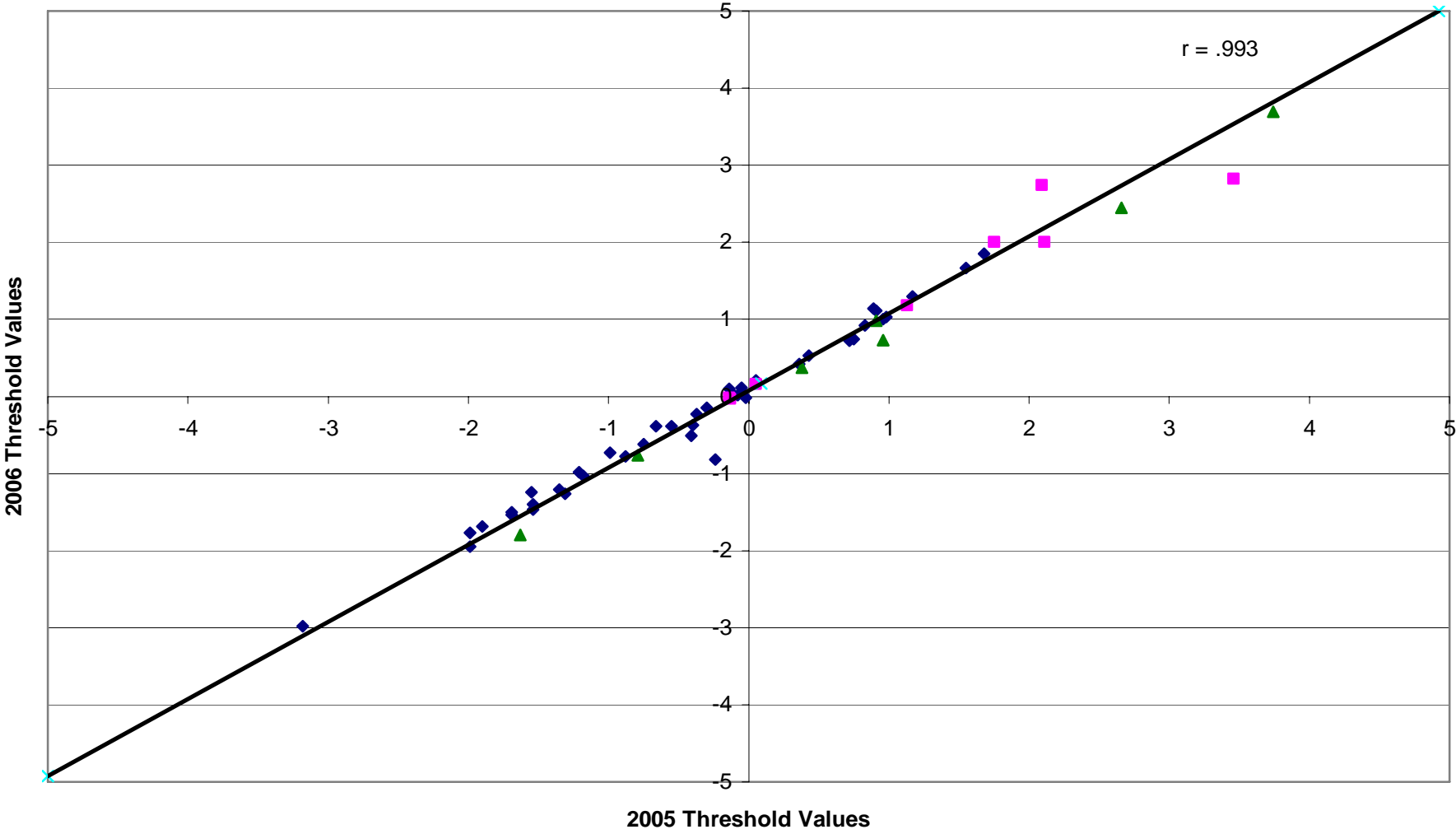
# Spring 2006 Grade 11 Social Studies



### Spring 2006 Grade 2 Reading Anchor Items

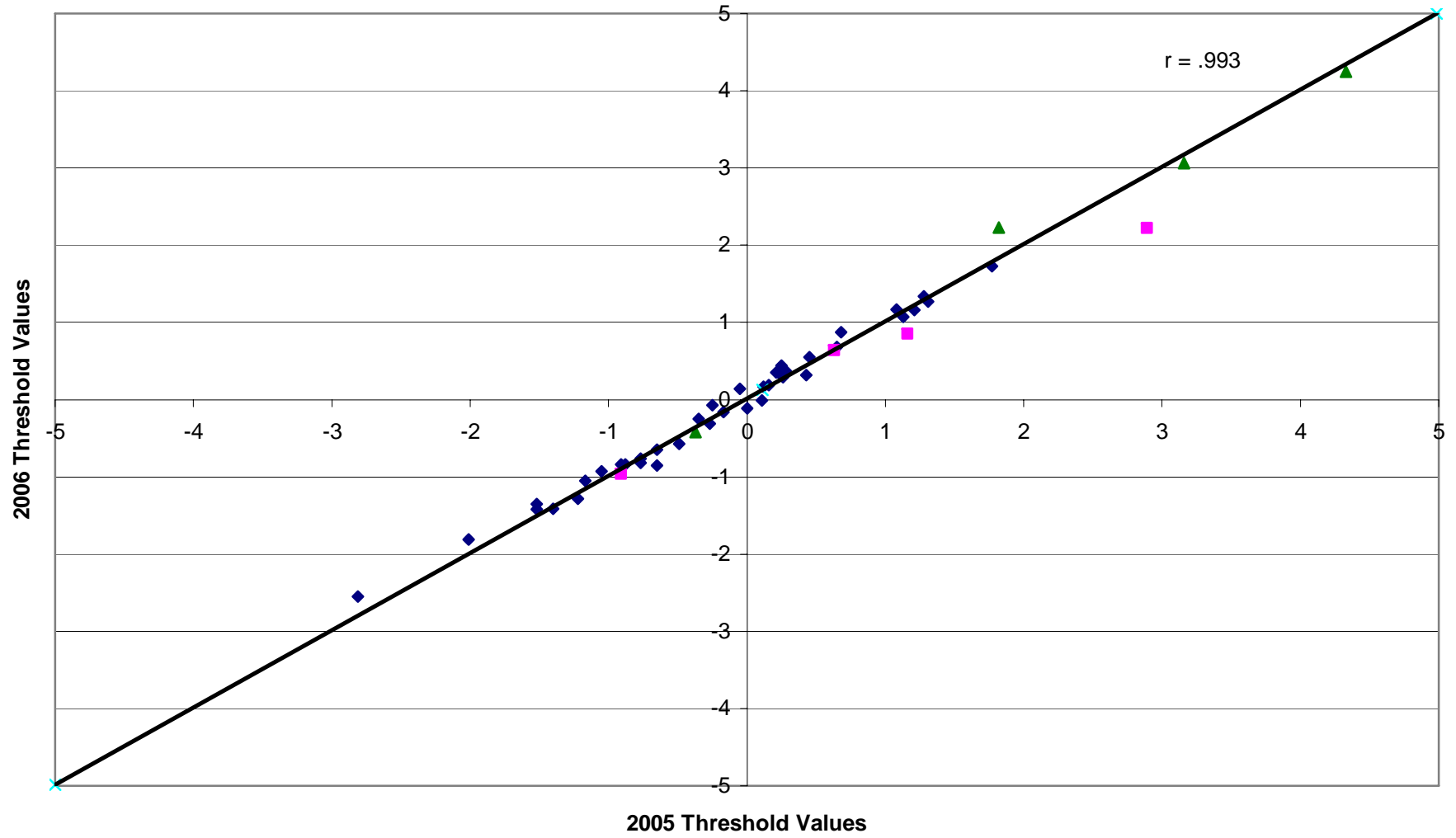


### Spring 2006 Grade 3 Reading Anchor Items



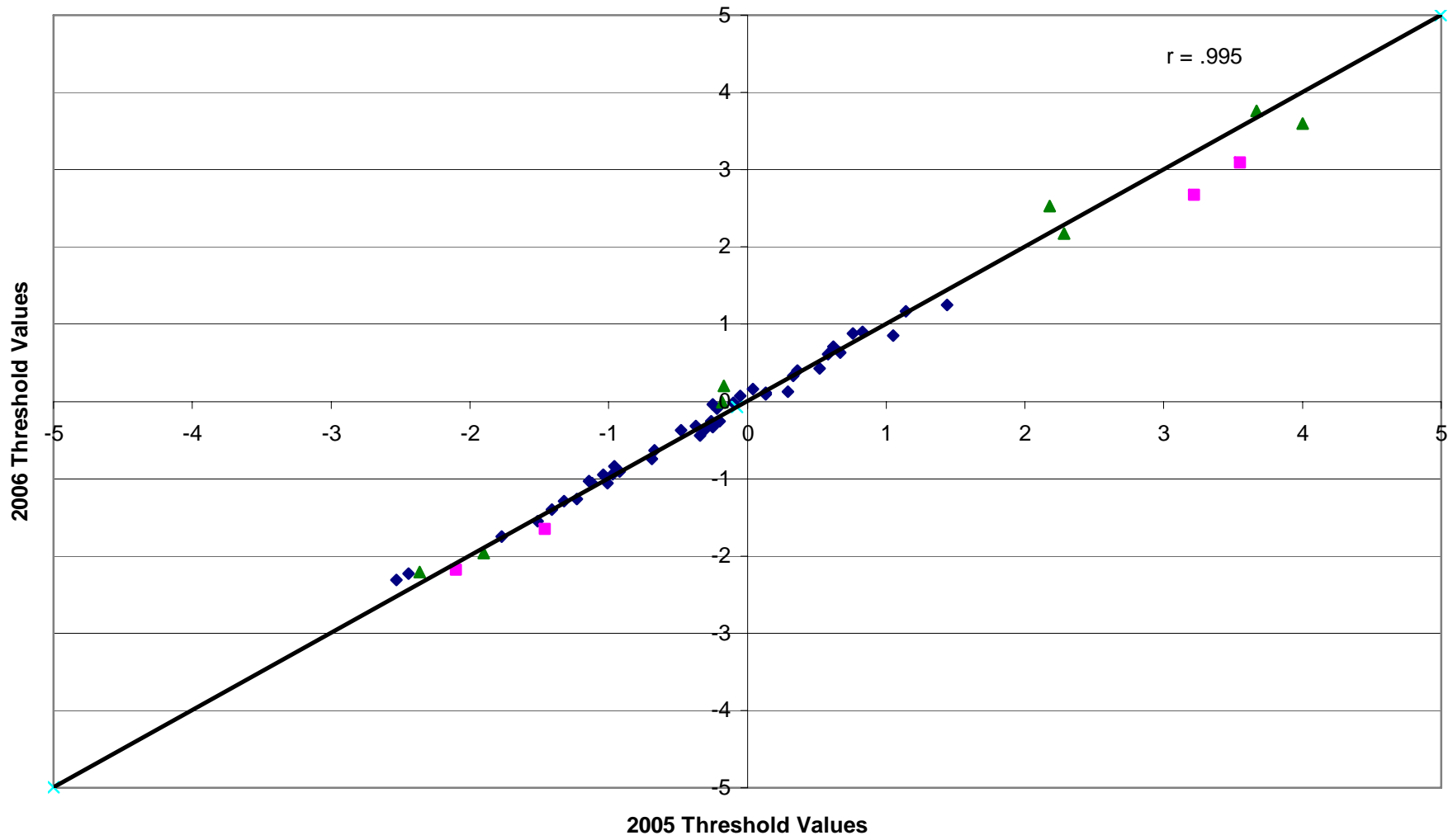
◆ Multiple Choice Items    ■ Short Answer Items    ▲ Extended Resonse Items    × 45 Degree Line Through the 2 Means

### Spring 2006 Grade 4 Reading Anchor Items



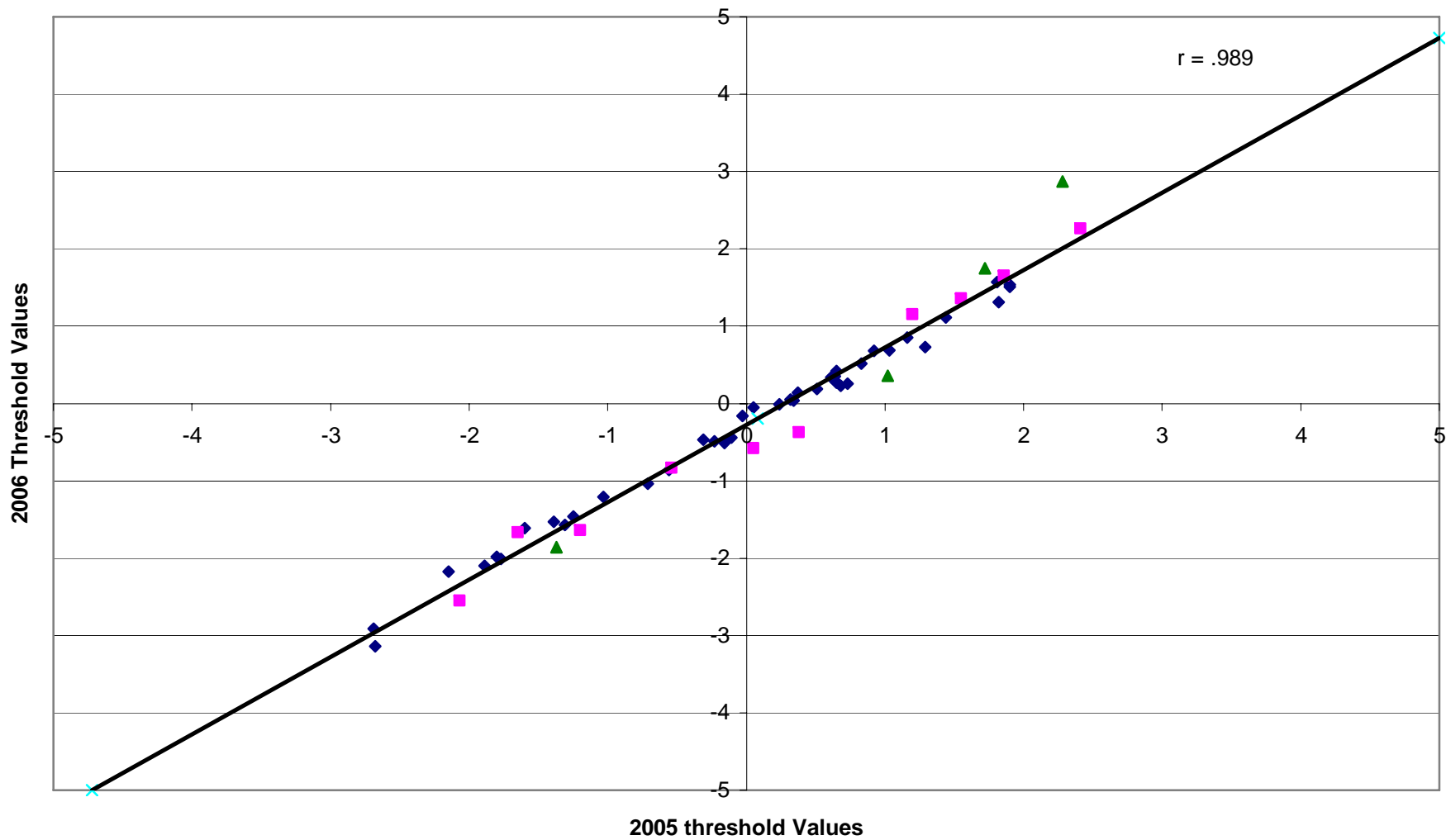
◆ Multiple Choice Items    ■ Short Answer Items    ▲ Extended Response Items    × 45 Degree Line Through the 2 Means

### Spring 2006 Grade 5 Reading Anchor Items



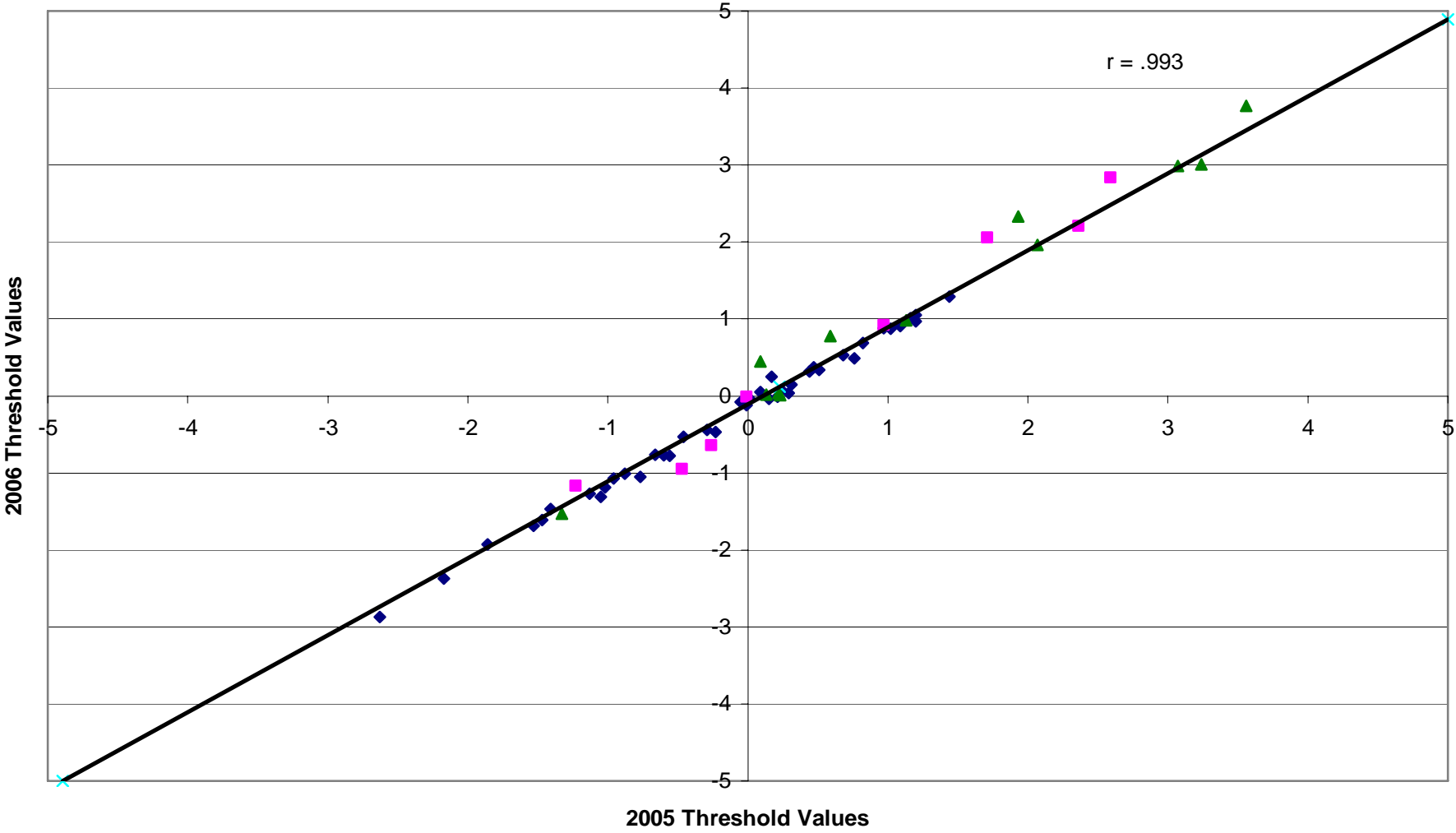
◆ Multiple Choice Items    ■ Short Answer Items    ▲ Extended Response Items    × 45 Degree Line Through the 2 Means

### Spring 2006 Grade 6 Reading Anchor items



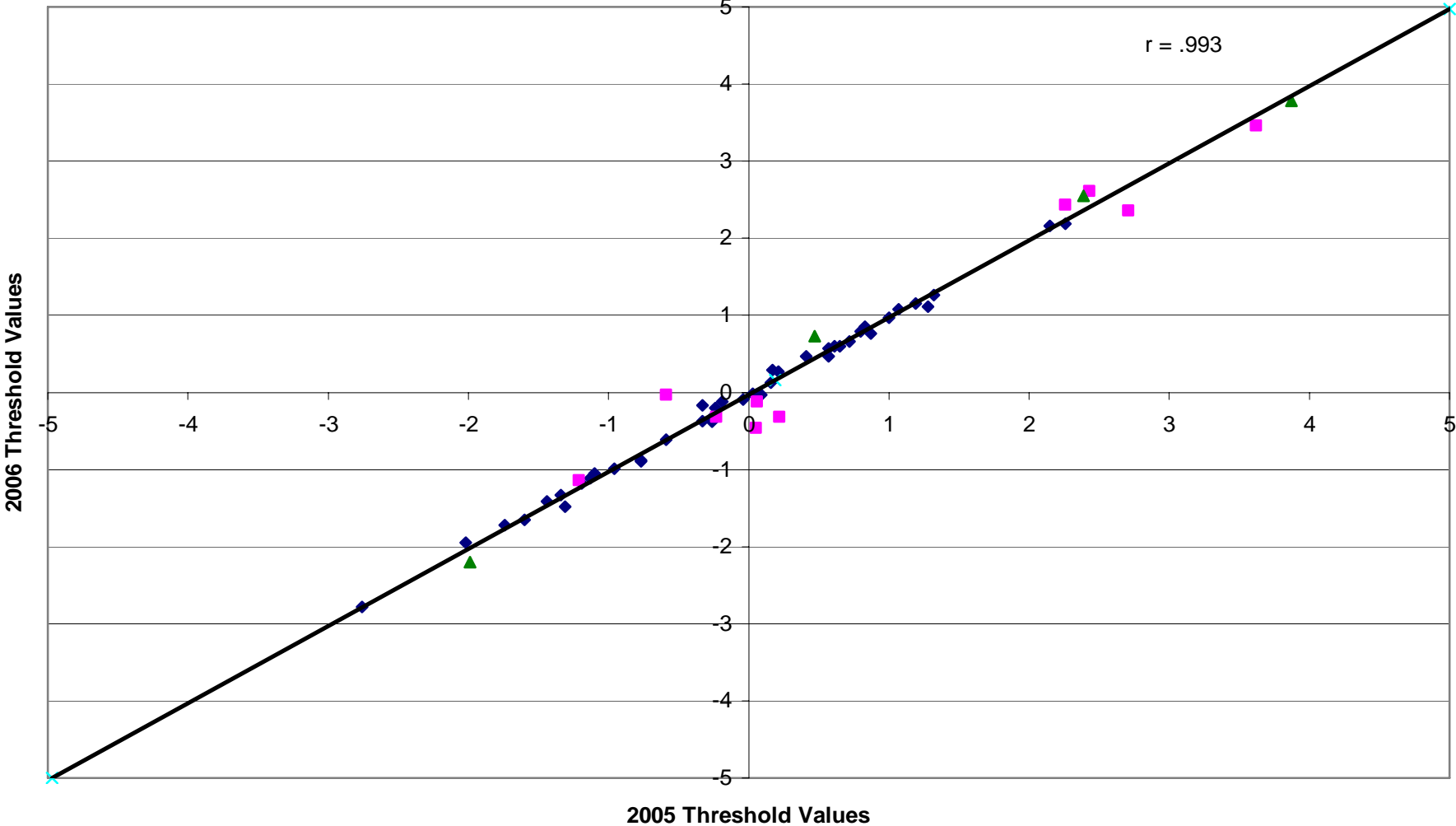
◆ Multiple Choice Items    ■ Short Answer Items    ▲ Extended Response Item    × 45 Degree Line Through the 2 Means

### Spring 2006 Grade 7 Reading Anchor Items



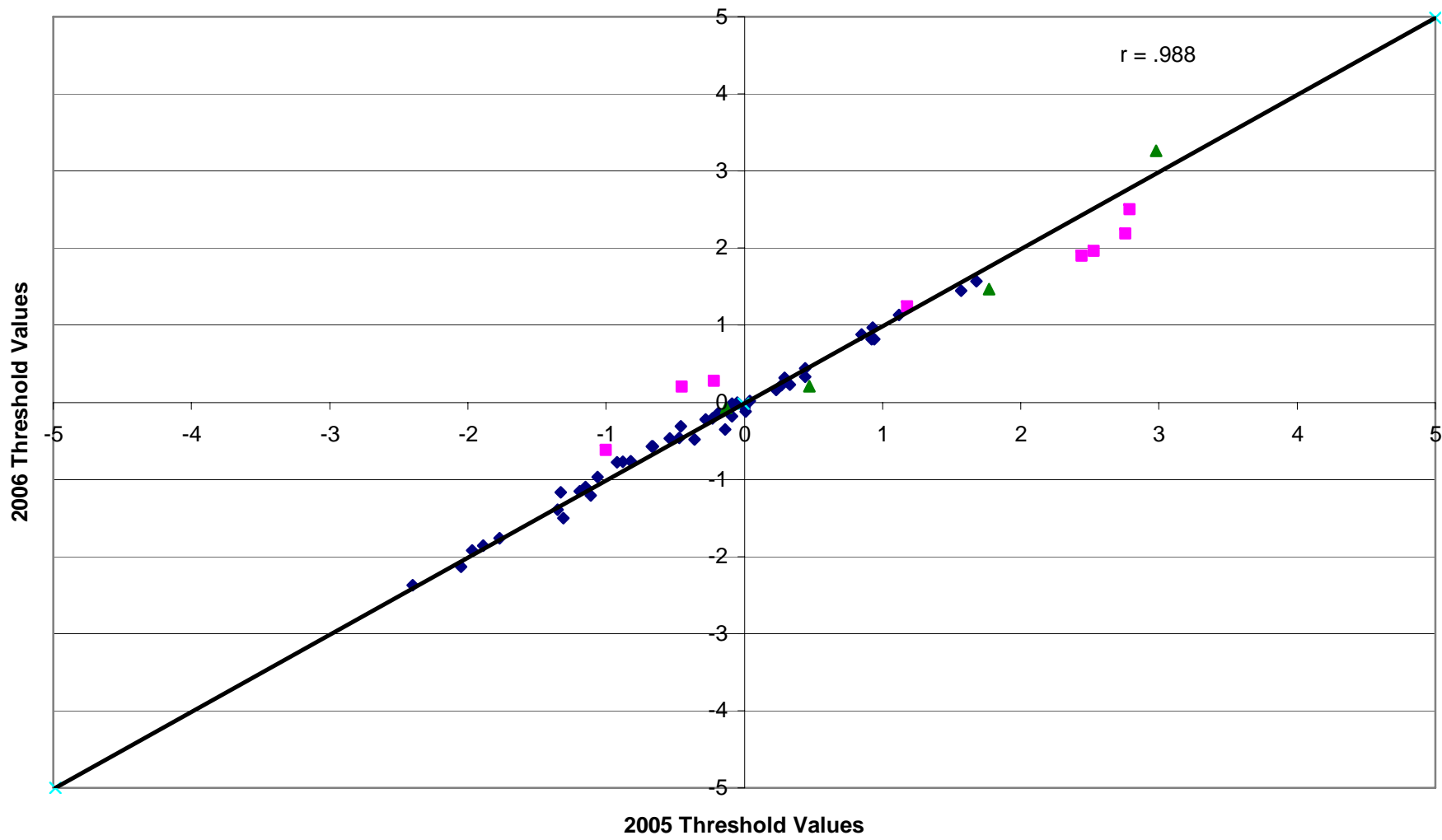
◆ Multiple Choice Items    ■ Short Answer Items    ▲ Extended Response Items    × 45 Degree Line Through the 2 Means

