

2009-2010

REVIEW OF THE
PALMETTO
ASSESSMENT OF
STATE STANDARDS
(PASS)



SC EDUCATION
OVERSIGHT COMMITTEE

PO Box 11867 | 227 Blatt Building | Columbia SC 29211 | WWW.SCEOC.ORG

Table of Contents

Executive Summary	iii
Introduction	1
Descriptions of PASS Assessments and State Academic Standards	1
Study of Alignment of PASS Item Bank to State Academic Standards.....	3
Categorical Concurrence	9
Background and Methodology – Categorical Concurrence	9
Findings – Categorical Concurrence	10
Depth-of-Knowledge Consistency.....	16
Background and Methodology – Depth-of-Knowledge	16
Findings – Depth-of-Knowledge	22
Range-of-Knowledge Correspondence.....	24
Background and Methodology – Range-of-Knowledge Correspondence	24
Findings – Range-of-Knowledge Correspondence	24
Balance-of-Representation	30
Background and Methodology – Balance of Representation	30
Findings – Balance of Representation	31
Summary and Recommendations From Alignment Analysis	33
Alignment Findings for Reading and Research.....	33
Alignment Findings for Writing	34
Alignment Findings for Mathematics	35
Alignment Findings for Science.....	35
Alignment Findings for Social Studies.....	36
Technical Review of PASS Tests.....	37
Technical Review Panel Findings	38
PASS Reading and Research Test	38
PASS Writing Test.....	39
PASS Mathematics Test	40
PASS Science Test	41
PASS Social Studies	42
References Cited	47
Appendix A Test Blueprints.....	49
Appendix B PASS Alignment Review Committee Members	57
Appendix C Tables of Alignment to Standards and Indicators Results.....	63
Appendix D Requested Statistical Data From the SCDE for PASS, 2009	115
Appendix E PASS Technical Review Panel.....	119

Review of the Palmetto Assessments of State Standards (PASS) Executive Summary

This report summarizes the results from the review of the Palmetto Assessment of State Standards (PASS) assessments and item bank by the Education Oversight Committee (EOC) pursuant to the Education Accountability Act:

Section 59-18-320. (A) After the first statewide field test of the assessment program in each of the four academic areas, and after the field tests of the end of course assessments of high school credit courses, the Education Oversight Committee, established in Section 59-6-10, will review the state assessment program and the course assessments for alignment with the state standards, level of difficulty and validity, and for the ability to differentiate levels of achievement, and will make recommendations for needed changes, if any. The review will be provided to the State Board of Education, the State Department of Education, the Governor, the Senate Education Committee, and the House Education and Public Works Committee as soon as feasible after the field tests. The Department of Education will then report to the Education Oversight Committee no later than one month after receiving the reports on the changes made to the assessments to comply with the recommendations.

The reviews of the item banks and technical data were conducted over the time period January to July 2009 with the assistance of 145 South Carolina educators who served as expert judges evaluating the content tested and the levels of thinking demanded by the items comprising the item banks used to generate the PASS tests, and the assistance of four South Carolina technical experts who evaluated the statistical characteristics of the 2009 PASS tests following the test administrations in spring 2009. The criteria for the alignment review were based on a methodology developed at the University of Wisconsin with the assistance of the Council of Chief State School Officers and the criteria for technical review were based on generally accepted statistical values for use in large-scale testing programs such as PASS.

The review of the alignment of the PASS item banks revealed both strengths and weaknesses in each content area. Strengths were observed in every subject area and weaknesses seemed more prominent in two of the subject areas tested, although weaknesses were identified for every subject area reviewed. The strengths were that, generally, there were at least some items in the bank for every subject assessing every academic standard slated to be tested. The weaknesses, which were observed primarily in the reading and research and writing, and to a lesser extent, in the social studies item banks, were that there were too few (or in some cases, none) items to adequately assess all of the objectives or indicators specified in the state standards. This is a concern because there may not be sufficient (or any) items to assess some of the indicators within a standard when test forms are created from the selection of items from the item bank while there are many items for other indicators: the indicators represented by many items are more likely to be tested and to have more weight in the total score calculated for the standard. This can lead to erroneous interpretations of student proficiency in the standard because some of the areas of learning in the standard are always tested and make up a large part of the test score for the standard, while other indicators in the standard may never be assessed. A second weakness of the item bank, especially in reading and research and in writing, along with social studies to a lesser extent, is that there were too few items in the bank assessing students at the same levels of thinking as specified in the state academic standards and too many assessing at lower levels. Again, this is a concern because there may not be sufficient

items in the item bank to assess the standards at the cognitive levels expected in the state standards, leading to erroneous interpretations from the test scores that students are able to perform at the levels of thinking expected in the standards when in fact they have not been assessed at those levels.

The review of the technical characteristics of the PASS tests administered in spring 2009 also revealed strengths and weaknesses in all subject areas. In general, the tests had acceptable reliability and had an overall difficulty at acceptable levels for criterion-referenced tests such as PASS. However, there were concerns about the overall test difficulties and the distributions of raw scores for some subjects at some grade levels, and recommendations were made by the technical review panel to ameliorate the issues observed.

The findings and recommendations from both the item bank alignment review and the technical review of the 2009 PASS tests are summarized below.

Findings for Reading and Research

Strengths – Reading and Research

- The item bank met the criterion for Categorical Concurrence, indicating an overall match between the content of the state academic standards and the items in the item bank.
- The item bank met the criterion for Range-of-Knowledge, indicating that the item bank has at least one item assessing 50% of the indicators in the academic standards.
- The reliability values for the tests at all grade levels are at or above the minimally acceptable value of 0.85.
- The average difficulty of the items is in the appropriate range for a criterion-referenced test (approximately 0.6).
- The measures of item fit to the latent trait model are in the appropriate ranges (approximately 1.0).

Areas for Concern – Reading and Research

- The item bank met the criterion for Depth-of-Knowledge in two grade levels, weakly met the criterion in two grades, and did not meet criterion in two grades, indicating a majority of the items in the grades where the criterion was not met assess students at a lower cognitive level than specified in the state academic standards.
- The item bank did not fully meet the Balance-of-Representation criterion at any grade level, suggesting that the numbers of items assessing individual indicators in the item bank are not well balanced in the standards where the criterion was not met or weakly met, which may make it difficult to construct future test forms which cover the content of the standards comprehensively.
- No items in the bank were identified as assessing a number of indicators from the reading and research standards, including spelling and several research indicators, so these indicators would not be assessed based on test forms generated from the item bank.
- The distributions of raw scores in grades 4 and 7 are strongly negatively skewed, indicating that many students are scoring at the very highest levels on these tests. This results in a “ceiling effect” on future test scores: over time it is expected that

with improved instruction and learning more and more students will score at the maximum range for the tests, limiting the degree to which one can differentiate between different levels of high student performance and limiting the degree to which one can accurately measure growth, especially of higher-performing students.

- A total of five items across grades 3, 5, and 8 had difficulty values (p values) below the criterion of p greater than or equal to 0.3, indicating that students are scoring at or below chance on the items and the items may be too difficult to provide useful information.
- A total of sixteen items across grades 3, 5, 6, 7, and 8 were flagged because their item discrimination values were below the minimal criterion (0.2), indicating a tendency for overall higher-scoring students to get an easy item wrong and/or for overall lower-scoring students to get a difficult item right, contrary to the expected patterns of performance. Items having poor discrimination values tend to decrease the overall reliability of a test.
- A total of six items across grades 3, 4, and 8 were flagged because their DIF values exceeded the maximum value for the criterion, indicating potential bias for or against specific demographic groups.

Recommendations – Reading and Research

1. Additional items should be developed and added to the item bank to more adequately cover the breadth and depth of the content and cognitive processing expectations for students defined in the SC Academic Standards for English Language Arts.
2. Until such time as sufficient items can be added to the item bank, the SCDE should develop and follow a plan for generating new test forms to ensure that the items selected cover the content and levels of thinking specified in the state academic standards.
3. Include more difficult items in future tests for grades 4 and 7 to ameliorate the ceiling effects observed with the 2009 test and to increase the ability to differentiate levels of achievement among higher-performing students. This can be accomplished by adding more difficult items to the tests (either by replacing easier items or by adding additional items).
4. Remove or revise items flagged for poor discrimination to increase the overall reliability of the test.
5. Review and revise or remove the exceptionally difficult items observed in grades 3, 5, and 8.
6. Review all items flagged for DIF to ensure that these items are not biased for or against males or females, or African American or White students.

Findings for Writing

Strengths – Writing

- The item bank met the criterion for Categorical Concurrence, indicating an overall match between the content of the state academic standards and the items in the item bank.
- The item bank met the criterion for Range-of-Knowledge, indicating that the item bank has at least one item assessing 50% of the indicators in the academic standards.

- The reliability values for the tests at all grade levels are at or above the minimally acceptable value of 0.85.
- The average difficulty of the items is in the appropriate range for a criterion-referenced test (approximately 0.6).

Areas for Concern – Writing

- The item bank met the criterion for Depth-of-Knowledge in three grade levels, weakly met the criterion in two grades, and did not meet criterion in one grade, indicating a majority of the items in the grades where the criterion was not met assess students at a lower cognitive level than specified in the state academic standards.
- The item bank did not fully meet the Balance-of-Representation criterion at any grade level, suggesting that the numbers of items assessing individual indicators in the item bank are not well balanced in the standards where the criterion was not met or weakly met, which may make it difficult to construct future test forms which cover the content of the standards comprehensively.
 - No items in the bank were identified as assessing several indicators from the writing standards, so these indicators would not be assessed based on test forms generated from the item bank.
 - The overall test distributions of writing scores become increasingly negatively skewed between grades 3 and 8, with distributions in grades 6, 7, and especially 8 showing evidence for a ceiling effect on the scores. Further evidence that the writing component is “easier” for middle school students than for elementary school students is that the mean raw score of eighth grade students is approximately five points higher than the mean raw score of third grade students. The differences in performance across the grades may reflect differential performance of students at different grade levels (e.g., eighth-grade students as a group are performing higher compared to the eighth grade academic standards than third-grade students are performing compared to their grade-level academic standards). However, the differences may also be attributable to differences across the grades in interpretation of the scoring rubric and selection of “anchor papers” to guide the scoring of the open-ended writing prompt. The suggestion that there may be differences in the scoring expectations is based on comparisons of the performance on each of the dimensions of writing scores for third- and eighth-grade students. For example, eight percent of third grade students scored a “4” (the maximum score) on the dimension “Content Development,” compared to eighteen percent of eighth grade students. Comparisons of the percentages of students scoring a maximum score on the other dimensions included:
 - Organization, four percent of third graders compared to fifteen percent of eighth graders;
 - Voice, eleven percent of third graders compared to twenty-six percent of eighth graders;
 - Conventions, eight percent of third graders compared to thirty-four percent of eighth graders.

Over time, as instruction and performance improve, the ceiling effect observed in the middle school grades, especially in grade eight, will negatively affect the ability to accurately differentiate the relative levels of performance among higher-performing students and the ability to measure growth from year to year by higher-performing students.

- A total of fourteen items across grades 3, 5, 6, and 8 had difficulty values (p values) below the criterion of p greater than or equal to 0.3, indicating that students are scoring at or below chance on the items and the items may be too difficult to provide useful information.
- A total of thirty-six items across grades 3, 4, 5, 6, 7, and 8 were flagged because their item discrimination values were below the minimal criterion (0.2), indicating a tendency for overall higher-scoring students to get an easy item wrong and/or for overall lower-scoring students to get a difficult item right, contrary to the expected patterns of performance. Items having poor discrimination values tend to decrease the overall reliability of a test.
- A total of sixteen items across grades 3, 4, 5, 6, 7, and 8 were flagged because their DIF values exceeded the maximum value for the criterion, indicating potential bias for or against specific demographic groups.

Recommendations – Writing

1. Additional items should be developed and added to the item bank to more adequately cover the breadth and depth of the content and cognitive processing expectations for students defined in the SC Academic Standards for English Language Arts.
2. Until such time as sufficient items can be added to the item bank, the SCDE should develop and follow a plan for generating new test forms to ensure that the items selected cover the content and levels of thinking specified in the state academic standards.
3. The shift upward in the distributions of scores across grades three through eight should be examined carefully to ameliorate the ceiling effect observed in the middle grades, especially in grade eight. The review should include reviewing the prompts, scoring rubrics, and the anchor papers and scoring guidelines for the extended writing component of the tests.
4. Remove or revise items flagged for poor discrimination to increase the overall reliability of the test.
5. Review and revise or remove the exceptionally difficult items observed in grades 3, 5, 6, and 8.
6. Review all items flagged for DIF to ensure that these items are not biased for or against males or females, or African American or White students.

Findings for Mathematics

Alignment Strengths – Mathematics

- The item bank met the criterion for Categorical Concurrence for all standards but Standard 1 (Mathematical Processes); however, based on the test blueprint, Standard 1 is not directly assessed on the test.
- The item bank met the criterion for Depth-of-Knowledge, indicating that the balance of items assessing the content at different levels of cognitive processing is acceptable.
- The item bank met the criteria for Range-of-Knowledge, indicating that the item bank has at least one item assessing 50% of the indicators in the academic standards.
- The reliability values for the tests at all grade levels are well above the minimally acceptable value of 0.85.

- The average difficulty of the items is in the appropriate range for a criterion-referenced test (approximately 0.6) in all grades but grade 8.
- The measures of item fit to the latent trait model are in the appropriate ranges (approximately 1.0).

Areas for Concern – Mathematics

- The item bank fully met the criterion for Balance-of-Representation for all standards in three grade levels and weakly met or did not meet the criterion for all standards in three grades, suggesting that the numbers of items assessing individual indicators in the item bank are not well balanced in the standards where the criterion was not met or weakly met, which may make it difficult to construct future test forms which cover the content of the standards comprehensively.
- No items in the item bank were identified as assessing three indicators in the mathematics standards, so these indicators would not be assessed based on test forms generated from the item bank.
- While the distributions of scores in grades three through six appear to support the measurement of differentiated levels of performance, in grade seven and especially in grade eight the distributions become positively skewed, suggesting that the test is becoming too difficult in grade eight to accurately measure different levels of performance among lower-performing students. The grade eight test shows evidence of a “floor effect,” in which there are not enough items with an appropriately low difficulty to accurately discriminate differential performance among students performing at the lowest levels. This conclusion that the test may be too difficult is also supported by the observation that the average difficulty of the grade eight test items is approximately 0.5, a value which is lower than the general expectation for the average difficulty of a criterion-referenced test of 0.6. The lower performance of eighth graders on the test may also reflect the effects of a cumulative deficit among the lowest-performing students who have not adequately learned the skills and knowledge from earlier grade levels necessary to perform well in eighth grade mathematics.
- A total of seven items across grades 3, 4, 7, and 8 had difficulty values (p values) below the criterion of p greater than or equal to 0.3, indicating that students are scoring at or below chance on the items and the items may be too difficult to provide useful information. One item each in grades 5 and 6 was flagged because of a difficulty value of 1.0, indicating all students got the item right. However, these items had flaws detected prior to scoring of the tests and all student responses to the items were counted as correct, resulting in a spurious value for the item difficulty in the files provided for review.
- A total of fifteen items across grades 3, 4, 5, 6, 7, and 8 were flagged because their item discrimination values were below the minimal criterion (0.2), indicating a tendency for overall higher-scoring students to get an easy item wrong and/or for overall lower-scoring students to get a difficult item right, contrary to the expected patterns of performance. Items having poor discrimination values tend to decrease the overall reliability of a test.
- A total of five items across grades 3, 5, and 8 were flagged because their DIF values exceeded the maximum value for the criterion, indicating potential bias for or against specific demographic groups.

Recommendations – Mathematics

1. Additional items should be developed and added to the item bank to ensure that all standards and indicators are assessed in future test forms.
2. Include less difficult items in future grade 8 tests to ameliorate the floor effect observed with the 2009 test and to increase the ability to differentiate levels of achievement among lower-performing students. This can be accomplished by adding less difficult items to the tests (either by replacing easier items or by adding additional items).
3. Remove or revise items flagged for poor discrimination to increase the overall reliability of the test.
4. Review and revise or remove the exceptionally difficult items observed in grades 3, 4, 7, and 8 and the two flawed items in grades 5 and 6.
5. Review all items flagged for DIF to ensure that these items are not biased for or against males or females, or African American or White students.

Findings for Science

Strengths - Science

- The item bank met the criterion for Categorical Concurrence, indicating an overall match between the content of the state academic standards and the items in the item bank.
- The item bank met the criterion for Depth-of-Knowledge, indicating that the balance of items assessing the content at different levels of cognitive processing is acceptable.
- The item bank met the criterion for Range-of-Knowledge, indicating that the item bank has at least one item assessing 50% of the indicators in the academic standards.
- The item bank met the criterion for Balance-of-Representation for all standards at all grade levels, indicating an acceptable balance in the numbers of items in the bank assessing the indicators within a standard.
- The reliability values for the tests at all grade levels but grade 4 are at or above the minimally acceptable value of 0.85.
- The average difficulty of the items is in the appropriate range for a criterion-referenced test (approximately 0.6) in all grades.
- The measures of item fit to the latent trait model are in the appropriate ranges (approximately 1.0).

Areas for Concern – Science

- No items in the item bank were identified as assessing three indicators in the science standards, so these indicators would not be assessed based on test forms generated from the item bank.
- The reliability of the grade 4 science test is marginal and needs to be increased in future versions of the test. Increasing the diversity of difficulty values on the test (two-thirds of the items on the 2009 test had difficulty values in the narrow range between 0.6 and 0.8) may help to increase the test reliability.
- A total of three items in grades 3 and 5 had difficulty values (p values) below the criterion of p greater than or equal to 0.3, indicating that students are scoring at or below chance on the items and the items may be too difficult to provide useful information.

- A total of twenty-nine items across grades 3, 4, 5, 6, 7, and 8 were flagged because their item discrimination values were below the minimal criterion (0.2), indicating a tendency for overall higher-scoring students to get an easy item wrong and/or for overall lower-scoring students to get a difficult item right, contrary to the expected patterns of performance. Items having poor discrimination values tend to decrease the overall reliability of a test.
- One item each in grades 5 and 6 was flagged because their DIF values exceeded the maximum value for the criterion, indicating potential bias for or against specific demographic groups.

Recommendations – Science

1. Additional items should be developed and added to the item bank to ensure that all standards and indicators are assessed in future test forms.
2. Increase the reliability of the grade 4 science test by spreading out the range of difficulty of the items and by removing or revising items showing poor discrimination values.
3. Review and revise or remove the exceptionally difficult items observed in grades 3 and 5.
4. Review all items flagged for DIF to ensure that these items are not biased for or against males or females, or African American or White students.

Findings for Social Studies

Strengths – Social Studies

- The item bank met the criterion for Categorical Concurrence, indicating an overall match between the content of the state academic standards and the items in the item bank.
- The item bank met the criterion for Range-of-Knowledge, indicating that the item bank has at least one item assessing 50% of the indicators in the academic standards.
- The reliability values for the tests at all grade levels are well above the minimally acceptable value of 0.85.
- The measures of item fit to the latent trait model are in the appropriate ranges (approximately 1.0).

Areas for Concern – Social Studies

- The item bank met the Depth-of-Knowledge criterion in four grades and weakly met the criterion in two grades, indicating a majority of the items in the grades where the criterion was weakly met assess students at a lower cognitive level than specified in the state academic standards.
- The item bank met the criterion for Balance-of-Representation for all standards at four grade levels and weakly met the criterion for one standard each in two grades, suggesting that the numbers of items assessing individual indicators in the item bank are poorly balanced in the standards where the criterion was weakly met, which may make it difficult to construct future test forms which cover the content of the standards comprehensively.
- The average difficulties of the social studies tests, which range from a low of 0.52 in grade 8 to a high of 0.58 in grades 3 and 5, are somewhat below the range preferred for a criterion-referenced test. The grade 8 test is the hardest and is of greatest concern. The difficulty of the tests may reflect the rather broad range of

standards and indicators in the social studies academic standards. The large amount of subject matter to be covered in the academic standards may not be fully taught, resulting in lower performance on the assessments.

- A total of four items across grades 3, 4, 6, and 8 had difficulty values (p values) below the criterion of p greater than or equal to 0.3, indicating that students are scoring at or below chance on the items and the items may be too difficult to provide useful information.
- A total of thirty-four items across grades 3, 4, 5, 6, 7, and 8 were flagged because their item discrimination values were below the minimal criterion (0.2), indicating a tendency for overall higher-scoring students to get an easy item wrong and/or for overall lower-scoring students to get a difficult item right, contrary to the expected patterns of performance. Items having poor discrimination values tend to decrease the overall reliability of a test.
- One item each in grades 6 and 8 was flagged because their DIF values exceeded the maximum value for the criterion, indicating potential bias for or against specific demographic groups.

