TECHNICAL REPORT

for the
Pennsylvania
System of School Assessment

2008 Writing
Grades 5, 8, and 11

Provided by
Data Recognition Corporation

November 2008
Revised February 2009

Table of Contents

Glossary of Common Terms

The following table contains terms used in the 2008 technical reports and their meanings. Some of these terms are used universally in the assessment community, and some of these terms are used commonly by psychometric professionals.

Table G–1. Glossary of Terms

Term	Common Definition
Ability	In the context of scaling, a latent-trait characteristic indicating the level of an individual on a particular construct or competence in a particular area. Following the Rasch literature, ability is used in this discussion as a generic term for the construct that is being measured by an exam. Competence, achievement, learning and status are among the alternative terminology that is sometimes used, but all are subject to some degree of misinterpretation.
Adjacent Agreement	A response that receives a score/rating difference of one (1) point in value. The scores are usually assigned by two different raters under the same conditions (e.g., two independent raters give the same paper scores that differ by one point).
Alternate Forms	Two or more versions of a test that are considered exchangeable, i.e., they measure the same constructs in the same ways, are intended for the same purposes, and are administered using the same directions. More specific terminology applies depending on the degree of statistical similarity between the test forms (e.g., parallel forms, equivalent forms, and comparable forms) where parallel forms refers to the situation in which the test forms have the highest degree of similarity to each other.
Average	A measure of central tendency in a score distribution that usually refers to the arithmetic mean of a set of scores. In this case, it is determined by adding all the scores in a distribution and then dividing the obtained value by the total number of scores. Sometimes people use the word 'average' to refer to other measures of central tendency such as the median (the score in the middle of a distribution) or mode (the score value with the greatest frequency).
Bias	In a statistical context, bias refers to any source of systematic error in the measurement of a test score. In discussing test fairness, bias may refer to construct-irrelevant components of test scores that differentially affect the performance of different groups of test takers (e.g., gender, ethnicity, etc.). Attempts are made to reduce bias by conducting item fairness reviews and various differential item functioning (DIF) analyses, detecting potential areas of concern, and either removing or revising the flagged test items prior to the development of the final operational form of the test.
Construct Validity	Evidence regarding the extent to which a test measures the theoretical construct or trait it is intended to measure. Such evidence can be demonstrated by examining the interrelationships of the scores (i.e., correlations) on one test with scores on other tests that are theorized to measure either the same traits, or unrelated traits, and determining if the results are in the expected direction (e.g., high correlations with same trait measures and low correlations with unrelated trait measures).

Term	Common Definition
Constructed-Response Item	See open-ended item.
Content Validity	Evidence regarding the extent to which a test provides an appropriate sampling of a content domain of interest—e.g., assessable portions of a state's grade 6 mathematics curriculum in terms of the knowledge, skills, objectives, and processes sampled.
Criterion-Referenced Assessment	An assessment where scores are intended to be interpreted as a measure of a student's performance as with respect to an expected level of mastery, educational objective, or standard. The types of resulting score interpretations provide information about what a student knows or can do in with respect to a given content area. The term more appropriately refers to the score interpretations rather than the test itself.
Cut Score	A specified point on a score scale such that scores at or above that point are interpreted or acted upon differently from scores below that point. For example, a score designated as the minimum level of performance needed to pass a competency test. One or more cut scores can be set for a test which results in dividing the score range into various proficiency level ranges. Methods for establishing cut scores vary.
Differential Item Functioning	Abbreviated as DIF, this statistic describes the performance of specific subpopulations, usually used to examine potential item bias relative to specific groups.
Distractor	A plausible, but incorrect option in a multiple-choice item (also called a foil).
Equating	A statistical process by which scores from one or more alternate forms of a test are converted to a common scale or metric for the purposes of comparability and determination of score equivalence. Equating is strongest of several "linking" methods used to establish comparability between scores from multiple tests.
Error of Measurement	The amount by which the score actually received (an observed score) differs from a hypothetical true score. Also see Standard Error of Measurement.
Exact Agreement	A response with identical scores/ratings assigned by two different raters under the same conditions (e.g. two independent raters give a paper the same score)
Frequency	The number of times that a certain value or range of values (score interval) occurs in a distribution of scores.
Frequency Distribution	A tabulation of scores from low to high or high to low showing the number and/or percent of individuals who obtain each score or who fall within each score interval or category.

Term	Common Definition
InFit	An inlier-pattern-sensitive fit statistic, more sensitive to unexpected score patterns for examinees with items that are near the examinee's ability level. It can be expressed in terms of mean squares (MS) to reflect 'practical significance,' or standardized Z scores (ZSTD) to reflect 'statistical significance'. MS values greater than 1.0 reflect underfit While MS falues less than 1.0 indicate overfit. The more extreme an ZSTD value is from 0, the more statistically improbably the outcome. With large n-counts, statistically significant ZSTD values might be observed even with fairly trivial practical differences.
Key	The correct response for an MC item.
Linking	The result of placing two or more tests on the same scale, so that scores can be used interchangeably. Several linkage methods exist. Also see Equating.
Logit	The Rasch logit is a transformed probability—in the simplest case, a logit is a transformed P-Value with the average P-Value becoming a logit of zero. Used correctly, the logit will define an interval scale of measurement, which means a change of one logit has the same meaning anywhere along the scale. The logit is not a standard normal deviate although it looks very similar. For example, avalue of positive four would be very high while a value of negative four would be very low.
Mean	Also referred to as the 'arithmetic mean' of a set of scores, is found by adding all the score values in a distribution and dividing by the total number of scores. For example, the mean of the set {66, 76, 85, and 97} is 81. The value of a mean can be influenced by extreme values in a score distribution.
Measure	A Rasch estimate (or calibration) for a parameter, i.e., a person ability parameter estimate or an item difficulty parameter estimate.
Median	The middle point or score in a set of rank-ordered observations that divides the distribution into two equal parts such that each part contains 50% of the total data set. More simply put, half of the scores are below the median value and half of the scores are above the median value. As an example, the median for the following ranked set of scores {2, 3, 6, 8, 9} is 6.
Multiple-Choice Item	A type of item format which requires the test taker to select a response from a group of possible choices, one of which is the correct answer (or key) to the question posed. The multiple-choice item format is likely the most common example of the selected-response item format. Also see Open-Ended Item.
N-count	Sometimes designated as N or n, it is the number observations (usually individuals or students) in a particular group. For example, the number of students tested, the number of students tested from a specific subpopulation (e.g., females), the number of students who attained a specific score, etc. In the follow set {23, 32, 56, 65, 78, 87}, n = 6.

Term	Common Definition
Open-ended item	OE item—also commonly referred to as a constructed-response (CR) item—refers to a specific item format that requires examinees to create their own responses, which can be expressed in various forms, (e.g., written paragraph, created table/graph, formulated calculation, etc.). Such items are frequently scored using more than two score categories (e.g., polytomous 0, 1, 2, and 3 scoring). This format is in contrast to those where students make a choice from a supplied set of answers options (e.g., multiple-choice—MC—or forced-choice items) and are typically dichotomously scored as right = 1 or wrong = 0. When interpreting item difficulty and discrimination indices it is important to consider whether an item is polytomously or dichotomously scored.
OutFit	An outlier-sensitive fit statistic, more sensitive to unexpected examinee score patterns on items that are so easy or hard for the examinee's ability level. It can be expressed in terms of mean squares (MS) to reflect 'practical significance,' or standardized Z scores (ZSTD) to reflect 'statistical significance'. MS values greater than 1.0 reflect underfit While MS falues less than 1.0 indicate overfit. The more extreme an ZSTD value is from 0, the more statistically improbably the outcome. With large n-counts, statistically significant ZSTD values might be observed even with fairly trivial practical differences.
P-value	An index that is designated as p (or p-value) that indicates an item's difficulty, calculated as the proportion (sometimes expressed as a percent) of some specified group (perhaps grade) who answer a test item correctly. P-values range from 0.0 to 1.0 on the proportion scale, with lower values corresponding to more difficult items and higher values corresponding to easier items. Most typically used in reference to multiple-choice items or other item types in which the item is only worth one point. For constructed-response items or item types in which the item is worth more than one point, difficulty on a p-value-like scale can be estimated by dividing the resulting item mean by the maximum number of points possible for the item.
Percent Correct	When referring to an individual item, the "percent correct" is the item's "P-value" expressed as a percent (instead of a proportion). When referring to a total test score, it is the percentage of the total number of points that a student received on a test. The percent correct score is obtained by dividing the student's raw score by the total number of points possible and multiplying the result by 100. Percent Correct scores often used in criterion-referenced interpretations and are generally more helpful if the overall difficulty of a test is known. Sometimes Percent Correct scores are incorrectly interpreted as Percentile Ranks.
Percentile	The score or point in a score distribution at or below which a given percentage of scores fall. It should be emphasized that it is a value on the score scale, not the associated percentage (although sometimes in casual usage this misinterpretation is made). For example, if 72 percent of the students score at or below a Scaled Score of 1500 on a given test, then the Scaled Score of 1500 would be considered the 72nd percentile. As another example, the median is the 50th Percentile.

Term	Common Definition
Percentile Rank	The percentage of scores in a specified distribution falling at/below a certain point on a score distribution. Percentile Ranks range in value from 1 to 99, and indicate the status or relative standing of an individual within a specified group, by indicating the percent of individuals in that group who obtained equal or lower scores. An individual's percentile rank can vary depending on which group is used to determine the ranking. As suggested above, Percentiles and Percentile Rank are sometimes used interchangeably; however strictly speaking, a percentile is a value on the score scale.
Performance Level Setting	Also referred to as standard setting, a procedure used in the determination of the cut scores for a given assessment that is used to measure students' progress towards certain performance standards. Standard setting methods vary (e.g., modified Angoff, Bookmark Method, etc.), but most use a panel of educators and expert judgments to operationalize the level of achievement students must demonstrate in order to be categorized within each performance level.
Point-biserial Correlation	In classical test theory this is an item discrimination index. It is the correlation between a dichotomously scored item and a continuous criterion, usually represented by the total test score (or the 'corrected' total test score with the reference item removed). It reflects the extent to which an item differentiates between high-scoring and low-scoring examinees. This discrimination index ranges from –1.00 to +1.00. The higher the discrimination index (the closer to +1.00), the better the item is considered to be performing.
Performance Level Descriptors	Descriptions of an individual's competency in a particular area of knowledge or skill, usually defined as ordered categories on a continuum, often labeled from "below basic" to "advanced," that constitute broad ranges for classifying performance. The exact labeling of these categories, and narrative descriptions, may vary from one assessment or testing program to another.
Raw Score	Sometimes abbreviated by RS—it is an unadjusted score usually determined by tallying the number of questions answered correctly, or by the sum of item scores (i.e., points). (Some rarer situations might include formula-scoring, the amount of time required to perform a task, the number of errors, application of basal/ceiling rules, etc.). Raw scores typically have little or no meaning by themselves and require additional information—like the number of items on the test, the difficulty of the test items, norm-referenced information, or criterion-referenced information.
Reliability	The expected degree to which test scores for a group of examinees are consistent over exchangeable replications of an assessment procedure, and therefore, considered dependable and repeatable for an individual examinee. A test that produces highly consistent, stable results (i.e., relatively free from random error) is said to be highly reliable. The reliability of a test is typically expressed as a reliability coefficient or by the standard error of measurement derived by that coefficient.

Term	Common Definition
Reliability Coefficient	A statistical index that reflects the degree to which scores are free from random measurement error. Theoretically, it expresses the consistency of test scores as the ratio of true score variance to total score variance (true score variance plus error variance). This statistic is often expressed as correlation coefficient (e.g., correlation between two forms of a test) or with an index that resembles a correlation coefficient (e.g., calculation of a test's internal consistency using Coefficient Alpha). Expressed this way, the reliability coefficient is a "unitless" index, which can be compared from test to test. The higher the value of the index (closer to 1.0), the greater the reliability of the test. Also see Standard Error of Measurement.
Scaled Score	A mathematical transformation of a raw score developed through a process called scaling. Scaled scores are most useful when comparing test results over time. Several different methods of scaling exist, but each is intended to provide a continuous and meaningful score scale across different forms of a test.
Selected-Response Item	See multiple-choice item.
Spiraling	A packaging process used when multiple forms of a test exist and it is desired that each form be tested in all classrooms (or other grouping unit—e.g., schools) participating in the testing process. This process allows for the random distribution of test booklets to students. For example, if a package has four test forms labeled A, B, C, & D, the order of the test booklets in the package would be: A, B, C, D, A, B, C, D, A, B, C, D, etc.
Standard Deviation	SD—a statistic that measures the degree of spread or dispersion of a set of scores. The value of this statistic is always greater than or equal to zero. If all of the scores in a distribution are identical, the standard deviation is equal to zero. The further the scores are away from each other in value, the greater the standard deviation. This statistic is calculated using the information about the deviations (distances) between each score and the distribution's mean. It is equivalent to the square root of the variance statistic. The standard deviation is a commonly used method of examining a distribution's variability since the standard deviation is expressed in the same units as the data.
Standard Error of Measurement	Abbreviated SEM, it is the amount an observed score is expected to fluctuate around the true score. As an example, across replications of a measurement procedure, the true score will not differ by more than plus or minus one standard error from the observed score about 68 percent of the time (assuming normally distributed errors). The SEM is frequently used to obtain an idea of the consistency of a person's score in actual score units, or to set a confidence band around a score in terms of the error of measurement. Often a single SEM value is applied to all test scores. On other occasions, the value of the SEM can vary along a score scale. These are referred to as conditional standard errors of measurement (CSEMs).
Subscale	On score reports, a subscale often refers to a set of items on a test measuring the same contextual area (e.g., Number Sense in Mathematics). Items with the same reporting category codes would be used to determine the subscale score.

Term	Common Definition
Technical Advisory Committee	Or TAC—a group of individuals (e.g., professionals in the field of education, testing, etc.) that are either appointed or selected to make recommendations for and to guide the technical development of a given testing program.
Validity	The degree to which accumulated evidence and theory support specific interpretations of test scores entailed by the purposed uses of a test. Or more commonly defined, the extent to which the test measures what it is intended to measure (i.e., the accuracy of the test). There are various ways of gathering validity evidence (also see Content Validity and Construct Validity).

PREFACE: An Overview of Recent and Future Assessments

The period from 2003 through 2006 brought significant structural changes in the test blueprint for the Pennsylvania System of School Assessment (PSSA). These changes necessitated extensive test development and field testing activity along with phased-in implementation in the operational assessment. Included in this process was the development and implementation of assessments in additional grade levels.

For reading and mathematics, content changes for grades 5, 8, and 11 were developed in 2003, field tested in spring 2004, and implemented in spring 2005. The *2005 PSSA Technical Report for Reading and Mathematics* provides a description of test development activities, review of open-ended tasks and multiple-choice items, field testing, selection of items, statistical analysis of assessment data, reliability, validity, standard setting, and other technical characteristics of the operational 2005 PSSA. Test development for the new grade levels of 4, 6, and 7 began in 2004, with field testing in 2005, and full implementation in 2006. Similarly, the *2006 PSSA Technical Report for Reading and Mathematics: Grades 4, 6, and 7* provides a complete description of test development activities, item review, field testing, statistical analysis, item selection, and technical characteristics of the operational 2006 PSSA for these grade levels. In 2007 the grade 3 reading and mathematics assessment became DRC's responsibility and is covered in the present technical report, along with grades 4 through 8, and 11.

Changes in the writing assessment were designed to sharpen the focus on what is assessed with respect to Academic Standards 1.4 and 1.5. To support this effort, a shift in grade levels assessed was made, moving from grades 6 and 9 to grades 5 and 8, thereby aligning assessment to the end of elementary and middle school years. The writing testing window was changed from fall to February for grades 5 and 8, making it consistent with grade 11. Mode-specific scoring guidelines replaced domain scoring, and the introduction of stimulus-based passages and associated multiple-choice items measuring revising and editing expanded the basis of the conventions score. An account of the development of writing prompts and stimulus-based, multiple-choice items, review processes, field testing and item analysis, standard setting, and other technical characteristics of the operational 2006 PSSA may be found in the *2006 PSSA Technical Report for Writing*.

The introduction of an operational science assessment in 2008 moved closer to reality with a major standalone field test at grades 4, 8, and 11 in April–May of 2007. A description of the development of science scenarios and related multiple-choice, short answer open-ended, and extended open-ended questions, item review processes, statistical analysis of field test data, and selection of items for the 2008 operational science test may be found in the *2008 PSSA Preliminary Technical Report for Science*.

To assist the reader in navigating through the year-to-year changes in all aspects of the PSSA, tables are presented along with explanatory text. Provided is an overview of the subject areas assessed, time of year the testing activity took place, and the type of testing that occurred (e.g., operational, field testing, grade 12 retest).

ASSESSMENT ACTIVITIES OCCURRING IN THE 2003–04 SCHOOL YEAR

Table P–1 outlines the operational assessments and field tests administered during the 2003–04 school year. (A spring operational assessment in mathematics and reading took place at grades 3, 5, 8, and 11.)

As a result of new Assessment Anchor Content Standards (Assessment Anchors) developed by the Pennsylvania Department of Education (PDE) during 2003, new test items were developed (see Chapter Two of the *2005 PSSA Technical Report for Reading and Mathematics*). Following the spring operational assessment, a separate, "standalone" field test of new items for grades 5, 8, and 11 was conducted. Note that grade 11 students also took an operational writing assessment in February, and grade 6 and grade 9 students participated in a fall writing assessment. Lastly, grade 12 students who as 11th graders in the preceding spring failed to attain at least the Proficient level in any subject area were offered an opportunity to retest.

Table P–1. Operational Assessment and Field Testing During the 2003–04 School Year

Grade	Assessment Activity	Date
3	Operational mathematics and reading with embedded field test (conducted by CTB/McGraw-Hill)	April 2004
5	Operational mathematics and reading	April 2004
	Standalone field test in mathematics and reading	April/May 2004
6	Operational writing	October 2004
8	Operational mathematics and reading	April 2004
	Standalone field test in mathematics and reading	April/May 2004
9	Operational writing	October 2004
11	Operational mathematics and reading	April 2004
	Standalone field test in mathematics and reading	April/May 2004
	Operational writing	February 2004
12	Retest opportunity for students who as grade 11 students in the spring of 2003 failed to reach at least the Proficient level in mathematics, reading, or writing	October/ November 2004

ASSESSMENT ACTIVITIES OCCURRING IN THE 2004–05 SCHOOL YEAR

Table P–2 displays the operational assessments and field tests that took place during the 2004–05 school year. The operational assessment at grades 5, 8, and 11 used items chosen from the spring 2004 field test. This was the first operational assessment that reflected the Pennsylvania Assessment Anchors and Eligible Content. Fulfilling the No Child Left Behind Act of 2001 (NCLB) requirement that states must implement a test at grades 3 through 8, a major field test in mathematics and reading was administered at grades 4, 6, and 7. Item development for these new grade levels took place during 2004.

The grades 6 and 9 writing assessment was reassessed in favor of moving the writing assessment to grades 5 and 8. This accounts for the separate (standalone) field test at these grade levels. There was also a test administration change from October to February. The writing assessment also underwent changes to align the test to the Academic Standards for writing. New writing prompts and stimulus-based, multiple-choice items were also field tested at grade 11 as part of the operational assessment, hence the reference to an "embedded" field test. No assessment activity of any kind occurred at grade 9. As in fall 2003, the retest opportunity at grade 12 continued.

Table P–2. Operational Assessment and Field Testing During the 2004–05 School Year

Grade	Assessment Activity	Date
3	Operational mathematics and reading with embedded field test (conducted by CTB/McGraw-Hill)	April 2005
4	Standalone field test for mathematics and reading	April 2005
5	Operational mathematics and reading with embedded field test	April 2005
	Standalone field test in writing	February 2005
6	Standalone field test for mathematics and reading	April 2005
7	Standalone field test for mathematics and reading	April 2005
8	Operational mathematics and reading with embedded field test	April 2005
	Standalone field test in writing	February 2005
11	Operational mathematics and reading with embedded field test	April 2005
	Operational writing with embedded field test	February 2005
12	Retest opportunity for students who as grade 11 students in the spring of 2004 failed to reach at least the Proficient level in mathematics, reading, or writing	October/ November 2004

ASSESSMENT ACTIVITIES OCCURRING IN THE 2005–06 SCHOOL YEAR

Table P–3 shows the assessment activities that occurred during the 2005–06 school year. Note that the reading and mathematics operational assessments ran consecutively from grades 3 through 8 and at grade 11. For grades 4, 6, and 7, it was the first year for operational assessments. Field testing for mathematics and reading was embedded as part of the operational assessment at each grade level. At grade 3, the reference to field testing with items developed by DRC reflects the transition process of shifting the assessment from CTB/McGraw-Hill to DRC in 2007. As in previous years, the retest opportunity at grade 12 continued.

The first operational assessments for writing at grades 5 and 8 took place this year while the grade 11 writing assessment continued in the same February test window. New this year for all three grade levels, the operational writing assessments featured mode-specific scoring guidelines; stimulus-based, multiple-choice items; and a grade-specific emphasis shift in writing modes assessed. See the *2006 PSSA Technical Report for Writing: Grades 5, 8, and 11* for further information about the new writing assessments. Since extensive field testing in February 2005 produced a pool of prompts for use over several years, no additional writing prompts were field tested in 2006. However, new multiple-choice items were field tested in the 2006 writing assessment.

Table P–3. Operational Assessment and Field Testing During the 2005–06 School Year

Grade	Assessment Activity	Date
3	Operational mathematics and reading with embedded field test of DRC-written items (conducted by CTB/McGraw-Hill)	April 2006
4	Operational mathematics and reading with embedded field test	March 2006
5	Operational mathematics and reading with embedded field test	March 2006
	Operational writing with embedded field test	February 2006
6	Operational mathematics and reading with embedded field test	March 2006
7	Operational mathematics and reading with embedded field test	March 2006
8	Operational mathematics and reading with embedded field test	March 2006
	Operational writing with embedded field test	February 2006
11	Operational mathematics and reading with embedded field test	March 2006
	Operational writing with embedded field test	February 2006
12	Retest opportunity for students who as grade 11 students in the spring of 2005 failed to reach at least the Proficient level in mathematics, reading, or writing	October/ November 2005

ASSESSMENT ACTIVITIES OCCURRING IN THE 2006–07 SCHOOL YEAR

Table P–4 shows the assessment plan for the 2006–07 school year. Note that the mathematics and reading assessments ran consecutively from grades 3 through 8 and at grade 11. For grades 4, 6, and 7, it was the second year for operational assessments and the first year in which these grade levels were included in the AYP calculations. Field testing for mathematics and reading continued to be embedded as part of the operational assessments at each grade level. This was the first year in which DRC was responsible for the grade 3 assessment, as the transition from CTB/McGraw-Hill was completed. As in previous years, the retest opportunity at grade 12 continued.

The operational assessment for writing at grades 5, 8, and 11 continued in the same February test window featuring the mode-specific scoring guidelines; stimulus-based, multiple-choice items; and a grade-specific emphasis in writing modes assessed, which were introduced in 2006. Since extensive field testing in February 2005 produced a pool of prompts for use over several years, no additional writing prompts needed to be field tested in 2007. However, new multiple-choice items were field tested in the 2007 writing assessment.

Following the spring operational assessments in writing and reading and mathematics, a separate, "standalone" field test in science occurred for grades 4, 8, and 11 with full implementation scheduled for 2008.

Table P–4. Operational Assessment and Field Testing During the 2006–07 School Year

Grade	Assessment Activity	Date
3	Operational mathematics and reading with embedded field test	March 2007
4	Operational mathematics and reading with embedded field test	March 2007
	Standalone field test in science	April/May 2007
5	Operational mathematics and reading with embedded field test	March 2007
	Operational writing with embedded field test	February 2007
6	Operational mathematics and reading with embedded field test	March 2007
7	Operational mathematics and reading with embedded field test	March 2007
8	Operational mathematics and reading with embedded field test	March 2007
	Operational writing with embedded field test	February 2007
	Standalone field test in science	April/May 2007
11	Operational mathematics and reading with embedded field test	March 2007
	Operational writing with embedded field test	February 2007
	Standalone field test in science	April/May 2007
12	Retest opportunity for students who as grade 11 students in the spring of 2006 failed to reach at least the Proficient level in mathematics, reading, or writing	October/ November 2006

ASSESSMENT ACTIVITIES OCCURRING IN THE 2007–08 SCHOOL YEAR

Table P–5 shows the assessment plan for the 2007–08 school year. Note that the mathematics and reading assessments ran consecutively from grades 3 through 8, and at grade 11. For grades 4, 6, and 7, it was the third year for operational assessments and the second year in which these grade levels were included in the AYP calculations. Field testing for mathematics and reading continued to be embedded as part of the operational assessments at each grade level. This was the second year in which DRC was responsible for the grade 3 assessment. As in previous years, the retest opportunity at grade 12 continued.

The operational assessment for writing at grades 5, 8, and 11 continued in the same February test window featuring the mode-specific scoring guidelines; stimulus-based, multiple-choice items; and a grade-specific emphasis in writing modes assessed, which were introduced in 2006. Since extensive field testing in February 2005 produced a pool of prompts for use over several years, no additional writing prompts needed to be field tested in 2007. However, new multiple-choice items were field tested in the 2008 writing assessment.

Joining the spring operational assessments in writing and reading and mathematics was science at grades 4, 8, and 11.

Table P–5. Operational Assessment and Field Testing During the 2007–08 School Year

Grade	Assessment Activity	Date
3	Operational mathematics and reading with embedded field test	March/April 2008
4	Operational mathematics and reading with embedded field test	March/April 2008
	Operational science with embedded field test	April/May 2008
5	Operational mathematics and reading with embedded field test	March/April 2008
	Operational writing with embedded field test	February 2008
6	Operational mathematics and reading with embedded field test	March/April 2008
7	Operational mathematics and reading with embedded field test	March/April 2008
8	Operational mathematics and reading with embedded field test	March/April 2008
	Operational writing with embedded field test	February 2008
	Operational science with embedded field test	April/May 2008
11	Operational mathematics and reading with embedded field test	March/April 2008
	Operational writing with embedded field test	February 2008
	Operational science with embedded field test	April/May 2008
12	Retest opportunity for students who as grade 11 students in the spring of 2007 failed to reach at least the Proficient level in mathematics, reading, or writing	October/ November 2007

ASSESSMENT ACTIVITIES PLANNED FOR THE 2008–09 SCHOOL YEAR

Table P–6 shows the assessment plan for the 2008–09 school year. The mathematics and reading assessments will continue to be operational for grades 3 through 8 and grade 11. Field testing for mathematics and reading will continue to be embedded as part of the operational assessments at each grade level. As in previous years, the retest opportunity at grade 12 will continue.

The operational assessment for writing at grades 5, 8, and 11 will continue with a February test window featuring mode-specific scoring guidelines; stimulus-based, multiple-choice items; and a grade-specific emphasis in writing modes assessed. An embedded field test of writing prompts will be incorporated in the 2009 assessment along with the general procedure of including a set of embedded field test of multiple-choice items.

The second operational assessment in science is scheduled to take place in April/May. Similar to the other operational assessments, field testing for science will be embedded as part of the operational assessments at each grade level.

Table P–6. Operational Assessment and Field Testing During the 2008–09 School Year (Planned)

Grade	Assessment Activity	Date
3	Operational mathematics and reading with embedded field test	March 2009
4	Operational mathematics and reading with embedded field test	March 2009
	Operational science with embedded field test	April/May 2009
5	Operational mathematics and reading with embedded field test	March 2009
	Operational writing with embedded field test	February 2009
6	Operational mathematics and reading with embedded field test	March 2009
7	Operational mathematics and reading with embedded field test	March 2009
8	Operational mathematics and reading with embedded field test	March 2009
	Operational writing with embedded field test	February 2009
	Operational science with embedded field test	April/May 2009
11	Operational mathematics and reading with embedded field test	March 2009
	Operational writing with embedded field test	February 2009
	Operational science with embedded field test	April/May 2009
12	Retest opportunity for students who as grade 11 students in the spring of 2008 failed to reach at least the Proficient level in mathematics, reading, or writing	October/ November 2008

Chapter One: Background of Pennsylvania System of School Assessment (PSSA)

This brief overview of assessment in Pennsylvania describes the original and subsequent legislative mandates, previous assessment programs, the history of the current program's development process, the program's intent and purpose, recent changes to the program, and the student population that participates in the assessments.

THE ORIGIN OF STATE ASSESSMENT IN PENNSYLVANIA

State assessment of student achievement came about as a result of legislation enacted in 1963. Generally known as the School District Reorganization Act (Act 299), the issue of whether large or small district size provided a better quality education led to the development of Section 299.1 of Act 299, which required the State Board of Education to

. . . develop or cause to be developed an evaluation procedure designed to measure objectively the adequacy and efficiency of the educational program offered by the public schools of the Commonwealth . . . The evaluation procedure shall be so constructed and developed as to provide each school district with relevant comparative data to enable directors and administrators to more readily appraise the educational performance and to effectuate without delay the strengthening of the district's educational program. Tests developed . . . shall be used for the purpose of providing a uniform evaluation of each school district . . .

In response to the legislative mandate, the State Board of Education contracted with Educational Testing Service of Princeton, New Jersey, to engage in a two-year process of surveying and interviewing stakeholders in business, industry, education, and the general public as to what constituted a quality education. This led to the State Board adoption of *The Goals of Quality Education* in 1965. In 1967, the Department of Education formed an organizational unit along with staff to begin developing appropriate measures and engaging in extensive field testing during the 1967–68 and 1968–69 school years.

Educational Quality Assessment (EQA) Program

The first state assessment of students in Pennsylvania took place in the 1969–70 school year. Initially, state assessment was a purely school-based evaluation in the form of the *Educational Quality Assessment (EQA)* program, which reported grade 5 and 11 school-level results in ten goal areas. Grade 8 was added in 1974. Measuring both cognitive and non-cognitive areas, the program operated from 1970 through 1988. As the program evolved, a matrix sampling design was used in measuring and reporting school results in subject areas such as reading, language arts, mathematics, science, health, social studies, and analytical thinking. Initially, it operated as a voluntary program, but in 1974 it became mandatory on a cyclical basis.

Testing for Essential Learning and Literacy Skills (TELLS)

The next major revision in state assessment was the advent of the state's first mandated competency testing program, *Testing for Essential Learning and Literacy Skills (TELLS)* in the 1984–85 school year. The impetus for a statewide essential skills test evolved from an October 1983 document entitled *Turning the Tide: An Agenda for Excellence in Pennsylvania Public Schools*. A two-pronged approach was advocated, calling for:

1. competency testing in grades 3, 5, and 8 as an "early warning system" to identify students with reading and mathematics difficulties and
2. state-funded remedial instruction to provide needed additional help.

In response to this and other recommendations, the State Board of Education added *Chapter 3: Student Testing* to its regulations on June 14, 1984. It required all public school students in grades 3, 5, and 8 to be given criterion-referenced tests in reading and mathematics. The second part of the program, remedial instruction, was mandated by Act 93-1984, and required districts to provide remedial instruction programs to students identified by the tests given under the State Board regulation. Subsequently, funds were distributed to districts and intermediate units for this part of the program. The *TELLS* and *EQA* testing programs coexisted until the *EQA* was concluded in 1988. The *TELLS* program continued through the spring of 1991.

THE PENNSYLVANIA SYSTEM OF SCHOOL ASSESSMENT (PSSA)

The Pennsylvania System of School Assessment (PSSA) program was instituted in 1992. The PSSA returned to a school evaluation model with reporting at the school level only. Test administration took place in February/March, and school district participation was every third year based on the strategic planning cycle. Reading and mathematics were assessed at grades 5, 8, and 11; districts could choose to participate in the writing assessment at grades 6 and 9. State Board revisions to Chapter 5 in November 1994 brought major changes to the PSSA, beginning with the spring 1995 assessment. These changes included

3. all districts were required to participate in the reading and mathematics assessment each year,
4. student-level reports were generated in addition to school reports, and
5. the grades 6 and 9 writing assessment became mandatory on a three-year cycle corresponding to the district's strategic planning cycle.

Pennsylvania Academic Standards and the PSSA

A major structural change took place in test content with the State Board of Education's adoption of the Pennsylvania Academic Standards for Reading, Writing, Speaking and Listening, and Mathematics in January 1999 (Pennsylvania State Board of Education, 1999). The Academic Standards, which are part of *Chapter 4 Regulations on Academic Standards and Assessment*, detailed what students should know (knowledge) and be able to do (skills) at various grade levels. Subsequently, the State Board approved a set of criteria defining Advanced, Proficient, Basic, and Below Basic levels of performance. Reading and mathematics performance level results were reported at both the student and school levels for the 2000 PSSA. At that point, the PSSA became a standards-based, criterion-referenced assessment measuring student attainment of the Academic Standards while simultaneously determining the extent to which school programs enabled students to achieve proficiency of the Academic Standards.

ASSESSMENT ANCHOR CONTENT STANDARDS, CONTENT STRUCTURE, AND NEW GRADE LEVELS

Assessment in 2005 was marked by major structural changes in the PSSA. Assessment Anchor Content Standards (Assessment Anchors) developed during the previous school year to clarify content structure and improve articulation between assessment and instruction were implemented in terms of test design and reporting. At the same time field testing of mathematics and reading occurred at grades 4, 6, and 7. As specified by PL 107-110, the *No Child Left Behind Act* of 2001 (NCLB), states, school districts, and schools must achieve a minimum level of improvement each year, known as adequately yearly progress, or AYP. Accordingly, the third year of calculations for AYP were conducted and reported for grades 5, 8, and 11.

The 2006 operational reading and mathematics assessment incorporated grades 4, 6, and 7 for the first time. The assessed grade levels for 2006 included grades 3 through 8 and 11. The fourth year of calculations for AYP were conducted and reported for grades 5, 8, and 11 and for the first time in grade 3.

In 2007 the operational reading and mathematics assessment continued in grades 3 through 8 and 11. AYP calculations for grades 4, 6, and 7 took place in 2007 when they were assessed for the second time.

In 2008 the operational reading and mathematics assessment continued in grades 3 through 8 and 11, utilizing the same content structure. AYP calculations continued for all grades in 2008.

Purposes of the PSSA

As outlined in Chapter 4 of the State Board Regulations, the purposes of the statewide assessment component of the PSSA are as follows:

1. Provide students, parents, educators, and citizens with an understanding of student and school performance.
2. Determine the degree to which school programs enable students to attain proficiency of Academic Standards.
3. Provide results to school districts (including charter schools) and Area Vocational Technical Schools (AVTSs) for consideration in the development of strategic plans.
4. Provide information to state policymakers, including the State Senate, the General Assembly, and the State Board, on how effective schools are in promoting and demonstrating student proficiency of Academic Standards.
5. Provide information to the general public on school performance.
6. Provide results to school districts (including charter schools and AVTSs) based upon the aggregate performance of all students, for students with an Individualized Education Program (IEP), and for those without an IEP.

The broad purpose of the state assessments is to provide information to teachers and schools to guide the improvement of curricula and instructional strategies to enable students to reach proficiency in the Academic Standards.

THE PENNSYLVANIA WRITING ASSESSMENT

In 1990 the state initiated an on-demand writing assessment in which students wrote an essay in response to a particular topic or prompt. Offered to school districts on a voluntary basis, the writing assessment consisted of three modes of writing: narrative, informational, and persuasive. The test administration for grades 6 and 9 used a matrix sampling design; nine prompts (three per mode) were administered to students within a school, although each student responded to just one randomly distributed prompt. Scoring was based on a six-point holistic scale. Student results were aggregated and reported at the school level only. In 1992 the writing assessment was incorporated as part of the PSSA. Beginning in 1995, districts were required to participate in the writing assessment every third year in accordance with their strategic planning cycle. However, districts were also given the choice to participate more frequently. As a result, participation rose dramatically from the expected 167 districts (one-third) in any given year to 235 (47%) in 1995, 306 (61%) in 1996, 412 (82%) in 1997, 445 (89%) in 1998, and 449 (90%) in 1999.

With the advent of the Pennsylvania Academic Standards in 1999, major changes took place in the writing assessment, including alignment to the Academic Standards as well as changes in scoring method, prompts, testing date, and reporting. These changes, which are summarized below, were implemented in the 2000–01 school year and were followed by performance level reporting in the 2001–02 school year.

- The writing assessment became mandatory for all districts every year.
- Administration of the grades 6 and 9 writing assessment was changed from February to October.
- Scoring changed to a 4-point scale for each of five domains (focus, content, organization, style, and conventions).
- Prompts were different for grade 6 and grade 9 rather than being identical at the two grade levels.
- Within a grade level all students responded to two common prompts.
- The reporting model was greatly revised, and individual student reports were issued for the first time.
- A writing assessment for grade 11 was administered for the first time in February 2001.
- In 2002, performance levels were adopted for writing and implemented in the reporting of total writing results for the February grade 11 and fall 2002 grades 6 and 9 writing assessment.

The 2006 PSSA operational writing assessment featured additional revisions that included the following enhancements:

- A shift from grades 6 and 9 to grades 5 and 8, to provide better alignment to the end of elementary school and middle school.
- Grades 5 and 8 joined grade 11 in a February test window rather than the October window used previously for grades 6 and 9.

- Students responded to two writing prompts, which were evaluated in terms of (1) a mode-specific scoring guideline and (2) a conventions scoring guideline instead of the former domain scoring.
- Stimulus-based revising/editing multiple-choice items were incorporated to provide a more reliable and valid measure of the Conventions Academic Standard.

The 2008 PSSA operational writing assessment continued with the same structure and time of year as in 2006 and 2007.

THE PENNSYLVANIA SCIENCE ASSESSMENT

In accordance with the NCLB requirement to implement an operational science assessment in 2008, a major test development effort in science took place during 2006, followed by a large-scale, standalone field test in April/May of 2007. A full implementation of an operational science assessment at grades 4, 8, and 11 occurred in April-May 2008.

Several historical milestones were significant to the development of a science test in Pennsylvania. These include:

- Adoption of Act 16 or Pennsylvania Senate Bill 652 in 2000, which redefined the PSSA "as a test developed and implemented by the Department of Education to determine only academic achievement relating directly to objective Academic Standards in the areas of reading, mathematics, and science." (see the *Science Assessment Handbook*, PDE, November 2006).
- Pennsylvania State Board of Education adoption of *Science and Technology Standards* on July 12, 2001 and the *Environment and Ecology Standards* on January 5, 2002.

Aligned to the *Pennsylvania Science Assessment Anchor Content Standards* and Eligible Content, the science test is designed to measure and report results in four major categories:

A. The Nature of Science,

B. Biological Sciences,

C. Physical Sciences, and

D. Earth and Space Sciences.

At grade 4, test questions consist of standalone multiple-choice and two-point short answer open-ended items. At grades 8 and 11 multiple-choice questions consist of both stand-alone and scenario-based types. All open-ended items at grade 8 are stand-alone 2-point questions, while grade 11 has stand alone 2-point questions and scenario-based 4-point questions. A science scenario consists of a description of a class project, an experiment, or other research. Scenarios typically contain text, graphs, charts and/or tables. Students use their content knowledge and science process skills to answer a set of multiple-choice items and, at grade 11 only, a four-point extended open-ended item related to the scenario. More information may be found in the following two Pennsylvania Department of Education publications available on the PDE website: *2007-2008 PSSA Assessment Handbook* and *2008 PSSA Science Item and Scoring Sampler* (one per assessed grade level).

An extensive description of the science test development activities, field testing, and statistical analyses may be found in the *2008 PSSA Preliminary Technical Report for Science*.

Chapter Two: New Test Development for Writing

The third PSSA operational writing test to include both multiple-choice items and writing prompts, aligned with the Academic Standards, was administered in the February 2008 to students in grades 5, 8, and 11. The multiple-choice items administered were field tested in the spring of 2007 (embedded in the first operational writing test) and the writing prompts were field tested in the spring of 2005. The new writing assessment represents several fundamental changes over the previous operational assessment. The changes in the PSSA writing test include the development of writing tests at each grade level (5, 8, and 11) that are in alignment with the Academic Standard 1.4 (Types of Writing [Mode]) and Academic Standard 1.5 (Quality of Writing [Revising and Editing]). Below is a more detailed description of these changes and their rationale.

Grade Level

Starting with the 2006 operational assessment and continuing with the 2007 and 2008 assessment, students in grades 5, 8, and 11 are administered the writing test. The assessment of students in grades 5 and 8 (rather than grades 6 and 9) provides a clearer alignment with the end of elementary and middle school. Further, this allows schools to use information from the writing assessment to evaluate the effectiveness of their writing programs and to assess the needs of incoming students.

Multiple-Choice Items

Starting with the 2006 operational assessment and continuing with the 2007 and 2008 assessment, students at each grade level respond to twelve multiple-choice, stimulus-based revising/editing items. The use of multiple-choice items allows for a more reliable and valid measure of conventions (which include revising and editing) because it provides focused, predictable opportunities to assess students' skills in using conventions of language and writing.

Writing Prompt

Starting with the 2006 operational assessment and continuing with the 2007 and 2008 assessment, students at each grade level respond to two writing prompts. Students at grade 5 respond to prompts at two of the three modes (narrative, informational, persuasive). Each year, PDE selects two of the three modes for use in the test. Students at grades 8 and 11 respond to prompts at only the informational and persuasive modes. This change aligns with the expository forms of writing most often used in middle and high school curriculums, and it reflects the expectations for writing that occur in post-secondary classrooms and in the workplace.

Writing Assessment Measures

In 1999, Pennsylvania adopted academic standards for writing (*Academic Standards for Reading, Writing, Speaking and Listening*) that describe what students should know and be able to do with the English language at a grade level. Within the framework of the new assessment, the writing prompts are measured under Academic Standards 1.4.A Narrative, 1.4.B Informational, and 1.4.C Persuasive, thus providing the responses to the eligible modes the prompts are designed to elicit. The writing prompts are also measured under Academic Standard 1.5.A–F Editing. The stimulus-based, multiple-choice items are measured under the Academic Standards 1.5.E Revising, and 1.5.F Editing.

OVERVIEW OF THE WRITING TEST

Multiple-Choice Items

Each multiple-choice item on the writing test is associated with an embedded passage containing errors. Starting with the 2006 operational assessment and continuing with the 2007 and 2008 assessment, four multiple-choice items are associated with each passage. Multiple revising and editing instances are incorporated within each passage and require that a student demonstrate both passive (recognizing and identifying grammatical and mechanical errors in text, i.e., misspellings, errors in word choice, errors in verb tense or pronoun usage) and active (choosing the appropriate correction of an embedded error, i.e., deleting an irrelevant detail, changing the sequence of details, placing correct marks of punctuation) revising and editing skills.

All multiple-choice items have four response options that include one single correct answer. The student is awarded one raw score point for choosing the correct response. Incorrect response choices, or distractors, typically represent some kind of misinterpretation or predisposition, unsound reasoning, or casual reading of the item and/or stimuli.

Writing Prompts

At each assessed grade level, students respond to writing prompts developed to measure composition of writing as specified in the Academic Standards 1.4.A–C and further clarified in Academic Standards 1.5 A–G. The student response to a prompt requires approximately 60 minutes per prompt, though students are allowed more time to finish their responses if necessary. The writing prompts were field tested in 2005 with only one field test prompt being administered per student. Prompt modes were spiraled across the total number of available forms. Spiraling is accomplished by administering each student one of many available prompts in a sequential manner. For example, the first student received Prompt 1, the second student Prompt 2, and so on until every prompt was administered. If there were more students than prompts, the sequence was repeated starting with the first prompt until every student was assigned a prompt. This process ensures that each prompt was administered to approximately equal and representative student populations in regard to demographics like gender, ethnicity, school size, and location in the state.

Beginning with the operational assessment in 2006 and continuing in 2007 and 2008, students in grade 5 respond to two prompts selected across three modes: narrative, informational, and persuasive. The narrative prompt can be story/fiction or personal narrative/recount, which aligns with Academic Standard 1.4.A. The informational prompt can be sequence (process analysis) or simple definition, which aligns with Academic Standard 1.4.B. The persuasive prompt can be problem/solution or evaluation, which aligns with Academic Standard 1.4.C. No writing prompts were field tested in 2006, 2007, or 2008.

Beginning with the operational assessment in 2006 and continuing in 2007 and 2008, students in grade 8 respond to two prompts: informational and persuasive. The informational prompt can be sequence (process analysis), illustration, conceptual definition, cause/effect, classification, or compare/contrast, which aligns with Academic Standard 1.4.B. The persuasive prompt can be problem/solution or evaluation, which aligns with Academic Standard 1.4.C. No writing prompts were field tested in 2006, 2007, or 2008.

Academic writing is the focus for the grade 11 PSSA writing assessment, including writing required for students who wish to pursue post-secondary educational and/or career opportunities.

Beginning with the operational assessment in 2006 and continuing in 2007 and 2008, students in grade 11 respond to two prompts: informational and persuasive. The informational prompt can be advanced sequence (process analysis), illustration, definition, cause/effect, classification, or compare/contrast, which aligns with Academic Standard 1.4.B. The persuasive prompt can be problem/solution or evaluation, which aligns with Academic Standard 1.4.C. No writing prompts were field tested in 2006, 2007, or 2008.

Beginning with the field test in 2005 and continuing through 2008, the responses to writing prompts are scored twice using two different scoring guidelines developed especially for the PSSA. The first score is based on the application of a mode-specific scoring guideline, and the second score is based on the application of a conventions scoring guideline. The mode-specific scoring guideline is designed to evaluate first-draft, on-demand responses. It identifies the essential criteria for successfully responding to a particular mode of writing relating to the core areas of writing: focus, development of content, organization, and style. In contrast, the conventions scoring guideline measures the demonstrated level of control of sentence formation, grammar, usage, spelling, and punctuation. For more information on the application of the new scoring guidelines, see the current *Writing Item and Scoring Sampler*, available on the PDE Web site.

Copies of the scoring guidelines used to score the mode and the conventions are contained in Appendix A.

Chapter Three: Item/Test Development Process

Key activities in the development process of the multiple-choice portion of the 2008 operational writing test include initial item development, review of newly developed items, bias/fairness/sensitivity review, field testing of new multiple-choice items in 2007, field test item review with data, and final selection of items for the 2008 Writing PSSA. Table 3–1 provides a timeline of these major activities, which are described in this chapter and in *Chapter Five: Field Test Procedures*.

Table 3–1. General Timeline Associated with 2007 MULTIPLE-CHOICE FIELD TEST and 2008 Operational Assessment of Writing at Grades 5, 8, and 11

	Activities in the MULTIPLE-CHOICE Item/Test Development Process	Timeframe
Field Test	Test Blueprint Developed / Finalized	January 2006
	Initial Multiple-Choice Item Development Conducted	March–June 2006
	PDE, with Pennsylvania Educators and Consultants, Reviewed Sample Multiple-Choice Items	June 2006
	Newly Developed Multiple-Choice Items Reviewed with PA Educators (New Item Review)	July 2006
	Multiple-Choice Items Reviewed for Bias, Fairness, and Sensitivity with PA Educators (Bias Review)	July 2006
	Field Test Forms Constructed	August–November 2006
	Test Materials Printed, Packaged, and Shipped	November 2006–January 2007
	Window for Test Administration	February 2007
	Multiple-Choice Field Test Results/Data Reviewed with PA Educators (Data Analysis)	July 2007
Core / Operational	Operational Test Form Constructed	August–November 2007
	Test Materials Printed, Packaged, and Shipped	November 2007–January 2008
	Test Administration Window	February 2008

Key activities in the development process of the writing prompt portion of the 2008 operational writing test include initial item development, review of newly developed items, bias/fairness/sensitivity review, field testing of new prompts in 2005, field test item review with data, and final selection of items for the 2008 Writing PSSA. While new multiple-choice items have been field tested each year, a total of 90 writing prompts was field tested in 2005. Each year since, PDE has selected the writing prompt that appears on the current year's assessment. Table 3–2 provides a timeline of these major activities, which are described in this chapter and in *Chapter Five: Field Test Procedures*.

Table 3–2. General Timeline Associated with 2005 WRITING PROMPT FIELD TEST and 2008 Operational Assessment of Writing at Grades 5, 8, and 11

	Activities in the WRITING PROMPT/Test Development Process	Timeframe
Field Test	Test Blueprint Developed / Finalized	February–May 2004
	Initial Writing Prompt Development Conducted	May–September 2004
	PDE, with Pennsylvania Educators and Consultants, Reviewed Sample Items	June 2004
	Newly Developed Writing Prompts Reviewed with PA Educators (New Item Review)	October 2004
	Writing Prompts Reviewed for Bias, Fairness, and Sensitivity with PA Educators (Bias Review)	October 2004
	Field Test Forms Constructed	October–November 2004
	Test Materials Printed, Packaged, and Shipped	November 2004–January 2005
	Window for Test Administration	February 2005
	Rangefinding of Writing Prompt Field Test Items Conducted	March 2005
	Writing Prompt Field Test Items Scored	May–June 2005
	Field Test Results/Data Reviewed with PA Educators (Data Analysis)	July 2005
Core Operational	Operational Test Form Constructed	August–November 2007
	Test Materials Printed, Packaged, and Shipped	November 2007–January 2008
	Test Administration Window	February 2008
	Supplemental Rangefinding of Operational Writing Prompts Conducted	March 2008
	Operational Writing Prompts Scored	May–June 2008

TEST CONTENT BLUEPRINT FOR 2008

As indicated in Chapter One and Chapter Two, the PSSA is based on the Pennsylvania Academic Standards for Reading, Writing, Speaking, and Listening. The writing test specifically measures Academic Standards 1.4 (Types of Writing) and 1.5 (Quality of Writing). The Reading, Writing, Speaking and Listening Standards were designed to show what students should know and be able to do with the English language at a grade level. The Standards establish an outline for what can be assessed on the PSSA writing test and help to communicate the range of knowledge and skills from which the PSSA items would be designed.