### Spring 2006 Grade 8 Reading Anchor Items



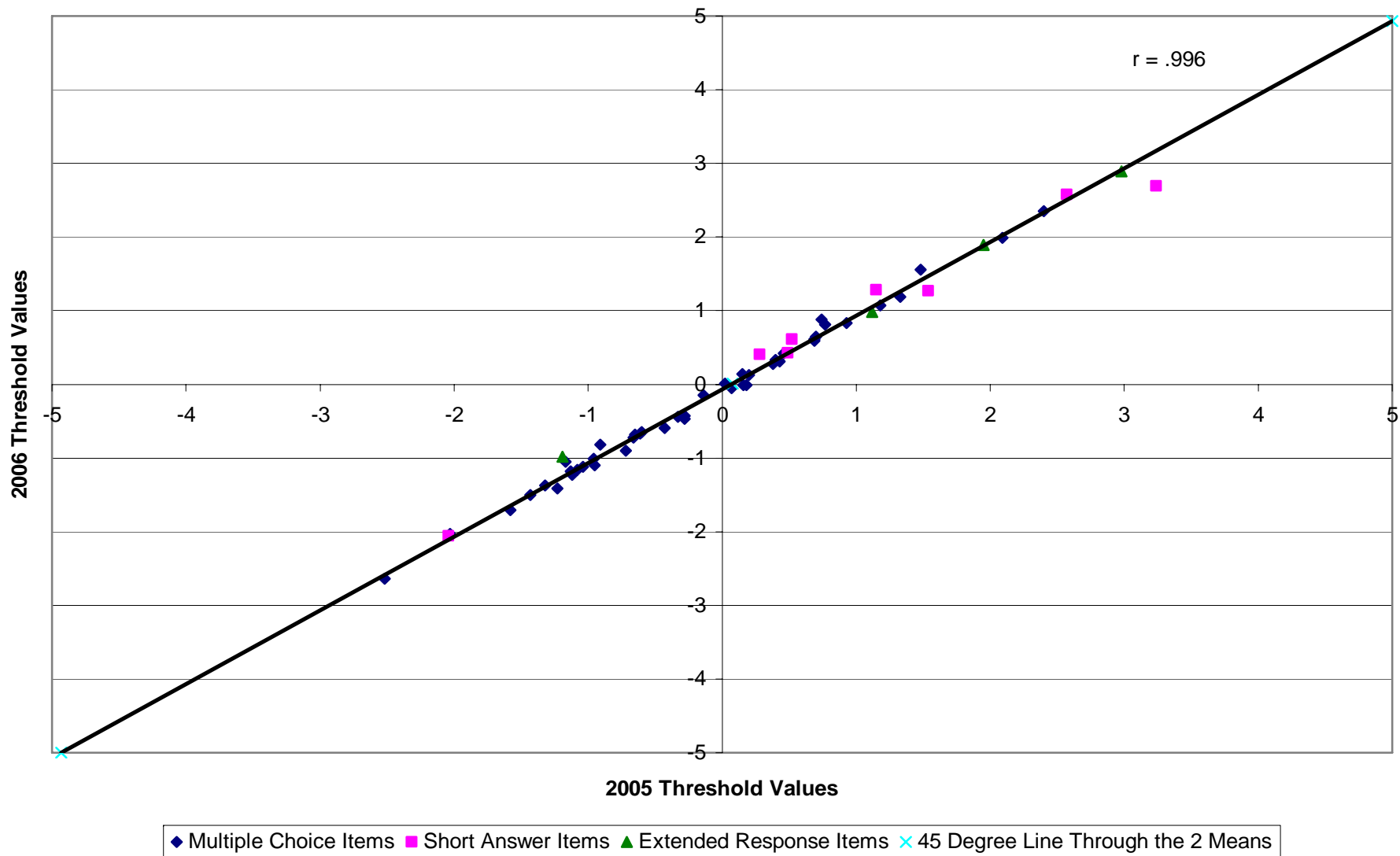
◆ Multipl Choice Items    ■ Short Answer Items    ▲ Extended Response Items    × 45 Degree Line Through the 2 Means

### Spring 2006 Grade 9 Reading Anchor Items

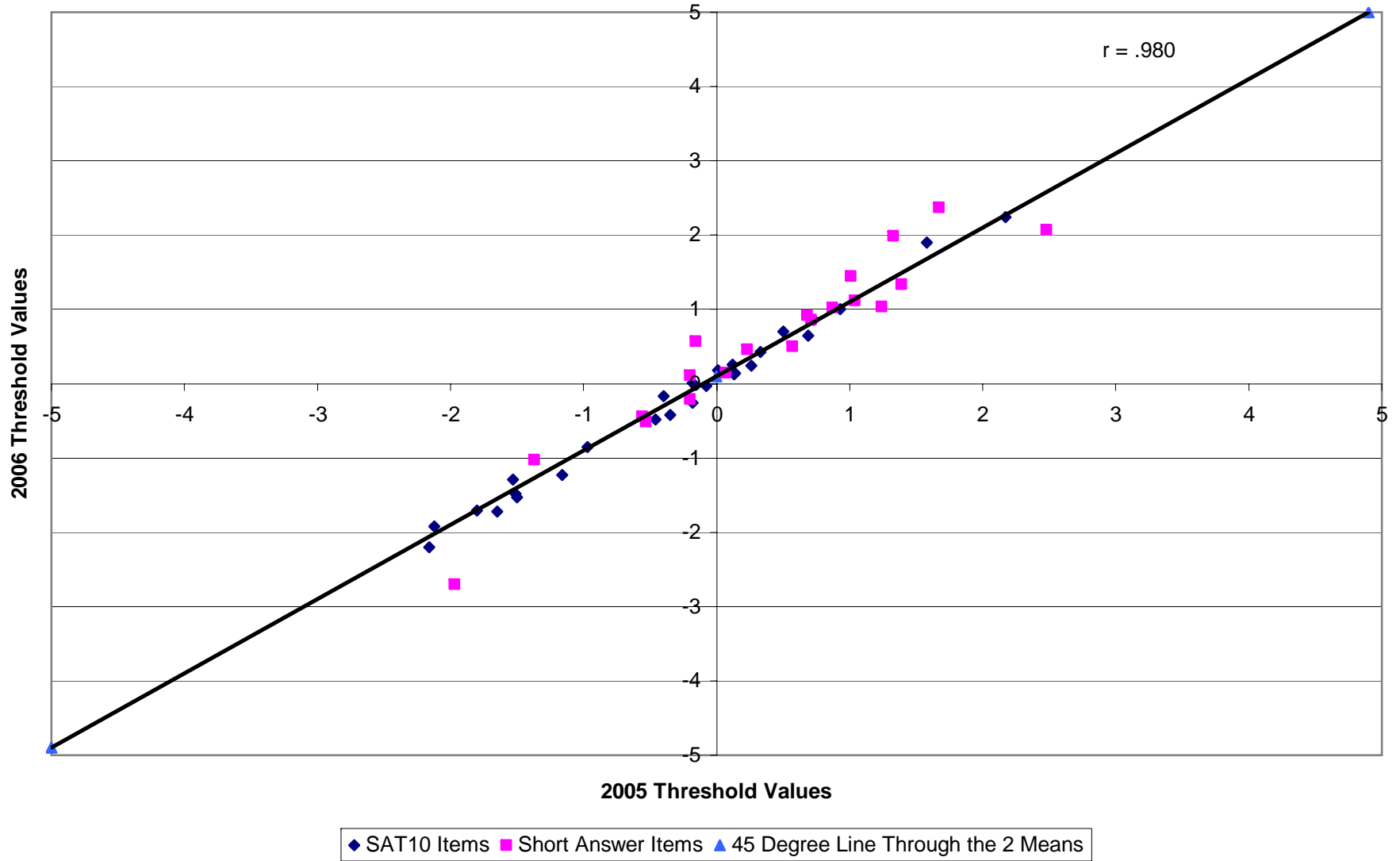


◆ Multiple Choice Items    ■ Short Answer Items    ▲ Extended Response Item    × 45 Degree Line Through the 2 Means

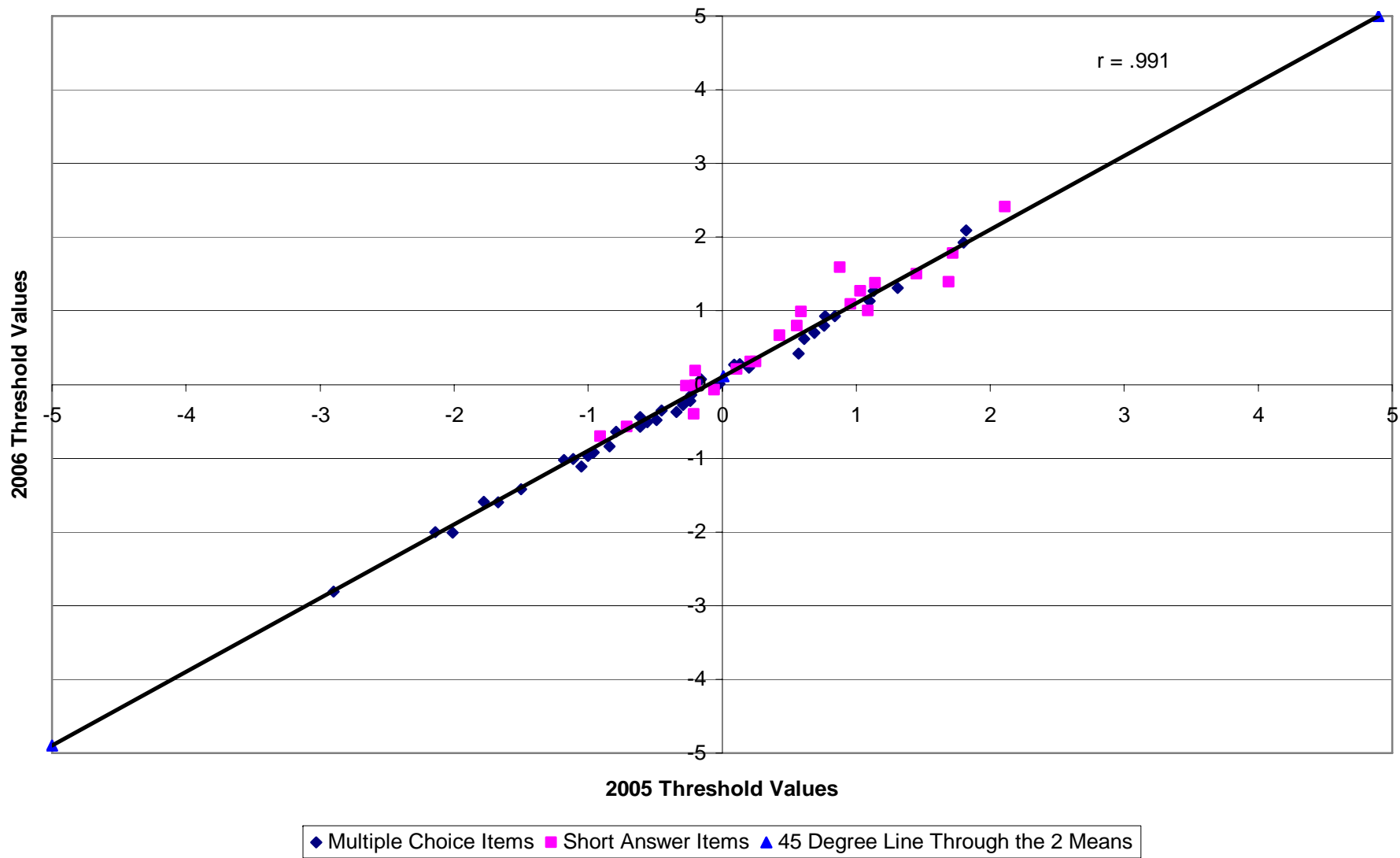
### Spring 2006 Grade 10 Reading Anchor Items



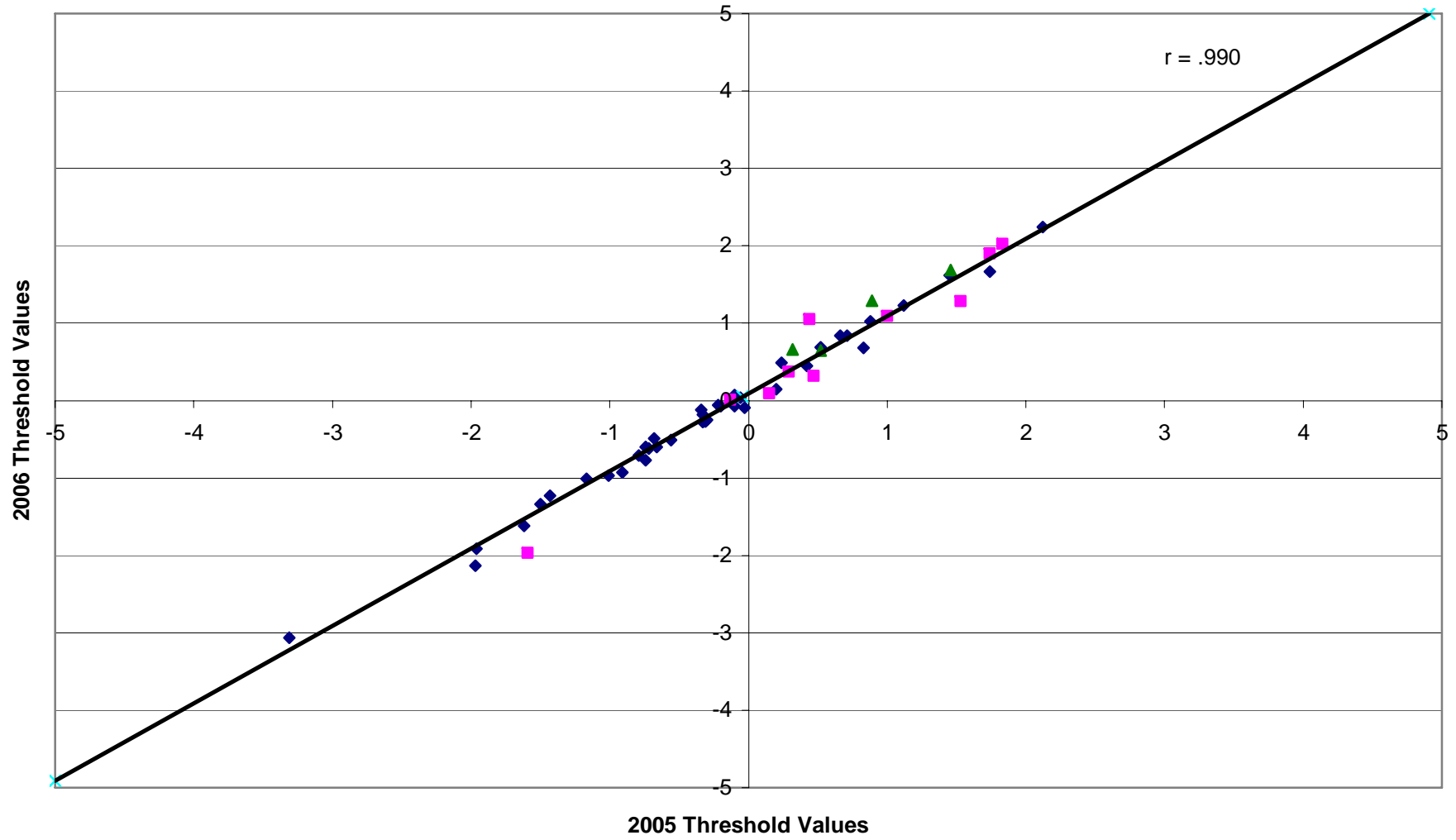
### Spring 2006 Grade 2 Mathematics Anchor Items



### Spring 2006 Grade 3 Mathematics Anchor Items

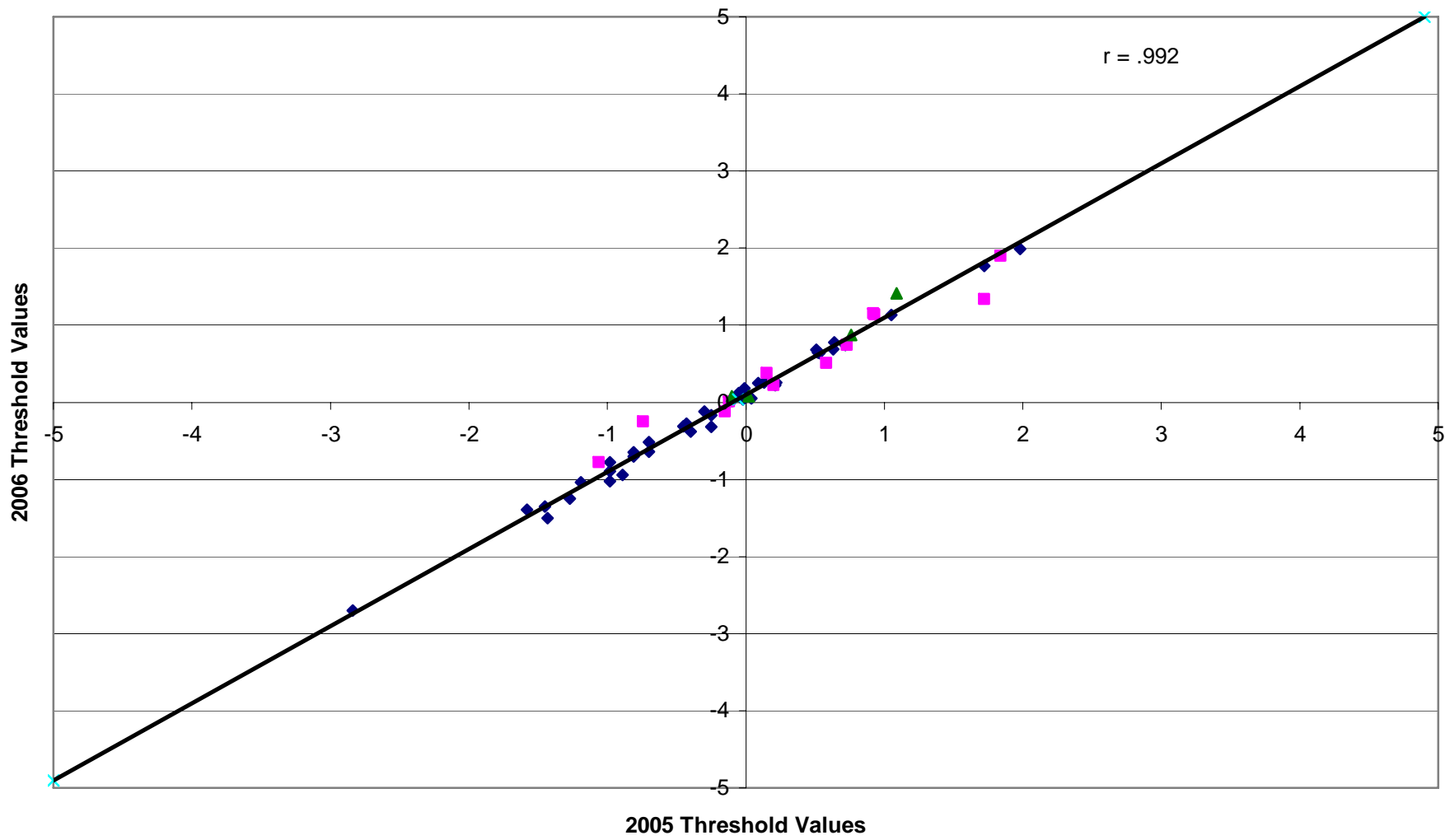


### Spring 2006 Grade 4 Mathematics Anchor Items



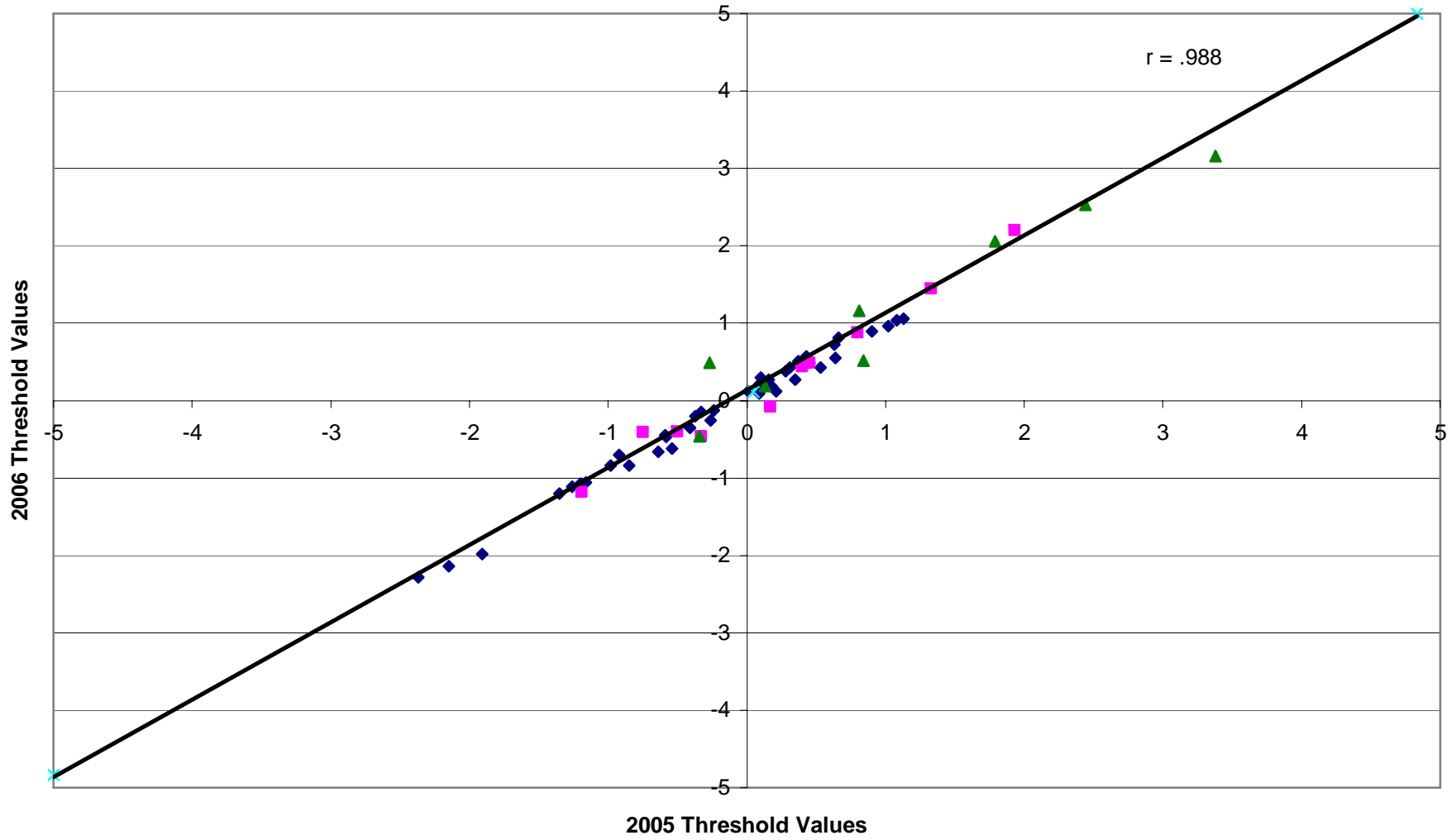
◆ Multiple Choice Items    ■ Short Answer Items    ▲ Extended Response Item    × 45 Degree Line Through the 2 Means

### Spring 2006 Grade 5 Mathematics Anchor Items



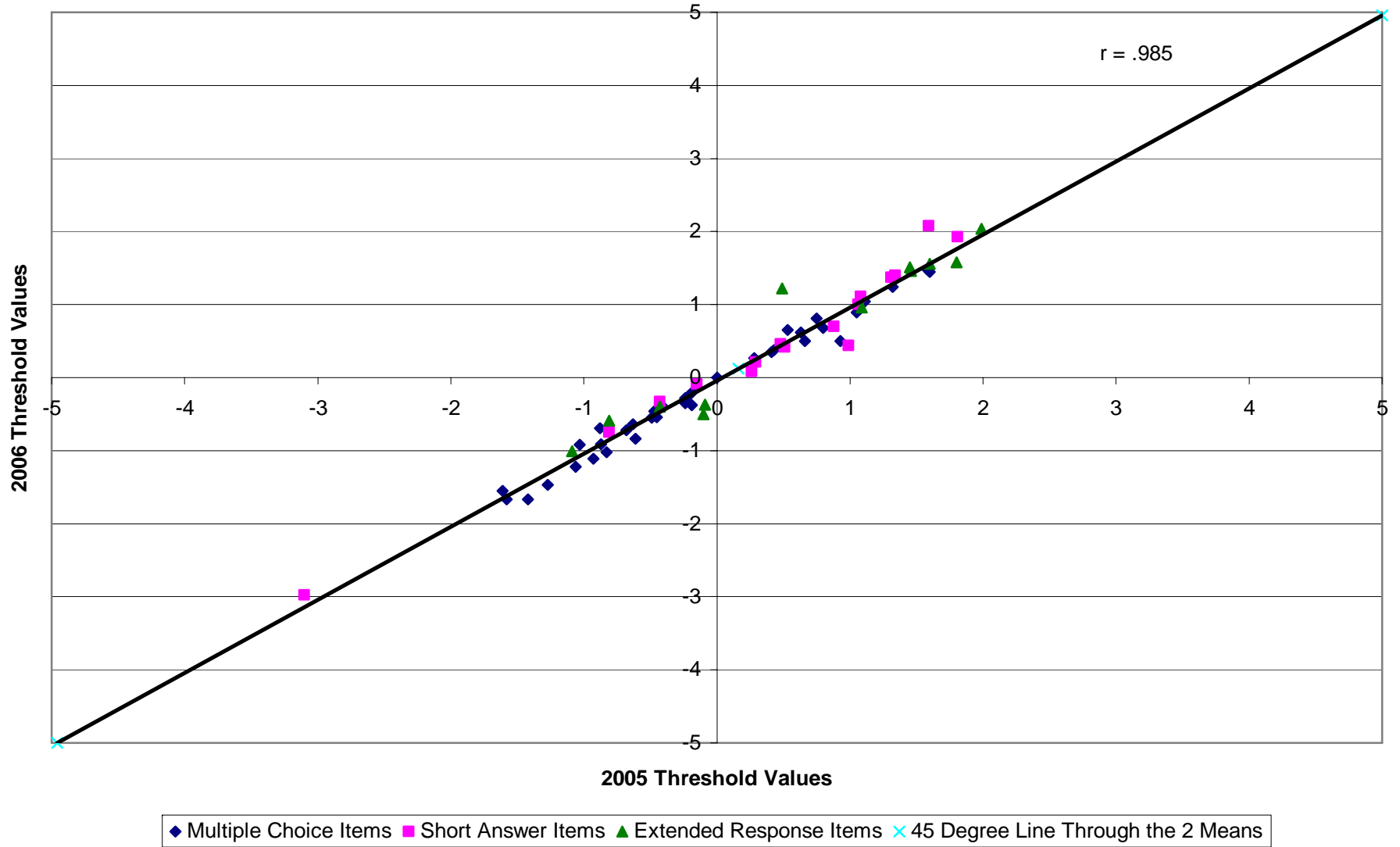
◆ Multiple choice Items    ■ Short Answer Items    ▲ Extended Response Items    × 45 Degree Line Through the 2 Means

### Spring 2006 Grade 6 Mathematics Anchor Items

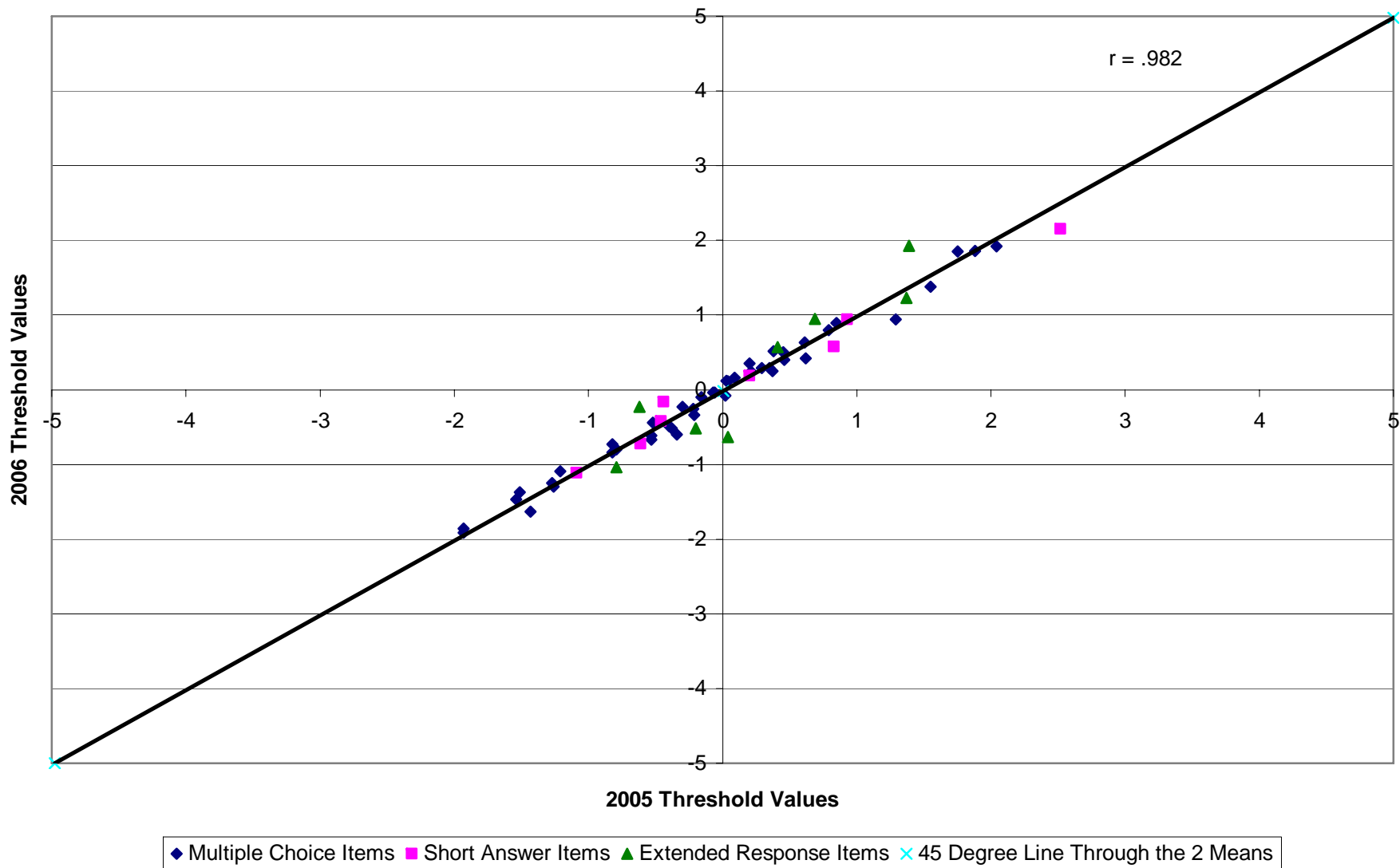


◆ Multiple Choice Items    ■ Short Answer Items    ▲ Extended Response Items    × 45 Degree Line Through the 2 Means