Recommendations – Social Studies

1. Additional items should be developed and added to the item bank to more adequately cover the breadth and depth of the content and cognitive processing expectations for students defined in the SC Academic Standards for Social Studies.
2. Examine the overall difficulties of the social studies tests, especially in grade 8, to identify measures to improve the distribution of difficulties to be more in line with the expectations for criterion-referenced tests (average p value of 0.6). In the examination process, attention should be directed toward evaluating the breadth of the academic social studies standards and the methodology for the selection of items representing the standards and indicators tested. The latter is important to ensure that a range of indicators in each standard is assessed each year. If only one or two indicators in a standard are assessed then the results will be more dependent on whether those specific indicators have been taught than on whether all of the indicators in a standard were taught.
3. Remove or revise items flagged for poor discrimination to increase the overall reliability of the test.
4. Review and revise or remove the exceptionally difficult items observed in grades 3, 4, 6, and 8.
5. Review all items flagged for DIF to ensure that these items are not biased for or against males or females, or African American or White students.

Review of the Palmetto Assessments of State Standards (PASS)

Introduction

This report summarizes the results from studies of the South Carolina Palmetto Assessments of State Standards (PASS) field tests of writing administered in March 2009 and the PASS field tests of reading & research, mathematics, science, and social studies administered in May 2009. The report also summarizes the review of the alignment of the PASS item banks to the South Carolina academic standards in all five subject areas. The studies were conducted under the auspices of the Education Oversight Committee (EOC) as part of its responsibilities listed in the Education Accountability Act of 1998 (EAA):

Section 59-18-320. (A) After the first statewide field test of the assessment program in each of the four academic areas, and after the field tests of the end of course assessments of high school credit courses, the Education Oversight Committee, established in Section 59-6-10, will review the state assessment program and the course assessments for alignment with the state standards, level of difficulty and validity, and for the ability to differentiate levels of achievement, and will make recommendations for needed changes, if any. The review will be provided to the State Board of Education, the State Department of Education, the Governor, the Senate Education Committee, and the House Education and Public Works Committee as soon as feasible after the field tests. The Department of Education will then report to the Education Oversight Committee no later than one month after receiving the reports on the changes made to the assessments to comply with the recommendations.

(B) After review and approval by the Education Oversight Committee, the standards-based assessment of mathematics, English/language arts, social studies, and science will be administered to all public school students in grades three through eight, to include those students as required by the federal Individuals with Disabilities Education Improvement Act and by Title 1 of the Elementary and Secondary Education Act.

The report describes the PASS assessments, describes the studies conducted for this review, presents the findings from the studies, and makes recommendations regarding the assessments. Two studies were conducted for this review. One study was designed to determine the alignment of the items in the PASS item bank to the state academic standards; the initial components of the study were conducted before the PASS field tests were administered. A second study was conducted focusing on the technical characteristics of the items and tests, and was conducted in July 2009 subsequent to the administration of the field tests.

Descriptions of PASS Assessments and State Academic Standards

The PASS tests are administered in five subject areas (reading & research; writing; mathematics; science; social studies) at six grade levels (grades three through eight), for a total of thirty tests. The PASS tests are intended to replace the Palmetto Achievement Challenge Tests (PACT), which were last administered in Spring 2008. Both the PASS and PACT tests are based on the SC academic standards in the five subject areas.

The PASS tests differ from the PACT tests in several respects:

- PASS tests are expected to provide student proficiency evaluations for each academic standard in each subject area, while PACT tests generally provided only total test scores and total test performance levels;

- PASS test items in all areas but writing are exclusively multiple choice in format; PACT tests in some subject areas contained mixed item formats including both multiple choice and constructed response;
- Because of the change in item format to multiple choice, PASS results are expected to be reported more quickly than PACT results;
- PASS tests of the English language arts (ELA) academic standards will be comprised of separate tests for reading and research (referred to as the PASS ELA test in materials provided by the SC Department of Education) and for writing, resulting in separate scores for each area, whereas the PACT ELA test combined writing, reading, and research into a single test and a single test score;
- PASS writing will be administered earlier in the school year than the tests in the other subjects, while PACT tests in all subjects were administered during the same time period at the end of the school year;
- Once performance level standards are established by the EOC, PASS test scores will provide three performance levels (Not Met, Met, and Exemplary), compared to four performance levels in PACT (Below Basic, Basic, Proficient, and Advanced).

The general designs for the PASS tests in each subject area are outlined in the test blueprints, obtained from the South Carolina Department of Education (SCDE) web site and attached in Appendix A. The blueprints help to clarify to educators how many items on the tests assess each of the state academic standards in the subject area tested. The test blueprints list the total number of items on the tests for each grade level and provide guides as to the numbers of items assessing each of the academic standards.

- In science and social studies each standard has approximately the same number of multiple choice items (which count one point each in the total test score if correct and zero points if incorrect), and thus each standard has approximately the same weight in the total test score.
- The writing test is composed of one extended writing prompt which is scored on a four-dimension rubric which contributes thirty points to the total score, plus twenty-five multiple choice items which contribute twenty-five points to the total score. It is not specified in the writing test blueprint how many items or points are allocated to each of the writing standards (Standards 4 and 5) listed in the state ELA academic standards.
- The reading and research (termed “ELA”) test blueprint indicates that the proportion of items assessing each academic standard may vary from grade to grade and from standard to standard. For example, the upper level of the range of items intended to assess ELA Standard 1 (Literary Text) is higher than the upper level of the range of items assessing Standard 3 (Vocabulary) at every grade level, with Standard 1 ranging from 33% of the total items in grades three and four to 40% in grade seven, and Standard 3 ranging from 20% in grade eight to 25% in grades three and four.
- The weighting of the number and proportions of items allocated to each standard also varies across the grades in the mathematics test blueprint. In grade three Standard 2 (Number and Operations) has more items allocated than each of the other four standards. In grades four and five Standard 2 (Number and Operations) and Standard 5 (Measurement) are allocated the same number of items and have higher weightings than the remaining three standards. Similarly, in grades six and seven two standards, Standard 2 (Number and Operations) and Standard 4 (Geometry) have greater weights than the remaining three

standards. In grade eight Standard 3 (Algebra) has the greatest weighting and Standard 4 (Geometry) has the least.

The PASS reading and research and writing tests were constructed based on the expectations for student learning described in the SC Academic Standards for English Language Arts (2008). Similarly, the PASS mathematics tests are based on the SC Academic Standards for Mathematics (2007), the PASS science tests are based on the SC Academic Standards for Science (2005), and the PASS social studies tests are based on the SC Academic Standards for Social Studies (2005). The academic standards documents describe what students are expected to know and be able to do in each subject area at each grade level by the end of the school year. The test items are written based on the end-of-grade expectations for achievement listed in the academic standards documents.

The standards in all the subject areas are written following the same format: the student expectations are listed for each grade level organized into “standards,” which are further defined by “indicators” subsumed under each standard. Standards are defined as, “Statements of the most important and consensually determined expectation for student learning in a particular discipline,” and indicators are defined as, “Specific statements of the cognitive processes and the content knowledge and skills that students must demonstrate in order to meet the standard” (SC Academic Standards for English Language Arts, 2008, p. 2). Indicators in the SC standards documents can be thought of as analogous to “objectives,” a term often used in descriptions of educational curriculum goals. The same numbering system is used for all subjects and grades: “3-1.1” indicates grade 3, Standard 1, Indicator 1. Across all subject areas, there are no more than seven standards in a grade level, but the number of indicators for each standard may vary from four to twelve. Each test item is written at a level to address a specific, primary indicator, although some items may address secondary indicators as well.

Study of Alignment of PASS Item Bank to State Academic Standards

The study of the alignment between test items and the academic standards is intended to address the overall question, “Are the tests evaluating student proficiency and progress in meeting the expectations for learning specified in the state academic standards actually testing those academic standards?” To address this overall question, the American Educational Research Association (AERA) proposed several related questions to be addressed to determine whether a test is aligned with the academic standards:

- “Does the test’s content match the content (topics and skills) in the standards? In other words, each test item should correspond to an objective in the standards. Similarly, key ideas in the standards should appear on the tests.
- Do the tests and standards cover a comparable “range” or breadth of knowledge, and is there an appropriate “balance” of knowledge across the standards? Alignment studies look at whether a test fairly and effectively samples across the range of objectives described in a state’s standards instead of focusing on only a few objectives or disproportionately sampling students’ knowledge of some objectives but not others.
- Does the level of cognitive demand or challenge called for in the standards match that required for students to do well on the assessment? For example, if the standards require students to synthesize information and explain their

- thinking, but the test items only ask students to recall facts, the standards and the tests would not be well aligned.
- Does the test avoid adding material that is irrelevant to the standard supposedly being assessed? For example, a test item may have an inappropriate “source of challenge,” requiring a student to read and understand a long passage about space travel, when it is seeking to measure a student’s knowledge of how to estimate distances and travel times.” (AERA, 2003, p. 2)

Several models have been used by states to analyze their tests’ alignments to their academic standards to address these questions. The Council of Chief State School Officers (CCSSO) has collaborated with university researchers and state departments of education for several years to develop methodologies for evaluating test alignment. The CCSSO and states have participated extensively in the development of two alignment evaluation models, the Webb model and the Surveys of Enacted Curriculum (SEC), both developed at the University of Wisconsin Center for Educational Research. Both the Webb and SEC models use information from the academic standards and the tests, but the SEC model also requires the collection of data on the implementation of curriculum in schools and classrooms based on surveys from teachers describing their implementation of curriculum content over the course of the school year (CCSSO, 2002). Since resources were not available to conduct the alignment analysis of PASS following the SEC methodology, and since the Webb methodology has been used in more than ten states and has been used for evaluating the alignments in language arts, mathematics, science, and social studies, the PASS alignment has been conducted using the Webb methodology as described in the literature.

The CCSSO describes the Webb alignment methodology as follows:

“The model developed by Norman Webb provides a reliable set of procedures and criteria for conducting alignment analysis studies, which combine qualitative expert judgments and quantified coding and analysis of standards and assessments. The product of the analysis is a set of statistics for each standard and grade on the degree of intersection, or alignment, between the content embedded in state content standards and the content in state assessments.” (CCSSO, 2002, p. 2)

There are four measures calculated in the Webb methodology, with criteria for acceptable levels for each measure. The four measures and the questions they address are:

1. Categorical Concurrence: Are the test items and the academic standards covering the same content?
2. Depth-of-Knowledge Consistency: Are the test items and the academic standards at the same level of cognitive complexity, or is there a mismatch between the complexity of thinking demanded in the standards and the complexity of thinking elicited by the items?
3. Range-of-Knowledge Correspondence: Does the breadth of knowledge and skills assessed by the items match the breadth of knowledge and skills defined in the academic standards; e.g., are most of the indicators in a standard assessed or only a few?
4. Balance of Representation: Are some objectives or indicators in a standard tested while others are not, or are the numbers of items assessing each indicator proportional to the number of indicators in the standard?

Each of the Webb measures and criteria for acceptable values will be described in more detail in the following sections of the report when the results of the analyses are reported.

The Webb measures (as do all the other measures of alignment) require data from expert judges on the content tested by each test item and on the complexity of cognitive processing required to successfully answer each item. These data were collected for the analysis January 16 and 17, 2009, when 145 educators (teachers, curriculum specialists, and school district curriculum supervisors) met in Columbia, SC to review the items in the PASS item bank. The reviewers were nominated, based on their expertise and experience teaching their subject area, by school district Superintendents during November and December 2008. All South Carolina school district superintendents were solicited by EOC staff for nominations to the item review committees, and nominations were received from sixty-two public school districts, a state special school district, the SC Public Charter School District, and from the science and social studies professional educator organizations. The members of the review committees were chosen based on size and geographic location of district to ensure representation from all areas of the state, subject area of expertise, and grade level(s) currently taught or having taught in the recent past. The members tended to be highly experienced: 81% of the members reported having over ten years of experience in education. The members of the committees reviewing the test items for the alignment study are listed in Appendix B.

Paper copies of the items in the item bank intended for use in the PASS assessments in reading and research, writing, mathematics, science, and social studies were provided to EOC staff for the study by the SCDE Office of Assessment in late December 2008 and early January 2009, along with Excel files containing item ID numbers and other information describing the items. The item bank included PACT items from previous test administrations which were intended for use in PASS, items field-tested in spring 2008 for use in PASS, and PASS items field tested in spring 2009. The items were sorted into groups for review by subject and grade level; the number of groups of items for each subject and grade level depended on the number of items. It was expected that each reviewer would be able to review a maximum of one hundred seventy-five items during the two days allocated for the review meetings, so the items were grouped into review booklets of copies of the items limited to one hundred seventy-five items. The actual maximum number of items in a group was one hundred sixty-seven in grade four reading and research, and the minimum number of items in a group was ninety-seven in grade eight social studies. All of the PASS items reviewed for reading and research, mathematics, science, and social studies were multiple choice in format; writing committee members reviewed both multiple choice items and extended writing prompts. Each item was reviewed by at least two judges, and items at some grades in some subjects were reviewed by three judges, depending on the number of items and judges available. The numbers of items and numbers of judges for each subject and grade are listed in Table 1.

Table 1
Numbers of Items Reviewed and Numbers of Reviewers
2009 PASS Alignment Study

Subject	Grade	Number of Reviewers	Number Items Reviewed	Number Items Retained for Analysis*
Reading & Research	3	6	307	282
	4	6	327	300
	5	6	324	306
	6	6	418	394
	7	6	341	322
	8	6	379	352
	Totals	36	2096	1956
Writing	3	2	143	143
	4	2	134	134
	5	2	139	139
	6	2	148	148
	7	2	140	140
	8	2	135	134
	Totals	12	839	838
Mathematics	3	6	261	240
	4	6	321	294
	5	6	256	235
	6	6	262	240
	7	6	341	332
	8	6	292	283
	Totals	36	1733	1624
Science	3	6	364	325
	4	6	366	324
	5	6	406	341
	6	6	485	384
	7	6	374	336
	8	6	415	348
	Totals	36	2410	2058
Social Studies	3	4	235	234
	4	4	289	287
	5	4	211	207
	6	5	259	254
	7	4	220	215
	8	4	194	191
	Totals	25	1408	1388

* A total of 622 items were removed from analysis by the SCDE subsequent to review by teachers and are not included in these analyses.

A total of 8,486 items were submitted by the SCDE for review by the EOC alignment review committees. Subsequent to the review meeting in January 2009 the SCDE requested that a total of 622 items be removed from the analysis because the items had

been archived and would not be a part of the PASS item pool. This left a total of 7,864 items which were included in this analysis.

At the January 2009 meeting to review the items the 145 committee members were first assembled as a whole group for introduction and discussion of the purpose for their review, the process they were to follow for the review, state test security statutes and regulations, and to answer questions. Each committee member signed an oath of security regarding the content of the test items they were to review. At the whole-group meeting the process for the judges to review the items was presented as a series of tasks to be accomplished. The data collection system was also described during this session. The tasks the committee members were asked to complete for all of the items they were assigned to review were:

TASK 1: To determine the degree of alignment between the PASS test items and the South Carolina Academic Standards.

The purpose of this task is to determine the degree to which PASS assessment items match the curriculum standards. Each analyst should work on this task individually. The task will be accomplished in several steps:

Step 1 - Read and answer the test question. As you are doing so, reflect on the kinds of knowledge and skills needed to correctly answer the question and on the level of cognitive challenge the question presents to students.

Step 2 - Review the standards document to identify the standard(s) you believe the item best addresses. The standard(s) you identify may or may not match those previously identified.

Step 3 - Record the standard(s) you believe the item is addressing in the space provided. Use the numbering system in the standards document (e. g., 3.1-2, 6.2-1, etc.) to identify the grade level and standard(s). If you identify more than one standard, CIRCLE the standard you believe is the primary one addressed.

TASK 2: To identify the level of cognitive demands made by the item which must be met to correctly answer it.

The purpose of this task is to make a judgment regarding the knowledge dimension and cognitive process for each test question. Refer to the document, "A Taxonomy for Teaching, Learning, and Assessing."

The cognitive processes are:

1. Remember
2. Understand
3. Apply
4. Analyze
5. Evaluate
6. Create

The knowledge dimensions are:

- A. Factual knowledge
- B. Conceptual knowledge
- C. Procedural knowledge
- D. Metacognitive knowledge

Based on your reading of the question, identify the cognitive process and the knowledge dimension needed to correctly answer the item and record the process and dimension in the space provided. Record the cognitive process and the knowledge dimension in the spaces provided (e.g., 3 B, 1 C, etc.).

Following group practice exercises identifying standards and cognitive processes and recording the data using sample items for review and discussion, the judges were assigned to separate rooms for each subject area. These rooms were staffed by EOC and SCDE personnel, including staff from the SCDE Office of Assessment and Office of Standards and Learning. The committee members were provided notebooks containing the items they were to review, data collection forms, the state writing rubric and composite writing matrix (writing review committee), and copies of the state academic standards documents for their subject area. The review committees for reading and research, mathematics, science, and social studies met for two days, January 16 and 17, 2009, and the review committee for writing met on one day, January 17. All of the committees completed their tasks for all items in the time allotted. The data collection sheets were collected by EOC personnel for analysis; the booklets containing copies of the items were shredded and destroyed on January 17, 2009. The data recorded on the data collection sheets were transcribed to Excel files and have provided the data for the alignment analyses in this report.

The analyses reported in this report for the Categorical Concurrence, Range-of Knowledge Correspondence, and Balance-of-Representation alignment measures are based on the reviewers' coding of the grade level, standard(s), and indicator(s) assessed by each item. Reviewers were asked to indicate the primary and secondary standard(s) and indicator(s) assessed if they believed more than one standard or indicator was being assessed by the item. Some items may have been written to assess more than one indicator and reviewers, acting independently, may have identified different standards or indicators for an item. Thus some items are counted more than once, once for each standard/indicator identified, in the tables reported in the following analyses. The reviewers also could indicate that they did not think an item was assessing a state standard and thus the item is not included in the following tables. Finally, if the reviewers identified an item as assessing a different grade level than the item was assigned, the item is not included in the following tables, which report the results only for those items which were deemed assessing a standard at the grade level of the test items reviewed.

While 100% exact agreement on standards was not expected because some items may have been written to assess more than one standard or indicator, the percentage of exact agreement among the reviewers on the standards assessed by the items was calculated and is reported in Table 2.

Table 2
 Identification of Standards Assessed by Items
 Percent Exact Agreement Among Reviewers
 PASS 2009 Alignment Study

Test	Percent Exact Agreement on Standards Assessed by Items
Reading & Research	85.5
Writing	97.6
Mathematics	96.4
Science	97.0
Social Studies	98.1

The high levels of these reliabilities reflect the seriousness and care with which the South Carolina educators on the review committees approached the review process. They also suggest that items assessing writing, mathematics, science, social studies, and to a lesser degree, reading and research tend to be written to focus on a single standard and indicator rather than multiple standards and indicators. The interpretation of the test results is more clear and accurate if the items on the tests are focused on a single standard than on multiple ones. One cannot determine with assurance which of the standards a student does not know if the student gets an item assessing multiple standards wrong. (Note: The reliabilities for the identification of the cognitive process level for each item are reported in the section reporting the Depth-of-Knowledge Consistency results.)

Categorical Concurrence

Background and Methodology – Categorical Concurrence

The categorical concurrence measure is intended to address the question, “Is all the content in the academic standards assessed by the test items?” The Webb definition of categorical concurrence is:

“The criterion of categorical concurrence between standards and assessments is met if the same or consistent categories appear in both documents.” Webb, Horton, and O’Neal, 2002, p. 4)

The data for this measure came from the identification by the alignment review committees of the primary standard and indicator measured by each item. This information was the first task accomplished by the alignment committee members who reviewed the items in January 2009, and was recorded on the data collection sheets, transcribed to Excel, and analyzed by EOC staff. Since each item was reviewed by more than one reviewer who independently identified the standard and indicator he or she thought was being measured by the item, and since at least some of the items may have been written to assess both a primary and a secondary standard or indicator, an item may have been assigned to more than one standard and would be duplicate-counted in the compilation of the data for the tables below displaying the analyses.