The PSSA writing test for grades 5, 8, and 11 in 2006, 2007, and 2008 followed this content blueprint and testing plan in order to reflect the Academic Standards.

2008 OPERATIONAL LAYOUT FOR WRITING

The PSSA operational layout was developed through the collaborative efforts of Data Recognition Corporation (DRC), the National Center for Improvement of Educational Assessment (NCIEA), and the Pennsylvania Department of Education. The layout was subsequently evaluated and approved by PDE. The writing test book is scannable and includes fields for student demographic data, stimuli (embedded error passages) linked to multiple-choice (MC) items, and writing prompts (WP). All MC items are worth 1 point. Responses to WP items receive a maximum of 4 points (on a scale of 1–4) for mode and also receive a maximum of 4 points (on a scale of 1–4) for conventions.

Multiple-Choice Items

Each test form contains a common set of operational items (i.e., each student takes an identical set of items) along with matrix/embedded field test items. The matrix and embedded field test items are unique across form.

Writing Prompts

Each test form contains two common operational writing prompts. These prompts are taken by all students at a grade level. The 2006, 2007, and 2008 operational forms did not contain matrix or embedded field test writing prompt.

Forms

The 2008 Writing PSSA is comprised of ten forms at each grade. All of the forms contain the common items identical for all students and sets of unique ("matrix") items that fulfill several purposes. These purposes include

- expanding the total pool of items for school-level reporting.
- field testing new items.
- using items from the previous year's assessment for the purpose of equating/linking.

Tables 3–3 and 3–4 display the design for the writing test forms. The column entries for these tables denote:

E. No. of Core Revising and Editing (R&E) Stimulus-based MC Items per Form—Each multiple-choice item is associated with a stimulus-passage. This column provides the number of core (common) operational revising and editing multiple-choice items that appear per form. These items appear in every test form at a grade level.

F. No. of Matrix R&E Stimulus-based MC Items per Form—Each multiple-choice item is associated with a stimulus-passage. This column provides the number of matrix revising and editing multiple-choice items that appear per form. These items include linking MC items and field test MC items. Matrix items will be used for equating.

G. Total No. of R&E MC Items per Form—This column provides the total number of multiple-choice items that appear in one test form (Column A plus Column B).

H. No. of Pre-equated Core 4-pt. Writing Prompts (WPs) per Form—This column provides the number of operational core writing prompts. These prompts appear in every test form at a grade level. Pre-equating means that all of the prompts are on the same metric or scale before they are administered on an operational form.

I. Total No. of Forms—This column provides the total number of forms at a grade level. The values in this column are used as a multiplier to calculate figures in Column H and Column J.

J. Total No. of Core R&E Stimulus-based MC Items per 10 Forms—This column provides the total number of stimulus-based, multiple-choice items that appear in all core positions of all test forms. Since core items are identical across all forms, this number should equal the core figure provided in Column A.

K. Total No. of Matrix R&E Stimulus-based MC Items per 10 Forms (Linking & Embedded FT)—This column provides the total number of revising and editing multiple-choice items that appear in all matrix positions in all test forms. This figure is found by multiplying the number of matrix MC items shown in Column B by the total number of forms found in Column E. The matrix positions shown in Column H are further broken out into the number of Matrix Linking and the number of Embedded Field Test Matrix items. The total number of Matrix MC items is equal to the number of Matrix items and Matrix Linking items added to the number of Embedded Field Test Matrix items.

L. Total No. of R&E Stimulus-based MC Items (Core + FT) per 10 Forms—This column provides the total number of multiple-choice items that will appear in all MC positions in all forms regardless of role. This figure is found by adding the total in Column G to the total in Column H.

M. Total No. of Pre-equated Core 4-pt. Writing Prompts (WPs) per 10 Forms—This column provides the total number of writing prompts that appear in all forms. Since all writing prompts are core, the figure in Column K equals the figure in Column D.

Table 3–3. 2008 Writing Test Plan, per Operational Form per Grade

A	B	C	D	E
No. of Core R&E Stimulus-based MC Items per Form	No. of Matrix R&E Stimulus-based MC Items per Form	Total No. of R&E MC Items per Form	No. of Pre-equated Core 4-pt. Writing Prompts (WP) per Form	Total No. of Forms
12	8	20	2	10

Table 3–4. 2008 Writing Test Plan, per 10 Operational Forms per Grade

F	G	H	I
Total No. of Core R&E Stimulus-based MC Items per 10 Forms	Total No. of Matrix R&E Stimulus-based MC Items per 10 Forms (Linking & Embedded FT)	Total No. of R&E Stimulus-based MC Items (Core + FT) per 10 Forms	Total No. of Pre-equated Core 4-pt. Writing Prompts (WP) per 10 Forms
12	80 (16 & 64)	92	2

Core Points

Since an individual student's score is based solely on the common, or core items, the total number of operational points is 100. The total score is obtained by combining the points from the core MC and WP portions of the test as displayed in Table 3–5.

Table 3–5. Maximum Eligible Core Points for Writing Prompts

Multiple-choice	**Writing Prompts**		**Totals**
	Conventions	**Mode**	
12	8	80	100
12 items × 1 point each (12×1)	2 items each worth a maximum of 4 points each (2×4)	2 items each worth a maximum of 4 points each. The raw score is then multiplied by 10. (2×4)×10	(12 + 8 + 80)

TEST SESSIONS AND TIMING

The test window for the 2008 operational assessment was from February 11 through February 22, including make-ups. The writing assessment consists of three sections. Test administration requires each complete section to be scheduled as one assessment session, although schools are permitted to combine multiple sections as a single session. Administration guidelines stipulate that the sections be administered in the sequence in which they are printed in the test book. Table 3–6 outlines the assessment schedule and estimated times for each section.

Table 3–6. Writing—All Grades

Section	Contents	Suggested Time*
1	20 Multiple-choice	50 Minutes
2	1 Writing Prompt	60 Minutes
3	1 Writing Prompt	60 Minutes
Total Time		150 Minutes

*These are approximate times. All students are entitled to extra time if needed. Students may request an extended assessment period if they indicate that they have not completed the task. Such requests are granted if the assessment administrator finds the request to be educationally valid.

REPORTING CATEGORIES AND POINT DISTRIBUTION

The writing assessment results will be reported in two categories:

- Composition – Academic Standard 1.4, Types of Writing
- Revising and Editing – Academic Standard 1.5, Quality of Writing

Academic Standards A, B, and C are associated with Composition. Academic Standards E and F are associated with Revising and Editing. The distribution of core items into these two categories is shown in Table 3–7.

Table 3–7. Core Points Distribution

Reporting Category	*Composition*	*Revising and Editing*	
Academic Standards	*1.4A, 1.4B, 1.4C*	*1.5E and 1.5F*	
Multiple-choice Items	N/A	12	12
Writing Prompt 1	4 (Mode)	4 (Conventions)	8
Writing Prompt 2	4 (Mode)	4 (Conventions)	8
Raw Sub-total	8	20	28
Weighting Factor applied to Raw Score	*x10*	*x1*	
Total Possible Points	80	20	100

For more information concerning the process used to converting the operational layout into forms (form construction), see Chapter Six. For more information about operational layout across forms and across years (form equivalency), see Chapter Ten.

TEST DEVELOPMENT CONSIDERATIONS

Achieving strong alignment of the items with the PSSA Academic Standards involves several components:

- grade-level appropriateness (reading/interest level, etc.)
- Webb's Depth of Knowledge (cognitive level, item/task level of complexity)
- estimated difficulty level
- relevancy of context
- rationale for distractors
- style
- accuracy
- correct terminology

The inclusion of multiple components such as these greatly enhances the comprehensiveness and utility of alignment (Bhola, Impara & Buckendahl, 2003). *The Standards for Educational and Psychological Testing* (AERA, APA, NCME, 1999) and the *Principles of Universal Design* (Thompson, Johnstone & Thurlow, 2002) guided the development process. In addition, DRC's *Bias, Fairness, and Sensitivity Guidelines* were used for developing items free of issues of bias, fairness, and sensitivity. All items were reviewed for fairness by bias and sensitivity committees and for content by Pennsylvania educators and field specialists.

Bias, Fairness, and Sensitivity

At every stage of the item and test development process, DRC employs procedures that are designed to ensure that items and tests meet Standard 7.4 of the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 1999).

> *Standard 7.4: Test developers should strive to identify and eliminate language, symbols, words, phrases, and content that are generally regarded as offensive by members of racial, ethnic, gender, or other groups, except when judged to be necessary for adequate representation of the domain.*

In meeting Standard 7.4, DRC employs a series of internal quality steps. DRC provides specific training for our test developers, item writers, and reviewers on how to write, review, revise, and edit items for issues of bias, fairness, and sensitivity (as well as for technical quality). Our training also includes an awareness of and sensitivity to issues of cultural diversity. In addition to providing *internal* training in reviewing items in order to eliminate potential bias, DRC also provides *external* training to the review panels of minority experts, teachers, and other stakeholders.

DRC's guidelines for bias, fairness, and sensitivity include instruction concerning how to eliminate language, symbols, words, phrases, and content that might be considered offensive by members of racial, ethnic, gender, or other groups. Areas of bias that are specifically targeted include, but are not limited to: stereotyping, gender, regional/geographic, ethnic/cultural, socioeconomic/class, religious, experiential, and biases against a particular age group (ageism) and against persons with disabilities. DRC catalogues topics that should be avoided, and maintains balance in gender and ethnic emphasis within the pool of available items and passages.

Universal Design

The Principles of Universal Design were incorporated throughout the item development process to allow participation of the widest possible range of students in the PSSA. The following checklist was used as a guideline:

7. Items measure what they are intended to measure.
8. Items respect the diversity of the assessment population.
9. Items have a clear format for text.
10. Items have concise and readable text.
11. Items allow changes to format, such as Braille, without changing meaning or difficulty.
12. The arrangement of the items on the test has an overall appearance that is clean and well organized.

A more extensive description of the application of Universal Design principles is described in Chapter Four.

Depth of Knowledge (DOK)

Important in statewide assessment is the alignment between the overall assessment system and the state's standards. A Depth of Knowledge (cognitive complexity) methodology developed by Webb (1999) offers a comprehensive model that can be applied to a wide variety of contexts. With regard to the alignment between standards statements and the assessment instruments, Webb's criteria include five categories, one dealing with content. Within the content category is a useful set of levels for evaluating DOK. According to Webb (1999, p.7–8) "Depth of Knowledge consistency between standards and assessments indicates alignment if what is elicited from students on the assessment is as demanding cognitively as what students are expected to know and do as stated in the standards." The four levels of cognitive complexity (Depth of Knowledge) are:

- **Level 1: Recall**—the student can recall information and facts.
- **Level 2: Skill/Concept**—the student can use information and facts in new situations.
- **Level 3: Strategic Thinking**—the student can use reason and strategic thinking to develop a plan.
- **Level 4: Extended Thinking**—the student can use extended thinking and investigation to solve a problem.

DOK levels were incorporated in the item writing and review process, and items were coded with respect to the level they represented. For the writing assessment, multiple-choice items are written to DOK levels 1 and 2. Students will either recall information they have learned (level 1) or apply learned information to a new context (level 2). For example, an item that asks students to identify a capitalization error (What is the capitalization rule for this word?) would be considered DOK level 1 because it requires learned facts. An item that asks students to insert a new sentence into an existing passage would be considered DOK level 2 because it requires more than mere recollection to arrive at the correct answer. The writing prompts are considered DOK level 3 because the student must create a unique piece of writing.

General Process of Item Construction

As part of the item construction process, each item was reviewed by content specialists and editors at DRC. Content specialists and editors evaluated each item to make sure that it measured the intended standards. They also assessed each item to make certain that it was appropriate to the intended grade and that it provided and cued only one correct answer. In addition, the difficulty level, Depth of Knowledge, graphics, language demand, and distractors were also evaluated. Other elements considered in this process include, but are not limited to: Universal Design, bias/fairness/sensitivity, source of challenge, grammar/punctuation, and PSSA style.

A flow chart summarizing the item and test development processes used appears in Appendix B. Additional details about the process are discussed below.

Sample Item Review: June 2004

Before training item writers to construct items, passages, and prompts for the new Pennsylvania writing test, DRC assessment and content experts developed a draft item construction orientation manual specifically for the PSSA writing assessment. This manual provided guidelines for the types of items and the character of the items to be developed for the assessment. In conjunction with this manual, DRC prepared a series of sample passages, prompts, and items that illustrated the initial view of what the future test items might look like.

A group of Pennsylvania educators was convened in Harrisburg on June 29 and 30, 2004, to review the proposed training materials and the samples of proposed item types. The Sample Item Review committee consisted of Pennsylvania teachers and subject-area supervisors from school districts throughout the Commonwealth of Pennsylvania, including some with post-secondary university affiliations. During this review, DRC received valuable feedback on the range and character of the items that Pennsylvania educators expected on the upcoming assessment. Committee members suggested revisions and made recommendations for reclassification of items. The committee also reviewed the items for adherence to the Principles of Universal Design, including language demand and issues of bias, fairness, and sensitivity.

Following this review, DRC consulted with PDE regarding the suggestions made by the committee members and made agreed-upon revisions to the training materials. This manual and DRC's standard item writing manual were then used to train item writers to construct items for the Pennsylvania assessment for subsequent years of item development for the writing assessment.

Test Item Writers and Training in Item Writing: Constructing Prompts, Passages, and Multiple-Choice Items

The prompts, embedded-error passages, and multiple-choice items were developed by DRC ELA/writing test development specialists, scoring directors, and writers who have experience writing prompts and items for English language arts and writing assessments. Qualified writers were professionals with language arts classroom experience or writers who demonstrated appropriate grade-level content knowledge. Writers attended a one-day training workshop and were provided with a detailed instruction manual. As they wrote and revised their passages and items, writers also received personalized feedback from DRC test development content specialists. Prompts were written only in 2004, while the multiple-choice items used operationally in 2008 were written in 2006.

Before developing items for the PSSA, the item writers were also trained in the following:

- Pennsylvania Academic Standards
- Webb's Four Levels of Cognitive Complexity: Recall, Basic Application of Skill/Concept, Strategic Thinking, and Extended Thinking
- General scoring guidelines
- Specific and general guidelines for item writing
- Bias, fairness, and sensitivity
- Principles of Universal Design
- Item quality technical style guidelines
- Reference information
- Sample items

In addition to the above, the training for passage, prompt, and item writing included guidelines on appropriate length, grade-level interest, and grade-level vocabulary. The training for multiple-choice items also included guidelines on proportionate distribution of items addressing each standard at each grade level, and general item construction guidelines to meet PDE's stated preferences. (For example, writers were told to use the phrase "incomplete sentence" rather than "sentence fragment.") The training for prompts also included special emphasis on Universal Design, clarity, validity, reliability, structure, format, interest, content, and vocabulary.

DRC sought and obtained from its item writers about twice as many passages and items as were needed to actually appear on the field test. The extra items allow future review committees to reject items and also allow DRC to select only the best items to move forward at each stage of development.

To ensure that the items were sufficient in number and adequately distributed across subcategories and levels of difficulty, writers were assigned a specific number of items to create and attach to each passage.

Since all passages were written on commission, the passages were purchased outright, eliminating the need to seek costly permissions later when the passages reached publication.

Accepted passages and items then underwent an internal review by test development content specialists, content editors, and testing experts to judge their merit with regard to the following criteria:

- Passages and prompts have interest value for students.
- Passages and prompts as a whole demonstrate topical variety.
- Passages, prompts, and items are grade appropriate in terms of vocabulary, length, and language characteristics.
- Passages, prompts, and items are free of bias, fairness, and sensitivity issues.
- Passages contain common, grade-appropriate errors.

- Prompts and items measure only one standard.
- Prompts and items are clear, concise, and parallel in structure.
- Items are, as much as possible, passage dependent.
- Items provide for a range of difficulty.
- Prompts are rich enough to elicit measurable responses.

Once through the internal DRC review process, those passages, prompts, and items deemed potentially acceptable were then reviewed and approved by two PDE-sponsored committees: the New Item Review Writing Content Committee and the Bias, Fairness, and Sensitivity Committee.

Writing Prompt Content Review: October 2004

Before field testing, all newly developed writing prompts were submitted to content committees for review. The content committees consisted of Pennsylvania teachers and subject-area supervisors from school districts throughout the Commonwealth of Pennsylvania, some with post-secondary university affiliations. The primary responsibility of the content committee was to evaluate writing prompts with regard to quality and content classification, including grade-level appropriateness, estimated difficulty, and DOK. The committee members suggested revisions and made recommendations for reclassification of writing prompts. In some cases a writing prompt was deleted, and the committee suggested a replacement writing prompt and/or reviewed a suggested replacement writing prompt provided by the facilitators. The committee also reviewed the writing prompts for adherence to the Principles of Universal Design, including language demand and issues of bias, fairness, and sensitivity.

The content review was held October 4–7, 2004. Committee members were PDE-approved. PDE internal staff members and DRC testing experts were also in attendance. The meeting commenced with an overview of the test development process by Patricia McDivitt, Vice President of Test Development (DRC). Ms. McDivitt also provided training on the procedures and forms to be used for writing prompt content review.

DRC assessment specialists in writing facilitated the reviews. Committee members, grouped by grade level, worked through and reviewed the prompts for quality and content, as well as for the following categories designated on a generic Item Review Form, which may be found in Appendix C:

- Content Alignment
- Rigor Level Alignment
- Technical Design

Within these three areas, reviewers checked the standard (mode) being assessed, the grade level appropriateness, and DOK. DRC assessment specialists recorded focused information on this form and on the item cards themselves.

The committee members then assigned each writing prompt a status: Accept or Edit. If a writing prompt was revised, committee members agreed on the revision. All comments were recorded, collected, and filed.

Security during the meetings was addressed by adhering to a strict set of procedures. Writing prompts in numbered binders were distributed for committee review and signed in and out by each member on a daily basis. All attendees, with the exception of PDE staff, were required to sign a Confidentiality Agreement. Secure materials that did not need to be retained after the meetings were deposited in secure barrels, and their contents were shredded.

Bias, Fairness, and Sensitivity Reviews–Writing Prompts

Before field testing, all newly developed writing prompts for grades 5, 8, and 11 were submitted to a Bias, Fairness, and Sensitivity Committee for review. This took place on October 5–8, 2004. The committee's primary responsibility was to evaluate writing prompts as to acceptability with regard to bias, fairness, and sensitivity issues. They made recommendations for changes or deletion of writing prompts to address bias, fairness, and/or sensitivity. An expert multi-ethnic committee composed of men and women was trained by a DRC test development director to review writing prompts for bias, fairness, and sensitivity issues. Training materials included a manual developed by DRC (DRC, 2003–2008). One committee member had expertise with special needs students. Another member worked for the Pennsylvania Department of Education in the curriculum department. Most of the writing prompts were read by all members, and some were read by a cross-section of committee members. Each member noted bias, fairness, and/or sensitivity comments on tracking sheets and on the item card, if needed, for clarification. All comments were then compiled and decisions on the actions to be taken were made by the DRC writing test development specialists in consultation with PDE. This review followed the same security procedures as outlined above, except that the materials were locked and stored at the DRC offices in Harrisburg while in use and then shredded at the meeting's adjournment.

The results from the Bias, Fairness, and Sensitivity committee review are summarized in Table 3–8.

Table 3–8. 2004 Bias, Fairness, and Sensitivity Committee Review of Writing Prompts

Grade	Prompts Accepted As Is	Prompts Accepted With Revision	Prompts Rejected
5	39	11	10
8	21	22	17
11	37	8	15
Total	97	41	42

Passage and Multiple-Choice Item Content Review: July 2006

Before field testing, all newly developed test items were submitted to content committees for review. The content committees consisted of Pennsylvania teachers and subject-area supervisors from school districts throughout the Commonwealth of Pennsylvania, some with post-secondary university affiliations. The primary responsibility of the content committee was to evaluate items with regard to quality and content classification, including grade-level appropriateness, estimated difficulty, DOK, and source of challenge. The committee members suggested revisions and made recommendations for reclassification of items. In some cases an item was deleted, and the committee suggested a replacement item and/or reviewed a suggested replacement item provided by the facilitators. The committee also reviewed the items for adherence to the Principles of Universal Design, including language demand and issues of bias, fairness, and sensitivity.

The content review was held July 11–13, 2006. Committee members were PDE-approved. PDE internal staff members and DRC testing experts were also in attendance. DRC assessment specialists in writing facilitated the reviews. Committee members, grouped by grade level, worked through and reviewed the passages, prompts, and items for quality and content, as well as for the following categories designated on a generic Item Review Form, which may be found in Appendix C:

- Content Alignment
- Rigor Level Alignment
- Technical Design

Within these three areas, reviewers checked the standard being assessed, the grade level appropriateness, DOK, source of challenge issues, and the validity of the answer options. DRC assessment specialists recorded focused information on this form and on the item cards themselves.

The committee members then assigned each item a status: Accept or Edit. If a passage or item was revised, committee members agreed on the revision. All comments were recorded, collected, and filed.

Security during the meetings was addressed by adhering to a strict set of procedures. Passages and items in numbered binders were distributed for committee review and signed in and out by each member on a daily basis. All attendees, with the exception of PDE staff, were required to sign a Confidentiality Agreement. Secure materials that did not need to be retained after the meetings were deposited in secure barrels, and their contents were shredded.

Bias, Fairness, and Sensitivity Reviews–Multiple-Choice Items

Before field testing, all newly developed writing test items for grades 5, 8, and 11 were submitted to a Bias, Fairness, and Sensitivity Committee for review. This took place on July 10, 2006. The committee's primary responsibility was to evaluate items as to acceptability with regard to bias, fairness, and sensitivity issues. They made recommendations for changes or deletion of items to address bias, fairness, and/or sensitivity. Included in the review were proposed writing passages used as stimuli for the multiple-choice items. An expert multi-ethnic committee composed of men and women was trained by a DRC test development director to review items for bias, fairness, and sensitivity issues. Training materials included a manual developed by DRC (DRC, 2003–2008). One committee member had expertise with special needs students. Another member worked for the Pennsylvania Department of Education in the curriculum department. Most of the writing items were read by all members, and some were read by a cross-section of committee members. Each member noted bias, fairness, and/or sensitivity comments on tracking sheets and on the item, if needed, for clarification. All comments were then compiled and decisions on the actions to be taken were made by the DRC writing test development specialists in consultation with PDE. This review followed the same security procedures as outlined above, except that the materials were locked and stored at the DRC offices in Harrisburg while in use and then shredded at the meeting's adjournment.

The results from the Bias, Fairness, and Sensitivity committee review are summarized in Table 3–9.

Table 3–9. 2006 Bias, Fairness, and Sensitivity Committee Review of Multiple-Choice Items

Grade	Stimulus Passages			Multiple-Choice Items		
	Accepted As Is	Accepted With Revision	Rejected	Accepted As Is	Accepted With Revision	Rejected
5	11	8	1	87	8	5*
8	9	11	0	96	4	0
11	9	8	3	84	1	15*
Total	29	29	4	267	13	20*

*Item rejected only because they were based on passages that were rejected.

ITEM AUTHORING AND TRACKING

Initially, items are prepared on PSSA Item Cards and used for preliminary sorting and review. Although very similar, the PSSA Item Card for multiple-choice items differs from the PSSA Item Card for passages in that the former has a location at the bottom of the card for comments regarding the distractors. Blank examples of these two cards are shown in Appendix D. In both instances, a column against the right margin provides for codes to identify the subject area, grade, content categories, passage information, item type, DOK, estimated difficulty, and answer key (MC items).

All items undergoing field testing were entered into the DRC Item Viewer and Authoring Network™ (IVAN), which is a comprehensive, secure, online item banking system. It accommodates item writing, item viewing and reviewing, and item tracking and versioning. IVAN manages the transition of an item from its developmental stage to its approval for use within a test form. The system supports an extensive item history that includes item usage within a form, item-level notes, content categories, and subcategories, item statistics from both classical and Rasch item analyses, and classifications derived from analyses of differential item functioning (DIF). A sample IVAN Item Card is presented in Appendix D.

Chapter Four: Universal Design Procedures Applied in the PSSA Test Development Process

Universally designed assessments allow participation of the widest possible range of students and contribute to valid inferences about participating students. Principles of Universal Design are based on the premise that each child in school is a part of the population to be tested, and that testing results should not be affected by disability, gender, or race (Thompson, Johnstone & Thurlow, 2002). At every stage of the item and test development process, including the 2005 writing field test and 2006, 2007, and 2008 operational tests, procedures were employed to ensure that items and subsequent tests were designed and developed using the elements of universally designed assessments that were developed by the National Center on Educational Outcomes (NCEO).

Federal legislation addresses the need for universally designed assessments. The *No Child Left Behind Act* (Elementary and Secondary Education Act) requires that each state must "provide for the participation in [statewide] assessments of all students" [Section 1111(b)(3)(C)(ix)(l)]. Both Title 1 and IDEA regulations call for universally designed assessments that are accessible and valid for all students, including students with disabilities and students with limited English proficiency. The benefits of universally designed assessments not only apply to these groups of students, but to all individuals with wide-ranging characteristics.

Committees involved in content and bias reviews included members familiar with the unique needs of students with disabilities and students with limited English proficiency.

What follows are the Universal Design guidelines followed during all stages of the item development process for the PSSA writing field test and operational test.

ELEMENTS OF UNIVERSALLY DESIGNED ASSESSMENTS

After a review of research relevant to the assessment development process and the Principles of Universal Design (Center for Universal Design, 1997), NCEO has produced seven elements of Universal Design as they apply to assessments (Thompson, Johnstone & Thurlow, 2002). These elements guided PSSA item development.

- **Inclusive Assessment Population**
  The PSSA target population includes all students at the assessed grades attending Commonwealth schools. For state, district, and school accountability purposes, the target population includes every student except those who will participate in accountability through an alternate assessment.
- **Precisely Defined Constructs**
  An important function of well-designed assessments is that they actually measure what they are intended to measure. The Pennsylvania Academic Standards provide clear descriptions of the constructs to be measured by the PSSA at an assessed grade level. Universally designed assessments must remove all non-construct-oriented cognitive, sensory, emotional, and physical barriers.

- **Accessible, Non-biased Items**
  DRC conducted both internal and external reviews of items and test specifications to ensure that they did not create barriers because of lack of sensitivity to disability, culture, or other subgroups. Item and test specifications were developed by a team of individuals who understand the varied characteristics of items that might create difficulties for any group of students. Accessibility is incorporated as a primary dimension of test specifications, so that accessibility was woven into the fabric of the test rather than being added after the fact.

- **Amenable to Accommodations**
  Even though items on universally designed assessments are accessible for most students, there are some students who continue to need accommodations. This essential element of universally designed assessment requires that the test is compatible with accommodations and a variety of widely used adaptive equipment and assistive technology.

- **Simple, Clear, and Intuitive Instructions and Procedures**
  Assessment instructions should be easy to understand, regardless of a student's experience, knowledge, language skills, or current concentration level. Knowledge questions that are posed within complex language can invalidate the test if students cannot understand how they are expected to respond to a question. To meet this guideline, directions and questions were prepared in simple, clear, and understandable language that underwent multiple reviews.

- **Maximum Readability and Comprehensibility**
  A variety of guidelines exist to ensure that text is maximally readable and comprehensible. Readability and comprehensibility are affected by many characteristics, including student background, sentence difficulty, text organization, and others. All of these features were considered as item text was developed.

- Plain language is a concept now being highlighted in research on assessments. Plain language has been defined as language that is straightforward and concise. The following strategies for editing text to produce plain language were used during the editing process of the new PSSA items.
  - Reduce excessive length
  - Use common words (unless necessary in context of the measurement of the item)
  - Avoid ambiguous words
  - Avoid inconsistent naming and graphic conventions
  - Avoid unclear signals about how to direct attention

- **Maximum Legibility**
  Legibility is the physical appearance of text, the way that the shapes of letters and numbers enable people to read text easily. Bias results when tests contain physical features that interfere with a student's focus on or understanding of the constructs that test items are intended to assess. A style guide (DRC, 2004–2008) was used, with PDE approval, that included dimensions of style consistent with Universal Design.

GUIDELINES FOR UNIVERSALLY DESIGNED ITEMS

All test items written and reviewed adhered closely to the following guidelines for Universal Design. Item writers and reviewers used a checklist during the item development process to ensure that each aspect was attended to.

13. **Items measure what they are intended to measure.** Item writing training included ensuring that writers and reviewers had a clear understanding of Pennsylvania's Academic Standards. During all phases of test development, items were presented with content standard information to ensure that each item reflected the intended standard. Careful consideration of the content standards was important in determining which skills involved in responding to an item were extraneous and which were relevant to what was being tested.
14. **Items respect the diversity of the assessment population.** To develop items that avoid content that might unfairly advantage or disadvantage any student subgroup, item writers, test developers, and reviewers were trained to write and review items for issues of bias, fairness, and sensitivity. Training also included an awareness of and sensitivity to issues of cultural and regional diversity.
15. **Items have a clear format for text.** Decisions about how items are presented to students must allow for maximum readability for all students. Appropriate typefaces and sizes were used with minimal use of italics, which is far less legible and is read considerably more slowly than standard typefaces. Captions, footnotes, keys, and legends were at least a 12-point size. Legibility was enhanced by sufficient spacing between letters, words, and lines. Blank space around paragraphs and ragged right margins were used.
16. **Items have concise and readable text.** Linguistic demands of stimuli and items can interfere with a student's ability to demonstrate knowledge of the construct being assessed. During item writing and review, the following guidelines were used.
    - Simple, clear, commonly used words were used whenever possible.
    - Extraneous text was omitted.
    - Vocabulary and sentence complexity were appropriate for the grade level assessed.
    - Technical terms and abbreviations were used only if related to the standard being measured.
    - Definitions and examples were clear and understandable.
    - Idioms were avoided unless idiomatic speech was being assessed.
    - The questions to be answered were clearly identifiable.
17. **Items allow changes to format without changing meaning or difficulty.** A Large Print and a Braille version of the PSSA were available at each assessed grade. Specific accommodations were permitted such as signing to a student, the use of oral presentation under specified conditions, and the use of various assistive technologies.

18. **The test has an overall appearance that is clean and organized.** Text that may not be necessary and may be potentially distracting to students was avoided. Also avoided were purely decorative features that did not serve a purpose. Information was organized in a manner consistent with an academic English framework with a left-right, top-bottom flow.

ITEM DEVELOPMENT

DRC works closely with the Pennsylvania Department of Education to help ensure that PSSA tests comply with nationally recognized Principles of Universal Design. We support the implementation of accommodations on large-scale statewide assessments for students with disabilities. In addition to the Principles of Universal Design as described in the Pennsylvania Technical Report, DRC applies the standards for test accessibility as described in *Tests Access: Making Tests Accessible for Students with Visual Impairments—A Guide for Test Publishers, and State Assessment Personnel* (Allman, 2004). To this end, we embrace the following precepts:

- Test directions are carefully worded to allow for alternate responses to writing prompts.
- During item and bias reviews, test committee members are made aware of the Principles of Universal Design and of issues that may adversely affect students with disabilities with the goal of ensuring that PSSA tests are bias free for all students.
- DRC special education content specialists review items with the goal of ensuring that they are universally designed and accessible.
- With the goal of ensuring that the PSSA tests are accessible to the widest range of diverse student populations, PDE instructs DRC to limit item types that are difficult to format in Braille, and that may become distorted when published in large print. DRC is instructed to limit the following on the PSSA.
  - Unnecessary boxes and framing of text, unless enclosing the text provides necessary context for the student
  - Use of italics (limited to only when it is absolutely necessary).

ITEM FORMATTING

DRC formats PSSA tests to maximize accessibility for all students by using text that is in a point size and font style that is easily readable. We limit spacing and number of items per page so that there is sufficient white space on each page. Whenever possible, we ensure that tables are positioned on the page with the associated test items. We use high contrast for text and background where possible to convey pertinent information. Tests are published on dull-finish paper to avoid the glare encountered on glossy paper. DRC pays close attention to the binding of the PSSA test booklets to ensure that they lie flat for two-page viewing and ease of reading and handling.

DRC ensures consistency across PSSA assessments by following these Principles of Universal Design:

- High contrast and clarity is used to convey detailed information.
- Typically, shading is avoided; when necessary for content purposes, 10% screens are used as the standard.
- Overlaid print is avoided.
- Tables are clearly labeled with titles and with short descriptions where applicable.
- Only relevant information is included in tables.
- Symbols used are meaningful and provide reasonable representations of the topic they depict.

ASSESSMENT ACCOMMODATIONS

While universally designed assessments provide for participation of the widest range of students, many students require accommodations to participate in the regular assessment. The intent of providing accommodations for students is to ensure that they are not unfairly disadvantaged during testing and that the accommodations used during instruction, if appropriate, are made available as students take the test. The literature related to assessment accommodations is still evolving and often focuses on state policies regulating accommodations rather than on providing empirical data that supports the reliability and validity of the use of accommodations. On a yearly basis, the Pennsylvania Department of Education examines accommodations policies and current research to ensure that valid, acceptable accommodations are available for students. An accommodations manual entitled *2008 Accommodations Guidelines for Students with IEPs and Students with 504 Plans* (PDE, January 2008) was developed for use with the 2008 PSSA.

Chapter Five: Field-Test Procedures

PROMPT FIELD-TEST

Field-test forms construction for the writing prompts took place from October through December of 2004, after the Item/Prompt Content Review. All prompts without an "Accepted" status were revised according to committee recommendation and then approved by PDE. DRC designed the field-test format and received PDE approval. Thirty forms, labeled 01–30, were then constructed for each grade, with ten multiple-choice field-test items and one field-test prompt. Grade 11 forms also contained two operational prompts.

Prompt Field-Test Plan: 2005 Standalone Field-Test at Grades 5 and 8

Each student taking the 2005 standalone field-test was administered one writing prompt (along with two short stimulus passages, with five stimulus-based revising and editing multiple-choice items per passage). The writing prompt was administered after the stimulus passage, with multiple-choice items. The standalone field-test yielded enough writing prompts for the development of the spring 2006–2009 operational and breach tests.

Prompt Field-Test Plan: 2005 Embedded Field-Test at Grade 11 (Transition Plan)

The transition plan for grade 11 included the administration of the existing grade 11 writing test in the spring of 2005. This was the last administration of the existing grade 11 writing assessment. In addition, the spring 2005 operational grade 11 writing test included embedded field-test writing prompts (along with embedded stimulus-based multiple-choice items). The embedded field-test yielded enough writing prompts for the development of the spring 2006–2009 operational and breach tests.

Multiple-Choice Field-Test Plan:2006, 2007 and 2008 Embedded Field-Test

For 2006, 2007, and 2008, the writing tests included embedded stimulus-based multiple-choice field-test items. The embedded stimulus-based multiple-choice field-test items provided for the development of one operational form for each subsequent year. The administration was divided into three sections as follows:

- Section one included 5 passages linked to 20 multiple-choice items. Three of these stimulus-based passages were operational; two were matrix (serving as core replenishment items for following administrations). Each passage was linked to 4 multiple-choice items. (approximately 50 minutes)
- Section two included one pre-equated 4-pt. prompt (approximately 60 minutes)
- Section three included one pre-equated 4-pt. prompt (approximately 60 minutes)

Within the matrix replenishment portion of each 2006, 2007, and 2008 test form, each student was administered short, field-test stimulus passages with four field-test stimulus-based revising and editing multiple-choice items per passage. More information on the 2007 embedded field-test process can be found in *Chapter Three: Item/Test Development Process* and *Chapter Six: Operational Forms Construction for 2008*.

STATISTICAL ANALYSIS OF ITEM DATA

All field-tested items were analyzed statistically following conventional item analysis methods. For MC items, traditional or classical item statistics included the corrected point-biserial correlation (Pt. Bis.) for the correct and incorrect responses (distractors), percent correct (P-Value), and the percent responding to incorrect responses. For writing prompts the statistical indices included the item-test correlation, the point-biserial correlation for each score level, percent in each score category or level, and the percent of non-scorable responses.

In general, more capable students are expected to respond correctly to easy items and less capable students are expected to respond incorrectly to difficult items. If either of these situations does *not* occur, the item will be reviewed by DRC test development staff and committees of Pennsylvania educators to determine the nature of the problem and the characteristics of the students affected. The primary way of detecting such conditions is through the point-biserial correlation coefficient for dichotomous (MC) items and the item-total correlation for polytomous writing prompts. In each case the statistic will be positive if the total test mean score is higher for the students who respond correctly to MC items (or attain a higher writing prompt score) and negative when the reverse is true.

Item statistics are used as a means of detecting items that deserve closer scrutiny, rather than being a mechanism for automatic retention or rejection. Toward this end, a set of criteria was used as a screening tool to identify items that needed a closer review by committees of Pennsylvania educators. For a MC item to be flagged, the criteria included any of the following:

- Point-biserial correlation for the correct response of less than 0.25
- Point-biserial correlation for any incorrect response greater than 0.0
- Percent correct less than 30% or greater than 90%
- Percent responding to any incorrect response greater than the percent correct

For a writing prompt to be flagged, the criteria included any of the following:

- Gender DIF code is B-, B+, C-, or C+
- Ethnic DIF code of B- or C-

Item analysis results for 2007 and 2008 embedded multiple-choice-field-test items are presented in Appendices F and H.

DIFFERENTIAL ITEM FUNCTIONING

Differential item functioning (DIF) occurs when two examinees with the same ability level but different group membership do not have the same probability of answering the item correctly. As a statistical concept it can be differentiated from item bias, which is a content issue that can arise when an item presents negative group stereotypes, uses language that is more familiar to one subpopulation than to another, or is presented in a format that disadvantages certain learning styles. While the source of item bias is usually plain to trained judges, DIF may have no clear cause. However, studying how DIF arises and how it presents itself has an effect on how best to detect and correct it.

Limitations of Statistical Detection

No statistical procedure should be used as a substitute for rigorous, hands-on reviews by content and bias specialists. The statistical results can help to organize the review so the effort is concentrated on the most problematic cases; however, no items should be automatically rejected simply because a statistical method flagged them or accepted because they were not flagged.

There have been a variety of methods proposed for detecting DIF, but no one statistic can be considered either necessary or sufficient. Different methods are more or less successful depending on the situation. No analysis can guarantee that a test is free of bias, but almost any thoughtful analysis will uncover the most flagrant problems.

A fundamental shortcoming of all of the statistical methods used in DIF evaluation is that all are intrinsic to the test being evaluated. If a test is unbiased overall but contains one or two DIF items, any method will locate the problems. If, however, all items on the test show consistent DIF to the disadvantage of a given subpopulation, a statistical analysis of the items will not be able to separate DIF effects from true differences in achievement.

Mantel-Haenszel Procedure for Differential Item Functioning

The *Mantel-Haenszel* procedure for detecting differential item functioning is a commonly used technique in educational testing. It does not depend on the application or the fit of any specific measurement model. However, it does have significant philosophical overlap with the Rasch model since it uses total score to organize the analysis.

The procedure as implemented by DRC contrasts a focal group with a reference group. While it makes no practical difference in the analysis which group is defined as the focal group, the group most apt to be disadvantaged by a biased measurement is typically defined as the focal group. In these analyses, the focal group was female for gender-based DIF and black for ethnicity-based DIF; reference groups were male and white, respectively. The Mantel-Haenszel (MH) statistic (Mantel & Haenszel, 1959) for each item is computed from a contingency table. It has two groups (focal and reference) and two outcomes (right or wrong). The ability groups are defined by the core test's score distribution for the total examinee populations.

The basic MH statistic is a single degree of freedom chi-square that compares the observed number in each cell to the expected number. The expected counts are computed to ensure that the analysis is not confounded with differences in the achievement level of the two groups.

For OE items, a comparable statistic is computed based on the standardized mean difference (SMD) (Dorans, Schmitt & Bleistein, 1992), computed as the differences in mean scores for the focal and reference groups if both groups had the same score distribution.

To assist the review committees in interpreting the analyses, the items are assigned a severity code based on the magnitude of the MH statistic. Items classified as A+ or A- have little or no statistical indication of differential item functioning. Items classified as B+ or B- have some indication of DIF and may not require revision. Items classified as C+ or C- have strong evidence of DIF and should be reviewed and revised if they are to be used again. The plus sign indicates that the item favors the focal group and a minus sign indicates that the item favors the reference group.

Counts of the number of items from each grade and content area that were assigned to each severity code are shown below in Table 5–1. DIF analyses were conducted only on field-test items.

Table 5–1. 2008 DIF Summary

Multiple-Choice Male/Female DIF Counts													
2007							2008						
Grade	A	B-	B+	C-	C+	Total	Grade	A	B-	B+	C-	C+	Total
5	64	0	0	0	0	64	**5**	63	1	0	0	0	64
8	58	2	4	0	0	64	**8**	61	1	2	0	0	64
11	60	0	4	0	0	64	**11**	64	0	0	0	0	64

Multiple-Choice White/Black DIF Counts													
2007							2008						
Grade	A	B-	B+	C-	C+	Total	Grade	A	B-	B+	C-	C+	Total
5	51	9	0	4	0	64	**5**	56	7	0	1	0	64
8	41	16	0	7	0	64	**8**	50	13	0	1	0	64
11	37	16	0	11	0	64	**11**	55	5	0	4	0	64

REVIEW OF PROMPTS WITH DATA

In the preceding section on Statistical Analysis of Item Data, it was stated that test development content-area specialists used certain statistics from item (prompt) and DIF analyses of the field test(s) to identify prompts for further review. Specific flagging criteria for this purpose were specified in the section above. Prompts not identified for this review were those that had good statistical characteristics and, consequently, regarded as statistically acceptable. Likewise, prompts of extremely poor statistical quality were easily regarded as unacceptable and needed no further review. However, there were some prompts, relatively few in number, which DRC content-area test development specialists deemed as needing further review by a committee of Pennsylvania educators. The intent was to capture all prompts that needed a closer look; thus the criteria employed tended to over-identify rather than under-identify prompts.

The review of the prompts with data was conducted by subject-area content committees composed of Pennsylvania educators. The review took place on July 11, 2005. In this session committee members were first trained by a DRC Senior Psychometrician, with regard to the statistical indices used in prompt evaluation. This was followed by a discussion with examples concerning reasons that a prompt might be retained regardless of the statistics. The committee review process involved a brief exploration of possible reasons for the statistical profile of a prompt (such as possible bias, grade appropriateness, instructional issues, etc.) and a decision regarding acceptance. DRC content-area test development specialists facilitated the review of the prompts.

REVIEW OF MULTIPLE-CHOICE ITEMS WITH DATA

In the preceding section on Statistical Analysis of Item Data, it was stated that test development content-area specialists used certain statistics from item and DIF analyses of the field-test(s) to identify items for further review. Specific flagging criteria for this purpose were specified in the section above. Items not identified for this review were those that had good statistical characteristics and, consequently, regarded as statistically acceptable. Likewise, items of extremely poor statistical quality were easily regarded as unacceptable and needed no further review. However, there were some items, relatively few in number, which DRC content-area test development specialists deemed as needing further review by a committee of Pennsylvania educators. The intent was to capture all items that needed a closer look; thus the criteria employed tended to over-identify rather than under-identify items.

The review of the items with data was conducted by subject-area content committees composed of Pennsylvania educators and PDE staff. The review took place on July 10, 2007. In this session committee members were first trained by a DRC Senior Psychometrician, with regard to the statistical indices used in item evaluation. This was followed by a discussion with examples concerning reasons that an item might be retained regardless of the statistics. The committee review process involved a brief exploration of possible reasons for the statistical profile of an item (such as possible bias, grade appropriateness, instructional issues, etc.) and a decision regarding acceptance. DRC content-area test development specialists facilitated the review of the items.

Chapter Six: Operational Forms Construction for 2008

FINAL SELECTION OF ITEMS AND 2008 PSSA FORMS CONSTRUCTION

When the final selection of items for the operational 2008 test was ready to begin, the candidate items that emerged from the spring 2005, 2006, and 2007 field tests had undergone multiple reviews, including:

- Reviews by DRC content-area test development specialists and curriculum specialists
- Formal bias, fairness, and sensitivity review by the Bias, Fairness, and Sensitivity Committee consisting of an expert, multi-ethnic group of men and women with members also having expertise with special needs students and English Language Learners
- Formal review by the content committees consisting of Pennsylvania educators
- PDE review
- Item data review by members of the PDE subject-area teacher committees

The end product of the above process was an "item status" designation for each field tested item. All items having an item status code of "Acceptable" were candidates to be selected for the 2007 PSSA. To have an item status code of "Acceptable" meant that the item met the following criteria:

- Appropriately aligned with its Academic Standard
- Acceptable in terms of bias/fairness/sensitivity issues, including differential item functioning (for gender and race)
- Free of major psychometric flaws, including a special review of flagged items

Next, all relevant information regarding the acceptable items was entered into the IVAN system. From the IVAN system, Excel files were created for writing. These files contained all relevant content codes and statistical characteristics. The IVAN system also created for each acceptable item a card displaying the item and all relevant content codes and item statistics for use by the content-area test development specialists and psychometric services staff.

DRC test development specialists reviewed the test design blueprint, including the number of items per content standard. Considerations such as item focus, topic variety, and answer option distribution were also noted.

Psychometricians provided content-area test development specialists with an overview of the psychometric guidelines for forms construction, including guidelines for selecting linking items to link to previous test forms.

Senior DRC content-area test development specialists reviewed all items in the operational pool to make an initial selection for common (core) items (including writing prompts) and matrix items and passages according to test blueprint requirements and psychometric guidelines.

For the common items, this meant that the combination of MC items and writing prompts would tap an appropriate variety of components under the Academic Standards under each Reporting Category. Items were selected in sets combined under the umbrella of a stimulus passage, and were examined with regard to how well they went together as a set. Of particular concern were the following:

- One item providing cues as to the correct answer to another item
- Presence of "clang" (distractors not unique from one another)
- Diversity of names and topics for gender and ethnicity

The first round of items was then evaluated for statistical features such as an acceptable point-biserial correlation and whether the items, as a collection, had a correct answer distribution of approximately 25 percent in each of the four positions. Selected items that were psychometrically problematic resulted in a search by the senior reviewer for suitable replacements. At this point, the second round of items was analyzed. If necessary, this iterative process between content-based selections and statistical properties continued in an effort to reach the best possible balance.

The process for selecting operational matrix (linking) MC items was a little different. The chief consideration was that items in the matrix section of the various forms, together with the common items, would yield a greater overall pool of items from which reliable results could be generated for school-level reporting. Once again the cardinal principle was the selection of an appropriate number of items to properly cover the Academic Standards. The test development specialist's task was to distribute these items so that items assigned to a particular form would go well with one another and reflect the same content and statistical considerations as previously outlined. Additionally, the forms needed to display similar difficulty levels.