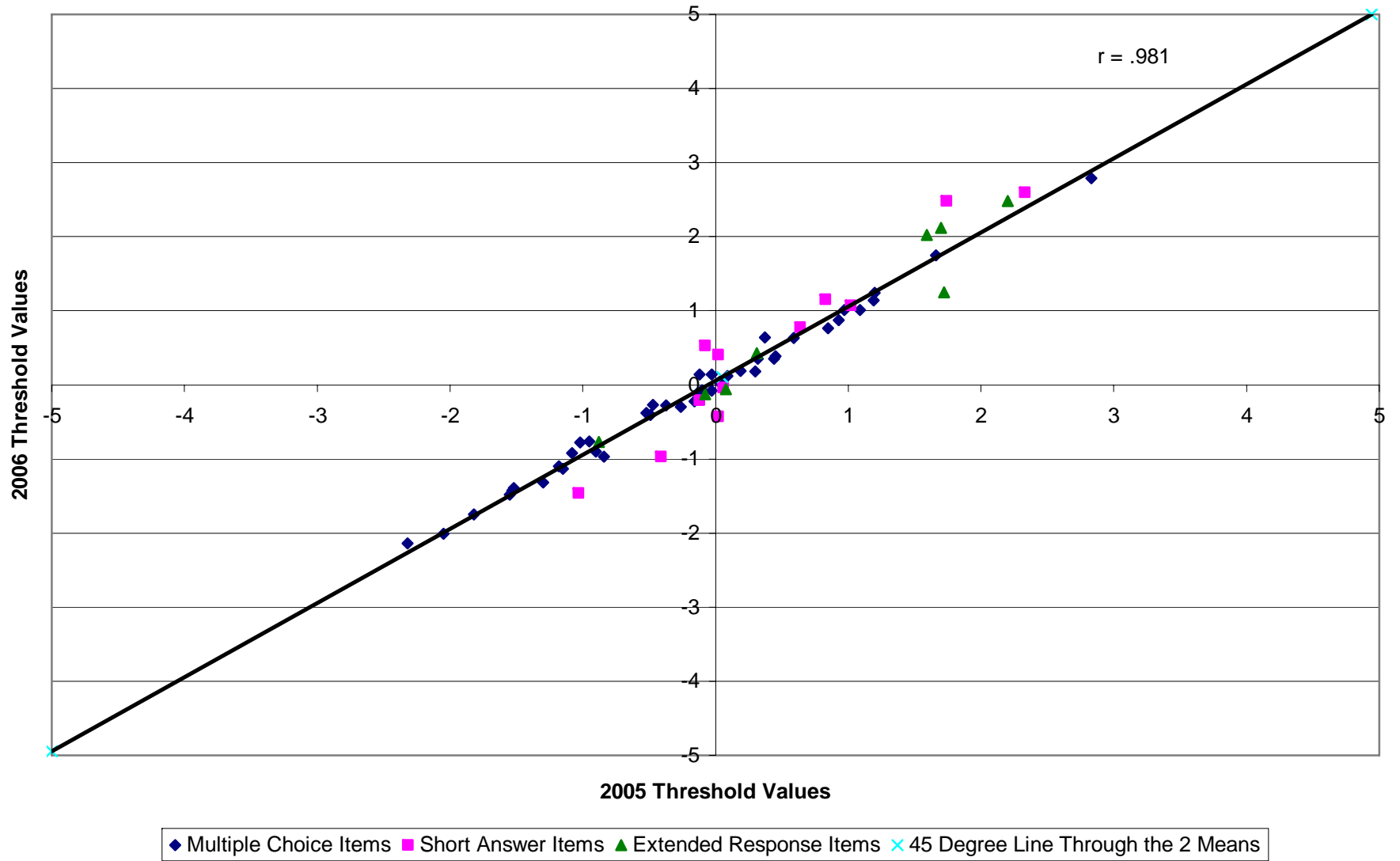
### Spring 2006 Grade 7 Mathematics Anchor Items



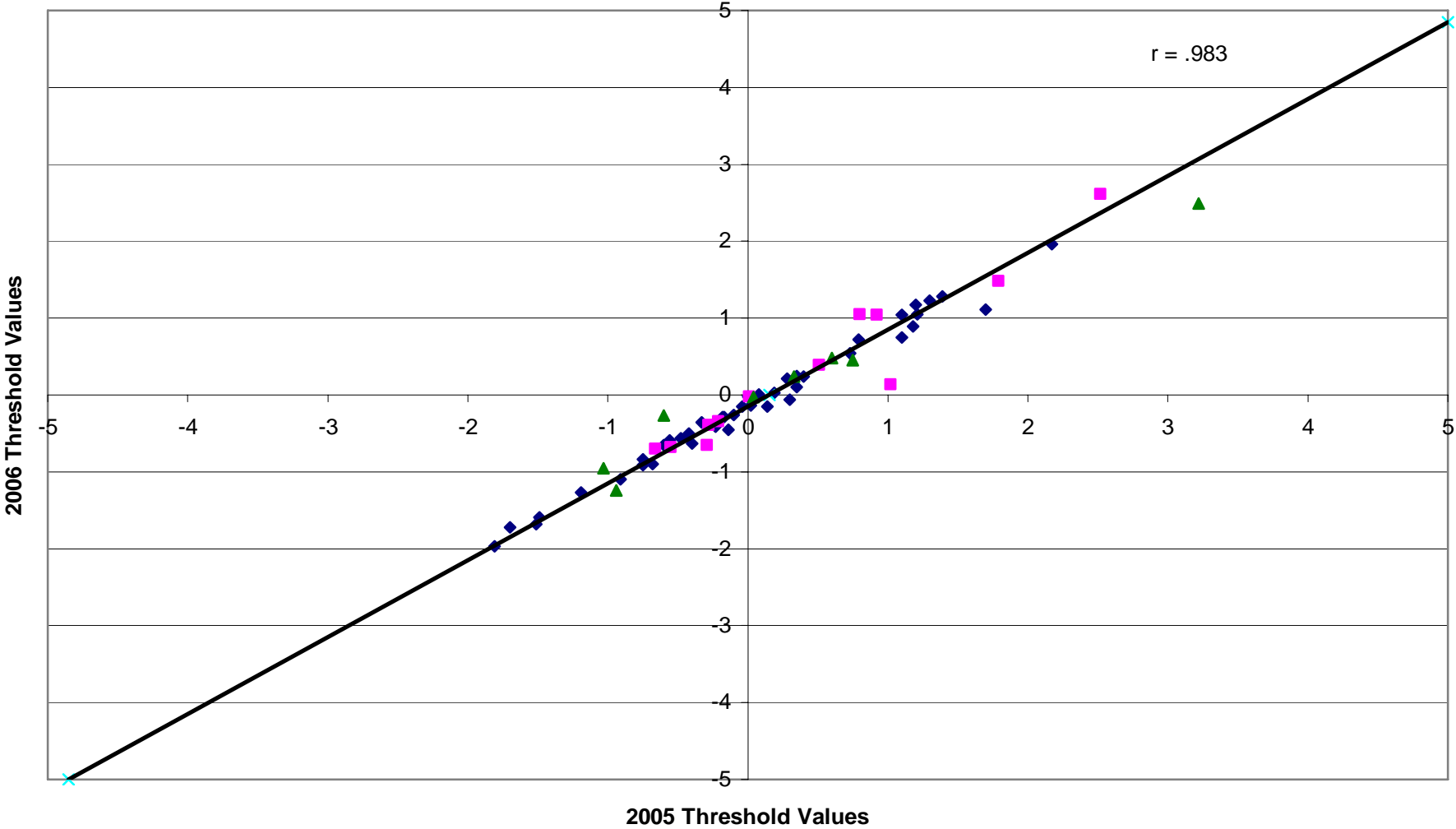
### Spring 2006 Grade 8 Mathematics Anchor Items



### Spring 2006 Grade 9 Mathematics Anchor Items

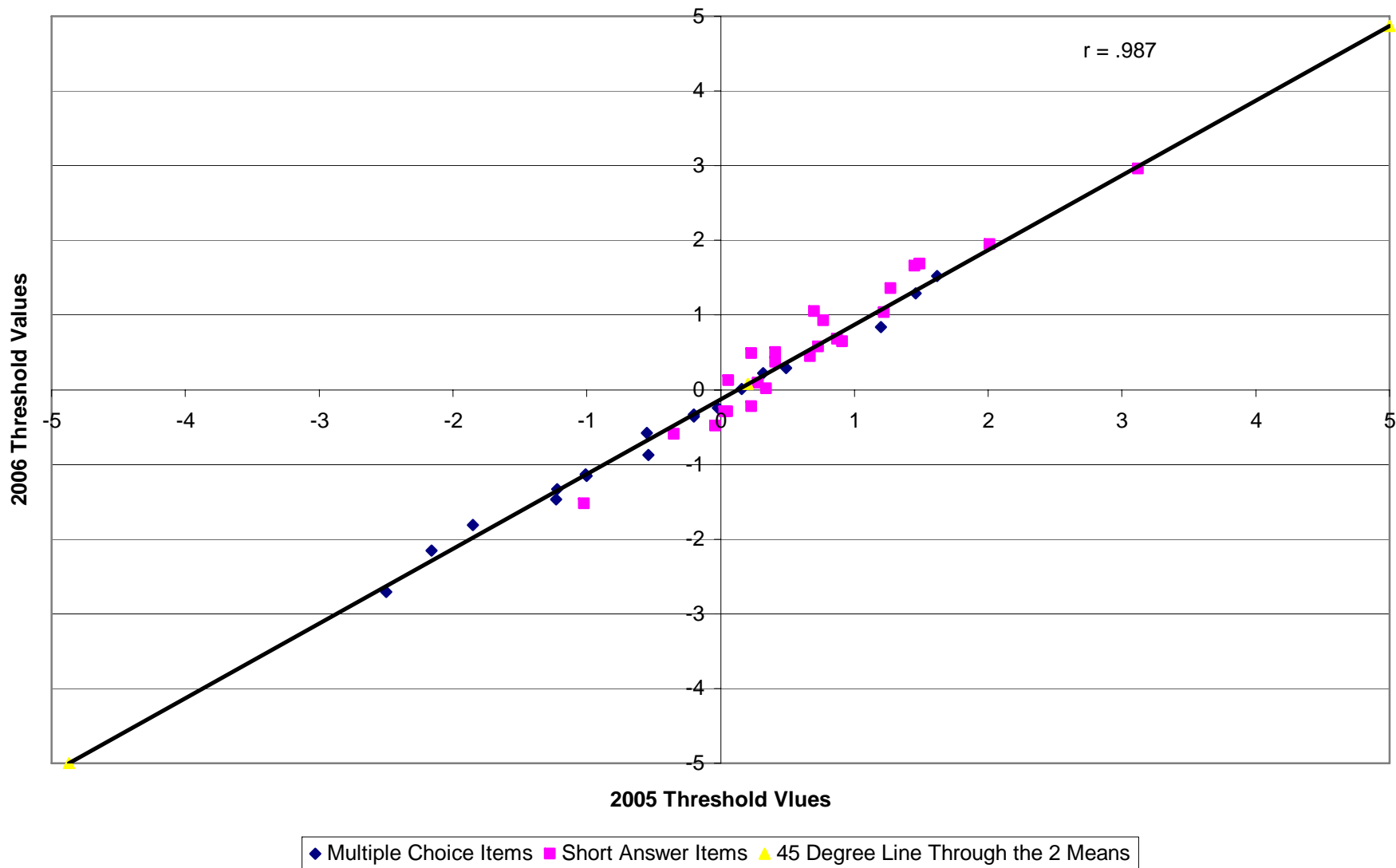


### Spring 2006 Grade 10 Mathematics Anchor Items

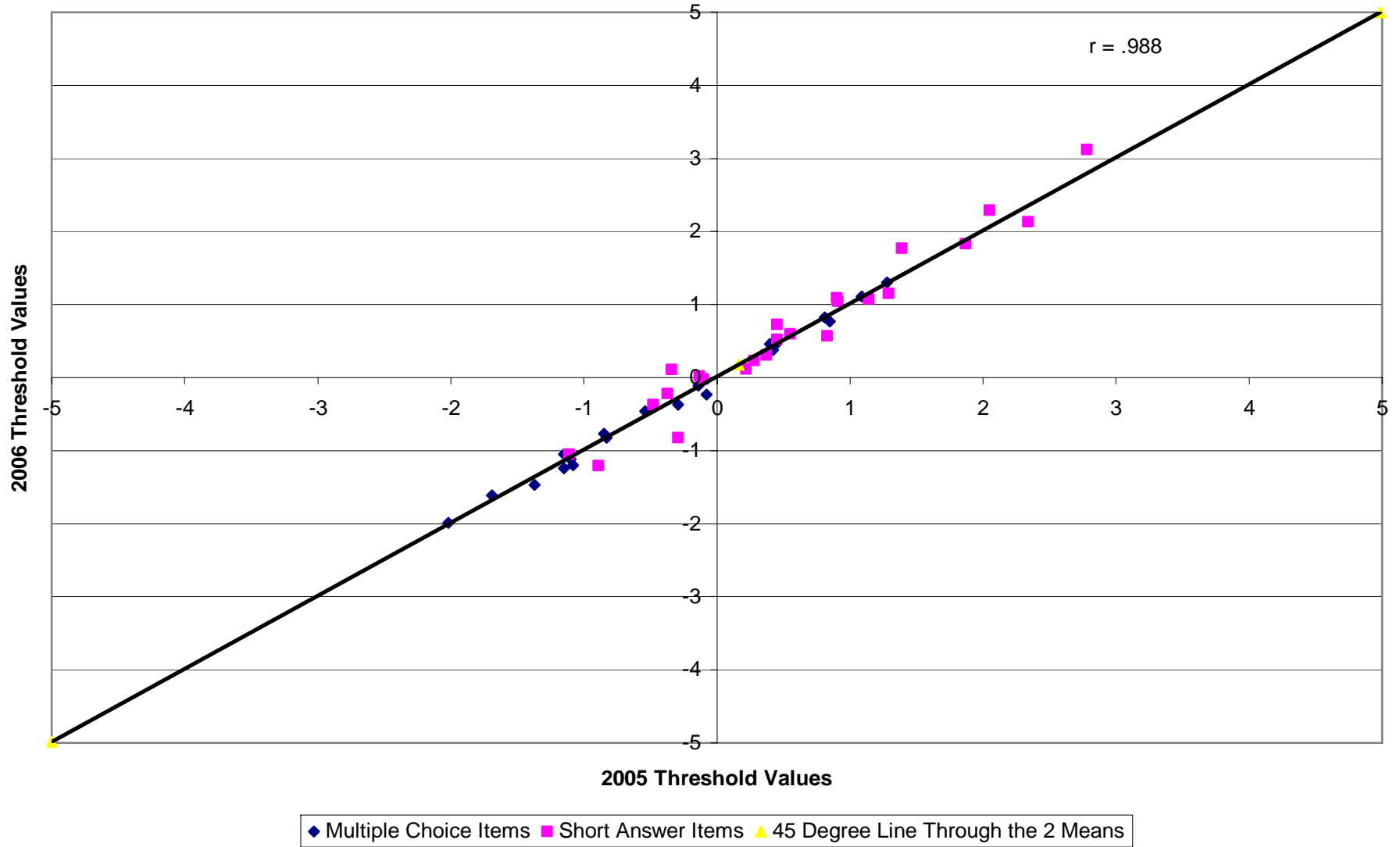


◆ Multiple Choice Items    ■ Short Answer Items    ▲ Extended Response Items    × 45 Degree Line Through the 2 Means

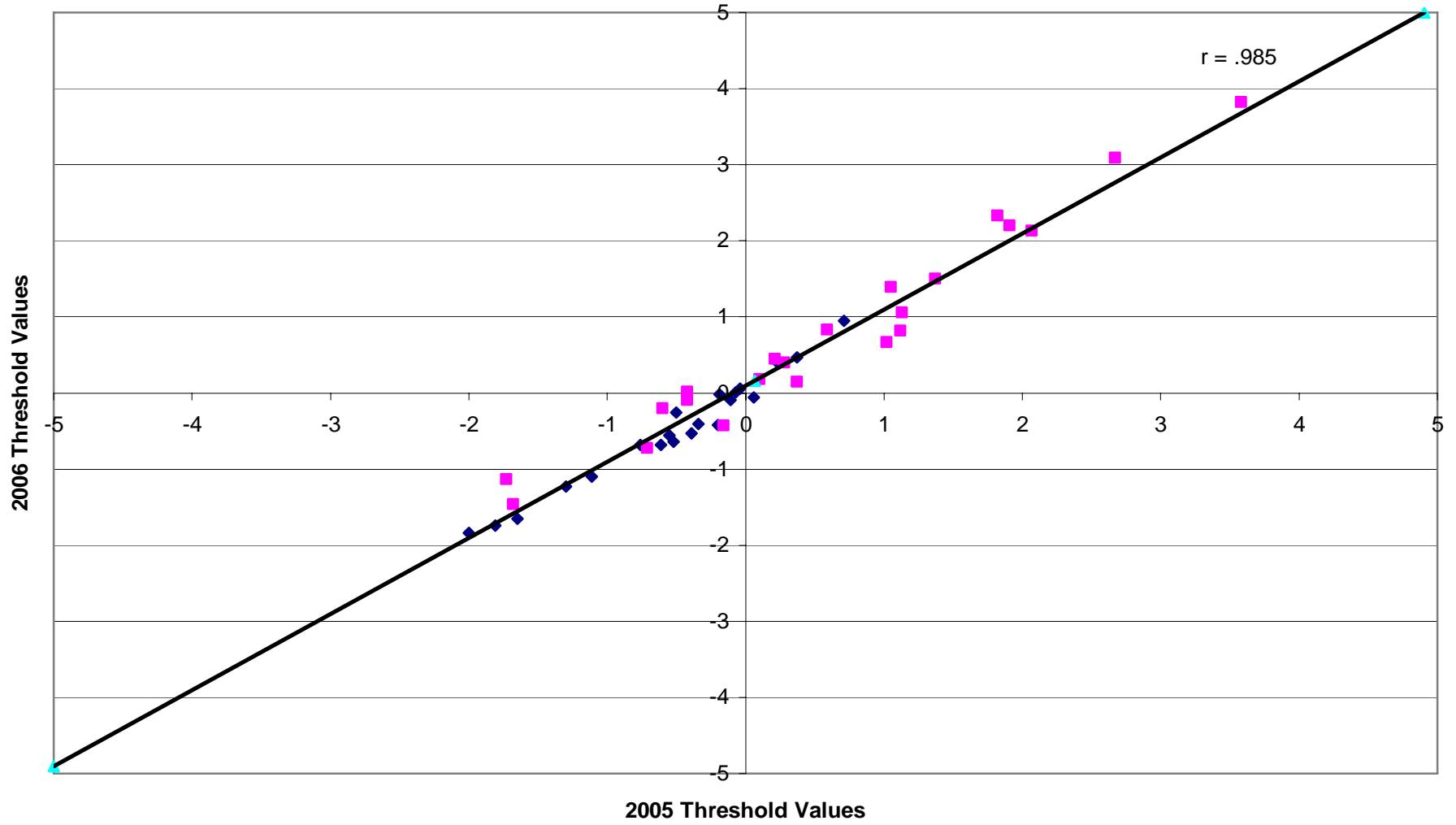
### Fall 2006 Grade 4 Science Anchor Items



### Fall 2006 Grade 6 Science Anchor Items

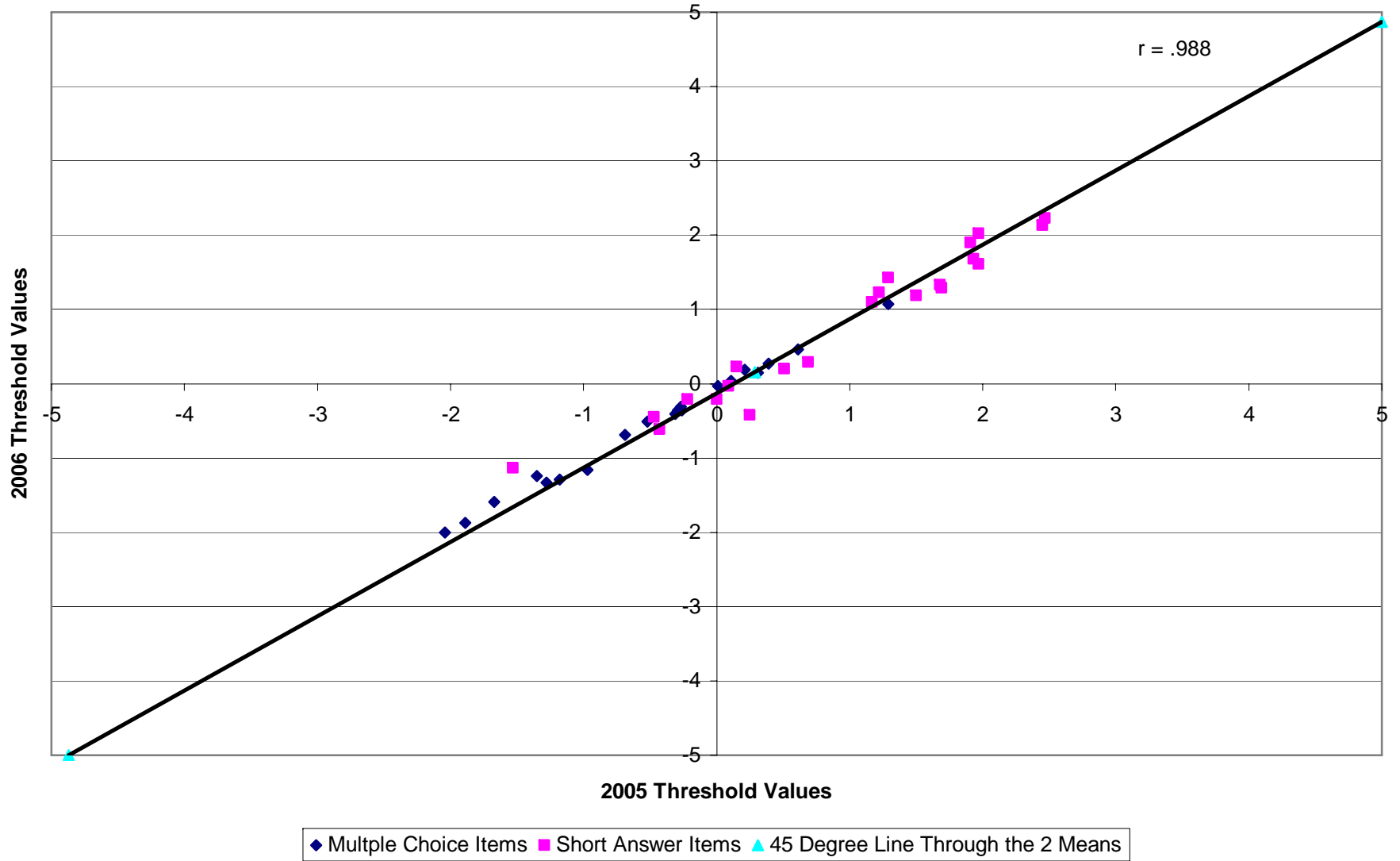


### Grade 8 Science Anchor Items

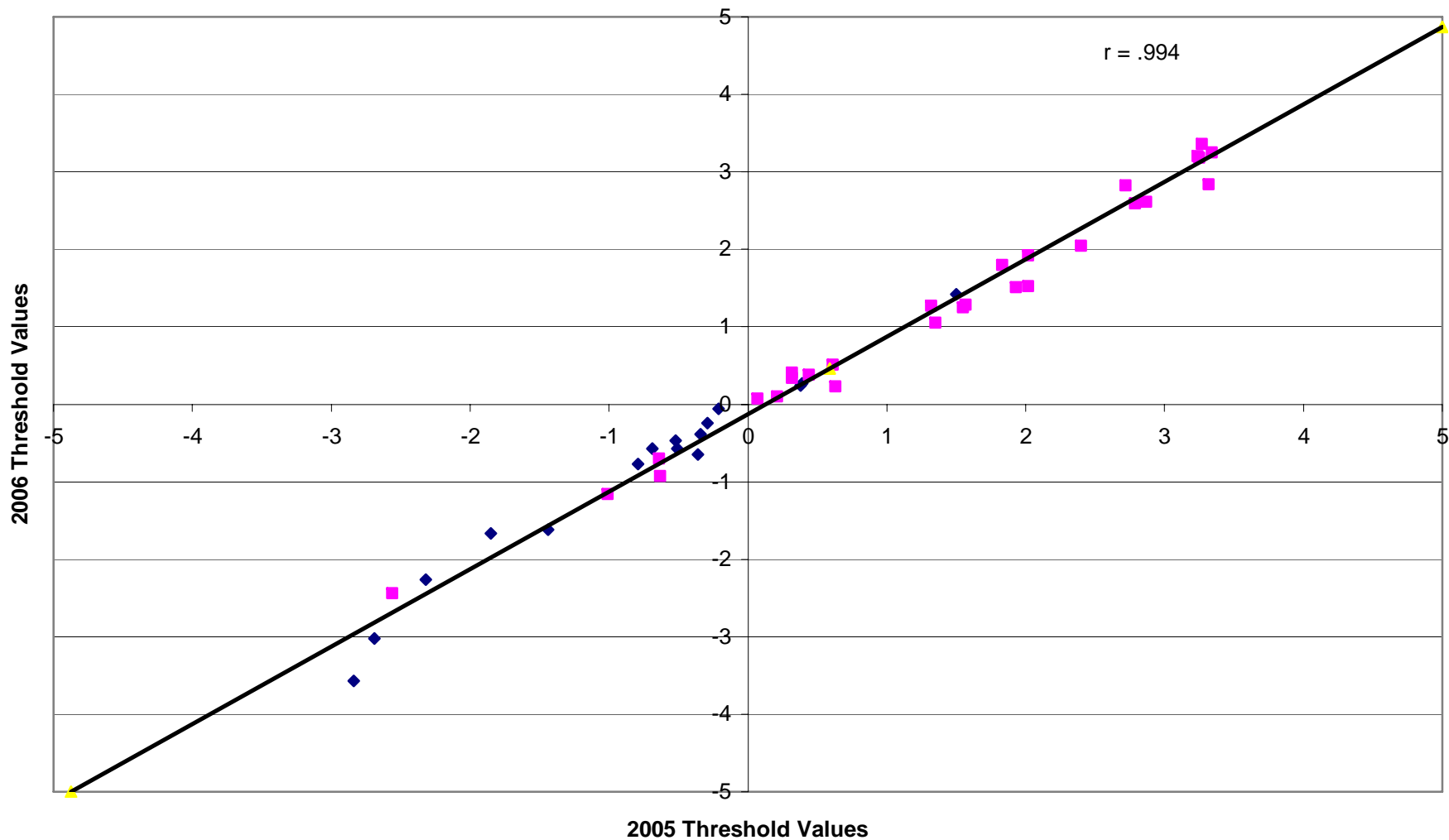


◆ Multiple Choice Items    ■ Short Answer Items    ▲ 45 Degree Line Through the 2 Means