The criterion for meeting the Webb measure of categorical concurrence is that there should be a minimum of six items assessing a standard on a test for alignment to be deemed acceptable. There is no published criterion for how many items in an item bank should be measuring each standard, so the Webb criterion was used to evaluate categorical concurrence for this analysis. However, one should keep in mind that the Webb criterion for a test is probably too low for an item bank because new items are selected from an item bank each year to generate new tests. If the item bank has only six items for a standard and all six items must be used in the test form to provide a reliable score for the standard, all the items would need to be re-used each year until more items are developed. The criterion for an item bank is also problematic because the standard may have more than six indicators, and to adequately measure students’ knowledge and skill in the standard they should be tested on every indicator if possible, or a representative sample of indicators if there are too many to assess each year. If there are six items in the bank for a standard and eight indicators, for example, at least two indicators would never be tested.

Findings – Categorical Concurrence

The results of the evaluation of categorical concurrence are displayed in Table 3 for reading and research, Table 4 for writing, Table 5 for mathematics, Table 6 for science, and Table 7 for social studies. More detailed tables listing the numbers of items identified measuring each indicator, the numbers of items not identified as measuring any state standard, and the numbers of items identified as testing standards at a different grade level than the one the item was assigned to, are available in Appendix C.

The first finding to note is that there are more than six items assessing each standard in all subjects but mathematics. Reading and research, writing, science, and social studies thus meet the Webb criterion.

Mathematics Standard 1 (Mathematical Processes) did not meet the criterion of at least six items assessing it. In fact, the reviewers for every grade but grade eight did not identify any items assessing Standard 1, and in grade eight only one item was assigned Standard 1 as a primary standard assessed. The reviewers did not identify Standard 1 as a secondary standard assessed, either. Standard 1 states, “The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation.” These are mathematical skills and processes which are necessary for success in mathematics and embedded in the mathematical operations and procedures necessary for performance in the other five standards: number and operations; algebra; geometry; measurement; and data analysis and probability. Standard 1 is also not listed as tested in the PASS mathematics blueprint. The SC Academic Standards for Mathematics addresses this issue as follows:

“Each grade level and high school core area begins with the mathematical processes standard, which centers in the specific methods that students will use in applying the skills and knowledge reflected in each five strands that follow this first standard: problem solving, reasoning and proof, communications, connections, and representation.” (2007, p. 3)

A second observation from the tables is that the percentages of items assessing individual standards in the item bank do not always reflect the relative weight for the standard in the test blueprint. This is notable for Standard 6 (Research) in the reading and research test, where that standard may compose 24% to 28% of the test score at each grade level, but the percentages of items in the item bank measuring Standard 6 range from 8% to 13%. While there are enough items in the item bank to produce more than one form of the test with a sufficient number of items for research, the relatively low numbers of items for selection for testing in research (as few as twenty-four items in grade three) may mean that not all indicators in the standard will be tested.

In mathematics, there is a mismatch between the percent of items in the blueprint for assessing Standard 5 (Measurement) in grade four (up to 25% of total test score) and the percent of items measuring this standard in the item bank (12%). Similar imbalances exist for mathematics in grade seven (up to 25% of items for Geometry in blueprint compared to 13% of item bank measuring Geometry) and in grade eight for Algebra (up to 30% of total score in blueprint compared to 20% of items in item bank).

In science and social studies, each standard is given approximately equal weighting in the blueprints, so the percentages of items in the item bank measuring each standard

should be approximately the same in each grade level. In science, the item bank has relatively low percentages of items measuring Standard 1 (inquiry) in grades six (9%) and eight (9%). In social studies, the following standards have less than 10% of the items in the bank measuring them: grade four, Standard 1; grade five, Standard 1; grade six, Standard 6; grade seven, Standards 1 and 4; and grade eight, Standards 6 and 7. This issue will be discussed in more detail in the findings for the Balance of Representation alignment measure.

Table 3
Items Aligned to Academic Standards
2009 PASS Reading and Research

Grade	Standard	# Indicators in Standard	# Items Identified Assessing Standard	% of All Items in Grade Assessing Standard
3	1: Reading Literary Texts	11	135	45.6
3	2: Reading Information	9	75	25.3
3	3: Reading Vocabulary	7	62	20.9
3	6: Research	7	24	8.1
Total Grade 3			296	100
4	1: Reading Literary Texts	11	191	45.3
4	2: Reading Information	9	132	31.3
4	3: Reading Vocabulary	4	43	10.2
4	6: Research	8	56	13.3
Total Grade 4			422	100
5	1: Reading Literary Texts	11	134	46.5
5	2: Reading Information	9	68	23.6
5	3: Reading Vocabulary	4	50	17.4
5	6: Research	9	34	11.8
Total Grade 5			288	100
6	1: Reading Literary Texts	11	170	43.1
6	2: Reading Information	10	109	27.7
6	3: Reading Vocabulary	5	70	17.8
6	6: Research	8	43	10.9
Total Grade 6			394	100
7	1: Reading Literary Texts	9	114	38.3
7	2: Reading Information	8	87	29.2
7	3: Reading Vocabulary	5	63	21.1
7	6: Research	8	34	11.4
Total Grade 7			298	100
8	1: Reading Literary Texts	8	136	36.9
8	2: Reading Information	8	109	29.5
8	3: Reading Vocabulary	5	76	20.6
8	6: Research	8	48	13.0
Total Grade 8			369	100

Table 4
Items Aligned to Academic Standards
2009 PASS Writing

Grade	Standard	# Indicators in Standard	# Items Identified Assessing Standard	% of All Items in Grade Assessing Standard
3	4: Writing Development	7	130	89.0
3	5: Writing Variety	4	16	11.0
Total Grade 3			146	100
4	4: Writing Development	6	106	89.8
4	5: Writing Variety	4	12	10.2
Total Grade 4			118	100
5	4: Writing Development	6	155	89.6
5	5: Writing Variety	4	18	10.4
Total Grade 5			173	100
6	4: Writing Development	7	109	82.0
6	5: Writing Variety	4	24	18.0
Total Grade 6			133	100
7	4: Writing Development	7	93	74.4
7	5: Writing Variety	4	32	25.6
Total Grade 7			125	100
8	4: Writing Development	7	110	77.5
8	5: Writing Variety	4	32	22.5
Total Grade 8			142	100

Table 5
Items Aligned to Academic Standards
2009 PASS Mathematics

Grade	Standard	# Indicators in Standard	# Items Identified Assessing Standard	% of All Items in Grade Assessing Standard
3	1: Processes	8	0	0
3	2: Number/Operations	12	66	30.1
3	3: Algebra	4	32	14.6
3	4: Geometry	8	49	22.4
3	5: Measurement	7	31	14.2
3	6: Data Analysis	7	41	18.7
Total Grade 3			219	100
4	1: Processes	8	0	0
4	2: Number/Operations	12	70	26.3
4	3: Algebra	6	43	16.2
4	4: Geometry	8	53	19.9
4	5: Measurement	9	31	11.7

Grade	Standard	# Indicators in Standard	# Items Identified Assessing Standard	% of All Items in Grade Assessing Standard
4	6: Data Analysis	7	69	25.9
Total Grade 4			266	100
5	1: Processes	8	0	0
5	2: Number/Operations	9	72	29.9
5	3: Algebra	5	38	15.8
5	4: Geometry	6	24	10.0
5	5: Measurement	8	60	24.9
5	6: Data Analysis	6	47	19.5
Total Grade 5			241	100
6	1: Processes	8	0	0
6	2: Number/Operations	9	55	23.6
6	3: Algebra	5	59	25.3
6	4: Geometry	9	44	18.9
6	5: Measurement	7	37	15.9
6	6: Data Analysis	5	38	16.3
Total Grade 6			233	100
7	1: Processes	8	0	0
7	2: Number/Operations	10	120	38.3
7	3: Algebra	7	47	15.0
7	4: Geometry	10	41	13.1
7	5: Measurement	5	52	16.6
7	6: Data Analysis	8	53	16.9
Total Grade 7			313	100
8	1: Processes	8	1	0.4
8	2: Number/Operations	7	74	26.6
8	3: Algebra	7	56	20.1
8	4: Geometry	4	43	15.5
8	5: Measurement	7	58	20.9
8	6: Data Analysis	8	46	16.5
Total Grade 8			278	100

Table 6
Items Aligned to Academic Standards
2009 PASS Science

Grade	Standard	# Indicators in Standard	# Items Identified Assessing Standard	% of All Items in Grade Assessing Standard
3	1: Inquiry	8	76	23.2
3	2: Life Science	5	86	26.2
3	3: Earth Science	8	66	20.1
3	5: Physical Science	4	40	12.2
3	5: Physical Science	8	60	18.3
Total Grade 3			328	100
4	1: Inquiry	7	72	22.8

Grade	Standard	# Indicators in Standard	# Items Identified Assessing Standard	% of All Items in Grade Assessing Standard
4	2: Life Science	6	60	19.0
4	3: Earth Science	8	55	17.4
4	4: Weather	6	57	18.0
4	5: Physical Science	10	72	22.8
Total Grade 4			316	100
5	1: Inquiry	8	48	16.8
5	2: Life Science	5	65	22.8
5	3: Earth Science	6	73	25.6
5	5: Physical Science	8	54	18.9
5	5: Physical Science	6	45	15.8
Total Grade 5			285	100
6	1: Inquiry	5	29	8.6
6	2: Life Science	9	100	29.8
6	3: Life Science	7	59	17.6
6	4: Earth Science	9	83	24.7
6	5: Physical Science	8	65	19.3
Total Grade 6			336	100
7	1: Inquiry	7	37	11.3
7	2: Life Science	7	59	18.0
7	3: Life Science	4	57	17.4
7	4: Earth & Life Science	6	70	21.3
7	5: Physical Science	10	105	32.0
Total Grade 7			328	100
8	1: Inquiry	7	30	8.7
8	2: Life & Earth Science	7	46	13.4
8	3: Earth Science	9	91	26.5
8	4: Earth Science	10	68	19.8
8	5: Physical Science	8	52	15.1
Total Grade 8			344	100

Table 7
Items Aligned to Academic Standards
2009 PASS Social Studies

Grade	Standard	# Indicators in Standard	# Items Identified Assessing Standard	% of All Items in Grade Assessing Standard
3	1: SC Geography	4	41	17.5
3	2: SC Settlement	7	50	21.4
3	3: SC & Revolution	4	45	19.2
3	4: SC & Civil War	7	55	23.5
3	5: SC Current	7	43	18.4
Total Grade 3			234	100

Grade	Standard	# Indicators in Standard	# Items Identified Assessing Standard	% of All Items in Grade Assessing Standard
4	1: US Exploration	4	29	9.2
4	2: US Settlement	7	49	15.6
4	3: US Revolution	7	45	14.3
4	4: US Founding	7	63	20.1
4	5: US Expansion	7	71	22.6
4	6: US & Civil War	6	57	18.2
Total Grade 4			314	100
5	1: US Reconstruction	5	20	9.5
5	2: US Expansion	5	26	12.4
5	3: US World Power	6	49	23.3
5	4: US Depression	7	52	24.8
5	5: US Cold War	5	36	17.1
5	6: US Current	6	27	12.9
Total Grade 5			210	100
6	1: Ancient World	5	78	28.4
6	2: Classical Civilizations	6	67	24.4
6	3: Middle Ages	6	39	14.2
6	4: Civilizations Other Continents	5	36	13.1
6	5: Renaissance & Reformation	6	37	13.5
6	6: European Exploration	3	18	6.5
Total Grade 6			275	100
7	1: European Colonization	6	25	11.7
7	2: Monarchies & Constitutional Governments	3	19	8.9
7	3: Age of Revolution	6	32	15
7	4: Imperialism	5	20	9.3
7	5: World Wars	6	38	17.8
7	6: Cold War	4	40	18.7
7	7: Current World	7	40	18.7
Total Grade 7			214	100
8	1: SC Settlement	7	50	24.4
8	2: SC & Revolution	5	26	12.7
8	3: SC & Civil War	6	41	20.0
8	4: SC & Reconstruction	5	24	11.7
8	5: SC After Reconstruction	6	29	14.1
8	6: SC in 20 th Century	5	17	8.3
8	7: SC Since WW2	5	18	8.8
Total Grade 8			205	100

Depth-of-Knowledge Consistency

Background and Methodology – Depth-of-Knowledge

Alignment of assessment items and the content of the academic standards is essential but not sufficient to ensure that what is tested reflects expectations for the levels of student understanding of that content inherent in the standards. Does an academic standard expect that students remember or recognize key terms or ideas in a content area, or does it rather expect students to be able to compare or differentiate the attributes of those key terms or ideas? The test items assessing the standard should be written so that students need to apply a cognitive process at the level required by the standard if they are to answer the item successfully. When the expectations for cognitive processing expressed in a standard are reflected in test items assessing that standard then the depth of knowledge needed to correctly answer the items is said to be consistent with the standard. This criterion for evaluating the alignment between tests and academic standards is termed “Depth of Knowledge Consistency” and is defined as:

“Depth-of-knowledge consistency between standards and an assessment 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.” Webb, Horton, and O’Neal, 2002, p. 5)

The depth-of-knowledge criterion asks the question, “Do the levels of thinking elicited by the test items match the levels of thinking specified in the academic standards?” To answer this question required two kinds of information: the cognitive processes specified in the academic standards and the cognitive processes elicited by the test items. One of the attributes of South Carolina’s academic standards is that the cognitive levels of the indicators within the standards for all subjects are specified based on the cognitive processes described and defined in the revised Bloom’s taxonomy of educational objectives (Anderson & Krathwohl, 2001). This widely-used resource describing the cognitive processes underlying educational objectives lists six main categories of cognitive processing:

1. Remember
2. Understand
3. Apply
4. Analyze
5. Evaluate
6. Create.

Within each category is a list of specific cognitive processes defining and giving examples to explain each broad category (Table 8). For example, the Remember category has two components, Recognizing and Recalling. In the process of writing the academic standards, the specific cognitive processing terms in the revised Bloom’s taxonomy were converted to transitive verbs generally placed at the beginning of the sentence defining the indicator. For example, “identifying,” which is an alternative name for the cognitive process “recognizing,” was changed to “identify” in this example social studies indicator:

Identify on a map the location and characteristics of significant physical features of South Carolina, including landforms; river systems such as the Pee Dee River Basin, the Santee River Basin, the Edisto River Basin, and the Savannah River

Basin; major cities; and climate regions. (SC Social Studies Standards, 2005, Grade 3, Standard 1, Indicator 1).

Table 8: The Cognitive Process Dimension

CATEGORIES & COGNITIVE PROCESSES	ALTERNATIVE NAMES	DEFINITIONS AND EXAMPLES
1. REMEMBER—Retrieve relevant knowledge from long-term memory		
RECOGNIZING	Identifying	Locating knowledge in long-term memory that is consistent with presented material (e.g., Recognize the dates of important events in United States history)
RECALLING	Retrieving	Retrieving relevant knowledge from long-term memory (e.g., Recall the dates of important events in United States history)
2. UNDERSTAND—Construct meaning from instructional messages, including oral, written, and graphic communication		
INTERPRETING	Clarifying, paraphrasing, representing, translating	Changing from one form of representation (e.g., numerical) to another (e.g., verbal) (e.g., Paraphrase important speeches and documents)
EXEMPLIFYING	Illustrating, instantiating	Finding a specific example or illustration of a concept or principle (e.g., Give examples of various artistic painting styles)
CLASSIFYING	Categorizing, subsuming	Determining that something belongs to a category (e.g., Classify observed or described cases of mental disorders)
SUMMARIZING	Abstracting, generalizing	Abstracting a general theme or major point(s) (e.g., Write a short summary of events portrayed on a videotape)
INFERRING	Concluding, extrapolating, interpolating, predicting	Drawing a logical conclusion from presented information (e.g., In learning a foreign language, infer grammatical principles from examples)
COMPARING	Contrasting, mapping, matching	Detecting correspondences between two ideas, objects, and the like (e.g., Compare historical events to contemporary situations)
EXPLAINING	Constructing models	Constructing a cause-and-effect model of a system (e.g., Explain the causes of important 18th Century events in France)
3. APPLY—Carry out or use a procedure in a given situation		
EXECUTING	Carrying out	Applying a procedure to a familiar task (e.g., Divide one whole number by another whole number, both with multiple digits)

Table 8: The Cognitive Process Dimension

CATEGORIES & COGNITIVE PROCESSES	ALTERNATIVE NAMES	DEFINITIONS AND EXAMPLES
IMPLEMENTING	Using	Applying a procedure to an unfamiliar task (e.g., Use Newton's Second Law in situations in which it is appropriate)

From Lorin W. Anderson and David R. Krathwohl, *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Educational Objectives*, © 2001. Published by Allyn and Bacon, Boston, MA. © 2001 by Pearson Education. Reprinted by permission of the publisher.

Table 2: The Cognitive Process Dimension

CATEGORIES & COGNITIVE PROCESSES	ALTERNATIVE NAMES	DEFINITIONS AND EXAMPLES
4. ANALYZE—Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose		
DIFFERENTIATING	Discriminating, distinguishing, focusing, selecting	Distinguishing relevant from irrelevant parts or important from unimportant parts of presented material (e.g., Distinguish between relevant and irrelevant numbers in a mathematical word problem)
ORGANIZING	Finding coherence, integrating, outlining, parsing, structuring	Determining how elements fit or function within a structure (e.g., Structure evidence in a historical description into evidence for and against a particular historical explanation)
ATTRIBUTING	Deconstructing	Determine a point of view, bias, values, or intent underlying presented material (e.g., Determine the point of view of the author of an essay in terms of his or her political perspective)
5. EVALUATE—Make judgments based on criteria and standards		
CHECKING	Coordinating, detecting, monitoring, testing	Detecting inconsistencies or fallacies within a process or product; determining whether a process or product has internal consistency; detecting the effectiveness of a procedure as it is being implemented (e.g., Determine if a scientist's conclusions follow from observed data)
CRITIQUING	Judging	Detecting inconsistencies between a product and external criteria, determining whether a product has external consistency; detecting the appropriateness of a procedure for a given problem (e.g., Judge which of two methods is the best way to solve a given problem)
6. CREATE—Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure		
GENERATING	Hypothesizing	Coming up with alternative hypotheses based on criteria (e.g., Generate hypotheses to account for an observed phenomenon)

Table 8: The Cognitive Process Dimension

CATEGORIES & COGNITIVE PROCESSES	ALTERNATIVE NAMES	DEFINITIONS AND EXAMPLES
PLANNING	Designing	Devising a procedure for accomplishing some task (e.g., Plan a research paper on a given historical topic)
PRODUCING	Constructing	Inventing a product (e.g., Build habitats for a specific purpose)

The cognitive process descriptions in the revised Bloom’s taxonomy have been widely distributed to South Carolina educators to raise awareness among educators of the importance of considering the levels of thinking required as well as the content in a subject when planning lessons for their students. For example, statements such as the following from the SC Mathematics standards document are repeated in the other content areas:

“The main verbs in the indicators are taxonomic. That is, the main verbs identify specific aspects of the cognitive process as described in the revised Bloom’s taxonomy ... use of the revised taxonomy will help teachers align lessons with both the content and the cognitive process identified in the indicators. Many of the indicators in mathematics address conceptual knowledge and fall under the second category of cognitive processing, *understanding*, which fosters transfer and meaningful learning rather than rote learning and memorization. These revised mathematics standards also contain some indicators that require students to *analyze* or *evaluate* mathematical representations or situations. As a result, students must use understanding as they demonstrate even more cognitively complex learning.” (SC Mathematics Standards, 2007, pp. 3 & 4)

The cognitive processes specified in the SC academic standards documents were compiled by EOC staff for each indicator in each standard for reading and research, writing, mathematics, science, and social studies. The specific cognitive processes in the indicators were coded into the six revised Bloom’s taxonomic categories (1. Remember, 2. Understand, 3. Apply, 4. Analyze, 5. Evaluate, or 6. Create), assigning a number from 1 to 6 to each indicator based on the cognitive processing category for the indicator. If an indicator listed more than one cognitive process, the highest level in the indicator was retained for this analysis. For example, the grade 6 research indicator 8 has two verbs, “design’ and “carry out”:

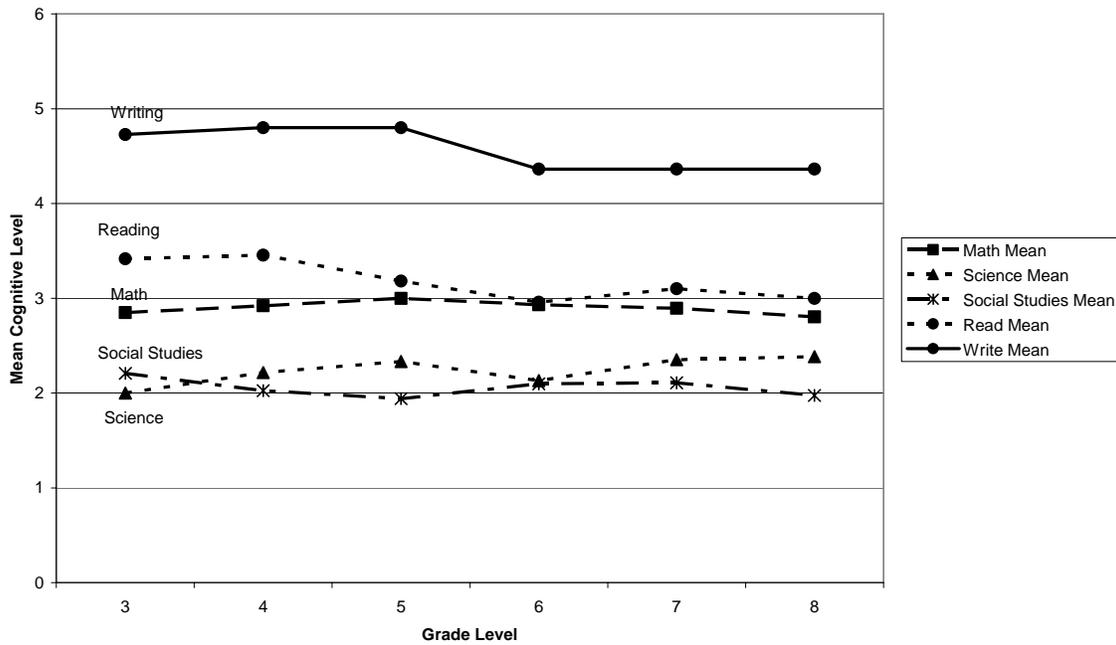
Design and carry out research projects by selecting a topic, constructing inquiry questions, accessing resources, and organizing information.