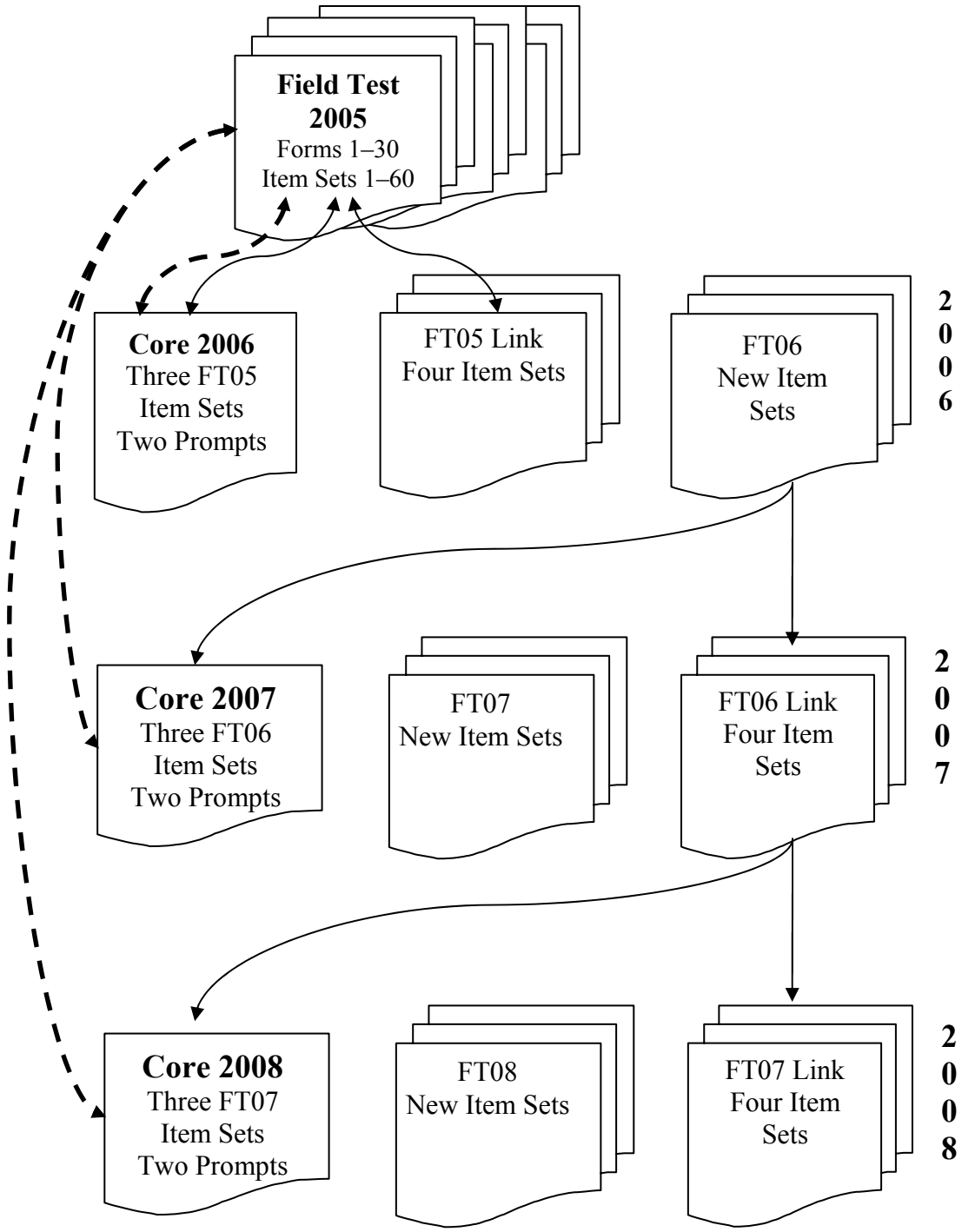
Once the recommendations were finalized for the common/core and matrix items, they were submitted to PDE for review. Department staff provided feedback, which could be in the form of approval or recommendations for replacing certain items. Any item replacement was accomplished by the collective effort of the test development specialists, psychometricians, and PDE staff until final PDE approval.

THE LINKING PROCESS

Year-to-year linking (equating) is accomplished primarily with multiple-choice items moving from field test to matrix. Multiple-choice matrix items are maintained in the same location and the same context as they were used at field test. An alternate route for linking is established through the use of the writing prompts which were field tested in 2005. There are 4 unique designated multiple-choice matrix items per grade appearing on 4 out of the 10 forms for a total of 16 unique matrix (year-to-year linking) items per grade. There are 2 core prompts available for linking per grade.

The following 2 tables illustrate how the linking items connect the assessment across administrations.

Table 6–1. Linking Plan for PSSA Writing from 2005 through 2008



Notes:

19. Solid-line connectors represent links of item sets, each including a passage of four passage-based multiple-choice items.

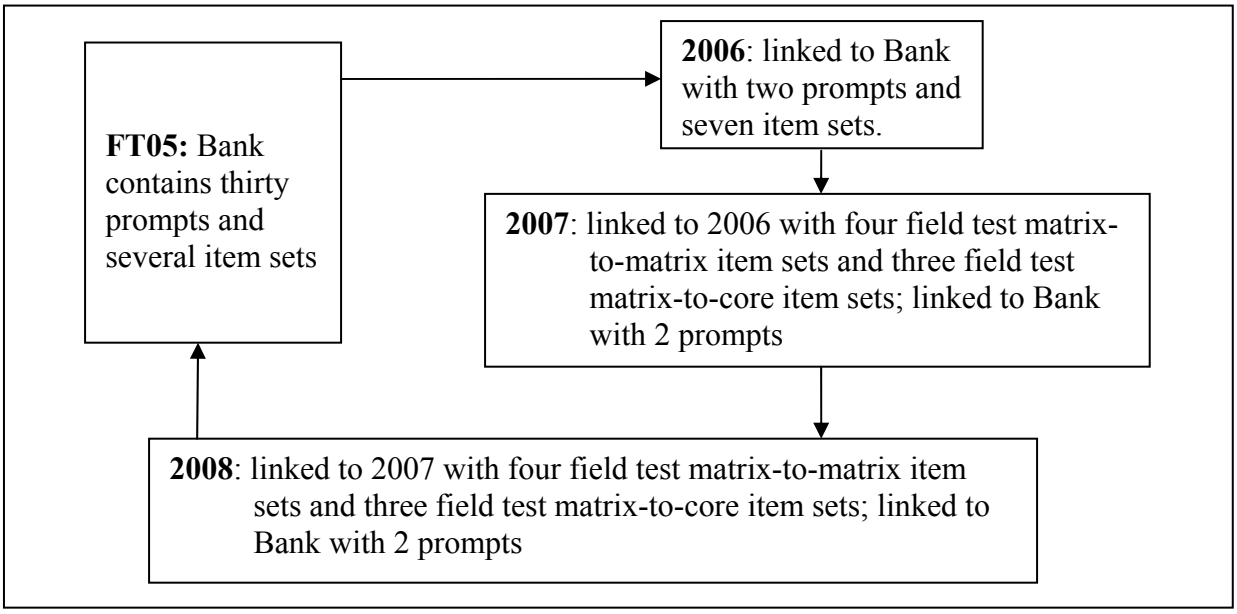
20. Dash-line connectors represent links containing two writing prompts.

21. Horizontal rows represent administrations (years).

22. All years will be linked to FT05 through the prompts, providing an alternate path for year-to-year linking.

23. This design incorporates consistency checks: *Bank→2006→2007→2008→Bank* should sum to zero, statistically. Similarly, 2008 to 2009.

Table 6–2. Linking Plan for PSSA Writing for 2005 through 2008



EMBEDDED FIELD TEST ITEMS

The 2006, 2007, and 2008 PSSA test forms contained common items (identical on all forms) along with matrix/embedded field test items. The common items are a set of "core" items taken by all students. The matrix and field test items are embedded and are unique, in most instances, to a form; however, there are several instances in which a matrix or embedded field test MC item appears on more than one form. There were no open-ended field test items in this administration; both prompts were common across forms. The purpose of administering field test items is to obtain statistics for new items which are then reviewed before becoming operational.

SPECIAL FORMS USED IN THE 2008 PSSA

Braille and Large Print

Students with visual impairments were able to respond to test materials that were available in either **Braille** or **large print**. At each grade level assessed, one form was selected for the creation of a Braille and a large-print edition. School district personnel ordered Braille or large-print assessment materials directly from the Pennsylvania Training and Technical Assistance Network (PaTTAN) in Harrisburg. They could also contact PaTTAN for technical assistance regarding students with visual impairments.

School personnel were directed to transcribe all student answers (MC and WP) into scannable answer documents exactly as the student responded. No alterations or corrections of student work were permitted, and the answer document had to have the identical form designation.

Instructions for the appropriate use of these special forms are detailed in the *2008 Accommodations Guidelines for Students with IEPs and Students with 504 Plans* (PDE, January 2008) available on the PDE website at www.pde.state.us.

Chapter Seven: Test Administration Procedures

TEST SESSIONS, TIMING, AND LAYOUT

The test window for the 2008 operational assessment was from February 11 through February 22, 2008, including make-ups. The assessment consisted of three sections. Additional information concerning testing time and test layouts can be found in Chapter Three.Chapter Seven: Test Administration Procedures

SHIPPING, PACKAGING, AND DELIVERY OF MATERIALS

There were two shipments sent out by Data Recognition Corporation (DRC). Shipment one was delivered by January 14, 2008, and contained the *Handbook for Assessment Coordinators and Administrators* and the *Directions for Administration Manuals* for each grade tested at a school. Shipment two was delivered by January 28, 2008, and contained the Spanish-translation *Directions for Administration Manuals*, administrative materials (e.g., return shipping labels, District/School Labels, Do Not Score Labels, and Student Precode Labels) and secure materials (e.g., test booklets and answer booklets). DRC ensured that all assessment materials were assembled correctly prior to shipping. DRC Operations staff used the automated Operations Materials Management System (Ops MMS) to assign secure materials to a district at the time of ship out. This system used barcode technology to provide an automated quality check between items requested for a site and items shipped to a site. A shipment box manifest was produced for and placed in each box shipped. DRC Operations staff double-checked all box contents with the box manifest prior to the box being sealed for shipment to ensure accurate delivery of materials. DRC Operations staff performed lot acceptance sampling on both shipments. Districts and schools were selected at random and examined for correct and complete packaging and labeling. This sampling represented a minimum of 10 percent of all shipping sites.

DRC's materials management system, along with the systems of shippers, allowed DRC to track the items from the point of shipment from DRC's warehouse facility to receipt at the district, school, or testing site. All DRC shipping facilities, materials processing facilities, and storage facilities are secure. Access is restricted by security code. Non-DRC personnel are escorted by a DRC employee at all times. Only DRC inventory control personnel have access to stored secure materials. DRC employees are trained in and made aware of the high level of security that is required.

The assessments for grades 5, 8, and 11 were shipped together. DRC packed 510,323 assessment booklets, approximately 59,918 manuals, and 53,889 non-secure materials for 3,002 testing sites. DRC used UPS to deliver materials to the testing sites.

MATERIALS RETURN

The materials return window was February 27–March 27, 2008. DRC used UPS for all returns.

TEST SECURITY MEASURES

Test security is essential to obtaining reliable and valid scores for accountability purposes. The 2008 PSSA included a Test Security Affidavit that was to be signed and returned by every principal or director where testing materials were shipped. DRC received 2,969 signed Test Security Affidavits of the 3,002 affidavits sent to the testing sites participating in the 2008

Writing PSSA. The purpose of the affidavit was to serve as a tool to document that the individuals responsible for administering the assessments both understood and acknowledged the importance of test security and accountability. The Test Security Affidavit attested that all security measures were followed concerning the handling of secure materials. Some of the security measures included:

- The contents of the test were not discussed, disseminated, described, or otherwise revealed to anyone.
- The contents of the test were not kept, copied, or reproduced.
- All booklets were kept in a locked, secure storage area at both the district and school levels.

SAMPLE MANUALS

Copies of the *Handbook for Assessment Coordinators and Administrators* and the *Directions for Administration Manuals* can be found on the Pennsylvania Department of Education website at www.pde.state.pa.us.

ASSESSMENT ACCOMMODATIONS

An accommodations manual entitled *2008 Accommodations Guidelines for Students with IEPs and Students with 504 Plans* (PDE, January 2008) was developed for use with the 2008 PSSA. Additional information regarding assessment accommodations can be found in Chapter Four of this report.

Chapter Eight: Processing and Scoring

RECEIPT OF MATERIALS

Receipt of PSSA writing materials began on February 28, 2008, and concluded on March 29, 2008. DRC's Operations Material Management System (Ops MMS) was utilized to receive secure materials securely, accurately, and efficiently. This system features advanced automation and cutting-edge barcode scanners. Captured data were organized into reports, which provided timely information with respect to suspected missing material.

The first step in the Ops MMS was the Box Receipt System. When a shipment arrived at DRC, the boxes were removed from the carrier's truck and passed under a barcode reader, which read the barcode contained on the return label and identified the district and school. If the label could not be read automatically, a floor operator entered the information into the system manually. The data collected in this process were stored in the Ops MMS database. After the barcode data were captured, the boxes were placed on a pallet and assigned a corresponding pallet number. A "three way match" among the district box count, the carrier box count, and the DRC return box count was conducted to verify a box return accuracy rate of 100%.

Once the box receipt process was completed, the materials separation phase began. Warehouse personnel opened the district boxes and sorted the contents by grade and status (used/unused) into new boxes. Once filled, a sorted box's documents were loaded into an automated counter, which recorded a booklet count for each box. An on-demand DRC box label was produced that contained a description of each box's contents and quantity in both barcode and human-readable format. This count remained correlated to the box as an essential quality control step throughout secure booklet processing and provided a target number for all steps of the check-in process.

Once labeled, the sorted and counted boxes proceeded to booklet check-in. This system used streamfeeder automation to carry documents past oscillating scanners that captured data from up to two representative barcodes and stored it in the Ops MMS database.

- The secure booklet check-in operator used a hand scanner to scan the counted box label. This procedure input material type and quantity parameters for what the Ops MMS should expect within a box. It then loaded the box's contents into the streamfeeder.
- The documents were fed past oscillating scanners that captured either a security code or both a security code and a pre-code, depending upon material type. A human operator monitored an Ops MMS screen, which displayed scan errors, an ordered accounting of what was successfully scanned, and the document count for each box.
- When all materials were scanned and the correct document count was reached, the box was sealed and placed on a pallet. If the correct document count was not reached, or if the operator encountered difficulties with material scanning, the box and its contents were delivered to an exception handling station for resolution.

This check-in process occurred immediately upon receipt of materials; therefore, DRC provided immediate feedback to districts and schools regarding any missing materials based on actual receipts versus expected receipts.

Upon completion of secure booklet check-in, DRC produced a Missing Materials Report that listed all schools in each participating district and the number of booklets, by grade, for each school that were not returned to DRC.

After scannable materials were processed through Book Receipt, the materials became available to the DRC Document Processing Center Log-in staff for document log-in. Based on a pre-determined sampling and calibration plan, the staff prioritized answer documents using the following process:

- A DRC scannable barcode batch header was scanned, and a batch number was assigned to each box of answer documents.
- The DRC box label barcode was scanned into the system to link the box and writing documents to the newly created batch and to create a Batch Control Sheet.
- The DRC box label barcode number, along with the number of writing documents in the box, was printed on the Batch Control Sheet for document tracking purposes. All documents that were linked to the box barcode were assigned to the batch number and tracked through all processing steps. As documents were processed, DRC staff dated and initialed the Batch Control Sheet to indicate that proper processing and controls were observed.
- Before the answer documents were scanned, all batches went through a quality inspection to ensure batch integrity and correct document placement.

After a quality check in the DRC Document Processing Log-in area, the spines were cut off the scannable documents, and the pages were sent to DRC's Imaging and Scoring System.

SCANNING OF MATERIALS

DRC used its image scanning system to capture constructed-response items as images. These were then loaded into the image scoring system for both the handscoring of constructed-response items and for the capture of multiple-choice and demographic data.

DRC's image scanners were calibrated using a standard deck of scannable pages with 16 known levels of gray. On a predefined page location, the average pixel darkness was compared to the standard calibration to determine the level of gray. Marks with an average darkness level of 4 or above on a scale of 16 (0 through F) were determined to be valid responses, per industry standard. If multiple marks were read for a single item and the difference of the grayscale reads was greater than four levels, the lighter mark was discarded. If the multiple marks had fewer than four levels of grayscale difference, the response was flagged systematically and forwarded to an editor for resolution.

Customized scanning programs for all scannable documents were prepared to read the writing documents and to electronically format the scanned information. Before materials arrived, all image scanning programs went through a quality review process that included scanning of mock data from production booklets to ensure proper data collection.

- DRC's image scanners read selected-response, demographic, and identification information. The image scanners also used barcode readers to read pre-printed barcodes from a label on the booklet.
- The scannable documents were automatically fed into the image scanners where pre-defined processing criteria determined which fields were to be captured electronically. Constructed-response images were separated out for image-based scoring.
- During scanning, a unique serial number was printed on each sheet of paper. This serial number was used for document integrity and to maintain sequencing within a batch of writing documents.
- A monitor randomly displayed images, and the human operator adjusted or cleaned the scanner when the scanned image did not meet DRC's strict quality standards for image clarity.
- All images passed through a process and a software clean-up program that despeckled, deskewed, and desmeared the images. A random sample of images was reviewed for image quality approval. If any document failed to meet image quality standards, the document was returned for rescanning.
- Page scan verification was performed to ensure that all pre-defined portions of the answer documents were represented in their entirety in the image files. If a page was missing, the entire writing document was flagged for resolution.

After each batch was scanned, writing documents were processed through a computer-based edit program to detect potential errors as a result of smudges, multiple marks, and omits in predetermined fields. Marks that did not meet the pre-defined editing standards were routed to editors for resolution.

- Experienced DRC Document Processing Center Editing staff reviewed all potential errors detected during scanning and made necessary corrections to the data file. The imaging system displayed each suspected error. The editing staff then inspected the image and made any needed corrections using the unique serial number printed on the document during scanning.
- Upon completion of editing, quality control reports were run to ensure that all detected potential errors were reviewed again and a final disposition was determined.

Before batches of writing documents were extracted for scoring, a final edit was performed to ensure that all requirements for final processing were met. If a batch contained errors, it was flagged for further review before being extracted for scoring and reporting.

- During this processing step, the actual number of documents scanned was compared to the number of writing documents assigned to the box during book receipt. Count discrepancies between book receipt and writing documents scanned were resolved at this time.
- Once all requirements for final processing were met, the batch was released for scoring and student level processing.

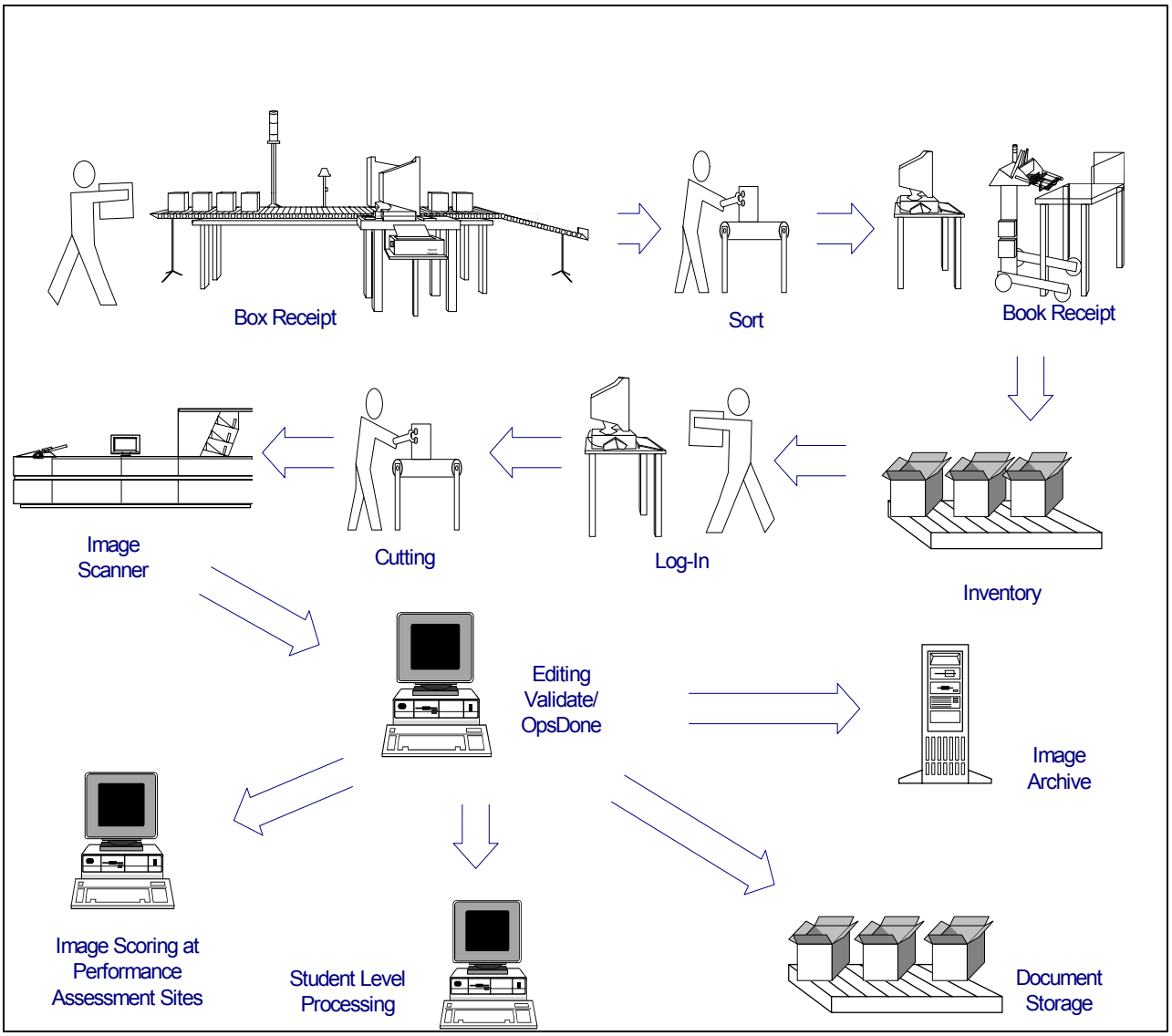
Table 8–1 shows the number of writing booklets received through booklet check-in and the number of booklets that contained student responses that were scanned and scored.

Table 8–1. Counts of 2007 PSSA Writing Materials Received – Grades 5, 8, and 11

	Writing Booklets Received	Used Writing Booklets Scanned
Grade 5	166,613	133,185
Grade 8	174,262	145,968
Grade 11	168,736	141,875

Figure 8–1 illustrates the production workflow for DRC's Ops MMS and Image Scanning and Scoring System from receipt of materials through all processing of materials and the presentation of scanned images for scoring.

Figure 8–1. Workflow System



MATERIALS STORAGE

Upon completion of processing, student writing booklets are boxed for security purposes and final storage:

- Project-specific box labels were created containing unique customer and project information, materials type, batch number, pallet/box number, and the number of boxes for a given batch.
- Boxes were stacked on project-specific pallets that were labeled with a list of its contents and delivered to the Materials Distribution Center for final secure storage.
- Materials will be destroyed one year after contract year ends with PDE written approval.

SCORING MULTIPLE-CHOICE ITEMS

The scoring process included the scoring of multiple-choice items against the answer key and the aggregation of raw scores from the constructed responses. A student's raw score is the actual number of points achieved by the student for tested elements of an assessment. From the raw scores, the scale scores were calculated.

The student file was scored against the finalized and approved multiple-choice answer key. Items were scored as right, wrong, omitted, or double-gridded (more than one answer was bubbled for an item). Sections of the test were evaluated as a whole and an attempt status was determined for each student. The score program defined all data elements at the student level for reporting.

RANGEFINDING

After student answer documents were received and processed, DRC's Performance Assessment Services (PAS) staff began to assemble groups of responses that exemplified the different score points represented in the mode-specific and conventions scoring guidelines. This was done for both the common narrative and persuasive prompts in grade 5 and the common persuasive and informational prompts in grades 8 and 11. The 2008 operational prompts were selected from the 2005 field test.

Once examples for all the score points were identified, sets of items were put together by mode. These sets were copied for use at rangefinding, held March 11-12, 2008 at the Hilton, Harrisburg, Pennsylvania. The rangefinding committees consisted of Pennsylvania educators, PDE staff members, DRC Test Development staff, and DRC Performance Assessment Services staff.

After an introductory general session, committees broke into grade level groups. Copies of the student example sets were presented to the committees by mode. The committees reviewed and scored the student samples together to ensure that everyone was interpreting the scoring guidelines consistently. Committee members then went on to score responses independently and those scores were discussed until a consensus was reached. Only responses for which a good agreement rate was attained were used in training the readers. Discussions of the responses used the language of the scoring guidelines, assuring PDE and all involved that the score point examples clearly illustrated the specific requirements of each score level. DRC PAS staff made

notes of how and why the committees arrived at score point decisions, and this information was used by the individual scoring directors in reader training.

READER RECRUITMENT/QUALIFICATIONS

DRC retains a number of experienced readers from year to year, and those readers made up approximately 60% of the reader pool (N=200) for 2008. To complete the reader staff for this project, DRC placed advertisements in local papers, minority publications, teacher newsletters, regional colleges, and universities. Open houses were held and applications for reader positions were screened by the DRC recruiting staff. Candidates were personally interviewed and a mandatory, on-demand writing sample was collected, along with references and proof of a four-year college degree. In this screening process, preference was given to candidates with previous experience scoring large-scale assessments and with degrees emphasizing expertise in writing. Since readers had to have a strong content-specific background, the reader pool consisted of educators, writers, editors, and other professionals who were valued for their experience, but who were also required to set aside their own biases about student performance and accept the scoring standards. All readers on this assessment held at least a four-year degree.

LEADERSHIP RECRUITMENT/QUALIFICATIONS

Scoring directors and team leaders were chosen by the project director from a pool consisting of experienced individuals who had proved to be successful readers and leaders on previous DRC contracts. Selectees had strong backgrounds in both scoring and writing and demonstrated organization, leadership, and management skills. The scoring directors and a majority of the team leaders had at least five years of leadership experience on the PSSA. All scoring directors, team leaders, and readers were required to sign confidentiality forms before any training or handling of secure materials began.

Each room of readers was assigned a scoring director. This individual was monitored by the project content coordinator and led the hand scoring for the duration of the project. The scoring director assisted in rangefinding, worked with supervisors to create training materials, conducted the team leader training, and was responsible for training the readers. The scoring director also made sure that reports were available and interpreted reports for the readers. The scoring director supervised the team leaders.

Team leaders assisted the scoring director with reader training and monitoring by working with their teams in small group discussions and answering individual questions that readers may not have felt comfortable asking in a large group. Once readers had qualified, the team leaders were responsible for maintaining the accuracy and workload of team members. The ongoing monitoring identified those readers who were having difficulty with scoring accurately and resulted in the reader receiving one-on-one retraining or in pairing that reader with a stronger reader. This process corrected any inaccuracies in scoring and, if not, that reader was released from the project.

TRAINING

After rangefinding was completed, DRC's PAS staff compiled the scoring guidelines and the scored student examples from the committees into packets used for training the readers.

Responses that were relevant in terms of the scoring concepts they illustrated were annotated for use in a scoring guide. The scoring guide for each mode served as the reader's constant reference. Readers were instructed how to apply the guidelines and were required to demonstrate a clear comprehension of each Academic Standard set by performing well on the training materials that were presented for each grade and mode. Training and qualifying sets consisted entirely of examples of student responses chosen by the rangefinding committee.

Team leaders assisted the scoring directors with the training and monitoring of readers. The scoring director conducted the team leader training before the reader training. This training followed the same procedures as the reader training, but qualifying standards were more stringent because of the responsibilities required of the team leaders. During team leader training, all materials were reviewed and discussed and anticipated reader questions and concerns were addressed. Team leaders were required to annotate all of their training responses with the official annotations received from the content committee members at the rangefinding meetings. To facilitate scoring consistency, it was imperative that each team leader imparted the same rationale for each response that other team leaders used. Once the team leaders qualified, leadership responsibilities were reviewed and team assignments were given. A ratio of one team leader for each group of 8–10 readers ensured adequate monitoring of the readers.

Reader training began with the scoring director providing an intensive review of the scoring guides and anchor papers to all readers. Next, the readers "practiced" by independently scoring the responses in the training sets. Afterwards, the scoring director and team leaders led a thorough discussion of each set, in either a small group or room-wide setting.

Once the scoring guides and all the training sets were discussed, readers were required to apply the scoring criteria by qualifying (i.e., scoring with acceptable agreement to the "true" scores) on at least one of the qualifying sets. Readers who failed to achieve the level of agreement determined by PDE were given additional training to acquire the highest degree of accuracy possible. Readers who did not perform at the required level of agreement by the end of the qualifying process were not allowed to score "live" student work and were released from the project.

HANDSCORING PROCESS

Student responses were scored independently and by multiple readers. All essays, grades 5, 8, and 11, were read once with 10% scored twice to ensure reliability. PDE determined the required number of reads.

Readers scored the imaged student responses on PC monitors at the DRC Scoring Center in Woodbury, Minnesota. Readers were seated at tables with two imaging stations at each table. Image distribution was controlled, thus ensuring that they were sent to designated groups of readers qualified to score those prompts. Imaged student responses were electronically separated for routing to individual readers by prompt, and readers were only provided with student responses for which they were qualified to score. Readers read each response and keyed in the scores. Alerts and non-score mismatches were routed to the scoring director or team leaders for electronic review and resolution.

Upon completion of operational scoring, 19,444 grade 11 students fell within the 15 point rescore indicator. The essays of these students were each read again with 10% scored twice to ensure reliability. PDE determined the point rescore indicator and required number of reads.

QUALITY CONTROL

Reader accuracy was monitored throughout the scoring session by producing both daily and on-demand reports, ensuring that an acceptable level of scoring accuracy was maintained. Inter-reader reliability was tracked and monitored with multiple quality control reports that were reviewed by quality assurance analysts. These reports were generated at the handscoring center and were reviewed by the scoring directors, team leaders, project coordinators, and project directors. The following reports were used in scoring the 2008 writing portion of the PSSA:

- **The Reader Monitor Report** monitored how often readers were in exact agreement and ensured that an acceptable agreement rate was maintained. This report provided daily and cumulative exact and adjacent inter-reader agreement and the percentage of responses requiring resolution. (see Table 8–2)
- **The Score Point Distribution Report** monitored the percentage of responses given each of the score points. For example, this daily and cumulative report showed how many 0s, 1s, 2s, 3s, and 4s a reader had given to all the responses he or she had scored at the time the report was produced. It also indicated the number of responses read by each reader so that production rates could be monitored.
- **The Item Status Report** monitored the progress of handscoring. This report tracked each response and indicated the status (e.g., "needs second reading," "complete"). This report ensured that all discrepancies were resolved by the end of the project.
- **The Response Read by Reader Report** identified all responses scored by an individual reader. This report was useful if any responses needed rescoring because of reader drift.
- **The Read-Behind Log** was used by the team leader/scoring director to monitor reader reliability. Student responses were randomly selected and team leaders read scored items from each team member. If the team leader disagreed with the reader's score, remediation occurred. This proved to be a very effective type of feedback because it was done with "live" items scored by a particular reader.
- **Validity Reports** tracked how the readers performed by comparing pre-determined scored responses to readers' scores for the same set of responses. If the readers fell outside of a determined percentage of agreement, remediation occured and additional validity responses were given to individuals who needed to be monitored more closely.

Recalibration sets were used throughout the scoring sessions to monitor scoring by comparing each reader's scores with the true scores and to refocus readers on Pennsylvania scoring standards. This check made sure there was no change in the scoring pattern as the project progressed. Readers failing to achieve a certain percent of agreement with the recalibration true scores were given additional training to achieve the highest degree of accuracy possible. Readers who were unable to recalibrate were released from the project. The procedure for creating and reading recalibration sets was similar to the one used for the training sets.

To handle possible alert papers (i.e., student responses indicating potential issues related to the student's safety and well-being that may require attention at the state or local level), the imaging system allowed readers to forward responses needing attention to the scoring director. These alerts were reviewed by the project director, who then notified PDE of this occurrence. However, PDE did not receive the student's responses or any other identifying information on that student. Also, at no time did the reader have access to information about the student's identity.

Table 8–2 shows the exact and adjacent agreement rates of the readers for the writing essays in grades 5, 8, and 11.

Table 8–2 Inter-rater Agreement for 2008 Grades 5, 8, & 11 Writing

		Composition			Revising and Editing		
Grade	Prompt	% Exact Agreement	% Adjacent Agreement	% Exact + Adjacent	% Exact Agreement	% Adjacent Agreement	% Exact + Adjacent
5	1	76	24	100	73	27	100
	2	76	24	100	72	28	100
8	1	78	22	100	74	26	100
	2	76	24	100	73	27	100
11	1	80	20	100	76	24	100
	2	78	22	100	75	25	100

Table 8-3 shows the percentages awarded for each possible score point. All prompts are scored with a 1-4 score point range for both Composition and for Revising and Editing.

Table 8–3 Percentages by Score Point for 2008 Grades 5, 8, & 11 Writing

		Composition					Revising and Editing				
Grade	Prompt	% 1	% 2	% 3	%4	%NS/ NT*	% 1	% 2	% 3	%4	%NS/ NT*
5	1	3	40	49	7	1	4	30	57	8	1
	2	3	36	53	7	1	4	31	57	7	1
8	1	2	29	61	6	1	3	28	60	7	1
	2	2	34	55	7	2	3	29	59	7	2
11	1	1	21	65	10	3	2	20	65	11	3
	2	3	30	55	8	4	3	27	58	9	4

* Denotes non-scorable and not taken

MATCH-BACK RULES

In order to create a single student record in the central student file, it was necessary to establish match-back rules to combine separate student records into one student record. Match-back rules were applied to link multiple-choice and constructed responses. They were also used to merge student responses captured on different subjects and to link test results with student demographic information.

DATA EXCHANGE, STORAGE, AND RECOVERY POLICIES

Data Exchange Procedures

The exchange of data between DRC, PDE, and other contractors is a critical and essential component in the success of the PSSA program. To support this process, DRC used the following data exchange procedures to ensure that all data files were successfully and accurately transferred.

- Files were posted to DRC's secure Pennsylvania FTP site with a standard and logical folder structure.
- Standard file naming conventions were established and used.
- The information necessary to perform these quality control procedures accompanied each data exchange.

Data Exchange Quality Control Procedures

- ***Record Count Check –*** Confirm the expected record count and provide the record count in files sent and received.
- ***File Count Check–*** Confirm that the number of files sent and received matches the number of files expected.
- ***Duplicate File Check –*** Verify that duplicate files were not sent or received.
- ***File Date*** – Verify that the version of the file received matches the file creation date.
- ***File Type Verification Check –*** Verify that data sent and received matches the format expected (e.g., Excel, CSV, PDF, Text file [delimited/fixed field length]).
- ***File Log –*** A log of files sent and received will be maintained.
- ***Data Validation –*** Data checking procedures will be used to verify that the data is in the specified file layout and matches the expected values.

Images

As part of the scanning process, the multi-page TIFF images were archived to tape before being separated into single page TIFFs and transmitted to the scoring centers. If any of the images were lost/deleted/corrupted at a scoring center, they could be restored from the archived multi-page TIFF images. In addition to archiving the images, the scoring center servers used RAID (Redundant Array of Independent Disks) 5 disk management technology to mirror the images to

redundant disk drives. If a disk drive failed in a scoring center server, the images could be quickly restored from the redundant disk drive. In the event that the disk drive and the multi-page TIFF images could not be restored, the original documents would be rescanned. Images are stored for a PDE specified period.

Data

Once a reader submitted a score for a constructed-response item, the data was electronically transmitted to our SQL Servers. The log files documenting the changes were backed up hourly. Full back-ups were done nightly (Monday–Friday) and two additional full back-ups were run over the weekend on the handscoring SQL Servers with the backup tapes being rotated off-site. All data is stored for a PDE-specified period.

Storage

All physical servers are housed in secure server rooms in DRC's corporate headquarters in Maple Grove, or the Brooklyn Park or Woodbury locations. The server rooms are constructed of concrete floors, walls, and ceilings and designed to be fire and crush proof. They have fire suppression systems to minimize the effect of any fire started within the server room. Access to the server rooms is controlled through a card access system and is restricted to authorized technology support staff only. A log is maintained documenting each time a server room is entered, by whom, and for what purpose. In case of a disaster at any of the locations, another server can take over full operations.

DRC maintains backup servers that can be used to replace a failed server within 24 hours. Every server's configuration is documented in the event a rebuild is required. Each server has an assigned primary and secondary network analyst responsible for its operation.

The servers utilize load-sharing, redundant power supplies and implement RAID subsystems to minimize the effect of a failed disk. The server rooms all have Uninterruptible Power Supply (UPS) systems. For longer periods of power failure, an on-site diesel power generate will automatically start and supply needed power. The computing environment, both servers and communications hardware, will continue to function without interruption when the utility power is disrupted.

Two copies of complete system and data backup are created each weekend. One of these copies is stored in a secure room at the Maple Grove location. The second copy is stored in a secure room at the Woodbury location. These backups are stored indefinitely. Incremental backups of all files on the network are made each day. The incremental backups are kept for 6 weeks.

DRC utilizes a storage area network (SAN) for maximum speed, flexibility, and redundancy in our data storage solution. Servers are connected to the SAN via redundant connections to ensure minimum interruptions due to hardware failures. The SAN allows disk space to be reallocated with ease for availability to those applications or servers as needed. The SAN currently houses 13 Terabytes of storage and is expandable to 26 Terabytes.

Chapter Nine: Summary Demographic, Program, and Accommodation Data for the 2008 Writing PSSA

ASSESSED STUDENTS

The total number of answer documents processed by grade level for the 2008 Writing PSSA is presented on the first line of Table 9-1. This number pertains to the total number of records on the student file and is typically less than the "Used Answer Booklets Scanned" column shown in Table 8-1. The reason for the difference is that completely blank answer booklets (no student name and no items responded to) get removed from the initial batch of materials scanned. See Chapter 8 for more details on processing. The second line shows the number and percent of students with a PSSA writing score, followed by the number and percent not receiving a score. The final line gives the number of students contributing to state summary statistics, which is especially relevant for all tables following 9-2. (See the section of this chapter entitled, "Composition of Sample Used in Subsequent Tables" for additional explanation.)

Assessed students include those from public schools who are required to participate as well as those from a small number of non-public schools (numbering fewer than 500 per grade level) that elected to participate. Also included were home-schooled students, which numbered fewer than 100 per grade.

As may be observed from Table 9–1, not all students were assessed. Although there are a variety of reasons for this, the major ones pertain to

1. extended absence from school that continued beyond the assessment window

2. being absent without make-up for at least one section of the writing assessment

3. a situation in which there was a non-attempt (failed to meet the criteria of having attempted one of more sections of the writing test) on the part of the student and no exclusion code was marked by school personnel.

4. ELL students in the first year in U.S. schools

5. medical emergency

6. other reasons (includes parental request due to religious reasons, students who are court-agency placed, students with multiple reasons coded, and the category of "other").

The number of students without scores for these reasons is presented in Table 9-2.

Students in an assessed grade who met <u>each</u> of the following criteria were excused from the PSSA and should have participated in an alternate writing assessment provided by the school entity:

1. had a significant cognitive disability,

2. required intensive instruction,

3. required adaptation and support to perform or participate meaningfully,

4. required substantial modification of the general education curriculum,

5. participation in the general education curriculum differed markedly in form and substance from that of other students (see *2008 PSSA Handbook for Assessment Coordinators and Administrators: Grades 5, 8, and 11 Writing, PDE, 2008, p.7*).

A student must have completed five or more multiple-choice items and responded to both writing prompts to be considered attempted.

Table 9–1. Students Assessed on the 2008 Writing PSSA

	Grade 5		Grade 8		Grade 11	
	N	Pct	N	Pct	N	Pct
Number of answer documents processed	129,590		141,634		140,125	
Students with a writing score	127,261	98.2	138,269	97.6	134,069	95.7
Number processed but not assessed (without a score)	2,329	1.8	3,365	2.4	6,056	4.3
Students with writing scores used in state summaries	125,547		136,417		132,349	

Table 9–2. Counts of Students without Scores on the 2008 Writing PSSA

Reason for Non-Assessment	Grade 5		Grade 8		Grade 11	
	N	Pct	N	Pct	N	Pct
Extended Absence from School	168	7.2	545	16.2	1,480	24.4
Absent Without Make-up	394	16.9	748	22.2	1,309	21.6
Non-Attempt Writing	1,462	62.8	1,630	48.4	2,394	39.5
ELL in First Year in U.S. Schools	113	4.8	58	1.7	40	0.7
Medical Emergency	82	3.5	111	3.3	205	3.4
Other Reasons	110	4.7	273	8.1	628	10.4
Total Count Not Assessed	2,329		3,365		6,056	

COMPOSITION OF SAMPLE USED IN SUBSEQUENT TABLES

Students included in the following demographic analyses were those who contributed to state summary statistics, using the individual student data file of June 4, 2008. Consequently, these results may not reflect some data used in subsequent updates. Students not included in the present data were those who (1) enrolled in a Pennsylvania school after October 1, 2007, (2) were coded as ELL and enrolled after March 23, 2007, or (3) were home schooled.

Because some student file updates may occur subsequent to these analyses, there could be small differences in the counts along with slight percentage differences.

COLLECTION OF STUDENT DEMOGRAPHIC INFORMATION

Data for analyses involving demographic characteristics were obtained primarily from information initially supplied by school district personnel through the Pennsylvania Information Management System (PIMS) and subsequently transmitted to DRC. Later corrections and updates of demographic and attribution (for AYP) data were carried out through the DRC Student Precode and Corrections System. Some data such as accommodation information is marked directly on the student answer document at the time the PSSA is administered.

DEMOGRAPHIC CHARACTERISTICS

Frequency data for each category is presented in Table 9–3. Percentages are based on students with a score in writing as shown at the bottom of the table.

Table 9–3. Demographic Characteristics of 2008 Writing PSSA

Demographic or Educational Characteristic	Grade 5		Grade 8		Grade 11	
	N	Pct	N	Pct	N	Pct
Gender						
Female	61,935	49.3	66,403	48.7	65,780	49.7
Male	63,492	50.6	70,807	51.2	66,325	50.1
Race/Ethnicity						
American Indian or Alaskan Native	191	0.2	257	0.2	212	0.2
Asian or Pacific Islander	3,568	2.8	3,496	2.6	3,263	2.5
Black/African American non-Hispanic	19,402	15.5	20,782	15.2	15,754	11.9
Latino/Hispanic	8,737	7.0	8,709	6.4	6,297	4.8
White non-Hispanic	92,731	73.9	102,264	75.0	105,596	80.1
Multi-Racial/Ethnic	775	0.6	681	0.5	552	0.4
Educational Category and Other Demographic Groups						
	N	Pct	N	Pct	N	Pct
IEP (not gifted)	19,804	15.8	20,707	15.2	17,333	13.1
Student exited IEP in last 2 years	1,474	1.2	766	0.6	324	0.2
Gifted and has an IEP	6,137	4.8	7,852	5.7	7,171	5.4
504 Plan / Chapter 15	1,408	1.1	1,459	1.1	1,264	0.9
Title I	37,120	29.6	25,583	18.8	15,719	11.9
Title III - Served	2,172	1.7	1,603	1.2	928	0.7
Title III - Not Served	376	0.3	265	0.2	258	0.2
Migrant Student	107	0.1	83	0.1	63	0.1
ELL (enrolled after 3-23-07)	0	0.0	0	0.0	0	0.0
ELL (enrolled before 3-23-07)	2,548	2.0	1,868	1.4	1,186	0.9
Exited ESL/bilingual program – 1 yr	513	0.4	331	0.2	184	0.1
Exited ESL/bilingual program – 2 yr	662	0.5	530	0.4	304	0.2
Former ELL no longer monitored	955	0.8	1,228	0.9	808	0.6
Foreign Exchange Student	6	0.0	6	0.0	98	0.1
Economically Disadvantaged	45,884	36.5	45,805	33.6	32,041	24.3

Table 9–3 (continued). Demographic Characteristics of 2008 Writing PSSA

Enrollment	Grade 5		Grade 8		Grade 11	
	N	Pct	N	Pct	N	Pct
Current Enrollment in school of residence after Oct 1, 2007	3,198	2.5	3,188	2.3	4,022	3.0
Current Enrollment in district of residence after Oct 1, 2007	1,431	1.1	1,733	1.3	1,546	1.2
Current Enrollment as PA resident after Oct 1, 2007	0	0.0	0	0.0	0	0.0
Enrolled in school of residence after Oct 1, 2006 but on/before Oct 1, 2007	29,052	23.1	26,393	19.3	21,242	16.0
Enrolled in district of residence after Oct 1, 2006 but on/before Oct 1, 2007	14,014	11.2	15,207	11.1	13,562	10.2
Homeless as defined by McKinney-Vento Act	214	0.2	210	0.2	116	0.1
School Choice Provision	121	0.1	190	0.1	50	0.0
Total Number Scored	125,547		136,417		132,349	

EDUCATION IN NON-TRADITIONAL SETTINGS

For each category the number and percent are presented for all students with a score in writing. Table 9–4 reveals an incidence of less than one percent for the majority of these settings. Also shown are home schooled students assessed by parental request.

Table 9–4. Participation in 2008 Writing PSSA by Students in Non-Traditional Settings

Non-Traditional Educational Settings	Grade 5		Grade 8		Grade 11	
	N	Pct	N	Pct	N	Pct
Court/agency placed	102	0.1	536	0.4	812	0.6
Homebound instruction	4	0.0	3	0.0	18	0.0
Special education student with IEP placed in program operated by entity other than district/school of residence	605	0.5	717	0.5	667	0.5
Student placed in alternative Education for Disruptive Youth program conducted outside of regular classroom	191	0.2	824	0.6	1,041	0.8
Home schooled student assessed by parental request	0	0.0	0	0.0	0	0.0
ELL student tested outside district	50	0.0	17	0.0	1	0.0

PRIMARY DISABILITY OF IEP STUDENTS ASSESSED ON THE PSSA

School personnel supplied the primary disability information for those students who had an IEP (not gifted) through the Pennsylvania Information Management System (PIMS) in conjunction with the DRC Student Precode System. Beginning with the 2006 assessment, the disability categories were presented in a sequence matching a Department of Education numbering system and two previously separate categories were combined. In Table 9–5, for all assessed students classified as IEP, the number and percent in each disability category are presented. For example, if 20,000 students statewide were categorized as IEP and 4,000 students were classified with a particular disability, the table entry would display 4,000 followed by 20 percent. Data is also supplied for the substantial percentage of students who were unclassified with respect to a specific disability. The last row presents the percent of all assessed students classified as IEP. The most prominent finding in Table 9-5 is that specific learning disability is the category with the highest incidence of occurrence across all grade levels.

Table 9–5
Incidence of Primary Disabilities among IEP Students Assessed on the 2008 Writing PSSA

Primary Disability of Students Having an IEP	Grade 5		Grade 8		Grade 11	
	N	Pct	N	Pct	N	Pct
Traumatic Brain Injury	27	0.1	45	0.2	33	0.2
Hearing Impairment including Deafness	148	0.7	147	0.7	127	0.7
Specific Learning Disability	10,898	55.0	13,303	64.2	11,136	64.2
Mental Retardation	475	2.4	711	3.4	697	4.0
Orthopedic Impairment	31	0.2	30	0.1	32	0.2
Emotional Disturbance	1,095	5.5	1,635	7.9	1,550	8.9
Speech or Language Impairment	3,380	17.1	715	3.5	141	0.8
Visual Impairment including Blindness	57	0.3	51	0.2	51	0.3
Deaf/Blind	5	0.0	5	0.0	13	0.1
Multiple Disabilities	31	0.2	32	0.2	28	0.2
Autism	532	2.7	419	2.0	238	1.4
Other Health Impairment	1,368	6.9	1,321	6.4	882	5.1
IEP Students without a disability code	1,757	8.9	2,293	11.1	2,405	13.9
Number of IEP Students Assessed	19,804	100.0	20,707	100	17,333	100
Percent of Assessed Students Classified as IEP		15.8		15.2		13.1

TEST ACCOMMODATIONS PROVIDED

School personnel supplied information regarding accommodations that a student may have received while taking the PSSA. Accommodations are classified in terms of presentation, response, setting, and timing modifications to enable students to better manage disabilities that hinder their ability to learn and respond to assessments.

The frequency with which these accommodations were utilized is summarized in Tables 9–6 through 9-9. The values in the table are based on all students with a score in writing. Please note that a glossary of accommodation terms as applied to the PSSA is provided in Table 9–12 at the end of this chapter.

PRESENTATION ACCOMMODATIONS RECEIVED

Presentation Accommodations are those which provide alternate ways for students to access and process printed instructional material and assessments. These include auditory, tactile, visual, and combined auditory/visual modes of presentation. There were ten categories of presentation modifications in the 2008 PSSA writing assessment. As depicted in Table 9–6 the actual frequencies are quite low, generally representing less than a tenth of one percent of assessed students statewide. The lone exception is test directions read aloud, signed, or recorded, in which more than 2,000 instances occurred at each grade level.

Table 9–6. Incidence of Presentation Accommodations Received on the 2008 Writing PSSA

Type of Presentation Accommodation	Grade 5		Grade 8		Grade 11	
	N	Pct	N	Pct	N	Pct
Braille format	7	0.0	7	0.0	15	0.0
Large print format	70	0.1	70	0.1	60	0.0
Magnification device	11	0.0	11	0.0	17	0.0
Reading windows, reading guides	123	0.1	14	0.0	10	0.0
Sign language interpreter	19	0.0	12	0.0	25	0.0
Qualified interpreter for ELL student	36	0.0	35	0.0	17	0.0
Test directions read aloud, signed, or recorded *	5,670	4.5	3,508	2.6	2,005	1.5
Test prompts recorded *	22	0.0	6	0.0	12	0.0
Electronic screen reader *	0	0.0	1	0.0	16	0.0
Other	453	0.4	340	0.3	221	0.2

*Not a standardized test format modification made available through PDE. See Table 9–12 for more explanation.

RESPONSE ACCOMMODATIONS RECEIVED

Response Accommodations permit students to complete assignments, tests, and activities in different ways to solve or organize problems using some type of assistive device or organizer. There were nine categories of response accommodations on the 2008 PSSA writing assessment. The frequency with which these accommodations were utilized is summarized in Table 9–7. The actual frequencies are quite low, most representing less than two-tenths of one percent of assessed students statewide.