### Grade 11 Science Anchor Items

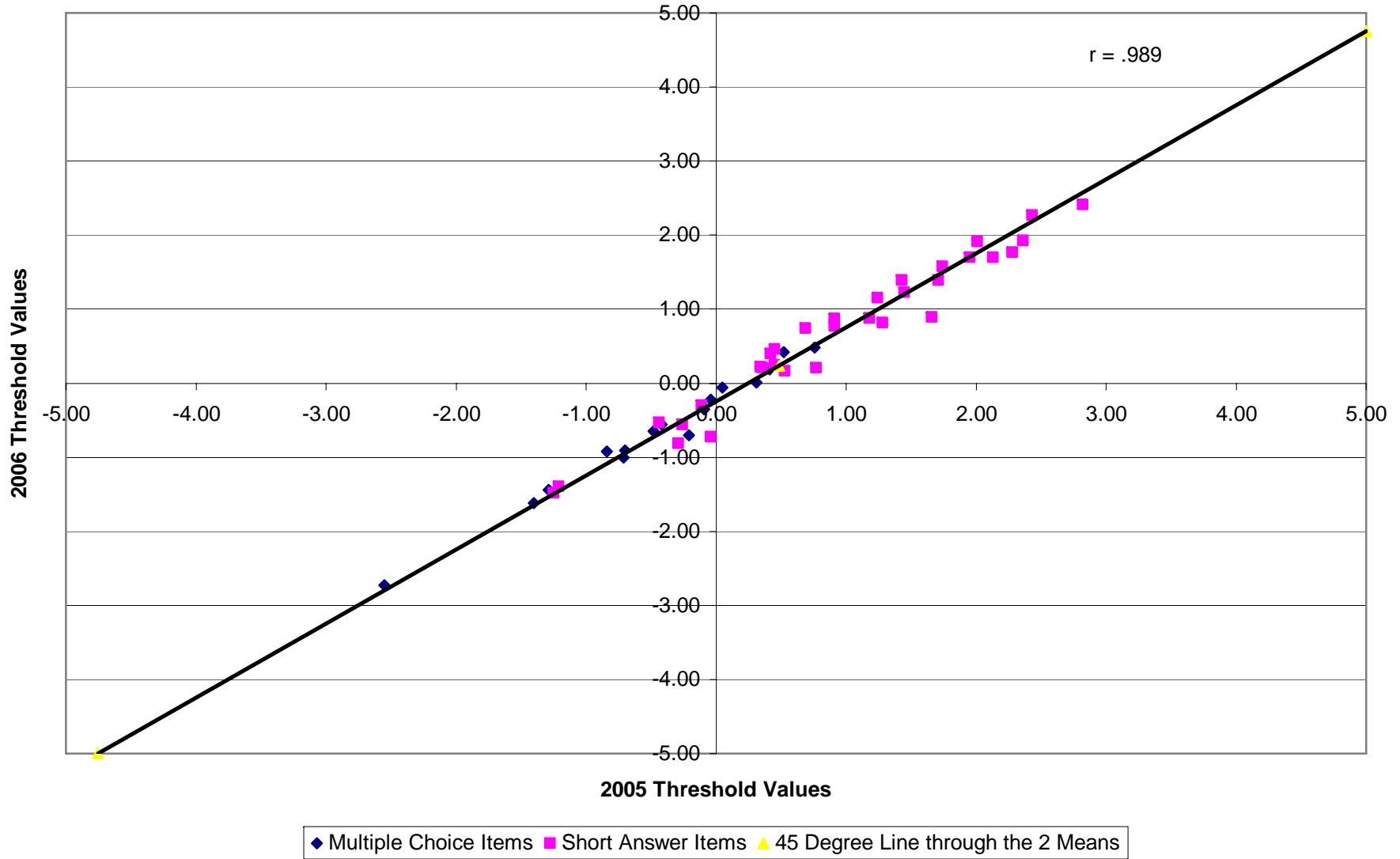


### Fall 2006 Grade 4 Social Studies Anchor Items

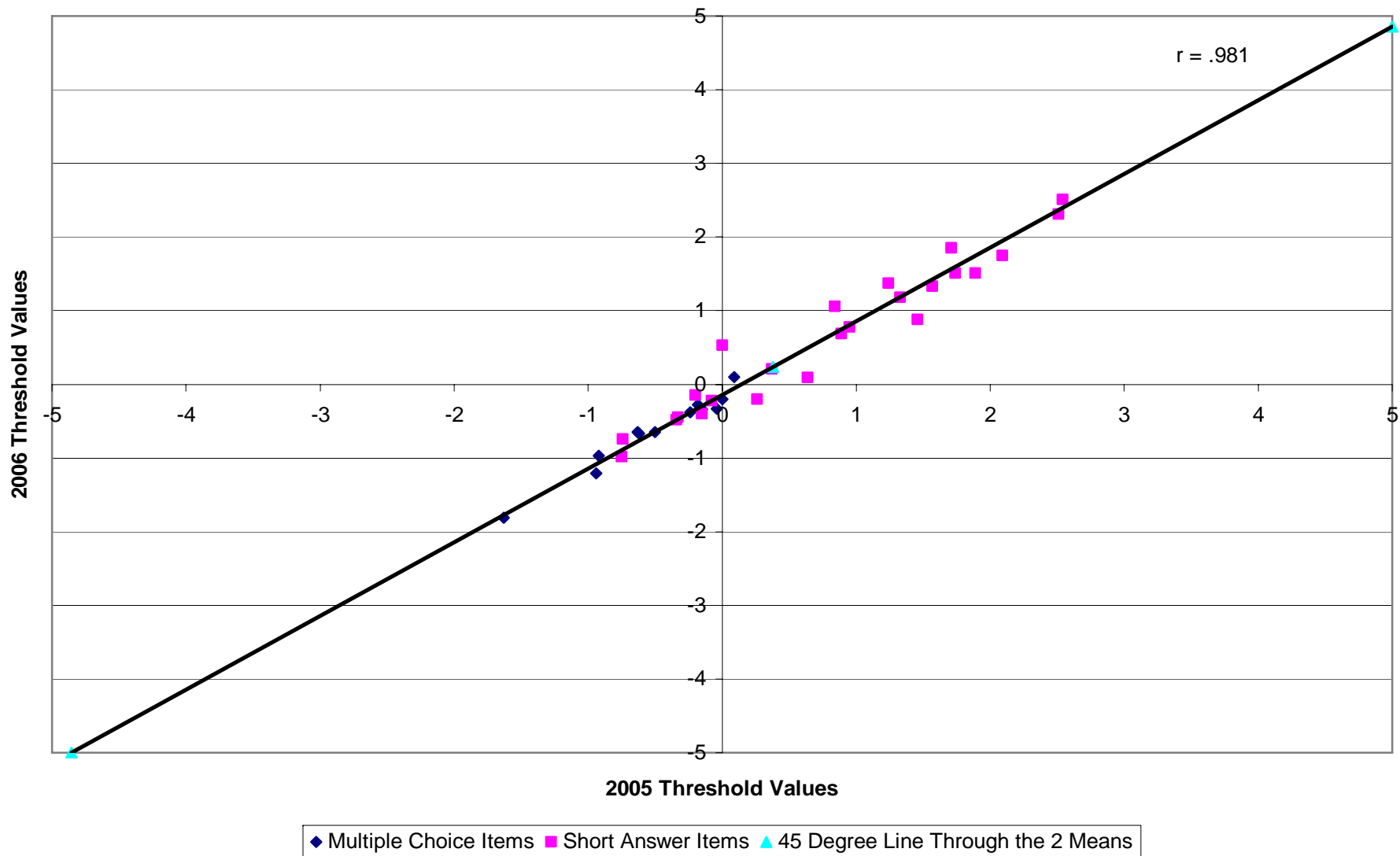


◆ Multiple Choice Items    ■ Short Answer Items    ▲ 45 Degree Line Through the 2 Means

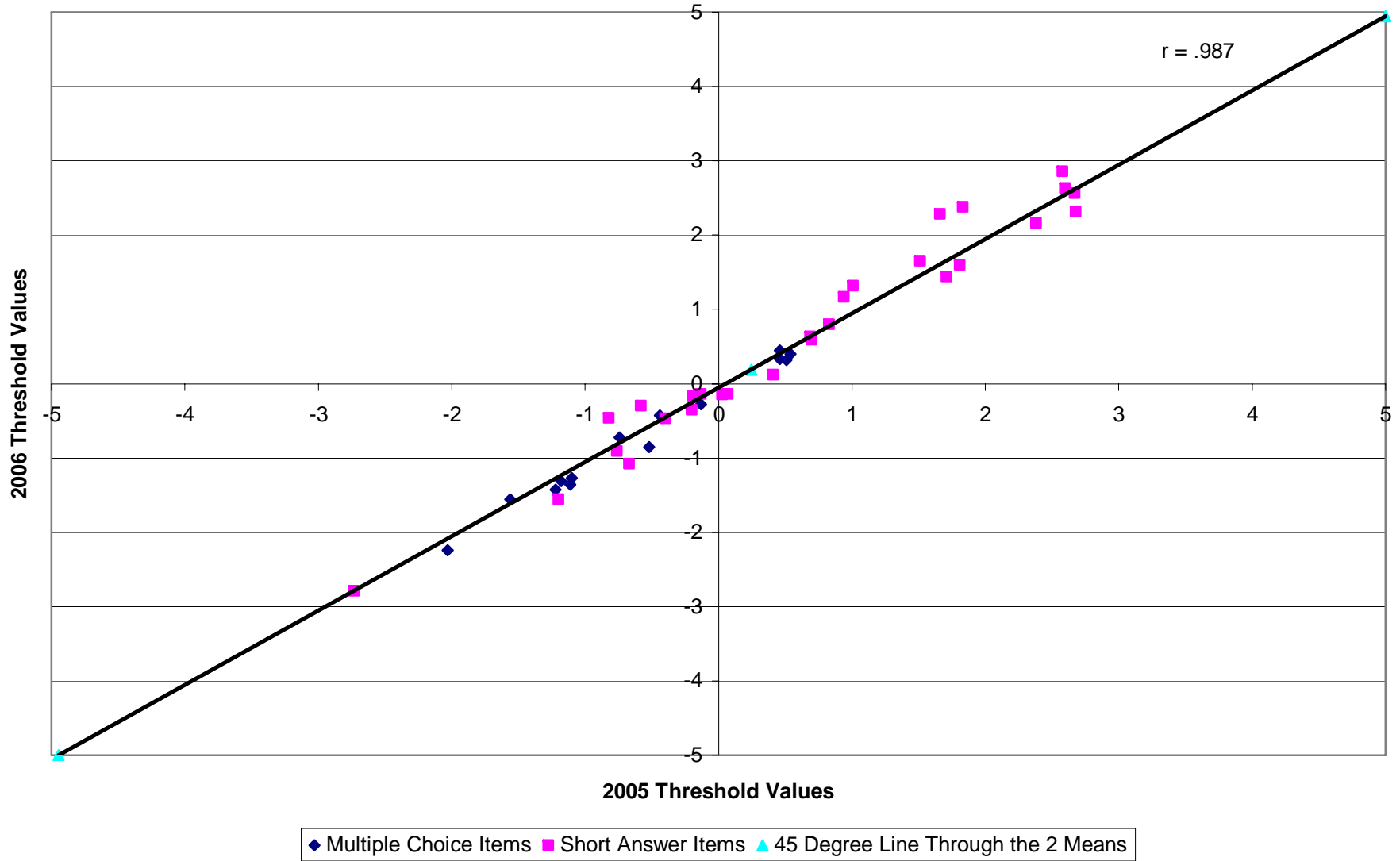
### Fall 2006 Grade 6 Social Studies Anchor Items



### Grade 8 Social Studies Anchor Items



### Grade 11 Social Studies Anchor Items



## **Appendix H**

### **Conversion Tables from Raw Scores to Scale Scores By Test and Grade**

Reading Grade 2			Reading Grade 3			Reading Grade 4			Reading Grade 5			Reading Grade 6		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
0	155	57	0	176	57	0	200	57	0	215	57	1	236	41
1	184	41	1	205	41	1	228	41	1	243	41	2	266	30
2	214	30	2	234	29	2	257	29	2	272	29	3	284	25
3	232	25	3	252	24	3	274	24	3	290	24	4	297	22
4	246	22	4	265	21	4	287	21	4	303	21	5	308	20
5	257	20	5	275	19	5	297	19	5	313	19	6	317	18
6	267	19	6	283	18	6	306	18	6	321	18	7	325	17
7	275	18	7	291	17	7	313	16	7	329	17	8	332	16
8	283	17	8	298	16	8	319	16	8	335	16	9	338	16
9	290	17	9	304	15	9	325	15	9	341	15	10	344	15
10	297	16	10	309	15	10	330	14	10	347	14	11	350	15
11	303	16	11	314	14	11	335	14	11	352	14	12	355	14
12	309	15	12	319	14	12	340	13	12	356	14	13	360	14
13	315	15	13	324	13	13	344	13	13	361	13	14	364	13
14	321	15	14	328	13	14	348	12	14	365	13	15	369	13
15	327	15	15	332	13	15	352	12	15	369	13	16	373	13
16	332	15	16	336	12	16	355	12	16	373	12	17	377	13
17	337	15	17	339	12	17	359	12	17	377	12	18	381	12
18	343	15	18	343	12	18	362	11	18	380	12	19	385	12
19	348	15	19	346	12	19	365	11	19	384	12	20	388	12
20	353	15	20	350	11	20	368	11	20	387	11	21	392	12
21	359	15	21	353	11	21	371	11	21	390	11	22	396	12
22	364	15	22	356	11	22	374	11	22	393	11	23	399	12
23	369	15	23	359	11	23	377	11	23	396	11	24	402	12
24	375	15	24	362	11	24	380	10	24	399	11	25	406	11
25	381	15	25	365	11	25	383	10	25	402	11	26	409	11
26	387	15	26	368	11	26	385	10	26	405	11	27	412	11
27	393	16	27	371	11	27	388	10	27	408	11	28	415	11
28	399	16	28	374	11	28	390	10	28	411	11	29	418	11
29	405	16	29	377	10	29	393	10	29	414	11	30	421	11

Reading Grade 2			Reading Grade 3			Reading Grade 4			Reading Grade 5			Reading Grade 6		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
30	412	17	30	379	10	30	395	10	30	417	10	31	424	11
31	419	17	31	382	10	31	398	10	31	419	10	32	427	11
32	427	18	32	385	10	32	400	10	32	422	10	33	430	11
33	435	18	33	387	10	33	403	10	33	425	10	34	433	11
34	444	19	34	390	10	34	405	10	34	427	10	35	436	11
35	453	20	35	393	10	35	407	10	35	430	10	36	439	11
36	463	21	36	395	10	36	410	10	36	433	10	37	442	11
37	474	21	37	398	10	37	412	10	37	435	10	38	444	11
38	486	22	38	400	10	38	415	10	38	438	10	39	447	11
39	499	23	39	403	10	39	417	10	39	440	10	40	450	11
40	514	25	40	406	10	40	419	10	40	443	10	41	453	11
41	530	27	41	408	10	41	421	10	41	446	10	42	455	11
42	551	31	42	411	10	42	424	10	42	448	10	43	458	11
43	583	42	43	413	10	43	426	10	43	451	10	44	461	11
44	613	58	44	416	10	44	428	10	44	453	10	45	464	11
			45	418	10	45	431	10	45	456	10	46	467	11
			46	421	10	46	433	10	46	459	10	47	469	11
			47	424	10	47	435	10	47	461	10	48	472	11
			48	426	10	48	437	10	48	464	10	49	475	11
			49	429	10	49	440	10	49	467	10	50	478	11
			50	432	10	50	442	10	50	469	10	51	481	11
			51	434	10	51	444	10	51	472	11	52	484	11
			52	437	10	52	447	10	52	475	11	53	487	11
			53	440	11	53	449	10	53	478	11	54	490	11
			54	443	11	54	452	10	54	481	11	55	493	11
			55	445	11	55	454	10	55	484	11	56	496	11
			56	448	11	56	456	10	56	487	11	57	499	11
			57	451	11	57	459	10	57	490	11	58	502	11
			58	454	11	58	462	10	58	493	11	59	505	11

Reading Grade 2			Reading Grade 3			Reading Grade 4			Reading Grade 5			Reading Grade 6		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
			59	457	11	59	464	10	59	496	11	60	508	12
			60	460	11	60	467	10	60	499	11	61	512	12
			61	463	11	61	469	10	61	502	12	62	515	12
			62	467	11	62	472	11	62	506	12	63	519	12
			63	470	12	63	475	11	63	509	12	64	523	12
			64	473	12	64	478	11	64	513	12	65	526	12
			65	477	12	65	481	11	65	517	12	66	530	13
			66	480	12	66	484	11	66	520	12	67	534	13
			67	484	12	67	487	11	67	524	13	68	539	13
			68	488	13	68	491	12	68	529	13	69	543	14
			69	492	13	69	494	12	69	533	13	70	548	14
			70	496	13	70	498	12	70	537	14	71	553	14
			71	501	14	71	502	13	71	542	14	72	558	15
			72	506	14	72	506	13	72	547	14	73	564	16
			73	511	15	73	510	13	73	552	15	74	571	16
			74	517	15	74	514	14	74	558	15	75	577	17
			75	523	16	75	519	14	75	564	16	76	585	18
			76	530	17	76	524	15	76	571	17	77	594	19
			77	537	18	77	530	15	77	578	17	78	604	21
			78	546	19	78	536	16	78	586	18	79	616	23
			79	556	21	79	542	16	79	595	20	80	631	26
			80	568	23	80	549	17	80	606	22	81	650	30
			81	584	27	81	557	18	81	619	25	82	677	36
			82	605	32	82	567	20	82	637	30	83	717	46
			83	638	43	83	578	22	83	667	41	84	752	61
			84	670	59	84	591	25	84	695	57			
						85	609	30						
						86	639	41						
						87	668	57						

Reading Grade 7			Reading Grade 8			Reading Grade 9			Reading Grade 10		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
0	242	57	0	255	57	0	251	57	0	261	57
1	270	41	1	283	41	1	280	41	1	289	41
2	300	29	2	313	29	2	308	29	2	318	29
3	317	24	3	330	24	3	326	24	3	335	24
4	330	21	4	343	21	4	339	21	4	348	21
5	341	19	5	353	19	5	349	19	5	358	19
6	349	18	6	362	18	6	357	18	6	367	18
7	357	17	7	370	17	7	364	17	7	374	17
8	363	16	8	376	16	8	371	16	8	380	16
9	369	15	9	382	15	9	377	15	9	386	15
10	375	14	10	388	15	10	382	14	10	392	14
11	380	14	11	393	14	11	387	14	11	396	14
12	384	13	12	398	14	12	391	13	12	401	13
13	389	13	13	402	13	13	396	13	13	405	13
14	393	13	14	406	13	14	400	13	14	409	13
15	397	12	15	411	13	15	404	12	15	413	12
16	400	12	16	414	12	16	407	12	16	417	12
17	404	12	17	418	12	17	411	12	17	421	12
18	407	12	18	422	12	18	414	12	18	424	12
19	411	11	19	425	12	19	417	11	19	427	11
20	414	11	20	429	12	20	421	11	20	431	11
21	417	11	21	432	11	21	424	11	21	434	11
22	420	11	22	435	11	22	427	11	22	437	11
23	423	11	23	438	11	23	429	11	23	440	11
24	426	11	24	442	11	24	432	11	24	443	11
25	429	11	25	445	11	25	435	10	25	445	11
26	431	10	26	448	11	26	438	10	26	448	10
27	434	10	27	450	11	27	440	10	27	451	10
28	437	10	28	453	11	28	443	10	28	454	10

Reading Grade 7			Reading Grade 8			Reading Grade 9			Reading Grade 10		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
29	439	10	29	456	11	29	446	10	29	456	10
30	442	10	30	459	11	30	448	10	30	459	10
31	445	10	31	462	11	31	451	10	31	461	10
32	447	10	32	465	11	32	453	10	32	464	10
33	450	10	33	467	11	33	455	10	33	466	10
34	452	10	34	470	10	34	458	10	34	469	10
35	455	10	35	473	10	35	460	10	35	471	10
36	457	10	36	476	10	36	463	10	36	474	10
37	459	10	37	478	10	37	465	10	37	476	10
38	462	10	38	481	10	38	467	10	38	479	10
39	464	10	39	484	10	39	470	10	39	481	10
40	467	10	40	487	10	40	472	10	40	484	10
41	469	10	41	489	10	41	474	10	41	486	10
42	471	10	42	492	10	42	477	10	42	488	10
43	474	10	43	495	11	43	479	10	43	491	10
44	476	10	44	498	11	44	481	10	44	493	10
45	479	10	45	500	11	45	484	10	45	496	10
46	481	10	46	503	11	46	486	10	46	498	10
47	484	10	47	506	11	47	488	10	47	500	10
48	486	10	48	509	11	48	491	10	48	503	10
49	488	10	49	512	11	49	493	10	49	505	10
50	491	10	50	515	11	50	496	10	50	508	10
51	493	10	51	518	11	51	498	10	51	510	10
52	496	10	52	521	11	52	500	10	52	513	10
53	499	10	53	524	11	53	503	10	53	515	10
54	501	10	54	527	11	54	505	10	54	518	10
55	504	10	55	530	11	55	508	10	55	520	10
56	507	10	56	533	11	56	510	10	56	523	10
57	509	11	57	536	11	57	513	10	57	526	10

Reading Grade 7			Reading Grade 8			Reading Grade 9			Reading Grade 10		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
58	512	11	58	539	11	58	516	10	58	528	10
59	515	11	59	543	12	59	518	10	59	531	10
60	518	11	60	546	12	60	521	10	60	534	11
61	521	11	61	550	12	61	524	11	61	536	11
62	524	11	62	553	12	62	526	11	62	539	11
63	527	11	63	557	12	63	529	11	63	542	11
64	530	12	64	560	12	64	532	11	64	545	11
65	534	12	65	564	12	65	535	11	65	548	11
66	537	12	66	568	13	66	538	11	66	551	11
67	541	12	67	572	13	67	541	11	67	555	11
68	545	12	68	576	13	68	545	11	68	558	12
69	549	13	69	581	13	69	548	12	69	561	12
70	553	13	70	585	14	70	551	12	70	565	12
71	557	13	71	590	14	71	555	12	71	569	12
72	562	14	72	595	14	72	559	12	72	572	13
73	566	14	73	600	15	73	563	13	73	576	13
74	572	15	74	606	15	74	567	13	74	581	13
75	577	15	75	612	16	75	571	13	75	585	14
76	583	16	76	619	17	76	576	14	76	590	14
77	589	16	77	626	17	77	581	14	77	595	15
78	597	17	78	634	18	78	587	15	78	601	15
79	605	18	79	643	20	79	593	16	79	607	16
80	614	20	80	654	22	80	599	17	80	613	17
81	625	22	81	667	25	81	607	18	81	621	18
82	638	25	82	686	30	82	615	19	82	629	19
83	656	30	83	715	41	83	626	21	83	639	21
84	686	41	84	744	57	84	639	24	84	652	24
85	715	57				85	656	29	85	670	29
						86	686	41	86	699	41

Mathematics Grade 2			Mathematics Grade 3			Mathematics Grade 4			Mathematics Grade 5			Mathematics Grade 6		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
0	149	57	0	178	57	0	200	57	0	245	57	0	266	57
1	178	41	1	206	41	1	228	41	1	273	41	1	295	41
2	208	30	2	236	30	2	258	30	2	303	29	2	324	29
3	226	25	3	254	25	3	276	25	3	320	24	3	342	24
4	239	22	4	267	22	4	289	22	4	333	21	4	355	21
5	250	20	5	278	20	5	300	20	5	343	19	5	365	19
6	259	18	6	287	18	6	308	18	6	352	18	6	374	18
7	266	17	7	295	17	7	316	17	7	359	17	7	381	17
8	273	16	8	302	16	8	323	16	8	366	16	8	387	16
9	279	15	9	308	16	9	329	15	9	372	15	9	393	15
10	285	15	10	314	15	10	335	15	10	377	14	10	399	14
11	290	14	11	319	14	11	340	14	11	382	14	11	404	14
12	295	14	12	324	14	12	345	14	12	387	13	12	408	13
13	300	13	13	329	14	13	349	13	13	391	13	13	412	13
14	304	13	14	334	13	14	353	13	14	395	13	14	416	12
15	308	13	15	338	13	15	357	13	15	399	12	15	420	12
16	312	12	16	342	13	16	361	12	16	403	12	16	424	12
17	316	12	17	346	12	17	365	12	17	406	12	17	427	12
18	319	12	18	350	12	18	368	12	18	410	11	18	430	11
19	323	12	19	353	12	19	372	12	19	413	11	19	433	11
20	326	11	20	357	12	20	375	11	20	416	11	20	436	11
21	329	11	21	360	11	21	378	11	21	419	11	21	439	11
22	332	11	22	363	11	22	382	11	22	422	11	22	442	11
23	335	11	23	366	11	23	385	11	23	425	11	23	445	10
24	338	11	24	369	11	24	388	11	24	427	10	24	448	10
25	341	11	25	372	11	25	391	11	25	430	10	25	450	10
26	344	11	26	375	11	26	393	11	26	433	10	26	453	10
27	346	10	27	378	11	27	396	11	27	435	10	27	455	10
28	349	10	28	381	10	28	399	10	28	438	10	28	458	10
29	352	10	29	384	10	29	402	10	29	440	10	29	460	10

Mathematics Grade 2			Mathematics Grade 3			Mathematics Grade 4			Mathematics Grade 5			Mathematics Grade 6		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
30	355	10	30	386	10	30	404	10	30	443	10	30	462	10
31	357	10	31	389	10	31	407	10	31	445	10	31	465	10
32	360	10	32	391	10	32	410	10	32	448	10	32	467	10
33	363	10	33	394	10	33	412	10	33	450	10	33	469	9
34	365	10	34	397	10	34	415	10	34	452	10	34	471	9
35	368	10	35	399	10	35	417	10	35	454	9	35	474	9
36	371	10	36	402	10	36	420	10	36	457	9	36	476	9
37	373	10	37	404	10	37	423	10	37	459	9	37	478	9
38	376	11	38	406	10	38	425	10	38	461	9	38	480	9
39	379	11	39	409	10	39	428	10	39	463	9	39	482	9
40	382	11	40	411	10	40	430	10	40	465	9	40	485	9
41	385	11	41	414	10	41	433	10	41	467	9	41	487	9
42	388	11	42	416	10	42	435	10	42	470	9	42	489	9
43	391	11	43	419	10	43	438	10	43	472	9	43	491	9
44	394	11	44	421	10	44	440	10	44	474	9	44	493	9
45	397	12	45	424	10	45	443	10	45	476	9	45	495	9
46	401	12	46	426	10	46	446	10	46	478	9	46	498	9
47	405	12	47	429	10	47	448	10	47	480	9	47	500	9
48	408	13	48	431	10	48	451	10	48	482	9	48	502	10
49	412	13	49	434	10	49	454	10	49	485	9	49	504	10
50	417	13	50	436	10	50	456	10	50	487	10	50	507	10
51	422	14	51	439	10	51	459	10	51	489	10	51	509	10
52	427	15	52	442	10	52	462	11	52	492	10	52	512	10
53	432	15	53	444	11	53	465	11	53	494	10	53	514	10
54	439	16	54	447	11	54	467	11	54	496	10	54	517	10
55	446	18	55	450	11	55	470	11	55	499	10	55	519	10
56	454	19	56	453	11	56	473	11	56	501	10	56	522	10
57	464	21	57	456	11	57	476	11	57	504	10	57	525	11
58	477	24	58	460	12	58	480	11	58	507	11	58	528	11

Mathematics Grade 2			Mathematics Grade 3			Mathematics Grade 4			Mathematics Grade 5			Mathematics Grade 6		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
59	494	29	59	463	12	59	483	11	59	510	11	59	531	11
60	523	41	60	467	12	60	486	12	60	512	11	60	534	11
61	552	57	61	471	13	61	490	12	61	516	11	61	537	12
			62	475	13	62	493	12	62	519	12	62	541	12
			63	479	14	63	497	12	63	522	12	63	544	12
			64	484	14	64	501	13	64	526	12	64	548	13
			65	489	15	65	505	13	65	530	13	65	553	13
			66	495	16	66	509	13	66	534	13	66	557	14
			67	502	17	67	514	14	67	539	14	67	562	15
			68	510	19	68	519	15	68	544	15	68	568	16
			69	519	21	69	525	15	69	549	16	69	575	17
			70	531	24	70	531	16	70	556	17	70	582	18
			71	548	29	71	538	18	71	564	18	71	591	20
			72	577	40	72	547	20	72	573	20	72	603	23
			73	605	57	73	558	23	73	585	23	73	619	28
						74	574	28	74	601	29	74	647	40
						75	602	40	75	630	40	75	675	57
						76	629	56	76	657	57			

Mathematics Grade 7			Mathematics Grade 8			Mathematics Grade 9			Mathematics Grade 10		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
0	275	57	0	286	57	0	298	57	0	336	57
1	275	57	1	315	41	1	326	41	1	364	41
2	303	41	2	344	29	2	355	29	2	393	29
3	332	29	3	361	24	3	373	24	3	410	24
4	349	24	4	373	21	4	386	21	4	423	21
5	362	21	5	383	19	5	396	19	5	433	19
6	372	19	6	392	18	6	405	18	6	441	17
7	380	17	7	399	16	7	412	17	7	448	16
8	387	16	8	405	15	8	419	16	8	454	15

Mathematics Grade 7			Mathematics Grade 8			Mathematics Grade 9			Mathematics Grade 10		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
9	393	15	9	411	15	9	425	15	9	460	15
10	399	15	10	416	14	10	430	14	10	465	14
11	404	14	11	421	14	11	435	14	11	470	13
12	409	14	12	425	13	12	440	13	12	474	13
13	413	13	13	429	13	13	444	13	13	478	13
14	418	13	14	433	12	14	448	13	14	482	12
15	422	12	15	437	12	15	452	12	15	486	12
16	425	12	16	440	12	16	456	12	16	489	12
17	429	12	17	444	11	17	459	12	17	493	11
18	432	12	18	447	11	18	462	11	18	496	11
19	436	11	19	450	11	19	466	11	19	499	11
20	439	11	20	453	11	20	469	11	20	502	11
21	442	11	21	455	11	21	472	11	21	505	11
22	445	11	22	458	10	22	475	11	22	507	10
23	448	11	23	461	10	23	477	10	23	510	10
24	451	11	24	463	10	24	480	10	24	513	10
25	454	11	25	466	10	25	483	10	25	515	10
26	457	11	26	468	10	26	485	10	26	518	10
27	460	10	27	471	10	27	488	10	27	520	10
28	462	10	28	473	10	28	490	10	28	523	10
29	465	10	29	476	10	29	493	10	29	525	10
30	468	10	30	478	10	30	495	10	30	528	10
31	470	10	31	480	10	31	498	10	31	530	10
32	473	10	32	482	9	32	500	10	32	532	10
33	475	10	33	485	9	33	502	10	33	535	10
34	478	10	34	487	9	34	505	10	34	537	10
35	480	10	35	489	9	35	507	10	35	539	10
36	483	10	36	491	9	36	509	10	36	541	10
37	485	10	37	493	9	37	512	10	37	544	10