In the revised Bloom’s taxonomy “design” is at the highest cognitive processing level (6. Create) and “carry out” is at the “3. Apply” level; the highest level, “6. Create,” was assigned to this indicator for this analysis.

This process resulted in computer files listing the indicators and their corresponding cognitive levels to be used for further analyses and for comparisons to the cognitive processes elicited in the PASS test items evaluated for alignment. Since the cognitive

processes were assigned to a numeric scale, the data describing the cognitive processing levels in the academic standards can be aggregated for various analyses. For example, the numbers corresponding to the cognitive processing levels of the indicators in a subject can be averaged across the indicators and standards in a grade level to get a “big picture” view of the overall levels of cognitive processing by grade level and by subject, as illustrated in Figure 1.

Figure 1
Mean Cognitive Levels of SC Academic Standards By Grade
 (1=Remember; 2=Understand; 3=Apply; 4=Analyze; 5=Evaluate; 6=Create)



The data displayed in Figure 1 suggest that the science and social studies academic standards specify, on average, cognitive levels between “2. Understand” and “3. Apply.” Mathematics standards at all grade levels and Reading standards in grades 6 through 8 specify, on average, cognitive levels at the “3. Apply” level. Reading standards in the elementary school grades specify a somewhat higher level, approaching “4. Analyze” in grades 3 and 4. Not surprisingly, the writing standards specify the highest cognitive levels on average, because several of the indicators require students to create written compositions, which are generally at the “6. Create” level.

Information on the levels of cognitive processing elicited by the test items was collected during the alignment meeting in January 2009. The educators reviewing the test items for the standards and indicators assessed by the items were also asked to rate the cognitive processing level for each item using the scale from 1 to 6 corresponding to the revised Bloom’s taxonomy categories of cognitive processes. The reviewers were given copies of the revised Bloom’s terms listed in Table 8 for use during the meeting. The reviewers were also asked to identify the knowledge dimension assessed by each item based on the dimensions described in the revised Bloom’s taxonomy. That information has not been analyzed for this report.

For each item, a reviewer’s identification of the primary indicator assessed and the reviewer’s rating of the cognitive process elicited by the item were recorded on the data collection sheets. Since an item may elicit more than one level of cognitive processing, reviewers were asked to record all the cognitive processes they thought were required by the item to answer it successfully. For example, an item which asks a student to compare the effects on body organs of infectious and non-infectious diseases requires that a student know what infectious and noninfectious diseases are (1. Remember) before the student can compare (2. Understand) their effects. If more than one cognitive process level was recorded by a reviewer, the highest level was retained for this analysis.

Each test item was reviewed by either two or three reviewers, depending on the subject and grade level, resulting in multiple ratings of cognitive levels for each item. As can be seen in Table 9, most of the reviewers were in agreement on the cognitive levels they assigned to each item. However, there was some variability across the subject areas, with the lowest exact agreement on cognitive levels observed in social studies (80%) and the highest agreement in science (91.3%).

Table 9
 Identification of Cognitive Processes Required to Successfully Answer Items
 Percent Exact Agreement Among Reviewers
 PASS 2009 Alignment Study

Test	Percent Exact Agreement on Cognitive Process Required by Items
Reading & Research	84.1
Writing	90.9
Mathematics	89.5
Science	91.3
Social Studies	80.0

The analysis for determining depth-of-knowledge consistency was carried out by compiling the reviewers’ cognitive process ratings for all the items measuring an indicator and then comparing the ratings to the cognitive process level specified in the indicator. This analysis began by sorting all the items and their associated cognitive process ratings by indicator and aggregating all of the ratings on all the items measuring that indicator. The cognitive process rating for each item measuring the indicator was coded as being at a lower level than the cognitive process specified in the standards document, at the same level, or at a higher level. The frequencies of item ratings which were below, the same as, or above the cognitive process specified in the standards document were compiled and compared to the criteria for acceptable depth-of-knowledge consistency.

A test meets the criterion for depth-of-knowledge consistency if at least 50% of the items elicit cognitive process levels at (or above) the level specified in the standards document (Webb, 1999; Webb, 2002; Webb, Horton, & O’Neal, 2002). Stated another way, if 50% or more of the items on a test can be answered successfully using lower cognitive process levels than specified in the standards, the test would not fully meet this criterion. The criterion for depth-of-knowledge of 50% of the items at or above the cognitive levels

stated in the academic standards was established for the Webb alignment methodology as described below:

“Fifty percent, a conservative cutoff point, is based on the assumption that a minimal passing score for any one standard of 60% or higher would require the student to successfully answer at least some items at or above the depth-of-knowledge level of the corresponding objectives. For example, assume an assessment included six items related to one standard and students were required to answer correctly four of those items to be judged proficient – i.e. 67% of the items. If three, 50% of the six items, were at or above the depth-of-knowledge level of the corresponding objectives, then for a student to achieve a proficient score would require the student to answer correctly at least one item at or above the depth-of-knowledge of one objective.” (Webb, Horton, & O’Neal, 2002, p. 5)

Thus the value for meeting the depth-of-knowledge criterion was chosen to assure that students answer at least some items measuring at the cognitive processing level stated in the standards document. If at least 50% of the items are at or above the cognitive levels in the academic standards the test is said to have “met” the criterion for depth-of-knowledge. The Webb methodology also provides some leeway for this criterion in that if between 40% and 50% of the test items are at or above the cognitive process levels in the standards the test has “weakly met” the depth-of-knowledge criterion (Webb, 1999; Webb, 2002; Webb, Horton, & O’Neal, 2002).

Findings – Depth-of Knowledge

The findings from the depth-of-knowledge analysis of PASS item banks in all five subject areas are summarized in Table 10. The criterion for depth-of-knowledge test alignment was applied to the item banks in this analysis.

Table 10
Depth-of-Knowledge Alignment Analysis
2009 PASS Item Bank

Subject	Grade	Levels of Cognitive Processes of PASS Items Compared to Cognitive Processes of Academic Standard Indicators:			Total Items Receiving Ratings for Cognitive Processes in Grade – Number (%)*
		Lower Level Than Indicator -Number (%)	Same Level as Indicator - Number (%)	Higher Level Than Indicator - Number (%)	
Reading & Research	3	170 (57.4)***	81 (27.4)	45 (15.2)	296 (100)
	4	287 (67.9)**	111 (26.2)	25 (5.9)	423 (100)
	5	133 (46.2)	101 (35.1)	54 (18.8)	288 (100)
	6	276 (69.5)**	79 (19.9)	42 (10.6)	397 (100)
	7	164 (54.5)***	77 (25.6)	60 (19.9)	301 (100)
	8	135 (36.6)	114 (30.9)	120 (32.5)	369 (100)
Writing	3	40 (27.4)	28 (19.2)	78 (53.4)	146 (100)
	4	65 (55.1)***	22 (18.6)	31 (26.3)	118 (100)
	5	103 (62.1)**	34 (20.5)	29 (17.5)	166 (100)
	6	32 (24.1)	101 (75.9)	0 (0.0)	133 (100)
	7	3 (2.4)	81 (64.8)	41 (32.8)	125 (100)
	8	72 (50.7)***	69 (48.6)	1 (0.7)	142 (100)

Subject	Grade	Levels of Cognitive Processes of PASS Items Compared to Cognitive Processes of Academic Standard Indicators:			Total Items Receiving Ratings for Cognitive Processes in Grade – Number (%)*
		Lower Level Than Indicator -Number (%)	Same Level as Indicator - Number (%)	Higher Level Than Indicator - Number (%)	
Math	3	37 (16.9)	153 (69.9)	29 (13.2)	219 (100)
	4	53 (19.6)	198 (73.3)	19 (7.0)	270 (100)
	5	51 (21.3)	108 (45.2)	80 (33.5)	239 (100)
	6	61 (26.2)	119 (51.1)	53 (22.8)	233 (100)
	7	75 (24.0)	139 (44.6)	98 (31.4)	312 (100)
	8	77 (27.6)	153 (54.8)	49 (17.6)	279 (100)
Science	3	121 (37.4)	145 (44.8)	58 (17.9)	324 (100)
	4	128 (40.8)	153 (48.7)	33 (10.5)	314 (100)
	5	115 (41.1)	110 (39.3)	55 (19.6)	280 (100)
	6	75 (22.3)	184 (54.8)	77 (22.9)	336 (100)
	7	106 (33.4)	122 (38.5)	89 (28.1)	317 (100)
	8	115 (33.4)	162 (47.1)	67 (19.5)	344 (100)
Social Studies	3	50 (21.4)	85 (36.3)	99 (42.3)	234 (100)
	4	158 (53.0)***	121 (40.6)	19 (6.4)	298 (100)
	5	97 (46.2)	98 (46.7)	15 (7.1)	210 (100)
	6	102 (37.2)	84 (30.7)	88 (32.1)	274 (100)
	7	72 (33.5)	124 (57.7)	19 (8.8)	215 (100)
	8	106 (51.7)***	49 (23.9)	50 (24.4)	205 (100)

* An item may have been counted more than once if different judges assigned different standards or indicators to the item.

** Items did not meet criterion for depth of knowledge consistency of 50% or more cognitive processes at or above the level of the indicator.

*** Items weakly met criterion for depth of knowledge consistency of 50% or more cognitive processes at or above grade level (i.e., between 40% and 50% of items were at or above the level of the indicator).

Note: Percentages may not add to 100% due to rounding.

The mathematics and science item banks at every grade level met the depth-of-knowledge criterion for alignment. The reading and research item bank fully met the criterion in grades five and eight, did not meet the criterion in grades four and six, and weakly met the criterion in grades three and seven. The writing item bank met the criterion in grades three, six, and seven, failed to meet the criterion in grade five, and weakly met the criterion in grades four and eight. The social studies item bank met the criterion in grades three, five, six, and seven, and weakly met the criterion in grades four and eight.

The data suggest that in four of six grades an excessive number of reading and research items in the item bank are assessing students' knowledge and skills at a lower cognitive level than is expected from the academic standards. PASS tests in reading and research will be constructed by sampling items representing the reading and research standards and indicators. If the items in the bank for each indicator and standard are assessing at too low or too high a cognitive processing level, it may be difficult or impossible to construct test forms assessing the standards at the level of cognitive processing required by the academic standards. The Webb criterion for depth-of-knowledge consistency is intended to assure that the majority of items on a test are not

assessing levels of cognitive processing below that expected in the state's academic standards. If an excessive proportion of items in the item bank assess at too low a level, the majority of items selected to construct a test may also be at too low a level to accurately assess students' achievement of the state academic standards. This may lead to erroneous interpretations of the test score results: we may conclude from the results that students scoring at levels meeting the performance standards on the test have the skills expected for their grade level, when in fact the test is not measuring at the levels expected in the state academic standards. In addition to reading and research, the writing item banks in three grades and the social studies item banks in two grades raise similar concerns about the construction of new test forms which accurately measure at the cognitive levels specified in the state academic standards.

Range-of-Knowledge Correspondence

Background and Methodology – Range-of-Knowledge Correspondence

The Range-of-Knowledge measure poses the question, "Do the test items cover the breadth of knowledge and skills represented by the indicators in a standard?" As defined by Webb,

"The range-of-knowledge criterion is used to judge whether a comparable span of knowledge expected of students by a standard is the same as, or corresponds to, the span of knowledge that students need in order to correctly answer the assessment items/activities." (Webb, Horton, and O'Neal, 2002, p. 7)

The criterion for an acceptable correspondence between the breadth of knowledge in the standards and the breadth of knowledge assessed on a test is that at least 50% of the indicators in a standard must have at least one item assessing the indicator. This criterion is based on the assumption that student performance should be assessed based on at least half of the domain of knowledge in a standard.

While the criterion of 50% of the indicators having associated test items may be appropriate for a test, it is probably too generous a criterion for an item bank. Since items are sampled from the group of items assessing a standard when new test forms are created, it seems reasonable to expect that there will be items in the bank assessing every indicator in the standard so that the measurement of the standard is representative of the knowledge expectations for students expressed in that standard. However, a criterion for this measure for item banks has not been published, so the 50% criterion will be used for this study.

Findings – Range-of-Knowledge Correspondence

Based on the Webb criterion, all the tests at all grade levels meet this criterion (Standard 1 Mathematical Processes in the mathematics academic standards is not directly assessed on PASS and no items are available assessing any of the indicators in this standard). Detailed tables displaying the numbers of items assessing each indicator are available in Appendix C.

Although the item bank met the criterion of at least one item in 50% or more of the indicators in a standard, there were indicators in the academic standards which did not have items in the item bank measuring them. These indicators are listed by subject area in Tables 11, Reading and Research; Table 12, Writing; Table 13, Mathematics; Table

14, Science; and Table 15, Social Studies. The subject area with the largest number of indicators without items in the item bank was reading and research, followed by writing. Mathematics and science had three indicators each without items, and every social studies indicator had at least one item in the bank assessing it.

Some of the reading and research indicators (e.g., Read independently for extended periods of time to gain information; Use appropriate visual aids to support oral presentation) would be difficult if not impossible to assess with a multiple choice item, which would help to explain why there were no items identified assessing those indicators. The indicators related to spelling were not tested. There was some overlap between reading and research and writing indicators regarding spelling in grade six, but no items were identified assessing the indicators in either subject. While spelling is assessed as a component of the Conventions writing domain in the extended writing rubric, the relationships between the spelling-related indicators in the reading and research standards and the writing assessments is not specified in either the reading and research or writing test blueprints. Finally, a number of research indicators did not have corresponding items in the item bank, suggesting that the assessment of student knowledge and skills in research as specified in the state academic standards may not give a full picture of student performance on this standard.

Table 11
Indicators from State Academic Standards Not Measured by Items in PASS Item Bank
PASS Reading and Research

Grade Level	Indicator from SC Academic Standards for English Language Arts (2008)
3	3-1.7 Create responses to literary texts through a variety of methods (for example, writing, creative dramatics , and the visual and performing arts).
3	3-1.11 Read independently for extended periods of time for pleasure.
3	3-2.4 Create responses to informational texts through a variety of methods (for example, drawings, written works, and oral presentations).
3	3-2.5 Use headings, subheadings, print styles , captions, and chapter headings to gain information.
3	3-2.9 Read independently for extended periods of time to gain information.
3	3-3.4 Read high-frequency words in texts . (See <i>Instructional Appendix: High-Frequency Words</i> .)
3	3-3.6 Spell high-frequency words . (See <i>Instructional Appendix: High-Frequency Words</i> .)
3	3-3.7 Spell correctly <ul style="list-style-type: none"> • words that have blends, • contractions, • compound words, • orthographic patterns (for example, <i>qu</i>, consonant doubling, changing the ending of a word from <i>-y</i> to <i>-ies</i> when forming the plural), and • common homonyms.
3	3-6.4 Paraphrase research information accurately and meaningfully.
3	3-6.6 Use vocabulary (including Standard American English) that is appropriate for the particular audience or purpose.

Grade Level	Indicator from SC Academic Standards for English Language Arts (2008)
3	3-6.7 Use appropriate visual aids (for example, pictures, objects, and charts) to support oral presentations.
4	4-1.11 Read independently for extended periods of time for pleasure.
4	4-2.9 Read independently for extended periods of time to gain information.
4	4-3.4 Spell correctly <ul style="list-style-type: none"> • words with prefixes and suffixes and • multisyllabic words.
4	4-6.5 Create a list of sources that contains information (including the author and title of a publication) necessary to properly credit and document the work of others.
4	4-6.7 Use vocabulary (including Standard American English) that is appropriate for the particular audience or purpose.
4	4-6.8 Select appropriate graphics, in print or electronic form, to support written works and oral and visual presentations.
5	5-1.7 Create responses to literary texts through a variety of methods (for example, writing, creative dramatics , and the visual and performing arts).
5	5-1.11 Read independently for extended periods of time for pleasure.
5	5-2.4 Create responses to informational texts through a variety of methods (for example, drawings, written works, and oral presentations).
5	5-2.8 Predict events in informational texts on the basis of cause-and-effect relationships.
5	5-2.9 Read independently for extended periods of time to gain information.
5	5-3.4 Spell correctly <ul style="list-style-type: none"> • multisyllabic constructions, • double consonant patterns, and • irregular vowel patterns in multisyllabic words.
5	5-6.5 Create a list of sources that contains information (including author, title, and full publication details) necessary to properly credit and document the work of others.
5	5-6.7 Use vocabulary (including Standard American English) that is appropriate for the particular audience or purpose.
5	5-6.8 Use appropriate organizational strategies to prepare written works and oral and visual presentations.
5	5-6.9 Select appropriate graphics, in print or electronic form, to support written works and oral and visual presentations.
6	6-1.7 Create responses to literary texts through a variety of methods (for example, written works, oral and auditory presentations, discussions, media productions, and the visual and performing arts).
6	6-1.11 Read independently for extended periods of time for pleasure.
6	6-2.4 Create responses to informational texts through a variety of methods (for example, drawings, written works, oral and auditory presentations, discussions, and media productions).

Grade Level	Indicator from SC Academic Standards for English Language Arts (2008)	
6	6-2.10	Read independently for extended periods of time to gain information.
6	6-3.4	Distinguish between the denotation and the connotation of a given word.
6	6-3.5	Spell new words using Greek and Latin roots and affixes . (See <i>Instructional Appendix: Greek and Latin Roots and Affixes</i> .)
6	6-6.3	Use a standardized system of documentation (for example, a list of sources with full publication information and the use of in-text citations) to properly credit the work of others.
6	6-6.4	Use vocabulary (including Standard American English) that is appropriate for the particular audience or purpose.
6	6-6.5	Use appropriate organizational strategies to prepare written works, oral and auditory presentations, and visual presentations.
6	6-6.6	Select appropriate graphics, in print or electronic form, to support written works, oral presentations, and visual presentations.
7	7-1.7	Create responses to literary texts through a variety of methods (for example, written works, oral and auditory presentations, discussions, media productions, and the visual and performing arts).
7	7-1.8	Compare/contrast literary texts from various genres (for example, poetry, drama , novels, and short stories).
7	7-1.9	Read independently for extended periods of time for pleasure.
7	7-2.4	Create responses to informational texts through a variety of methods (for example, drawings, written works, oral and auditory presentations, discussions, and media productions).
7	7-2.5	Analyze the impact that text elements (for example, print styles and chapter headings) have on the meaning of a given informational text .
7	7-2.8	Read independently for extended periods of time to gain information.
7	7-3.5	Spell new words using Greek and Latin roots and affixes . (See <i>Instructional Appendix: Greek and Latin Roots and Affixes</i> .)
7	7-6.4	Use vocabulary (including Standard American English) that is appropriate for the particular audience or purpose.
7	7-6.5	Use appropriate organizational strategies to prepare written works, oral and auditory presentations, and visual presentations.
7	7-6.6	Select appropriate graphics, in print or electronic form, to support written works, oral presentations, and visual presentations.
8	8-1.6	Create responses to literary texts through a variety of methods (for example, written works, oral and auditory presentations, discussions, media productions, and the visual and performing arts).
8	8-1.7	Compare/contrast literary texts from various genres (for example, poetry, drama , novels, and short stories).
8	8-1.8	Read independently for extended periods of time for pleasure.
8	8-2.8	Read independently for extended periods of time to gain information.
8	8-3.5	Spell new words using Greek and Latin roots and affixes . (See <i>Instructional Appendix: Greek and Latin Roots and Affixes</i> .)
8	8-6.3	Use a standardized system of documentation (including a list of sources with full publication information and the use of in-text citations) to properly credit the work of others.