Table 9–7. Incidence of Response Accommodations Received on the 2008 Writing PSSA

Type of Response Accommodation	Grade 5		Grade 8		Grade 11	
	N	Pct	N	Pct	N	Pct
Brailler / Note taker	4	0.0	5	0.0	10	0.0
Test Administrator marked MC responses at student's directions	60	0.0	42	0.0	40	0.0
Test administrator transcribed student responses	669	0.5	414	0.3	211	0.2
Augmentative communication device	2	0.0	3	0.0	8	0.0
Typewriter, word processor or computer	268	0.2	252	0.2	186	0.1
Audio recording of student responses	2	0.0	1	0.0	4	0.0
Translation dictionary for ELL student	5	0.0	29	0.0	3	0.0
Electronic screen reader *	1	0.0	1	0.0	16	0.0
Other	145	0.1	134	0.1	75	0.1

*Not a standardized test format modification made available through PDE. See Table 9–12 for more explanation.

SETTING ACCOMMODATIONS RECEIVED

Setting Accommodations permit a change in location in which a student receives instruction or participates in an assessment. There were three categories of setting accommodations on the 2008 PSSA writing assessment. As depicted in Table 9–8, the most common accommodations were small group testing and testing in a separate setting. Typically the percentage of IEP students tested in separate or small group settings decreases from lower to higher grade levels.

Table 9–8. Incidence of Setting Accommodations Received on the 2008 Writing PSSA

Type of Setting Accommodation	Grade 5		Grade 8		Grade 11	
	N	Pct	N	Pct	N	Pct
Hospital/home testing	30	0.0	70	0.1	129	0.1
Tested in separate setting	6,201	4.9	4,213	3.1	2,586	2.0
Small group testing	12,102	9.6	10,389	7.7	7,489	5.7

TIMING ACCOMMODATIONS RECEIVED

Timing Accommodations involve a change in the allowable length of time to complete assignments or assessments, including the way in which time is organized. There were four categories of timing accommodations on the 2008 PSSA writing assessment. As depicted in Table 9–9, the most common accommodations were scheduled extended time and requested extended time.

Table 9–9. Incidence of Timing Accommodations Received on the 2008 Writing PSSA

Type of Timing Accommodation	Grade 5		Grade 8		Grade 11	
	N	Pct	N	Pct	N	Pct
Scheduled Extended Time	5,843	4.7	3,940	3.0	3,430	2.7
Requested Extended Time	2,546	2.0	2,869	2.1	2,101	1.6
Multiple Test Sessions	1,327	1.1	1,050	0.8	886	0.7
Changed Test Schedule	172	0.1	217	0.2	176	0.1

THE INCIDENCE OF ACCOMMODATIONS AND IEP AND ELL STATUS

It is reasonable to expect that students with an IEP would receive the majority of accommodations; however, certain accommodations are specific to particular disabilities or to students classified as English Language Learners (ELL). A cross-tabulation between each of the accommodations and IEP and ELL status revealed a much greater incidence for students with an IEP. As observed in Tables 9-6 through 9-9, the most frequently occurring accommodations for assessed students were:

- Test directions read aloud
- tested in separate setting
- small group testing
- scheduled extended time
- requested extended time
- multiple test sessions.

Because the accommodations with the largest frequencies can potentially supply the most stable data when broken out for subgroup analysis, these six were selected for display in Table 9-10.

Coding for IEP is dichotomous as students are classified as IEP and non-IEP. For purposes of this analysis, an English Language Learner (ELL) was a student classified as ELL and enrolled in a U.S. school on or before March 23, 2007. All other assessed students, including those who exited an ESL/bilingual program and in the first or second year of monitoring were regarded as "Not ELL." Students coded as ELL and enrolled in a U.S. school after March 23, 2007 are excluded from state summary statistics as stated earlier in this chapter.

Customarily, a considerably larger percent of IEP students receive a given accommodation than Non-IEP students. Likewise, certain accommodations tend to occur more frequently for ELL students than for non-ELL students. To separate out the effect of being classified IEP or ELL, four possible combinations are presented in Table 9-10. These include: (1) General education

students (those who are neither IEP nor ELL), and students classified as (2) IEP but not ELL, (3) ELL but not IEP, and (4) both IEP and ELL. The bottom row for each grade provides the total number of students having a writing score within each of the four classifications.

General findings from Table 9-10 include:

- General education (neither IEP nor ELL) students had a very low incidence of accommodations, as 12 of the 18 instances (across grades) were less than one percent and none reached two percent.
- The IEP / not ELL students generally manifested the largest percentage of these accommodations (13 of 18 instances) and second largest in the remaining instances.
- The ELL / not IEP students received a larger percent of these accommodations than the General education students and a smaller percent than the IEP / not ELL group in all instances.
- The Both IEP and IEP group had the largest percent of accommodations in five instances and exceeded the ELL / not IEP group in 16 of 18 instances.

Table 9–10. Incidence of IEP and ELL Students Receiving Selected Accommodations

	Classification of Students Regarding IEP and ELL							
Accommodation Received	**General education (Not IEP or ELL)**		**IEP and not ELL**		**ELL and not IEP**		**Both IEP and ELL**	
Grade 5	**N**	**Pct**	**N**	**Pct**	**N**	**Pct**	**N**	**Pct**
Test directions read aloud, signed, recorded	253	0.2	5,226	26.9	108	5.0	83	22.1
Tested in separate setting	1,074	1.0	4,849	25.0	172	7.9	106	28.3
Small group testing	1,986	1.9	9,513	49.0	426	19.6	177	47.2
Scheduled extended time	1,286	1.2	4,265	22.0	208	9.6	84	22.4
Requested extended time	1,844	1.8	652	3.4	43	2.0	7	1.9
Multiple test sessions	251	0.2	1,022	5.3	39	1.8	15	4.0
Column N for Grade 5	103,570		19,429		2,173		375	
Grade 8	**N**	**Pct**	**N**	**Pct**	**N**	**Pct**	**N**	**Pct**
Test directions read aloud, signed, recorded	184	0.2	3,288	16.0	18	1.1	18	8.5
Tested in separate setting	599	0.5	3,444	16.8	139	8.4	31	14.6
Small group testing	1,047	0.9	9,025	44.0	244	14.7	73	34.3
Scheduled extended time	718	0.6	3,058	14.9	128	7.7	36	16.9
Requested extended time	2,036	1.8	811	4.0	19	1.1	3	1.4
Multiple test sessions	159	0.1	839	4.1	42	2.5	10	4.7
Column N for Grade 8	114,055		20,494		1,655		213	

Grade 11	N	Pct	N	Pct	N	Pct	N	Pct
Test directions read aloud, signed, recorded	90	0.1	1,892	11.0	14	1.3	9	8.9
Tested in separate setting	290	0.3	2,190	12.7	95	8.8	11	10.9
Small group testing	637	0.6	6,623	38.4	187	17.2	42	41.6
Scheduled extended time	432	0.4	2,872	16.7	111	10.2	15	14.9
Requested extended time	1426	1.3	642	3.7	30	2.8	3	3.0
Multiple test sessions	120	0.1	749	4.3	14	1.3	3	3.0
Column N for Grade 11	113,931		17,232		1,085		101	

THE INCIDENCE OF ACCOMMODATIONS AND PRIMARY DISABILITY CLASSIFICATION

To further delineate the use of commonly employed accommodations, a grade level breakdown by primary disability is presented in Table 9–11. A selection was made based on the more frequently occurring categories of disability and accommodations rather than displaying data for all of them. As may be seen from a perusal of Tables 9–6 through 9–9, the accommodations with the larger frequencies are those that involve a change in test timing, setting or that necessitate the reading of test directions. Selected for incorporation in Table 9–11 are six accommodations with frequencies in excess of 1,000 in at least one grade level. These include one presentation, two setting, and three timing accommodations. Response accommodations tended to be infrequent and highly specific to particular and infrequent disability categories or to students classified as English Language Learner (ELL) and were not included in Table 9–11. Seven Primary Disability categories were selected that had a minimum of 100 students so classified at each grade level.

The entries for Table 9–11 represent the number and percent of students with a particular disability (columns) who received the listed accommodation (rows). For example, if 200 students out of 500 classified with a particular disability received scheduled extended time, the table entry would display 200 followed by 40%. The frequency of assessed students at each grade with a particular disability may be found in Table 9–5.

The most prominent and consistent findings from Table 9-11 are (1) the heavy use of test directions read aloud, signed, or recorded, scheduled extended time, separate settings, and small group testing for all disability categories except speech and language impairment and that (2) the general tendency for the percent of 5th grade students receiving these particular accommodations to exceed that of 8th and 11th grade students.

Table 9-11 Incidence of Test Accommodations Received for Selected Primary Disability Classifications on the 2008 PSSA

		Primary Disability of Assessed Student with an IEP: Number and Percent													
Type of Accommodation Received	Grade Level	Autism		Emotional Disturbance		Deafness / Hearing Impairment		Mental Retardation		Other Health Impairment		Specific Learning Disability		Speech or Language Impairment	
Test directions read aloud, signed, recorded	5	155	29%	320	29%	33	22%	165	35%	450	33%	3619	33%	105	3%
	8	69	16%	233	14%	16	11%	150	21%	223	17%	2083	16%	26	4%
	11	28	12%	147	9%	18	14%	131	19%	82	9%	1170	10%	5	4%
Separate setting	5	178	33%	280	26%	21	14%	128	27%	476	35%	3362	31%	153	5%
	8	77	18%	209	13%	16	11%	142	20%	281	21%	2365	18%	29	4%
	11	43	18%	215	14%	11	9%	119	17%	126	14%	1446	13%	12	8%
Small group testing	5	282	53%	571	52%	43	29%	269	57%	809	59%	6497	60%	302	9%
	8	212	50%	699	42%	28	19%	327	46%	653	49%	6004	45%	82	11%
	11	97	40%	605	38%	30	23%	353	50%	329	37%	4171	37%	23	16%
Scheduled extended time	5	126	24%	274	25%	17	12%	149	31%	348	25%	2817	26%	99	3%
	8	59	14%	275	17%	18	12%	145	20%	145	11%	1771	13%	17	2%
	11	48	20%	253	16%	23	18%	140	20%	111	13%	1711	15%	8	6%
Student-requested extended time	5	20	4%	38	4%	4	3%	10	2%	55	4%	363	3%	70	2%
	8	29	7%	56	3%	5	3%	35	5%	70	5%	541	4%	15	2%
	11	13	5%	63	4%	11	9%	46	7%	38	4%	401	4%	5	4%
Multiple test sessions	5	45	8%	89	8%	3	2%	32	7%	73	5%	586	5%	27	1%
	8	23	6%	100	6%	3	2%	21	3%	27	2%	339	3%	5	1%
	11	11	5%	92	6%	5	4%	44	6%	32	4%	297	3%	3	2%

Note: Results displayed are for most frequently occurring accommodations and disability classifications

GLOSSARY OF ACCOMMODATIONS TERMS

Table 9-12 provides a brief description of accommodations terms as used in the PSSA. School personnel identified the accommodations that a student received by marking a bubble in the student answer document as seen in the left column. The right column contains an explanation abstracted from the *2008 Accommodations Guidelines* (PDE, 2008, pages 24-46).

Table 9–12. Glossary of Accommodations Terms as Applied in the PSSA

Type of Testing Accommodation	Explanation
Student used the following Presentation Accommodations *(mark all that apply)*	
Braille format	Students may use a Braille edition of the test. Answers must then be transcribed into the answer booklet without alteration.
Large print format	Students with visual impairments may use a large print edition. Answers must then be transcribed into the answer booklet without alteration.
Magnification device	Devices to magnify print may be used for students with visual impairments and or print disabilities.
Reading windows, reading guides	Students with visual impairments may use reading windows and reading guides in all assessments.
Sign language interpreter	Deaf/hearing impaired students may receive test directions from a qualified interpreter. Signing is also permitted for: essay prompts (writing), items/questions (math, science only).
Qualified interpreter for ELL student	An interpreter may translate directions or clarify instructions for the assessments. They may translate, not define specific words or test questions on the mathematics and science tests. On the reading test interpreters may only translate directions and may not translate or define words in the passage or test questions.
Test directions read aloud, signed, or recorded	Directions for all PSSA tests may be read aloud, signed or presented by audio recording.
Test items/questions read aloud or signed	Students unable to decode text visually may have items / questions read aloud for mathematics and science only; however, words may not be defined.
Test prompts recorded	Writing essay prompts may be presented by audio recording.
Electronic screen reader (PDE approval required)	Students with a severe visual disability may use an electronic screen reader; however, PDE must approve the program and functions prior to the test window.
Other (PDE approval required)	Other presentation accommodations indicated in the *Accommodation Guidelines* may be provided; however, PDE approval is required prior to the test window.
Spanish mathematics version	This version may be taken by students whose first language is Spanish and who have been enrolled in U.S. schools for fewer than 3 years.
Student used the following Response Accommodations *(mark all that apply)*	

Brailler / Note taker (per *Accommodations Guidelines*)	Students using this device as part of their regular instructional program may use it on the PSSA; however, without thesaurus, spell- or grammar checker, etc.
Test administrator scribed open-ended responses at student's direction	A test administrator may record word-for-word exactly what a student dictated directly into the PSSA test booklet. This includes MC and OE responses for reading, math and science. For writing, MC items and scribing one's own recorded essay.
Test administrator marked multiple-choice responses at student's direction	A test administrator may mark an answer booklet at the direction of a student. (e.g., a student may point to a multiple-choice answer with the test administrator marking the response in the answer booklet).
Test administrator transcribed (copied) student responses. (per *Accommodations Guidelines*)	For writing prompts the test administrator may transcribe handwriting that is extremely difficult to read. On reading, mathematics, or science illegible handwriting may be transcribed for open-ended items only.
Augmentative communication device	Students with severe communication difficulties may use a special device to convey responses, which must be transcribed into the test booklet by the test administrator.
Typewriter, word processor or computer (per *Accommodations Guidelines*)	An allowable accommodation as a typing function only for students with identified need. Supports such as dictionaries, thesauri, spell checkers and grammar checkers must be turned off. Answers must then be transcribed into the answer booklet without alteration.
Audio recording of student responses (per *Accommodations Guidelines*)	An electronic recording device may be used to record responses, which must be transcribed into the test booklet by the test administrator. [Students who are unable to use a pencil or have illegible handwriting may answer reading, mathematics, and writing multiple-choice questions orally. Answers must be recorded in the answer booklet without alteration during the testing period.]
Manipulative (Cranmer Abacus, number line)	An adaptive calculator or a Cranmer Abacus may be used for the calculator portion of the test only. Eligible students are only those with blindness, low vision, or partial sight.
Translation dictionary for ELL student	A word-to-word dictionary that translates native language to English (or vice versa) without word definitions or pictures is allowed on any portion of the mathematics test and open-ended section of the reading test (but not for the reading passage or multiple-choice items). Cannot be used on any section of the writing test.
Electronic screen reader (PDE approval required)	Students with blindness or extremely low vision may use computer software that converts text to synthesized speech or Braille.
Other (per *Accommodations Guidelines* or PDE approval)	Other accommodations may be appropriate and available if they do not compromise the integrity of the assessment. Documentation must be provided to PDE.

Table 9–12 (continued). Glossary of Accommodations Terms as Applied in the PSSA

Student used the following Setting Accommodations *(mark all that apply)*	
Hospital/home testing	A student who is confined to a hospital or to home during the testing window may be tested in that environment.
Tested in a separate setting	A separate room may be used to reduce distraction.
Small group testing	Some students may require a test setting with fewer students or a setting apart from all other students.
Student used the following Timing Accommodations *(mark all that apply)*	
Scheduled extended time	Extended time may be allotted for each section of the test as a planned accommodation to enable students to finish.
Student-requested extended time	A student may request extended time if working productively.
Multiple test sessions	Multiple test sessions (breaks within a test section) may be scheduled for the completion of each test section; however, a test section must be completed within one school day.
Changed test schedule	Students whose disabilities prevent them from following a regular, planned test schedule may follow an individual schedule, enabling test completion.

Chapter Ten: Form Analysis and Item Calibration

SAMPLING

In order to expedite the analysis process, a target sample of students was selected for use in calibrating items. The target sample was aimed to cover roughly 50% of the student population while preserving ethnic representation. This was done using random sampling without replacement at the district level for approximately 85% of the sample and at the school level for Pittsburgh and Philadelphia districts for approximately 15% of the sample based on 2007–2008 enrollment counts. In any given year, additional students end up being available before the calibration is scheduled to begin. If possible, the additional students are included in the analyses, provided there is time to ensure the demographic profile is similar to the original target sample.

TEST FORM STATISTICS

Table 10–1 contains an overview of the test-level data. Test length in total number of points (Pts.), mean number of points received (Mean), standard deviations (SD), test reliability (R), and traditional standard error of measurement (SEM) are shown by grade. These statistics are based on the total test using both multiple-choice items and writing prompt scores for the common sections of each form. Detailed item-level statistics for the common items can be found in Appendices F through I.

Test reliability is discussed in more detail in Chapter Thirteen.

Table 10–1. 2007 Summary of Common Item Performances

Grade	Pts.	Mean	SD	R	SEM
5	100	66.56	13.93	0.77	6.69
8	100	68.05	13.32	0.79	6.05
11	100	69.71	13.27	0.78	6.28

The standard deviation shown in the table is the standard deviation of observed scores. Assuming normally distributed scores, one would expect about two-thirds of the observations to be within one standard deviation of the mean. An estimate of the standard deviation of the true scores can be computed as $\hat{\sigma}_T = \sqrt{\hat{\sigma}_x^2 - \hat{\sigma}_x^2(1-\hat{\rho}_{xx})}$.

The conditional standard error of measurement (CSEM) also indicates the degree of measurement error in score units, but as a function of one's actual test score. Therefore, the CSEM may be especially useful in characterizing measurement precision in the neighborhood of a score level used for decision-making—such as cut scores for identifying students who meet a performance standard. The CSEMs for writing are documented in Appendix K in the column labeled "Scaled Scored SE."

TRADITIONAL ITEM STATISTICS

Although all items were previously reviewed for both content and statistical quality, a thorough item analysis was conducted in the spring to ensure that the items and forms performed as expected. With any psychometric model, an item analysis is a search for unexpected results. For

example, *more able*[1] students are expected to pass easy items and *less able* students are expected to fail difficult items. If either of these situations does not occur, the item should be reviewed to determine the nature of the problem and the characteristics of the students affected.

The most familiar indices of item performance are *proportion correct* (P-Value) and item discrimination. Discrimination for dichotomous items is typically represented by the *point-biserial correlation* coefficient. The correlation will have a positive value when the mean score of the students answering correctly is higher than the mean score of the students answering incorrectly. This indicates that students who did well on the total test tended to do well on this item. The index will take its maximum theoretical value of 1.0 if *every* student who answered the item correctly scored better on the test than *any* student who answered incorrectly[2].

The P-Value indicates an item's difficulty for some specified group (e.g. grade level). It is calculated as the proportion (sometimes percent) of students in the group who answer an item correctly. P-values range from 0.0 to 1.0 on the proportion scale. Lower values correspond to more difficult items and higher values correspond to easier items.

Table 10–2 provides some distributional indices for the P-Value and corrected point-biserial correlation (Pt. Bis.) for the multiple-choice items on the common form in each grade and content area.

Table 10–2. Common Form Statistics by Grade and Content for Multiple-Choice Items

	Grade 5		Grade 8		Grade 11	
	P-Value	Pt. Bis.	P-Value	Pt. Bis.	P-Value	Pt. Bis.
Minimum	0.562	0.329	0.509	0.385	0.431	0.356
Maximum	0.882	0.523	0.880	0.520	0.903	0.562
Mean	0.710	-	0.706	-	0.660	-
Median	0.685	0.453	0.708	0.431	0.639	0.470

[1] Following the Rasch literature, *ability* is used in this discussion as a generic term for the construct that is being measured by the exam. *Competence*, *achievement*, *learning* and *status* are among the alternatives that are sometimes used, but are all subject to some degree of misinterpretation.

[2] It is legitimate to view the point biserial correlations as standardized means. A positive value means students who chose that response had a higher mean score than the average student; a negative value means students who chose that response had a lower than average mean score.

RASCH ITEM STATISTICS AND SCALING

WINSTEPS© software, implementing the Rasch model, was used to obtain estimates of logit difficulties for both dichotomously- and polytomously-scored items. The parameters estimated for polytomous items are the *step difficulties* associated with the Masters Partial Credit model. This software is capable of handling all the item types currently in use with the PSSA. WINSTEPS© version 3.54 was used for all calibrations. See Wright and Masters (1982) and Rasch (1960) for further information about the models used for these analyses.

The Rasch model expresses item difficulty (and student ability) in units referred to as *logits*, rather than in percent correct. In the simplest case, a logit is a transformed P-value with the average P-value becoming a logit of zero. In this form, logits resemble z-scores or standard normal deviates; a very difficult item might have a logit of +4 and a very easy item might have a logit of -4. However, they have no formal relationship to the normal distribution.

The logit metric has several mathematical advantages over P-values. It is an interval scale, meaning that two items with logits of zero and one (respectively) are the *same distance* apart as items with logits of +3 and +4. Logits are not dependent on the ability level of the students. For example, a form can have a mean logit of zero, whether the average P-value of the sample is 0.8 or 0.3.

The standard Rasch calibration procedure arbitrarily sets the mean difficulty of the items on any form at zero. Under normal circumstances where all students are administered a common set of items, any item with a P-value lower than the average item on the form receives a positive logit difficulty and any item with a P-value higher than the average receives a negative logit. Consequently, the logits for any calibration, whether it is a grade 3 reading test or a high school science test, relate to an arbitrary origin defined by the center of items on that form. The average grade 3 reading item will have a logit of zero; the average high school science item will have a logit of zero. Logits for both item difficulties and student abilities are placed on the same scale and relate to the same mean item difficulty.

There are any number of other arbitrary choices that could be made for centering the item difficulties. Rather than using all the items, the origin could be defined by a subset. For the PSSA, all test forms in a particular grade and content area share a common block of items. The items on all forms can then be easily adjusted to a single (but still arbitrary) origin by defining the origin as the mean of the **common** items. With this done, the origins for all the forms will be statistically equal. Items on forms A and F that are equally difficult will now have *statistically* equal logit difficulties.

During PSSA administration, test forms were spiraled within classrooms. In effect, students are administered the same set of common items but different field-test or matrix sets. As a result, there are cross checks that are made to ensure the calibrations and links are reasonable across forms. The goal of spiraling is to achieve randomly equivalent samples of students across forms with equal standard deviations and arbitrary means. Any differences in performance observed among the groups should be due only to differences in form difficulty. After linking, the mean of the logit abilities should be statistically equal for each sample of students.

Because of the equivalent samples, the common items should have the same P-values regardless of which form and sample is being considered. Finally, for all items, a plot of the relationship between the P-value and the logit should fall along a single, curved line. Figures 10–1 through 10–3 plot this relationship for common multiple-choice items. The curves are nearly linear in the

center, but curve towards asymptotes of one and zero, respectively, on the left and on the right. The graphs show that items with low P-values (indicating a more difficult item that fewer students answered correctly) also showed higher logit difficulty, and items with high P-values had lower logit difficulties. The spread of the graph points is indicative of the dispersion of item difficulties in the common items.

Figure 10–1. Grade 5

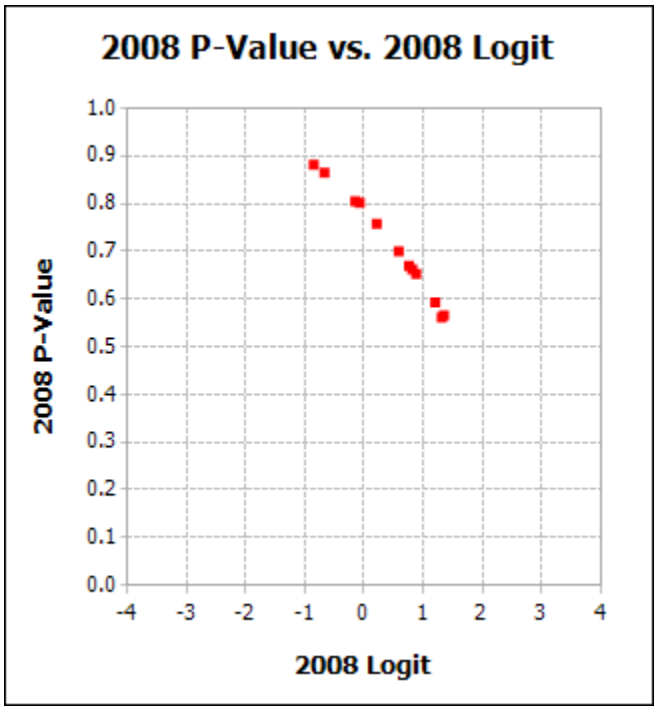


Figure 10–2. Grade 8

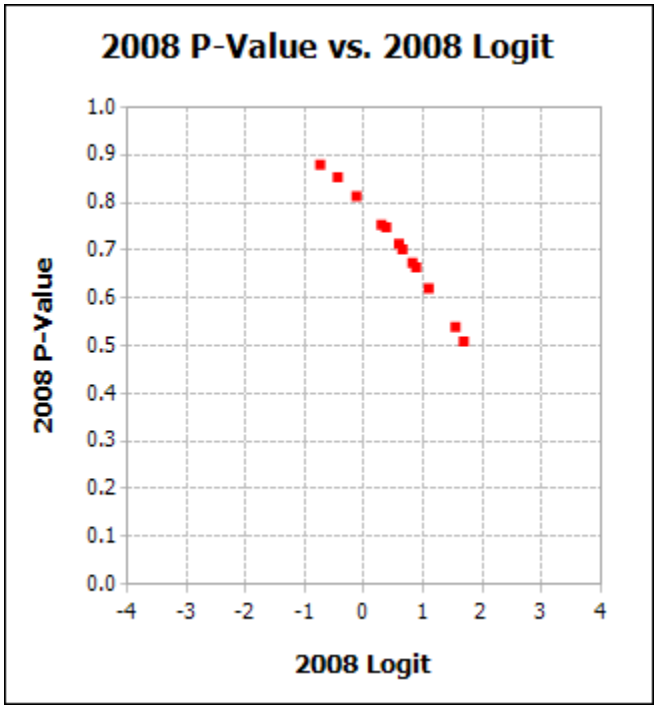
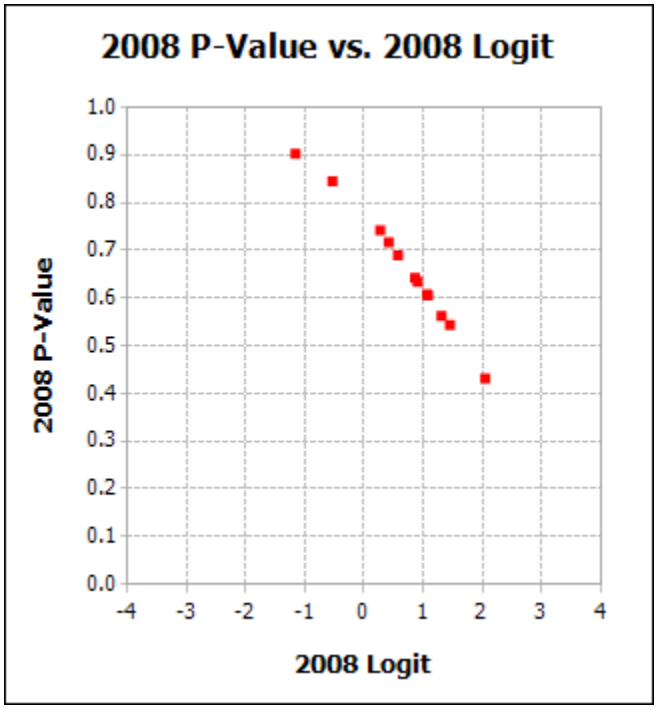


Figure 10–3. Grade 11



Below are the mean raw scores by form for the common items. In addition, the number of students (N), test length in total points (Pts.), minimum (weighted) observed score (Min), maximum (weighted) observed score (Max), median score (Median), and standard deviation (SD) are shown by form, grade, and content area. The extent to which the mean raw scores across forms are similar indicates the extent to which the student populations taking each form are of approximately equal ability. This equivalence of ability distributions across forms is the desired outcome of spiraling and allows for optimum analysis of the embedded field-test items.

Table 10-3. 2008 Summary Raw-Score Statistics for Common Items by Form

	Grade 5						
Form	**N**	**Pts.**	**Min**	**Max**	**Mean**	**Median**	**SD**
ALL	125547	100	22	100	66.56	66.0	13.93
1	12632	100	22	100	66.60	66.0	13.91
2	12547	100	22	100	66.40	66.0	13.93
3	12564	100	22	100	66.50	66.0	13.96
4	12548	100	22	100	66.60	67.0	13.94
5	12529	100	22	100	66.44	66.0	14.09
6	12574	100	22	100	66.67	67.0	13.90
7	12562	100	22	100	66.54	66.0	13.84
8	12554	100	23	100	66.51	66.0	13.86
9	12523	100	22	100	66.74	67.0	13.95
10	12514	100	22	100	66.64	66.0	13.94

	Grade 8						
Form	**N**	**Pts.**	**Min**	**Max**	**Mean**	**Median**	**SD**
ALL	136417	100	22	100	68.05	72.0	13.32
1	13698	100	22	100	68.02	72.0	13.47
2	13631	100	22	100	67.94	72.0	13.25
3	13628	100	22	100	68.10	72.0	13.20
4	13676	100	22	100	67.85	72.0	13.42
5	13654	100	22	100	68.00	72.0	13.40
6	13588	100	22	100	68.11	72.0	13.15
7	13660	100	22	100	68.06	72.0	13.24
8	13622	100	22	100	68.18	73.0	13.42
9	13640	100	22	100	68.25	73.0	13.30
10	13620	100	23	100	68.04	73.0	13.37

	Grade 11						
Form	**N**	**Pts.**	**Min**	**Max**	**Mean**	**Median**	**SD**
ALL	132349	100	22	100	69.71	73.0	13.27
1	13287	100	22	100	69.65	73.0	13.25
2	13321	100	22	100	69.57	73.0	13.32
3	13209	100	22	100	69.75	73.0	13.28
4	13338	100	23	100	69.72	73.0	13.23
5	13197	100	22	100	69.76	73.0	13.21
6	13255	100	22	100	69.72	73.0	13.35
7	13175	100	22	100	69.89	73.0	13.41
8	13224	100	22	100	69.68	73.0	13.25
9	13217	100	22	100	69.61	73.0	13.12
10	13126	100	23	100	69.76	73.0	13.30

Chapter Eleven: Linking

Rasch model linking of the exam for the current year to the exam for previous years is just as straightforward as linking forms within year. However, the student samples are not equivalent across years and identical items can have different properties in different years because of changes in the item's context or changes in the students' experiences. Consequently, between-year linking requires more scrutiny than within-year linking.

The link between years is based on items that are used in both years in approximately the same context. The *same context* in this situation means the items are not altered in any way, they appear in about the same position in the booklet, and they are administered at about the same time of year.

A transitional matrix-to-matrix section linking plan was used to measure growth. This was based on the recommendation of the national technical advisory committee in collaboration with PDE and DRC staff. This link was accomplished via intact matrix sections on a subset of the forms. Item level statistics for the linking items can be found in Appendix J.

For *within-year* linking, the procedure is to link forms via the common section. The result is a bank of items with comparable logit difficulties. For *between-year* linking, the procedure is to link the current year's test to the previous years' tests.

1. Linking items are identified.
2. The logit difficulties of all items are adjusted in the current year's bank so that the mean 2008 logit difficulty for the linking items is equal to the mean 2007 logit difficulty for the same items.
3. The validity of the link is assessed by identifying any items that do not maintain their relative position across years.

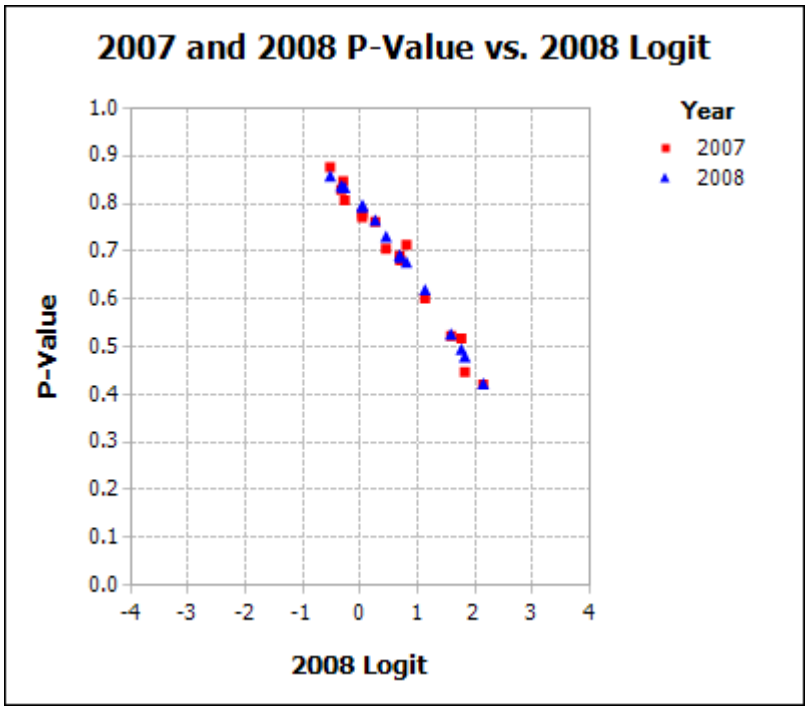
Since the linking process forces the current logit difficulties for the linking items to have the same mean as the previous logit difficulties for these same items, the current-year logits will be *displaced* from their estimates obtained from an independent calibration. The size of the displacements reflects the difference, if any, in the origins. The variation among the displacements corresponds to the approximate size of the standard errors for the items.

Plotting P-values against logit difficulties across years is not as reliable as it is within year. Using spiraled forms within year, a given P-value will translate to a given logit regardless of the form it is used on, within the limits of statistical precision. Within year, the P-value-to-logit plot should be a single curved line; between years, the plot could have separate lines for each year. The difference between the two lines is a reflection of the adjustment (positive or negative) that is required to link the two item tests. The following sections show the linking results by grade.

GRADE 5

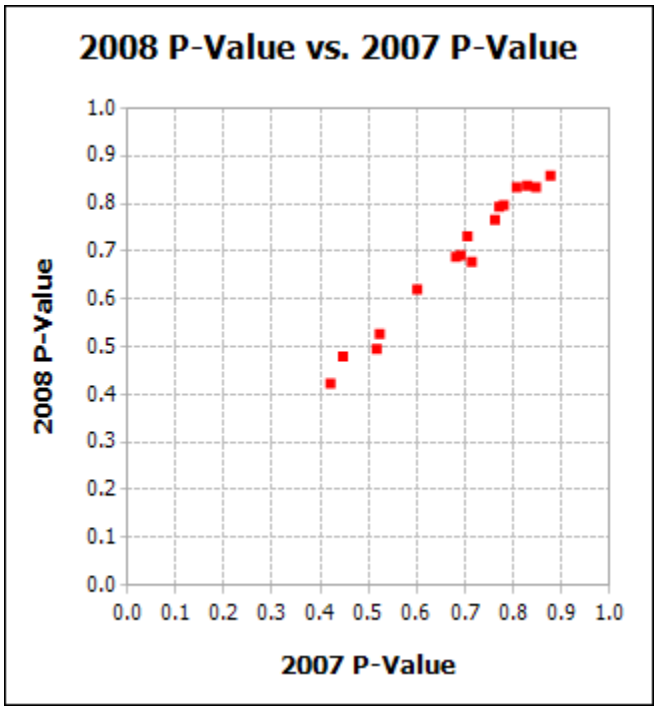
In Figure 11–1, the two lines sloping downward toward the right relate item P-values for the two years to the 2008 logit difficulties. They show the curvilinear relationship required by the model, with low P-values being translated into high logit difficulties and high P-values into low difficulties. The smoothness of this line indicates good agreement among the forms. Because the forms were spiraled within classroom, the samples generated are randomly equivalent and one would expect the same P-value to translate into the same logit.

Figure 11–1. Grade 5



In Figure 11–2, the trend, rising from left to right, describes the item P-values[3] for the two years (the clusters of points reflect items which were used on multiple matrix forms). If the P-values for both years are correlated at 1.0, one would expect the relationship to fall on a straight line with a slope of one. The extent to which the trend does not pass through the origin indicates a change in student performance.

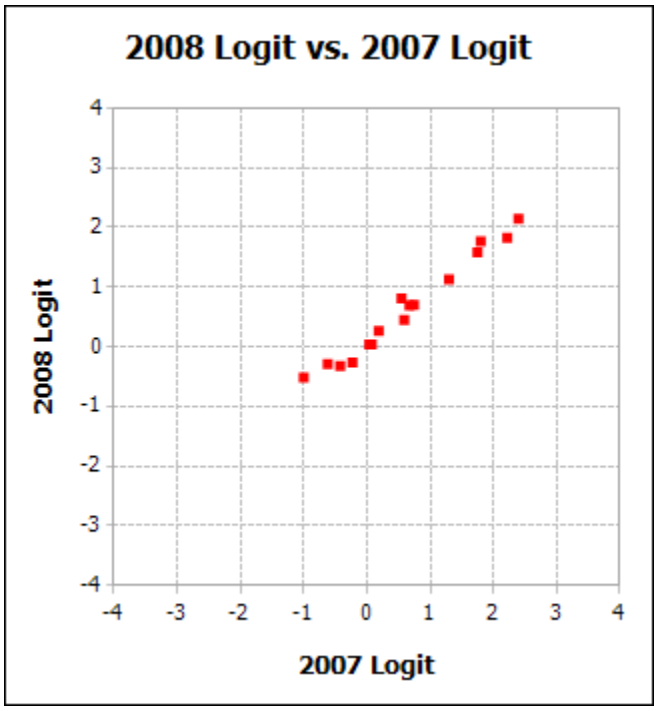
Figure 11–2. Grade 5



[3] Many test score users are familiar with the P-value metric, which is why these charts are provided. However, the logit charts, as on the following page, have some advantages for visualizing this trend data.

Figure 11–3 below uses the same data as Figure 11–1 and 11–2, but focuses on the relationship between 2007 and 2008 logit difficulties.

Figure 11–3. Grade 5



GRADES 8 AND 11

Similar cross-year linking analyses were performed for grades 8 and 11 and are shown in the plots below. Again, the graphs show the curvilinear relationship required by the model, with low P-values being translated into high logit difficulties and high P-values into low difficulties. The smoothness of this line indicates good agreement among the forms.

Figure 11–4. Grade 8

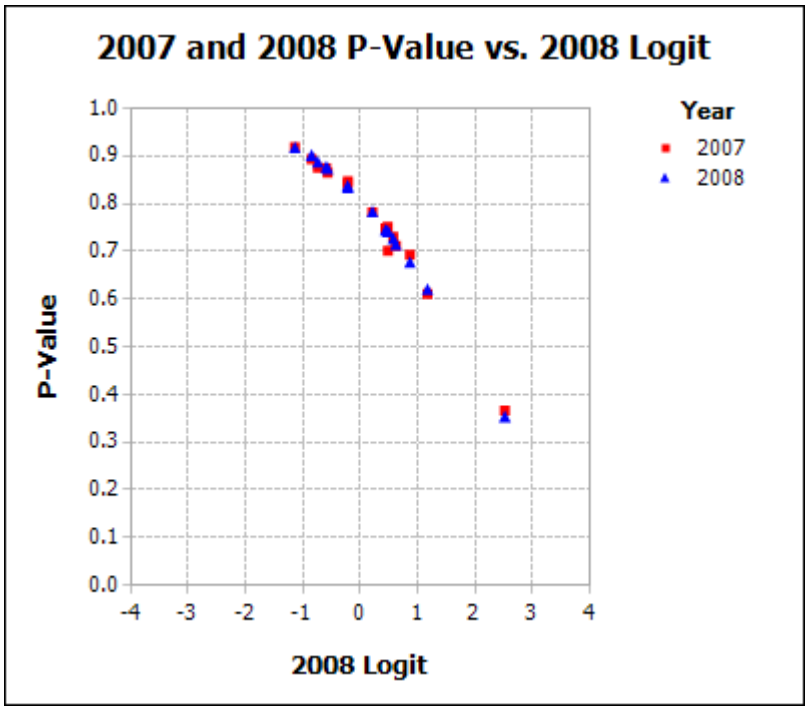


Figure 11–5. Grade 8

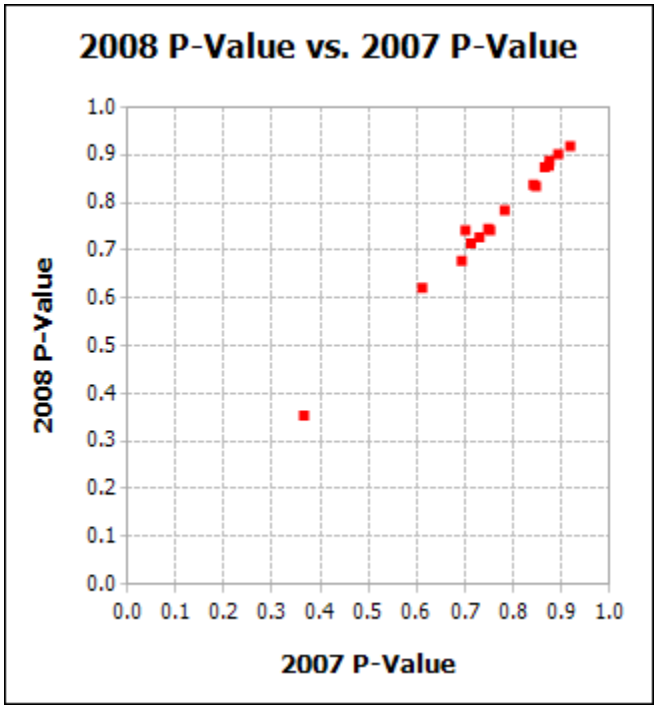


Figure 11–6. Grade 8

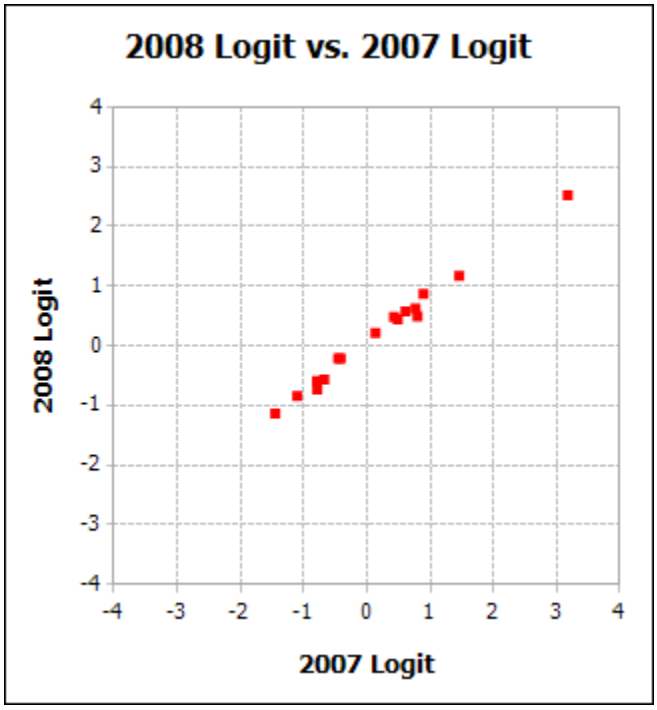


Figure 11–7. Grade 11

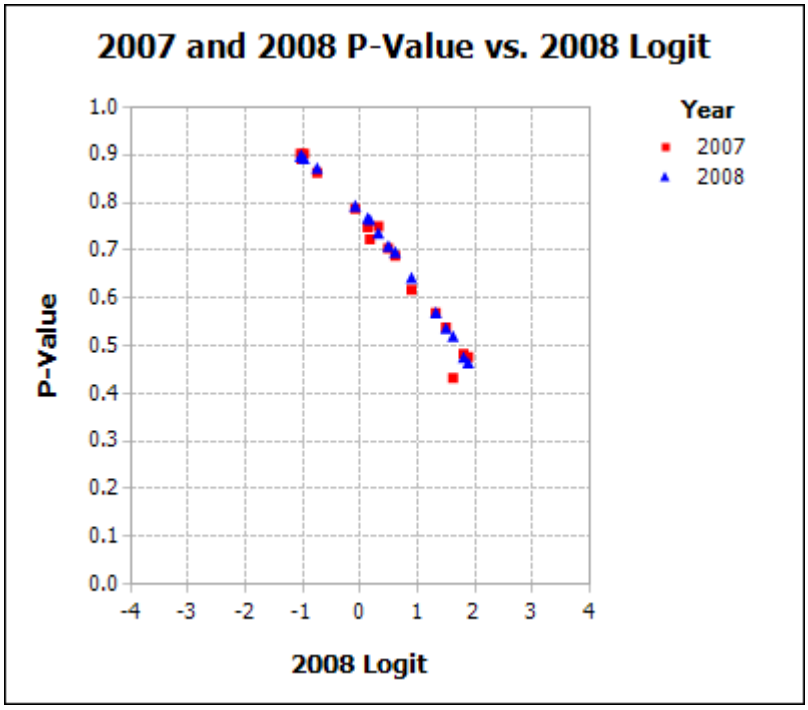


Figure 11–8. Grade 11

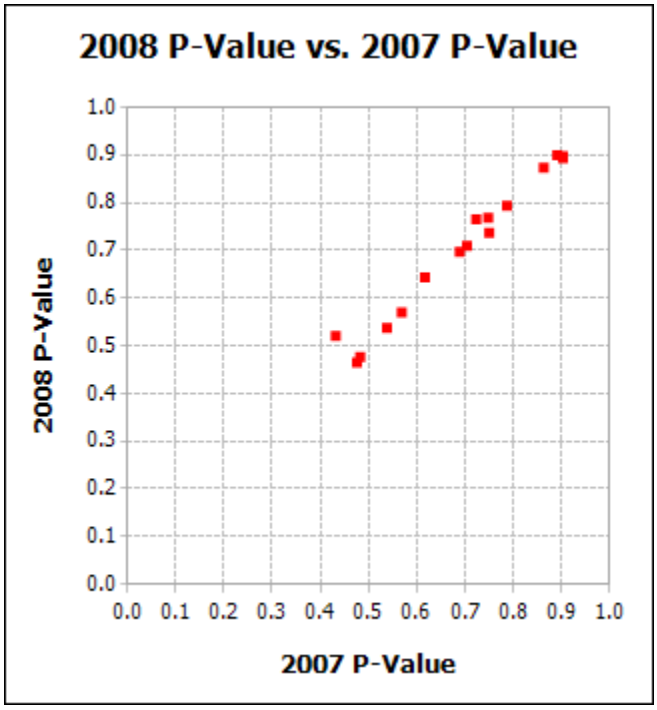
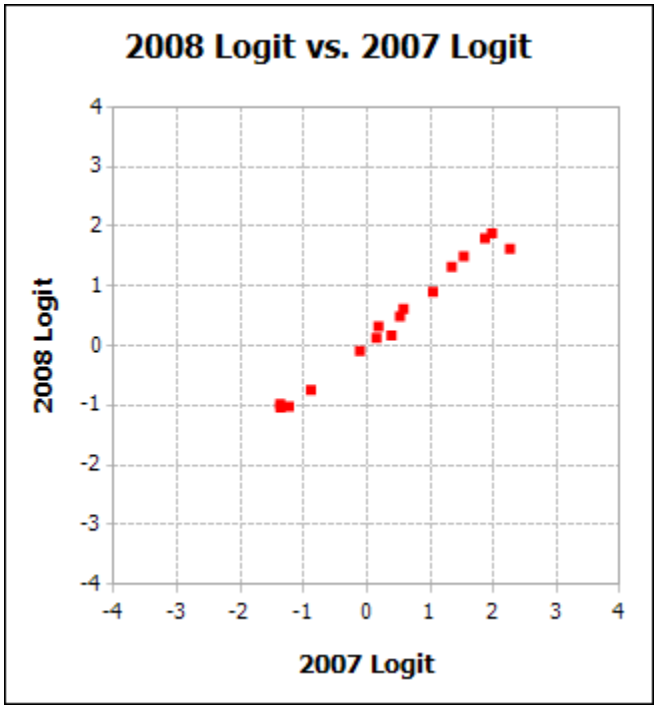
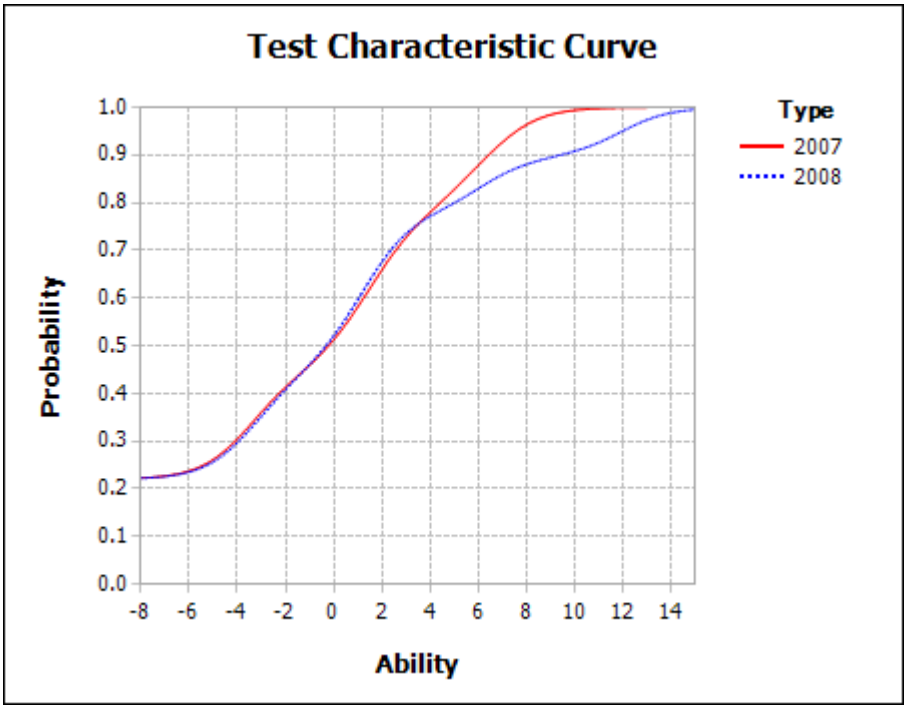


Figure 11–9


2008 Logit vs. 2007 Logit
2008 Logit
2007 Logit
4
3
2
1
0
-1
-2
-3
-4
-4
-3
-2
-1
0
1
2
3
4

The 2007 vs. 2008 Test Characteristic Curves (TCCs) by grade are shown in the figures below[4]. TCCs show the similarity between the 2007 and 2008 tests in terms of difficulty in the logit metric. Assuming equal numbers of items for the two years, curves that are close to being coincident will translate into similar raw score cutpoints. With extreme differences in test difficulties, some loss of precision and reliability may result.