Mathematics Grade 7			Mathematics Grade 8			Mathematics Grade 9			Mathematics Grade 10		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
38	488	10	38	496	9	38	514	10	38	546	10
39	490	10	39	498	9	39	516	10	39	548	10
40	492	10	40	500	9	40	519	10	40	551	10
41	495	10	41	502	9	41	521	10	41	553	10
42	497	10	42	504	9	42	523	10	42	555	10
43	499	10	43	506	9	43	526	10	43	557	10
44	502	10	44	509	9	44	528	10	44	560	10
45	504	10	45	511	9	45	531	10	45	562	10
46	506	10	46	513	10	46	533	10	46	565	10
47	509	10	47	515	10	47	535	10	47	567	10
48	511	10	48	518	10	48	538	10	48	569	10
49	514	10	49	520	10	49	540	10	49	572	10
50	516	10	50	523	10	50	543	10	50	574	10
51	519	10	51	525	10	51	545	10	51	577	10
52	521	10	52	527	10	52	548	10	52	579	10
53	524	10	53	530	10	53	551	10	53	582	10
54	526	10	54	532	10	54	553	10	54	585	11
55	529	10	55	535	10	55	556	10	55	588	11
56	532	11	56	538	10	56	559	11	56	591	11
57	535	11	57	541	11	57	562	11	57	594	11
58	538	11	58	543	11	58	564	11	58	597	11
59	541	11	59	546	11	59	567	11	59	600	11
60	544	11	60	549	11	60	570	11	60	603	12
61	547	12	61	553	11	61	573	11	61	607	12
62	551	12	62	556	12	62	577	11	62	610	12
63	555	12	63	560	12	63	580	12	63	614	13
64	559	13	64	563	13	64	583	12	64	618	13
65	563	13	65	567	13	65	587	12	65	622	13
66	568	14	66	572	14	66	591	13	66	627	14

Mathematics Grade 7			Mathematics Grade 8			Mathematics Grade 9			Mathematics Grade 10		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
67	573	15	67	577	14	67	595	13	67	632	15
68	578	16	68	582	15	68	599	13	68	638	15
69	585	17	69	588	16	69	604	14	69	644	16
70	593	18	70	595	17	70	609	15	70	651	17
71	602	20	71	603	19	71	615	16	71	660	19
72	614	23	72	613	21	72	621	17	72	670	21
73	630	28	73	625	24	73	629	18	73	682	24
74	658	40	74	642	29	74	638	20	74	700	29
75	686	57	75	671	41	75	649	23	75	728	41
			76	699	57	76	665	28	76	757	57
						77	692	40			
						78	719	56			

Science Grade 4			Science Grade 6			Science Grade 8			Science Grade 11		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
0	214	25	0	195	28	0	146	40	0	190	31
1	227	18	1	209	20	1	166	28	1	205	22
2	240	13	2	223	14	2	187	21	2	221	16
3	248	11	3	232	12	3	199	17	3	231	13
4	253	9	4	238	10	4	208	15	4	237	12
5	258	9	5	243	9	5	215	14	5	243	10
6	262	8	6	247	9	6	222	13	6	248	10
7	265	7	7	251	8	7	227	12	7	252	9
8	268	7	8	254	8	8	232	11	8	255	9
9	271	7	9	257	7	9	236	11	9	258	8
10	273	6	10	259	7	10	240	10	10	261	8
11	276	6	11	262	7	11	244	10	11	264	8
12	278	6	12	264	7	12	247	10	12	267	7
13	280	6	13	266	6	13	251	9	13	269	7
14	282	6	14	268	6	14	254	9	14	271	7
15	284	6	15	270	6	15	257	9	15	273	7
16	285	5	16	272	6	16	259	9	16	275	7
17	287	5	17	274	6	17	262	9	17	277	6
18	288	5	18	276	6	18	265	8	18	279	6
19	290	5	19	277	6	19	267	8	19	281	6
20	291	5	20	279	6	20	270	8	20	283	6
21	293	5	21	281	6	21	272	8	21	285	6
22	294	5	22	282	5	22	274	8	22	286	6
23	296	5	23	284	5	23	277	8	23	288	6
24	297	5	24	285	5	24	279	8	24	290	6
25	298	5	25	287	5	25	281	8	25	291	6
26	299	5	26	288	5	26	283	8	26	293	6
27	301	5	27	289	5	27	285	8	27	294	6
28	302	5	28	291	5	28	287	8	28	296	6
29	303	5	29	292	5	29	289	8	29	297	6
30	304	5	30	293	5	30	291	7	30	299	6
31	306	5	31	295	5	31	293	7	31	300	6
32	307	5	32	296	5	32	295	7	32	302	6
33	308	5	33	297	5	33	297	7	33	303	6
34	309	5	34	299	5	34	299	7	34	305	6
35	310	5	35	300	5	35	301	7	35	306	6
36	311	5	36	301	5	36	303	7	36	308	6
37	313	5	37	303	5	37	305	7	37	309	6
38	314	5	38	304	5	38	307	7	38	311	6
39	315	5	39	305	5	39	309	7	39	312	6
40	316	5	40	307	5	40	311	7	40	314	6

Science Grade 4			Science Grade 6			Science Grade 8			Science Grade 11		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
41	317	5	41	308	5	41	313	7	41	315	6
42	318	5	42	310	5	42	315	7	42	317	6
43	320	5	43	311	5	43	317	8	43	318	6
44	321	5	44	312	5	44	319	8	44	320	6
45	322	5	45	314	5	45	321	8	45	322	6
46	323	5	46	315	5	46	323	8	46	323	6
47	325	5	47	317	5	47	325	8	47	325	6
48	326	5	48	318	6	48	328	8	48	327	6
49	328	5	49	320	6	49	330	8	49	328	6
50	329	5	50	322	6	50	332	8	50	330	6
51	330	5	51	323	6	51	335	8	51	332	6
52	332	5	52	325	6	52	337	8	52	334	6
53	334	5	53	327	6	53	340	9	53	336	7
54	335	5	54	329	6	54	342	9	54	338	7
55	337	6	55	331	6	55	345	9	55	340	7
56	339	6	56	333	7	56	348	9	56	342	7
57	341	6	57	335	7	57	352	10	57	344	7
58	343	6	58	338	7	58	355	10	58	347	7
59	345	7	59	340	7	59	359	11	59	349	8
60	348	7	60	343	8	60	363	11	60	352	8
61	351	7	61	346	8	61	368	12	61	355	9
62	354	8	62	350	9	62	373	13	62	359	9
63	358	8	63	354	9	63	379	14	63	363	10
64	362	9	64	359	10	64	387	15	64	368	11
65	368	11	65	366	12	65	396	17	65	375	13
66	375	13	66	374	14	66	409	21	66	384	16
67	388	18	67	389	20	67	431	29	67	399	22
68	401	25	68	403	28	68	451	40	68	414	31

Social Studies Grade 4			Social Studies Grade 6			Social Studies Grade 8			Social Studies Grade 11		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
0	185	27	0	219	25	0	194	32	0	167	36
1	198	20	1	231	18	1	210	23	1	185	26
2	213	14	2	244	13	2	226	16	2	204	19
3	222	12	3	252	11	3	236	14	3	215	16
4	229	11	4	258	9	4	243	12	4	223	14
5	235	10	5	262	9	5	249	11	5	230	12
6	239	9	6	266	8	6	253	10	6	236	12
7	244	9	7	270	7	7	258	9	7	241	11
8	247	8	8	273	7	8	261	9	8	245	10
9	251	8	9	275	7	9	265	8	9	249	10
10	254	8	10	278	6	10	268	8	10	252	9
11	257	7	11	280	6	11	271	8	11	256	9
12	260	7	12	282	6	12	273	8	12	259	9
13	262	7	13	284	6	13	276	7	13	262	9
14	265	7	14	286	6	14	278	7	14	265	8
15	267	7	15	288	6	15	280	7	15	268	8
16	270	7	16	290	6	16	283	7	16	270	8
17	272	6	17	292	5	17	285	7	17	273	8
18	274	6	18	293	5	18	287	7	18	275	8
19	276	6	19	295	5	19	289	7	19	278	8
20	278	6	20	296	5	20	291	6	20	280	8
21	280	6	21	298	5	21	292	6	21	282	8
22	282	6	22	299	5	22	294	6	22	285	8
23	284	6	23	301	5	23	296	6	23	287	7
24	286	6	24	302	5	24	298	6	24	289	7
25	288	6	25	304	5	25	299	6	25	291	7
26	289	6	26	305	5	26	301	6	26	293	7
27	291	6	27	306	5	27	303	6	27	295	7
28	293	6	28	308	5	28	304	6	28	298	7
29	295	6	29	309	5	29	306	6	29	300	7
30	296	6	30	310	5	30	308	6	30	302	7
31	298	6	31	312	5	31	309	6	31	304	7
32	300	6	32	313	5	32	311	6	32	306	7
33	301	6	33	314	5	33	312	6	33	308	7
34	303	6	34	315	5	34	314	6	34	310	7
35	305	6	35	317	5	35	315	6	35	312	7
36	306	6	36	318	5	36	317	6	36	314	7
37	308	6	37	319	5	37	318	6	37	316	7
38	310	6	38	320	5	38	320	6	38	319	7
39	311	6	39	322	5	39	322	6	39	321	7
40	313	6	40	323	5	40	323	6	40	323	7
41	315	6	41	324	5	41	325	6	41	325	8

Social Studies Grade 4			Social Studies Grade 6			Social Studies Grade 8			Social Studies Grade 11		
RS	SS	SSE	RS	SS	SSE	RS	SS	SSE	RS	SS	SSE
42	317	6	42	325	5	42	326	6	42	327	8
43	318	6	43	327	5	43	328	6	43	330	8
44	320	6	44	328	5	44	330	6	44	332	8
45	322	6	45	329	5	45	331	6	45	334	8
46	324	6	46	330	5	46	333	6	46	337	8
47	325	6	47	332	5	47	335	6	47	339	8
48	327	6	48	333	5	48	336	6	48	341	8
49	329	6	49	335	5	49	338	6	49	344	8
50	331	6	50	336	5	50	340	6	50	346	8
51	333	6	51	337	5	51	342	7	51	349	8
52	335	6	52	339	5	52	344	7	52	352	8
53	337	6	53	341	5	53	346	7	53	354	8
54	340	7	54	342	5	54	348	7	54	357	8
55	342	7	55	344	6	55	350	7	55	360	9
56	344	7	56	346	6	56	352	7	56	363	9
57	347	7	57	348	6	57	355	7	57	366	9
58	350	7	58	350	6	58	357	8	58	369	9
59	353	8	59	352	6	59	360	8	59	373	10
60	356	8	60	354	7	60	363	8	60	377	10
61	359	8	61	357	7	61	366	9	61	381	10
62	363	9	62	360	8	62	370	9	62	385	11
63	368	9	63	364	8	63	374	10	63	391	12
64	373	10	64	368	9	64	379	11	64	397	13
65	379	12	65	373	10	65	385	13	65	405	15
66	388	14	66	381	13	66	394	16	66	416	18
67	402	19	67	393	18	67	409	22	67	434	26
68	415	27	68	406	25	68	425	32	68	452	36

## **Attachment I**

### **Item Statistics by Test and Grade**

**Item Statistics for 2006 Reading Grade 2**

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.392	0.956	0.132	0.717	0.113	0.737
2	1	0.419	0.937	1.484	0.223	0.000	0.987
3	1	0.346	0.927	12.506	0.000	0.674	0.412
4	1	0.442	0.629	0.016	0.900	0.000	0.990
5	1	0.379	0.720	0.022	0.883	6.223	0.013
6	1	0.368	0.858	0.028	0.868	0.862	0.353
7	1	0.448	0.885	1.063	0.302	2.665	0.103
8	1	0.464	0.805	1.109	0.292	2.187	0.139
9	1	0.490	0.450	0.001	0.977	7.915	0.005
10	1	0.284	0.847	0.009	0.924	0.069	0.793
11	1	0.414	0.615	2.888	0.089	0.700	0.403
12	1	0.380	0.915	0.001	0.982	6.261	0.012
13	1	0.362	0.747	1.613	0.204	0.722	0.396
14	1	0.428	0.831	1.226	0.268	0.009	0.922
15	1	0.473	0.849	0.373	0.542	0.458	0.498
16	1	0.357	0.499	0.601	0.438	0.258	0.611
17	1	0.342	0.742	0.077	0.781	0.448	0.503
18	1	0.438	0.807	1.013	0.314	0.278	0.598
19	1	0.340	0.920	0.684	0.408	0.312	0.576
20	1	0.437	0.774	0.129	0.720	2.297	0.130
21	1	0.480	0.879	0.943	0.332	0.004	0.951
22	1	0.459	0.452	2.720	0.099	1.737	0.187
23	1	0.426	0.692	1.012	0.314	0.625	0.429
24	1	0.484	0.695	0.004	0.953	1.989	0.158
25	1	0.422	0.605	3.102	0.078	11.383	0.001
26	1	0.165	0.502	0.000	0.989	1.139	0.286
27	1	0.370	0.818	2.381	0.123	5.004	0.025
28	1	0.449	0.817	0.056	0.813	0.005	0.942
29	2	0.500	1.418	1.362	0.243	2.312	0.128
30	4	0.396	1.530	0.412	0.521	0.143	0.705
31	2	0.473	0.999	10.050	0.002	3.062	0.080
32	4	0.610	1.496	0.102	0.749	2.548	0.110
33	4	0.593	1.461	0.019	0.892	3.054	0.081
Mean	44	0.419	0.638				

### Item Statistics for 2006 Reading Grade 3

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.398	0.847	0.249	0.618	1.039	0.308
2	1	0.326	0.934	0.000	0.995	2.455	0.117
3	1	0.212	0.930	0.564	0.453	2.475	0.116
4	1	0.225	0.744	6.124	0.013	0.018	0.892
5	1	0.246	0.978	0.000	0.998	0.570	0.450
6	1	0.394	0.729	1.443	0.230	2.712	0.100
7	1	0.407	0.802	1.678	0.195	8.104	0.004
8	1	0.238	0.853	0.027	0.869	0.004	0.949
9	1	0.295	0.532	2.103	0.147	4.278	0.039
10	1	0.510	0.874	2.106	0.147	5.774	0.016
11	1	0.225	0.373	0.620	0.431	0.119	0.730
12	1	0.470	0.770	0.088	0.766	0.220	0.639
13	1	0.471	0.879	2.394	0.122	2.561	0.110
14	1	0.358	0.805	0.459	0.498	1.137	0.286
15	1	0.453	0.920	0.059	0.808	4.553	0.033
16	1	0.407	0.608	3.364	0.067	0.081	0.775
17	1	0.428	0.743	4.782	0.029	0.743	0.389
18	1	0.329	0.489	6.683	0.010	2.223	0.136
19	1	0.341	0.835	0.301	0.583	0.550	0.458
20	1	0.272	0.710	0.290	0.590	0.086	0.769
21	1	0.419	0.899	0.343	0.558	0.012	0.913
22	1	0.242	0.525	2.138	0.144	1.455	0.228
23	1	0.313	0.749	7.323	0.007	3.177	0.075
24	1	0.340	0.728	4.682	0.030	0.537	0.463
25	1	0.282	0.547	0.220	0.639	0.005	0.943
26	1	0.319	0.572	4.542	0.033	0.402	0.526
27	1	0.420	0.613	2.302	0.129	0.059	0.809
28	1	0.430	0.790	0.063	0.801	0.115	0.734
29	1	0.327	0.680	1.721	0.190	2.502	0.114
30	1	0.419	0.855	1.371	0.242	0.177	0.674
31	1	0.321	0.666	0.011	0.916	0.129	0.720
32	2	0.460	1.307	0.397	0.528	0.041	0.840
33	2	0.397	0.562	0.179	0.672	0.776	0.378
34	4	0.466	1.434	3.444	0.063	5.022	0.025
35	1	0.432	0.916	2.035	0.154	3.929	0.047
36	1	0.474	0.821	0.302	0.583	1.431	0.232

37	1	0.386	0.857	6.465	0.011	0.313	0.576
38	1	0.408	0.555	0.238	0.626	0.063	0.802
39	1	0.393	0.651	0.213	0.645	2.017	0.156
40	1	0.445	0.672	5.979	0.014	3.328	0.068
41	4	0.598	1.744	0.928	0.335	1.204	0.273
42	1	-0.032	0.898	0.098	0.755	3.816	0.051
43	1	0.242	0.782	0.668	0.414	0.053	0.817
44	1	0.347	0.895	0.777	0.378	0.045	0.833
45	1	0.289	0.412	4.629	0.031	1.146	0.284
46	1	0.299	0.917	1.801	0.180	0.627	0.429
47	2	0.307	0.500	2.114	0.146	0.218	0.640
48	4	0.473	2.261	0.324	0.569	1.465	0.226
49	1	0.361	0.805	1.274	0.259	2.402	0.121
50	1	0.405	0.747	2.828	0.093	0.000	0.990
51	1	0.426	0.910	0.436	0.509	0.114	0.736
52	1	0.374	0.944	0.391	0.532	0.016	0.898
53	2	0.501	0.846	1.415	0.234	1.557	0.212
54	2	0.360	0.964	0.216	0.642	0.064	0.800
55	2	0.502	1.536	0.187	0.666	2.446	0.118
56	4	0.461	1.812	1.841	0.175	0.380	0.538
57	1	0.479	0.847	0.001	0.980	6.487	0.011
58	1	0.492	0.914	0.604	0.437	0.210	0.647
59	1	0.472	0.741	5.297	0.021	0.087	0.768
60	1	0.419	0.643	1.474	0.225	1.270	0.260
61	1	0.572	0.851	3.356	0.067	1.568	0.211
62	1	0.501	0.798	0.001	0.970	0.309	0.578
63	2	0.331	1.332	0.001	0.976	0.765	0.382
64	2	0.541	1.386	6.470	0.011	4.464	0.035
Maximum	84						
Mean		0.382	0.658				

---

### Item Statistics for 2006 Reading Grade 4

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.349	0.848	2.346	0.126	2.206	0.137
2	1	0.267	0.790	2.695	0.101	0.158	0.691
3	1	0.343	0.880	2.112	0.146	0.104	0.747
4	1	0.282	0.796	0.329	0.567	0.437	0.508
5	1	0.386	0.869	2.388	0.122	1.300	0.254
6	1	0.228	0.753	0.001	0.970	1.451	0.228
7	1	0.314	0.798	1.884	0.170	0.174	0.676
8	1	0.252	0.623	0.346	0.556	0.470	0.493
9	1	0.192	0.970	0.003	0.960	0.259	0.611
10	1	0.381	0.911	3.188	0.074	0.110	0.740
11	1	0.275	0.694	1.673	0.196	0.002	0.962
12	1	0.368	0.397	3.607	0.058	2.026	0.155
13	1	0.410	0.717	7.587	0.006	2.493	0.114
14	1	0.445	0.776	1.814	0.178	5.186	0.023
15	1	0.366	0.685	0.423	0.516	1.198	0.274
16	1	0.428	0.916	0.048	0.826	0.557	0.455
17	1	0.335	0.540	2.307	0.129	1.042	0.307
18	1	0.336	0.865	0.103	0.748	0.116	0.734
19	1	0.217	0.727	0.458	0.499	1.521	0.218
20	1	0.460	0.761	1.918	0.166	4.113	0.043
21	1	0.316	0.520	0.586	0.444	0.002	0.961
22	1	0.387	0.875	0.020	0.888	0.000	0.993
23	1	0.402	0.843	0.017	0.896	0.153	0.695
24	1	0.357	0.915	0.203	0.653	0.435	0.509
25	1	0.284	0.863	0.274	0.601	0.268	0.605
26	1	0.302	0.650	0.111	0.739	0.534	0.465
27	1	0.228	0.720	0.017	0.898	0.823	0.364
28	1	0.321	0.886	0.002	0.965	3.740	0.053
29	1	0.425	0.688	5.591	0.018	0.003	0.954
30	1	0.344	0.940	1.137	0.286	0.447	0.504
31	1	0.438	0.821	2.712	0.100	0.003	0.954
32	1	0.442	0.753	0.193	0.660	1.570	0.210
33	1	0.408	0.602	0.011	0.915	1.084	0.298
34	1	0.459	0.667	0.290	0.590	0.684	0.408
35	1	0.228	0.501	8.452	0.004	0.181	0.670

36	2	0.397	1.115	0.161	0.689	0.006	0.937
37	4	0.622	2.262	4.686	0.030	2.681	0.102
38	1	0.297	0.481	0.726	0.394	0.132	0.717
39	1	0.415	0.583	4.310	0.038	5.863	0.015
40	1	0.409	0.518	0.873	0.350	0.078	0.780
41	1	0.329	0.671	0.974	0.324	0.011	0.918
42	2	0.480	1.437	1.778	0.182	1.796	0.180
43	2	0.417	0.927	3.050	0.081	0.320	0.572
44	4	0.549	1.747	1.077	0.299	1.813	0.178
45	1	0.310	0.856	0.667	0.414	3.159	0.076
46	1	0.288	0.768	1.527	0.217	0.218	0.641
47	1	0.280	0.699	5.599	0.018	0.335	0.562
48	1	0.402	0.789	1.511	0.219	0.824	0.364
49	1	0.305	0.833	1.464	0.226	0.543	0.461
50	1	0.275	0.866	0.117	0.733	0.126	0.723
51	2	0.329	1.718	0.250	0.617	0.067	0.796
52	4	0.314	1.253	3.933	0.047	3.416	0.065
53	1	0.315	0.905	1.498	0.221	3.938	0.047
54	1	0.393	0.785	0.259	0.611	0.087	0.767
55	1	0.375	0.865	2.276	0.131	0.004	0.952
56	1	0.043	0.498	0.000	0.990	0.440	0.507
57	2	0.441	1.488	1.116	0.291	2.930	0.087
58	2	0.316	1.785	0.258	0.611	1.383	0.240
59	4	0.444	1.605	3.782	0.052	10.429	0.001
60	1	0.377	0.937	3.785	0.052	0.131	0.718
61	1	0.470	0.815	0.003	0.956	2.834	0.092
62	1	0.324	0.691	0.033	0.855	0.875	0.349
63	1	0.449	0.769	3.594	0.058	0.201	0.654
64	1	0.406	0.901	0.000	0.989	0.107	0.743
65	1	0.406	0.680	5.548	0.018	1.119	0.290
66	2	0.523	1.097	0.402	0.526	0.646	0.422
67	2	0.320	1.181	1.453	0.228	0.120	0.729
Maximum	87						
Mean		0.358	0.679				

---

### Item Statistics for 2006 Reading Grade 5

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.267	0.856	0.043	0.836	0.279	0.597
2	1	0.338	0.892	7.688	0.006	1.253	0.263
3	1	0.322	0.763	0.038	0.846	0.949	0.330
4	1	0.297	0.538	12.192	0.000	1.307	0.253
5	1	0.328	0.780	0.709	0.400	8.388	0.004
6	1	0.258	0.869	2.394	0.122	1.711	0.191
7	1	0.457	0.845	1.176	0.278	0.077	0.781
8	1	0.269	0.735	1.428	0.232	3.310	0.069
9	1	0.202	0.595	1.467	0.226	1.179	0.277
10	1	0.217	0.952	1.090	0.296	2.874	0.090
11	1	0.202	0.927	0.909	0.340	3.602	0.058
12	1	0.290	0.480	0.660	0.417	2.678	0.102
13	1	0.283	0.703	0.088	0.767	0.035	0.851
14	1	0.347	0.656	15.740	0.000	0.742	0.389
15	1	0.335	0.956	0.033	0.855	0.027	0.870
16	1	0.331	0.832	0.037	0.847	7.182	0.007
17	1	0.274	0.888	0.147	0.702	0.121	0.728
18	1	0.371	0.543	4.845	0.028	1.591	0.207
19	1	0.383	0.636	0.241	0.623	4.455	0.035
20	1	0.427	0.866	0.100	0.751	2.637	0.104
21	1	0.307	0.579	0.294	0.587	0.692	0.406
22	1	0.332	0.723	0.032	0.857	11.755	0.001
23	1	0.360	0.913	1.788	0.181	2.937	0.087
24	1	0.373	0.707	0.613	0.434	1.966	0.161
25	1	0.389	0.857	0.069	0.793	7.251	0.007
26	1	0.385	0.600	0.995	0.319	1.364	0.243
27	1	0.384	0.901	0.715	0.398	0.158	0.691
28	1	0.262	0.509	0.150	0.698	0.004	0.951
29	1	0.225	0.727	1.420	0.233	0.153	0.696
30	1	0.148	0.576	4.353	0.037	0.094	0.759
31	1	0.344	0.405	0.003	0.957	0.476	0.490
32	1	0.036	0.401	0.396	0.529	0.990	0.320
33	2	0.434	1.024	0.511	0.475	0.314	0.575
34	2	0.459	0.907	0.143	0.705	0.276	0.599
35	1	0.294	0.475	1.839	0.175	0.088	0.767
36	1	0.368	0.860	0.795	0.373	1.058	0.304

37	1	0.435	0.831	0.220	0.639	0.030	0.862
38	1	0.331	0.449	0.026	0.873	0.838	0.360
39	1	0.340	0.674	0.165	0.685	0.004	0.952
40	2	0.389	1.410	1.643	0.200	1.425	0.233
41	2	0.382	1.042	1.001	0.317	2.578	0.108
42	4	0.635	1.771	1.473	0.225	5.276	0.022
43	1	0.229	0.726	0.451	0.502	0.231	0.631
44	1	0.457	0.463	0.024	0.876	2.626	0.105
45	1	0.333	0.763	3.389	0.066	0.585	0.444
46	1	0.333	0.792	0.146	0.702	1.393	0.238
47	2	0.211	1.093	0.935	0.334	1.469	0.226
48	2	0.368	1.637	1.353	0.245	0.155	0.694
49	4	0.515	1.956	2.286	0.131	3.147	0.076
50	1	0.501	0.777	0.014	0.904	0.099	0.753
51	1	0.387	0.643	0.073	0.787	1.421	0.233
52	1	0.419	0.772	0.723	0.395	2.647	0.104
53	1	0.384	0.550	0.782	0.376	0.958	0.328
54	1	0.321	0.689	1.003	0.317	0.554	0.457
55	1	0.261	0.853	0.068	0.794	6.095	0.014
56	2	0.361	1.117	0.015	0.902	0.246	0.620
57	4	0.586	1.795	3.459	0.063	1.364	0.243
58	1	0.333	0.699	1.874	0.171	3.115	0.078
59	1	0.330	0.818	0.221	0.638	0.120	0.729
60	1	0.237	0.775	4.054	0.044	1.149	0.284
61	1	0.433	0.696	9.927	0.002	0.427	0.514
62	1	0.400	0.869	0.064	0.801	0.154	0.694
63	2	0.445	1.382	0.806	0.369	6.611	0.010
64	4	0.501	1.968	1.966	0.161	9.049	0.003
Maximum	84						
Mean		0.346	0.649				

---

### Item Statistics for 2006 Reading Grade 6

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.298	0.903	3.371	0.066	1.888	0.169
2	1	0.301	0.725	1.753	0.186	0.222	0.637
3	1	0.197	0.972	0.270	0.604	1.993	0.158
4	1	0.101	0.541	1.493	0.222	2.403	0.121
5	1	0.170	0.978	0.173	0.678	0.702	0.402
6	1	0.355	0.626	0.327	0.567	0.921	0.337
7	1	0.256	0.936	2.052	0.152	2.879	0.090
8	1	0.348	0.413	2.400	0.121	4.806	0.028
9	1	0.273	0.553	0.173	0.677	4.739	0.029
10	1	0.236	0.783	0.349	0.555	0.737	0.391
11	1	0.117	0.363	0.171	0.679	0.393	0.531
12	1	0.413	0.780	0.038	0.845	0.035	0.851
13	1	0.313	0.656	0.242	0.623	0.006	0.939
14	1	0.223	0.640	0.745	0.388	0.359	0.549
15	1	0.447	0.697	4.889	0.027	0.092	0.761
16	1	0.333	0.687	0.936	0.333	2.618	0.106
17	1	0.349	0.685	1.294	0.255	0.000	0.996
18	1	0.326	0.609	3.979	0.046	2.777	0.096
19	1	0.295	0.588	0.322	0.571	0.238	0.626
20	1	0.221	0.624	7.473	0.006	0.217	0.641
21	1	0.341	0.704	0.724	0.395	1.307	0.253
22	1	0.221	0.643	0.791	0.374	0.185	0.667
23	1	0.262	0.906	2.811	0.094	3.083	0.079
24	1	0.228	0.370	0.016	0.898	0.045	0.832
25	1	0.210	0.639	0.272	0.602	0.761	0.383
26	1	0.344	0.668	0.133	0.715	0.793	0.373
27	1	0.307	0.550	0.368	0.544	0.085	0.771
28	1	0.310	0.873	0.004	0.952	0.294	0.587
29	1	0.241	0.649	4.983	0.026	0.537	0.464
30	1	0.401	0.909	2.006	0.157	1.772	0.183
31	1	0.236	0.359	8.771	0.003	1.906	0.167
32	2	0.288	1.709	1.944	0.163	7.774	0.005
33	2	0.467	1.176	1.428	0.232	1.093	0.296
34	1	0.292	0.897	1.141	0.285	1.504	0.220
35	1	0.338	0.941	1.824	0.177	0.345	0.557
36	1	0.302	0.945	0.006	0.937	11.426	0.001