Grade Level	Indicator from SC Academic Standards for English Language Arts (2008)	
8	8-6.4	Use vocabulary (including Standard American English) that is appropriate for the particular audience or purpose.
8	8-6.6	Select appropriate graphics, in print or electronic form, to support written works, oral presentations, and visual presentations.

Table 12
Indicators from State Academic Standards Not Measured by Items in PASS Item Bank
PASS Writing

Grade Level	Indicator from SC Academic Standards for English Language Arts (2008)	
3	3-4.1	Generate and organize ideas for writing using prewriting techniques (for example, creating lists, having discussions, and examining literary models).
3	3-4.7	Use correct letter formation when using manuscript and cursive writing.
3	3-5.4	Create written pieces (for example, riddles and jokes) to entertain others.
4	4-4.1	Generate and organize ideas for writing using prewriting techniques (for example, creating lists, having discussions, and examining literary models).
4	4-5.4	Create written pieces (for example, skits and plays) to entertain others.
5	5-4.1	Generate and organize ideas for writing using prewriting techniques (for example, creating lists, having discussions, and examining literary models).
5	5-5.1	Create informational pieces (for example, book reviews and newsletter articles) that use language appropriate for the specific audience .
5	5-5.2	Create narratives that have a fully developed plot and a consistent point of view .
5	5-5.4	Create written pieces (for example, picture books, comic books, and graphic novels) to entertain a specific audience .
6	6-4.1	Organize written works using prewriting techniques, discussions, graphic organizers , models, and outlines.
6	6-4.7	Spell correctly using Standard American English .
7	7-4.1	Organize written works using prewriting techniques, discussions, graphic organizers , models, and outlines.
7	7-4.2	Use complete sentences in a variety of types (including simple, compound, complex, and compound-complex).
7	7-4.3	Create multiple-paragraph compositions that include a central idea with supporting details and use appropriate transitions between paragraphs.
8	8-4.2	Use complete sentences in a variety of types (including simple, compound, complex, and compound-complex).
8	8-4.3	Create multiple-paragraph compositions that include a central idea with supporting details and use appropriate transitions between paragraphs.
8	8-4.4	Use grammatical conventions of written Standard American English , including the reinforcement of conventions previously taught. (See <i>Instructional Appendix: Composite Writing Matrix</i> .)

Table 13
Indicators from State Academic Standards Not Measured by Items in PASS Item Bank
PASS Mathematics

Grade Level	Indicator from SC Academic Standards for Mathematics (2007)
3	Every Indicator assessed by at least one item in item bank
4	4-2.12 Generate strategies to add and subtract decimals through hundredths.
5	Every Indicator assessed by at least one item in item bank
6	6-4.4 Construct two-dimensional shapes with line or rotational symmetry. 6-6.1 Predict the characteristics of one population based on the analysis of sample data.
7	Every Indicator assessed by at least one item in item bank
8	Every Indicator assessed by at least one item in item bank

Table 14
Indicators from State Academic Standards Not Measured by Items in PASS Item Bank
PASS Science

Grade Level	Indicator from SC Academic Standards for Science (2005)
3	3-1.4 Predict the outcome of a simple investigation and compare the result with the prediction.
4	Every Indicator assessed by at least one item in item bank
5	Every Indicator assessed by at least one item in item bank
6	6-5.8 Illustrate ways that simple machines exist in common tools and in complex machines.
7	7-1.7 Use appropriate safety procedures when conducting investigations.
8	Every Indicator assessed by at least one item in item bank

Table 15
Indicators from State Academic Standards Not Measured by Items in PASS Item Bank
PASS Social Studies

Grade Level	Indicator from SC Academic Standards for Social Studies (2005)
3	Every Indicator assessed by at least one item in item bank
4	Every Indicator assessed by at least one item in item bank
5	Every Indicator assessed by at least one item in item bank
6	Every Indicator assessed by at least one item in item bank
7	Every Indicator assessed by at least one item in item bank
8	Every Indicator assessed by at least one item in item bank

Balance-of-Representation

Background and Methodology – Balance-of-Representation

Balance-of-Representation poses the question, “Are the numbers of items assessing an indicator proportional to the number of indicators tested for a standard, assuring that one indicator does not receive more weight than the other indicators in the scores from the assessment?” Webb defines Balance of Representation as follows:

“The balance-of-representation criterion is used to indicate the degree to which one objective is given more emphasis on the assessment than another.” (Webb, Horton, and O’Neal, 2002, p. 9)

The Balance-of-Representation measure assumes that every indicator within a standard has equal importance, so the number of items from each indicator assessing a standard should be proportional to the number of indicators assessed for the standard. Thus if six indicators assessed for a standard are each tested by a single item, their proportions would be balanced in the assessment of the standard. If, on the other hand, those six indicators from a standard were tested with one item each from five of the indicators and five items from the sixth indicator, the overall score for the standard would not provide an accurate picture of student proficiency in that standard because almost half the items tested were based on only one indicator. The student who performs well on the indicator tested with five items but poorly on the remaining items testing one indicator each may be designated by the total score as meeting expectations for the standard, but actually may have some serious weaknesses in his or her understanding of all components of the content covered by the standard.

The Balance-of-Representation measure seems appropriate for use with the evaluation of the PASS assessments because the state academic standards do not assign higher priorities or weightings to some indicators compared to others – all indicators appear in the standards documents to have the same importance within their standards. This assumption that all indicators have equal importance within a standard underlies the Webb measure, also. The criterion for acceptable Balance-of-Representation is based

on the evaluation of a test form. However, the criterion can be calculated for an item bank and provides a useful measure of the balance of items needed in the item bank to construct future forms with sufficient items for each indicator to generate accurate evaluations of student performance in each standard tested.

The criterion for Balance-of-Representation is based on an index calculated for each of the standards assessed. The index is calculated only on data from indicators which have at least one item assessing it; if there are no items assessing an indicator that indicator is not used in the calculation of the index (information on the indicators which were not assessed in the item bank is presented in the section on Range-of-Knowledge Consistency). The index is calculated by computing the difference between the proportion of indicators assessed for the standard and the proportion of items assessing each indicator. The index ranges from 0 to 1, with a value of 1 indicating a perfect balance between the proportion of indicators assessed for a standard and the proportion of items assessing each indicator. If most of the items assess a single indicator and the remaining indicators in the standard are assessed by only one item each, the index has a value less than 0.5. Index values of 0.7 or higher indicate that the items are distributed relatively equally among all the indicators. Index values of 0.7 or higher indicate that the Balance-of-Representation criterion has been “Met.” Index values between 0.6 and 0.7 indicate that the criterion has been “Weakly Met.”

Finding – Balance-of-Representation

Tables for each subject and grade level displaying the index for each standard are available in Appendix C. The summary results from the analysis of Balance-of-Representation are listed below in Table 16. The criterion for each standard in each subject at each grade level is listed as “Met,” “Weakly Met,” or “Not Met” in the table.

An example of a standard where the criterion was “Not Met” is Grade 6 reading and research, Standard 3 (Reading Vocabulary). The Balance-of-Representation index was 0.49 for this standard. This standard has five indicators, four of which had test items in the bank measuring them. Indicator 6-3.1 had fifty-three items in the bank identified as measuring it; Indicator 6-3.2 had six items in the bank; Indicator 6-3.3 had nine items; and Indicator 6-3.4 had two items. If one were sampling items randomly from the item bank to create a new test form measuring Standard 3, most likely items from Indicator 6-3.1 would be selected; the pool of items for Indicator 6-3.4 is very shallow and items representing this indicator would not be likely to be selected. Even if deliberate efforts were made to select items measuring Indicator 6-3.4, the number of test forms which can measure that indicator without repeating the use of the same item is quite limited.

An example of a standard where the criterion was “Met” is found in a grade six science Standard 1 (Scientific Inquiry), where the Balance-of-Representation index is 0.87. This standard has five indicators and each indicator was measured by items in the science item bank. Indicator 6-1.1 had six items in the bank measuring it; Indicator 6-1.2 had two items measuring it; Indicator 6-1.3 had seven items measuring it; Indicator 6-1.4 had eight items; and Indicator 6-1.5 had six items. With the exception of Indicator 6-1.2, each indicator in this standard had similar numbers of associated items in the item bank. While Balance-of-Representation provides a measure of how well distributed among the indicators the items assessing a standard are, meeting the criterion does not always assure that sufficient items are available in the pool to fully assess each standard.

Science met the Balance-of-Representation criterion at every grade level for every standard. Social studies also met the criterion in all grades but six and eight, where the criterion was weakly met for some standards. Mathematics met the criterion in three of six grades. Reading and research failed to meet the criterion at some level at every grade, suggesting that the numbers of items assessing individual indicators in the item bank are not well balanced, which may make it difficult to construct future test forms which cover the content of the standards comprehensively. Similar findings are observed in writing, although the linkage between the standards and indicators listed in the state standards document and the blueprint are not specified, making it difficult to interpret the findings.

Table 16
Balance of Representation Results
PASS Alignment Review

Alignment Criterion	Grade Level of Test	Did the Item Bank Meet the Criterion?				
		Reading & Research	Writing	Mathematics	Science	Social Studies
Balance of Representation: Are the items relatively equally distributed among the indicators for a standard, or do some indicators have most of the items and others few items? (Criterion measured with an index ranging from 0 to 1, with values 0.7 and above meet the criterion, values 0.60 – 0.69 weakly meet the criterion, and values less than 0.6 fail to meet the criterion.)	3	Stds. 2 & 6 Met; Stds. 1 & 3 Weakly Met	Stds. 4 & 5 Weakly Met	Stds. 2, 3, 4, 5 & 6 Met; Std. 1 not evaluated	Stds. 1, 2, 3, 4, & 5 Met	Stds. 1, 2, 3, 4, & 5 Met
	4	Std. 2 Met; Stds. 1, 3, & 6 Weakly Met	Std. 4 Met; Std. 5 Weakly Met	Stds. 2, 3, 4, & 5 Met; Std. 6 Not Met; Std. 1 not evaluated	Stds. 1, 2, 3, 4, & 5 Met	Stds. 1, 2, 3, 4, 5, & 6 Met
	5	Std. 1 Met; Stds. 2, 3, & 6 Weakly Met	Std. 4 Weakly Met; Std. 5 Met	Stds. 2, 3, 4, 5, & 6 Met; Std. 1 not evaluated	Stds. 1, 2, 3, 4, & 5 Met	Stds. 1, 2, 3, 4, 5, & 6 Met
	6	Std. 6 Met; Stds. 1 & 2 Weakly Met; Std. 3 Not Met	Std. 4 Weakly Met; Std. 5 Not Met	Stds. 2, 3, 4, 5, & 6 Met; Std. 1 not evaluated	Stds. 1, 2, 3, 4, & 5 Met	Stds. 3, 4, 5, & 6 Met; Stds. 1 & 2 Weakly Met;
	7	Std. 2 Met; Stds. 1 & 6 Weakly Met; Std. 3 Not Met	Std. 4 Not Met; Std. 5 Weakly Met	Stds. 3, 4, 5, & 6 Met; Std. 2 Weakly Met; Std. 1 not evaluated	Stds. 1, 2, 3, 4, & 5 Met	Stds. 1, 2, 3, 4, 5, 6, & 7 Met
	8	Stds. 1 & 6 Met; Stds. 2 & 3 Not Met	Stds. 4 & 5 Not Met	Stds. 3, 4, 5, & 6 Met; Std. 2 Weakly Met; Std. 1 not evaluated	Stds. 1, 2, 3, 4, 5, & 6 Met	Stds. 1, 2, 4, 5, 6, & 7 Met; Std. 3 Weakly Met

Summary and Recommendations from Alignment Analysis

The review of the alignment of the PASS item banks revealed both strengths and weaknesses in each content area. Strengths were observed in every subject area and weaknesses seemed more prominent in two of the subject areas tested, although weaknesses were identified for every subject area reviewed. The strengths were that, generally, there were at least some items in the bank for every subject assessing every academic standard slated to be tested. The weaknesses, which were observed primarily in the reading and research and writing, and to a lesser extent, in the social studies item banks, were that there were too few (or in some cases, none) items to adequately assess all of the objectives or indicators specified in the state standards. This is a concern because there may not be sufficient (or any) items to assess some of the indicators within a standard when test forms are created from the selection of items from the item bank while there are many items for other indicators: the indicators represented by many items are more likely to be tested and to have more weight in the total score calculated for the standard. This can lead to erroneous interpretations of student proficiency in the standard because some of the areas of learning in the standard are always tested and make up a large part of the test score for the standard, while other indicators in the standard may never be assessed. A second weakness of the item bank, especially in reading and research and in writing, along with social studies to a lesser extent, is that there were too few items in the bank assessing students at the same levels of thinking as specified in the state academic standards and too many assessing at lower levels. Again, this is a concern because there may not be sufficient items in the item bank to assess the standards at the cognitive levels expected in the state standards, leading to erroneous interpretations from the test scores that students are able to perform at the levels of thinking expected in the standards when in fact they have not been assessed at those levels.

Alignment Findings for Reading and Research

Alignment Strengths – Reading and Research

- Met the criterion for Categorical Concurrence, indicating an overall match between the content of the state academic standards and the items in the item bank.
- Met the criterion for Range-of-Knowledge, indicating that the item bank has at least one item assessing 50% of the indicators in the academic standards.

Alignment Areas of Concern – Reading and Research

- Met the criterion for Depth-of-Knowledge in two grade levels, weakly met the criterion in two grades, and did not meet criterion in two grades, indicating a majority of the items in the grades where the criterion was not met assess students at a lower cognitive level than specified in the state academic standards.
- Did not fully meet the Balance-of-Representation criterion at any grade level, suggesting that the numbers of items assessing individual indicators in the item bank are not well balanced in the standards where the criterion was not met or weakly met, which may make it difficult to construct future test forms which cover the content of the standards comprehensively.
- No items in the bank were identified as assessing a number of indicators from the reading and research standards, including spelling and several research

indicators, so these indicators would not be assessed based on test forms generated from the item bank.

Alignment Recommendations – Reading and Research

- Additional items should be developed and added to the item bank to more adequately cover the breadth and depth of the content and cognitive processing expectations for students defined in the SC Academic Standards for English Language Arts.
- Until such time as sufficient items can be added to the item bank, the SCDE should develop and follow a plan for generating new test forms to ensure that the items selected cover the content and levels of thinking specified in the state academic standards.

Alignment Findings for Writing

Alignment Strengths – Writing

- Met the criterion for Categorical Concurrence, indicating an overall match between the content of the state academic standards and the items in the item bank.
- Met the criterion for Range-of-Knowledge, indicating that the item bank has at least one item assessing 50% of the indicators in the academic standards.

Alignment Areas of Concern – Writing

- Met the criterion for Depth-of-Knowledge in three grade levels, weakly met the criterion in two grades, and did not meet criterion in one grade, indicating a majority of the items in the grades where the criterion was not met assess students at a lower cognitive level than specified in the state academic standards.
- Did not fully meet the Balance-of-Representation criterion at any grade level, suggesting that the numbers of items assessing individual indicators in the item bank are not well balanced in the standards where the criterion was not met or weakly met, which may make it difficult to construct future test forms which cover the content of the standards comprehensively.
- No items in the bank were identified as assessing several indicators from the writing standards, so these indicators would not be assessed based on test forms generated from the item bank.

Alignment Recommendations – Writing

- Additional items should be developed and added to the item bank to more adequately cover the breadth and depth of the content and cognitive processing expectations for students defined in the SC Academic Standards for English Language Arts.
- Until such time as sufficient items can be added to the item bank, the SCDE should develop and follow a plan for generating new test forms to ensure that the items selected cover the content and levels of thinking specified in the state academic standards.

Alignment Findings for Mathematics

Alignment Strengths – Mathematics

- Met the criterion for Categorical Concurrence for all standards but Standard 1 (Mathematical Processes); however, based on the test blueprint, Standard 1 is not directly assessed on the test.
- Met the criterion for Depth-of-Knowledge, indicating that the balance of items assessing the content at different levels of cognitive processing is acceptable.
- Met the criteria for Range-of-Knowledge, indicating that the item bank has at least one item assessing 50% of the indicators in the academic standards.

Alignment Areas of Concern – Mathematics

- Fully met the criterion for Balance-of-Representation for all standards in three grade levels and weakly met or did not meet the criterion for all standards in three grades, suggesting that the numbers of items assessing individual indicators in the item bank are not well balanced in the standards where the criterion was not met or weakly met, which may make it difficult to construct future test forms which cover the content of the standards comprehensively.
- No items in the item bank were identified as assessing three indicators in the mathematics standards, so these indicators would not be assessed based on test forms generated from the item bank.

Alignment Recommendation – Mathematics

- Additional items should be developed and added to the item bank to ensure that all standards and indicators are assessed in future test forms.

Alignment Findings for Science

Alignment Strengths - Science

- Met the criterion for Categorical Concurrence, indicating an overall match between the content of the state academic standards and the items in the item bank.
- Met the criterion for Depth-of-Knowledge, indicating that the balance of items assessing the content at different levels of cognitive processing is acceptable.
- Met the criterion for Range-of-Knowledge, indicating that the item bank has at least one item assessing 50% of the indicators in the academic standards.
- Met the criterion for Balance-of-Representation for all standards at all grade levels, indicating an acceptable balance in the numbers of items in the bank assessing the indicators within a standard.

Alignment Areas of Concern – Science

- No items in the item bank were identified as assessing three indicators in the science standards, so these indicators would not be assessed based on test forms generated from the item bank.

Alignment Recommendation – Science

- Additional items should be developed and added to the item bank to ensure that all standards and indicators are assessed in future test forms.

Alignment Findings for Social Studies

Alignment Strengths – Social Studies

- Met the criterion for Categorical Concurrence, indicating an overall match between the content of the state academic standards and the items in the item bank.
- Met the criterion for Range-of-Knowledge, indicating that the item bank has at least one item assessing 50% of the indicators in the academic standards.

Alignment Areas of Concern – Social Studies

- Met the Depth-of-Knowledge criterion in four grades and weakly met the criterion in two grades, indicating a majority of the items in the grades where the criterion was weakly met assess students at a lower cognitive level than specified in the state academic standards.
- Met the criterion for Balance-of-Representation for all standards at four grade levels and weakly met the criterion for one standard each in two grades, suggesting that the numbers of items assessing individual indicators in the item bank are poorly balanced in the standards where the criterion was weakly met, which may make it difficult to construct future test forms which cover the content of the standards comprehensively.

Alignment Recommendation – Social Studies

- Additional items should be developed and added to the item bank to more adequately cover the breadth and depth of the content and cognitive processing expectations for students defined in the SC Academic Standards for Social Studies.

Technical Review of PASS Tests

In addition to evaluating the alignment between the accountability tests and the state academic standards, the EAA requires the EOC to review the tests for their “level of difficulty and validity, and for the ability to differentiate levels of achievement, and will make recommendations for needed changes, if any” (Section 59-18-320A). The review of the tests for difficulty, validity, and differentiation of achievement levels required item and test statistical technical data which could not be calculated and reviewed until after the tests were administered and scored in Spring 2009. These data were made available to the EOC by the SCDE as they became available from the testing contractors. Data for the technical review were provided to the EOC between June 8 and July 1, 2009. In June 2008 EOC staff provided the SCDE a list of data and statistics needed for the review which included the classical and latent trait item and test statistics commonly generated and evaluated in large-scale testing programs (Appendix D); this list provided the basis for the data provided to the EOC by the SCDE and its testing contractors. Data for the technical review were provided to the EOC between June 8 and July 1, 2009. The item and test data available for review by the technical panel included results for the items composing the operational test forms for reading & research, mathematics, science, and social studies. Data from items field tested separately from the operational forms for those subject areas was not available for review. The writing data reviewed by the panel included the operational test items, including the results from the extended writing portion of the test and the results from twenty-five operational multiple choice items at each grade level, plus data from five additional multiple choice items field-tested on the same forms as the operational test items.