Figure 11–10. Grade 5



[4] In the TCC figures, the Y-Axis 'Probability' represents total test raw score expressed on a proportion-correct metric.

Figure 11–11. Grade 8

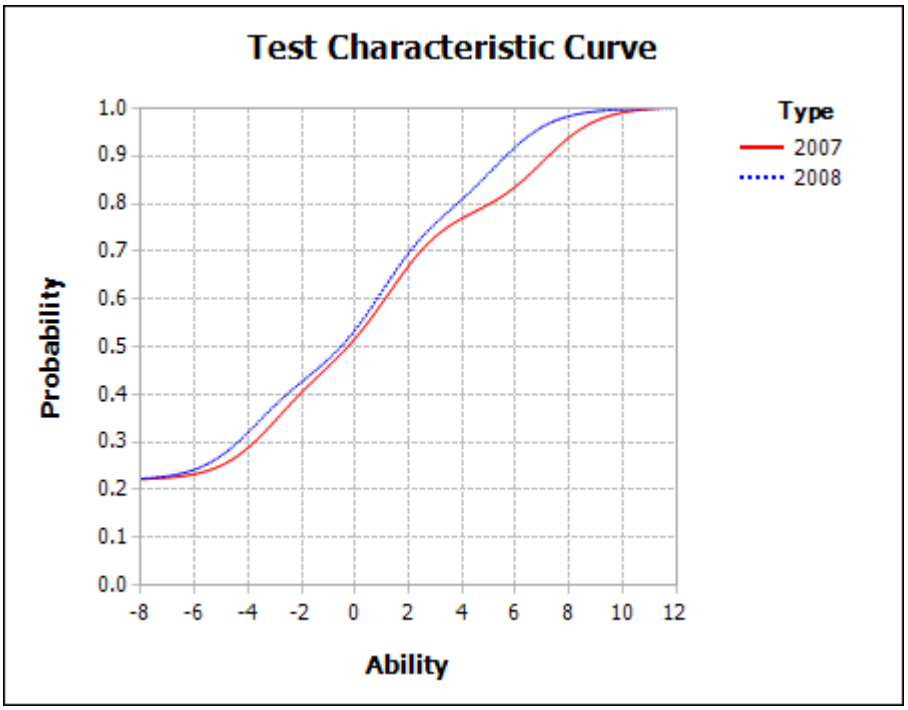
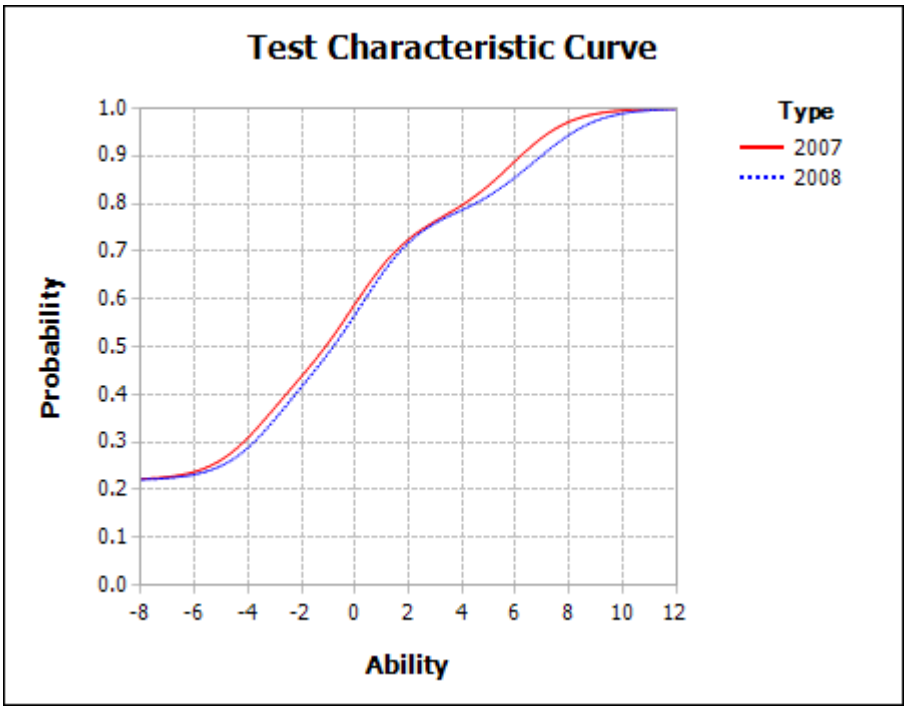


Figure 11–12. Grade 11



Chapter Twelve: Scaled Scores & Performance Levels

COMMON ITEMS AND MATRIX SAMPLED ITEMS

Beginning with the design changes implemented for the 2000 PSSA, student-level scores were based on the common items only. This ensures that any decision made about students will be made in the most equitable manner. School-level scaled scores for the content areas are based on the mean of the student-level scaled scores. This ensures that the scaled scores used for school accountability directly reflect the student-level results. It is a simple matter to aggregate up to the school, district, and state levels.

For the purpose of providing school-level results at the content standard (Academic Standards category) level, all items on all matrix forms plus the common items are utilized. This ensures that decisions about potential school-level strengths and weaknesses are based on broad sampling of the curriculum.

SCALED SCORES FOR CONTENT STANDARDS

As of 2003, school-level scaled scores are no longer reported for the academic content standards (Academic Standards categories). Instead, school results are presented as the percent of total points achieved as compared to district and state level results.

INTERPRETING SCALED SCORES AND PERFORMANCE LEVELS

A *Scaled Score*, in the simplest sense, is a transformed number-correct score[5]. When all students take the same items, as in the common sections of the PSSA, the more points the student earns, the higher the associated scaled score. The value of switching to the more abstract scaled score metric lies in the achievement of a more general and equitable result.

To illustrate, a raw score of 30 is meaningless unless the reader is also told how many points were possible. The same score has quite different meanings if it is based on a thirty-item test as opposed to a sixty-item test. *Number correct scores are transformed to percent correct scores to remove the effect of test length.* In the same way, a score based on sixty *difficult* items is quite different from the same score based on sixty *easy* items. *Number correct scores are transformed to scaled scores to remove the effects of test length and item difficulty.* As a result, scaled scores lend themselves to interpretations at what is referred to as an interval level, while raw scores do not. Interval-level scales allow one to interpret a scaled score difference of 5 points the same whether the scores are 1295 vs. 1300 or 1445 vs. 1450. Raw score differences, in this context, cannot be interpreted in this manner and are thus neither generalizable nor equatable.

The scale for the new PSSA writing assessment was established by setting the mean at all three grade levels to the 2005 Proficient score cutpoint of 1236. The standard deviation was set to 100 and the scale minimum to 700 in order to create a scale similar to the grade 11 scale.

[5] This is done in two steps. First, a nonlinear transformation is used to convert number correct scores to logits, and then a linear transformation is used to convert logits to scaled scores.

These values are arbitrary; they could have been zero and one, or 100 and 110, or any other ordered pair without affecting any of the relationships among schools, years, students, or items. Changing the scale would simply be changing the labels on the axis of a graph without moving any of the points. Like the temperature scales of Fahrenheit and Celsius, the new scale will acquire meaning to users only with experience.

Raw to scaled score tables for the spring 2008 assessment can be found in Appendix K.

PSSA PERFORMANCE LEVELS FOR WRITING

Performance levels are another way to attach meaning to the scaled score metric. They associate precise quantitative ranges of scaled scores with verbal, qualitative descriptions of student status. While much less precise, the qualitative description of the levels is one way for parents and teachers to interpret the student scores. They are also useful in assessing the status of the school.

The current Performance Level Descriptors, as developed by PDE and teacher panels, are given in Appendix E.

Chapter Thirteen: Test Score Reliability and Validity Evidence

RELIABILITY

This chapter provides reliability indices and standard errors of measurement (SEM) for the 2008 PSSA assessments. For the Rasch model (assuming adequate model/data fit) raw scores are sufficient statistics for abilities and scaled scores; performance levels set on scaled scores are identical to those based on raw scores.

Reliability Indices

Reliability can be calculated using any of a number of indices. Because of the composition of the PSSA writing assessment, which consists of relatively few multiple-choice items and heavily weighted writing prompts, the Technical Advisory Committee requested the use of the stratified alpha coefficient (Cronbach, Schönemann, & McKie, 1965), a weighted reliability coefficient that accounts for the contribution of each subtest to the overall test variance:

$$R = 1 - \frac{\sum \sigma_j^2 (1 - \alpha_j)}{\sigma_X^2}$$

where σ_j^2 is the variance of stratum (or subtest) j, α_j is the reliability of stratum j, and σ_X^2 is the variance of the test as a whole. Reliabilities were computed by dividing the test into three strata: multiple-choice items, Composition scores, and Revising and Editing scores. This division was chosen based on both conceptual grounds and test-component variance-covariance matrices.

While sensitive to random errors associated with content sampling variability, the reliability index is not sensitive to other types of errors that can affect test scores, such as temporal stability or variability in performance that might occur across testing occasions. It is also not sensitive to rater error. Consequently, this index might be positively biased by these factors.

The reliability coefficient is a unit-free indicator that reflects the degree to which scores are free of measurement error. The *standard error of measurement (SEM)* is another indicator of precision. If everyone being tested had the same *true score*[6], there would still be some variation in observed scores due to imperfections in the measurement process, such as random differences in attention during instruction or concentration during testing. The standard error is defined as the *standard deviation*[7] of the distribution of observed scores for students with identical true scores. Because the SEM is an index of the random variability in test scores in actual score units, it represents important information for test score users.

Generally speaking, reliabilities go up with an increase in test length and population heterogeneity and go down with shorter tests and more homogeneous populations. Tables 13–1 through 13–3 provide reliability information on the writing test for the total student population

---

[6] True score is the score the person would receive if the measurement process were perfect.

[7] The standard deviation of a distribution is a measure of the dispersion of the observations. For the normal distribution about 16% of the observations are more than one standard deviation above the mean and the same percentage is more than one standard deviation below the mean.

and for students in each gender group and the ethnicity groups of White and Black, Hispanic, Asian, American Indian, and multi-racial. Other groups such as English language learner (ELL), individualized education plan (IEP), and economically disadvantaged (ED) were also included for reliability estimation. The contents of the table include number of points possible (K), number of students tested (N), mean points received (X), standard deviation (SD), mean P-Value (P), reliability (R), and traditional standard errors of measurement (SEM).

Table 13–1. Grade 5

Overall

Group	K	N	X	SD	P	R	SEM
All	100	125547	66.563	13.933	0.699	0.769	6.695

Gender

Group	K	N	X	SD	P	R	SEM
Male	100	63492	63.717	13.874	0.674	0.773	6.606
Female	100	61935	69.491	13.375	0.724	0.743	6.785

Ethnicity

Group	K	N	X	SD	P	R	SEM
White	100	92731	68.569	13.331	0.731	0.749	6.672
Black	100	19402	59.358	13.244	0.587	0.741	6.743
Hispanic	100	8737	59.301	13.567	0.587	0.760	6.647
Asian	100	3568	72.355	13.884	0.757	0.744	7.019
Am. Indian	100	191	65.995	14.283	0.686	0.770	6.843
Multi	100	775	63.627	13.750	0.659	0.758	6.767

ELL

Group	K	N	X	SD	P	R	SEM
All	100	2548	54.568	12.983	0.497	0.732	6.720

IEP

Group	K	N	X	SD	P	R	SEM
All	100	19804	54.876	14.089	0.536	0.789	6.478

ED

Group	K	N	X	SD	P	R	SEM
All	100	45884	60.531	13.263	0.612	0.748	6.659

Table 13–2. Grade 8

Overall

Group	K	N	X	SD	P	R	SEM
All	100	136417	68.054	13.321	0.699	0.794	6.048

Gender

Group	K	N	X	SD	P	R	SEM
Male	100	69854	65.393	13.430	0.676	0.797	6.048
Female	100	66403	70.883	12.590	0.725	0.770	6.044

Ethnicity

Group	K	N	X	SD	P	R	SEM
White	100	102264	70.101	12.535	0.730	0.770	6.010
Black	100	20782	60.630	13.046	0.586	0.777	6.160
Hispanic	100	8709	60.724	13.497	0.593	0.789	6.205
Asian	100	3496	72.809	12.976	0.755	0.772	6.192
Am. Indian	100	257	66.358	13.136	0.668	0.838	5.290
Multi	100	681	61.809	14.641	0.626	0.847	5.723

ELL

Group	K	N	X	SD	P	R	SEM
All	100	1868	53.842	13.000	0.475	0.768	6.268

IEP

Group	K	N	X	SD	P	R	SEM
All	100	20707	55.601	13.123	0.517	0.785	6.090

ED

Group	K	N	X	SD	P	R	SEM
All	100	45805	62.088	13.134	0.612	0.782	6.129

Table 13–3. Grade 11

Overall

Group	K	N	X	SD	P	R	SEM
All	100	132349	69.711	13.272	0.672	0.776	6.277

Gender

Group	K	N	X	SD	P	R	SEM
Male	100	66325	67.406	13.724	0.646	0.786	6.345
Female	100	65780	72.076	12.345	0.698	0.747	6.205

Ethnicity

Group	K	N	X	SD	P	R	SEM
White	100	105956	71.220	12.673	0.696	0.760	6.210
Black	100	15754	62.156	13.152	0.549	0.754	6.523
Hispanic	100	6297	62.333	13.566	0.557	0.774	6.455
Asian	100	3263	73.790	13.665	0.722	0.784	6.352
Am. Indian	100	212	66.127	13.296	0.631	0.743	6.736
Multi	100	552	63.178	13.838	0.585	0.761	6.765

ELL

Group	K	N	X	SD	P	R	SEM
All	100	1186	54.380	12.910	0.453	0.738	6.608

IEP

Group	K	N	X	SD	P	R	SEM
All	100	17333	56.066	13.529	0.468	0.768	6.522

ED

Group	K	N	X	SD	P	R	SEM
All	100	32041	63.444	13.224	0.576	0.763	6.437

Rater Agreement

Rater agreement information is provided in Chapter 8.

VALIDITY

As noted in the *Standards for Educational and Psychological Testing*, "validity refers to the degree to which evidence and theory support the interpretation of test scores entailed by the proposed uses of the tests" (AERA, APA, & NCME, 1999, p. 9). Thus, the validity of the PSSA must be judged in relation to its primary purposes as delineated in Chapter One. Multiple sources of evidence should be considered, and in fact, virtually all of this technical report's content is part of this body of evidence (test developmental steps, item writing procedures, item review, item analysis, bias analysis, etc.). Below, validity evidence specifically related to test content is presented in terms of how the PSSA assessments were assembled to reflect the state content standards. Very significant supporting information on the item development processes is presented in Chapter Three.

Validity Evidence

The PDE's commitment to validity is also evidenced by the fact that the Pennsylvania State Board of Education commissioned an independent study of an earlier version of the PSSA. That study, conducted by HumRRO, included an extensive evaluation of the items (Thacker and Dickinson, 2004) and of statistical relationships of the PSSA, including convergent and discriminant validity (Thacker, Dickinson and Koger, 2004).

References

Achieve, Inc. (2005). Measuring Up 2005: A Report on Assessment Anchors and Tests in Reading and Mathematics for Pennsylvania. Washington, DC: Achieve, Inc.

AERA, APA, NCME (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education). (1999). *Standards for Educational and Psychological Tests*. Washington, DC: American Educational Research Association.

Allman, C. (2004). Test access: Making tests accessible for students with visual impairments—A guide for test publishers, test developers, and state assessment personnel (2nd edition). Louisville, KY: American Printing House for the Blind. Available from http://www.aph.org.

Bhola, D. L., Impara, J. C., & Buckendahl, C. W. (2003). Aligning tests with states' content standards: methods and issues. *Educational Measurement: Issues and Practice, 22* (3), 21–29.

Cronbach, L., Schoenemann, P. & McKie, D. (1965). Alpha coefficients for stratified-parallel tests. *Educational and Psychological Measurement*, 25, 291–312.

Data Recognition Corporation. (2000). *Item Viewer and Authoring Network (IVAN): Informational Guide*. Maple Grove, MN: DRC.

Data Recognition Corporation. (2003–2007). *Fairnes*s *in Testing: Training Manual for Issues of Bias, Fairness, and Sensitivity*. Maple Grove, MN: DRC.

Data Recognition Corporation. (2004–2007). *Pennsylvania System of School Assessment (PSSA) Style Guide*. Maple Grove, MN: DRC.

Data Recognition Corporation. (2005, December). *Technical Report for the PSSA 2005 Reading and Mathematics*. Maple Grove, MN: DRC.

Data Recognition Corporation. (2007, May). T*echnical Report for the PSSA 2006 Writing: Grades 5, 8, and 11*. Maple Grove, MN: DRC.

Data Recognition Corporation. (2007, May). *Technical Report for the PSSA 2006 Reading and Mathematics: Grades 4, 6 and 7*. Maple Grove, MN: DRC.

Data Recognition Corporation (2007) *Preliminary Technical Report for 2008 PSSA Science,* Maple Grove, MN : DRC.

Data Recognition Corporation. (2008, February). T*echnical Report for the PSSA 2007 Writing: Grades 5, 8, and 11*. Maple Grove, MN: DRC.

Data Recognition Corporation. (2008, February). *Technical Report for the PSSA 2007 Reading and Mathematics: Grades 3, 4, 5, 6, 7, 8, and 11*. Maple Grove, MN: DRC.

Data Recognition Corporation (2008, February) *Preliminary Technical Report for 2008 PSSA Science,* Maple Grove, MN : DRC.

Pennsylvania Department of Education. (2007). *2007–2008 Science Item and Scoring Sampler*. Harrisburg, PA: PDE. Posted separately by grade level. Retrieved March 4, 2008 from http://www.pde.state.pa.

Pennsylvania Department of Education. (2008). *2007-2008 PSSA Assessment Handbook*. Harrisburg, PA: PDE. Retrieved March 4, 2008 from http://www.pde.state.pa.

Dorans, N., Schmitt, Al, & Bleistein, C. (1992). The standardization approach to assessing comprehensive differential item functioning. *Journal of Educational Measurement*, 29, 309–319.

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

No Child Left Behind Act of 2001, Pub. L. No. 107–110, 115 Stat. 1425 (2002).

Pennsylvania State Board of Education. (1999, January). *Chapter 4. Academic Standards and Assessment*. Harrisburg, PA: Pennsylvania State Board of Education. Retrieved November 8, 2004, from http://www.pde.state.pa.us. Also available from http://www.pacode.com/secure/data/022/Chapter4/s4.51.html.

Pennsylvania Department of Education. (2005, December). 2005–2006 *Writing Assessment Handbook*. Harrisburg, PA: PDE. Retrieved January 30, 2006, from http://www.pde.state.pa.us.

Pennsylvania Department of Education. (2005). 2005–2006 *Writing Item and Scoring Sampler*. Harrisburg, PA: PDE. Posted separately by grade level. Retrieved September 14, 2005, from http://www.pde.state.pa.us.

Pennsylvania Department of Education. (2006). *2006–2007 Writing Item and Scoring Sampler*. Harrisburg, PA: PDE. Posted separately by grade level. Retrieved January 30, 2007 from http://www.pde.state.pa.

Pennsylvania Department of Education. (2006, December). *2006–2007 Writing Assessment Handbook*. Harrisburg, PA: PDE. Retrieved January 30, 2006 from http://www.pde.state.pa.

Pennsylvania Department of Education. (2006). *2006–2007 Science Item and Scoring Sampler*. Harrisburg, PA: PDE. Posted separately by grade level. Retrieved March 15, 2007 from http://www.pde.state.pa.

Pennsylvania Department of Education. (2006, November). *Science Assessment Handbook*. Harrisburg, PA: PDE. Retrieved March 15, 2007 from http://www.pde.state.pa.

Pennsylvania Department of Education. (2007, January). *2007 Accommodations Guidelines for Students with IEPs, Students with 504 Plans, English Language Learners, and all Students*. Harrisburg, PA: PDE. Retrieved January 30, 2007, from http://www.pde.state.pa.us.

Pennsylvania Department of Education. (2007). *PSSA 2007 Handbook for Assessment Coordinators and Administrators: Grades 5, 8, and 11 Writing*. Harrisburg, PA: Retrieved January 30, 2007, from http://www.pde.state.pa.us.

Pennsylvania Department of Education. (2007, February). *PSSA Writing Directions for Administration Manual*. Harrisburg, PA: PDE. Posted separately by grade level. Retrieved February 20, 2007 from http://www.pde.state.pa.

Rasch, G. (1960). *Probabilistic Models for Some Intelligence and Attainment Tests*. Copenhagen: Danish Institute for Educational Research.

Thacker, A. A. & Dickinson, E. R. (2004). *Item Content and Difficulty Mapping by Form and Item Type for the 2001–2003 Pennsylvania System of School Assessment (PSSA)*. Alexandria, VA: Human Resources Research Organization.

Thacker, A. A., Dickinson, E. R. & Koger, M. E. (2004). *Relationships Among the Pennsylvania System of School Assessment (PSSA) and Other Commonly Administered Assessments.* Alexandria, VA: Human Resources Research Organization.

Thompson, S., Johnstone, C. J. & Thurlow, M. L. (2002). *Universal Design Applied to Large Scale Assessments* (Synthesis Report 44), Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.

Webb, N. L. (1999). *Research Monograph No. 18: Alignment of Science and Mathematics Standards and Assessments in Four States.* Madison, WI: National Institute for Science Education.

WINSTEPS (2000). *WINSTEPS® Rasch Measurement.* Copyright John M. Linacre.

Wright, B. & Masters, G. (1982). *Rating Scale Analysis*. Chicago: MESA Press.

Appendix A:

PSSA Writing Scoring Guidelines

PSSA NARRATIVE SCORING GUIDELINE

4	FOCUS	Sharp, distinct controlling point or theme with evident awareness of the narrative.
	CONTENT DEVELOPMENT	Strong story line with illustrative details that addresses a complex idea or examines a complex experience. Thoroughly elaborated narrative sequence that employs narrative elements as appropriate.
	ORGANIZATION	Skillful narrative pattern with clear and consistent sequencing of events, employing a beginning, a middle, and an end. Minor interruptions to the sequence may occur.
	STYLE	Precise control of language, literary devices, and sentence structures that creates a consistent and effective point of view and tone.
3	FOCUS	Clear controlling point or theme with general awareness of the narrative.
	CONTENT DEVELOPMENT	Story line with details that addresses an idea or examines an experience. Sufficiently elaborated narrative sequence that employs narrative elements as appropriate.
	ORGANIZATION	Narrative pattern with generally consistent sequencing of events, employing a beginning, a middle, and an end. Interruptions to the sequence may occur.
	STYLE	Appropriate control of language, literary devices, and sentence structures that creates a consistent point of view and tone.
2	FOCUS	Vague evidence of a controlling point or theme with inconsistent awareness of the narrative.
	CONTENT DEVELOPMENT	Inconsistent story line that inadequately addresses an idea or examines an experience. Insufficiently elaborated narrative sequence that may employ narrative elements.
	ORGANIZATION	Narrative pattern with generally inconsistent sequencing of events that may employ a beginning, a middle, and an end. Interruptions to the sequence may interfere with meaning.
	STYLE	Limited control of language and sentence structures that creates interference with point of view and tone.
1	FOCUS	Little or no evidence of a controlling point or theme with minimal awareness of the narrative.
	CONTENT DEVELOPMENT	Insufficient story line that minimally addresses an idea or examines an experience. Unelaborated narrative that may employ narrative elements.
	ORGANIZATION	Narrative pattern with little or no sequencing of events. Interruptions to the sequence interfere with meaning.
	STYLE	Minimal control of language and sentence structures that creates an inconsistent point of view and tone.

PSSA INFORMATIONAL SCORING GUIDELINE

4	FOCUS	Sharp, distinct controlling point made about a single topic with evident awareness of task and audience.
	CONTENT DEVELOPMENT	Substantial, relevant, and illustrative content that demonstrates a clear understanding of the purpose. Thorough elaboration with effectively presented information consistently supported with well-chosen details.
	ORGANIZATION	Effective organizational strategies and structures, such as logical order and transitions, which develop a controlling idea.
	STYLE	Precise control of language, stylistic techniques, and sentence structures that creates a consistent and effective tone.
3	FOCUS	Clear controlling point made about a single topic with general awareness of task and audience.
	CONTENT DEVELOPMENT	Adequate, specific, and/or illustrative content that demonstrates an understanding of the purpose. Sufficient elaboration with clearly presented information supported with well-chosen details.
	ORGANIZATION	Organizational strategies and structures, such as logical order and transitions, which develop a controlling idea.
	STYLE	Appropriate control of language, stylistic techniques, and sentence structures that creates a consistent tone.
2	FOCUS	Vague evidence of a controlling point made about a single topic with an inconsistent awareness of task and audience.
	CONTENT DEVELOPMENT	Inadequate, vague content that demonstrates a weak understanding of the purpose. Underdeveloped and/or repetitive elaboration with inconsistently supported information. May be an extended list.
	ORGANIZATION	Inconsistent organizational strategies and structures, such as logical order and transitions, which ineffectively develop a controlling idea.
	STYLE	Limited control of language and sentence structures that creates interference with tone.
1	FOCUS	Little or no evidence of a controlling point made about a single topic with a minimal awareness of task and audience.
	CONTENT DEVELOPMENT	Minimal evidence of content that demonstrates a lack of understanding of the purpose. Superficial, undeveloped writing with little or no support. May be a bare list.
	ORGANIZATION	Little or no evidence of organizational strategies and structures, such as logical order and transitions, which inadequately develop a controlling idea.
	STYLE	Minimal control of language and sentence structures that creates an inconsistent tone.

PSSA PERSUASIVE SCORING GUIDELINE

4	FOCUS	Sharp, distinct controlling point presented as a position and made convincing through a clear, thoughtful, and substantiated argument with evident awareness of task and audience.
	CONTENT DEVELOPMENT	Substantial, relevant, and illustrative content that demonstrates a clear understanding of the purpose. Thoroughly elaborated argument that includes a clear position consistently supported with precise and relevant evidence. Rhetorical (persuasive) strategies are evident.
	ORGANIZATION	Effective organizational strategies and structures, such as logical order and transitions, to develop a position supported with a purposeful presentation of content.
	STYLE	Precise control of language, stylistic techniques, and sentence structures that creates a consistent and effective tone.
3	FOCUS	Clear controlling point presented as a position and made convincing through a credible and substantiated argument with general awareness of task and audience.
	CONTENT DEVELOPMENT	Adequate, specific and/or illustrative content that demonstrates an understanding of the purpose. Sufficiently elaborated argument that includes a clear position supported with some relevant evidence. Rhetorical (persuasive) strategies may be evident.
	ORGANIZATION	Organizational strategies and structures, such as logical order and transitions, to develop a position supported with sufficient presentation of content.
	STYLE	Appropriate control of language, stylistic techniques, and sentence structures that creates a consistent tone.
2	FOCUS	Vague evidence of a controlling point presented as a position that may lack a credible and/or substantiated argument with an inconsistent awareness of task and audience.
	CONTENT DEVELOPMENT	Inadequate, vague content that demonstrates a weak understanding of the purpose. Insufficiently elaborated argument that includes an underdeveloped position supported with little evidence.
	ORGANIZATION	Inconsistent organizational strategies and structures, such as logical order and transitions, to develop a position with inadequate presentation of content.
	STYLE	Limited control of language and sentence structures that creates interference with tone.
1	FOCUS	Little or no evidence of a controlling point presented as a position that lacks a credible and/or substantiated argument with minimal awareness of task and audience.
	CONTENT DEVELOPMENT	Minimal evidence of content that demonstrates a lack of understanding of the purpose. Unelaborated argument that includes an undeveloped position supported with minimal or no evidence.
	ORGANIZATION	Little or no evidence of organizational strategies and structures, such as logical order and transitions, to develop a position with insufficient presentation of content.
	STYLE	Minimal control of language and sentence structures that creates an inconsistent tone.

PSSA CONVENTIONS SCORING GUIDELINE

4

- Thorough control of sentence formation.
- Few errors, if any, are present in grammar, usage, spelling, and punctuation, but the errors that are present do not interfere with meaning.

3

- Adequate control of sentence formation.
- Some errors may be present in grammar, usage, spelling, and punctuation, but few, if any, of the errors that are present may interfere with meaning.

2

- Limited and/or inconsistent control of sentence formation. Some sentences may be awkward or fragmented
- Many errors may be present in grammar, usage, spelling, and punctuation, and some of those errors may interfere with meaning.

1

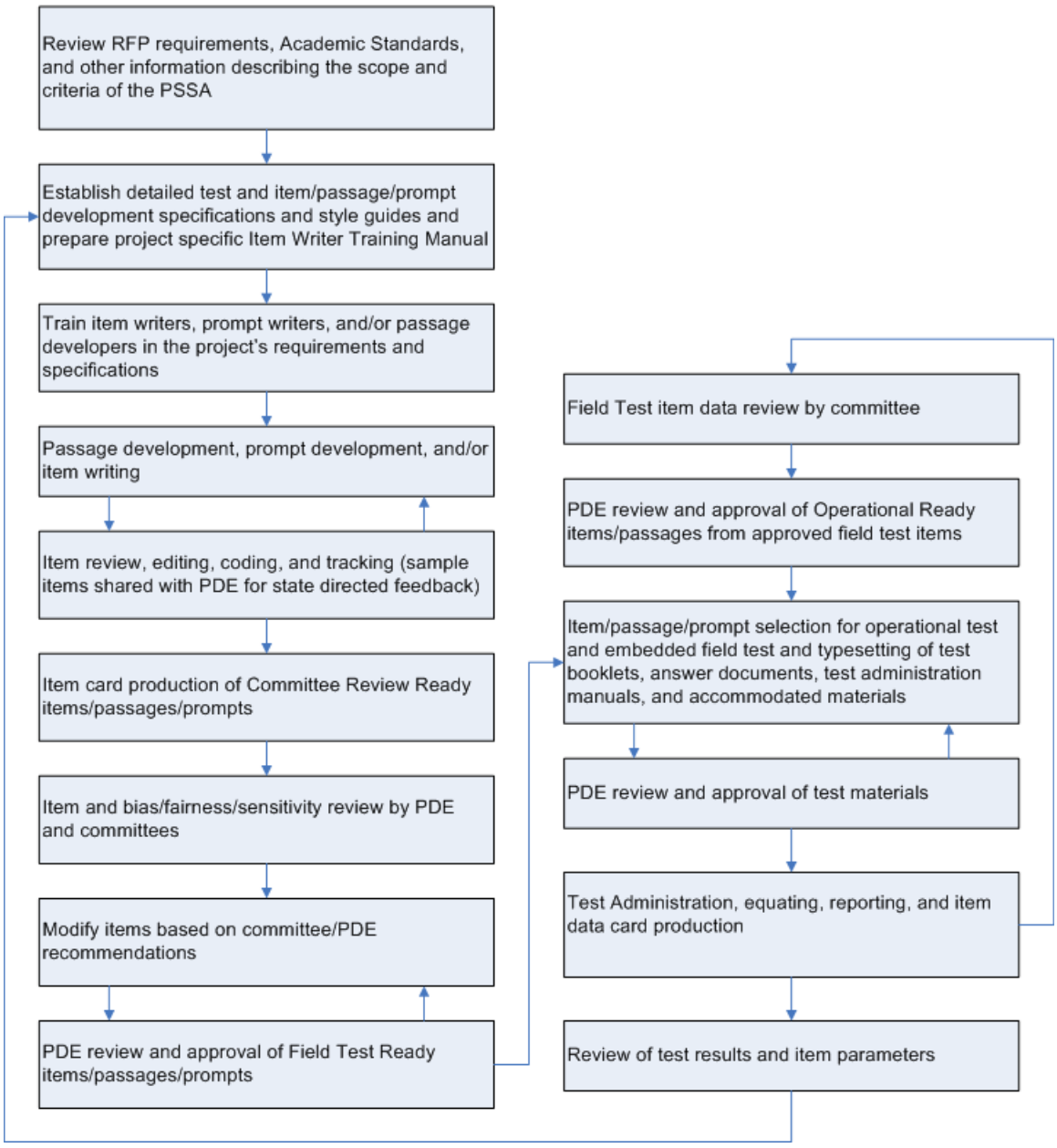
- Minimal control of sentence formation. Many sentences are awkward and fragmented.
- Many errors may be present in grammar, usage, spelling, and punctuation, and many of those errors may interfere with meaning.

Appendix B:

Item and Test Development Processes

DRC Item and Test Development Process

Writing



Appendix C:

2008□Item Review Form

Item Rating Sheet

Reviewer Signature: _____

Content Area: _____ **Grade:** _____

	Content Alignment	Rigor Level Alignment				Technical Design			Universal Design		STATUS
	Standards	Grade	Difficulty	Depth of Knowledge	Source of Challenge	Correct Answer	Distracters	Graphics	Language Demand	Bias	Acceptance Status
Unique ID number	—Higher —Lower —None	—Above —At —Below	—Easy —Medium —Hard	—Recall —Application —Strategic Thinking	—Yes —No	—Yes —No	—Yes —No	—Yes —No	—Yes —No	—Yes —No	— Approved as is. — Accepted with suggested revisions.

Appendix D:

2008 Item Review Cards and IVAN Card

Client:	50	Item ID: *(for internal use only)*

Item Writing Form - Pennsylvania

Item Writer Information		Stimulus	
Item Writer Name		**Stimulus Used**	
Item Writer #		**Stimulus ID**	
Email Address		**Stimulus Title**	
Submission Date		**Stimulus Type**	
Item Information		**Delivery**	Atch ☐ Fax ☐ Mail ☐
Item Type		**Title**	
Grade		**Author**	
Subject		**Publisher**	
Goal 1		**Date Published**	
Goal 2		**Source Page**	
Goal 3		**URL**	
Goal 4		**Permission Needed**	
Taxonomy Level			
Depth of Knowledge		**Passage Title #1**	
Difficulty		**Temp Passage ID #1**	
Focus			
Graphics		**Passage Title #2**	
Calculator		**Temp Passage ID #2**	
Points			

Comment	

Prompt / Stem

Answer Options	
Key:	
Option A. Rationale:	
Option B. Rationale:	
Option C. Rationale:	
Option D. Rationale:	

Rubric

Client:	50	Item ID: *(for internal use only)*

Passage Writing Form - Pennsylvania

Passage Writer Information		**Reference**	
Passage Writer Name		**Delivery**	Atch ☐ Fax ☐ Mail ☐
Passage Writer #		**Title**	
Email Address		**Publisher**	
Submission Date		**Date Published**	
Item Information		**Source Page**	
Subject		**URL**	
Grade		**Permission Needed**	
Type			
Category		**Paired Passage**	
Temp. Passage ID			
Passage Title			
Passage Author			

Comment	

Passage

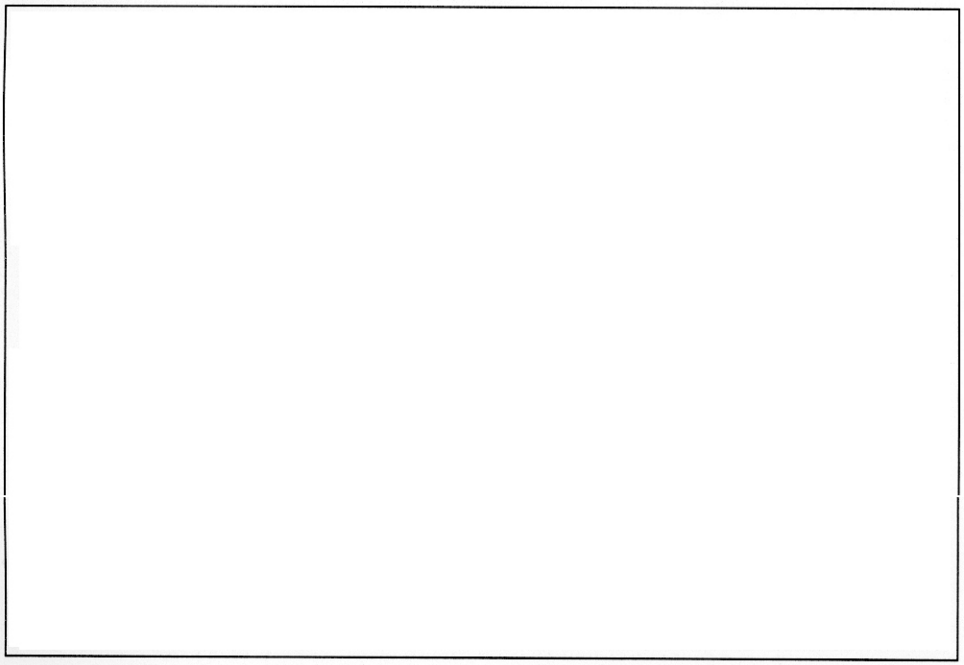
IVAN Item Card

DATA RECOGNITION DRC CORPORATION

Released: **Item Status:**

Item Name	Item Type	Key	Grade	Subject	Report Category	Asmt Anchor	Sub - Anchor	Eligible Content	Content Difficulty	DRP	Item Calculator

Depth of Knowledge:



Administration

Form Grade	Form Subject	Form Name	Sequence	Form Type	Month	Year	Report Category	Asmt Anchor	Sub-Anchor	Eligible Content	Day	Session	Calculator

Statistics Detail

Label	P-Value	Pt. Bis. Corr.
0		
1		
2		
3		
4		
Omits		
Mean		

Label	Value
N	
Outfit t	
Logit	

DIF Analysis	Value
White/Black	
Male/Female	

Notes:

Appendix E:

2008 Performance Level Descriptors

Pennsylvania Department of Education
Grade 5 Writing
Performance Level Descriptors

A student scoring at the **Advanced Level** produces narrative, informational, and persuasive pieces of writing that demonstrate a comprehensive command of composition skills. A student writing at this level

1. writes with a sharp, distinct focus that identifies topic and task
2. shows a sophisticated awareness of audience and mode
3. –
4. gathers, organizes, and selects substantial, effective content appropriate for topic, task, and audience
5. –
6. develops paragraphs with strong topic sentences and illustrative supporting details
7. crafts effective introductions, bodies, and conclusions
8. uses logical organizational structures and strategies within sentences and between paragraphs to thoroughly develop content
9. uses a variety of effective transitions to develop a controlling idea
10. varies lengths and patterns of simple and compound sentences
11. utilizes vivid and precise language to develop and maintain a consistent voice
12. revises writing to effectively improve organization, word choice, logic, order of ideas, and precision of vocabulary
13. demonstrates skill in editing to eliminate most errors in spelling, capitalization, punctuation, usage, and sentence structure

A student scoring at the **Proficient Level** produces narrative, informational, and persuasive pieces of writing that demonstrate a thorough understanding of composition skills. A student writing at this level

1. writes with a clear focus that identifies topic and task
2. shows a general awareness of audience and mode
3. –
4. gathers, organizes, and selects content appropriate for topic, task, and audience
5. –
6. develops paragraphs with topic sentences and relevant supporting details
7. produces adequate introductions, bodies, and conclusions
8. uses logical organizational structures and strategies within sentences and between paragraphs to sufficiently develop content
9. uses functional transitions to develop a controlling idea
10. varies lengths and patterns of simple and compound sentences
11. utilizes precise language to develop and maintain a consistent voice
12. revises writing to sufficiently address organization, word choice, logic, order of ideas, and precision of vocabulary
13. demonstrates skill in editing to eliminate common errors in spelling, capitalization, punctuation, usage, and sentence structure

A student scoring at the **Basic Level** produces narrative, informational, and persuasive pieces of writing that demonstrate a limited understanding of composition skills. A student writing at this level

1. writes with a vague or indistinct focus to identify topic and/or task
2. shows a limited awareness of audience and mode
3. –
4. needs assistance to gather and select content appropriate for topic, task, and audience
5. –
6. constructs under-developed paragraphs with unclear topic sentences and/or insufficient supporting details
7. produces inadequate introductions, bodies, and/or conclusions
8. shows limited ability to use logical organizational structures and/or strategies within sentences and/or between paragraphs to develop content
9. uses few and/or ineffective transitions
10. lacks variety in lengths and patterns of simple and compound sentences
11. utilizes vague or imprecise language often leading to an ineffective voice
12. demonstrates limited ability to revise writing
13. shows a limited ability to eliminate errors in spelling, capitalization, punctuation, usage, and sentence structure

A student scoring at the **Below Basic Level** produces writing that demonstrates a below grade-level understanding of composition skills and requires extensive assistance with composing, revising, and editing.

Pennsylvania Department of Education
Grade 8 Writing
Performance Level Descriptors

A student scoring at the **Advanced Level** produces narrative, informational, and persuasive pieces of writing that demonstrate a comprehensive command of composition skills. A student writing at this level

1. writes with a sharp, distinct focus that identifies topic and task
2. shows a sophisticated awareness of audience and mode
3. establishes a single point of view when appropriate
4. gathers valid and reliable information and organizes substantial, effective content appropriate for topic
5. employs most effective format for purpose and audience
6. develops paragraphs with illustrative supporting details specific to the topic and relevant to the focus
7. crafts effective introductions that establish topic and purpose; crafts effective conclusions that reiterate topic and purpose
8. uses logical and sophisticated organizational structures and strategies within sentences and between paragraphs to thoroughly develop content
9. uses a variety of effective transitions to develop a controlling idea
10. varies lengths and patterns of simple, compound, and complex sentences
11. utilizes vivid and precise language to maintain a consistent voice and tone
12. revises writing to effectively improve logic and organization, content, paragraph development, detail, style, tone, and word choice
13. demonstrates skill in editing to eliminate most errors in spelling, capitalization, punctuation, usage, and sentence structure

A student scoring at the **Proficient Level** produces narrative, informational, and persuasive pieces of writing that demonstrate a thorough understanding of composition skills. A student writing at this level

1. writes with a clear focus that identifies topic and task
2. shows a general awareness of audience and mode
3. establishes a single point of view when appropriate
4. gathers valid and/or reliable information and organizes content appropriate for topic
5. employs effective format for purpose and audience
6. develops paragraphs with supporting relevant details specific to the topic and relevant to the focus
7. produces adequate introductions that establish topic and purpose; produces adequate conclusions that reiterate topic and purpose
8. uses logical organizational structures and strategies within sentences and between paragraphs to sufficiently develop content
9. uses functional transitions to develop a controlling idea
10. varies lengths and patterns of simple, compound, and complex sentences
11. utilizes precise language to maintain a consistent voice and tone
12. revises writing after rethinking to sufficiently address logic and organization, content, paragraph development, detail, style, tone, and word choice

13. demonstrates skill in editing to eliminate common errors in spelling, capitalization, punctuation, usage, and sentence structure

A student scoring at the **Basic Level** produces narrative, informational, and persuasive pieces of writing that demonstrate a limited understanding of composition skills. A student writing at this level

1. writes with a vague or indistinct focus to identify topic and/or task
2. shows a limited awareness of audience and mode
3. may not establish a single point of view
4. needs assistance to gather valid and/or reliable information and organize content appropriate for topic
5. may employ ineffective format for purpose and/or audience
6. constructs under-developed paragraphs with insufficient supporting details
7. produces inadequate introductions and/or conclusions
8. shows limited ability to use logical organizational strategies within sentences and/or between paragraphs
9. uses few and/ineffective transitions
10. lacks variety in lengths and patterns of simple, compound, and/or complex sentences
11. utilizes vague or imprecise language often leading to an ineffective voice and/or tone
12. demonstrates limited ability to revise writing
13. shows a limited ability to eliminate errors in spelling, capitalization, punctuation, usage, and sentence structure

A student scoring at the **Below Basic Level** produces writing that demonstrates a below grade-level understanding of composition skills and requires extensive assistance with composing, revising, and editing.

Pennsylvania Department of Education
Grade 11 Writing
Performance Level Descriptors

A student scoring at the **Advanced Level** produces narrative, informational, and persuasive pieces of writing that demonstrate a comprehensive command of composition skills. A student writing at this level

1. writes with a sharp, distinct focus that identifies topic and task
2. shows a sophisticated awareness of audience and mode
3. establishes and maintains a single point of view when appropriate
4. gathers and organizes valid and reliable information; analyzes substantial, effective content appropriate for topic
5. employs most effective format for purpose and audience
6. writes fully-developed paragraphs with illustrative supporting details specific to the topic and relevant to the focus
7. crafts effective introductions and conclusions
8. uses logical and sophisticated organizational structures and strategies to thoroughly develop content
9. uses a variety of effective transitions to develop a controlling idea
10. varies lengths, types, and patterns of sentences
11. utilizes vivid and precise language throughout to maintain a consistent voice and tone
12. revises writing to effectively improve style, word choice, sentence variety and subtlety of meaning after rethinking purpose, audience, and genre
13. demonstrates skill in editing to eliminate most errors in spelling, capitalization, punctuation, usage, and sentence structure

A student scoring at the **Proficient Level** produces narrative, informational, and persuasive pieces of writing that demonstrate a thorough understanding of composition skills. A student writing at this level

1. writes with a clear focus that identifies topic and task
2. shows a general awareness of audience and mode
3. establishes and maintains a single point of view when appropriate
4. gathers and organizes valid and/or reliable information; analyzes content appropriate for topic
5. employs effective format for purpose and audience
6. writes well-developed paragraphs with relevant supporting details specific to the topic and relevant to the focus
7. produces adequate introductions and conclusions
8. uses logical organizational structures and strategies to sufficiently develop content
9. uses functional transitions to develop a controlling idea
10. varies lengths, types, and patterns of sentences
11. utilizes precise language to maintain a consistent voice and tone
12. revises writing to sufficiently address style, word choice, sentence variety and subtlety of meaning after rethinking purpose, audience, and genre

13. demonstrates skill in editing to eliminate common errors in spelling, capitalization, punctuation, usage, and sentence structure

A student scoring at the **Basic Level** produces narrative, informational, and persuasive pieces of writing that demonstrate a limited understanding of composition skills. A student writing at this level

1. writes with a vague or indistinct focus to identify topic and/or task
2. shows a limited awareness of audience and mode
3. may establish but not maintain a single point of view
4. needs assistance to gather valid and/or reliable information and organize content appropriate for topic
5. may employ ineffective format for purpose and/or audience
6. constructs under-developed paragraphs with insufficient supporting details
7. produces inadequate introductions and/or conclusions
8. shows a limited ability to use logical organizational structures and/or strategies to develop content
9. uses few and/or ineffective transitions
10. lacks variety in types and patterns of sentences
11. utilizes vague or imprecise language often leading to an ineffective voice and/or tone
12. demonstrates limited ability to revise writing
13. shows a limited ability to eliminate errors in spelling, capitalization, punctuation, usage, and sentence structure

A student scoring at the **Below Basic Level** produces writing that demonstrates a below grade-level understanding of composition skills and requires extensive assistance with composing, revising, and editing.