37	1	0.333	0.934	0.659	0.417	1.674	0.196
38	1	0.336	0.777	0.507	0.476	3.702	0.054
39	2	0.253	1.207	2.151	0.143	5.754	0.016
40	2	0.324	1.362	0.043	0.836	9.119	0.003
41	4	0.435	1.510	0.075	0.784	1.040	0.308
42	1	0.317	0.771	2.670	0.102	0.004	0.948
43	1	0.220	0.833	0.136	0.713	0.002	0.963
44	1	0.375	0.514	2.264	0.132	1.321	0.250
45	1	0.189	0.457	0.119	0.730	0.664	0.415
46	1	0.280	0.854	4.668	0.031	1.057	0.304
47	2	0.381	1.414	11.839	0.001	7.179	0.007
48	2	0.360	1.143	1.594	0.207	0.142	0.706
49	4	0.467	1.982	0.801	0.371	1.132	0.287
50	1	0.406	0.698	0.577	0.448	1.506	0.220
51	1	0.360	0.739	0.035	0.851	3.553	0.059
52	1	0.301	0.406	0.641	0.423	0.762	0.383
53	1	0.347	0.616	0.475	0.491	1.474	0.225
54	1	0.299	0.708	1.587	0.208	1.067	0.302
55	1	0.299	0.677	0.013	0.908	0.197	0.657
56	2	0.382	0.939	2.173	0.140	0.214	0.644
57	4	0.598	1.830	0.677	0.411	15.437	0.000
58	1	0.301	0.555	2.732	0.098	0.528	0.468
59	1	0.260	0.536	0.935	0.334	0.004	0.949
60	1	0.413	0.439	0.683	0.409	2.195	0.138
61	1	0.326	0.466	2.441	0.118	0.337	0.562
62	1	0.405	0.551	0.085	0.770	0.676	0.411
63	2	0.308	0.998	4.795	0.029	0.348	0.555
64	4	0.509	1.484	0.416	0.519	0.359	0.549
Maximum	84						
Mean		0.315	0.620				

---

### Item Statistics for 2006 Reading Grade 7

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.306	0.776	0.551	0.458	0.228	0.633
2	1	0.304	0.618	1.259	0.262	16.316	0.000
3	1	0.247	0.875	4.600	0.032	0.201	0.654
4	1	0.374	0.846	2.645	0.104	0.040	0.842
5	1	0.217	0.477	0.762	0.383	1.366	0.243
6	1	0.240	0.677	0.020	0.887	2.916	0.088
7	1	0.278	0.508	0.004	0.950	0.094	0.759
8	1	0.306	0.418	0.068	0.795	0.087	0.768
9	1	0.280	0.669	0.040	0.842	0.003	0.955
10	1	0.247	0.623	0.030	0.862	8.157	0.004
11	1	0.257	0.968	2.245	0.134	0.252	0.616
12	1	0.307	0.468	0.446	0.504	0.571	0.450
13	1	0.380	0.499	2.633	0.105	0.046	0.831
14	1	0.261	0.889	6.077	0.014	1.228	0.268
15	1	0.341	0.841	0.029	0.864	3.444	0.063
16	1	0.466	0.613	1.974	0.160	3.829	0.050
17	1	0.380	0.925	1.885	0.170	1.226	0.268
18	1	0.404	0.902	2.338	0.126	0.003	0.958
19	1	0.284	0.761	7.769	0.005	0.701	0.403
20	1	0.414	0.811	0.000	0.990	13.964	0.000
21	1	0.325	0.808	2.120	0.145	2.202	0.138
22	1	0.300	0.546	0.780	0.377	0.000	0.987
23	1	0.420	0.908	1.820	0.177	2.035	0.154
24	1	0.285	0.486	10.655	0.001	6.435	0.011
25	1	0.348	0.849	0.365	0.546	0.000	0.993
26	1	0.453	0.708	0.132	0.716	0.676	0.411
27	1	0.334	0.656	1.135	0.287	8.387	0.004
28	1	0.320	0.870	4.512	0.034	0.911	0.340
29	1	0.208	0.562	0.857	0.355	3.563	0.059
30	1	0.240	0.662	5.945	0.015	0.019	0.891
31	1	0.430	0.802	0.337	0.561	0.088	0.766
32	1	0.427	0.695	2.276	0.131	0.440	0.507
33	1	0.431	0.751	1.997	0.158	2.712	0.100
34	1	0.436	0.584	1.640	0.200	0.182	0.669
35	2	0.377	0.891	0.370	0.543	3.102	0.078
36	2	0.447	0.970	0.879	0.348	10.277	0.001

37	1	0.482	0.699	2.391	0.122	3.448	0.063
38	1	0.354	0.692	0.000	0.998	4.791	0.029
39	1	0.452	0.676	0.878	0.349	0.427	0.513
40	1	0.454	0.691	4.357	0.037	0.001	0.981
41	1	0.317	0.637	0.026	0.873	1.126	0.289
42	1	0.478	0.698	3.837	0.050	6.173	0.013
43	2	0.377	0.928	0.651	0.420	0.530	0.467
44	4	0.549	1.401	2.440	0.118	1.713	0.191
45	1	0.477	0.580	11.600	0.001	2.913	0.088
46	1	0.261	0.862	1.116	0.291	0.102	0.749
47	1	0.307	0.949	0.013	0.908	2.429	0.119
48	1	0.260	0.505	0.272	0.602	0.010	0.919
49	2	0.319	1.759	0.281	0.596	0.076	0.783
50	2	0.371	1.104	0.276	0.600	0.007	0.936
51	4	0.492	1.863	0.223	0.637	0.923	0.337
52	1	0.423	0.687	2.208	0.137	12.204	0.000
53	1	0.431	0.587	0.312	0.577	0.005	0.945
54	1	0.438	0.811	5.611	0.018	4.880	0.027
55	1	0.371	0.766	0.660	0.417	0.440	0.507
56	2	0.524	0.634	0.297	0.586	2.330	0.127
57	4	0.638	1.592	0.220	0.639	0.377	0.539
58	4	0.610	1.941	0.000	0.996	6.241	0.012
59	1	0.354	0.638	3.394	0.065	0.624	0.430
60	1	0.483	0.802	0.479	0.489	3.596	0.058
61	1	0.461	0.725	2.240	0.134	0.176	0.675
62	1	0.386	0.720	9.284	0.002	0.860	0.354
63	1	0.352	0.686	8.338	0.004	3.971	0.046
64	2	0.532	0.881	0.631	0.427	0.669	0.413
65	2	0.400	0.625	3.544	0.060	3.098	0.078
Maximum	85						
Mean		0.376	0.612				

---

### Item Statistics for 2006 Reading Grade 8

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.282	0.600	2.135	0.144	1.273	0.259
2	1	0.329	0.491	9.852	0.002	0.614	0.433
3	1	0.167	0.267	0.092	0.762	0.532	0.466
4	1	0.256	0.897	0.001	0.973	0.662	0.416
5	1	0.236	0.969	0.711	0.399	0.423	0.516
6	1	0.265	0.657	6.568	0.010	18.159	0.000
7	1	0.286	0.903	0.020	0.888	2.746	0.097
8	1	0.280	0.875	0.274	0.601	0.000	0.986
9	1	0.214	0.935	2.850	0.091	2.946	0.086
10	1	0.222	0.483	5.061	0.024	0.000	0.983
11	1	0.257	0.844	0.575	0.448	0.602	0.438
12	1	0.357	0.889	0.008	0.928	0.358	0.550
13	1	0.252	0.515	0.264	0.607	3.382	0.066
14	1	0.373	0.746	1.218	0.270	0.051	0.821
15	1	0.280	0.715	0.308	0.579	0.325	0.569
16	1	0.268	0.620	0.127	0.722	2.216	0.137
17	1	0.376	0.856	0.533	0.465	0.190	0.663
18	1	0.301	0.916	0.111	0.739	4.270	0.039
19	1	0.329	0.594	3.340	0.068	0.239	0.625
20	1	0.368	0.809	0.012	0.914	3.236	0.072
21	1	0.329	0.843	0.884	0.347	2.924	0.087
22	1	0.372	0.869	1.555	0.212	2.783	0.095
23	1	0.348	0.920	1.763	0.184	0.325	0.568
24	1	0.292	0.580	0.100	0.751	0.505	0.477
25	1	0.338	0.553	0.417	0.518	0.008	0.928
26	1	0.275	0.559	4.512	0.034	1.572	0.210
27	1	0.440	0.593	3.079	0.079	0.115	0.735
28	1	0.418	0.727	2.360	0.125	0.036	0.849
29	1	0.428	0.775	3.417	0.065	3.496	0.061
30	1	0.372	0.688	2.079	0.149	3.501	0.061
31	1	0.311	0.768	1.383	0.240	0.071	0.790
32	1	0.326	0.620	0.590	0.443	0.037	0.848
33	1	0.435	0.774	2.839	0.092	7.106	0.008
34	4	0.546	1.759	0.237	0.627	1.745	0.187
35	1	0.448	0.863	2.480	0.115	3.217	0.073
36	1	0.233	0.733	1.158	0.282	0.434	0.510

37	1	0.307	0.452	0.839	0.360	0.042	0.837
38	1	0.301	0.659	3.209	0.073	1.404	0.236
39	1	0.343	0.741	0.027	0.869	0.710	0.400
40	2	0.508	0.914	0.177	0.674	1.966	0.161
41	2	0.396	1.101	8.042	0.005	2.570	0.109
42	4	0.527	1.863	8.772	0.003	8.891	0.003
43	1	0.068	0.541	0.133	0.716	0.578	0.447
44	1	0.399	0.717	1.178	0.278	10.808	0.001
45	1	0.328	0.476	0.983	0.322	7.663	0.006
46	1	0.142	0.272	5.258	0.022	4.106	0.043
47	2	0.383	1.568	0.010	0.920	0.477	0.490
48	2	0.411	0.867	0.353	0.553	7.641	0.006
49	2	0.476	1.025	0.019	0.890	0.636	0.425
50	2	0.426	1.083	0.247	0.619	0.286	0.593
51	1	0.385	0.872	0.420	0.517	0.001	0.975
52	1	0.479	0.785	0.051	0.822	0.170	0.680
53	1	0.386	0.842	0.564	0.453	2.183	0.140
54	1	0.334	0.906	4.849	0.028	1.286	0.257
55	1	0.419	0.928	0.614	0.433	0.224	0.636
56	1	0.422	0.877	7.531	0.006	2.519	0.112
57	2	0.415	0.533	6.379	0.012	0.117	0.732
58	4	0.646	1.725	8.294	0.004	13.172	0.000
59	1	0.316	0.682	0.328	0.567	0.855	0.355
60	1	0.380	0.810	0.112	0.738	1.654	0.198
61	1	0.469	0.774	0.048	0.826	1.459	0.227
62	1	0.204	0.739	0.052	0.820	0.004	0.947
63	2	0.423	1.333	0.267	0.605	0.021	0.886
64	4	0.588	1.384	0.590	0.443	1.166	0.280
Maximum	84						
Mean		0.351	0.627				

---

### Item Statistics for 2006 Reading Grade 9

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.239	0.939	1.599	0.206	0.580	0.446
2	1	0.311	0.592	2.385	0.122	0.000	0.990
3	1	0.370	0.886	1.068	0.301	0.257	0.612
4	1	0.341	0.931	2.848	0.091	0.295	0.587
5	1	0.328	0.743	9.222	0.002	7.318	0.007
6	1	0.363	0.796	0.054	0.816	0.024	0.876
7	1	0.286	0.438	0.222	0.638	0.803	0.370
8	1	0.369	0.849	4.374	0.037	7.677	0.006
9	1	0.390	0.936	0.742	0.389	0.622	0.430
10	1	0.306	0.959	0.000	0.987	0.121	0.728
11	1	0.228	0.593	0.004	0.951	1.019	0.313
12	1	0.281	0.891	1.713	0.191	0.901	0.342
13	1	0.134	0.813	0.580	0.446	1.397	0.237
14	1	0.270	0.950	0.036	0.850	1.893	0.169
15	1	0.364	0.906	1.258	0.262	0.280	0.597
16	1	0.368	0.762	0.766	0.381	0.159	0.690
17	1	0.264	0.705	0.031	0.861	0.036	0.849
18	1	0.436	0.789	0.482	0.487	0.732	0.392
19	1	0.409	0.810	0.178	0.673	20.639	0.000
20	1	0.392	0.847	0.638	0.425	0.182	0.670
21	1	0.439	0.888	0.017	0.897	2.096	0.148
22	1	0.364	0.462	1.000	0.317	1.162	0.281
23	1	0.473	0.847	0.033	0.855	1.860	0.173
24	1	0.383	0.771	0.341	0.559	1.126	0.289
25	1	0.369	0.765	0.719	0.397	2.222	0.136
26	1	0.457	0.811	2.700	0.100	0.593	0.441
27	1	0.389	0.581	0.336	0.562	0.806	0.369
28	1	0.409	0.882	0.306	0.580	0.000	0.982
29	1	0.407	0.739	1.904	0.168	0.254	0.614
30	1	0.417	0.562	6.029	0.014	0.043	0.836
31	1	0.456	0.869	0.232	0.630	2.948	0.086
32	1	0.280	0.688	0.651	0.420	2.918	0.088
33	1	0.350	0.754	1.266	0.261	0.007	0.931
34	1	0.427	0.667	0.094	0.759	5.167	0.023
35	1	0.419	0.777	0.512	0.474	2.622	0.105
36	1	0.377	0.704	4.141	0.042	0.673	0.412

37	2	0.546	0.864	0.212	0.645	0.277	0.599
38	4	0.590	2.467	5.156	0.023	0.240	0.624
39	1	0.152	0.529	3.448	0.063	0.819	0.365
40	1	0.284	0.687	0.113	0.737	0.438	0.508
41	1	0.403	0.824	0.005	0.942	0.005	0.944
42	1	0.329	0.746	0.181	0.670	1.092	0.296
43	2	0.578	1.026	1.571	0.210	0.039	0.843
44	2	0.587	0.957	0.589	0.443	2.111	0.146
45	4	0.670	1.932	0.596	0.440	1.603	0.206
46	1	0.350	0.642	7.991	0.005	3.129	0.077
47	1	0.344	0.539	1.158	0.282	1.051	0.305
48	1	0.456	0.521	2.399	0.121	3.294	0.070
49	1	0.453	0.619	0.112	0.738	1.971	0.160
50	1	0.431	0.630	0.001	0.977	1.141	0.285
51	2	0.519	1.248	0.005	0.946	3.460	0.063
52	2	0.512	1.267	4.977	0.026	1.984	0.159
53	2	0.464	1.221	3.029	0.082	2.687	0.101
54	1	0.575	0.767	0.556	0.456	0.069	0.793
55	1	0.405	0.710	0.071	0.789	0.253	0.615
56	1	0.457	0.877	0.078	0.781	1.482	0.223
57	1	0.376	0.565	0.653	0.419	2.560	0.110
58	1	0.410	0.808	0.723	0.395	1.594	0.207
59	1	0.486	0.817	2.408	0.121	1.010	0.315
60	4	0.649	2.247	2.948	0.086	10.988	0.001
61	1	0.445	0.914	0.912	0.340	0.378	0.539
62	1	0.448	0.716	6.429	0.011	6.194	0.013
63	1	0.523	0.824	0.097	0.755	0.774	0.379
64	1	0.435	0.775	0.687	0.407	0.017	0.898
65	2	0.418	0.721	0.858	0.354	0.515	0.473
66	2	0.458	1.195	0.002	0.966	1.422	0.233
67	4	0.685	2.139	2.107	0.147	0.446	0.504
Maximum	87						
Mean		0.407	0.675				

---

### Item Statistics for 2006 Reading Grade 10

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.157	0.847	1.260	0.262	1.737	0.188
2	1	0.272	0.876	0.658	0.417	0.057	0.812
3	1	0.445	0.621	0.303	0.582	0.467	0.494
4	1	0.348	0.552	4.026	0.045	7.042	0.008
5	1	0.415	0.599	15.997	0.000	1.500	0.221
6	1	0.304	0.362	0.297	0.586	0.104	0.747
7	1	0.355	0.856	1.907	0.167	1.383	0.240
8	1	0.294	0.518	1.470	0.225	0.802	0.371
9	1	0.308	0.849	1.880	0.170	3.458	0.063
10	1	0.396	0.618	6.723	0.010	2.988	0.084
11	1	0.187	0.823	0.672	0.412	0.771	0.380
12	1	0.310	0.862	0.637	0.425	2.698	0.100
13	1	0.104	0.680	1.631	0.202	2.646	0.104
14	1	0.400	0.762	1.595	0.207	0.802	0.370
15	1	0.237	0.683	6.050	0.014	6.770	0.009
16	1	0.231	0.654	5.825	0.016	1.904	0.168
17	1	0.177	0.222	0.136	0.712	1.603	0.205
18	1	0.358	0.958	2.091	0.148	0.974	0.324
19	1	0.304	0.789	0.794	0.373	0.859	0.354
20	1	0.266	0.841	3.449	0.063	0.016	0.899
21	1	0.323	0.927	0.185	0.667	6.250	0.012
22	1	0.404	0.756	7.179	0.007	5.514	0.019
23	1	0.295	0.905	1.212	0.271	0.923	0.337
24	1	0.233	0.463	0.087	0.768	0.198	0.657
25	1	0.238	0.792	1.202	0.273	2.360	0.124
26	1	0.169	0.514	0.668	0.414	0.026	0.872
27	1	0.400	0.564	11.068	0.001	13.973	0.000
28	1	0.386	0.799	0.122	0.727	0.454	0.500
29	1	0.515	0.880	7.181	0.007	2.514	0.113
30	1	0.305	0.438	3.579	0.059	0.423	0.515
31	1	0.420	0.756	0.034	0.854	0.614	0.433
32	1	0.458	0.781	0.059	0.809	0.014	0.905
33	1	0.298	0.281	0.277	0.598	0.359	0.549
34	1	0.299	0.559	0.475	0.491	1.488	0.222
35	1	0.282	0.627	1.165	0.280	0.263	0.608
36	1	0.468	0.888	0.271	0.603	0.410	0.522

37	2	0.608	1.241	1.085	0.297	0.014	0.905
38	4	0.694	1.705	2.153	0.142	0.001	0.973
39	1	0.227	0.683	1.145	0.285	3.506	0.061
40	1	0.419	0.691	1.338	0.247	1.668	0.196
41	1	0.438	0.503	3.136	0.077	0.217	0.641
42	1	0.390	0.709	0.380	0.538	1.342	0.247
43	1	0.339	0.837	0.185	0.667	0.122	0.727
44	2	0.443	1.119	0.756	0.385	0.383	0.536
45	4	0.632	2.077	3.720	0.054	7.473	0.006
46	1	0.437	0.748	0.387	0.534	2.161	0.142
47	1	0.354	0.575	0.005	0.941	6.069	0.014
48	1	0.509	0.779	2.372	0.124	0.375	0.540
49	1	0.407	0.559	0.083	0.773	0.015	0.902
50	1	0.345	0.727	0.780	0.377	3.752	0.053
51	2	0.568	1.028	0.175	0.676	0.088	0.767
52	2	0.505	1.315	0.835	0.361	1.019	0.313
53	4	0.649	1.690	0.022	0.882	8.501	0.004
54	1	0.170	0.503	2.184	0.139	0.486	0.486
55	1	0.388	0.823	0.422	0.516	0.052	0.820
56	1	0.505	0.780	3.201	0.074	2.776	0.096
57	1	0.156	0.634	0.321	0.571	3.444	0.063
58	2	0.395	0.848	0.301	0.583	0.144	0.704
59	2	0.577	0.772	2.056	0.152	0.506	0.477
60	4	0.707	1.742	2.416	0.120	6.992	0.008
61	1	0.449	0.812	0.329	0.566	0.642	0.423
62	1	0.454	0.758	0.018	0.894	0.446	0.504
63	1	0.422	0.657	0.224	0.636	0.319	0.572
64	1	0.506	0.793	0.424	0.515	0.413	0.521
65	1	0.445	0.854	0.430	0.512	0.557	0.455
66	2	0.527	0.722	1.383	0.240	1.024	0.312
67	2	0.508	0.812	0.115	0.735	1.840	0.175
Maximum	87						
Mean		0.381	0.614				

---

### Item Statistics for 2006 Mathematics Grade 2

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.258	0.915	0.047	0.828	0.036	0.849
2	1	0.379	0.927	0.726	0.394	0.621	0.431
3	1	0.357	0.897	1.548	0.213	1.035	0.309
4	1	0.438	0.891	5.630	0.018	0.167	0.682
5	1	0.339	0.768	1.997	0.158	0.857	0.355
6	1	0.408	0.619	2.593	0.107	3.204	0.073
7	1	0.380	0.804	3.488	0.062	10.936	0.001
8	1	0.539	0.742	0.675	0.411	1.359	0.244
9	1	0.493	0.720	0.108	0.743	3.418	0.064
10	1	0.546	0.588	1.390	0.238	4.415	0.036
11	1	0.480	0.712	3.558	0.059	1.626	0.202
12	1	0.312	0.781	1.318	0.251	0.325	0.568
13	1	0.370	0.911	0.233	0.629	0.697	0.404
14	1	0.459	0.560	2.050	0.152	1.940	0.164
15	1	0.322	0.939	3.679	0.055	0.399	0.527
16	1	0.243	0.320	0.103	0.748	2.071	0.150
17	1	0.390	0.747	0.950	0.330	0.321	0.571
18	1	0.566	0.812	1.365	0.243	3.769	0.052
19	1	0.363	0.855	0.319	0.572	0.262	0.609
20	1	0.250	0.927	4.347	0.037	0.230	0.631
21	1	0.512	0.722	0.025	0.875	0.189	0.663
22	1	0.592	0.629	0.932	0.334	0.112	0.738
23	1	0.199	0.952	1.557	0.212	1.837	0.175
24	1	0.310	0.703	0.119	0.730	0.605	0.437
25	1	0.468	0.668	0.011	0.918	0.584	0.445
26	1	0.330	0.699	0.009	0.925	0.937	0.333
27	1	0.323	0.382	0.614	0.433	7.222	0.007
28	2	0.587	1.380	0.300	0.584	2.769	0.096
29	2	0.645	1.272	0.059	0.808	7.104	0.008
30	2	0.501	1.370	4.622	0.032	0.475	0.491
31	2	0.546	1.407	0.393	0.531	0.107	0.744
32	2	0.523	1.011	3.762	0.052	2.215	0.137
33	2	0.482	1.572	0.195	0.658	0.002	0.968
34	2	0.539	1.111	0.119	0.730	1.147	0.284
35	2	0.633	1.588	0.878	0.349	1.440	0.230
36	2	0.594	1.406	0.410	0.522	0.005	0.941

37	2	0.485	1.572	1.874	0.171	0.008	0.930
38	2	0.564	1.696	0.683	0.409	0.375	0.540
39	2	0.419	1.337	1.596	0.206	2.624	0.105
40	2	0.649	1.402	0.214	0.643	0.406	0.524
41	2	0.607	0.959	1.628	0.202	2.870	0.090
42	2	0.398	1.471	2.590	0.108	2.321	0.128
43	2	0.608	1.647	0.375	0.540	1.958	0.162
44	2	0.610	1.353	0.094	0.760	2.642	0.104
Maximum	61						
Mean		0.455	0.717				

---

### Item Statistics for 2006 Mathematics Grade 3

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.452	0.914	0.193	0.660	3.520	0.061
2	1	0.192	0.940	0.004	0.951	0.026	0.871
3	1	0.291	0.901	0.420	0.517	2.155	0.142
4	1	0.487	0.822	0.575	0.448	0.765	0.382
5	1	0.462	0.686	0.506	0.477	0.058	0.810
6	1	0.443	0.802	0.957	0.328	1.376	0.241
7	1	0.372	0.562	2.793	0.095	0.164	0.686
8	1	0.417	0.773	0.055	0.815	0.003	0.960
9	1	0.413	0.874	0.030	0.863	0.644	0.422
10	1	0.393	0.865	2.057	0.151	0.040	0.841
11	1	0.442	0.860	1.731	0.188	1.866	0.172
12	1	0.536	0.752	1.993	0.158	0.246	0.620
13	1	0.453	0.864	2.845	0.092	0.014	0.907
14	1	0.224	0.971	1.527	0.217	1.594	0.207
15	1	0.500	0.730	0.201	0.654	2.044	0.153
16	1	0.441	0.813	0.120	0.729	1.882	0.170
17	1	0.403	0.787	0.430	0.512	2.343	0.126
18	1	0.433	0.607	7.785	0.005	2.337	0.126
19	1	0.235	0.914	0.664	0.415	0.023	0.880
20	1	0.357	0.367	0.778	0.378	0.228	0.633
21	1	0.266	0.939	0.066	0.797	0.197	0.657
22	1	0.465	0.683	1.064	0.302	0.311	0.577
23	1	0.380	0.784	0.364	0.546	2.710	0.100
24	1	0.471	0.855	0.697	0.404	12.607	0.000
25	1	0.393	0.719	0.001	0.981	0.111	0.739
26	1	0.488	0.588	0.381	0.537	8.684	0.003
27	1	0.158	0.949	2.088	0.148	0.264	0.608
28	1	0.315	0.486	0.019	0.891	11.605	0.001
29	1	0.548	0.622	1.812	0.178	9.882	0.002
30	1	0.502	0.485	0.024	0.876	1.410	0.235
31	1	0.505	0.797	0.747	0.387	1.881	0.170
32	1	0.387	0.337	0.116	0.733	1.307	0.253
33	1	0.517	0.494	1.744	0.187	3.932	0.047
34	1	0.439	0.562	1.527	0.217	0.802	0.371
35	1	0.425	0.846	2.825	0.093	0.540	0.463
36	1	0.386	0.765	0.165	0.684	0.666	0.414

37	2	0.600	1.194	1.322	0.250	3.726	0.054
38	2	0.654	0.928	3.729	0.053	1.600	0.206
39	2	0.555	1.453	0.142	0.706	4.330	0.037
40	2	0.476	0.975	0.075	0.784	1.964	0.161
41	2	0.625	0.745	0.002	0.962	0.220	0.639
42	1	0.492	0.659	0.209	0.648	7.074	0.008
43	1	0.379	0.768	1.629	0.202	0.453	0.501
44	1	0.522	0.523	1.113	0.291	6.397	0.011
45	1	0.506	0.693	0.030	0.864	1.604	0.205
46	1	0.429	0.783	1.311	0.252	1.747	0.186
47	1	0.252	0.716	1.141	0.285	0.540	0.462
48	1	0.453	0.563	0.620	0.431	2.917	0.088
49	1	0.421	0.805	2.137	0.144	0.096	0.757
50	1	0.349	0.879	3.720	0.054	0.032	0.858
51	2	0.591	1.441	0.028	0.868	0.671	0.413
52	2	0.612	1.076	0.066	0.797	0.449	0.503
53	2	0.540	1.486	1.730	0.188	0.753	0.386
54	2	0.601	1.246	1.493	0.222	2.206	0.137
55	2	0.454	1.167	3.816	0.051	5.880	0.015
56	2	0.552	1.147	0.761	0.383	3.050	0.081
57	2	0.551	1.513	2.191	0.139	0.222	0.637
58	2	0.376	1.197	4.525	0.033	1.159	0.282
59	2	0.505	1.531	0.028	0.866	0.174	0.677
Maximum	73						
Mean		0.442	0.688				