The technical data were evaluated on July 8, 2009 at a meeting at the EOC offices in Columbia by the members of a PASS Technical Review Panel (Appendix E) convened by EOC staff for this purpose. This four-member panel, chaired by a University professor of educational research and measurement and composed of experienced school district testing and evaluation directors, was provided summary data for review from the PASS tests of reading & research, writing, mathematics, science, and social studies prior to the July 8 meeting. Members were encouraged to request additional data needed for their review and additional data were provided to the panel at its meeting based on their requests. In addition to the four panelists, the July 8 meeting was attended by EOC staff and a staff member representing the SCDE Office of Assessment. In compliance with state security statute and regulation, all test materials were collected from the participants at the end of the meeting.

The panelists were asked to review the data based on the statutory requirements (difficulty, validity, and ability to differentiate levels of achievement). At the July 8 meeting the panelists discussed their criteria for making the evaluations and then discussed each panel subject area test separately, considering the results for each grade level. The panelists included examination of the distributions and means of raw scores, test reliabilities (measures of the degree to which a test will provide consistent results across different administrations of the test expressed on a scale of 0 to 1, with a minimally acceptable criterion of 0.85), and item statistics including:

- difficulty (proportion of students correctly answering each item; values range 0 to 1, with values below 0.3 indicating that students may be performing at the chance level);

- item discrimination (degree to which overall higher-scoring students answered the item correctly and overall lower-scoring students wrongly answered the item; values range from -1 to +1, with values less than 0.2 indicating poor discrimination);
- Differential Item Functioning, or DIF (a statistical measure of the degree to which students belonging to four the specific demographic groups studied – females vs. males and African American vs. White students - tended to get the item right or wrong at a different rate than one would expect given their overall performance on the test; coded values range from A+/- to C+/- (where the “+” reports an item differs for the focal group and a “-“ illustrates that the item differs for the reference group) with C+/- indicating an unacceptable degree of DIF); and
- infit and outfit mean square errors (measures of the degree to which the item fits the requirements of the latent trait statistical model used to score the tests; acceptable values range from 0.7 to 1.3).

The test and item statistics reviewed by the panel are summarized in the sections on their findings for each test; figures showing the distributions of test raw scores are available at <http://eoc.sc.gov>. The panel findings for each subject area test include the positive technical attributes of the tests, areas for concern revealed by the technical data, and recommendations for improvement.

Technical Review Panel Findings

PASS Reading and Research Test (Table 17)

Positive Attributes – Reading & Research

- The reliability values for the tests at all grade levels are at or above the minimally acceptable value of 0.85.
- The average difficulty of the items is in the appropriate range for a criterion-referenced test (approximately 0.6).
- The measures of item fit to the latent trait model are in the appropriate ranges (approximately 1.0).

Areas for Concern – Reading and Research

- The distributions of raw scores in grades 4 and 7 are strongly negatively skewed, indicating that many students are scoring at the very highest levels on these tests. This results in a “ceiling effect” on future test scores: over time it is expected that with improved instruction and learning more and more students will score at the maximum range for the tests, limiting the degree to which one can differentiate between different levels of high student performance and limiting the degree to which one can accurately measure growth, especially of higher-performing students.
- A total of five items across grades 3, 5, and 8 had difficulty values (p values) below the criterion of p greater than or equal to 0.3, indicating that students are scoring at or below chance on the items and the items may be too difficult to provide useful information.
- A total of sixteen items across grades 3, 5, 6, 7, and 8 were flagged because their item discrimination values were below the minimal criterion (0.2), indicating a tendency for overall higher-scoring students to get an easy item wrong and/or for overall lower-scoring students to get a difficult item right, contrary to the

- expected patterns of performance. Items having poor discrimination values tend to decrease the overall reliability of a test.
- A total of six items across grades 3, 4, and 8 were flagged because their DIF values exceeded the maximum value for the criterion, indicating potential bias for or against specific demographic groups.

Recommendations – Reading & Research

1. Include more difficult items in future tests for grades 4 and 7 to ameliorate the ceiling effects observed with the 2009 test and to increase the ability to differentiate levels of achievement among higher-performing students. This can be accomplished by adding more difficult items to the tests (either by replacing easier items or by adding additional items).
2. Remove or revise items flagged for poor discrimination to increase the overall reliability of the test.
3. Review and revise or remove the exceptionally difficult items observed in grades 3, 5, and 8.
4. Review all items flagged for DIF to ensure that these items are not biased for or against males or females, or African American or White students.

PASS Writing Test (Table 18)

Positive Attributes – Writing

- The reliability values for the tests at all grade levels are at or above the minimally acceptable value of 0.85.
- The average difficulty of the items is in the appropriate range for a criterion-referenced test (approximately 0.6).
- The measures of item fit to the latent trait model are in the appropriate ranges (approximately 1.0).

Areas for Concern – Writing

- The overall test distributions of writing scores become increasingly negatively skewed between grades 3 and 8, with distributions in grades 6, 7, and especially 8 showing evidence for a ceiling effect on the scores. Further evidence that the writing component is “easier” for middle school students than for elementary school students is that the mean raw score of eighth grade students is approximately five points higher than the mean raw score of third grade students. The differences in performance across the grades may reflect differential performance of students at different grade levels (e.g., eighth-grade students as a group are performing higher compared to the eighth grade academic standards than third-grade students are performing compared to their grade-level academic standards). However, the differences may also be attributable to differences across the grades in interpretation of the scoring rubric and selection of “anchor papers” to guide the scoring of the open-ended writing prompt. The suggestion that there may be differences in the scoring expectations is based on comparisons of the performance on each of the dimensions of writing scores for third- and eighth-grade students. For example, eight percent of third grade students scored a “4” (the maximum score) on the dimension “Content Development,” compared to eighteen percent of eighth grade students. Comparisons of the percentages of students scoring a maximum score on the other dimensions included:

Organization, four percent of third graders compared to fifteen percent of eighth graders;
Voice, eleven percent of third graders compared to twenty-six percent of eighth graders;
Conventions, eight percent of third graders compared to thirty-four percent of eighth graders.

Over time, as instruction and performance improve, the ceiling effect observed in the middle school grades, especially in grade eight, will negatively affect the ability to accurately differentiate the relative levels of performance among higher-performing students and the ability to measure growth from year to year by higher-performing students.

- A total of fourteen items across grades 3, 5, 6, and 8 had difficulty values (p values) below the criterion of p greater than or equal to 0.3, indicating that students are scoring below chance on the items and the items may be too difficult to provide useful information.
- A total of thirty-six items across grades 3, 4, 5, 6, 7, and 8 were flagged because their item discrimination values were below the minimal criterion (0.2), indicating a tendency for overall higher-scoring students to get an easy item wrong and/or for overall lower-scoring students to get a difficult item right, contrary to the expected patterns of performance. Items having poor discrimination values tend to decrease the overall reliability of a test.
- A total of sixteen items across grades 3, 4, 5, 6, 7, and 8 were flagged because their DIF values exceeded the maximum value for the criterion, indicating potential bias for or against specific demographic groups.

Recommendations – Writing

1. The shift upward in the distributions of scores across grades three through eight should be examined carefully to ameliorate the ceiling effect observed in the middle grades, especially in grade eight. The review should include reviewing the prompts, scoring rubrics, and the anchor papers and scoring guidelines for the extended writing component of the tests.
2. Remove or revise items flagged for poor discrimination to increase the overall reliability of the test.
3. Review and revise or remove the exceptionally difficult items observed in grades 3, 5, 6, and 8.
4. Review all items flagged for DIF to ensure that these items are not biased for or against males or females, or African American or White students.

PASS Mathematics Test (Table 19)

Positive Attributes – Mathematics

- The reliability values for the tests at all grade levels are well above the minimally acceptable value of 0.85.
- The average difficulty of the items is in the appropriate range for a criterion-referenced test (approximately 0.6) in all grades but grade 8.
- The measures of item fit to the latent trait model are in the appropriate ranges (approximately 1.0).

Areas for Concern – Mathematics

- While the distributions of scores in grades three through six appear to support the measurement of differentiated levels of performance, in grade seven and

especially in grade eight the distributions become positively skewed, suggesting that the test is becoming too difficult in grade eight to accurately measure different levels of performance among lower-performing students. The grade eight test shows evidence of a “floor effect,” in which there are not enough items with an appropriately low difficulty to accurately discriminate differential performance among students performing at the lowest levels. This conclusion that the test may be too difficult is also supported by the observation that the average difficulty of the grade eight test items is approximately 0.5, a value which is lower than the general expectation for the average difficulty of a criterion-referenced test of 0.6. The lower performance of eighth graders on the test may also reflect the effects of a cumulative deficit among the lowest-performing students who have not adequately learned the skills and knowledge from earlier grade levels necessary to perform well in eighth grade mathematics.

- A total of seven items across grades 3, 4, 7, and 8 had difficulty values (p values) below the criterion of p greater than or equal to 0.3, indicating that students are scoring at or below chance on the items and the items may be too difficult to provide useful information. One item each in grades 5 and 6 was flagged because of a difficulty value of 1.0, indicating all students got the item right. However, these items had flaws detected prior to scoring of the tests and all student responses to the items were counted as correct, resulting in a spurious value for the item difficulty in the files provided for review.
- A total of fifteen items across grades 3, 4, 5, 6, 7, and 8 were flagged because their item discrimination values were below the minimal criterion (0.2), indicating a tendency for overall higher-scoring students to get an easy item wrong and/or for overall lower-scoring students to get a difficult item right, contrary to the expected patterns of performance. Items having poor discrimination values tend to decrease the overall reliability of a test.
- A total of five items across grades 3, 5, and 8 were flagged because their DIF values exceeded the maximum value for the criterion, indicating potential bias for or against specific demographic groups.

Recommendations – Mathematics

1. Include less difficult items in future grade 8 tests to ameliorate the floor effect observed with the 2009 test and to increase the ability to differentiate levels of achievement among lower-performing students. This can be accomplished by adding less difficult items to the tests (either by replacing easier items or by adding additional items).
2. Remove or revise items flagged for poor discrimination to increase the overall reliability of the test.
3. Review and revise or remove the exceptionally difficult items observed in grades 3, 4, 7, and 8 and the two flawed items in grades 5 and 6.
4. Review all items flagged for DIF to ensure that these items are not biased for or against males or females, or African American or White students.

PASS Science Test (Table 20)

Positive Attributes – Science

- The reliability values for the tests at all grade levels but grade 4 are at or above the minimally acceptable value of 0.85.
- The average difficulty of the items is in the appropriate range for a criterion-referenced test (approximately 0.6) in all grades.

- The measures of item fit to the latent trait model are in the appropriate ranges (approximately 1.0).

Areas for Concern – Science

- The reliability of the grade 4 science test is marginal and needs to be increased in future versions of the test. Increasing the diversity of difficulty values on the test (two-thirds of the items on the 2009 test had difficulty values in the narrow range between 0.6 and 0.8) may help to increase the test reliability.
- A total of three items in grades 3 and 5 had difficulty values (p values) below the criterion of p greater than or equal to 0.3, indicating that students are scoring at or below chance on the items and the items may be too difficult to provide useful information.
- A total of twenty-nine items across grades 3, 4, 5, 6, 7, and 8 were flagged because their item discrimination values were below the minimal criterion (0.2), indicating a tendency for overall higher-scoring students to get an easy item wrong and/or for overall lower-scoring students to get a difficult item right, contrary to the expected patterns of performance. Items having poor discrimination values tend to decrease the overall reliability of a test.
- One item each in grades 5 and 6 was flagged because their DIF values exceeded the maximum value for the criterion, indicating potential bias for or against specific demographic groups.

Recommendations – Science

1. Increase the reliability of the grade 4 science test by spreading out the range of difficulty of the items and by removing or revising items showing poor discrimination values.
2. Review and revise or remove the exceptionally difficult items observed in grades 3 and 5.
3. Review all items flagged for DIF to ensure that these items are not biased for or against males or females, or African American or White students.

PASS Social Studies Test (Table 21)

Positive Attributes – Social Studies

- The reliability values for the tests at all grade levels are well above the minimally acceptable value of 0.85.
- The measures of item fit to the latent trait model are in the appropriate ranges (approximately 1.0).

Areas for Concern – Social Studies

- The average difficulties of the social studies tests, which range from a low of 0.52 in grade 8 to a high of 0.58 in grades 3 and 5, are somewhat below the range preferred for a criterion-referenced test. The grade 8 test is the hardest and is of greatest concern. The difficulty of the tests may reflect the rather broad range of standards and indicators in the social studies academic standards. The large amount of subject matter to be covered in the academic standards may not be fully taught, resulting in lower performance on the assessments.
- A total of four items across grades 3, 4, 6, and 8 had difficulty values (p values) below the criterion of p greater than or equal to 0.3, indicating that students are scoring at or below chance on the items and the items may be too difficult to provide useful information.

- A total of thirty-four items across grades 3, 4, 5, 6, 7, and 8 were flagged because their item discrimination values were below the minimal criterion (0.2), indicating a tendency for overall higher-scoring students to get an easy item wrong and/or for overall lower-scoring students to get a difficult item right, contrary to the expected patterns of performance. Items having poor discrimination values tend to decrease the overall reliability of a test.
- One item each in grades 6 and 8 was flagged because their DIF values exceeded the maximum value for the criterion, indicating potential bias for or against specific demographic groups.

Recommendations – Social Studies

1. Examine the overall difficulties of the social studies tests, especially in grade 8, to identify measures to improve the distribution of difficulties to be more in line with the expectations for criterion-referenced tests (average p value of 0.6). In the examination process, attention should be directed toward evaluating the breadth of the academic social studies standards and the methodology for the selection of items representing the standards and indicators tested. The latter is important to ensure that a range of indicators in each standard is assessed each year. If only one or two indicators in a standard are assessed then the results will be more dependent on whether those specific indicators have been taught than on whether all of the indicators in a standard were taught.
2. Remove or revise items flagged for poor discrimination to increase the overall reliability of the test.
3. Review and revise or remove the exceptionally difficult items observed in grades 3, 4, 6, and 8.
4. Review all items flagged for DIF to ensure that these items are not biased for or against males or females, or African American or White students.

Table 17

2009 PASS Reading & Research Test Item and Test Statistics

Grade Level of Test	Number of Items Tested	Number of Students Tested	Mean Raw Score	Standard Deviation of Raw Scores	Reliability (KR ₂₀)	Ranges of Values for Item Statistics		Numbers of Items Flagged for Extreme Statistical Values		
						Item Difficulty (p value)	Item Discrimination (r _{pb})	Item Difficulty (p value)	Item Discrimination (r _{pb})	Ethnic or Gender DIF
3	36	54756	21.2	6.9	0.86	0.25-0.91	0.11-0.52	2	3	1
4	36	53178	24.5	7.1	0.88	0.39-0.92	0.20-0.55	0	0	1
5	38	52401	25.1	6.5	0.85	0.21-0.93	0.06-0.48	1	3	0
6	40	51769	26.3	7.1	0.86	0.30-0.92	0.16-0.53	0	4	0
7	45	51578	29.9	8.4	0.89	0.41-0.93	0.14-0.57	0	2	0
8	50	51920	31.9	8.5	0.88	0.14-0.92	0.04-0.52	2	4	4

* Flag criteria: p value less than 0.3 or greater than 0.95; discrimination value less than 0.2; DIF (Differential Item Functioning) flagged C+ or C-

Table 18

2009 PASS Writing Test Item and Test Statistics

Grade Level of Test	Number of Items Tested	Number of Students Tested	Mean Raw Score	Standard Deviation of Raw Scores	Reliability (KR ₂₀)	Ranges of Values for Item Statistics		Numbers of Items Flagged for Extreme Statistical Values		
						Item Difficulty (p value)	Item Discrimination (r _{pb})	Item Difficulty (p value)	Item Discrimination (r _{pb})	Ethnic or Gender DIF
3	55	54414	33.3	9.3	0.86	0.17-0.89	-0.09-0.80	5	7	2
4	55	52875	36.5	8.6	0.87	0.32-0.83	0.11-0.74	0	3	3
5	55	52176	35.95	8.3	0.85	0.17-0.89	0.04-0.77	4	9	3
6	55	51591	36.9	9.2	0.87	0.23-0.89	0.06-0.81	2	3	4
7	55	51471	37.9	9.1	0.87	0.34-0.79	0.09-0.78	0	6	2
8	55	51832	38.8	8.1	0.84	0.09-0.92	-0.09-0.77	3	8	2

* Flag criteria: p value less than 0.3 or greater than 0.95; discrimination value less than 0.2; DIF (Differential Item Functioning) flagged C+ or C-

Table 19

2009 PASS Mathematics Test Item and Test Statistics

Grade Level of Test	Number of Items Tested	Number of Students Tested	Mean Raw Score	Standard Deviation of Raw Scores	Reliability (KR ₂₀)	Ranges of Values for Item Statistics		Numbers of Items Flagged for Extreme Statistical Values*		
						Item Difficulty (p value)	Item Discrimination (r _{pb})	Item Difficulty (p value)	Item Discrimination (r _{pb})	Ethnic or Gender DIF
3	50	54825	31.7	9.3	0.9	0.28-0.87	0.14-0.55	2	3	1
4	56	53241	34.1	10.6	0.91	0.23-0.83	0.14-0.53	2	2	0
5	56	52450	32.2	10.5	0.91	0.31-1.0	-0.12-0.58	1	2	1
6	61	51819	36.1	11.9	0.92	0.30-1.0	0.11-0.56	1	3	0
7	61	51636	33.7	11.4	0.91	0.25-0.82	0.11-0.50	1	2	0
8	63	51988	32	12.7	0.92	0.25-0.75	0.06-0.57	2	3	3

* Flag criteria: p value less than 0.3 or greater than 0.95; discrimination value less than 0.2; DIF (Differential Item Functioning) flagged C+ or C-

Table 20

2009 PASS Science Test Item and Test Statistics

Grade Level of Test	Number of Items Tested	Number of Students Tested	Mean Raw Score	Standard Deviation of Raw Scores	Reliability (KR ₂₀)	Ranges of Values for Item Statistics		Numbers of Items Flagged for Extreme Statistical Values		
						Item Difficulty (p value)	Item Discrimination (r _{pb})	Item Difficulty (p value)	Item Discrimination (r _{pb})	Ethnic or Gender DIF
3	45	27612	27.3	7.6	0.85	0.26-0.91	0.04-0.49	1	5	0
4	45	53235	29.1	8	0.8**	0.31-0.89	0.17-0.44	0	1	0
5	50	26349	28.5	8.1	0.85	0.28-0.85	-0.05-0.52	2	9	1
6	55	25990	33.2	10	0.9	0.34-0.89	0.1-0.52	0	3	1
7	55	51604	33.2	9.7	0.89	0.36-0.83	0.01-0.51	0	3	0
8	60	26089	35.1	10.8	0.9	0.30-0.82	-0.009-0.54	0	8	0

* Flag criteria: p value less than 0.3 or greater than 0.95; discrimination value less than 0.2; DIF (Differential Item Functioning) flagged C+ or C-

** Reliability below minimal guideline of 0.85

Table 21

2009 PASS Social Studies Test Item and Test Statistics

Grade Level of Test	Number of Items Tested	Number of Students Tested	Mean Raw Score	Standard Deviation of Raw Scores	Reliability (KR ₂₀)	Ranges of Values for Item Statistics		Numbers of Items Flagged for Extreme Statistical Values		
						Item Difficulty (p value)	Item Discrimination (r _{pb})	Item Difficulty (p value)	Item Discrimination (r _{pb})	Ethnic or Gender DIF
3	45	27351	26.2	8.7	0.89	0.29-0.88	0.10-0.49	1	3	0
4	50	53187	27.3	9.3	0.88	0.27-0.80	0.16-0.51	1	3	0
5	50	26188	28.9	9.1	0.88	0.35-0.86	-0.01-0.51	0	5	0
6	55	25925	29.7	9.9	0.88	0.24-0.77	0.07-0.52	1	5	1
7	60	51538	32.2	11.9	0.91	0.33-0.79	0.11-0.54	0	5	0
8	60	25988	31	10.2	0.88	0.27-0.79	0.02-0.50	1	13	1

*Flag criteria: p value less than 0.3 or greater than 0.95; discrimination value less than 0.2; DIF (Differential Item Functioning) flagged C+ or C-

References Cited

American Educational Research Association (2003). "Standards and Tests: Keeping Them Aligned," *Research Points: Essential Information for Education Policy*, Vol. 1, No. 1, Spring 2003.