Appendix F:

2007 Grades 5, 8, and 11 Multiple-Choice Statistics

Table Legend

Column	Description
Cont.	Tested Content
Grade	Tested Grade
ID	Item identification number
Pub. ID	Public item identification number
Form	Form on which the item appeared 'All' = common form
Seq.	Sequence number of the item
Status	Status of the item at the time of administration 'OP' = common, 'MXLK' = matrix linking 'FT' = field test
Key	Answer key
R.C.	Reporting category
N	Number of students
P-Val.	P-Value
Proportion [A-D, Omit]	Proportion selecting the response
Pt. Bis.	Item total correlation
Correlation [A-D]	Point biserial of the response
Logit	Rasch logit difficulty
Logit SE	Rasch logit difficulty standard error
Fit	Rasch outfit statistic

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	5	549466	0001	All	1	OP	B	B	130124	0.618	0.109	0.618	0.149	0.121	0.002	0.355	-0.292	0.355	-0.287	-0.282	1.155	0.007	9.9
Writing	5	550198	0002	All	2	OP	A	B	130124	0.840	0.840	0.053	0.085	0.022	0.001	0.348	0.348	-0.249	-0.238	-0.230	-0.326	0.009	9.9
Writing	5	550199	0003	All	3	OP	D	B	130124	0.833	0.089	0.047	0.031	0.833	0.001	0.358	-0.242	-0.278	-0.217	0.358	-0.268	0.009	9.9
Writing	5	549467	0004	All	4	OP	A	B	130124	0.637	0.637	0.201	0.091	0.070	0.001	0.391	0.391	-0.257	-0.352	-0.404	1.040	0.007	9.9
Writing	5	549378	0005	All	9	OP	B	B	130124	0.838	0.028	0.838	0.090	0.042	0.001	0.352	-0.255	0.352	-0.235	-0.245	-0.323	0.009	9.9
Writing	5	549379	0006	All	10	OP	C	B	130124	0.814	0.063	0.057	0.814	0.065	0.001	0.428	-0.275	-0.317	0.428	-0.306	-0.091	0.008	9.9
Writing	5	549380	0007	All	11	OP	A	B	130124	0.479	0.479	0.075	0.167	0.276	0.002	0.249	0.249	-0.124	-0.253	-0.246	1.922	0.007	9.9
Writing	5	550128	0008	All	12	OP	D	B	130124	0.686	0.149	0.082	0.079	0.686	0.003	0.304	-0.225	-0.232	-0.249	0.304	0.755	0.007	9.9
Writing	5	549468	0009	All	17	OP	A	B	130124	0.748	0.748	0.026	0.163	0.062	0.001	0.363	0.363	-0.304	-0.265	-0.275	0.381	0.008	9.9
Writing	5	550200	0010	All	18	OP	B	B	130124	0.447	0.181	0.447	0.308	0.061	0.002	0.321	-0.227	0.321	-0.333	-0.363	2.108	0.007	9.9
Writing	5	550201	0011	All	19	OP	B	B	130124	0.707	0.045	0.707	0.138	0.106	0.003	0.380	-0.273	0.380	-0.297	-0.292	0.622	0.007	9.9
Writing	5	549469	0012	All	20	OP	C	B	130124	0.679	0.126	0.111	0.679	0.082	0.002	0.382	-0.286	-0.291	0.382	-0.319	0.788	0.007	9.9
Writing	5	553730	0013	1	5	FT	C	B	13113	0.390	0.234	0.300	0.390	0.074	0.002	0.184	-0.192	-0.138	0.184	-0.277	2.591	0.022	9.9
Writing	5	553721	0014	1	6	FT	A	B	13113	0.910	0.910	0.049	0.021	0.018	0.001	0.321	0.321	-0.223	-0.205	-0.187	-1.491	0.036	8.7
Writing	5	553725	0015	1	7	FT	A	B	13113	0.349	0.349	0.099	0.166	0.384	0.001	0.127	0.127	-0.187	-0.142	-0.100	2.868	0.023	9.9
Writing	5	553729	0016	1	8	FT	D	B	13113	0.777	0.076	0.027	0.118	0.777	0.002	0.365	-0.275	-0.293	-0.251	0.365	0.018	0.025	9.9
Writing	5	553756	0017	1	13	FT	B	B	13113	0.771	0.077	0.771	0.084	0.067	0.001	0.417	-0.298	0.417	-0.300	-0.309	0.076	0.025	9.9
Writing	5	553757	0018	1	14	FT	B	B	13113	0.877	0.040	0.877	0.042	0.041	0.001	0.371	-0.216	0.371	-0.251	-0.264	-0.998	0.031	4.9
Writing	5	553758	0019	1	15	FT	C	B	13113	0.517	0.279	0.157	0.517	0.045	0.002	0.279	-0.210	-0.259	0.279	-0.347	1.798	0.022	9.9
Writing	5	553759	0020	1	16	FT	D	B	13113	0.691	0.082	0.159	0.062	0.691	0.005	0.438	-0.366	-0.322	-0.352	0.438	0.673	0.023	9.9
Writing	5	553792	0021	2	5	FT	B	B	13027	0.601	0.074	0.601	0.056	0.267	0.001	0.261	-0.229	0.261	-0.267	-0.188	1.297	0.022	9.9
Writing	5	553793	0022	2	6	FT	B	B	13027	0.762	0.139	0.762	0.057	0.041	0.002	0.304	-0.147	0.304	-0.312	-0.277	0.186	0.025	9.9
Writing	5	553794	0023	2	7	FT	C	B	13027	0.780	0.143	0.018	0.780	0.058	0.002	0.356	-0.281	-0.235	0.356	-0.254	0.038	0.025	9.9
Writing	5	553795	0024	2	8	FT	C	B	13027	0.714	0.041	0.176	0.714	0.066	0.003	0.330	-0.277	-0.257	0.330	-0.226	0.545	0.023	9.9
Writing	5	549376	0025	2	13	MXLK	A	B	13027	0.816	0.816	0.054	0.041	0.089	0.001	0.417	0.417	-0.306	-0.320	-0.268	-0.335	0.027	9.9
Writing	5	549377	0026	2	14	MXLK	D	B	13027	0.616	0.200	0.093	0.089	0.616	0.002	0.390	-0.258	-0.405	-0.356	0.390	1.183	0.022	9.9
Writing	5	550126	0027	2	15	MXLK	D	B	13027	0.543	0.136	0.119	0.200	0.543	0.002	0.411	-0.312	-0.456	-0.332	0.411	1.783	0.022	9.9
Writing	5	550127	0028	2	16	MXLK	D	B	13027	0.636	0.102	0.115	0.143	0.636	0.004	0.387	-0.305	-0.330	-0.306	0.387	1.110	0.022	9.9
Writing	5	553778	0029	3	5	FT	B	B	13005	0.799	0.094	0.799	0.060	0.046	0.001	0.329	-0.236	0.329	-0.260	-0.186	-0.151	0.026	9.9
Writing	5	553754	0030	3	6	FT	B	B	13005	0.666	0.112	0.666	0.159	0.062	0.001	0.337	-0.259	0.337	-0.256	-0.281	0.853	0.023	9.9
Writing	5	553755	0031	3	7	FT	C	B	13005	0.571	0.050	0.311	0.571	0.067	0.001	0.268	-0.248	-0.185	0.268	-0.330	1.459	0.022	9.9
Writing	5	553753	0032	3	8	FT	A	B	13005	0.861	0.861	0.051	0.051	0.036	0.001	0.445	0.445	-0.296	-0.308	-0.304	-0.782	0.030	4.0
Writing	5	553713	0033	3	13	FT	D	B	13005	0.447	0.378	0.149	0.025	0.447	0.001	0.294	-0.300	-0.195	-0.376	0.294	2.217	0.022	9.9
Writing	5	553715	0034	3	14	FT	C	B	13005	0.523	0.139	0.178	0.523	0.158	0.002	0.284	-0.232	-0.258	0.284	-0.240	1.749	0.022	9.9
Writing	5	553714	0035	3	15	FT	C	B	13005	0.807	0.064	0.071	0.807	0.055	0.003	0.377	-0.249	-0.305	0.377	-0.229	-0.227	0.026	9.9
Writing	5	553716	0036	3	16	FT	A	B	13005	0.681	0.681	0.183	0.060	0.073	0.003	0.211	0.211	-0.090	-0.259	-0.201	0.746	0.023	9.9
Writing	5	549370	0037	4	5	MXLK	B	B	13020	0.699	0.023	0.699	0.029	0.247	0.001	0.338	-0.235	0.338	-0.279	-0.282	0.948	0.023	9.9
Writing	5	549371	0038	4	6	MXLK	A	B	13020	0.827	0.827	0.075	0.047	0.049	0.001	0.444	0.444	-0.333	-0.288	-0.305	-0.096	0.026	6.5
Writing	5	549372	0039	4	7	MXLK	C	B	13020	0.567	0.247	0.118	0.567	0.067	0.001	0.254	-0.147	-0.274	0.254	-0.293	1.829	0.022	9.9
Writing	5	550124	0040	4	8	MXLK	C	B	13020	0.733	0.059	0.074	0.733	0.133	0.002	0.394	-0.309	-0.291	0.394	-0.291	0.686	0.023	9.9
Writing	5	553760	0041	4	13	FT	C	B	13020	0.388	0.167	0.378	0.388	0.065	0.002	0.284	-0.308	-0.239	0.284	-0.370	2.636	0.022	9.9
Writing	5	553761	0042	4	14	FT	D	B	13020	0.870	0.047	0.033	0.048	0.870	0.002	0.438	-0.276	-0.287	-0.320	0.438	-0.851	0.031	3.0
Writing	5	553762	0043	4	15	FT	C	B	13020	0.469	0.101	0.216	0.469	0.212	0.002	0.126	-0.233	-0.093	0.126	-0.065	2.133	0.022	9.9

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	5	553763	0044	4	16	FT	D	B	13020	0.481	0.028	0.346	0.139	0.481	0.006	0.322	-0.358	-0.297	-0.276	0.322	2.056	0.022	9.9
Writing	5	553780	0045	5	5	FT	B	B	13024	0.546	0.111	0.546	0.278	0.064	0.001	0.358	-0.331	0.358	-0.319	-0.253	1.639	0.022	9.9
Writing	5	553781	0046	5	6	FT	C	B	13024	0.732	0.182	0.041	0.732	0.043	0.001	0.335	-0.223	-0.292	0.335	-0.300	0.418	0.024	9.9
Writing	5	553782	0047	5	7	FT	C	B	13024	0.688	0.056	0.189	0.688	0.065	0.001	0.382	-0.270	-0.305	0.382	-0.310	0.729	0.023	9.9
Writing	5	553779	0048	5	8	FT	D	B	13024	0.696	0.036	0.168	0.098	0.696	0.002	0.385	-0.320	-0.309	-0.282	0.385	0.674	0.023	9.9
Writing	5	553764	0049	5	13	FT	B	B	13024	0.779	0.082	0.779	0.065	0.071	0.002	0.419	-0.254	0.419	-0.325	-0.336	0.048	0.025	9.9
Writing	5	553765	0050	5	14	FT	C	B	13024	0.858	0.028	0.075	0.858	0.035	0.003	0.413	-0.278	-0.282	0.413	-0.299	-0.712	0.030	9.9
Writing	5	553766	0051	5	15	FT	A	B	13024	0.631	0.631	0.051	0.103	0.210	0.004	0.273	0.273	-0.266	-0.304	-0.155	1.104	0.022	9.9
Writing	5	553767	0052	5	16	FT	D	B	13024	0.555	0.093	0.164	0.182	0.555	0.005	0.330	-0.291	-0.292	-0.272	0.330	1.584	0.022	9.9
Writing	5	553787	0053	6	5	FT	B	B	13052	0.178	0.162	0.178	0.123	0.535	0.001	-0.040	-0.094	-0.040	-0.097	0.124	4.261	0.028	9.9
Writing	5	553789	0054	6	6	FT	C	B	13052	0.349	0.290	0.183	0.349	0.177	0.001	0.243	-0.212	-0.268	0.243	-0.290	2.912	0.023	9.9
Writing	5	553788	0055	6	7	FT	A	B	13052	0.934	0.934	0.022	0.030	0.013	0.002	0.286	0.286	-0.193	-0.189	-0.145	-1.882	0.042	9.9
Writing	5	553790	0056	6	8	FT	D	B	13052	0.794	0.110	0.076	0.018	0.794	0.002	0.255	-0.063	-0.316	-0.225	0.255	-0.046	0.026	9.9
Writing	5	549367	0057	6	13	MXLK	A	B	13052	0.937	0.937	0.022	0.023	0.017	0.002	0.348	0.348	-0.228	-0.212	-0.221	-1.985	0.043	3.9
Writing	5	549368	0058	6	14	MXLK	A	B	13052	0.512	0.512	0.154	0.160	0.172	0.002	0.268	0.268	-0.281	-0.235	-0.208	2.321	0.022	9.9
Writing	5	549369	0059	6	15	MXLK	B	B	13052	0.768	0.169	0.768	0.050	0.012	0.002	0.374	-0.299	0.374	-0.309	-0.198	0.350	0.024	9.9
Writing	5	550123	0060	6	16	MXLK	B	B	13052	0.657	0.071	0.657	0.150	0.118	0.005	0.362	-0.213	0.362	-0.347	-0.270	1.173	0.022	9.9
Writing	5	553718	0061	7	5	FT	B	B	13046	0.498	0.178	0.498	0.154	0.169	0.001	0.314	-0.309	0.314	-0.263	-0.265	1.933	0.021	9.9
Writing	5	553722	0062	7	6	FT	B	B	13046	0.552	0.134	0.552	0.196	0.118	0.001	0.316	-0.264	0.316	-0.235	-0.329	1.611	0.022	9.9
Writing	5	553726	0063	7	7	FT	A	B	13046	0.531	0.531	0.144	0.184	0.139	0.002	0.259	0.259	-0.237	-0.226	-0.220	1.735	0.022	9.9
Writing	5	553731	0064	7	8	FT	C	B	13046	0.490	0.193	0.199	0.490	0.114	0.004	0.278	-0.249	-0.259	0.278	-0.239	1.984	0.021	9.9
Writing	5	553774	0065	7	13	FT	A	B	13046	0.274	0.274	0.602	0.093	0.028	0.002	0.243	0.243	-0.228	-0.299	-0.385	3.392	0.024	9.9
Writing	5	553775	0066	7	14	FT	B	B	13046	0.587	0.139	0.587	0.088	0.184	0.003	0.301	-0.257	0.301	-0.255	-0.243	1.394	0.022	9.9
Writing	5	553776	0067	7	15	FT	C	B	13046	0.822	0.038	0.049	0.822	0.087	0.004	0.432	-0.239	-0.266	0.432	-0.379	-0.330	0.027	9.9
Writing	5	553777	0068	7	16	FT	A	B	13046	0.692	0.692	0.227	0.032	0.044	0.005	0.388	0.388	-0.296	-0.348	-0.339	0.713	0.023	9.9
Writing	5	553783	0069	8	5	FT	B	B	13009	0.829	0.020	0.829	0.118	0.033	0.001	0.394	-0.253	0.394	-0.309	-0.263	-0.422	0.027	9.9
Writing	5	553785	0070	8	6	FT	D	B	13009	0.847	0.032	0.042	0.078	0.847	0.000	0.360	-0.258	-0.270	-0.222	0.360	-0.617	0.029	9.9
Writing	5	553784	0071	8	7	FT	B	B	13009	0.705	0.069	0.705	0.113	0.111	0.001	0.403	-0.294	0.403	-0.356	-0.275	0.590	0.023	9.9
Writing	5	557896	0072	8	8	FT	D	B	13009	0.421	0.129	0.289	0.159	0.421	0.002	0.223	-0.224	-0.189	-0.238	0.223	2.396	0.022	9.9
Writing	5	549399	0073	8	13	MXLK	D	B	13009	0.717	0.047	0.061	0.172	0.717	0.003	0.309	-0.235	-0.243	-0.228	0.309	0.386	0.024	9.9
Writing	5	549400	0074	8	14	MXLK	C	B	13009	0.729	0.076	0.116	0.729	0.076	0.003	0.461	-0.350	-0.334	0.461	-0.370	0.316	0.024	9.9
Writing	5	550134	0075	8	15	MXLK	C	B	13009	0.642	0.103	0.174	0.642	0.076	0.004	0.339	-0.278	-0.303	0.339	-0.206	0.899	0.023	9.9
Writing	5	550137	0076	8	16	MXLK	A	B	13009	0.339	0.339	0.036	0.257	0.361	0.006	0.179	0.179	-0.277	-0.202	-0.147	2.905	0.023	9.9
Writing	5	553717	0077	9	5	FT	A	B	12948	0.517	0.517	0.208	0.156	0.116	0.002	0.350	0.350	-0.312	-0.325	-0.286	1.856	0.022	9.9
Writing	5	553724	0078	9	6	FT	B	B	12948	0.495	0.375	0.495	0.068	0.059	0.002	0.187	-0.110	0.187	-0.276	-0.273	1.989	0.022	9.9
Writing	5	553728	0079	9	7	FT	C	B	12948	0.655	0.037	0.032	0.655	0.274	0.002	0.340	-0.276	-0.271	0.340	-0.283	1.006	0.022	9.9
Writing	5	553720	0080	9	8	FT	D	B	12948	0.425	0.155	0.133	0.284	0.425	0.003	0.229	-0.216	-0.273	-0.183	0.229	2.414	0.022	9.9
Writing	5	553768	0081	9	13	FT	A	B	12948	0.546	0.546	0.070	0.062	0.320	0.002	0.332	0.332	-0.337	-0.332	-0.257	1.681	0.022	9.9
Writing	5	553786	0082	9	14	FT	C	B	12948	0.604	0.030	0.277	0.604	0.087	0.002	0.339	-0.342	-0.262	0.339	-0.308	1.328	0.022	9.9
Writing	5	553769	0083	9	15	FT	B	B	12948	0.715	0.095	0.715	0.105	0.082	0.004	0.367	-0.264	0.367	-0.285	-0.271	0.595	0.023	9.9
Writing	5	553770	0084	9	16	FT	D	B	12948	0.586	0.068	0.134	0.205	0.586	0.007	0.266	-0.286	-0.239	-0.179	0.266	1.440	0.022	9.9
Writing	5	553791	0085	10	5	FT	A	B	12880	0.435	0.435	0.124	0.323	0.117	0.001	0.283	0.283	-0.426	-0.230	-0.176	2.325	0.022	9.9
Writing	5	553772	0086	10	6	FT	C	B	12880	0.782	0.055	0.078	0.782	0.084	0.001	0.445	-0.339	-0.335	0.445	-0.297	0.018	0.025	9.9

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	5	553771	0087	10	7	FT	D	B	12880	0.554	0.060	0.277	0.108	0.554	0.001	0.316	-0.287	-0.251	-0.297	0.316	1.587	0.022	9.9
Writing	5	553773	0088	10	8	FT	C	B	12880	0.765	0.115	0.076	0.765	0.042	0.002	0.356	-0.269	-0.313	0.356	-0.168	0.153	0.025	9.9
Writing	5	553719	0089	10	13	FT	D	B	12880	0.568	0.326	0.066	0.038	0.568	0.002	0.350	-0.294	-0.319	-0.340	0.350	1.503	0.022	9.9
Writing	5	553723	0090	10	14	FT	C	B	12880	0.662	0.042	0.104	0.662	0.190	0.003	0.347	-0.293	-0.319	0.347	-0.240	0.902	0.023	9.9
Writing	5	553732	0091	10	15	FT	C	B	12880	0.729	0.066	0.110	0.729	0.092	0.003	0.376	-0.313	-0.226	0.376	-0.312	0.428	0.024	9.9
Writing	5	553727	0092	10	16	FT	D	B	12880	0.733	0.051	0.095	0.115	0.733	0.005	0.440	-0.327	-0.334	-0.338	0.440	0.400	0.024	9.9
Writing	8	549401	0093	All	1	OP	C	B	140738	0.808	0.060	0.120	0.808	0.011	0.001	0.280	-0.233	-0.200	0.280	-0.131	-0.307	0.009	9.9
Writing	8	549402	0094	All	2	OP	A	B	140738	0.748	0.748	0.061	0.037	0.155	0.001	0.291	0.291	-0.228	-0.163	-0.229	0.119	0.008	9.9
Writing	8	550135	0095	All	3	OP	D	B	140738	0.531	0.116	0.257	0.094	0.531	0.002	0.374	-0.309	-0.321	-0.373	0.374	1.355	0.007	9.9
Writing	8	550136	0096	All	4	OP	D	B	140738	0.622	0.175	0.143	0.059	0.622	0.001	0.298	-0.266	-0.265	-0.141	0.298	0.879	0.007	9.9
Writing	8	549409	0097	All	9	OP	B	B	140738	0.902	0.035	0.902	0.028	0.033	0.001	0.378	-0.243	0.378	-0.245	-0.240	-1.243	0.011	9.9
Writing	8	549410	0098	All	10	OP	D	B	140738	0.557	0.070	0.247	0.124	0.557	0.002	0.382	-0.379	-0.319	-0.320	0.382	1.213	0.007	9.9
Writing	8	550144	0099	All	11	OP	D	B	140738	0.695	0.184	0.071	0.048	0.695	0.001	0.356	-0.302	-0.264	-0.223	0.356	0.446	0.008	9.9
Writing	8	550145	0100	All	12	OP	A	B	140738	0.490	0.490	0.184	0.156	0.169	0.002	0.425	0.425	-0.225	-0.509	-0.463	1.601	0.007	9.9
Writing	8	549429	0101	All	17	OP	C	B	140738	0.696	0.019	0.128	0.696	0.156	0.001	0.475	-0.309	-0.446	0.475	-0.339	0.445	0.008	9.9
Writing	8	549430	0102	All	18	OP	B	B	140738	0.716	0.201	0.716	0.035	0.046	0.002	0.279	-0.141	0.279	-0.291	-0.326	0.325	0.008	9.9
Writing	8	550163	0103	All	19	OP	C	B	140738	0.415	0.193	0.273	0.415	0.117	0.003	0.279	-0.273	-0.247	0.279	-0.311	2.009	0.007	9.9
Writing	8	550165	0104	All	20	OP	D	B	140738	0.818	0.080	0.052	0.048	0.818	0.003	0.405	-0.230	-0.313	-0.313	0.405	-0.385	0.009	9.9
Writing	8	553839	0105	1	5	FT	B	B	14181	0.366	0.269	0.366	0.168	0.195	0.001	0.139	-0.188	0.139	-0.184	-0.034	3.174	0.023	9.9
Writing	8	553840	0106	1	6	FT	B	B	14181	0.712	0.051	0.712	0.181	0.055	0.001	0.347	-0.250	0.347	-0.252	-0.303	0.767	0.023	9.9
Writing	8	553842	0107	1	7	FT	C	B	14181	0.874	0.044	0.874	0.059	0.021	0.002	0.319	-0.196	0.319	-0.236	-0.186	-0.787	0.030	9.9
Writing	8	553841	0108	1	8	FT	B	B	14181	0.865	0.072	0.034	0.865	0.028	0.001	0.288	-0.194	-0.200	0.288	-0.179	-0.675	0.029	9.9
Writing	8	553832	0109	1	13	FT	B	B	14181	0.479	0.430	0.479	0.045	0.044	0.003	0.404	-0.363	0.404	-0.401	-0.369	2.396	0.022	9.9
Writing	8	553831	0110	1	14	FT	C	B	14181	0.560	0.142	0.158	0.560	0.138	0.002	0.238	-0.231	-0.174	0.238	-0.192	1.852	0.022	9.9
Writing	8	553833	0111	1	15	FT	C	B	14181	0.386	0.069	0.208	0.386	0.334	0.003	-0.007	-0.192	-0.036	-0.007	0.098	3.032	0.022	9.9
Writing	8	553834	0112	1	16	FT	D	B	14181	0.425	0.178	0.198	0.195	0.425	0.004	0.366	-0.321	-0.370	-0.353	0.366	2.756	0.022	9.9
Writing	8	553812	0113	2	5	FT	B	B	14084	0.748	0.049	0.748	0.191	0.011	0.001	0.211	-0.244	0.211	-0.126	-0.157	0.496	0.024	9.9
Writing	8	553813	0114	2	6	FT	A	B	14084	0.436	0.436	0.212	0.180	0.170	0.001	0.157	0.157	-0.253	-0.088	-0.076	2.703	0.022	9.9
Writing	8	553814	0115	2	7	FT	C	B	14084	0.581	0.049	0.220	0.581	0.147	0.002	0.298	-0.288	-0.209	0.298	-0.283	1.723	0.022	9.9
Writing	8	553815	0116	2	8	FT	C	B	14084	0.635	0.036	0.148	0.635	0.179	0.002	0.400	-0.344	-0.321	0.400	-0.331	1.352	0.022	9.9
Writing	8	549403	0117	2	13	MXLK	A	B	14084	0.895	0.895	0.062	0.020	0.021	0.001	0.359	0.359	-0.281	-0.233	-0.166	-1.249	0.034	9.9
Writing	8	550138	0118	2	14	MXLK	C	B	14084	0.782	0.110	0.064	0.782	0.042	0.001	0.443	-0.336	-0.342	0.443	-0.268	-0.058	0.026	9.9
Writing	8	549404	0119	2	15	MXLK	D	B	14084	0.527	0.175	0.040	0.256	0.527	0.002	0.231	-0.214	-0.193	-0.192	0.231	1.862	0.022	9.9
Writing	8	550141	0120	2	16	MXLK	C	B	14084	0.703	0.138	0.083	0.703	0.074	0.003	0.325	-0.275	-0.222	0.325	-0.215	0.529	0.024	9.9
Writing	8	553739	0121	3	5	FT	A	B	14083	0.847	0.847	0.067	0.035	0.050	0.001	0.337	0.337	-0.253	-0.235	-0.187	-0.452	0.028	9.9
Writing	8	553742	0122	3	6	FT	A	B	14083	0.748	0.748	0.062	0.158	0.030	0.001	0.375	0.375	-0.282	-0.286	-0.266	0.490	0.024	9.9
Writing	8	553746	0123	3	7	FT	C	B	14083	0.918	0.031	0.038	0.918	0.012	0.001	0.335	-0.224	-0.239	0.335	-0.161	-1.449	0.036	9.9
Writing	8	553750	0124	3	8	FT	C	B	14083	0.875	0.018	0.070	0.875	0.035	0.003	0.353	-0.232	-0.247	0.353	-0.234	-0.785	0.030	9.9
Writing	8	553835	0125	3	13	FT	A	B	14083	0.673	0.673	0.023	0.020	0.282	0.001	0.346	0.346	-0.259	-0.243	-0.300	1.076	0.023	9.9
Writing	8	553838	0126	3	14	FT	A	B	14083	0.794	0.794	0.079	0.061	0.063	0.002	0.407	0.407	-0.272	-0.338	-0.261	0.084	0.026	9.9
Writing	8	553837	0127	3	15	FT	C	B	14083	0.626	0.141	0.078	0.626	0.153	0.002	0.313	-0.255	-0.261	0.313	-0.233	1.426	0.023	9.9
Writing	8	553836	0128	3	16	FT	C	B	14083	0.718	0.099	0.132	0.718	0.048	0.003	0.384	-0.304	-0.279	0.384	-0.280	0.735	0.024	9.9
Writing	8	553734	0129	4	5	FT	B	B	14025	0.611	0.124	0.611	0.115	0.147	0.002	0.311	-0.285	0.311	-0.251	-0.218	1.460	0.022	9.9

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	8	553738	0130	4	6	FT	A	B	14025	0.782	0.782	0.073	0.042	0.102	0.001	0.253	0.253	-0.199	-0.205	-0.143	0.137	0.025	9.9
Writing	8	553741	0131	4	7	FT	C	B	14025	0.893	0.037	0.046	0.893	0.024	0.001	0.346	-0.240	-0.216	0.346	-0.221	-1.098	0.032	9.9
Writing	8	553745	0132	4	8	FT	C	B	14025	0.701	0.114	0.092	0.701	0.092	0.001	0.303	-0.245	-0.208	0.303	-0.219	0.802	0.023	9.9
Writing	8	549427	0133	4	13	MXLK	A	B	14025	0.714	0.714	0.077	0.174	0.034	0.001	0.333	0.333	-0.326	-0.216	-0.240	0.377	0.024	9.9
Writing	8	549428	0134	4	14	MXLK	B	B	14025	0.512	0.246	0.512	0.123	0.115	0.003	0.341	-0.335	0.341	-0.336	-0.193	1.801	0.022	9.9
Writing	8	550162	0135	4	15	MXLK	C	B	14025	0.760	0.141	0.072	0.760	0.024	0.002	0.339	-0.243	-0.285	0.339	-0.198	0.020	0.026	9.9
Writing	8	550164	0136	4	16	MXLK	D	B	14025	0.795	0.035	0.043	0.125	0.795	0.003	0.363	-0.260	-0.267	-0.258	0.363	-0.294	0.027	9.9
Writing	8	553808	0137	5	5	FT	A	B	14070	0.463	0.463	0.199	0.174	0.163	0.001	0.222	0.222	-0.265	-0.193	-0.135	2.548	0.022	9.9
Writing	8	553809	0138	5	6	FT	B	B	14070	0.887	0.061	0.887	0.036	0.015	0.001	0.328	-0.216	0.328	-0.236	-0.193	-0.953	0.032	9.9
Writing	8	553810	0139	5	7	FT	C	B	14070	0.267	0.463	0.224	0.267	0.045	0.001	0.118	-0.084	-0.140	0.118	-0.393	4.011	0.025	9.9
Writing	8	553811	0140	5	8	FT	B	B	14070	0.519	0.105	0.519	0.073	0.299	0.003	0.266	-0.221	0.266	-0.368	-0.187	2.164	0.022	9.9
Writing	8	553733	0141	5	13	FT	D	B	14070	0.497	0.258	0.111	0.132	0.497	0.002	0.496	-0.439	-0.489	-0.466	0.496	2.313	0.022	9.9
Writing	8	553736	0142	5	14	FT	A	B	14070	0.693	0.693	0.203	0.062	0.039	0.002	0.340	0.340	-0.246	-0.293	-0.282	0.936	0.023	9.9
Writing	8	553740	0143	5	15	FT	A	B	14070	0.768	0.768	0.057	0.048	0.124	0.002	0.417	0.417	-0.256	-0.322	-0.323	0.328	0.025	9.9
Writing	8	553748	0144	5	16	FT	B	B	14070	0.297	0.385	0.297	0.073	0.241	0.004	0.182	-0.266	0.182	-0.401	0.005	3.753	0.024	9.9
Writing	8	549419	0145	6	5	MXLK	A	B	14023	0.540	0.540	0.237	0.062	0.159	0.002	0.329	0.329	-0.214	-0.284	-0.375	1.470	0.022	9.9
Writing	8	549420	0146	6	6	MXLK	B	B	14023	0.615	0.134	0.615	0.124	0.125	0.001	0.320	-0.258	0.320	-0.245	-0.261	1.024	0.023	9.9
Writing	8	550154	0147	6	7	MXLK	D	B	14023	0.957	0.010	0.012	0.021	0.957	0.001	0.277	-0.171	-0.192	-0.155	0.277	-2.933	0.057	8.1
Writing	8	550155	0148	6	8	MXLK	C	B	14023	0.729	0.040	0.181	0.729	0.048	0.001	0.379	-0.314	-0.300	0.379	-0.238	0.143	0.025	9.9
Writing	8	553735	0149	6	13	FT	B	B	14023	0.941	0.021	0.941	0.024	0.012	0.001	0.325	-0.191	0.325	-0.229	-0.180	-2.012	0.042	9.9
Writing	8	553743	0150	6	14	FT	B	B	14023	0.573	0.090	0.573	0.148	0.187	0.002	0.347	-0.263	0.347	-0.232	-0.365	1.746	0.022	9.9
Writing	8	553747	0151	6	15	FT	C	B	14023	0.762	0.054	0.077	0.762	0.104	0.002	0.397	-0.252	-0.332	0.397	-0.274	0.321	0.025	9.9
Writing	8	553751	0152	6	16	FT	A	B	14023	0.790	0.790	0.024	0.148	0.035	0.002	0.404	0.404	-0.277	-0.351	-0.202	0.069	0.026	9.9
Writing	8	553824	0153	7	5	FT	C	B	14041	0.518	0.206	0.231	0.518	0.045	0.001	0.344	-0.289	-0.312	0.344	-0.332	2.159	0.022	9.9
Writing	8	553825	0154	7	6	FT	A	B	14041	0.397	0.397	0.175	0.168	0.259	0.002	0.167	0.167	-0.132	-0.310	-0.076	2.973	0.022	9.9
Writing	8	553826	0155	7	7	FT	B	B	14041	0.834	0.050	0.834	0.018	0.097	0.001	0.221	-0.286	0.221	-0.201	-0.042	-0.264	0.027	9.9
Writing	8	553827	0156	7	8	FT	D	B	14041	0.243	0.343	0.124	0.289	0.243	0.001	0.116	-0.141	-0.353	-0.025	0.116	4.172	0.026	9.9
Writing	8	553807	0157	7	13	FT	A	B	14041	0.686	0.686	0.069	0.165	0.078	0.002	0.257	0.257	-0.302	-0.135	-0.197	1.008	0.023	9.9
Writing	8	553804	0158	7	14	FT	A	B	14041	0.607	0.607	0.074	0.288	0.029	0.001	0.357	0.357	-0.335	-0.286	-0.318	1.563	0.022	9.9
Writing	8	553805	0159	7	15	FT	B	B	14041	0.654	0.119	0.654	0.174	0.049	0.004	0.095	-0.097	0.095	-0.001	-0.179	1.239	0.022	9.9
Writing	8	553806	0160	7	16	FT	C	B	14041	0.564	0.256	0.157	0.564	0.020	0.003	0.506	-0.489	-0.458	0.506	-0.213	1.856	0.022	9.9
Writing	8	553820	0161	8	5	FT	B	B	14052	0.514	0.227	0.514	0.099	0.159	0.001	0.305	-0.256	0.305	-0.235	-0.321	2.216	0.022	9.9
Writing	8	553821	0162	8	6	FT	A	B	14052	0.709	0.709	0.103	0.051	0.134	0.003	0.287	0.287	-0.215	-0.250	-0.196	0.819	0.024	9.9
Writing	8	553822	0163	8	7	FT	C	B	14052	0.785	0.056	0.072	0.785	0.086	0.001	0.378	-0.156	-0.284	0.378	-0.337	0.184	0.025	9.9
Writing	8	553823	0164	8	8	FT	B	B	14052	0.902	0.026	0.902	0.057	0.014	0.001	0.407	-0.242	0.407	-0.318	-0.213	-1.167	0.034	3.1
Writing	8	549431	0165	8	13	MXLK	A	B	14052	0.840	0.840	0.050	0.094	0.015	0.001	0.380	0.380	-0.276	-0.294	-0.182	-0.535	0.029	9.9
Writing	8	549432	0166	8	14	MXLK	B	B	14052	0.548	0.207	0.548	0.155	0.088	0.002	0.229	-0.254	0.229	-0.062	-0.276	1.850	0.022	9.9
Writing	8	550166	0167	8	15	MXLK	A	B	14052	0.793	0.793	0.140	0.037	0.028	0.001	0.377	0.377	-0.294	-0.293	-0.213	-0.007	0.026	9.9
Writing	8	550169	0168	8	16	MXLK	C	B	14052	0.789	0.069	0.093	0.789	0.047	0.002	0.424	-0.362	-0.273	0.424	-0.280	-0.020	0.026	9.9
Writing	8	553800	0169	9	5	FT	B	B	14098	0.560	0.080	0.560	0.061	0.297	0.001	0.279	-0.266	0.279	-0.303	-0.204	1.838	0.022	9.9
Writing	8	553801	0170	9	6	FT	B	B	14098	0.856	0.034	0.856	0.058	0.051	0.002	0.280	-0.239	0.280	-0.187	-0.136	-0.572	0.029	9.9
Writing	8	553802	0171	9	7	FT	C	B	14098	0.702	0.100	0.130	0.702	0.067	0.001	0.371	-0.335	-0.276	0.371	-0.219	0.830	0.023	9.9
Writing	8	553803	0172	9	8	FT	D	B	14098	0.733	0.153	0.044	0.067	0.733	0.003	0.314	-0.179	-0.273	-0.294	0.314	0.588	0.024	9.9

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	8	553816	0173	9	13	FT	A	B	14098	0.752	0.752	0.029	0.024	0.193	0.001	0.306	0.306	-0.196	-0.205	-0.253	0.428	0.024	9.9
Writing	8	553817	0174	9	14	FT	B	B	14098	0.693	0.134	0.693	0.155	0.016	0.001	0.326	-0.276	0.326	-0.253	-0.194	0.894	0.023	9.9
Writing	8	553818	0175	9	15	FT	B	B	14098	0.842	0.054	0.842	0.092	0.012	0.001	0.314	-0.228	0.314	-0.226	-0.176	-0.414	0.028	9.9
Writing	8	553819	0176	9	16	FT	C	B	14098	0.730	0.059	0.078	0.730	0.130	0.004	0.335	-0.318	-0.218	0.335	-0.223	0.610	0.024	9.9
Writing	8	553796	0177	10	5	FT	A	B	14081	0.652	0.652	0.064	0.071	0.212	0.001	0.303	0.303	-0.281	-0.174	-0.248	1.208	0.023	9.9
Writing	8	553798	0178	10	6	FT	A	B	14081	0.871	0.871	0.025	0.043	0.061	0.001	0.451	0.451	-0.275	-0.307	-0.323	-0.764	0.030	3.5
Writing	8	553797	0179	10	7	FT	B	B	14081	0.603	0.148	0.603	0.062	0.186	0.002	0.176	-0.085	0.176	-0.252	-0.130	1.560	0.022	9.9
Writing	8	553799	0180	10	8	FT	D	B	14081	0.906	0.039	0.020	0.033	0.906	0.001	0.325	-0.189	-0.209	-0.226	0.325	-1.281	0.034	9.9
Writing	8	553737	0181	10	13	FT	B	B	14081	0.276	0.384	0.276	0.151	0.185	0.003	0.060	0.019	0.060	-0.225	-0.093	3.913	0.025	9.9
Writing	8	553749	0182	10	14	FT	C	B	14081	0.574	0.139	0.170	0.574	0.115	0.002	0.405	-0.331	-0.336	0.405	-0.363	1.761	0.022	9.9
Writing	8	553752	0183	10	15	FT	C	B	14081	0.883	0.033	0.049	0.883	0.033	0.001	0.367	-0.234	-0.264	0.367	-0.217	-0.934	0.031	6.7
Writing	8	553744	0184	10	16	FT	D	B	14081	0.433	0.239	0.193	0.132	0.433	0.003	0.379	-0.360	-0.392	-0.334	0.379	2.724	0.022	9.9
Writing	11	549433	0185	All	1	OP	A	B	134692	0.789	0.789	0.034	0.048	0.128	0.001	0.244	0.244	-0.188	-0.180	-0.160	-0.052	0.008	9.9
Writing	11	549434	0186	All	2	OP	B	B	134692	0.652	0.284	0.652	0.053	0.011	0.000	0.255	-0.258	0.255	-0.100	-0.097	0.814	0.007	9.9
Writing	11	550167	0187	All	3	OP	B	B	134692	0.191	0.077	0.191	0.405	0.326	0.002	0.174	-0.270	0.174	-0.146	-0.271	3.418	0.008	9.9
Writing	11	550168	0188	All	4	OP	D	B	134692	0.917	0.015	0.034	0.034	0.917	0.001	0.211	-0.108	-0.102	-0.178	0.211	-1.272	0.010	9.9
Writing	11	549435	0189	All	9	OP	C	B	134692	0.757	0.084	0.073	0.757	0.085	0.002	0.293	-0.276	-0.198	0.293	-0.145	0.190	0.008	9.9
Writing	11	549436	0190	All	10	OP	D	B	134692	0.599	0.011	0.195	0.194	0.599	0.001	0.307	-0.214	-0.232	-0.301	0.307	1.064	0.007	9.9
Writing	11	550170	0191	All	11	OP	C	B	134692	0.543	0.303	0.032	0.543	0.121	0.002	0.309	-0.304	-0.259	0.309	-0.194	1.389	0.007	9.9
Writing	11	550171	0192	All	12	OP	A	B	134692	0.318	0.318	0.166	0.194	0.315	0.001	0.174	0.174	-0.319	0.035	-0.233	2.538	0.007	9.9
Writing	11	549447	0193	All	17	OP	B	B	134692	0.764	0.086	0.764	0.080	0.068	0.001	0.356	-0.246	0.356	-0.264	-0.245	0.129	0.008	9.9
Writing	11	549448	0194	All	18	OP	C	B	134692	0.846	0.041	0.097	0.846	0.015	0.001	0.323	-0.196	-0.261	0.323	-0.159	-0.487	0.008	9.9
Writing	11	550182	0195	All	19	OP	C	B	134692	0.544	0.153	0.209	0.544	0.092	0.003	0.219	-0.220	-0.144	0.219	-0.197	1.358	0.007	9.9
Writing	11	550183	0196	All	20	OP	A	B	134692	0.767	0.767	0.062	0.139	0.030	0.001	0.280	0.280	-0.209	-0.184	-0.236	0.114	0.008	9.9
Writing	11	553868	0197	1	5	FT	D	B	13564	0.941	0.016	0.023	0.020	0.941	0.000	0.277	-0.156	-0.161	-0.197	0.277	-2.053	0.040	9.9
Writing	11	553869	0198	1	6	FT	C	B	13564	0.676	0.061	0.104	0.676	0.158	0.001	0.258	-0.225	-0.260	0.258	-0.128	0.674	0.022	9.9
Writing	11	553867	0199	1	7	FT	B	B	13564	0.302	0.328	0.302	0.141	0.229	0.001	-0.023	0.110	-0.023	-0.135	0.011	3.070	0.024	9.9
Writing	11	553866	0200	1	8	FT	D	B	13564	0.828	0.055	0.067	0.050	0.828	0.001	0.312	-0.248	-0.190	-0.197	0.312	-0.502	0.026	9.9
Writing	11	553890	0201	1	13	FT	A	B	13564	0.787	0.787	0.032	0.144	0.036	0.001	0.293	0.293	-0.244	-0.198	-0.212	-0.144	0.025	9.9
Writing	11	553892	0202	1	14	FT	B	B	13564	0.913	0.022	0.913	0.032	0.033	0.001	0.288	-0.159	0.288	-0.207	-0.171	-1.526	0.034	6.7
Writing	11	553891	0203	1	15	FT	D	B	13564	0.626	0.039	0.244	0.090	0.626	0.002	0.231	-0.242	-0.084	-0.360	0.231	1.002	0.022	9.9
Writing	11	553893	0204	1	16	FT	C	B	13564	0.683	0.174	0.066	0.683	0.074	0.002	0.352	-0.319	-0.262	0.352	-0.196	0.627	0.022	9.9
Writing	11	553878	0205	2	5	FT	D	B	13482	0.854	0.028	0.057	0.061	0.854	0.001	0.410	-0.247	-0.305	-0.276	0.410	-0.758	0.028	2.9
Writing	11	553879	0206	2	6	FT	D	B	13482	0.909	0.053	0.029	0.008	0.909	0.001	0.232	-0.139	-0.173	-0.152	0.232	-1.465	0.034	9.9
Writing	11	553880	0207	2	7	FT	B	B	13482	0.617	0.219	0.617	0.103	0.059	0.001	0.134	-0.036	0.134	-0.140	-0.225	1.061	0.022	9.9
Writing	11	553881	0208	2	8	FT	B	B	13482	0.428	0.198	0.428	0.095	0.278	0.002	0.231	-0.341	0.231	-0.302	-0.089	2.216	0.021	9.9
Writing	11	549437	0209	2	13	MXLK	A	B	13482	0.707	0.707	0.044	0.152	0.096	0.001	0.413	0.413	-0.278	-0.332	-0.320	0.421	0.023	9.9
Writing	11	549438	0210	2	14	MXLK	B	B	13482	0.902	0.032	0.902	0.044	0.022	0.001	0.364	-0.242	0.364	-0.263	-0.186	-1.544	0.035	5.3
Writing	11	550173	0211	2	15	MXLK	C	B	13482	0.562	0.034	0.182	0.562	0.221	0.001	0.274	-0.227	-0.223	0.274	-0.243	1.548	0.021	9.9
Writing	11	550174	0212	2	16	MXLK	B	B	13482	0.780	0.097	0.780	0.095	0.026	0.001	0.289	-0.213	0.289	-0.210	-0.184	-0.183	0.025	9.9
Writing	11	553850	0213	3	5	FT	A	B	13491	0.689	0.689	0.123	0.093	0.094	0.001	0.293	0.293	-0.230	-0.204	-0.224	0.577	0.022	9.9
Writing	11	553851	0214	3	6	FT	B	B	13491	0.891	0.044	0.891	0.044	0.018	0.001	0.307	-0.160	0.307	-0.282	-0.121	-1.230	0.032	5.6
Writing	11	553852	0215	3	7	FT	C	B	13491	0.538	0.082	0.011	0.538	0.369	0.000	0.196	-0.303	-0.201	0.196	-0.127	1.532	0.021	9.9