---

### Item Statistics for 2006 Mathematics Grade 4

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.218	0.812	8.543	0.003	0.691	0.406
2	1	0.457	0.587	3.135	0.077	4.331	0.037
3	1	0.338	0.798	0.029	0.864	1.143	0.285
4	1	0.342	0.857	0.108	0.742	0.219	0.640
5	1	0.304	0.946	1.119	0.290	1.196	0.274
6	1	0.324	0.760	2.519	0.113	0.792	0.374
7	1	0.470	0.766	3.602	0.058	2.471	0.116
8	1	0.394	0.834	1.864	0.172	3.591	0.058
9	1	0.452	0.706	0.729	0.393	1.278	0.258
10	1	0.303	0.894	0.555	0.456	0.422	0.516
11	1	0.431	0.764	0.005	0.946	7.985	0.005
12	1	0.426	0.519	0.145	0.703	1.798	0.180
13	1	0.271	0.977	1.253	0.263	0.042	0.838
14	1	0.382	0.884	1.919	0.166	0.058	0.810
15	1	0.333	0.589	3.836	0.050	0.530	0.467
16	1	0.477	0.740	6.644	0.010	0.175	0.675
17	1	0.374	0.861	0.550	0.458	0.002	0.966
18	1	0.413	0.734	3.831	0.050	0.029	0.865
19	1	0.255	0.934	2.845	0.092	2.731	0.098
20	1	0.469	0.731	3.653	0.056	0.002	0.964
21	1	0.305	0.797	0.024	0.876	0.411	0.521
22	1	0.393	0.812	3.068	0.080	0.320	0.571
23	1	0.439	0.692	3.361	0.067	0.022	0.882
24	1	0.237	0.277	0.134	0.714	0.667	0.414
25	1	0.192	0.916	1.173	0.279	0.513	0.474
26	1	0.488	0.749	0.407	0.523	9.775	0.002
27	1	0.400	0.825	0.332	0.565	0.121	0.728
28	1	0.287	0.731	0.122	0.727	0.078	0.779
29	1	0.420	0.814	0.001	0.977	0.943	0.332
30	1	0.492	0.729	0.005	0.946	0.466	0.495
31	1	0.449	0.634	2.683	0.101	3.195	0.074
32	1	0.410	0.732	0.652	0.420	0.127	0.721
33	1	0.584	0.729	1.209	0.272	1.416	0.234
34	1	0.400	0.556	0.110	0.741	2.449	0.118
35	1	0.373	0.852	0.446	0.504	1.196	0.274
36	1	0.521	0.614	1.728	0.189	0.000	0.991

37	1	0.440	0.383	0.637	0.425	5.274	0.022
38	1	0.393	0.646	0.623	0.430	0.480	0.489
39	2	0.446	1.741	0.156	0.693	1.351	0.245
40	2	0.460	1.593	1.577	0.209	1.908	0.167
41	2	0.452	1.191	5.144	0.023	0.735	0.391
42	2	0.411	0.801	1.515	0.218	0.704	0.402
43	4	0.598	2.016	0.147	0.701	13.522	0.000
44	1	0.406	0.556	0.183	0.669	0.761	0.383
45	1	0.338	0.666	0.121	0.728	0.029	0.865
46	1	0.275	0.711	0.050	0.823	0.130	0.718
47	1	0.355	0.810	0.208	0.648	1.560	0.212
48	1	0.165	0.597	2.621	0.105	1.267	0.260
49	1	0.476	0.675	0.103	0.748	0.247	0.619
50	1	0.380	0.714	0.103	0.748	0.258	0.611
51	1	0.483	0.628	3.600	0.058	1.220	0.269
52	1	0.358	0.473	0.980	0.322	3.584	0.058
53	1	0.275	0.394	1.611	0.204	0.071	0.790
54	2	0.481	1.194	0.092	0.762	2.267	0.132
55	2	0.528	0.520	2.222	0.136	0.569	0.451
56	2	0.393	1.603	2.495	0.114	0.700	0.403
57	2	0.443	1.044	1.207	0.272	1.930	0.165
58	4	0.543	1.358	1.744	0.187	0.039	0.844
59	4	0.530	3.035	0.022	0.883	2.237	0.135
Maximum	76						
Mean		0.397	0.664				

---

### Item Statistics for 2006 Mathematics Grade 5

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.316	0.613	0.060	0.806	4.403	0.036
2	1	0.360	0.621	1.782	0.182	0.000	0.988
3	1	0.360	0.858	0.323	0.570	8.651	0.003
4	1	0.403	0.671	0.784	0.376	0.001	0.973
5	1	0.520	0.633	1.668	0.196	0.102	0.749
6	1	0.400	0.755	0.160	0.689	3.865	0.049
7	1	0.299	0.870	0.569	0.451	0.319	0.572
8	1	0.214	0.812	0.035	0.852	0.906	0.341
9	1	0.331	0.710	5.998	0.014	7.601	0.006
10	1	0.136	0.242	0.001	0.977	0.011	0.916
11	1	0.361	0.493	1.363	0.243	1.209	0.272
12	1	0.485	0.584	2.261	0.133	0.545	0.460
13	1	0.456	0.699	1.843	0.175	4.129	0.042
14	1	0.460	0.815	0.571	0.450	0.123	0.725
15	1	0.478	0.592	0.006	0.937	0.037	0.847
16	1	0.381	0.756	0.537	0.464	0.664	0.415
17	1	0.304	0.800	3.992	0.046	8.010	0.005
18	1	0.277	0.841	0.366	0.545	1.849	0.174
19	1	0.255	0.954	0.874	0.350	3.235	0.072
20	1	0.422	0.504	0.235	0.628	1.695	0.193
21	1	0.472	0.777	1.307	0.253	0.509	0.476
22	1	0.420	0.502	0.174	0.677	4.225	0.040
23	1	0.431	0.697	0.705	0.401	0.765	0.382
24	1	0.288	0.853	0.341	0.559	0.006	0.939
25	1	0.235	0.764	0.103	0.748	3.045	0.081
26	1	0.478	0.496	0.003	0.957	0.354	0.552
27	1	0.443	0.602	3.083	0.079	0.404	0.525
28	1	0.152	0.474	1.097	0.295	0.001	0.977
29	1	0.458	0.537	0.861	0.353	0.218	0.641
30	1	0.419	0.578	0.086	0.769	0.794	0.373
31	1	0.389	0.629	0.084	0.772	0.579	0.447
32	1	0.360	0.587	0.006	0.939	1.717	0.190
33	1	0.405	0.660	0.021	0.885	1.243	0.265
34	1	0.022	0.278	0.122	0.727	0.274	0.601
35	1	0.504	0.400	0.165	0.685	2.116	0.146
36	1	0.473	0.611	0.197	0.658	0.092	0.762

37	1	0.314	0.584	2.358	0.125	0.190	0.663
38	1	0.352	0.759	0.535	0.465	3.167	0.075
39	2	0.527	0.907	0.861	0.353	0.053	0.817
40	2	0.371	1.311	6.555	0.010	0.793	0.373
41	2	0.565	1.402	2.357	0.125	6.084	0.014
42	2	0.526	1.037	0.103	0.748	1.550	0.213
43	4	0.634	2.123	0.090	0.764	0.762	0.383
44	1	0.246	0.792	0.006	0.936	0.116	0.733
45	1	0.513	0.627	0.296	0.587	0.234	0.629
46	1	0.344	0.784	2.910	0.088	0.044	0.834
47	1	0.462	0.734	3.418	0.064	2.534	0.111
48	1	0.471	0.754	0.090	0.765	0.856	0.355
49	1	0.484	0.482	4.218	0.040	5.847	0.016
50	1	0.435	0.763	1.532	0.216	3.431	0.064
51	1	0.414	0.691	0.067	0.795	0.031	0.859
52	1	0.332	0.424	5.170	0.023	0.248	0.618
53	1	0.394	0.422	0.270	0.603	0.071	0.789
54	2	0.488	1.049	0.306	0.580	0.367	0.544
55	2	0.355	1.482	3.909	0.048	0.941	0.332
56	2	0.517	0.522	2.889	0.089	3.693	0.055
57	2	0.527	0.817	4.825	0.028	1.820	0.177
58	4	0.601	1.829	0.360	0.549	1.324	0.250
59	4	0.620	1.794	0.016	0.899	1.326	0.250
Maximum	76						
Mean		0.401	0.597				

---

### Item Statistics for 2006 Mathematics Grade 6

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.492	0.785	0.172	0.678	0.000	0.987
2	1	0.390	0.680	1.151	0.283	0.339	0.560
3	1	0.422	0.471	0.029	0.865	0.352	0.553
4	1	0.446	0.566	0.563	0.453	0.015	0.901
5	1	0.533	0.712	0.650	0.420	1.069	0.301
6	1	0.266	0.643	0.111	0.739	0.272	0.602
7	1	0.308	0.784	0.052	0.819	3.676	0.055
8	1	0.246	0.893	0.673	0.412	4.368	0.037
9	1	0.465	0.392	1.562	0.211	0.014	0.906
10	1	0.166	0.405	0.308	0.579	3.671	0.055
11	1	0.327	0.489	0.000	0.987	2.371	0.124
12	1	0.290	0.553	0.243	0.622	0.004	0.948
13	1	0.331	0.484	2.856	0.091	0.521	0.471
14	1	0.446	0.543	0.336	0.562	0.951	0.330
15	1	0.440	0.475	0.749	0.387	0.017	0.896
16	1	0.403	0.548	0.548	0.459	0.180	0.672
17	1	0.376	0.749	0.495	0.482	0.440	0.507
18	1	0.383	0.501	0.041	0.839	5.217	0.022
19	1	0.473	0.572	1.352	0.245	0.036	0.850
20	1	0.410	0.535	0.575	0.448	4.330	0.037
21	1	0.348	0.661	2.562	0.109	1.249	0.264
22	1	0.152	0.374	0.905	0.341	0.070	0.792
23	1	0.274	0.907	1.469	0.226	0.337	0.562
24	1	0.434	0.718	0.628	0.428	0.544	0.461
25	1	0.247	0.917	0.803	0.370	4.655	0.031
26	1	0.456	0.617	5.038	0.025	2.489	0.115
27	1	0.339	0.683	0.387	0.534	1.212	0.271
28	1	0.277	0.623	0.951	0.329	0.305	0.581
29	1	0.389	0.512	0.716	0.397	0.443	0.505
30	1	0.444	0.726	2.760	0.097	0.164	0.686
31	1	0.572	0.500	0.004	0.950	17.502	0.000
32	1	0.491	0.652	1.339	0.247	0.002	0.962
33	1	0.466	0.468	0.046	0.831	4.163	0.041
34	1	0.400	0.422	0.264	0.607	0.122	0.727
35	1	0.184	0.411	8.814	0.003	0.013	0.910
36	1	0.460	0.506	2.008	0.156	5.655	0.017

37	1	0.383	0.440	4.092	0.043	0.770	0.380
38	2	0.421	0.666	0.024	0.876	4.449	0.035
39	2	0.507	1.165	0.658	0.417	5.317	0.021
40	2	0.569	1.544	0.012	0.914	1.485	0.223
41	2	0.564	1.430	1.879	0.170	0.320	0.571
42	4	0.617	1.213	0.033	0.856	4.293	0.038
43	1	0.332	0.749	1.165	0.280	0.337	0.561
44	1	0.332	0.519	0.108	0.743	0.451	0.502
45	1	0.550	0.631	8.385	0.004	2.729	0.099
46	1	0.362	0.567	0.594	0.441	0.228	0.633
47	1	0.229	0.528	5.271	0.022	1.604	0.205
48	1	0.419	0.765	7.590	0.006	0.470	0.493
49	1	0.319	0.790	3.266	0.071	2.762	0.097
50	1	0.339	0.535	0.439	0.508	0.603	0.437
51	1	0.454	0.805	3.185	0.074	0.035	0.851
52	1	0.423	0.372	1.373	0.241	1.185	0.276
53	2	0.657	1.205	1.624	0.202	0.002	0.961
54	2	0.528	1.319	0.102	0.750	3.762	0.052
55	2	0.534	0.778	4.188	0.041	0.691	0.406
56	2	0.613	0.743	2.289	0.130	10.250	0.001
57	4	0.601	1.383	0.917	0.338	0.529	0.467
58	4	0.632	1.699	3.639	0.056	5.240	0.022
Maximum	75						
Mean		0.413	0.551				

---

### Item Statistics for 2006 Mathematics Grade 7

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.447	0.599	0.044	0.834	1.248	0.264
2	1	0.561	0.719	0.262	0.609	1.206	0.272
3	1	0.371	0.686	3.475	0.062	10.150	0.001
4	1	0.444	0.624	0.124	0.724	0.977	0.323
5	1	0.508	0.421	0.887	0.346	0.800	0.371
6	1	0.473	0.603	0.289	0.591	0.579	0.447
7	1	0.445	0.267	1.416	0.234	1.580	0.209
8	1	0.360	0.738	5.083	0.024	0.001	0.971
9	1	0.551	0.652	0.404	0.525	5.706	0.017
10	1	0.414	0.617	0.468	0.494	3.572	0.059
11	1	0.468	0.445	1.574	0.210	0.031	0.860
12	1	0.446	0.370	0.136	0.712	0.593	0.441
13	1	0.446	0.753	1.488	0.223	4.327	0.038
14	1	0.372	0.831	0.125	0.723	0.963	0.326
15	1	0.453	0.769	1.725	0.189	2.599	0.107
16	1	0.383	0.672	0.364	0.546	0.147	0.702
17	1	0.377	0.446	2.787	0.095	6.114	0.013
18	1	0.443	0.680	0.003	0.955	7.814	0.005
19	1	0.193	0.384	3.772	0.052	0.057	0.811
20	1	0.386	0.832	0.724	0.395	0.322	0.570
21	1	0.357	0.721	0.021	0.884	0.242	0.623
22	1	0.407	0.547	1.528	0.216	9.172	0.002
23	1	0.399	0.622	0.395	0.530	0.020	0.887
24	1	0.458	0.458	0.424	0.515	1.071	0.301
25	1	0.331	0.493	4.856	0.028	1.382	0.240
26	1	0.498	0.410	5.038	0.025	12.452	0.000
27	1	0.547	0.416	1.747	0.186	0.163	0.686
28	1	0.205	0.655	0.487	0.485	8.633	0.003
29	1	0.282	0.306	0.008	0.929	0.139	0.709
30	1	0.403	0.477	1.194	0.275	1.913	0.167
31	1	0.313	0.577	0.458	0.498	0.009	0.925
32	1	0.382	0.469	0.003	0.955	0.135	0.713
33	1	0.327	0.836	0.920	0.338	0.335	0.563
34	1	0.376	0.817	0.047	0.828	0.452	0.502
35	1	0.181	0.342	1.135	0.287	0.000	0.995
36	1	0.481	0.319	0.058	0.810	8.050	0.005

37	1	0.499	0.393	1.000	0.317	0.368	0.544
38	2	0.665	0.501	1.925	0.165	0.643	0.423
39	2	0.665	0.904	0.075	0.784	0.369	0.544
40	2	0.591	0.723	0.080	0.778	1.528	0.216
41	2	0.663	0.816	0.027	0.869	0.022	0.882
42	4	0.652	1.690	0.247	0.619	1.339	0.247
43	1	0.282	0.610	0.006	0.938	0.070	0.792
44	1	0.329	0.585	4.058	0.044	0.113	0.737
45	1	0.529	0.584	1.132	0.287	0.473	0.491
46	1	0.441	0.637	0.271	0.603	0.081	0.776
47	1	0.332	0.805	0.355	0.551	2.163	0.141
48	1	0.467	0.707	1.817	0.178	0.010	0.922
49	1	0.000	1.000	0.000	0.000	0.000	0.000
50	1	0.410	0.324	3.585	0.058	0.806	0.369
51	1	0.365	0.272	0.523	0.469	0.112	0.738
52	1	0.291	0.457	0.686	0.408	10.659	0.001
53	2	0.628	0.732	1.318	0.251	0.075	0.784
54	2	0.487	1.709	0.000	0.994	4.419	0.036
55	2	0.661	0.489	3.488	0.062	0.134	0.715
56	2	0.506	1.362	0.855	0.355	1.550	0.213
57	4	0.682	1.479	6.451	0.011	2.355	0.125
58	4	0.730	1.709	9.937	0.002	0.087	0.767
Maximum	75						
Mean		0.445	0.521				

---

### Item Statistics for 2006 Mathematics Grade 8

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.388	0.207	0.020	0.889	0.477	0.490
2	1	0.475	0.508	0.355	0.551	0.292	0.589
3	1	0.448	0.207	1.245	0.264	4.157	0.041
4	1	0.565	0.413	1.179	0.278	1.375	0.241
5	1	0.405	0.768	0.108	0.743	0.119	0.730
6	1	0.430	0.559	2.834	0.092	0.013	0.910
7	1	0.481	0.515	1.102	0.294	0.221	0.639
8	1	0.231	0.641	1.746	0.186	2.873	0.090
9	1	0.531	0.546	2.788	0.095	8.346	0.004
10	1	0.178	0.355	0.132	0.716	0.497	0.481
11	1	0.593	0.592	1.947	0.163	4.729	0.030
12	1	0.397	0.849	0.084	0.772	0.058	0.810
13	1	0.439	0.626	0.358	0.549	0.379	0.538
14	1	0.514	0.635	0.293	0.588	1.454	0.228
15	1	0.328	0.491	1.063	0.303	2.962	0.085
16	1	0.510	0.480	2.853	0.091	0.119	0.730
17	1	0.440	0.607	0.626	0.429	2.944	0.086
18	1	0.367	0.821	0.692	0.405	2.590	0.108
19	1	0.333	0.855	0.063	0.802	0.728	0.394
20	1	0.496	0.700	0.584	0.445	2.706	0.100
21	1	0.540	0.517	1.604	0.205	0.813	0.367
22	1	0.497	0.489	1.712	0.191	2.101	0.147
23	1	0.447	0.681	0.183	0.669	1.365	0.243
24	1	0.389	0.670	0.501	0.479	0.132	0.716
25	1	0.445	0.548	1.193	0.275	0.831	0.362
26	1	0.396	0.743	0.933	0.334	5.072	0.024
27	1	0.337	0.364	0.349	0.555	0.973	0.324
28	1	0.447	0.481	4.851	0.028	0.233	0.630
29	1	0.406	0.776	2.716	0.099	1.512	0.219
30	1	0.424	0.455	2.896	0.089	1.185	0.276
31	1	0.180	0.438	3.367	0.067	0.015	0.903
32	1	0.472	0.656	0.931	0.335	0.223	0.637
33	1	0.370	0.476	2.379	0.123	4.650	0.031
34	1	0.380	0.480	0.451	0.502	0.328	0.567
35	1	0.044	0.693	0.054	0.817	0.888	0.346
36	1	0.286	0.198	0.303	0.582	3.124	0.077

37	1	0.444	0.555	1.322	0.250	0.006	0.937
38	1	0.443	0.277	0.562	0.454	0.850	0.357
39	2	0.641	0.892	0.051	0.822	0.734	0.391
40	2	0.621	0.779	4.008	0.045	0.417	0.519
41	2	0.548	1.263	0.014	0.907	0.690	0.406
42	2	0.676	0.964	0.143	0.706	0.220	0.639
43	4	0.661	1.274	0.001	0.970	0.317	0.573
44	1	0.399	0.435	5.776	0.016	0.750	0.386
45	1	0.395	0.354	0.688	0.407	8.089	0.004
46	1	0.474	0.384	0.878	0.349	3.080	0.079
47	1	0.427	0.585	0.037	0.848	2.304	0.129
48	1	0.360	0.469	0.914	0.339	0.917	0.338
49	1	0.431	0.785	0.117	0.732	14.751	0.000
50	1	0.614	0.459	0.028	0.868	1.657	0.198
51	1	0.384	0.660	1.188	0.276	0.126	0.722
52	1	0.441	0.379	0.080	0.777	7.594	0.006
53	1	0.462	0.800	1.250	0.263	0.219	0.640
54	2	0.526	0.707	0.421	0.516	0.019	0.890
55	2	0.487	0.570	0.091	0.763	0.026	0.873
56	2	0.581	1.357	0.059	0.808	2.153	0.142
57	2	0.673	1.149	2.556	0.110	5.205	0.023
58	4	0.644	2.481	3.532	0.060	1.473	0.225
59	4	0.711	2.505	2.850	0.091	0.079	0.779
Maximum	76						
Mean		0.452	0.528				

---

### Item Statistics for 2006 Mathematics Grade 9

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.414	0.624	0.521	0.470	0.420	0.517
2	1	0.309	0.322	0.002	0.968	0.000	0.995
3	1	0.452	0.798	0.587	0.444	0.957	0.328
4	1	0.422	0.573	0.769	0.381	1.997	0.158
5	1	0.388	0.787	0.002	0.960	1.903	0.168
6	1	0.447	0.724	0.167	0.683	13.649	0.000
7	1	0.264	0.511	0.870	0.351	11.763	0.001
8	1	0.329	0.872	1.375	0.241	0.038	0.845
9	1	0.323	0.884	0.074	0.785	0.347	0.556
10	1	0.416	0.593	2.115	0.146	1.559	0.212
11	1	0.458	0.802	0.078	0.780	0.344	0.558
12	1	0.304	0.468	0.199	0.656	0.783	0.376
13	1	0.364	0.539	1.311	0.252	4.462	0.035
14	1	0.320	0.346	1.509	0.219	0.938	0.333
15	1	0.370	0.420	0.006	0.940	0.028	0.868
16	1	0.458	0.520	0.005	0.943	1.117	0.290
17	1	0.386	0.695	0.686	0.407	1.070	0.301
18	1	0.412	0.509	0.879	0.348	0.000	0.985
19	1	0.471	0.418	0.017	0.896	4.660	0.031
20	1	0.463	0.720	0.777	0.378	0.516	0.473
21	1	0.364	0.105	2.883	0.090	2.524	0.112
22	1	0.318	0.562	0.786	0.375	1.500	0.221
23	1	0.377	0.809	1.314	0.252	1.384	0.239
24	1	0.355	0.564	3.250	0.071	1.174	0.279
25	1	0.446	0.608	1.522	0.217	3.768	0.052
26	1	0.272	0.347	1.487	0.223	0.000	0.990
27	1	0.507	0.520	3.307	0.069	2.986	0.084
28	1	0.496	0.603	5.563	0.018	1.115	0.291
29	1	0.340	0.630	3.385	0.066	0.062	0.803
30	1	0.438	0.476	0.999	0.318	1.198	0.274
31	1	0.335	0.304	3.943	0.047	4.745	0.029
32	1	0.535	0.700	1.789	0.181	0.844	0.358
33	1	0.413	0.759	0.263	0.608	3.849	0.050
34	1	0.488	0.708	1.996	0.158	0.207	0.649
35	1	0.403	0.393	0.571	0.450	0.714	0.398
36	1	0.375	0.499	5.465	0.019	1.976	0.160

37	1	0.514	0.523	0.022	0.883	0.193	0.661
38	1	0.210	0.476	0.529	0.467	2.292	0.130
39	1	0.275	0.374	0.001	0.977	0.026	0.871
40	1	0.493	0.462	0.107	0.743	1.792	0.181
41	2	0.609	0.869	1.433	0.231	0.036	0.849
42	2	0.639	0.575	0.119	0.730	0.552	0.458
43	2	0.645	0.695	9.198	0.002	0.303	0.582
44	2	0.499	1.393	0.021	0.885	2.358	0.125
45	4	0.618	0.502	2.623	0.105	0.076	0.783
46	1	0.425	0.806	0.000	0.988	4.949	0.026
47	1	0.220	0.733	0.026	0.871	0.613	0.434
48	1	0.124	0.343	0.340	0.560	6.522	0.011
49	1	0.447	0.604	1.220	0.269	0.499	0.480
50	1	0.296	0.223	1.109	0.292	1.121	0.290
51	1	0.398	0.843	0.381	0.537	0.014	0.905
52	1	0.426	0.753	4.375	0.036	1.389	0.239
53	1	0.441	0.574	1.020	0.313	0.003	0.959
54	1	0.423	0.612	1.050	0.306	1.669	0.196
55	1	0.509	0.657	3.910	0.048	0.574	0.449
56	2	0.648	0.982	0.662	0.416	7.830	0.005
57	2	0.616	0.469	9.755	0.002	0.544	0.461
58	2	0.501	1.236	0.570	0.450	0.185	0.667
59	2	0.668	0.685	0.601	0.438	1.312	0.252
60	4	0.693	2.437	4.696	0.030	0.029	0.866
61	4	0.536	0.572	1.072	0.301	0.030	0.862
Maximum	78						
Mean		0.428	0.501				

---

### Item Statistics for 2006 Mathematics Grade 10

Sequence N.	Max. Point	ptbis	Mean	DIF (White vs. Black)		DIF (Male vs. Female)	
				MH	p <	MH	p <
1	1	0.385	0.399	1.018	0.313	1.178	0.278
2	1	0.473	0.548	0.318	0.573	3.070	0.080
3	1	0.310	0.536	0.080	0.778	11.941	0.001
4	1	-0.067	0.274	0.013	0.909	3.319	0.069
5	1	0.424	0.440	0.183	0.668	0.008	0.931
6	1	0.434	0.435	0.140	0.708	2.063	0.151
7	1	0.257	0.251	0.945	0.331	0.460	0.497
8	1	0.436	0.230	0.075	0.784	3.796	0.051
9	1	0.424	0.700	0.121	0.728	0.413	0.520
10	1	0.087	0.134	5.835	0.016	0.129	0.719
11	1	0.430	0.471	2.970	0.085	0.716	0.398
12	1	0.496	0.502	0.395	0.530	11.466	0.001
13	1	0.449	0.618	1.217	0.270	0.634	0.426
14	1	0.229	0.756	1.469	0.226	11.232	0.001
15	1	0.190	0.669	0.003	0.954	0.066	0.798
16	1	0.467	0.565	9.256	0.002	11.456	0.001
17	1	0.285	0.814	0.089	0.765	0.288	0.591
18	1	0.198	0.240	0.420	0.517	0.685	0.408
19	1	0.379	0.631	0.098	0.754	1.179	0.278
20	1	0.522	0.503	0.047	0.828	3.394	0.065
21	1	0.468	0.776	0.634	0.426	1.210	0.271
22	1	0.364	0.394	2.922	0.087	2.769	0.096
23	1	0.371	0.771	1.986	0.159	1.297	0.255
24	1	0.445	0.559	5.237	0.022	5.306	0.021
25	1	0.477	0.392	0.318	0.573	3.324	0.068
26	1	0.451	0.446	4.096	0.043	0.156	0.693
27	1	0.315	0.304	0.011	0.915	0.374	0.541
28	1	0.313	0.496	4.657	0.031	1.981	0.159
29	1	0.392	0.295	0.341	0.559	4.330	0.037
30	1	0.291	0.315	3.448	0.063	1.406	0.236
31	1	0.343	0.517	2.056	0.152	0.130	0.718
32	1	0.410	0.248	0.257	0.612	0.630	0.427
33	1	0.464	0.577	0.041	0.840	4.972	0.026
34	1	0.243	0.222	0.200	0.655	2.028	0.154
35	1	0.381	0.322	0.054	0.816	0.672	0.412
36	1	0.408	0.336	1.969	0.161	0.000	0.994

37	1	0.288	0.473	0.121	0.728	2.323	0.128
38	1	0.334	0.456	1.445	0.229	0.472	0.492
39	2	0.589	0.765	0.036	0.850	2.027	0.154
40	2	0.527	0.806	1.009	0.315	0.018	0.894
41	2	0.655	0.598	0.533	0.466	1.180	0.277
42	2	0.698	0.629	0.723	0.395	0.394	0.530
43	4	0.695	1.898	2.306	0.129	0.773	0.379
44	1	0.372	0.377	0.319	0.572	0.911	0.340
45	1	0.338	0.422	0.028	0.868	1.509	0.219
46	1	0.044	0.573	1.202	0.273	0.774	0.379
47	1	0.393	0.528	0.001	0.972	2.336	0.126
48	1	0.405	0.474	2.381	0.123	2.626	0.105
49	1	0.328	0.216	4.189	0.041	0.029	0.865
50	1	0.216	0.628	0.595	0.441	3.125	0.077
51	1	0.351	0.474	1.167	0.280	4.502	0.034
52	1	0.431	0.543	1.476	0.224	0.133	0.715
53	1	0.378	0.298	2.599	0.107	0.297	0.586
54	2	0.699	0.727	0.211	0.646	2.766	0.096
55	2	0.606	0.859	1.574	0.210	10.382	0.001
56	2	0.622	1.030	0.403	0.526	3.121	0.077
57	2	0.690	0.562	0.280	0.597	1.070	0.301
58	4	0.765	1.730	1.839	0.175	2.818	0.093
59	4	0.709	1.450	0.329	0.566	1.829	0.176
Maximum	76						
Mean		0.408	0.437				