Anderson, L. W., & Krathwohl, D. R. (2001). *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Educational Objectives*. Boston: Allyn and Bacon.

Council of Chief State School Officers (2002). *Models for Alignment Analysis and Assistance to States*, Washington, DC: Council of Chief State School Officers.

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

Webb, N. L. (April 2002). "An Analysis of the Alignment Between Mathematics Standards and Assessments for Three States." Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Webb, N. L., Horton, M., & O'Neal, S. (April 2002). "An Analysis of the Alignment Between Language Arts Standards and Assessments for Four States." Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

APPENDIX A

Test Blueprints for Reading & Research, Writing, Mathematics, Science & Social Studies

**Palmetto Assessment of State Standards (PASS)
English Language Arts (ELA) Test Blueprint for Grades 3-8**

The PASS ELA tests measure the 2008 *South Carolina Academic Standards for English Language Arts* in grades three through eight. At each grade level, four broad standards are assessed.

Standard 1 (Literary Text)	Standard 2 (Informational Text)
Standard 3 (Vocabulary)	Standard 6 (Research)

Test items are distributed according to this table.

Grade	Total Number of Items	Standard	Item Number Ranges per Standard
3	36	1	8-12
		2	8-11
		3	8-9
		6	8-10
4	36	1	8-12
		2	8-11
		3	8-9
		6	8-10
5	38	1	8-14
		2	8-12
		3	8-9
		6	8-10
6	40	1	10-15
		2	9-12
		3	8-10
		6	8-10
7	45	1	12-18
		2	9-14
		3	8-10
		6	8-12
8	50	1	12-18
		2	10-16
		3	8-10
		6	10-14

NOTE: Because of embedded field test items and/or vertical linking items, the tests for 2009 will contain 6 to 12 more total items than specified in the blueprint. These items are for test development and research purposes only and will NOT be included in the calculation of student scores.

**Palmetto Assessment of State Standards (PASS)
Writing Test Blueprint for Grades 3-8**

The PASS writing tests measure the 2008 *South Carolina Academic Standards for English Language Arts* in writing for grades three through eight. Each grade level will have one extended-response item and 25 multiple-choice items which assess the writing domains of content and development, organization, voice, and conventions.

The table indicates the range of points and items for the four domains.

Domain	Possible Points Extended Response	Possible Points Multiple-Choice Items
Content/Development	1-4	5-8
Organization	1-4	5-8
Voice	1-3	5-8
Conventions	1-4	5-8

The extended-response item is scored using the 15 point rubric. The score will be weighted x 2.

NOTE: Because of embedded field test items and/or vertical linking items, the tests for 2009 will contain 6 to 12 more total items than specified in the blueprint. These items are for test development and research purposes only and will NOT be included in the calculation of student scores.

**Palmetto Assessment of State Standards (PASS)
Mathematics Test Blueprint for Grades 3–8**

The PASS mathematics tests measure the 2007 *South Carolina Academic Standards for Mathematics* in grades three through eight.

At each grade level, five broad standards are assessed—number and operations, algebra, geometry, measurement, and data analysis and probability. The items are distributed according to this table.

Grade	Total No. of Items	Standard	Items per Standard
3	50	Number and Operations	13-15
		Algebra	8-10
		Geometry	8-10
		Measurement	8-10
		Data Analysis and Probability	8-10
4	56	Number and Operations	12-14
		Algebra	9-11
		Geometry	9-11
		Measurement	12-14
		Data Analysis and Probability	9-11
5	56	Number and Operations	12-14
		Algebra	9-11
		Geometry	9-11
		Measurement	12-14
		Data Analysis and Probability	9-11
6	61	Number and Operations	12-15
		Algebra	12-12
		Geometry	13-15
		Measurement	10-12
		Data Analysis and Probability	10-12
7	61	Number and Operations	13-15
		Algebra	10-12
		Geometry	13-15
		Measurement	10-12
		Data Analysis and Probability	10-12
8	63	Number and Operations	11-13
		Algebra	17-19
		Geometry	8-10
		Measurement	11-13
		Data Analysis and Probability	11-13

NOTE: Because of embedded field test items and/or vertical linking items, the tests for 2009 will contain 6 to 12 more total items than specified in the blueprint. These items are for test development and research purposes only and will NOT be included in the calculation of student scores.

**Palmetto Assessment of State Standards (PASS)
Science Test Blueprint for Grades 3-8**

The Pass science tests measure the 2005 *South Carolina Science Academic Standards* in grades three through eight.

There are five to six broad standards at each grade level. Each standard is followed by detailed indicators. The test items will be aligned to the broad standards, guided by the scope of the detailed indicators for each standard.

All test items are 1-point, three- or four-option, multiple-choice questions. The items are distributed approximately evenly across the standards. The items are distributed according to this table:

Grade	Number of Standards	Number of Items	Items per Standard
3	5	45	8-10
4	5	45	8-11
5	5	50	8-11
6	5	55	9-12
7	5	55	9-12
8	6	60	9-12

NOTE: Because of embedded field test items and/or vertical linking items, the tests for 2009 will contain 6 to 12 more total items than specified in the blueprint. These items are for test development and research purposes only and will NOT be included in the calculation of student scores.

**Palmetto Assessment of State Standards (PASS)
Social Studies Test Blueprint for Grades 3–8**

The PASS social studies tests measure the 2005 *South Carolina Social Studies Academic Standards* in grades three through eight.

There are five to seven broad standards at each grade level. Each standard is followed by detailed indicators. The test items will be aligned to the broad standards, guided by the scope of the detailed indicators for each standard.

All test items are 1-point, four-option, multiple-choice questions. The third grade test has 45 questions; tests for the remaining grades increase in length corresponding to the number of standards.

The items are distributed approximately evenly across the standards, according to this table:

Grade	Number of Standards	Number of Items	Items per Standard
3	5	45	8-10
4	6	50	8-10
5	6	50	8-10
6	6	55	8-12
7	7	60	8-12
8	7	60	8-12

NOTE: Because of embedded field test items and/or vertical linking items, the tests for 2009 will contain 6 to 12 more total items than specified in the blueprint. These items are for test development and research purposes only and will NOT be included in the calculation of student scores.

APPENDIX B

PASS Alignment Review Members by Subject

Alignment Review Selection, January 16-17, 2009

English language arts	Laurie Frazier	Aiken
	Celeste Walton	Aiken
	Claire Mundy	Anderson 1
	Delisa McCall	Anderson 3
	Summer Morrell	Anderson 4
	Monica Addison	Bamberg 2
	Sally Merritt	Beaufort
	Laura Garner	Berkeley
	Victoria Rusnock	Charleston
	Elizabeth Brittain	Cherokee
	Sharon Davis	Clarendon 2
	Kathi Campbell	Dillon 2
	Lisa Cuthbert	Dorchester 2
	Eva Burrows	Florence 5
	Lynn Turner	Georgetown
	Chinon Conder	Hampton 1
	Jean Burden	Horry
	Judi Inabinet	Horry
	Robyn Magdic	Laurens 56
	Erica Bissell	Lexington 1
	Betsy McEwen	Lexington 3
	Sharon Kotula	Lexington 5
	Franklyn McInnis	Marion 2
	Sylvia Spearman	McCormick
	Janna Richardson	Newberry
	Cheryl Peden	Oconee
	Rebecca Page	Pickens
	Ginny Morris	Richland 1
	James Spaulding	SC Public Charter Schools
	Margaret Walker	SCDJJ
	Belinda Snow	Spartanburg 5
	Anna Doyle	Spartanburg 6
	Maria Stukes	Sumter 2
	Barbara Fewell	York 3
	Brian Day	Calhoun
	Tom Roe	Greenville
Jenny Howard	SCDE, Office of Assessment	
Mathematics	Stacy Brooks	Anderson 1
	Deidre Green	Anderson 4
	Emma Caldwell	Barnwell 19
	Adrienne Chisolm	Beaufort
	Vickie Breauchy	Berkeley
	Jonetta Gregory	Charleston
	Natasha Jones	Charleston
	Debbie Alexander	Cherokee
	Sandy Perkins	Chesterfield
	Patricia Buckman	Clarendon 1
Beth Herring	Darlington	
Jenny Singletary	Dorchester 2	

Science

Paula Huggins	Dorchester 4
Donna Cook	Florence 1
Mary Howard	Florence 3
Dottie Powell	Florence 5
Elissa Blosser	Horry
Kathryn Watkins	Kershaw
Robin Jewett	Lancaster
Jeanne Spencer	Laurens 56
Rosa McPhail	Lee
Ryacus Dean	Lexington 5
Candice Brucke	Oconee
Graylyn Gaines	Orangeburg 3
Pam Jumper	Orangeburg 5
Linda Coulter	Richland 1
Courtney Randle	Richland 2
Katie Leonard	Spartanburg 2
Ingrid Anderson	Spartanburg 5
Mark Easterling	Williamsburg
Michelle Quick	York 1
Tina Edge	Dillon 1
Cathy Hale	Greenville
Jane Allen	Lexington 2
Jill Winland	Lexington 4
Kay Owens	York 3
Harriett Prichard	SCDE, Office of Assessment
Devada Kimsey	Abbeville
Karey Santos	Aiken
Robin Ritland	Anderson 2
Carolyn Cromer	Anderson 5
Amy Hawkins	Anderson 5
Amber Koonce	Berkeley
Grace Furnum	Calhoun
Deborah Belflower	Charleston
Deborah Hamrick	Cherokee
Tiffany Lemon	Clarendon 2
Dawn McChesney	Darlington
LaShonda Williams	Dorchester 4
Susan Rhodes	Florence 1
Mirandi Squires	Florence 5
Derenda Marshall	Georgetown
Lynn Talton	Greenville
Jean McCall	Greenwood 51
Annette Leshner	Kershaw
Heather Gresham	Lexington 1
Gayle Hinton	Lexington 2
Mina Brooks	Newberry
Brandon Shook	Newberry
Lisa Benton	Orangeburg 5
Paula Grant	Pickens
Colette Dryden	Richland 1
James Westmoreland	Richland 2

	Barbara Littlejohn	Spartanburg 2
	Heidi Beers	Spartanburg 3
	Stacey Cabaniss	Spartanburg 6
	Paulette Hipps	Sumter 17
	David Norton	York 3
	Lois Lewis	Beaufort
	Jane Kolb	Dorchester 2
	Kim Garnet	Horry
	Tonda Vial	Laurens 55
	Amy Buki	Spartanburg 7
Social Studies	Linda Geddings	SCDE, Office of Assessment
	Christine Liner	Aiken
	Iris Aschenbrand	Anderson 1
	Terri Ivester	Anderson 2
	Debbie Melton	Barnwell 29
	Mendy Gannon	Beaufort
	Elizabeth Reidenbach	Charleston
	Braber Spell	Chesterfield
	Sharon Livingston	Clarendon 1
	Celeste McElveen	Clarendon 3
	Downing Hudson	Georgetown
	Paula Burgess	Greenville
	Merinda Luse	Horry
	Cathy Peake	Kershaw
	Tesa Jaques	Lexington 1
	Perri Bryant	Lexington 3
	Vicki Huffman	McCormick
	Tracee Simpson	Pickens
	Mary Bostic	Richland 1
	Corinne Jimenez	Richland 2
	Barbara Hairfield	SCSSC
	Arleen Newett	Spartanburg 7
	Olivia Ortmann	Sumter 17
	Brian Griffith	Sumter 2
	Jill Rogers	Darlington
	Kim Taylor	Lexington 5
	Leslie Skinner	SCDE, Office of Assessment
Writing	Joseph Powell	Aiken
	Cathy Delaney	Berkeley
	Annette Gasden	Charleston
	Pam James	Florence 1
	Debbie Barron	Greenville
	Brandy Caroway	Lancaster
	Dana Williams	Orangeburg 5
	Heather Bass	Richland 2
	Lana O'Shields	Spartanburg 1
	Shirley Salters-Keels	Williamsburg
	Mildred Rowland	York 1
	Lori Clarke	Lexington 2
	Judy Shillinglaw	SCDE, Office of Assessment

Other SCDE Staff

Amelia Brailsford

Coordinator of Development,
Office of Assessment

EOC Staff

Jo Anne Anderson
Melanie Barton

Executive Director
Director of Policy Development
& Evaluation

Katrina Greene
Paul Horne
David Potter
Dana Yow

Director of Evaluation
Director of Curriculum & Program Review
Director of Research
Director of Public Engagement
& Communications

APPENDIX C

Tables of Alignment to Standards and Indicators Results

**Table C-1 Reading and Research
2009 PASS Reading and Research Alignment to Standards and Indicators
Grade 3**

Reading & Research Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
3-1.1	26		0.192593			
3-1.2	53		0.392593			
3-1.3	4		0.02963			
3-1.4	16		0.118519			
3-1.5	13		0.096296			
3-1.6	3		0.022222			
3-1.7	0					
3-1.8	5		0.037037			
3-1.9	5		0.037037			
3-1.10	10		0.074074			
3-1.11	0	135		0.62963	weak	yes
3-2.1	14		0.186667			
3-2.2	33		0.44			
3-2.3	12		0.16			
3-2.4	0					
3-2.5	0					
3-2.6	4		0.053333			
3-2.7	5		0.066667			
3-2.8	7		0.093333			
3-2.9	0	75		0.706667	yes	yes
3-3.1	33		0.532258			
3-3.2	5		0.080645			
3-3.3	4		0.064516			
3-3.4	0					
3-3.5	20		0.322581			
3-3.6	0					
3-3.7	0	62		0.645161	weak	yes
3-6.1	7		0.291667			
3-6.2	9		0.375			
3-6.3	6		0.25			
3-6.4	0					
3-6.5	2		0.083333			
3-6.6	0					
3-6.7	0	24		0.833333	yes	yes
Total	296	296				

No Standard Identified or Standards from Other Grades Identified	Number Items
None	2
2-1.5	1
2-3.2	1
Total	4

**Table C-2 Reading and Research
2009 PASS Reading and Research Alignment to Standards and Indicators
Grade 4**

Reading & Research Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
4-1.1	33		0.172775			
4-1.2	63		0.329843			
4-1.3	5		0.026178			
4-1.4	21		0.109948			
4-1.5	19		0.099476			
4-1.6	19		0.099476			
4-1.7	1		0.005236			
4-1.8	8		0.041885			
4-1.9	11		0.057592			
4-1.10	11		0.057592			
4-1.11	0	191		0.687435	weak	yes
4-2.1	33		0.25			
4-2.2	33		0.25			
4-2.3	20		0.151515			
4-2.4	1		0.007576			
4-2.5	1		0.007576			
4-2.6	15		0.113636			
4-2.7	15		0.113636			
4-2.8	14		0.106061			
4-2.9	0	132		0.723485	yes	yes
4-3.1	31		0.72093			
4-3.2	1		0.023256			
4-3.3	11		0.255814			
4-3.4	0	43		0.612403	weak	yes
4-6.1	7		0.125			
4-6.2	24		0.428571			
4-6.3	19		0.339286			
4-6.4	1		0.017857			
4-6.5	0					
4-6.6	5		0.089286			
4-6.7	0					
4-6.8	0	56		0.632143	weak	yes
Total	422					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	26
3-3.5	3
Total	29

**Table C-3 Reading and Research
2009 PASS Reading and Research Alignment to Standards and Indicators
Grade 5**

Reading & Research Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
5-1.1	40		0.298507			
5-1.2	7		0.052239			
5-1.3	14		0.104478			
5-1.4	22		0.164179			
5-1.5	21		0.156716			
5-1.6	13		0.097015			
5-1.7	0					
5-1.8	4		0.029851			
5-1.9	8		0.059701			
5-1.10	5		0.037313			
5-1.11	0	134		0.71393	yes	yes
5-2.1	10		0.147059			
5-2.2	33		0.485294			
5-2.3	7		0.102941			
5-2.4	0					
5-2.5	4		0.058824			
5-2.6	6		0.088235			
5-2.7	8		0.117647			
5-2.8	0					
5-2.9	0	68		0.681373	weak	yes
5-3.1	36		0.72			
5-3.2	6		0.12			
5-3.3	8		0.16			
5-3.4	0	50		0.613333	weak	yes
5-4.1	0					
5-4.2	0					
5-4.3	1					
5-4.4	0					
5-4.5	1					
5-4.6	0	N/A				
5-5.1	0					
5-5.2	0					
5-5.3	0					
5-5.4	0	N/A				
5-6.1	4		0.117647			
5-6.2	18		0.529412			
5-6.3	6		0.176471			
5-6.4	1		0.029412			
5-6.5	0					
5-6.6	5		0.147059			
5-6.7	0					

Reading & Research Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
5-6.8	0					
5-6.9	0	34		0.670588	weak	yes
Total	288					

N/A: Writing Standard

No Standard Identified or Standards from Other Grades Identified	Number Items
None	5
3-3.5	5
4-1.5	7
4-1.8	2
4-2.3	7
7-1.6	1
8-2.5	1
Total	28

**Table C-4 Reading and Research
2009 PASS Reading and Research Alignment to Standards and Indicators
Grade 6**

Reading & Research Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
6-1.1	70		0.411765			
6-1.2	11		0.064706			
6-1.3	28		0.164706			
6-1.4	17		0.1			
6-1.5	16		0.094118			
6-1.6	8		0.047059			
6-1.7	0					
6-1.8	12		0.070588			
6-1.9	4		0.023529			
6-1.10	4		0.023529			
6-1.11	0	170		0.645752	weak	yes
6-2.1	29		0.266055			
6-2.2	35		0.321101			
6-2.3	8		0.073394			
6-2.4	0					
6-2.5	8		0.073394			
6-2.6	11		0.100917			
6-2.7	10		0.091743			
6-2.8	4		0.036697			
6-2.9	4		0.036697			
6-2.10	0	109		0.662844	weak	yes
6-3.1	53		0.757143			
6-3.2	6		0.085714			
6-3.3	9		0.128571			
6-3.4	2		0.028571			
6-3.5	0	70		0.492857	no	yes
6-4.1	0					
6-4.2	0					
6-4.3	0					
6-4.4	2					
6-4.5	0					
6-4.6	0					
6-4.7	0	N/A				
6-5.1	0					
6-5.2	0					
6-5.3	0					
6-5.4	0	N/A				
6-6.1	6		0.139535			
6-6.2	4		0.093023			
6-6.3	0					

Reading & Research Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
6-6.4	0					
6-6.5	0					
6-6.6	0					
6-6.7	22		0.511628			
6-6.8	11		0.255814	0.732558	yes	yes
Total	394					

N/A: Writing Standard

No Standard Identified or Standards from Other Grades Identified	Number Items
None	44
1-1.3	1
3-3.5	3
4-1.1	5
4-2.1	2
5-2.7	1
5-6.2	4
7-1.6	1
Total	61

**Table C-5 Reading and Research
2009 PASS Reading and Research Alignment to Standards and Indicators
Grade 7**

Reading & Research Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
7-1.1	61		0.535088			
7-1.2	7		0.061404			
7-1.3	8		0.070175			
7-1.4	10		0.087719			
7-1.5	21		0.184211			
7-1.6	7		0.061404			
7-1.7	0					
7-1.8	0					
7-1.9	0	114		0.614035	weak	yes
7-2.1	18		0.206897			
7-2.2	36		0.413793			
7-2.3	10		0.114943			
7-2.4	0					
7-2.5	0					
7-2.6	16		0.183908			
7-2.7	7		0.08046			yes
7-2.8	0	87		0.77931	yes	
7-3.1	45		0.714286			
7-3.2	3		0.047619			
7-3.3	11		0.174603			
7-3.4	4		0.063492			
7-3.5	0	63		0.535714	no	yes
7-6.1	2		0.058824			
7-6.2	2		0.058824			
7-6.3	6		0.176471			
7-6.4	0					
7-6.5	0					
7-6.6	0					
7-6.7	18		0.529412			
7-6.8	6	34	0.176471			
Total	298			0.670588	weak	yes