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	11	553853	0216	3	8	FT	C	B	13491	0.569	0.302	0.079	0.569	0.050	0.001	0.342	-0.296	-0.303	0.342	-0.248	1.342	0.021	9.9
Writing	11	553874	0217	3	13	FT	B	B	13491	0.617	0.215	0.617	0.038	0.129	0.001	0.317	-0.283	0.317	-0.127	-0.283	1.045	0.022	9.9
Writing	11	553875	0218	3	14	FT	C	B	13491	0.863	0.006	0.052	0.863	0.077	0.001	0.279	-0.118	-0.199	0.279	-0.212	-0.882	0.029	9.9
Writing	11	553876	0219	3	15	FT	A	B	13491	0.748	0.748	0.035	0.185	0.030	0.002	0.350	0.350	-0.224	-0.304	-0.191	0.153	0.024	9.9
Writing	11	553877	0220	3	16	FT	C	B	13491	0.483	0.273	0.215	0.483	0.027	0.002	0.309	-0.287	-0.284	0.309	-0.226	1.865	0.021	9.9
Writing	11	549445	0221	4	5	MXLK	C	B	13436	0.876	0.035	0.048	0.876	0.040	0.001	0.282	-0.104	-0.220	0.282	-0.214	-1.048	0.030	9.9
Writing	11	549446	0222	4	6	MXLK	A	B	13436	0.706	0.706	0.145	0.109	0.037	0.003	0.327	0.327	-0.340	-0.177	-0.164	0.649	0.023	9.9
Writing	11	550180	0223	4	7	MXLK	B	B	13436	0.583	0.350	0.583	0.038	0.027	0.001	0.361	-0.329	0.361	-0.261	-0.256	1.734	0.021	9.9
Writing	11	550181	0224	4	8	MXLK	D	B	13436	0.948	0.010	0.019	0.023	0.948	0.001	0.287	-0.156	-0.179	-0.193	0.287	-2.317	0.045	0.2
Writing	11	553846	0225	4	13	FT	A	B	13436	0.787	0.787	0.140	0.026	0.045	0.002	0.400	0.400	-0.357	-0.256	-0.193	-0.109	0.025	9.9
Writing	11	553849	0226	4	14	FT	B	B	13436	0.750	0.103	0.750	0.066	0.079	0.001	0.324	-0.216	0.324	-0.277	-0.214	0.183	0.024	9.9
Writing	11	553848	0227	4	15	FT	B	B	13436	0.476	0.287	0.476	0.048	0.187	0.002	0.328	-0.318	0.328	-0.314	-0.267	1.975	0.021	9.9
Writing	11	553847	0228	4	16	FT	D	B	13436	0.704	0.090	0.159	0.045	0.704	0.001	0.410	-0.317	-0.315	-0.313	0.410	0.523	0.023	9.9
Writing	11	553843	0229	5	5	FT	D	B	13463	0.686	0.016	0.238	0.060	0.686	0.000	0.406	-0.195	-0.371	-0.281	0.406	0.619	0.022	9.9
Writing	11	557898	0230	5	6	FT	C	B	13463	0.642	0.085	0.134	0.642	0.138	0.001	0.290	-0.280	-0.215	0.290	-0.195	0.907	0.022	9.9
Writing	11	557899	0231	5	7	FT	C	B	13463	0.445	0.375	0.156	0.445	0.025	0.000	0.213	-0.167	-0.247	0.213	-0.247	2.113	0.021	9.9
Writing	11	553844	0232	5	8	FT	A	B	13463	0.870	0.870	0.007	0.082	0.040	0.001	0.336	0.336	-0.157	-0.321	-0.134	-0.945	0.029	9.9
Writing	11	553885	0233	5	13	FT	A	B	13463	0.543	0.543	0.237	0.035	0.184	0.002	0.206	0.206	-0.207	-0.265	-0.110	1.519	0.021	9.9
Writing	11	553882	0234	5	14	FT	B	B	13463	0.793	0.036	0.793	0.035	0.135	0.001	0.254	-0.078	0.254	-0.187	-0.221	-0.182	0.025	9.9
Writing	11	553883	0235	5	15	FT	C	B	13463	0.905	0.016	0.034	0.905	0.043	0.001	0.340	-0.191	-0.245	0.340	-0.214	-1.408	0.033	0.9
Writing	11	553884	0236	5	16	FT	D	B	13463	0.801	0.045	0.086	0.066	0.801	0.002	0.430	-0.281	-0.298	-0.330	0.430	-0.249	0.025	9.9
Writing	11	553859	0237	6	5	FT	A	B	13462	0.406	0.406	0.475	0.082	0.036	0.001	0.105	0.105	-0.040	-0.270	-0.223	2.374	0.022	9.9
Writing	11	553860	0238	6	6	FT	B	B	13462	0.659	0.091	0.659	0.180	0.067	0.002	0.398	-0.378	0.398	-0.289	-0.270	0.824	0.022	9.9
Writing	11	553858	0239	6	7	FT	B	B	13462	0.742	0.097	0.742	0.027	0.133	0.001	0.280	-0.249	0.280	-0.202	-0.171	0.254	0.023	9.9
Writing	11	553861	0240	6	8	FT	D	B	13462	0.594	0.220	0.102	0.082	0.594	0.002	0.244	-0.220	-0.267	-0.076	0.244	1.231	0.021	9.9
Writing	11	549449	0241	6	13	MXLK	C	B	13462	0.921	0.032	0.036	0.921	0.010	0.001	0.318	-0.196	-0.245	0.318	-0.138	-1.444	0.034	2.2
Writing	11	549450	0242	6	14	MXLK	A	B	13462	0.903	0.903	0.041	0.040	0.015	0.001	0.296	0.296	-0.177	-0.206	-0.186	-1.163	0.031	9.9
Writing	11	550184	0243	6	15	MXLK	B	B	13462	0.687	0.085	0.687	0.113	0.113	0.002	0.404	-0.330	0.404	-0.306	-0.288	1.104	0.021	9.9
Writing	11	550186	0244	6	16	MXLK	D	B	13462	0.743	0.165	0.038	0.052	0.743	0.002	0.135	0.003	-0.210	-0.206	0.135	0.586	0.022	9.9
Writing	11	553862	0245	7	5	FT	B	B	13415	0.611	0.076	0.611	0.044	0.268	0.001	0.382	-0.179	0.382	-0.255	-0.385	1.091	0.022	9.9
Writing	11	553863	0246	7	6	FT	A	B	13415	0.588	0.588	0.087	0.104	0.220	0.001	0.419	0.419	-0.318	-0.348	-0.369	1.232	0.021	9.9
Writing	11	553864	0247	7	7	FT	C	B	13415	0.898	0.037	0.037	0.898	0.028	0.001	0.339	-0.192	-0.241	0.339	-0.220	-1.325	0.032	4.2
Writing	11	553865	0248	7	8	FT	D	B	13415	0.550	0.072	0.026	0.352	0.550	0.001	0.333	-0.294	-0.315	-0.283	0.333	1.467	0.021	9.9
Writing	11	553886	0249	7	13	FT	B	B	13415	0.883	0.034	0.883	0.054	0.028	0.001	0.376	-0.261	0.376	-0.247	-0.232	-1.117	0.031	4.3
Writing	11	553889	0250	7	14	FT	C	B	13415	0.704	0.145	0.109	0.704	0.040	0.001	0.274	-0.106	-0.307	0.274	-0.237	0.480	0.023	9.9
Writing	11	553887	0251	7	15	FT	B	B	13415	0.388	0.121	0.388	0.426	0.064	0.001	0.110	-0.226	0.110	-0.041	-0.189	2.469	0.022	9.9
Writing	11	553888	0252	7	16	FT	D	B	13415	0.520	0.048	0.080	0.350	0.520	0.002	0.340	-0.315	-0.381	-0.267	0.340	1.648	0.021	9.9
Writing	11	549443	0253	8	5	MXLK	B	B	13468	0.880	0.066	0.880	0.034	0.020	0.001	0.263	-0.170	0.263	-0.249	-0.084	-0.892	0.029	9.9
Writing	11	549444	0254	8	6	MXLK	A	B	13468	0.933	0.933	0.010	0.018	0.039	0.001	0.330	0.330	-0.169	-0.190	-0.249	-1.791	0.038	-0.2
Writing	11	550178	0255	8	7	MXLK	C	B	13468	0.662	0.078	0.091	0.662	0.166	0.003	0.347	-0.294	-0.287	0.347	-0.240	1.281	0.022	9.9
Writing	11	550179	0256	8	8	MXLK	B	B	13468	0.748	0.045	0.748	0.119	0.085	0.002	0.347	-0.255	0.347	-0.298	-0.190	0.541	0.023	9.9
Writing	11	553894	0257	8	13	FT	C	B	13468	0.903	0.056	0.023	0.903	0.017	0.001	0.363	-0.281	-0.231	0.363	-0.169	-1.366	0.033	3.5
Writing	11	553895	0258	8	14	FT	B	B	13468	0.723	0.186	0.723	0.070	0.020	0.002	0.336	-0.253	0.336	-0.312	-0.174	0.389	0.023	9.9

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	11	553896	0259	8	15	FT	D	B	13468	0.903	0.015	0.031	0.051	0.903	0.001	0.357	-0.209	-0.251	-0.236	0.357	-1.369	0.033	6.2
Writing	11	553897	0260	8	16	FT	B	B	13468	0.432	0.168	0.432	0.214	0.183	0.003	0.227	-0.107	0.227	-0.282	-0.224	2.263	0.022	9.9
Writing	11	553855	0261	9	5	FT	D	B	13452	0.821	0.040	0.009	0.130	0.821	0.000	0.176	-0.126	-0.135	-0.125	0.176	-0.414	0.026	9.9
Writing	11	553856	0262	9	6	FT	A	B	13452	0.655	0.655	0.113	0.161	0.068	0.002	0.401	0.401	-0.322	-0.336	-0.265	0.837	0.022	9.9
Writing	11	553854	0263	9	7	FT	B	B	13452	0.905	0.022	0.905	0.059	0.013	0.001	0.301	-0.176	0.301	-0.237	-0.143	-1.393	0.033	4.0
Writing	11	553857	0264	9	8	FT	C	B	13452	0.859	0.062	0.035	0.859	0.043	0.001	0.262	-0.139	-0.082	0.262	-0.293	-0.798	0.029	9.9
Writing	11	553828	0265	9	13	FT	B	B	13452	0.427	0.078	0.427	0.303	0.191	0.001	0.315	-0.301	0.315	-0.270	-0.335	2.252	0.022	9.9
Writing	11	553845	0266	9	14	FT	D	B	13452	0.450	0.128	0.328	0.092	0.450	0.001	0.353	-0.503	-0.241	-0.339	0.353	2.105	0.021	9.9
Writing	11	553829	0267	9	15	FT	C	B	13452	0.798	0.019	0.141	0.798	0.042	0.001	0.355	-0.211	-0.290	0.355	-0.226	-0.208	0.025	9.9
Writing	11	553830	0268	9	16	FT	C	B	13452	0.368	0.037	0.189	0.368	0.404	0.002	0.134	-0.396	-0.180	0.134	-0.064	2.632	0.022	9.9
Writing	11	553898	0269	10	5	FT	A	B	13459	0.679	0.679	0.058	0.115	0.146	0.002	0.232	0.232	-0.218	-0.165	-0.161	0.694	0.022	9.9
Writing	11	553899	0270	10	6	FT	C	B	13459	0.401	0.115	0.351	0.401	0.131	0.002	0.178	-0.181	-0.169	0.178	-0.158	2.414	0.022	9.9
Writing	11	553900	0271	10	7	FT	C	B	13459	0.799	0.100	0.079	0.799	0.021	0.001	0.300	-0.236	-0.209	0.300	-0.170	-0.200	0.025	9.9
Writing	11	553901	0272	10	8	FT	D	B	13459	0.417	0.041	0.433	0.108	0.417	0.001	0.347	-0.397	-0.340	-0.278	0.347	2.314	0.022	9.9
Writing	11	553870	0273	10	13	FT	A	B	13459	0.697	0.697	0.030	0.190	0.082	0.001	0.357	0.357	-0.268	-0.256	-0.326	0.575	0.022	9.9
Writing	11	553871	0274	10	14	FT	A	B	13459	0.570	0.570	0.126	0.126	0.175	0.003	0.294	0.294	-0.219	-0.304	-0.222	1.382	0.021	9.9
Writing	11	553872	0275	10	15	FT	B	B	13459	0.748	0.039	0.748	0.118	0.093	0.001	0.309	-0.148	0.309	-0.281	-0.206	0.208	0.024	9.9
Writing	11	553873	0276	10	16	FT	D	B	13459	0.604	0.121	0.138	0.134	0.604	0.002	0.308	-0.173	-0.293	-0.277	0.308	1.174	0.021	9.9

Appendix G:

2007 Grades 5, 8, and 11 Open-Ended Statistics

Table Legend

Column	Description
Cont.	Tested Content
Grade	Tested Grade
ID	Item identification number
Pub. ID	Public item identification number
Form	Form on which the item appeared 'All' = common form
Seq.	Sequence number of the item
Status	Status of the item at the time of administration 'OP' = common
Pts.	Maximum points possible
R.C.	Reporting category
N	Number of students
Mean	Mean score
Proportion [0-4, Omit]	Proportion achieving score point
Pt. Bis.	Item total correlation
Correlation [0-4]	Point biserial of the score point
Logit	Rasch logit difficulty
Logit SE	Rasch logit difficulty standard error
Fit	Rasch outfit statistic

Information											Proportions				Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Pts.	R.C.	N	Mean	1	2	3	4	Pt. Bis.	1	2	3	4	Logit	Logit SE	Fit
Writing	5	543236	0277	All	21	OP	4	B	130124	2.787	0.022	0.248	0.650	0.080	0.680	-0.322	-0.483	0.304	0.409	0.951	0.006	-9.9
Writing	5	543236	0278	All	21	OP	4	B	130124	2.682	0.020	0.338	0.583	0.059	0.577	-0.256	-0.444	0.351	0.306	0.922	0.006	-9.9
Writing	5	543247	0279	All	22	OP	4	B	130124	2.690	0.033	0.310	0.593	0.065	0.681	-0.361	-0.448	0.348	0.407	1.907	0.006	9.9
Writing	5	543247	0280	All	22	OP	4	B	130124	2.438	0.029	0.549	0.378	0.044	0.551	-0.317	-0.371	0.377	0.265	1.991	0.006	-9.9
Writing	8	543336	0281	All	21	OP	4	B	140738	2.651	0.025	0.372	0.531	0.072	0.625	-0.295	-0.475	0.382	0.327	1.578	0.006	-9.9
Writing	8	543336	0282	All	21	OP	4	B	140738	2.748	0.025	0.285	0.607	0.083	0.721	-0.341	-0.521	0.350	0.425	1.711	0.006	-3.5
Writing	8	543347	0283	All	22	OP	4	A	140738	2.713	0.021	0.327	0.569	0.083	0.635	-0.278	-0.498	0.363	0.341	1.994	0.006	-9.9
Writing	8	543347	0284	All	22	OP	4	A	140738	2.782	0.024	0.266	0.614	0.096	0.718	-0.339	-0.517	0.314	0.433	2.361	0.006	9.9
Writing	11	543456	0285	All	21	OP	4	B	134692	2.901	0.008	0.169	0.736	0.086	0.498	-0.201	-0.369	0.154	0.314	1.034	0.007	-9.9
Writing	11	543456	0286	All	21	OP	4	B	134692	2.925	0.008	0.170	0.713	0.110	0.626	-0.262	-0.456	0.145	0.411	0.871	0.006	9.9
Writing	11	543501	0287	All	22	OP	4	B	134692	2.767	0.010	0.298	0.607	0.085	0.497	-0.246	-0.365	0.216	0.309	0.555	0.006	-9.9
Writing	11	543501	0288	All	22	OP	4	B	134692	2.892	0.009	0.199	0.683	0.109	0.645	-0.273	-0.466	0.168	0.430	0.729	0.006	-4.8

Appendix H:

2008 Grades 5, 8, and 11 Multiple-Choice Statistics

Table Legend

Column	Description
Cont.	Tested Content
Grade	Tested Grade
ID	Item identification number
Pub. ID	Public item identification number
Form	Form on which the item appeared 'All' = common form
Seq.	Sequence number of the item
Status	Status of the item at the time of administration 'OP' = common, 'MXLK' = matrix link 'FT' = field test
Key	Answer key
R.C.	Reporting category
N	Number of students
P-Val.	P-Value
Proportion [A-D, Omit]	Proportion selecting the response
Pt. Bis.	Item total correlation
Correlation [A-D]	Point biserial of the response
Logit	Rasch logit difficulty
Logit SE	Rasch logit difficulty standard error
Fit	Rasch outfit statistic

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	5	553764	0001	All	1	OP	B	B	125547	0.805	0.068	0.805	0.061	0.066	0.001	0.491	-0.325	0.491	-0.346	-0.386	-0.148	0.009	9.9
Writing	5	553765	0002	All	2	OP	C	B	125547	0.882	0.023	0.067	0.882	0.027	0.001	0.459	-0.290	-0.333	0.459	-0.311	-0.848	0.010	9.9
Writing	5	553766	0003	All	3	OP	A	B	125547	0.653	0.653	0.037	0.101	0.208	0.001	0.329	0.329	-0.256	-0.317	-0.235	0.883	0.008	9.9
Writing	5	553767	0004	All	4	OP	D	B	125547	0.593	0.077	0.167	0.160	0.593	0.002	0.430	-0.380	-0.343	-0.368	0.430	1.207	0.007	9.9
Writing	5	553778	0005	All	9	OP	B	B	125547	0.802	0.086	0.802	0.060	0.051	0.002	0.430	-0.316	0.430	-0.325	-0.270	-0.069	0.008	9.9
Writing	5	553754	0006	All	10	OP	B	B	125547	0.670	0.105	0.670	0.152	0.071	0.002	0.449	-0.366	0.449	-0.353	-0.346	0.762	0.008	9.9
Writing	5	553755	0007	All	11	OP	C	B	125547	0.566	0.057	0.298	0.566	0.077	0.002	0.393	-0.357	-0.300	0.393	-0.425	1.351	0.007	9.9
Writing	5	553753	0008	All	12	OP	A	B	125547	0.865	0.865	0.053	0.045	0.035	0.002	0.509	0.509	-0.356	-0.352	-0.343	-0.667	0.010	9.9
Writing	5	553719	0009	All	17	OP	D	B	125547	0.562	0.312	0.077	0.048	0.562	0.001	0.472	-0.410	-0.421	-0.442	0.472	1.316	0.007	9.9
Writing	5	553723	0010	All	18	OP	C	B	125547	0.663	0.051	0.112	0.663	0.173	0.002	0.457	-0.373	-0.415	0.457	-0.332	0.818	0.008	9.9
Writing	5	553732	0011	All	19	OP	C	B	125547	0.700	0.067	0.128	0.700	0.103	0.002	0.445	-0.371	-0.289	0.445	-0.383	0.586	0.008	9.9
Writing	5	553727	0012	All	20	OP	D	B	125547	0.758	0.045	0.078	0.117	0.758	0.003	0.523	-0.383	-0.392	-0.406	0.523	0.215	0.008	9.9
Writing	5	557647	0013	1	5	FT	A	B	12632	0.513	0.513	0.216	0.119	0.151	0.001	0.165	0.165	-0.110	-0.200	-0.134	1.978	0.023	9.9
Writing	5	557648	0014	1	6	FT	C	B	12632	0.744	0.140	0.051	0.744	0.064	0.001	0.436	-0.323	-0.263	0.436	-0.402	0.339	0.025	9.9
Writing	5	557649	0015	1	7	FT	D	B	12632	0.387	0.370	0.146	0.096	0.387	0.001	0.337	-0.322	-0.330	-0.366	0.337	2.858	0.024	9.9
Writing	5	557650	0016	1	8	FT	B	B	12632	0.836	0.054	0.836	0.046	0.063	0.001	0.317	-0.197	0.317	-0.234	-0.215	-0.497	0.029	9.9
Writing	5	557651	0017	1	13	FT	B	B	12632	0.892	0.075	0.892	0.016	0.017	0.001	0.375	-0.296	0.375	-0.233	-0.191	-1.187	0.034	9.3
Writing	5	557652	0018	1	14	FT	A	B	12632	0.766	0.766	0.162	0.033	0.038	0.001	0.376	0.376	-0.298	-0.241	-0.277	0.158	0.026	9.9
Writing	5	557653	0019	1	15	FT	C	B	12632	0.578	0.138	0.041	0.578	0.242	0.001	0.379	-0.384	-0.378	0.379	-0.264	1.539	0.023	9.9
Writing	5	557654	0020	1	16	FT	D	B	12632	0.659	0.193	0.065	0.080	0.659	0.003	0.374	-0.255	-0.324	-0.338	0.374	0.975	0.024	9.9
Writing	5	557655	0021	2	5	FT	A	B	12547	0.611	0.611	0.122	0.072	0.193	0.002	0.367	0.367	-0.314	-0.300	-0.290	1.279	0.023	9.9
Writing	5	557656	0022	2	6	FT	D	B	12547	0.624	0.058	0.189	0.127	0.624	0.001	0.360	-0.363	-0.243	-0.323	0.360	1.192	0.023	9.9
Writing	5	557657	0023	2	7	FT	B	B	12547	0.598	0.160	0.598	0.176	0.064	0.002	0.361	-0.313	0.361	-0.269	-0.329	1.366	0.023	9.9
Writing	5	557658	0024	2	8	FT	A	B	12547	0.822	0.822	0.047	0.095	0.033	0.002	0.400	0.400	-0.284	-0.292	-0.260	-0.397	0.028	9.9
Writing	5	553756	0025	2	13	MXLK	B	B	12547	0.781	0.056	0.781	0.094	0.067	0.001	0.411	-0.310	0.411	-0.284	-0.307	0.036	0.026	9.9
Writing	5	553757	0026	2	14	MXLK	B	B	12547	0.849	0.052	0.849	0.052	0.046	0.001	0.438	-0.294	0.438	-0.297	-0.316	-0.519	0.029	9.9
Writing	5	553758	0027	2	15	MXLK	C	B	12547	0.483	0.291	0.182	0.483	0.043	0.001	0.259	-0.205	-0.235	0.259	-0.348	1.766	0.023	9.9
Writing	5	553759	0028	2	16	MXLK	D	B	12547	0.670	0.084	0.159	0.082	0.670	0.004	0.436	-0.394	-0.325	-0.337	0.436	0.691	0.024	9.9
Writing	5	557659	0029	3	5	FT	C	B	12564	0.680	0.101	0.109	0.680	0.110	0.001	0.431	-0.353	-0.405	0.431	-0.258	0.806	0.024	9.9
Writing	5	557660	0030	3	6	FT	A	B	12564	0.575	0.575	0.108	0.193	0.124	0.000	0.261	0.261	-0.299	-0.160	-0.222	1.534	0.023	9.9
Writing	5	557661	0031	3	7	FT	A	B	12564	0.697	0.697	0.153	0.087	0.060	0.001	0.292	0.292	-0.270	-0.102	-0.279	0.679	0.024	9.9
Writing	5	557662	0032	3	8	FT	D	B	12564	0.713	0.116	0.090	0.080	0.713	0.001	0.418	-0.292	-0.327	-0.352	0.418	0.563	0.024	9.9
Writing	5	557663	0033	3	13	FT	A	B	12564	0.712	0.712	0.155	0.084	0.048	0.001	0.308	0.308	-0.163	-0.287	-0.306	0.569	0.024	9.9
Writing	5	557664	0034	3	14	FT	C	B	12564	0.788	0.136	0.041	0.788	0.034	0.001	0.404	-0.308	-0.268	0.404	-0.305	-0.053	0.027	9.9
Writing	5	557665	0035	3	15	FT	B	B	12564	0.749	0.073	0.749	0.093	0.084	0.002	0.437	-0.317	0.437	-0.308	-0.345	0.277	0.025	9.9
Writing	5	557666	0036	3	16	FT	D	B	12564	0.619	0.092	0.167	0.120	0.619	0.002	0.330	-0.348	-0.195	-0.291	0.330	1.234	0.023	9.9
Writing	5	553792	0037	4	5	MXLK	B	B	12548	0.613	0.070	0.613	0.056	0.259	0.000	0.258	-0.213	0.258	-0.265	-0.188	1.133	0.023	9.9
Writing	5	553793	0038	4	6	MXLK	B	B	12548	0.759	0.143	0.759	0.056	0.041	0.001	0.307	-0.148	0.307	-0.313	-0.297	0.265	0.026	9.9
Writing	5	553794	0039	4	7	MXLK	C	B	12548	0.791	0.139	0.018	0.791	0.052	0.001	0.377	-0.302	-0.251	0.377	-0.260	0.041	0.026	9.9
Writing	5	553795	0040	4	8	MXLK	C	B	12548	0.666	0.040	0.216	0.666	0.076	0.003	0.300	-0.278	-0.228	0.300	-0.226	0.809	0.024	9.9
Writing	5	557667	0041	4	13	FT	D	B	12548	0.655	0.117	0.102	0.124	0.655	0.001	0.401	-0.349	-0.327	-0.292	0.401	1.010	0.024	9.9
Writing	5	557668	0042	4	14	FT	B	B	12548	0.785	0.099	0.785	0.052	0.063	0.001	0.448	-0.347	0.448	-0.296	-0.328	0.004	0.027	9.9
Writing	5	557669	0043	4	15	FT	C	B	12548	0.684	0.048	0.162	0.684	0.105	0.001	0.322	-0.302	-0.155	0.322	-0.341	0.807	0.024	9.9

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	5	557670	0044	4	16	FT	A	B	12548	0.426	0.426	0.144	0.174	0.253	0.003	0.315	0.315	-0.391	-0.427	-0.152	2.568	0.024	9.9
Writing	5	557671	0045	5	5	FT	B	B	12529	0.612	0.162	0.612	0.123	0.102	0.001	0.370	-0.291	0.370	-0.308	-0.297	1.273	0.024	9.9
Writing	5	557672	0046	5	6	FT	C	B	12529	0.569	0.110	0.121	0.569	0.198	0.002	0.302	-0.228	-0.250	0.302	-0.273	1.569	0.023	9.9
Writing	5	557673	0047	5	7	FT	A	B	12529	0.846	0.846	0.048	0.064	0.042	0.001	0.446	0.446	-0.297	-0.317	-0.308	-0.664	0.030	9.9
Writing	5	557674	0048	5	8	FT	D	B	12529	0.891	0.028	0.052	0.028	0.891	0.002	0.410	-0.257	-0.290	-0.263	0.410	-1.252	0.034	9.9
Writing	5	557675	0049	5	13	FT	B	B	12529	0.851	0.067	0.851	0.045	0.036	0.002	0.393	-0.253	0.393	-0.311	-0.240	-0.726	0.030	9.9
Writing	5	557676	0050	5	14	FT	D	B	12529	0.715	0.074	0.031	0.177	0.715	0.003	0.424	-0.428	-0.359	-0.273	0.424	0.523	0.025	9.9
Writing	5	557677	0051	5	15	FT	D	B	12529	0.698	0.234	0.035	0.030	0.698	0.002	0.423	-0.363	-0.280	-0.325	0.423	0.653	0.024	9.9
Writing	5	557678	0052	5	16	FT	A	B	12529	0.560	0.560	0.180	0.219	0.038	0.003	0.370	0.370	-0.350	-0.286	-0.393	1.633	0.023	9.9
Writing	5	557679	0053	6	5	FT	B	B	12574	0.730	0.145	0.730	0.047	0.078	0.001	0.398	-0.283	0.398	-0.314	-0.311	0.447	0.025	9.9
Writing	5	557680	0054	6	6	FT	B	B	12574	0.525	0.236	0.525	0.088	0.150	0.001	0.341	-0.277	0.341	-0.369	-0.277	1.882	0.023	9.9
Writing	5	557681	0055	6	7	FT	D	B	12574	0.717	0.035	0.098	0.149	0.717	0.001	0.346	-0.341	-0.348	-0.173	0.346	0.549	0.025	9.9
Writing	5	557682	0056	6	8	FT	C	B	12574	0.675	0.067	0.111	0.675	0.145	0.003	0.432	-0.358	-0.374	0.432	-0.297	0.859	0.024	9.9
Writing	5	553713	0057	6	13	MXLK	D	B	12574	0.466	0.350	0.159	0.024	0.466	0.001	0.312	-0.334	-0.177	-0.404	0.312	1.826	0.023	9.9
Writing	5	553715	0058	6	14	MXLK	C	B	12574	0.512	0.143	0.184	0.512	0.159	0.002	0.272	-0.232	-0.256	0.272	-0.219	1.586	0.023	9.9
Writing	5	553714	0059	6	15	MXLK	C	B	12574	0.815	0.058	0.069	0.815	0.056	0.002	0.427	-0.271	-0.331	0.427	-0.291	-0.267	0.028	9.9
Writing	5	553716	0060	6	16	MXLK	A	B	12574	0.681	0.681	0.188	0.060	0.069	0.003	0.208	0.208	-0.100	-0.235	-0.203	0.702	0.024	9.9
Writing	5	557683	0061	7	5	FT	D	B	12562	0.832	0.084	0.038	0.044	0.832	0.001	0.448	-0.359	-0.285	-0.274	0.448	-0.449	0.029	9.8
Writing	5	557684	0062	7	6	FT	C	B	12562	0.282	0.095	0.389	0.282	0.233	0.002	0.068	-0.217	-0.024	0.068	-0.086	3.650	0.026	9.9
Writing	5	557685	0063	7	7	FT	D	B	12562	0.513	0.111	0.254	0.120	0.513	0.001	0.404	-0.491	-0.300	-0.345	0.404	1.966	0.023	9.9
Writing	5	557686	0064	7	8	FT	A	B	12562	0.645	0.645	0.043	0.236	0.073	0.003	0.165	0.165	-0.227	-0.088	-0.150	1.073	0.024	9.9
Writing	5	557687	0065	7	13	FT	B	B	12562	0.709	0.059	0.709	0.044	0.187	0.001	0.314	-0.231	0.314	-0.314	-0.217	0.613	0.024	9.9
Writing	5	557688	0066	7	14	FT	C	B	12562	0.809	0.044	0.117	0.809	0.029	0.001	0.370	-0.298	-0.241	0.370	-0.287	-0.220	0.027	9.9
Writing	5	557689	0067	7	15	FT	B	B	12562	0.779	0.052	0.779	0.130	0.036	0.003	0.419	-0.354	0.419	-0.286	-0.302	0.049	0.026	9.9
Writing	5	557690	0068	7	16	FT	A	B	12562	0.622	0.622	0.179	0.112	0.084	0.003	0.285	0.285	-0.228	-0.233	-0.223	1.236	0.023	9.9
Writing	5	553783	0069	8	5	MXLK	B	B	12554	0.829	0.024	0.829	0.113	0.033	0.001	0.402	-0.285	0.402	-0.295	-0.278	-0.327	0.028	9.9
Writing	5	553785	0070	8	6	MXLK	D	B	12554	0.817	0.053	0.050	0.079	0.817	0.001	0.377	-0.290	-0.274	-0.230	0.377	-0.293	0.028	9.9
Writing	5	553784	0071	8	7	MXLK	B	B	12554	0.719	0.065	0.719	0.101	0.113	0.002	0.418	-0.313	0.418	-0.352	-0.289	0.453	0.025	9.9
Writing	5	557896	0072	8	8	MXLK	D	B	12554	0.413	0.125	0.293	0.167	0.413	0.002	0.214	-0.225	-0.174	-0.238	0.214	2.147	0.023	9.9
Writing	5	557691	0073	8	13	FT	B	B	12554	0.505	0.125	0.505	0.228	0.141	0.000	0.258	-0.208	0.258	-0.278	-0.171	1.996	0.023	9.9
Writing	5	557692	0074	8	14	FT	A	B	12554	0.853	0.853	0.052	0.022	0.073	0.001	0.310	0.310	-0.252	-0.248	-0.157	-0.701	0.030	9.9
Writing	5	557693	0075	8	15	FT	D	B	12554	0.786	0.073	0.065	0.075	0.786	0.001	0.405	-0.278	-0.303	-0.284	0.405	-0.038	0.026	9.9
Writing	5	557694	0076	8	16	FT	C	B	12554	0.647	0.090	0.070	0.647	0.191	0.001	0.396	-0.339	-0.398	0.396	-0.269	1.032	0.024	9.9
Writing	5	557695	0077	9	5	FT	A	B	12523	0.760	0.760	0.052	0.132	0.055	0.001	0.397	0.397	-0.340	-0.263	-0.302	0.244	0.026	9.9
Writing	5	557696	0078	9	6	FT	B	B	12523	0.657	0.034	0.657	0.099	0.210	0.001	0.363	-0.282	0.363	-0.397	-0.235	1.029	0.024	9.9
Writing	5	557697	0079	9	7	FT	C	B	12523	0.566	0.347	0.044	0.566	0.040	0.002	0.370	-0.295	-0.416	0.370	-0.352	1.651	0.023	9.9
Writing	5	557698	0080	9	8	FT	D	B	12523	0.777	0.080	0.068	0.072	0.777	0.002	0.474	-0.317	-0.373	-0.354	0.474	0.095	0.026	9.9
Writing	5	557699	0081	9	13	FT	A	B	12523	0.676	0.676	0.062	0.168	0.094	0.001	0.333	0.333	-0.349	-0.242	-0.209	0.894	0.024	9.9
Writing	5	557700	0082	9	14	FT	B	B	12523	0.409	0.152	0.409	0.127	0.310	0.001	0.311	-0.367	0.311	-0.351	-0.235	2.721	0.024	9.9
Writing	5	557701	0083	9	15	FT	C	B	12523	0.651	0.217	0.032	0.651	0.098	0.002	0.330	-0.306	-0.354	0.330	-0.157	1.066	0.024	9.9
Writing	5	557702	0084	9	16	FT	D	B	12523	0.740	0.049	0.064	0.144	0.740	0.003	0.412	-0.322	-0.360	-0.277	0.412	0.406	0.025	9.9
Writing	5	557703	0085	10	5	FT	D	B	12514	0.719	0.059	0.110	0.111	0.719	0.000	0.391	-0.357	-0.331	-0.224	0.391	0.522	0.025	9.9
Writing	5	557704	0086	10	6	FT	B	B	12514	0.924	0.035	0.924	0.017	0.023	0.000	0.370	-0.266	0.370	-0.211	-0.223	-1.775	0.040	6.2

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	5	557705	0087	10	7	FT	C	B	12514	0.663	0.133	0.073	0.663	0.129	0.001	0.388	-0.372	-0.317	0.388	-0.223	0.941	0.024	9.9
Writing	5	557706	0088	10	8	FT	B	B	12514	0.753	0.176	0.753	0.041	0.027	0.003	0.323	-0.217	0.323	-0.300	-0.256	0.251	0.026	9.9
Writing	5	557707	0089	10	13	FT	A	B	12514	0.652	0.652	0.242	0.074	0.031	0.001	0.286	0.286	-0.200	-0.269	-0.287	1.019	0.024	9.9
Writing	5	557708	0090	10	14	FT	C	B	12514	0.787	0.074	0.082	0.787	0.056	0.001	0.449	-0.390	-0.295	0.449	-0.288	-0.038	0.027	9.9
Writing	5	557709	0091	10	15	FT	C	B	12514	0.923	0.019	0.019	0.923	0.037	0.002	0.344	-0.258	-0.214	0.344	-0.201	-1.748	0.040	6.8
Writing	5	557710	0092	10	16	FT	D	B	12514	0.790	0.059	0.082	0.066	0.790	0.003	0.432	-0.305	-0.343	-0.272	0.432	-0.064	0.027	9.1
Writing	8	553835	0093	All	1	OP	A	B	136417	0.620	0.620	0.015	0.017	0.347	0.001	0.484	0.484	-0.293	-0.308	-0.463	1.097	0.007	9.9
Writing	8	553838	0094	All	2	OP	A	B	136417	0.813	0.813	0.072	0.053	0.061	0.001	0.456	0.456	-0.323	-0.361	-0.290	-0.126	0.008	9.9
Writing	8	553837	0095	All	3	OP	C	B	136417	0.664	0.131	0.067	0.664	0.137	0.001	0.385	-0.307	-0.310	0.385	-0.292	0.882	0.007	9.9
Writing	8	553836	0096	All	4	OP	C	B	136417	0.714	0.101	0.135	0.714	0.048	0.002	0.425	-0.336	-0.316	0.425	-0.336	0.590	0.007	9.9
Writing	8	553800	0097	All	9	OP	B	B	136417	0.539	0.089	0.539	0.060	0.310	0.001	0.385	-0.358	0.385	-0.405	-0.309	1.546	0.007	9.9
Writing	8	553801	0098	All	10	OP	B	B	136417	0.853	0.033	0.853	0.058	0.055	0.001	0.395	-0.321	0.395	-0.283	-0.220	-0.443	0.009	9.9
Writing	8	553802	0099	All	11	OP	C	B	136417	0.702	0.101	0.128	0.702	0.067	0.001	0.451	-0.397	-0.339	0.451	-0.309	0.651	0.007	9.9
Writing	8	553803	0100	All	12	OP	D	B	136417	0.748	0.149	0.041	0.061	0.748	0.002	0.413	-0.272	-0.335	-0.367	0.413	0.375	0.008	9.9
Writing	8	553820	0101	All	17	OP	B	B	136417	0.509	0.234	0.509	0.107	0.149	0.001	0.398	-0.337	0.398	-0.364	-0.374	1.688	0.007	9.9
Writing	8	553821	0102	All	18	OP	A	B	136417	0.673	0.673	0.112	0.069	0.142	0.004	0.436	0.436	-0.345	-0.398	-0.316	0.820	0.007	9.9
Writing	8	553822	0103	All	19	OP	C	B	136417	0.753	0.070	0.086	0.753	0.089	0.002	0.503	-0.311	-0.395	0.503	-0.421	0.298	0.008	9.9
Writing	8	553823	0104	All	20	OP	B	B	136417	0.880	0.039	0.880	0.058	0.021	0.002	0.520	-0.348	0.520	-0.398	-0.310	-0.739	0.009	2.3
Writing	8	557711	0105	1	5	FT	B	B	13698	0.562	0.231	0.562	0.065	0.141	0.001	0.426	-0.340	0.426	-0.400	-0.400	1.556	0.021	9.9
Writing	8	557712	0106	1	6	FT	A	B	13698	0.851	0.851	0.012	0.011	0.126	0.000	0.423	0.423	-0.208	-0.227	-0.376	-0.712	0.029	9.9
Writing	8	557713	0107	1	7	FT	D	B	13698	0.681	0.015	0.049	0.254	0.681	0.001	0.413	-0.284	-0.417	-0.332	0.413	0.770	0.023	9.9
Writing	8	557714	0108	1	8	FT	D	B	13698	0.593	0.096	0.120	0.188	0.593	0.002	0.308	-0.296	-0.236	-0.248	0.308	1.356	0.022	9.9
Writing	8	557715	0109	1	13	FT	B	B	13698	0.416	0.095	0.416	0.423	0.063	0.003	0.252	-0.323	0.252	-0.187	-0.320	2.458	0.021	9.9
Writing	8	557716	0110	1	14	FT	C	B	13698	0.578	0.103	0.084	0.578	0.234	0.001	0.311	-0.333	-0.375	0.311	-0.163	1.456	0.021	9.9
Writing	8	557717	0111	1	15	FT	A	B	13698	0.886	0.886	0.054	0.032	0.025	0.002	0.421	0.421	-0.286	-0.294	-0.264	-1.157	0.032	4.3
Writing	8	557718	0112	1	16	FT	D	B	13698	0.847	0.074	0.050	0.026	0.847	0.003	0.421	-0.300	-0.287	-0.289	0.421	-0.659	0.029	9.8
Writing	8	553839	0113	2	5	MXLK	B	B	13631	0.347	0.301	0.347	0.162	0.189	0.001	0.155	-0.194	0.155	-0.211	-0.049	2.524	0.021	9.9
Writing	8	553840	0114	2	6	MXLK	B	B	13631	0.711	0.052	0.711	0.184	0.052	0.001	0.343	-0.256	0.343	-0.240	-0.324	0.626	0.023	9.9
Writing	8	553842	0115	2	7	MXLK	B	B	13631	0.875	0.042	0.875	0.061	0.021	0.001	0.328	-0.194	0.328	-0.231	-0.234	-0.591	0.028	9.9
Writing	8	553841	0116	2	8	MXLK	C	B	13631	0.867	0.069	0.038	0.867	0.025	0.001	0.318	-0.223	-0.222	0.318	-0.186	-0.563	0.028	9.9
Writing	8	557719	0117	2	13	FT	A	B	13631	0.853	0.853	0.042	0.092	0.012	0.001	0.410	0.410	-0.310	-0.306	-0.218	-0.696	0.029	9.9
Writing	8	557720	0118	2	14	FT	A	B	13631	0.681	0.681	0.160	0.103	0.054	0.002	0.325	0.325	-0.252	-0.279	-0.204	0.772	0.023	9.9
Writing	8	557721	0119	2	15	FT	C	B	13631	0.459	0.207	0.152	0.459	0.177	0.004	0.268	-0.189	-0.308	0.268	-0.237	2.172	0.021	9.9
Writing	8	557722	0120	2	16	FT	D	B	13631	0.722	0.055	0.123	0.097	0.722	0.003	0.374	-0.266	-0.280	-0.294	0.374	0.473	0.023	9.9
Writing	8	557723	0121	3	5	FT	B	B	13628	0.501	0.287	0.501	0.158	0.052	0.002	0.342	-0.303	0.342	-0.312	-0.308	1.952	0.021	9.9
Writing	8	557724	0122	3	6	FT	A	B	13628	0.383	0.383	0.044	0.255	0.314	0.003	0.250	0.250	-0.378	-0.239	-0.224	2.668	0.021	9.9
Writing	8	557725	0123	3	7	FT	C	B	13628	0.702	0.130	0.119	0.702	0.047	0.002	0.430	-0.309	-0.371	0.430	-0.331	0.639	0.023	9.9
Writing	8	557726	0124	3	8	FT	D	B	13628	0.757	0.052	0.115	0.072	0.757	0.003	0.364	-0.318	-0.183	-0.340	0.364	0.216	0.024	9.9
Writing	8	557727	0125	3	13	FT	A	B	13628	0.931	0.931	0.039	0.017	0.013	0.001	0.391	0.391	-0.303	-0.229	-0.193	-1.867	0.040	2.0
Writing	8	557728	0126	3	14	FT	A	B	13628	0.861	0.861	0.018	0.080	0.041	0.001	0.379	0.379	-0.248	-0.346	-0.142	-0.781	0.029	9.9
Writing	8	557729	0127	3	15	FT	B	B	13628	0.677	0.028	0.677	0.150	0.144	0.001	0.341	-0.267	0.341	-0.315	-0.231	0.818	0.023	9.9
Writing	8	557730	0128	3	16	FT	D	B	13628	0.694	0.088	0.109	0.106	0.694	0.003	0.408	-0.325	-0.307	-0.316	0.408	0.696	0.023	9.9
Writing	8	553739	0129	4	5	MXLK	A	B	13676	0.830	0.830	0.072	0.041	0.056	0.001	0.344	0.344	-0.266	-0.242	-0.199	-0.213	0.026	9.9

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	8	553742	0130	4	6	MXLK	A	B	13676	0.739	0.739	0.067	0.161	0.032	0.001	0.399	0.399	-0.325	-0.305	-0.273	0.445	0.024	9.9
Writing	8	553746	0131	4	7	MXLK	C	B	13676	0.912	0.032	0.043	0.912	0.013	0.001	0.377	-0.269	-0.246	0.377	-0.220	-1.136	0.032	4.5
Writing	8	553750	0132	4	8	MXLK	C	B	13676	0.878	0.018	0.072	0.878	0.031	0.002	0.381	-0.247	-0.274	0.381	-0.252	-0.737	0.029	9.9
Writing	8	557731	0133	4	13	FT	A	B	13676	0.689	0.689	0.039	0.023	0.246	0.002	0.335	0.335	-0.348	-0.304	-0.241	0.702	0.023	9.9
Writing	8	557732	0134	4	14	FT	D	B	13676	0.509	0.387	0.047	0.055	0.509	0.002	0.302	-0.225	-0.375	-0.363	0.302	1.876	0.021	9.9
Writing	8	557733	0135	4	15	FT	A	B	13676	0.675	0.675	0.133	0.107	0.080	0.004	0.470	0.470	-0.384	-0.423	-0.297	0.800	0.023	9.9
Writing	8	557734	0136	4	16	FT	D	B	13676	0.772	0.035	0.087	0.103	0.772	0.004	0.376	-0.280	-0.286	-0.266	0.376	0.060	0.025	9.9
Writing	8	557735	0137	5	5	FT	C	B	13654	0.894	0.050	0.021	0.894	0.033	0.001	0.328	-0.252	-0.234	0.328	-0.154	-1.235	0.033	9.9
Writing	8	557736	0138	5	6	FT	B	B	13654	0.613	0.078	0.613	0.188	0.119	0.001	0.347	-0.196	0.347	-0.354	-0.253	1.231	0.022	9.9
Writing	8	557737	0139	5	7	FT	D	B	13654	0.565	0.084	0.301	0.048	0.565	0.002	0.439	-0.327	-0.417	-0.349	0.439	1.535	0.021	9.9
Writing	8	557738	0140	5	8	FT	D	B	13654	0.877	0.082	0.020	0.020	0.877	0.002	0.335	-0.228	-0.253	-0.214	0.335	-0.992	0.031	9.9
Writing	8	557739	0141	5	13	FT	A	B	13654	0.584	0.584	0.196	0.109	0.109	0.001	0.312	0.312	-0.248	-0.307	-0.229	1.413	0.021	9.9
Writing	8	557740	0142	5	14	FT	D	B	13654	0.654	0.083	0.079	0.181	0.654	0.002	0.386	-0.330	-0.305	-0.300	0.386	0.959	0.022	9.9
Writing	8	557741	0143	5	15	FT	D	B	13654	0.522	0.061	0.069	0.346	0.522	0.002	0.106	-0.202	-0.199	-0.022	0.106	1.796	0.021	9.9
Writing	8	557742	0144	5	16	FT	B	B	13654	0.568	0.191	0.568	0.158	0.080	0.003	0.262	-0.188	0.262	-0.211	-0.283	1.517	0.021	9.9
Writing	8	553734	0145	6	5	MXLK	B	B	13588	0.617	0.119	0.617	0.117	0.144	0.002	0.295	-0.285	0.295	-0.240	-0.185	1.175	0.022	9.9
Writing	8	553738	0146	6	6	MXLK	A	B	13588	0.776	0.776	0.075	0.038	0.109	0.002	0.256	0.256	-0.208	-0.228	-0.135	0.216	0.024	9.9
Writing	8	553741	0147	6	7	MXLK	C	B	13588	0.895	0.032	0.050	0.895	0.023	0.001	0.379	-0.268	-0.248	0.379	-0.231	-0.845	0.030	9.9
Writing	8	553745	0148	6	8	MXLK	C	B	13588	0.731	0.088	0.090	0.731	0.090	0.001	0.338	-0.262	-0.234	0.338	-0.252	0.487	0.023	9.9
Writing	8	557743	0149	6	13	FT	A	B	13588	0.632	0.632	0.071	0.059	0.236	0.002	0.372	0.372	-0.267	-0.267	-0.332	1.135	0.022	9.9
Writing	8	557961	0150	6	14	FT	B	B	13588	0.849	0.024	0.849	0.066	0.059	0.002	0.347	-0.235	0.347	-0.208	-0.271	-0.612	0.028	9.9
Writing	8	557744	0151	6	15	FT	D	B	13588	0.740	0.064	0.100	0.094	0.740	0.001	0.363	-0.215	-0.373	-0.206	0.363	0.376	0.024	9.9
Writing	8	557745	0152	6	16	FT	D	B	13588	0.673	0.168	0.068	0.088	0.673	0.002	0.329	-0.210	-0.258	-0.337	0.329	0.859	0.022	9.9
Writing	8	557962	0153	7	5	FT	A	B	13660	0.456	0.456	0.134	0.379	0.030	0.001	0.248	0.248	-0.183	-0.245	-0.264	2.194	0.021	9.9
Writing	8	557746	0154	7	6	FT	B	B	13660	0.845	0.097	0.845	0.033	0.025	0.001	0.408	-0.310	0.408	-0.262	-0.269	-0.569	0.028	5.8
Writing	8	557747	0155	7	7	FT	D	B	13660	0.695	0.096	0.078	0.129	0.695	0.002	0.315	-0.265	-0.298	-0.180	0.315	0.693	0.023	9.9
Writing	8	557748	0156	7	8	FT	C	B	13660	0.657	0.144	0.154	0.657	0.044	0.002	0.327	-0.240	-0.284	0.327	-0.243	0.955	0.022	9.9
Writing	8	557749	0157	7	13	FT	B	B	13660	0.769	0.168	0.769	0.041	0.021	0.001	0.333	-0.232	0.333	-0.289	-0.269	0.131	0.025	9.9
Writing	8	557750	0158	7	14	FT	C	B	13660	0.484	0.121	0.144	0.484	0.249	0.002	0.243	-0.194	-0.298	0.243	-0.180	2.026	0.021	9.9
Writing	8	557751	0159	7	15	FT	A	B	13660	0.621	0.621	0.098	0.073	0.206	0.003	0.302	0.302	-0.303	-0.260	-0.205	1.193	0.022	9.9
Writing	8	557963	0160	7	16	FT	D	B	13660	0.556	0.121	0.121	0.199	0.556	0.002	0.371	-0.361	-0.382	-0.254	0.371	1.593	0.021	9.9
Writing	8	557971	0161	8	5	FT	D	B	13622	0.696	0.078	0.179	0.047	0.696	0.001	0.338	-0.308	-0.244	-0.245	0.338	0.712	0.023	9.9
Writing	8	558045	0162	8	6	FT	A	B	13622	0.266	0.266	0.072	0.464	0.196	0.002	0.102	0.102	-0.305	-0.061	-0.140	3.457	0.023	9.9
Writing	8	558044	0163	8	7	FT	B	B	13622	0.355	0.587	0.355	0.026	0.031	0.001	0.155	-0.117	0.155	-0.327	-0.323	2.851	0.022	9.9
Writing	8	557972	0164	8	8	FT	D	B	13622	0.443	0.221	0.224	0.110	0.443	0.001	0.385	-0.305	-0.444	-0.328	0.385	2.308	0.021	9.9
Writing	8	553816	0165	8	13	MXLK	A	B	13622	0.741	0.741	0.029	0.028	0.199	0.002	0.307	0.307	-0.219	-0.239	-0.244	0.481	0.024	9.9
Writing	8	553817	0166	8	14	MXLK	B	B	13622	0.673	0.133	0.673	0.178	0.014	0.001	0.313	-0.274	0.313	-0.245	-0.202	0.871	0.022	9.9
Writing	8	553818	0167	8	15	MXLK	B	B	13622	0.831	0.056	0.831	0.098	0.013	0.001	0.323	-0.235	0.323	-0.231	-0.215	-0.217	0.026	9.9
Writing	8	553819	0168	8	16	MXLK	C	B	13622	0.720	0.059	0.077	0.720	0.140	0.003	0.314	-0.304	-0.212	0.314	-0.208	0.577	0.023	9.9
Writing	8	557973	0169	9	5	FT	A	B	13640	0.840	0.840	0.028	0.088	0.043	0.001	0.299	0.299	-0.194	-0.173	-0.255	-0.493	0.028	9.9
Writing	8	557974	0170	9	6	FT	B	B	13640	0.447	0.279	0.447	0.170	0.103	0.001	0.169	-0.078	0.169	-0.231	-0.213	2.276	0.021	9.9
Writing	8	557975	0171	9	7	FT	B	B	13640	0.636	0.083	0.636	0.216	0.063	0.001	0.338	-0.313	0.338	-0.214	-0.362	1.123	0.022	9.9
Writing	8	557976	0172	9	8	FT	D	B	13640	0.658	0.164	0.023	0.153	0.658	0.002	0.294	-0.224	-0.370	-0.212	0.294	0.980	0.022	9.9