---

### Item Statistics for 2006 Science by Grade

Grade	Seq.	Maximum Point	Mean	ptbis	DIF Black vs. White		DIF Male vs. Female	
					MH	p <	MH	p <
4	1	1	0.739	0.44	0.444	0.505	13.273	0.000
4	2	1	0.775	0.18	0.474	0.491	1.057	0.304
4	3	1	0.868	0.32	3.422	0.064	4.056	0.044
4	4	1	0.855	0.37	0.002	0.962	1.017	0.313
4	5	2	1.576	0.41	0.983	0.321	4.732	0.030
4	6	2	1.208	0.37	0.998	0.318	6.234	0.013
4	7	1	0.939	0.20	4.240	0.039	0.061	0.805
4	8	1	0.600	0.48	4.169	0.041	0.311	0.577
4	9	1	0.834	0.27	3.379	0.066	0.397	0.528
4	10	2	1.292	0.38	0.771	0.380	1.358	0.244
4	11	2	1.093	0.47	2.223	0.136	2.021	0.155
4	12	1	0.853	0.32	0.042	0.838	0.091	0.764
4	13	1	0.964	0.24	0.014	0.906	1.555	0.212
4	14	1	0.807	0.22	5.093	0.024	0.582	0.446
4	15	1	0.584	0.25	3.626	0.057	8.464	0.004
4	16	2	0.713	0.44	0.256	0.613	12.764	0.000
4	17	2	1.237	0.38	1.344	0.246	2.101	0.147
4	18	1	0.743	0.35	1.040	0.308	1.079	0.299
4	19	1	0.884	0.36	2.536	0.111	8.475	0.004
4	20	1	0.617	0.40	0.814	0.367	5.573	0.018
4	21	1	0.363	0.41	4.301	0.038	0.717	0.397
4	22	2	1.356	0.34	0.082	0.774	0.378	0.538
4	23	2	0.895	0.33	1.595	0.207	0.006	0.941
4	24	2	1.292	0.43	3.874	0.049	0.307	0.579
4	25	2	0.850	0.46	0.613	0.434	0.701	0.402
4	26	1	0.518	0.12	0.773	0.379	1.187	0.276
4	27	1	0.742	0.30	0.121	0.728	0.586	0.444
4	28	1	0.521	0.25	0.539	0.463	4.211	0.040
4	29	1	0.695	0.35	1.189	0.276	0.945	0.331
4	30	2	1.345	0.51	8.771	0.003	7.299	0.007
4	31	2	0.991	0.48	0.459	0.498	10.968	0.001
4	32	1	0.713	0.26	6.172	0.013	0.112	0.738
4	33	1	0.919	0.35	0.258	0.612	0.764	0.382
4	34	1	0.462	0.29	0.173	0.677	0.086	0.769
4	35	2	0.924	0.48	0.002	0.962	0.170	0.680

4	36	2	1.485	0.42	0.146	0.702	7.826	0.005
4	37	1	0.665	0.23	12.631	0.000	0.019	0.889
4	38	1	0.669	0.29	0.757	0.384	0.255	0.613
4	39	1	0.692	0.18	1.145	0.285	0.186	0.667
4	40	1	0.635	0.38	0.222	0.638	1.504	0.220
4	41	2	0.860	0.50	0.023	0.878	0.073	0.787
4	42	2	1.121	0.33	1.237	0.266	0.004	0.948
4	43	1	0.817	0.30	3.540	0.060	1.096	0.295
4	44	1	0.820	0.43	0.013	0.908	7.352	0.007
4	45	2	1.041	0.43	1.231	0.267	2.022	0.155
4	46	2	1.261	0.29	1.778	0.182	3.758	0.053
4	47	1	0.497	0.26	1.754	0.185	2.597	0.107
4	48	1	0.782	0.25	0.067	0.795	0.008	0.930
4	49	1	0.403	0.36	2.575	0.109	3.248	0.071
4	50	1	0.550	0.18	1.485	0.223	3.519	0.061
Max		68						
Mean			0.633	0.341				

Grade	Seq.	Maximum Point	Mean	ptbis	DIF Black vs. White		DIF Male vs. Female	
					MH	p <	MH	p <
6	1	1	0.889	0.18	0.128	0.721	1.834	0.176
6	2	1	0.662	0.27	0.547	0.460	0.516	0.473
6	3	1	0.801	0.37	0.062	0.804	2.914	0.088
6	4	1	0.861	0.18	1.804	0.179	1.390	0.238
6	5	2	1.169	0.55	10.227	0.001	3.345	0.067
6	6	2	1.299	0.35	3.025	0.082	7.677	0.006
6	7	1	0.745	0.37	0.124	0.725	1.677	0.195
6	8	1	0.805	0.39	1.707	0.191	3.568	0.059
6	9	1	0.861	0.27	0.240	0.624	0.508	0.476
6	10	2	1.507	0.38	1.688	0.194	0.458	0.499
6	11	2	0.933	0.46	1.814	0.178	25.259	0.000
6	12	1	0.400	0.23	2.282	0.131	0.387	0.534
6	13	1	0.647	0.34	0.318	0.573	3.066	0.080
6	14	1	0.810	0.35	0.026	0.872	1.852	0.174
6	15	1	0.598	0.14	0.304	0.581	4.055	0.044
6	16	2	1.380	0.30	4.139	0.042	0.009	0.926
6	17	2	1.394	0.51	0.408	0.523	0.632	0.427
6	18	1	0.580	0.35	2.855	0.091	0.004	0.950
6	19	1	0.806	0.36	0.621	0.431	0.071	0.790
6	20	1	0.840	0.21	1.274	0.259	1.183	0.277

6	21	1	0.506	0.39	2.382	0.123	0.420	0.517
6	22	2	0.821	0.49	3.279	0.070	1.883	0.170
6	23	2	0.785	0.58	0.522	0.470	2.486	0.115
6	24	2	0.943	0.51	0.334	0.564	0.121	0.728
6	25	2	0.643	0.52	0.095	0.758	0.156	0.693
6	26	1	0.864	0.35	0.035	0.851	3.391	0.066
6	27	1	0.528	0.26	21.422	0.000	0.993	0.319
6	28	1	0.904	0.26	4.358	0.037	0.433	0.510
6	29	1	0.849	0.29	0.528	0.468	7.531	0.006
6	30	2	0.680	0.27	0.242	0.623	6.522	0.011
6	31	2	1.304	0.43	0.070	0.792	1.087	0.297
6	32	1	0.880	0.37	0.320	0.571	4.112	0.043
6	33	1	0.743	0.44	0.068	0.794	7.014	0.008
6	34	1	0.535	0.26	2.082	0.149	5.018	0.025
6	35	2	1.471	0.28	0.838	0.360	5.008	0.025
6	36	2	0.925	0.43	5.795	0.016	47.793	0.000
6	37	1	0.592	0.24	2.226	0.136	1.876	0.171
6	38	1	0.925	0.30	0.212	0.645	0.022	0.883
6	39	1	0.703	0.16	2.081	0.149	0.048	0.826
6	40	1	0.644	0.23	6.052	0.014	6.448	0.011
6	41	2	1.465	0.39	0.250	0.617	0.690	0.406
6	42	2	1.442	0.39	3.198	0.074	2.334	0.127
6	43	1	0.839	0.40	1.604	0.205	0.971	0.325
6	44	1	0.520	0.12	0.204	0.652	0.401	0.527
6	45	2	0.961	0.37	0.712	0.399	0.160	0.689
6	46	2	0.940	0.26	5.477	0.019	0.958	0.328
6	47	1	0.754	0.39	0.668	0.414	2.006	0.157
6	48	1	0.447	0.29	0.440	0.507	0.017	0.897
6	49	1	0.725	0.36	0.005	0.945	16.051	0.000
6	50	1	0.569	0.42	2.033	0.154	1.270	0.260
Max		68						
Mean			0.631	0.34				

Grade	Seq.	Maximum Point	Mean	ptbis	DIF Black vs. White		DIF Male vs. Female	
					MH	p <	MH	p <
8	1	1	0.709	0.32	4.655	0.031	0.950	0.330
8	2	1	0.872	0.31	0.212	0.645	0.558	0.455
8	3	1	0.854	0.21	4.877	0.027	1.209	0.272
8	4	1	0.861	0.35	0.166	0.684	1.828	0.176
8	5	2	0.431	0.51	0.248	0.618	0.138	0.710

8	6	2	1.075	0.32	0.038	0.846	0.190	0.663
8	7	1	0.456	0.31	0.092	0.762	3.355	0.067
8	8	1	0.797	0.19	0.207	0.649	3.979	0.046
8	9	1	0.452	0.03	0.928	0.335	0.647	0.421
8	10	2	0.624	0.45	3.504	0.061	4.449	0.035
8	11	2	0.617	0.50	0.081	0.776	0.014	0.907
8	12	1	0.851	0.33	1.121	0.290	0.441	0.507
8	13	1	0.777	0.34	0.005	0.944	0.122	0.727
8	14	1	0.595	0.29	1.435	0.231	0.926	0.336
8	15	1	0.579	0.41	4.139	0.042	0.004	0.947
8	16	2	0.357	0.51	6.880	0.009	0.146	0.702
8	17	2	1.245	0.48	0.187	0.665	0.353	0.552
8	18	1	0.666	0.32	2.151	0.143	1.443	0.230
8	19	1	0.860	0.29	0.087	0.768	0.011	0.918
8	20	1	0.656	0.44	3.000	0.083	0.057	0.812
8	21	1	0.788	0.41	5.940	0.015	1.525	0.217
8	22	2	0.631	0.55	5.457	0.019	4.545	0.033
8	23	2	1.228	0.37	0.549	0.459	1.987	0.159
8	24	2	0.703	0.55	3.735	0.053	3.917	0.048
8	25	2	1.201	0.44	0.807	0.369	10.267	0.001
8	26	1	0.562	0.36	1.048	0.306	4.062	0.044
8	27	1	0.498	0.12	0.049	0.825	4.708	0.030
8	28	1	0.598	0.19	0.408	0.523	0.280	0.597
8	29	1	0.800	0.43	2.618	0.106	0.801	0.371
8	30	2	1.010	0.61	0.111	0.739	8.250	0.004
8	31	2	0.482	0.43	11.292	0.001	3.355	0.067
8	32	1	0.683	0.31	2.868	0.090	0.718	0.397
8	33	1	0.382	0.33	3.260	0.071	9.187	0.002
8	34	1	0.708	0.32	9.216	0.002	0.579	0.447
8	35	2	0.866	0.62	8.091	0.004	4.975	0.026
8	36	2	1.147	0.63	2.791	0.095	0.457	0.499
8	37	1	0.482	0.30	1.232	0.267	1.227	0.268
8	38	1	0.411	0.26	0.493	0.483	0.389	0.533
8	39	1	0.687	0.36	0.290	0.591	0.073	0.787
8	40	1	0.628	0.54	0.220	0.639	0.582	0.446
8	41	2	0.831	0.50	0.005	0.945	0.115	0.734
8	42	2	0.630	0.57	2.444	0.118	3.386	0.066
8	43	1	0.893	0.35	0.018	0.893	0.233	0.630
8	44	1	0.580	0.43	0.298	0.585	0.490	0.484
8	45	2	1.064	0.54	0.892	0.345	0.129	0.719
8	46	2	0.583	0.53	0.930	0.335	1.162	0.281
8	47	1	0.595	0.37	0.990	0.320	1.783	0.182

8	48	1	0.701	0.32	0.082	0.775	5.638	0.018
8	49	1	0.518	0.30	2.423	0.120	0.000	0.988
8	50	1	0.490	0.30	0.000	0.989	1.603	0.206
Max		68						
Mean			0.525	0.385				

Grade	Seq.	Maximum Point	Mean	ptbis	DIF Black vs. White		DIF Male vs. Female	
					MH	p <	MH	p <
11	1	1	0.872	0.31	2.474	0.116	2.020	0.155
11	2	1	0.687	0.32	0.061	0.805	0.435	0.510
11	3	1	0.610	0.11	0.414	0.520	9.314	0.002
11	4	1	0.513	0.27	2.878	0.090	0.123	0.726
11	5	2	0.420	0.50	0.081	0.776	3.319	0.068
11	6	2	1.229	0.24	8.162	0.004	0.033	0.855
11	7	1	0.634	0.34	2.024	0.155	0.677	0.411
11	8	1	0.859	0.31	0.506	0.477	5.090	0.024
11	9	1	0.786	0.46	3.020	0.082	5.900	0.015
11	10	2	0.480	0.47	1.154	0.283	1.500	0.221
11	11	2	0.911	0.63	0.828	0.363	1.352	0.245
11	12	1	0.461	0.20	1.087	0.297	0.148	0.701
11	13	1	0.825	0.39	1.038	0.308	4.306	0.038
11	14	1	0.778	0.35	0.123	0.726	0.369	0.543
11	15	1	0.791	0.39	3.896	0.048	2.888	0.089
11	16	2	0.748	0.56	7.660	0.006	0.511	0.475
11	17	2	0.856	0.51	4.818	0.028	11.561	0.001
11	18	1	0.591	0.45	0.013	0.908	0.641	0.423
11	19	1	0.766	0.39	0.565	0.452	0.367	0.545
11	20	1	0.450	0.22	0.135	0.713	0.159	0.690
11	21	1	0.687	0.39	0.001	0.977	0.624	0.429
11	22	2	0.522	0.58	4.577	0.032	1.169	0.280
11	23	2	0.937	0.57	0.170	0.680	2.808	0.094
11	24	2	1.021	0.53	1.289	0.256	7.340	0.007
11	25	2	1.440	0.43	0.323	0.570	28.017	0.000
11	26	1	0.337	0.31	0.123	0.726	1.310	0.252
11	27	1	0.399	0.19	0.011	0.917	10.466	0.001
11	28	1	0.688	0.52	0.029	0.865	0.029	0.864
11	29	1	0.617	0.34	16.276	0.000	0.105	0.746
11	30	2	0.465	0.50	0.001	0.981	2.019	0.155
11	31	2	0.763	0.50	1.148	0.284	0.008	0.928
11	32	1	0.626	0.26	0.622	0.430	1.235	0.266

11	33	1	0.547	0.46	0.020	0.887	2.887	0.089
11	34	1	0.457	0.37	1.622	0.203	10.274	0.001
11	35	2	0.537	0.47	0.758	0.384	3.088	0.079
11	36	2	0.597	0.44	0.540	0.462	12.465	0.000
11	37	1	0.461	0.31	0.110	0.740	0.382	0.537
11	38	1	0.624	0.45	2.630	0.105	0.191	0.662
11	39	1	0.523	0.45	1.467	0.226	2.498	0.114
11	40	1	0.560	0.30	0.065	0.799	5.668	0.017
11	41	2	0.308	0.48	2.705	0.100	0.141	0.707
11	42	2	1.209	0.52	0.584	0.445	2.555	0.110
11	43	1	0.532	0.47	2.747	0.097	1.593	0.207
11	44	1	0.654	0.43	0.204	0.652	1.407	0.236
11	45	2	1.142	0.54	1.284	0.257	0.149	0.700
11	46	2	1.234	0.57	1.879	0.170	4.565	0.033
11	47	1	0.752	0.53	0.506	0.477	6.542	0.011
11	48	1	0.629	0.56	0.294	0.587	9.039	0.003
11	49	1	0.500	0.45	0.048	0.826	0.122	0.726
11	50	1	0.675	0.33	1.106	0.293	1.952	0.162
Max		68						
Mean			0.510	0.413				

---

### Item Statistics for 2006 Social Studies by Grade

Grade	Seq.	Maximum Point	Mean	ptbis	DIF Black vs. White		DIF Male vs. Female	
					MH	p <	MH	p <
4	1	1	0.942	0.29	2.215	0.137	5.779	0.016
4	2	1	0.927	0.21	0.035	0.851	0.365	0.545
4	3	1	0.559	0.27	1.551	0.213	1.002	0.317
4	4	1	0.963	0.12	0.042	0.839	1.665	0.197
4	5	2	0.448	0.36	0.309	0.578	21.553	0.000
4	6	2	0.748	0.49	1.020	0.313	8.375	0.004
4	7	2	0.436	0.29	1.630	0.202	0.736	0.391
4	8	2	0.488	0.33	2.803	0.094	13.038	0.000
4	9	1	0.707	0.32	0.017	0.895	0.247	0.619
4	10	1	0.466	0.33	7.438	0.006	5.308	0.021
4	11	2	0.875	0.49	0.680	0.410	0.581	0.446
4	12	2	1.367	0.30	2.366	0.124	9.437	0.002
4	13	2	0.497	0.28	0.093	0.761	6.153	0.013
4	14	1	0.675	0.37	10.079	0.001	0.009	0.925
4	15	1	0.738	0.30	0.966	0.326	0.022	0.882
4	16	1	0.753	0.35	1.991	0.158	3.880	0.049
4	17	1	0.578	0.41	6.927	0.008	0.000	0.984
4	18	1	0.583	0.37	8.409	0.004	1.841	0.175
4	19	2	0.618	0.36	0.617	0.432	0.816	0.366
4	20	2	0.889	0.38	0.015	0.903	5.697	0.017
4	21	2	1.422	0.34	0.900	0.343	3.757	0.053
4	22	2	0.707	0.44	0.283	0.595	5.959	0.015
4	23	1	0.504	0.28	0.002	0.965	9.198	0.002
4	24	1	0.738	0.43	0.001	0.979	2.108	0.147
4	25	1	0.725	0.32	0.097	0.755	0.110	0.741
4	26	1	0.576	0.25	0.418	0.518	0.555	0.456
4	27	1	0.875	0.38	0.306	0.580	0.011	0.918
4	28	1	0.895	0.29	0.159	0.690	1.056	0.304
4	29	1	0.978	0.21	0.815	0.367	0.095	0.758
4	30	1	0.883	0.16	0.001	0.976	0.219	0.640
4	31	1	0.899	0.26	0.504	0.478	0.031	0.860
4	32	2	1.037	0.36	0.385	0.535	0.401	0.527
4	33	2	0.669	0.46	0.194	0.660	0.322	0.570
4	34	2	0.988	0.40	0.035	0.851	0.244	0.621
4	35	2	0.520	0.51	0.060	0.807	0.711	0.399
4	36	2	0.947	0.39	2.436	0.119	1.251	0.263

4	37	2	0.858	0.53	1.342	0.247	0.288	0.592
4	38	1	0.722	0.35	0.027	0.870	0.424	0.515
4	39	1	0.337	0.31	1.068	0.301	4.889	0.027
4	40	1	0.802	0.38	2.423	0.120	0.000	0.987
4	41	2	0.923	0.43	1.431	0.232	0.283	0.595
4	42	1	0.961	0.28	0.056	0.813	1.108	0.292
4	43	1	0.718	0.33	5.106	0.024	0.042	0.838
4	44	2	0.852	0.39	3.525	0.060	2.838	0.092
4	45	2	0.889	0.39	4.009	0.045	1.581	0.209
4	46	1	0.679	0.17	1.240	0.266	0.397	0.529
4	47	1	0.646	0.40	1.649	0.199	4.401	0.036
4	48	1	0.771	0.39	1.607	0.205	0.541	0.462
Max		68						
Mean			0.541	0.343				

Grade	Seq.	Maximum Point	Mean	ptbis	DIF Black vs. White		DIF Male vs. Female	
					MH	p <	MH	p <
6	1	1	0.626	0.23	6.059	0.014	0.653	0.419
6	2	1	0.533	0.29	5.609	0.018	2.355	0.125
6	3	1	0.685	0.32	0.692	0.405	0.008	0.930
6	4	1	0.724	0.16	0.162	0.687	1.252	0.263
6	5	2	0.183	0.35	3.104	0.078	1.223	0.269
6	6	2	1.077	0.36	0.120	0.729	0.088	0.767
6	7	2	0.756	0.48	2.503	0.114	0.226	0.635
6	8	2	0.675	0.39	0.305	0.581	2.320	0.128
6	9	1	0.294	0.04	0.420	0.517	2.663	0.103
6	10	1	0.897	0.28	4.036	0.045	4.820	0.028
6	11	1	0.434	0.20	0.763	0.382	0.969	0.325
6	12	1	0.349	0.25	0.000	0.998	0.092	0.762
6	13	1	0.613	0.28	0.202	0.653	1.996	0.158
6	14	1	0.197	0.13	0.000	0.993	0.490	0.484
6	15	1	0.416	0.29	1.750	0.186	2.979	0.084
6	16	2	0.490	0.49	1.153	0.283	0.590	0.442
6	17	2	0.532	0.48	0.754	0.385	0.172	0.679
6	18	2	1.053	0.40	0.221	0.638	0.226	0.634
6	19	2	0.702	0.54	1.945	0.163	2.038	0.153
6	20	2	0.330	0.42	0.013	0.909	0.577	0.448
6	21	1	0.308	0.09	2.640	0.104	1.821	0.177
6	22	1	0.647	0.28	2.593	0.107	2.043	0.153
6	23	1	0.558	0.42	0.532	0.466	6.029	0.014

6	24	2	0.361	0.42	2.018	0.155	0.157	0.692
6	25	1	0.651	0.33	0.069	0.793	2.575	0.109
6	26	1	0.730	0.24	0.854	0.355	4.648	0.031
6	27	1	0.576	0.27	0.361	0.548	0.043	0.836
6	28	1	0.314	0.28	0.060	0.806	2.111	0.146
6	29	1	0.374	0.22	0.121	0.728	0.077	0.781
6	30	1	0.495	0.23	2.521	0.112	2.793	0.095
6	31	2	0.527	0.39	1.889	0.169	0.141	0.707
6	32	2	0.431	0.46	3.159	0.076	7.001	0.008
6	33	2	0.670	0.39	1.140	0.286	2.080	0.149
6	34	2	0.359	0.35	1.900	0.168	2.981	0.084
6	35	2	0.815	0.39	0.003	0.958	0.016	0.898
6	36	2	0.568	0.52	0.139	0.709	0.070	0.791
6	37	2	0.467	0.41	0.304	0.581	3.002	0.083
6	38	2	0.554	0.29	0.208	0.648	0.075	0.785
6	39	1	0.314	0.02	4.943	0.026	0.292	0.589
6	40	1	0.351	0.24	0.969	0.325	0.919	0.338
6	41	1	0.643	0.24	0.390	0.532	0.470	0.493
6	42	1	0.583	0.27	3.904	0.048	0.130	0.719
6	43	1	0.753	0.25	1.735	0.188	0.001	0.973
6	44	2	0.875	0.39	0.424	0.515	14.550	0.000
6	45	2	0.285	0.27	3.918	0.048	9.732	0.002
6	46	1	0.468	0.29	0.041	0.840	0.194	0.659
6	47	1	0.504	0.27	0.160	0.690	0.301	0.584
6	48	1	0.580	0.41	0.732	0.392	0.434	0.510
Max		68						
Mean			0.387	0.313				

Grade	Seq.	Maximum Point	Mean	ptbis	DIF Black vs. White		DIF Male vs. Female	
					MH	p <	MH	p <
8	1	1	0.547	0.29	1.000	0.317	0.084	0.771
8	2	1	0.693	0.35	0.003	0.958	0.000	0.991
8	3	1	0.764	0.31	0.027	0.870	6.294	0.012
8	4	1	0.778	0.34	2.894	0.089	1.310	0.252
8	5	1	0.537	0.19	0.002	0.968	0.825	0.364
8	6	1	0.353	0.23	0.176	0.675	3.200	0.074
8	7	2	0.337	0.49	2.516	0.113	1.322	0.250
8	8	2	0.566	0.33	0.000	0.997	3.453	0.063
8	9	2	0.059	0.21	1.357	0.244	1.225	0.268
8	10	2	0.505	0.37	1.095	0.295	0.016	0.901

8	11	1	0.618	0.31	6.139	0.013	0.006	0.938
8	12	1	0.569	0.41	0.004	0.947	4.850	0.028
8	13	1	0.522	0.36	2.126	0.145	0.407	0.524
8	14	1	0.527	0.31	1.304	0.254	0.023	0.879
8	15	2	0.403	0.37	0.223	0.637	0.185	0.667
8	16	2	0.847	0.57	5.646	0.017	0.135	0.713
8	17	2	0.989	0.41	0.501	0.479	8.193	0.004
8	18	2	0.420	0.49	5.413	0.020	1.535	0.215
8	19	1	0.631	0.45	5.965	0.015	1.205	0.272
8	20	1	0.533	0.28	0.544	0.461	0.000	0.990
8	21	1	0.687	0.44	0.055	0.815	0.191	0.662
8	22	1	0.570	0.30	0.004	0.949	3.099	0.078
8	23	2	0.673	0.56	6.307	0.012	0.511	0.475
8	24	2	0.735	0.44	7.319	0.007	1.106	0.293
8	25	1	0.502	0.36	1.949	0.163	0.034	0.854
8	26	1	0.489	0.40	0.307	0.579	2.465	0.116
8	27	1	0.473	0.34	0.994	0.319	2.441	0.118
8	28	1	0.383	0.12	0.012	0.912	0.527	0.468
8	29	1	0.503	0.43	0.490	0.484	1.920	0.166
8	30	1	0.369	0.23	2.355	0.125	0.006	0.939
8	31	2	0.674	0.43	6.399	0.011	2.040	0.153
8	32	2	0.689	0.50	1.041	0.308	11.720	0.001
8	33	2	0.774	0.55	3.196	0.074	1.915	0.166
8	34	2	0.844	0.50	3.610	0.057	3.024	0.082
8	35	1	0.416	0.46	0.237	0.626	0.143	0.705
8	36	1	0.406	0.31	0.228	0.633	0.672	0.412
8	37	1	0.575	0.31	3.119	0.077	0.022	0.883
8	38	1	0.677	0.41	0.234	0.629	1.901	0.168
8	39	2	0.766	0.55	0.910	0.340	4.147	0.042
8	40	2	0.490	0.50	1.786	0.181	3.981	0.046
8	41	2	0.187	0.45	0.340	0.560	0.507	0.476
8	42	2	0.603	0.40	0.103	0.748	1.993	0.158
8	43	1	0.319	0.26	0.057	0.811	0.232	0.630
8	44	1	0.571	0.30	0.903	0.342	8.426	0.004
8	45	1	0.504	0.32	0.691	0.406	0.334	0.563
8	46	1	0.731	0.48	0.015	0.901	7.060	0.008
8	47	2	0.131	0.36	0.398	0.528	0.000	0.986
8	48	2	0.691	0.48	0.001	0.981	0.603	0.438
Max		68						
Mean			0.392	0.38				

---

Grade	Seq.	Maximum Point	Mean	ptbis	DIF Black vs. White		DIF Male vs. Female	
					MH	p <	MH	p <
11	1	1	0.846	0.36	5.216	0.022	2.817	0.093
11	2	1	0.381	0.26	0.469	0.493	0.000	0.987
11	3	1	0.717	0.40	1.664	0.197	1.101	0.294
11	4	1	0.710	0.36	1.918	0.166	7.023	0.008
11	5	1	0.715	0.33	0.044	0.834	1.243	0.265
11	6	1	0.642	0.40	1.819	0.177	2.417	0.120
11	7	2	0.865	0.50	4.135	0.042	2.374	0.123
11	8	2	0.641	0.38	0.515	0.473	12.786	0.000
11	9	2	0.992	0.34	0.101	0.751	2.886	0.089
11	10	2	0.536	0.50	6.163	0.013	0.200	0.654
11	11	1	0.674	0.36	3.015	0.082	0.303	0.582
11	12	1	0.754	0.26	0.270	0.604	1.719	0.190
11	13	1	0.284	0.30	1.993	0.158	8.095	0.004
11	14	1	0.552	0.40	0.329	0.566	5.060	0.024
11	15	2	1.007	0.60	3.217	0.073	0.331	0.565
11	16	2	0.342	0.47	0.187	0.665	0.368	0.544
11	17	2	0.104	0.35	4.217	0.040	0.005	0.944
11	18	2	0.565	0.51	0.109	0.742	1.308	0.253
11	19	1	0.522	0.37	8.358	0.004	0.222	0.637
11	20	1	0.403	0.27	0.260	0.610	0.888	0.346
11	21	1	0.399	0.24	0.759	0.384	2.385	0.122
11	22	1	0.554	0.46	0.583	0.445	3.341	0.068
11	23	2	0.799	0.55	0.857	0.354	0.342	0.559
11	24	2	0.593	0.59	3.337	0.068	1.636	0.201
11	25	1	0.353	0.19	4.151	0.042	0.007	0.933
11	26	1	0.664	0.41	0.184	0.668	0.361	0.548
11	27	1	0.387	0.20	2.297	0.130	0.656	0.418
11	28	1	0.558	0.31	0.046	0.831	0.020	0.887
11	29	1	0.608	0.49	6.766	0.009	0.096	0.757
11	30	1	0.735	0.40	0.862	0.353	10.152	0.001
11	31	2	0.410	0.52	0.644	0.422	6.228	0.013
11	32	2	0.693	0.65	0.000	0.993	0.114	0.736
11	33	2	0.162	0.44	0.074	0.786	3.488	0.062
11	34	2	0.824	0.59	0.054	0.817	3.325	0.068
11	35	1	0.585	0.41	2.726	0.099	0.644	0.422
11	36	1	0.443	0.28	0.383	0.536	0.012	0.911
11	37	1	0.652	0.47	0.426	0.514	0.075	0.784
11	38	1	0.724	0.54	2.495	0.114	0.706	0.401

11	39	2	0.944	0.56	2.422	0.120	9.941	0.002
11	40	2	0.195	0.33	1.232	0.267	0.102	0.750
11	41	2	0.802	0.51	0.297	0.586	4.687	0.030
11	42	2	1.091	0.60	0.170	0.680	0.900	0.343
11	43	1	0.726	0.37	4.303	0.038	0.261	0.609
11	44	1	0.512	0.37	0.973	0.324	0.271	0.603
11	45	1	0.670	0.39	0.416	0.519	0.558	0.455
11	46	1	0.635	0.35	0.881	0.348	0.811	0.368
11	47	2	0.785	0.51	0.006	0.940	0.004	0.947
11	48	2	0.574	0.51	1.814	0.178	0.323	0.570
Max		68						
Mean			0.431	0.416				

---