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	8	557977	0173	9	13	FT	A	B	13640	0.609	0.609	0.296	0.065	0.029	0.001	0.264	0.264	-0.149	-0.370	-0.314	1.298	0.021	9.9
Writing	8	557978	0174	9	14	FT	B	B	13640	0.582	0.221	0.582	0.036	0.160	0.001	0.361	-0.297	0.361	-0.376	-0.296	1.467	0.021	9.9
Writing	8	557979	0175	9	15	FT	C	B	13640	0.546	0.113	0.255	0.546	0.084	0.002	0.342	-0.363	-0.211	0.342	-0.404	1.688	0.021	9.9
Writing	8	557980	0176	9	16	FT	D	B	13640	0.405	0.175	0.058	0.360	0.405	0.002	0.295	-0.245	-0.385	-0.290	0.295	2.532	0.021	9.9
Writing	8	557981	0177	10	5	FT	B	B	13620	0.320	0.284	0.320	0.255	0.141	0.001	0.094	0.034	0.094	-0.259	-0.072	3.050	0.022	9.9
Writing	8	557982	0178	10	6	FT	C	B	13620	0.745	0.158	0.054	0.745	0.042	0.001	0.289	-0.173	-0.241	0.289	-0.281	0.321	0.024	9.9
Writing	8	557983	0179	10	7	FT	D	B	13620	0.680	0.052	0.082	0.185	0.680	0.001	0.210	-0.276	-0.195	-0.093	0.210	0.799	0.023	9.9
Writing	8	557984	0180	10	8	FT	B	B	13620	0.515	0.205	0.515	0.243	0.034	0.002	0.331	-0.332	0.331	-0.250	-0.367	1.847	0.021	9.9
Writing	8	557985	0181	10	13	FT	B	B	13620	0.625	0.153	0.625	0.192	0.028	0.001	0.367	-0.276	0.367	-0.316	-0.336	1.165	0.022	9.9
Writing	8	557986	0182	10	14	FT	D	B	13620	0.811	0.086	0.043	0.059	0.811	0.001	0.444	-0.322	-0.306	-0.318	0.444	-0.240	0.026	9.9
Writing	8	557987	0183	10	15	FT	C	B	13620	0.635	0.212	0.066	0.635	0.085	0.002	0.147	-0.071	-0.115	0.147	-0.192	1.098	0.022	9.9
Writing	8	557988	0184	10	16	FT	A	B	13620	0.742	0.742	0.190	0.038	0.027	0.003	0.410	0.410	-0.313	-0.366	-0.289	0.342	0.024	9.9
Writing	11	553862	0185	All	1	OP	B	B	132349	0.634	0.070	0.634	0.041	0.253	0.001	0.494	-0.271	0.494	-0.340	-0.481	0.911	0.007	9.9
Writing	11	553863	0186	All	2	OP	A	B	132349	0.605	0.605	0.086	0.095	0.212	0.001	0.562	0.562	-0.423	-0.466	-0.515	1.081	0.007	9.9
Writing	11	553864	0187	All	3	OP	C	B	132349	0.903	0.033	0.032	0.903	0.031	0.001	0.418	-0.248	-0.283	0.418	-0.286	-1.156	0.010	9.9
Writing	11	553865	0188	All	4	OP	D	B	132349	0.562	0.068	0.026	0.342	0.562	0.001	0.470	-0.404	-0.409	-0.420	0.470	1.310	0.007	9.9
Writing	11	553843	0189	All	9	OP	D	B	132349	0.690	0.016	0.242	0.051	0.690	0.001	0.557	-0.310	-0.521	-0.372	0.557	0.574	0.008	9.9
Writing	11	557898	0190	All	10	OP	C	B	132349	0.643	0.076	0.135	0.643	0.145	0.001	0.415	-0.385	-0.317	0.415	-0.302	0.863	0.007	9.9
Writing	11	557899	0191	All	11	OP	C	B	132349	0.431	0.384	0.159	0.431	0.024	0.001	0.356	-0.314	-0.381	0.356	-0.362	2.051	0.007	9.9
Writing	11	553844	0192	All	12	OP	A	B	132349	0.845	0.845	0.007	0.110	0.036	0.001	0.497	0.497	-0.219	-0.477	-0.214	-0.533	0.009	9.9
Writing	11	553870	0193	All	17	OP	A	B	132349	0.717	0.717	0.027	0.186	0.069	0.001	0.503	0.503	-0.352	-0.393	-0.442	0.420	0.008	9.9
Writing	11	553871	0194	All	18	OP	A	B	132349	0.544	0.544	0.142	0.141	0.170	0.003	0.406	0.406	-0.324	-0.405	-0.332	1.452	0.007	9.9
Writing	11	553872	0195	All	19	OP	B	B	132349	0.742	0.039	0.742	0.118	0.099	0.002	0.442	-0.277	0.442	-0.382	-0.301	0.277	0.008	9.9
Writing	11	553873	0196	All	20	OP	D	B	132349	0.607	0.121	0.131	0.139	0.607	0.003	0.469	-0.321	-0.416	-0.421	0.469	1.066	0.007	9.9
Writing	11	557989	0197	1	5	FT	B	B	13287	0.819	0.028	0.819	0.130	0.023	0.000	0.366	-0.170	0.366	-0.328	-0.194	-0.380	0.027	9.9
Writing	11	557990	0198	1	6	FT	A	B	13287	0.753	0.753	0.110	0.068	0.069	0.001	0.353	0.353	-0.247	-0.275	-0.246	0.204	0.025	9.9
Writing	11	557991	0199	1	7	FT	B	B	13287	0.534	0.411	0.534	0.031	0.024	0.000	0.443	-0.412	0.443	-0.359	-0.327	1.730	0.022	9.9
Writing	11	557992	0200	1	8	FT	C	B	13287	0.511	0.033	0.378	0.511	0.077	0.001	0.104	-0.263	-0.032	0.104	-0.171	1.878	0.022	9.9
Writing	11	557993	0201	1	13	FT	C	B	13287	0.243	0.194	0.433	0.243	0.127	0.002	0.256	-0.435	-0.183	0.256	-0.355	3.883	0.027	9.9
Writing	11	557994	0202	1	14	FT	A	B	13287	0.641	0.641	0.044	0.168	0.145	0.002	0.369	0.369	-0.261	-0.320	-0.282	1.020	0.023	9.9
Writing	11	557995	0203	1	15	FT	D	B	13287	0.784	0.120	0.010	0.085	0.784	0.001	0.384	-0.263	-0.227	-0.337	0.384	-0.059	0.026	9.9
Writing	11	557996	0204	1	16	FT	B	B	13287	0.790	0.065	0.790	0.053	0.090	0.002	0.327	-0.243	0.327	-0.279	-0.176	-0.111	0.026	9.9
Writing	11	557997	0205	2	5	FT	A	B	13321	0.632	0.632	0.189	0.106	0.072	0.002	0.158	0.158	-0.075	-0.164	-0.161	1.063	0.022	9.9
Writing	11	557998	0206	2	6	FT	C	B	13321	0.259	0.262	0.221	0.259	0.256	0.001	0.247	-0.255	-0.317	0.247	-0.240	3.706	0.027	9.9
Writing	11	557999	0207	2	7	FT	C	B	13321	0.339	0.193	0.258	0.339	0.209	0.001	0.254	-0.273	-0.168	0.254	-0.362	3.030	0.024	9.9
Writing	11	558000	0208	2	8	FT	D	B	13321	0.779	0.029	0.172	0.018	0.779	0.002	0.307	-0.255	-0.218	-0.261	0.307	-0.039	0.025	9.9
Writing	11	553846	0209	2	13	MXLK	A	B	13321	0.787	0.787	0.132	0.031	0.048	0.002	0.478	0.478	-0.426	-0.297	-0.255	-0.087	0.026	9.9
Writing	11	553849	0210	2	14	MXLK	B	B	13321	0.731	0.113	0.731	0.073	0.081	0.002	0.398	-0.289	0.398	-0.344	-0.258	0.319	0.024	9.9
Writing	11	553848	0211	2	15	MXLK	B	B	13321	0.452	0.330	0.452	0.051	0.166	0.002	0.372	-0.363	0.372	-0.340	-0.307	1.887	0.022	9.9
Writing	11	553847	0212	2	16	MXLK	D	B	13321	0.702	0.091	0.159	0.047	0.702	0.002	0.462	-0.368	-0.356	-0.349	0.462	0.492	0.024	9.9
Writing	11	558001	0213	3	5	FT	D	B	13209	0.669	0.091	0.102	0.137	0.669	0.001	0.446	-0.261	-0.442	-0.341	0.446	0.841	0.023	9.9
Writing	11	558002	0214	3	6	FT	C	B	13209	0.774	0.043	0.120	0.774	0.060	0.003	0.350	-0.269	-0.268	0.350	-0.209	0.037	0.025	9.9
Writing	11	558003	0215	3	7	FT	B	B	13209	0.781	0.105	0.781	0.089	0.024	0.001	0.480	-0.405	0.480	-0.342	-0.261	-0.022	0.026	9.9

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	11	558004	0216	3	8	FT	D	B	13209	0.587	0.209	0.098	0.105	0.587	0.001	0.265	-0.153	-0.190	-0.349	0.265	1.399	0.022	9.9
Writing	11	558005	0217	3	13	FT	A	B	13209	0.438	0.438	0.132	0.074	0.354	0.001	0.219	0.219	-0.303	-0.336	-0.106	2.375	0.022	9.9
Writing	11	558006	0218	3	14	FT	B	B	13209	0.407	0.134	0.407	0.226	0.230	0.003	0.308	-0.224	0.308	-0.341	-0.289	2.584	0.023	9.9
Writing	11	558007	0219	3	15	FT	C	B	13209	0.569	0.195	0.106	0.569	0.128	0.003	0.361	-0.257	-0.345	0.361	-0.321	1.521	0.022	9.9
Writing	11	558008	0220	3	16	FT	D	B	13209	0.372	0.225	0.195	0.206	0.372	0.002	0.478	-0.540	-0.386	-0.526	0.478	2.837	0.023	9.9
Writing	11	553850	0221	4	5	MXLK	A	B	13338	0.702	0.702	0.124	0.088	0.085	0.001	0.321	0.321	-0.248	-0.240	-0.230	0.614	0.023	9.9
Writing	11	553851	0222	4	6	MXLK	B	B	13338	0.894	0.038	0.894	0.046	0.021	0.002	0.381	-0.206	0.381	-0.334	-0.165	-1.022	0.031	7.0
Writing	11	553852	0223	4	7	MXLK	C	B	13338	0.533	0.074	0.008	0.533	0.384	0.001	0.225	-0.362	-0.197	0.225	-0.153	1.499	0.022	9.9
Writing	11	553853	0224	4	8	MXLK	C	B	13338	0.564	0.310	0.078	0.564	0.047	0.001	0.411	-0.362	-0.359	0.411	-0.311	1.322	0.022	9.9
Writing	11	558009	0225	4	13	FT	B	B	13338	0.886	0.050	0.886	0.051	0.011	0.001	0.362	-0.218	0.362	-0.296	-0.181	-1.180	0.032	9.3
Writing	11	558010	0226	4	14	FT	D	B	13338	0.776	0.053	0.094	0.076	0.776	0.001	0.403	-0.311	-0.298	-0.266	0.403	-0.006	0.025	9.9
Writing	11	558011	0227	4	15	FT	C	B	13338	0.874	0.046	0.031	0.874	0.047	0.002	0.423	-0.267	-0.272	0.423	-0.303	-1.014	0.031	5.5
Writing	11	558012	0228	4	16	FT	D	B	13338	0.737	0.152	0.070	0.038	0.737	0.002	0.416	-0.334	-0.263	-0.344	0.416	0.311	0.024	9.9
Writing	11	558013	0229	5	5	FT	A	B	13197	0.717	0.717	0.054	0.092	0.137	0.001	0.346	0.346	-0.295	-0.248	-0.245	0.486	0.024	9.9
Writing	11	558014	0230	5	6	FT	C	B	13197	0.655	0.054	0.239	0.655	0.051	0.001	0.195	-0.291	-0.063	0.195	-0.248	0.927	0.023	9.9
Writing	11	558015	0231	5	7	FT	B	B	13197	0.807	0.018	0.807	0.039	0.136	0.001	0.161	-0.155	0.161	-0.196	-0.063	-0.262	0.027	9.9
Writing	11	558016	0232	5	8	FT	A	B	13197	0.685	0.685	0.232	0.046	0.036	0.001	0.317	0.317	-0.265	-0.232	-0.222	0.718	0.023	9.9
Writing	11	558017	0233	5	13	FT	B	B	13197	0.769	0.079	0.769	0.122	0.029	0.001	0.417	-0.357	0.417	-0.266	-0.328	0.075	0.025	9.9
Writing	11	558018	0234	5	14	FT	D	B	13197	0.572	0.054	0.080	0.293	0.572	0.001	0.384	-0.179	-0.371	-0.353	0.384	1.485	0.022	9.9
Writing	11	558019	0235	5	15	FT	C	B	13197	0.799	0.099	0.048	0.799	0.052	0.002	0.452	-0.295	-0.369	0.452	-0.316	-0.186	0.026	9.7
Writing	11	558020	0236	5	16	FT	C	B	13197	0.835	0.032	0.039	0.835	0.092	0.002	0.311	-0.238	-0.264	0.311	-0.169	-0.541	0.028	9.9
Writing	11	558021	0237	6	5	FT	D	B	13255	0.395	0.240	0.163	0.200	0.395	0.001	0.314	-0.374	-0.264	-0.265	0.314	2.661	0.023	9.9
Writing	11	558022	0238	6	6	FT	B	B	13255	0.819	0.016	0.819	0.087	0.078	0.000	0.297	-0.194	0.297	-0.203	-0.224	-0.399	0.027	9.9
Writing	11	558023	0239	6	7	FT	B	B	13255	0.762	0.077	0.762	0.085	0.076	0.001	0.394	-0.271	0.394	-0.339	-0.238	0.117	0.025	9.9
Writing	11	558024	0240	6	8	FT	C	B	13255	0.798	0.122	0.009	0.798	0.070	0.001	0.415	-0.335	-0.212	0.415	-0.307	-0.202	0.026	9.9
Writing	11	553874	0241	6	13	MXLK	B	B	13255	0.630	0.200	0.630	0.038	0.130	0.001	0.367	-0.333	0.367	-0.160	-0.319	0.899	0.023	9.9
Writing	11	553875	0242	6	14	MXLK	C	B	13255	0.873	0.005	0.048	0.873	0.074	0.001	0.315	-0.139	-0.245	0.315	-0.224	-0.747	0.029	9.9
Writing	11	553876	0243	6	15	MXLK	A	B	13255	0.764	0.764	0.036	0.172	0.027	0.001	0.421	0.421	-0.279	-0.366	-0.223	0.132	0.025	9.9
Writing	11	553877	0244	6	16	MXLK	C	B	13255	0.466	0.284	0.222	0.466	0.026	0.002	0.355	-0.340	-0.321	0.355	-0.292	1.804	0.022	9.9
Writing	11	558025	0245	7	5	FT	A	B	13175	0.516	0.516	0.073	0.381	0.029	0.001	0.231	0.231	-0.370	-0.151	-0.239	1.908	0.023	9.9
Writing	11	558026	0246	7	6	FT	B	B	13175	0.805	0.036	0.805	0.044	0.114	0.001	0.420	-0.225	0.420	-0.299	-0.340	-0.247	0.027	9.9
Writing	11	558027	0247	7	7	FT	D	B	13175	0.684	0.074	0.075	0.165	0.684	0.001	0.400	-0.279	-0.349	-0.308	0.400	0.749	0.024	9.9
Writing	11	558028	0248	7	8	FT	C	B	13175	0.840	0.049	0.049	0.840	0.061	0.001	0.378	-0.218	-0.334	0.378	-0.218	-0.600	0.029	9.4
Writing	11	558029	0249	7	13	FT	C	B	13175	0.868	0.050	0.062	0.868	0.018	0.003	0.437	-0.318	-0.324	0.437	-0.207	-0.929	0.031	4.9
Writing	11	558030	0250	7	14	FT	D	B	13175	0.752	0.040	0.075	0.131	0.752	0.002	0.350	-0.216	-0.221	-0.299	0.350	0.218	0.025	9.9
Writing	11	558031	0251	7	15	FT	B	B	13175	0.245	0.132	0.245	0.138	0.483	0.002	0.199	-0.233	0.199	-0.298	-0.190	4.004	0.028	9.9
Writing	11	558032	0252	7	16	FT	A	B	13175	0.855	0.855	0.060	0.043	0.040	0.002	0.374	0.374	-0.248	-0.264	-0.240	-0.776	0.030	9.9
Writing	11	558033	0253	8	5	FT	A	B	13224	0.717	0.717	0.201	0.060	0.021	0.000	0.457	0.457	-0.441	-0.267	-0.182	0.465	0.024	9.9
Writing	11	558034	0254	8	6	FT	D	B	13224	0.872	0.051	0.058	0.019	0.872	0.001	0.301	-0.220	-0.174	-0.211	0.301	-0.989	0.031	9.9
Writing	11	558035	0255	8	7	FT	B	B	13224	0.522	0.167	0.522	0.168	0.141	0.003	0.189	-0.079	0.189	-0.251	-0.147	1.811	0.022	9.9
Writing	11	558036	0256	8	8	FT	C	B	13224	0.666	0.077	0.181	0.666	0.075	0.001	0.449	-0.377	-0.369	0.449	-0.302	0.838	0.023	9.9
Writing	11	553894	0257	8	13	MXLK	C	B	13224	0.898	0.056	0.026	0.898	0.020	0.001	0.437	-0.351	-0.271	0.437	-0.212	-1.038	0.031	3.1
Writing	11	553895	0258	8	14	MXLK	B	B	13224	0.755	0.167	0.755	0.065	0.011	0.002	0.398	-0.324	0.398	-0.325	-0.187	0.171	0.025	9.9

Information										Proportions						Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Key	R.C.	N	P-Val.	A	B	C	D	Omit	Pt. Bis.	A	B	C	D	Logit	Logit SE	Fit
Writing	11	553896	0259	8	15	MXLK	D	B	13224	0.893	0.021	0.034	0.051	0.893	0.001	0.405	-0.263	-0.284	-0.259	0.405	-0.976	0.031	9.9
Writing	11	553897	0260	8	16	MXLK	B	B	13224	0.506	0.140	0.506	0.183	0.168	0.003	0.356	-0.185	0.356	-0.392	-0.329	1.622	0.022	9.9
Writing	11	558037	0261	9	5	FT	D	B	13217	0.565	0.050	0.125	0.259	0.565	0.002	0.316	-0.222	-0.248	-0.291	0.316	1.515	0.022	9.9
Writing	11	558038	0262	9	6	FT	C	B	13217	0.847	0.028	0.059	0.847	0.065	0.001	0.404	-0.178	-0.309	0.404	-0.302	-0.701	0.029	9.0
Writing	11	558039	0263	9	7	FT	A	B	13217	0.725	0.725	0.126	0.106	0.042	0.001	0.362	0.362	-0.250	-0.323	-0.210	0.393	0.024	9.9
Writing	11	558040	0264	9	8	FT	C	B	13217	0.686	0.032	0.207	0.686	0.074	0.001	0.432	-0.326	-0.421	0.432	-0.200	0.690	0.023	9.9
Writing	11	558041	0265	9	13	FT	B	B	13217	0.612	0.205	0.612	0.144	0.038	0.002	0.449	-0.408	0.449	-0.351	-0.313	1.200	0.023	9.9
Writing	11	558042	0266	9	14	FT	B	B	13217	0.853	0.083	0.853	0.047	0.015	0.002	0.335	-0.236	0.335	-0.240	-0.189	-0.768	0.029	9.9
Writing	11	558043	0267	9	15	FT	C	B	13217	0.852	0.025	0.098	0.852	0.023	0.001	0.431	-0.225	-0.370	0.431	-0.222	-0.764	0.029	6.2
Writing	11	558052	0268	9	16	FT	D	B	13217	0.902	0.041	0.024	0.031	0.902	0.002	0.419	-0.274	-0.254	-0.283	0.419	-1.421	0.034	4.8
Writing	11	558051	0269	10	5	FT	A	B	13126	0.707	0.707	0.058	0.207	0.027	0.001	0.219	0.219	-0.201	-0.141	-0.205	0.554	0.024	9.9
Writing	11	558046	0270	10	6	FT	B	B	13126	0.940	0.008	0.940	0.029	0.022	0.000	0.341	-0.167	0.341	-0.226	-0.240	-2.135	0.042	5.9
Writing	11	558047	0271	10	7	FT	C	B	13126	0.799	0.040	0.042	0.799	0.117	0.001	0.417	-0.313	-0.299	0.417	-0.290	-0.210	0.027	9.9
Writing	11	558049	0272	10	8	FT	D	B	13126	0.740	0.068	0.062	0.130	0.740	0.001	0.368	-0.246	-0.258	-0.300	0.368	0.301	0.025	9.9
Writing	11	558048	0273	10	13	FT	A	B	13126	0.774	0.774	0.189	0.014	0.021	0.001	0.156	0.156	-0.101	-0.191	-0.120	0.015	0.026	9.9
Writing	11	557964	0274	10	14	FT	C	B	13126	0.734	0.074	0.123	0.734	0.068	0.001	0.419	-0.248	-0.324	0.419	-0.363	0.346	0.024	9.9
Writing	11	558056	0275	10	15	FT	B	B	13126	0.936	0.014	0.936	0.028	0.021	0.001	0.373	-0.231	0.373	-0.235	-0.242	-2.037	0.041	2.5
Writing	11	558057	0276	10	16	FT	D	B	13126	0.851	0.032	0.055	0.060	0.851	0.001	0.436	-0.309	-0.322	-0.270	0.436	-0.738	0.029	9.9

Appendix I:

2008 Grades 5, 8, and 11 Open-Ended Statistics

Table Legend

Column	Description
Cont.	Tested Content
Grade	Tested Grade
ID	Item identification number
Pub. ID	Public item identification number
Form	Form on which the item appeared 'All' = common form
Seq.	Sequence number of the item
Status	Status of the item at the time of administration 'OP' = common
Pts.	Maximum points possible
R.C.	Reporting category
N	Number of students
Mean	Mean score
Proportion [0-4, Omit]	Proportion achieving score point
Pt. Bis.	Item total correlation
Correlation [0-4]	Point biserial of the score point
Logit	Rasch logit difficulty
Logit SE	Rasch logit difficulty standard error
Fit	Rasch outfit statistic

Information											Proportions				Correlations					Rasch		
Cont.	Grade	ID	Pub. ID	Form	Seq.	Status	Pts.	R.C.	N	Mean	1	2	3	4	Pt. Bis.	1	2	3	4	Logit	Logit SE	Fit
Writing	5	543245	0277	All	21	OP	4	A	125547	2.625	0.025	0.400	0.500	0.075	0.595	-0.314	-0.429	0.350	0.319	1.498	0.006	-9.9
Writing	5	543245	0278	All	21	OP	4	A	125547	2.715	0.034	0.302	0.580	0.085	0.668	-0.357	-0.471	0.369	0.353	1.648	0.006	9.9
Writing	5	543248	0279	All	22	OP	4	B	125547	2.639	0.031	0.365	0.537	0.067	0.626	-0.336	-0.444	0.391	0.311	3.200	0.007	9.9
Writing	5	543248	0280	All	22	OP	4	B	125547	2.684	0.039	0.311	0.577	0.073	0.661	-0.369	-0.452	0.394	0.331	2.292	0.007	9.9
Writing	8	543314	0281	All	21	OP	4	B	136417	2.731	0.019	0.295	0.622	0.064	0.636	-0.291	-0.500	0.397	0.308	0.997	0.006	-9.9
Writing	8	543314	0282	All	21	OP	4	B	136417	2.744	0.024	0.284	0.615	0.076	0.668	-0.322	-0.515	0.400	0.328	1.279	0.006	-9.9
Writing	8	543361	0283	All	22	OP	4	A	136417	2.680	0.021	0.346	0.565	0.068	0.626	-0.300	-0.479	0.386	0.316	0.710	0.006	-9.9
Writing	8	543361	0284	All	22	OP	4	A	136417	2.727	0.026	0.297	0.599	0.077	0.665	-0.330	-0.499	0.391	0.335	1.344	0.006	-9.9
Writing	11	543492	0285	All	21	OP	4	B	132349	2.886	0.012	0.191	0.696	0.101	0.587	-0.237	-0.443	0.196	0.365	1.503	0.007	-9.9
Writing	11	543492	0286	All	21	OP	4	B	132349	2.905	0.011	0.188	0.685	0.116	0.641	-0.242	-0.502	0.206	0.395	1.389	0.007	9.9
Writing	11	543491	0287	All	22	OP	4	B	132349	2.725	0.029	0.301	0.587	0.084	0.636	-0.335	-0.446	0.331	0.353	1.105	0.006	-9.9
Writing	11	543491	0288	All	22	OP	4	B	132349	2.776	0.025	0.271	0.608	0.096	0.680	-0.325	-0.506	0.332	0.383	0.628	0.006	9.9

Appendix J:

2008 Linking Item Statistics

Table Legend

Column	Description
ID	Item identification number
Item Type	Type of the item 'MC' = multiple choice
ID	Item identification number
Form	Form on which the item appeared
Seq.	Sequence number of the item
Prev. Form	Form on which the item previously appeared 0 = common form
Prev. Seq.	Previous sequence number of the item
2007 P-Value	2007 P-Value
2008 P-Value	2008 P-Value
2007 Logit	2007 Rasch logit difficulty
2008 Logit	2008 Rasch logit difficulty

Grade 5

ID	Item Type	Form	Seq.	Prev. Form	Prev. Seq.	2007 P-Value	2008 P-Value	2007 Logit	2008 Logit
553756	MC	2	13	1	13	0.7705	0.7814	0.0755	0.0361
553757	MC	2	14	1	14	0.8771	0.8490	-0.9978	-0.5191
553758	MC	2	15	1	15	0.5168	0.4829	1.7984	1.7662
553759	MC	2	16	1	16	0.6913	0.6702	0.6731	0.6906
553792	MC	4	5	2	5	0.6014	0.6133	1.2965	1.1325
553793	MC	4	6	2	6	0.7618	0.7588	0.1863	0.2645
553794	MC	4	7	2	7	0.7799	0.7908	0.0383	0.0413
553795	MC	4	8	2	8	0.7143	0.6658	0.5452	0.8092
553713	MC	6	13	3	13	0.4472	0.4659	2.2166	1.8258
553715	MC	6	14	3	14	0.5234	0.5122	1.7494	1.5863
553714	MC	6	15	3	15	0.8072	0.8147	-0.2272	-0.2668
553716	MC	6	16	3	16	0.6814	0.6807	0.7464	0.7017
553783	MC	8	5	8	5	0.8285	0.8291	-0.4221	-0.3271
553785	MC	8	6	8	6	0.8474	0.8174	-0.6169	-0.2934
553784	MC	8	7	8	7	0.7049	0.7190	0.5896	0.4530
557896	MC	8	8	8	8	0.4207	0.4129	2.3960	2.1465
					Mean	0.6859	0.6790	0.6280	0.6280

Grade 8

ID	Item Type	Form	Seq.	Prev. Form	Prev. Seq.	2007 P-Value	2008 P-Value	2007 Logit	2008 Logit
553839	MC	2	5	1	5	0.3657	0.3474	3.1736	2.5238
553840	MC	2	6	1	6	0.7120	0.7110	0.7668	0.6260
553842	MC	2	7	1	7	0.8741	0.8747	-0.7874	-0.5909
553841	MC	2	8	1	8	0.8652	0.8667	-0.6751	-0.5633
553739	MC	4	5	3	5	0.8468	0.8304	-0.4515	-0.2130
553742	MC	4	6	3	6	0.7479	0.7395	0.4898	0.4447
553746	MC	4	7	3	7	0.9182	0.9116	-1.4492	-1.1364
553750	MC	4	8	3	8	0.8745	0.8777	-0.7847	-0.7367
553734	MC	6	5	4	5	0.6110	0.6170	1.4596	1.1751
553738	MC	6	6	4	6	0.7816	0.7763	0.1374	0.2160
553741	MC	6	7	4	7	0.8928	0.8946	-1.0984	-0.8449
553745	MC	6	8	4	8	0.7010	0.7306	0.8015	0.4874
553816	MC	8	13	9	13	0.7524	0.7413	0.4280	0.4813
553817	MC	8	14	9	14	0.6933	0.6734	0.8943	0.8709
553818	MC	8	15	9	15	0.8420	0.8309	-0.4143	-0.2168
553819	MC	8	16	9	16	0.7300	0.7199	0.6097	0.5769
					Mean	0.7630	0.7590	0.1938	0.1938

Grade 11

ID	Item Type	Form	Seq.	Prev. Form	Prev. Seq.	2007 P-Value	2008 P-Value	2007 Logit	2008 Logit
553846	MC	2	13	4	13	0.7866	0.7873	-0.1089	-0.0866
553849	MC	2	14	4	14	0.7503	0.7314	0.1826	0.3194
553848	MC	2	15	4	15	0.4762	0.4522	1.9750	1.8868
553847	MC	2	16	4	16	0.7039	0.7022	0.5233	0.4923
553850	MC	4	5	3	5	0.6888	0.7015	0.5774	0.6137
553851	MC	4	6	3	6	0.8914	0.8942	-1.2302	-1.0223
553852	MC	4	7	3	7	0.5378	0.5325	1.5322	1.4991
553853	MC	4	8	3	8	0.5690	0.5641	1.3422	1.3220
553874	MC	6	13	3	13	0.6169	0.6302	1.0453	0.8992
553875	MC	6	14	3	14	0.8630	0.8725	-0.8816	-0.7469
553876	MC	6	15	3	15	0.7484	0.7641	0.1525	0.1320
553877	MC	6	16	3	16	0.4829	0.4662	1.8651	1.8039
553894	MC	8	13	8	13	0.9026	0.8978	-1.3657	-1.0380
553895	MC	8	14	8	14	0.7231	0.7545	0.3888	0.1709
553896	MC	8	15	8	15	0.9028	0.8935	-1.3692	-0.9762
553897	MC	8	16	8	16	0.4318	0.5060	2.2625	1.6217
					Mean	0.6922	0.6969	0.4307	0.4307

Appendix K:

2008 Raw to Scaled Score Tables

Table Legend

Column	Description
Raw Score	Raw score
Meas.	Rasch ability measure
Meas. SE	Rasch ability measure standard error
Scaled Score	Scale score
Scaled Score SE	Scale score standard error
Freq.	Frequency
Freq. %	Frequency percent
Cum. Freq.	Cumulative frequency
Cum. Freq. %	Cumulative frequency percent
Pctile	Percentile

Grade 5 Raw-to-Scale Table

Raw Score	Meas.	Meas. SE	Scaled Score	Scaled Score SE	Freq.	Freq. %	Cum. Freq.	Cum. Freq. %	Pctile
22	-7.7009	1.8401	700	184	19	0.0	19	0.0	1
23	-6.4596	1.0267	700	103	107	0.1	126	0.1	1
24	-5.7112	0.7459	700	75	199	0.2	325	0.3	1
25	-5.2483	0.6260	700	63	265	0.2	590	0.5	1
26	-4.9008	0.5578	700	56	268	0.2	858	0.7	1
27	-4.6152	0.5136	700	51	218	0.2	1076	0.9	1
28	-4.3677	0.4831	700	48	153	0.1	1229	1.0	1
29	-4.1453	0.4612	700	46	86	0.1	1315	1.0	1
30	-3.9403	0.4452	700	45	57	0.0	1372	1.1	1
31	-3.7474	0.4337	700	43	37	0.0	1409	1.1	1
32	-3.5631	0.4255	715	43	28	0.0	1437	1.1	1
33	-3.3845	0.4201	733	42	60	0.0	1497	1.2	1
34	-3.2096	0.4169	750	42	176	0.1	1673	1.3	1
35	-3.0364	0.4156	768	42	328	0.3	2001	1.6	1
36	-2.8637	0.4160	785	42	504	0.4	2505	2.0	2
37	-2.6900	0.4178	802	42	586	0.5	3091	2.5	2
38	-2.5143	0.4207	820	42	529	0.4	3620	2.9	3
39	-2.3358	0.4245	838	42	483	0.4	4103	3.3	3
40	-2.1538	0.4286	856	43	349	0.3	4452	3.5	3
41	-1.9683	0.4327	875	43	305	0.2	4757	3.8	4
42	-1.7796	0.4359	893	44	241	0.2	4998	4.0	4
43	-1.5886	0.4378	913	44	183	0.1	5181	4.1	4
44	-1.3968	0.4377	932	44	208	0.2	5389	4.3	4
45	-1.2061	0.4355	951	44	451	0.4	5840	4.7	4
46	-1.0182	0.4310	970	43	970	0.8	6810	5.4	5
47	-0.8350	0.4248	988	42	1559	1.2	8369	6.7	6
48	-0.6576	0.4173	1006	42	2315	1.8	10684	8.5	8
49	-0.4869	0.4090	1023	41	2857	2.3	13541	10.8	10
50	-0.3230	0.4006	1039	40	3290	2.6	16831	13.4	12
51	-0.1658	0.3923	1055	39	3390	2.7	20221	16.1	15
52	-0.0150	0.3845	1070	38	3432	2.7	23653	18.8	17
53	0.1300	0.3773	1084	38	3293	2.6	26946	21.5	20
54	0.2699	0.3708	1098	37	2962	2.4	29908	23.8	23
55	0.4053	0.3652	1112	37	2289	1.8	32197	25.6	25
56	0.5368	0.3604	1125	36	1700	1.4	33897	27.0	26
57	0.6652	0.3564	1138	36	1165	0.9	35062	27.9	27
58	0.7911	0.3533	1151	35	958	0.8	36020	28.7	28
59	0.9151	0.3511	1163	35	1238	1.0	37258	29.7	29
60	1.0379	0.3498	1175	35	1836	1.5	39094	31.1	30
61	1.1600	0.3493	1187	35	2558	2.0	41652	33.2	32
62	1.2821	0.3498	1200	35	3353	2.7	45005	35.8	35
63	1.4049	0.3512	1212	35	4000	3.2	49005	39.0	37
64	1.5291	0.3537	1224	35	4662	3.7	53667	42.7	41
65	1.6555	0.3574	1237	36	4823	3.8	58490	46.6	45
66	1.7849	0.3623	1250	36	4434	3.5	62924	50.1	48
67	1.9183	0.3686	1263	37	3187	2.5	66111	52.7	51
68	2.0570	0.3765	1277	38	1637	1.3	67748	54.0	53
69	2.2024	0.3863	1292	39	447	0.4	68195	54.3	54
70	2.3562	0.3984	1307	40	706	0.6	68901	54.9	55
71	2.5207	0.4132	1324	41	1206	1.0	70107	55.8	55
72	2.6987	0.4312	1341	43	2043	1.6	72150	57.5	57
73	2.8939	0.4531	1361	45	3377	2.7	75527	60.2	59
74	3.1110	0.4794	1383	48	5059	4.0	80586	64.2	62
75	3.3557	0.5103	1407	51	6988	5.6	87574	69.8	67
76	3.6337	0.5442	1435	54	8580	6.8	96154	76.6	73
77	3.9482	0.5762	1466	58	8722	6.9	104876	83.5	80
78	4.2943	0.5977	1501	60	5844	4.7	110720	88.2	86

Grade 5 Raw-to-Scale Table

Raw Score	Meas.	Meas. SE	Scaled Score	Scaled Score SE	Freq.	Freq. %	Cum. Freq.	Cum. Freq. %	Pctile
79	4.6560	0.6023	1537	60	1044	0.8	111764	89.0	89
80	5.0142	0.5932	1573	59	110	0.1	111874	89.1	89
81	5.3581	0.5797	1607	58	45	0.0	111919	89.1	89
82	5.6877	0.5695	1640	57	104	0.1	112023	89.2	89
83	6.0094	0.5664	1672	57	201	0.2	112224	89.4	89
84	6.3329	0.5727	1705	57	403	0.3	112627	89.7	90
85	6.6701	0.5908	1738	59	776	0.6	113403	90.3	90
86	7.0373	0.6240	1775	62	1432	1.1	114835	91.5	91
87	7.4585	0.6775	1817	68	2167	1.7	117002	93.2	92
88	7.9702	0.7569	1868	76	2774	2.2	119776	95.4	94
89	8.6187	0.8517	1933	85	2346	1.9	122122	97.3	96
90	9.3910	0.8856	2011	89	418	0.3	122540	97.6	97
91	10.1184	0.8083	2083	81	1	0.0	122541	97.6	98
92	10.6989	0.7190	2141	72	4	0.0	122545	97.6	98
93	11.1716	0.6610	2189	66	3	0.0	122548	97.6	98
94	11.5865	0.6313	2230	63	28	0.0	122576	97.6	98
95	11.9786	0.6247	2269	62	65	0.1	122641	97.7	98
96	12.3766	0.6410	2309	64	146	0.1	122787	97.8	98
97	12.8138	0.6874	2353	69	303	0.2	123090	98.0	98
98	13.3497	0.7890	2406	79	581	0.5	123671	98.5	98
99	14.1585	1.0532	2487	105	954	0.8	124625	99.3	99
100	15.4362	1.8533	2615	185	922	0.7	125547	100.0	99

Grade 8 Raw-to-Scale Table

Raw Score	Meas.	Meas. SE	Scaled Score	Scaled Score SE	Freq.	Freq. %	Cum. Freq.	Cum. Freq. %	Pctile
22	-8.1136	1.8389	700	184	30	0.0	30	0.0	1
23	-6.8752	1.0247	700	102	81	0.1	111	0.1	1
24	-6.1309	0.7431	700	74	166	0.1	277	0.2	1
25	-5.6720	0.6229	700	62	208	0.2	485	0.4	1
26	-5.3284	0.5543	700	55	232	0.2	717	0.5	1
27	-5.0466	0.5101	700	51	142	0.1	859	0.6	1
28	-4.8025	0.4796	700	48	98	0.1	957	0.7	1
29	-4.5832	0.4580	700	46	46	0.0	1003	0.7	1
30	-4.3809	0.4425	700	44	45	0.0	1048	0.8	1
31	-4.1902	0.4316	705	43	27	0.0	1075	0.8	1
32	-4.0072	0.4243	723	42	16	0.0	1091	0.8	1
33	-3.8292	0.4200	741	42	49	0.0	1140	0.8	1
34	-3.6538	0.4182	758	42	161	0.1	1301	1.0	1
35	-3.4788	0.4188	776	42	299	0.2	1600	1.2	1
36	-3.3025	0.4214	794	42	428	0.3	2028	1.5	1
37	-3.1231	0.4259	812	43	451	0.3	2479	1.8	2
38	-2.9392	0.4320	830	43	448	0.3	2927	2.1	2
39	-2.7494	0.4395	849	44	374	0.3	3301	2.4	2
40	-2.5526	0.4477	869	45	282	0.2	3583	2.6	3
41	-2.3485	0.4557	889	46	214	0.2	3797	2.8	3
42	-2.1377	0.4624	910	46	135	0.1	3932	2.9	3
43	-1.9218	0.4663	932	47	111	0.1	4043	3.0	3
44	-1.7040	0.4663	953	47	170	0.1	4213	3.1	3
45	-1.4882	0.4620	975	46	459	0.3	4672	3.4	3
46	-1.2782	0.4539	996	45	994	0.7	5666	4.2	4
47	-1.0769	0.4431	1016	44	1724	1.3	7390	5.4	5
48	-0.8859	0.4309	1035	43	2461	1.8	9851	7.2	6
49	-0.7056	0.4184	1053	42	2973	2.2	12824	9.4	8
50	-0.5356	0.4063	1070	41	3337	2.4	16161	11.8	11
51	-0.3750	0.3951	1086	40	3383	2.5	19544	14.3	13
52	-0.2230	0.3851	1102	39	3245	2.4	22789	16.7	16
53	-0.0782	0.3761	1116	38	2846	2.1	25635	18.8	18
54	0.0604	0.3684	1130	37	2418	1.8	28053	20.6	20
55	0.1936	0.3618	1143	36	1676	1.2	29729	21.8	21
56	0.3224	0.3562	1156	36	1193	0.9	30922	22.7	22
57	0.4477	0.3517	1169	35	854	0.6	31776	23.3	23
58	0.5700	0.3481	1181	35	904	0.7	32680	24.0	24
59	0.6901	0.3454	1193	35	1307	1.0	33987	24.9	24
60	0.8088	0.3436	1205	34	1979	1.5	35966	26.4	26
61	0.9265	0.3427	1216	34	2716	2.0	38682	28.4	27
62	1.0438	0.3426	1228	34	3502	2.6	42184	30.9	30
63	1.1614	0.3433	1240	34	4116	3.0	46300	33.9	32
64	1.2797	0.3449	1252	34	4377	3.2	50677	37.1	36
65	1.3995	0.3474	1264	35	4120	3.0	54797	40.2	39
66	1.5213	0.3508	1276	35	3620	2.7	58417	42.8	41
67	1.6459	0.3552	1288	36	2270	1.7	60687	44.5	44
68	1.7738	0.3605	1301	36	1094	0.8	61781	45.3	45
69	1.9061	0.3669	1314	37	530	0.4	62311	45.7	45
70	2.0434	0.3744	1328	37	1058	0.8	63369	46.5	46
71	2.1867	0.3829	1343	38	1892	1.4	65261	47.8	47
72	2.3369	0.3924	1358	39	3124	2.3	68385	50.1	49
73	2.4949	0.4027	1373	40	5141	3.8	73526	53.9	52
74	2.6613	0.4134	1390	41	7747	5.7	81273	59.6	57
75	2.8367	0.4240	1408	42	10396	7.6	91669	67.2	63
76	3.0207	0.4336	1426	43	11857	8.7	103526	75.9	72
77	3.2122	0.4413	1445	44	10942	8.0	114468	83.9	80
78	3.4093	0.4461	1465	45	6445	4.7	120913	88.6	86

Grade 8 Raw-to-Scale Table

Raw Score	Meas.	Meas. SE	Scaled Score	Scaled Score SE	Freq.	Freq. %	Cum. Freq.	Cum. Freq. %	Pctile
79	3.6092	0.4476	1485	45	1014	0.7	121927	89.4	89
80	3.8091	0.4460	1505	45	85	0.1	122012	89.4	89
81	4.0064	0.4421	1524	44	34	0.0	122046	89.5	89
82	4.1995	0.4367	1544	44	74	0.1	122120	89.5	89
83	4.3878	0.4310	1563	43	211	0.2	122331	89.7	90
84	4.5712	0.4256	1581	43	439	0.3	122770	90.0	90
85	4.7504	0.4212	1599	42	904	0.7	123674	90.7	90
86	4.9264	0.4181	1616	42	1572	1.2	125246	91.8	91
87	5.1005	0.4167	1634	42	2396	1.8	127642	93.6	93
88	5.2742	0.4171	1651	42	2898	2.1	130540	95.7	95
89	5.4490	0.4196	1669	42	2309	1.7	132849	97.4	97
90	5.6270	0.4245	1687	42	392	0.3	133241	97.7	98
91	5.8103	0.4322	1705	43	0	0.0	133241	97.7	98
92	6.0017	0.4435	1724	44	5	0.0	133246	97.7	98
93	6.2050	0.4592	1744	46	3	0.0	133249	97.7	98
94	6.4254	0.4810	1766	48	19	0.0	133268	97.7	98
95	6.6709	0.5115	1791	51	58	0.0	133326	97.7	98
96	6.9543	0.5557	1819	56	170	0.1	133496	97.9	98
97	7.2995	0.6242	1854	62	365	0.3	133861	98.1	98
98	7.7600	0.7442	1900	74	696	0.5	134557	98.6	98
99	8.5060	1.0255	1974	103	970	0.7	135527	99.3	99
100	9.7456	1.8393	2098	184	890	0.7	136417	100.0	99

Grade 11 Raw-to-Scale Table

Raw Score	Meas.	Meas. SE	Scaled Score	Scaled Score SE	Freq.	Freq. %	Cum. Freq.	Cum. Freq. %	Pctile
22	-7.4403	1.8372	700	184	17	0.0	17	0.0	1
23	-6.2067	1.0212	700	102	63	0.0	80	0.1	1
24	-5.4699	0.7379	700	74	180	0.1	260	0.2	1
25	-5.0190	0.6162	742	62	200	0.2	460	0.3	1
26	-4.6840	0.5461	776	55	211	0.2	671	0.5	1
27	-4.4116	0.5004	803	50	133	0.1	804	0.6	1
28	-4.1778	0.4682	827	47	97	0.1	901	0.7	1
29	-3.9698	0.4448	847	44	49	0.0	950	0.7	1
30	-3.7801	0.4272	866	43	30	0.0	980	0.7	1
31	-3.6035	0.4139	884	41	21	0.0	1001	0.8	1
32	-3.4364	0.4039	901	40	13	0.0	1014	0.8	1
33	-3.2765	0.3964	917	40	59	0.0	1073	0.8	1
34	-3.1217	0.3909	932	39	191	0.1	1264	1.0	1
35	-2.9705	0.3871	947	39	386	0.3	1650	1.2	1
36	-2.8217	0.3845	962	38	541	0.4	2191	1.7	1
37	-2.6744	0.3830	977	38	591	0.4	2782	2.1	2
38	-2.5281	0.3823	991	38	475	0.4	3257	2.5	2
39	-2.3820	0.3821	1006	38	351	0.3	3608	2.7	3
40	-2.2360	0.3821	1021	38	270	0.2	3878	2.9	3
41	-2.0900	0.3822	1035	38	47	0.0	3925	3.0	3
42	-1.9440	0.3820	1050	38	45	0.0	3970	3.0	3
43	-1.7983	0.3813	1064	38	26	0.0	3996	3.0	3
44	-1.6534	0.3800	1079	38	92	0.1	4088	3.1	3
45	-1.5097	0.3781	1093	38	446	0.3	4534	3.4	3
46	-1.3677	0.3754	1108	38	937	0.7	5471	4.1	4
47	-1.2279	0.3722	1122	37	1595	1.2	7066	5.3	5
48	-1.0907	0.3686	1135	37	1945	1.5	9011	6.8	6
49	-0.9562	0.3646	1149	36	2073	1.6	11084	8.4	8
50	-0.8247	0.3606	1162	36	1920	1.5	13004	9.8	9
51	-0.6961	0.3567	1175	36	1689	1.3	14693	11.1	10
52	-0.5703	0.3529	1187	35	1457	1.1	16150	12.2	12
53	-0.4469	0.3495	1200	35	1086	0.8	17236	13.0	13
54	-0.3258	0.3465	1212	35	879	0.7	18115	13.7	13
55	-0.2066	0.3440	1224	34	701	0.5	18816	14.2	14
56	-0.0891	0.3420	1236	34	1015	0.8	19831	15.0	15
57	0.0274	0.3406	1247	34	1268	1.0	21099	15.9	15
58	0.1431	0.3398	1259	34	1838	1.4	22937	17.3	17
59	0.2584	0.3397	1270	34	2552	1.9	25489	19.3	18
60	0.3739	0.3402	1282	34	3477	2.6	28966	21.9	21
61	0.4901	0.3416	1293	34	3823	2.9	32789	24.8	23
62	0.6075	0.3437	1305	34	3900	2.9	36689	27.7	26
63	0.7266	0.3467	1317	35	3864	2.9	40553	30.6	29
64	0.8481	0.3507	1329	35	3457	2.6	44010	33.3	32
65	0.9728	0.3557	1342	36	2904	2.2	46914	35.4	34
66	1.1014	0.3619	1354	36	2129	1.6	49043	37.1	36
67	1.2351	0.3695	1368	37	1598	1.2	50641	38.3	38
68	1.3749	0.3787	1382	38	1182	0.9	51823	39.2	39
69	1.5225	0.3899	1397	39	1296	1.0	53119	40.1	40
70	1.6797	0.4033	1412	40	2218	1.7	55337	41.8	41
71	1.8488	0.4196	1429	42	3496	2.6	58833	44.5	43
72	2.0330	0.4393	1448	44	4922	3.7	63755	48.2	46
73	2.2363	0.4633	1468	46	6654	5.0	70409	53.2	51
74	2.4643	0.4922	1491	49	8241	6.2	78650	59.4	56
75	2.7233	0.5265	1517	53	9521	7.2	88171	66.6	63
76	3.0207	0.5641	1546	56	9995	7.6	98166	74.2	70
77	3.3597	0.5986	1580	60	8685	6.6	106851	80.7	77
78	3.7316	0.6173	1617	62	5213	3.9	112064	84.7	83

Grade 11 Raw-to-Scale Table

Raw Score	Meas.	Meas. SE	Scaled Score	Scaled Score SE	Freq.	Freq. %	Cum. Freq.	Cum. Freq. %	Pctile
79	4.1115	0.6114	1655	61	1222	0.9	113286	85.6	85
80	4.4720	0.5875	1692	59	186	0.1	113472	85.7	86
81	4.8002	0.5583	1724	56	138	0.1	113610	85.8	86
82	5.0969	0.5317	1754	53	270	0.2	113880	86.0	86
83	5.3678	0.5100	1781	51	478	0.4	114358	86.4	86
84	5.6192	0.4934	1806	49	834	0.6	115192	87.0	87
85	5.8563	0.4811	1830	48	1350	1.0	116542	88.1	88
86	6.0833	0.4725	1853	47	1994	1.5	118536	89.6	89
87	6.3037	0.4669	1875	47	2813	2.1	121349	91.7	91
88	6.5201	0.4640	1896	46	3213	2.4	124562	94.1	93
89	6.7351	0.4636	1918	46	2439	1.8	127001	96.0	95
90	6.9508	0.4658	1939	47	511	0.4	127512	96.3	96
91	7.1698	0.4707	1961	47	6	0.0	127518	96.3	96
92	7.3949	0.4789	1984	48	18	0.0	127536	96.4	96
93	7.6299	0.4914	2007	49	30	0.0	127566	96.4	96
94	7.8800	0.5098	2032	51	70	0.1	127636	96.4	96
95	8.1531	0.5368	2060	54	138	0.1	127774	96.5	96
96	8.4620	0.5774	2091	58	295	0.2	128069	96.8	97
97	8.8308	0.6421	2127	64	555	0.4	128624	97.2	97
98	9.3132	0.7582	2176	76	924	0.7	129548	97.9	98
99	10.0791	1.0348	2252	103	1452	1.1	131000	99.0	98
100	11.3318	1.8442	2377	184	1349	1.0	132349	100.0	99