No Standard Identified or Standards from Other Grades Identified	Number Items
None	11
4-1.1	1
4-1.8	1
5-1.2	1
5-2.1	1
6-1.2	1
6-1.3	6
6-2.9	1
8-3.2	1
Total	24

**Table C-6 Reading and Research
2009 PASS Reading and Research Alignment to Standards and Indicators
Grade 8**

Reading & Research Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
8-1.1	49		0.360294			
8-1.2	9		0.066176			
8-1.3	25		0.183824			
8-1.4	8		0.058824			
8-1.5	45		0.330882			
8-1.6	0					
8-1.7	0					
8-1.8	0	136		0.708824	yes	yes
8-2.1	14		0.12844			
8-2.2	56		0.513761			
8-2.3	20		0.183486			
8-2.4	2		0.018349			
8-2.5	2		0.018349			
8-2.6	10		0.091743			
8-2.7	5		0.045872			
8-2.8	0	109		0.588467	no	yes
8-3.1	56		0.736842			
8-3.2	2		0.026316			
8-3.3	9		0.118421			
8-3.4	9		0.118421			
8-3.5	0	76		0.513158	no	yes
8-6.1	13		0.270833			
8-6.2	3		0.0625			
8-6.3	0					
8-6.4	0					
8-6.5	4		0.083333			
8-6.6	0					
8-6.7	15		0.3125			
8-6.8	13	48	0.270833	0.745833	yes	yes
Total	369					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	2
2-3.4	1
3-2.3	1
4-2.3	3
5-1.6	2
5-2.1	1
6-1.3	5
6-1.4	1
6-2.8	1
7-1.1	8
7-2.1	6
7-2.2	6
Total	37

**Table C-7 Reading and Research
2009 PASS Writing Alignment to Standards and Indicators
Grade 3**

Writing Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
3-4.1	0					
3-4.2	10		0.076923			
3-4.3	38		0.292308			
3-4.4	7		0.053846			
3-4.5	58		0.446154			
3-4.6	17		0.130769			
3-4.7	0	130		0.661538	weak	yes
3-5.1	4		0.25			
3-5.2	1		0.0625			
3-5.3	11		0.6875			
3-5.4	0	16		0.645833	weak	yes
Total	146					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	2
2-4.3	1
2-5.3	6
4-5.1	4
4-5.3	6
6-4.6	1
6-5.4	6
Total	26

**Table C-8 Reading and Research
2009 PASS Writing Alignment to Standards and Indicators
Grade 4**

Writing Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
4-4.1	0					
4-4.2	17		0.160377			
4-4.3	17		0.160377			
4-4.4	16		0.150943			
4-4.5	37		0.349057			
4-4.6	19	106	0.179245	0.850943	yes	yes
4-5.1	1		0.083333			
4-5.2	3		0.25			
4-5.3	8		0.666667			
4-5.4	0	12		0.666667	weak	yes
Total	118					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	0
2-5.1	1
3-5.1	3
3-5.3	4
5-5.3	4
7-5.2	1
7-5.3	1
7-5.4	3
Total	17

**Table C-9 Reading and Research
2009 PASS Writing Alignment to Standards and Indicators
Grade 5**

Writing Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
5-4.1	0					
5-4.2	4		0.025806			
5-4.3	19		0.122581			
5-4.4	14		0.090323			
5-4.5	93		0.6			
5-4.6	25	155	0.16129	0.6	weak	yes
5-5	5		0.277778			
5-5.1	0					
5-5.2	0					
5-5.3	13		0.722222	0.777778	yes	yes
5-5.4	0	18				
Total	173					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	1
2-4.6	4
3-5	8
4-4.6	3
4-5	7
7-5	6
8-5	3
Total	32

**Table C-10 Reading and Research
2009 PASS Writing Alignment to Standards and Indicators
Grade 6**

Writing Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
6-4.1	0					
6-4.2	6		0.055046			
6-4.3	3		0.027523			
6-4.4	14		0.12844			
6-4.5	64		0.587156			
6-4.6	22		0.201835			
6-4.7	0	109		0.611009	weak	yes
6-5.1	1		0.041667			
6-5.2	4		0.166667			
6-5.3	17		0.708333			
6-5.4	2	24	0.083333	0.541667	no	yes
Total	133					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	6
1-5.3	2
2-4.5	2
3-4.5	5
3-5.1	1
4-4.6	1
4-5.1	2
5-4.6	2
7-5.3	1
Total	22

**Table C-11 Reading and Research
2009 PASS Writing Alignment to Standards and Indicators
Grade 7**

Writing Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
7-4.1	0					
7-4.2	0					
7-4.3	0					
7-4.4	2		0.021505			
7-4.5	78		0.83871			
7-4.6	10		0.107527			
7-4.7	3	93	0.032258	0.41129	no	yes
7-5.1	1		0.03125			
7-5.2	20		0.625			
7-5.3	7		0.21875			
7-5.4	4	32	0.125	0.625	weak	yes
Total	125					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	0
2-4.4	2
3-4.6	2
4-4.4	2
5-4.4	2
5-4.6	3
6-4.1	1
6-4.6	5
Total	17

**Table C-12 Reading and Research
2009 PASS Writing Alignment to Standards and Indicators
Grade 8**

Writing Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
8-4.1	1		0.009091			
8-4.2	0					
8-4.3	0					
8-4.4	0					
8-4.5	71		0.645455			
8-4.6	37		0.336364			
8-4.7	1	110	0.009091	0.518182	no	yes
8-5.1	1		0.03125			
8-5.2	2		0.0625			
8-5.3	27		0.84375			
8-5.4	2	32	0.0625	0.40625	no	yes
Total	142					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	3
3-5.1	3
6-8.4	1
Total	7

**Table C-13 Mathematics
2009 PASS Mathematics Alignment to Standards and Indicators
Grade 3**

Math Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
3-1.1	0	0	NA	NA	NA	NA
3-1.2	0					
3-1.3	0					
3-1.4	0					
3-1.5	0					
3-1.6	0					
3-1.7	0					
3-1.8	0					
3-2.1	5	66	0.075758	0.795455	yes	yes
3-2.2	13		0.19697			
3-2.3	5		0.075758			
3-2.4	9		0.136364			
3-2.5	8		0.121212			
3-2.6	4		0.060606			
3-2.7	4		0.060606			
3-2.8	4		0.060606			
3-2.9	3		0.045455			
3-2.10	4		0.060606			
3-2.11	2		0.030303			
3-2.12	5		0.075758			
3-3.1	5	32	0.15625	0.78125	yes	yes
3-3.2	15		0.46875			
3-3.3	4		0.125			
3-3.4	8		0.25			
3-4.1	6	49	0.122449	0.923469	yes	yes
3-4.2	6		0.122449			
3-4.3	8		0.163265			
3-4.4	5		0.102041			
3-4.5	5		0.102041			
3-4.6	6		0.122449			
3-4.7	5		0.102041			
3-4.8	8		0.163265			
3-5.1	3	31	0.096774	0.861751	yes	yes
3-5.2	6		0.193548			
3-5.3	4		0.129032			
3-5.4	5		0.16129			

Math Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
3-5.5	5		0.16129			
3-5.6	2		0.064516			
3-5.7	6		0.193548			
3-6.1	1	41	0.02439	0.724739	yes	yes
3-6.2	4		0.097561			
3-6.3	17		0.414634			
3-6.4	6		0.146341			
3-6.5	5		0.121951			
3-6.6	3		0.073171			
3-6.7	5		0.121951			
Total	219	219				

No Standard Identified or Standards from Other Grades Identified	Number Items
None	12
K-5.3	1
4-4.3	10
Total	23

**Table C-14 Mathematics
2009 PASS Mathematics Alignment to Standards and Indicators
Grade 4**

Math Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
4-1.1	0					
4-1.2	0					
4-1.3	0					
4-1.4	0					
4-1.5	0					
4-1.6	0					
4-1.7	0					
4-1.8	0	0			NA	NA
4-2.1	2		0.03			
4-2.2	6		0.09			
4-2.3	10		0.14			
4-2.4	2		0.03			
4-2.5	5		0.07			
4-2.6	7		0.10			
4-2.7	11		0.16			
4-2.8	9		0.13			
4-2.9	4		0.06			
4-2.10	6		0.09			
4-2.11	8		0.11			
4-2.12	0	70	0.00	0.81	yes	yes
4-3.1	1		0.02			
4-3.2	9		0.21			
4-3.3	6		0.14			
4-3.4	15		0.35			
4-3.5	7		0.16			
4-3.6	5	43	0.12	0.78	yes	yes
4-4.1	11		0.21			
4-4.2	16		0.30			
4-4.3	4		0.08			
4-4.4	3		0.06			
4-4.5	2		0.04			
4-4.6	3		0.06			
4-4.7	6		0.11			
4-4.8	8	53	0.15	0.71	yes	yes
4-5.1	2		0.06			
4-5.2	4		0.13			

Math Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
4-5.3	9		0.29			
4-5.4	4		0.13			
4-5.5	2		0.06			
4-5.6	3		0.10			
4-5.7	1		0.03			
4-5.8	2		0.06			
4-5.9	4	31	0.13	0.77	yes	yes
4-6.1	3		0.04			
4-6.2	39		0.57			
4-6.3	1		0.01			
4-6.4	7		0.10			
4-6.5	7		0.10			
4-6.6	5		0.07			
4-6.7	7	69	0.10	0.58	no	yes
Total	266					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	15
1-4.5	11
3-2.1	3
3-2.4	2
3-2.5	1
3-2.7	2
3-5.3	1
3-5.4	11
3-5.5	2
5-2.9	1
5-3.4	7
5-5.1	1
Total	57

**Table C-15 Mathematics
2009 PASS Mathematics Alignment to Standards and Indicators
Grade 5**

Math Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
5-1.1	0					
5-1.2	0					
5-1.3	0					
5-1.4	0					
5-1.5	0					
5-1.6	0					
5-1.7	0					
5-1.8	0	0	NA		NA	NA
5-2.1	11		0.152778			
5-2.2	14		0.194444			
5-2.3	10		0.138889			
5-2.4	12		0.166667			
5-2.5	10		0.138889			
5-2.6	4		0.055556			
5-2.7	4		0.055556			
5-2.8	4		0.055556			
5-2.9	3	72	0.041667	0.763889	yes	yes
5-3.1	4		0.105263			
5-3.2	7		0.184211			
5-3.3	18		0.473684			
5-3.4	5		0.131579			
5-3.5	4	38	0.105263	0.726316	yes	yes
5-4.1	2		0.051282			
5-4.2	5		0.128205			
5-4.3	7		0.179487			
5-4.4	6		0.153846			
5-4.5	4	39	0.102564			
5-4.6	15		0.384615	0.769231	yes	yes
5-5.1	3		0.066667			
5-5.2	6		0.133333			
5-5.3	5		0.111111			
5-5.4	15		0.333333			
5-5.5	5		0.111111			

Math Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
5-5.6	4		0.088889			
5-5.7	4		0.088889			
5-5.8	3	45	0.066667	0.783333	yes	yes
5-6.1	6		0.12766			
5-6.2	4		0.085106			
5-6.3	13		0.276596			
5-6.4	12		0.255319			
5-6.5	12		0.255319			
5-6.6	0	47	0	0.812766	yes	yes
Total	241					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	12
3-2.4	4
3-2.5	1
3-2.7	1
3-4.8	1
4-3.1	1
4-3.2	1
4-3.3	3
4-3.4	11
4-5.5	1
4-6.2	2
Total	38

Table C-16 Mathematics
2009 PASS Mathematics Alignment to Standards and Indicators
Grade 6

Math Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
6-1.1	0					
6-1.2	0					
6-1.3	0					
6-1.4	0					
6-1.5	0					
6-1.6	0					
6-1.7	0					
6-1.8	0	0	NA		NA	NA
6-2.1	9		0.163636			
6-2.2	9		0.163636			
6-2.3	5		0.090909			
6-2.4	12		0.218182			
6-2.5	6		0.109091			
6-2.6	2		0.036364			
6-2.7	4		0.072727			
6-2.8	4		0.072727			
6-2.9	4	55	0.072727	0.787879	yes	yes
6-3.1	12		0.20339			
6-3.2	16		0.271186			
6-3.3	20		0.338983			
6-3.4	8		0.135593			
6-3.5	3	59	0.050847	0.786441	yes	yes
6-4.1	7		0.159091			
6-4.2	10		0.227273			
6-4.3	3		0.068182			
6-4.4	0		0			
6-4.5	7		0.159091			
6-4.6	7		0.159091			
6-4.7	4		0.090909			
6-4.8	4		0.090909			
6-4.9	2	44	0.045455	0.795455	yes	yes
6-5.1	7		0.189189			
6-5.2	3		0.081081			
6-5.3	3		0.081081			
6-5.4	6		0.162162			
6-5.5	11		0.297297			

Math Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
6-5.6	2		0.054054			
6-5.7	5	37	0.135135	0.779923	yes	yes
6-6.1	0		0			
6-6.2	16		0.421053			
6-6.3	3		0.078947			
6-6.4	14		0.368421			
6-6.5	5	38	0.131579	0.710526	yes	yes
Total	233					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	0
3-6.1	1
4-2.3	1
5-2.2	1
5-2.7	2
5-5.4	1
7-2.5	1
7-2.8	1
7-4.8	1
7-5.1	2
Total	11

**Table C-17 Mathematics
2009 PASS Mathematics Alignment to Standards and Indicators
Grade 7**

Math Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
7-1.1	0					
7-1.2	0					
7-1.3	0					
7-1.4	0					
7-1.5	0					
7-1.6	0					
7-1.7	0					
7-1.8	0	0	NA		NA	NA
7-2.1	12		0.1			
7-2.2	4		0.033333			
7-2.3	10		0.083333			
7-2.4	4		0.033333			
7-2.5	11		0.091667			
7-2.6	4		0.033333			
7-2.7	19		0.158333			
7-2.8	6		0.05			
7-2.9	44		0.366667			
7-2.10	6	120	0.05	0.675	weak	yes
7-3.1	8		0.170213			
7-3.2	14		0.297872			
7-3.3	3		0.06383			
7-3.4	9		0.191489			
7-3.5	4		0.085106			
7-3.6	5		0.106383			
7-3.7	4	47	0.085106	0.768997	yes	yes
7-4.1	2		0.04878			
7-4.2	3		0.073171			
7-4.3	10		0.243902			
7-4.4	1		0.02439			
7-4.5	9		0.219512			
7-4.6	4		0.097561			
7-4.7	3		0.073171			
7-4.8	4		0.097561			
7-4.9	4		0.097561			
7-4.10	1	41	0.02439	0.736585	yes	yes
7-5.1	19		0.365385			

Math Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
7-5.2	14		0.269231			
7-5.3	3		0.057692			
7-5.4	4		0.076923			
7-5.5	12	52	0.230769	0.734615	yes	yes
7-6.1	4		0.075472			
7-6.2	18		0.339623			
7-6.3	4		0.075472			
7-6.4	6		0.113208			
7-6.5	4		0.075472			
7-6.6	5		0.09434			
7-6.7	9		0.169811			
7-6.8	3	53	0.056604	0.740566	yes	yes
Total	313					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	10
4-4.6	1
4-6.3	4
5-2.5	1
5-4.1	7
6-2.5	1
6-3.3	6
Total	30

**Table C-18 Mathematics
2009 PASS Mathematics Alignment to Standards and Indicators
Grade 8**

Math Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
8-1.1	0					
8-1.2	0					
8-1.3	0					
8-1.4	0					
8-1.5	0					
8-1.6	0					
8-1.7	1					
8-1.8	0	1				
8-2.1	20		0.27027			
8-2.2	2		0.027027			
8-2.3	4		0.054054			
8-2.4	2		0.027027			
8-2.5	4		0.054054			
8-2.6	6		0.081081			
8-2.7	36	74	0.486486	0.528958	no	yes
8-3.1	16		0.285714			
8-3.2	4		0.071429			
8-3.3	2		0.035714			
8-3.4	7		0.125			
8-3.5	11		0.196429			
8-3.6	11		0.196429			
8-3.7	5	56	0.089286	0.75	yes	yes
8-4.1	20		0.465116			
8-4.2	9		0.209302			
8-4.3	8		0.186047			
8-4.4	6	43	0.139535	0.784884	yes	yes
8-5.1	6		0.103448			
8-5.2	12		0.206897			
8-5.3	5		0.086207			
8-5.4	5		0.086207			
8-5.5	8		0.137931			
8-5.6	5		0.086207			
8-5.7	17	58	0.293103	0.785714	yes	yes
8-6.1	9		0.195652			
8-6.2	4		0.086957			
8-6.3	10		0.217391			

Math Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
8-6.4	5		0.108696			
8-6.5	1		0.021739			
8-6.6	5		0.108696			
8-6.7	5		0.108696			
8-6.8	7	46	0.152174	0.809783	yes	yes
Total	278					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	3
5-6.2	2
6-4.7	2
6-6.3	1
7-2.9	6
7-3.4	1
7-4.8	1
7-5.2	4
Total	20

**Table C-19 Science
2009 PASS Science Alignment to Standards and Indicators
Grade 3**

Science Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
3-1.1	7		0.092105			
3-1.2	2		0.026316			
3-1.3	12		0.157895			
3-1.4	0					
3-1.5	13		0.171053			
3-1.6	28		0.368421			
3-1.7	7		0.092105			
3-1.8	7	76	0.092105	0.731203	yes	yes
3-2.1	12		0.139535			
3-2.2	33		0.383721			
3-2.3	16		0.186047			
3-2.4	15		0.174419			
3-2.5	10	86	0.116279	0.816279	yes	yes
3-3.1	13		0.19697			
3-3.2	7		0.106061			
3-3.3	3		0.045455			
3-3.4	8		0.121212			
3-3.5	7		0.106061			
3-3.6	7		0.106061			
3-3.7	14		0.212121			
3-3.8	7	66	0.106061	0.840909	yes	yes
3-4.1	7		0.145833			
3-4.2	22		0.458333			
3-4.3	11	48	0.229167	0.791667	yes	yes
3-4.4	8		0.166667			
3-5.1	8		0.153846			
3-5.2	2		0.038462			
3-5.3	4		0.076923			
3-5.4	4		0.076923			
3-5.5	7		0.134615			
3-5.6	7		0.134615			
3-5.7	3		0.057692			
3-5.8	17	52	0.326923	0.708333	yes	yes
Total	328					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	0
1-1.4	1
2-1.4	1
4-1.6	1
Total	3

**Table C-20 Science
2009 PASS Science Alignment to Standards and Indicators
Grade 4**

Science Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
4-1.1	5		0.069444			
4-1.2	9		0.125			
4-1.3	12		0.166667			
4-1.4	10		0.138889			
4-1.5	5		0.069444			
4-1.6	26		0.361111			
4-1.7	5	72	0.069444	0.757937	yes	yes
4-2.1	17		0.283333			
4-2.2	11		0.183333			
4-2.3	8		0.133333			
4-2.4	7		0.116667			
4-2.5	11		0.183333			
4-2.6	6	60	0.1	0.85	yes	yes
4-3.1	4		0.072727			
4-3.2	11		0.2			
4-3.3	4		0.072727			
4-3.4	8		0.145455			
4-3.5	7		0.127273			
4-3.6	7		0.127273			
4-3.7	6		0.109091			
4-3.8	8	55	0.145455	0.879545	yes	yes
4-4.1	13		0.22807			
4-4.2	10		0.175439			
4-4.3	4		0.070175			
4-4.4	9		0.157895			
4-4.5	14		0.245614			
4-4.6	7	57	0.122807	0.850877	yes	yes
4-5.1	1		0.013889			
4-5.2	5		0.069444			
4-5.3	4		0.055556			
4-5.4	4		0.055556			
4-5.5	9		0.125			
4-5.6	10		0.138889			
4-5.7	9		0.125			
4-5.8	6		0.083333			
4-5.9	16		0.222222			
4-5.10	8	72	0.111111	0.777778	yes	yes
Total	316					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	12
1-1.1	1
2-1.2	1
3-1.2	1
3-1.3	1
3-1.5	1
3-2.1	1
3-3.7	1
5-1.2	1
5-1.6	2
6-4.6	1
Total	23

**Table C-21 Science
2009 PASS Science Alignment to Standards and Indicators
Grade 5**

Science Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
5-1.1	5		0.104167			
5-1.2	15		0.3125			
5-1.3	2		0.041667			
5-1.4	2		0.041667			
5-1.5	2		0.041667			
5-1.6	7		0.145833			
5-1.7	6		0.125			
5-1.8	9	48	0.1875	0.729167	yes	yes
5-2.1	4		0.061538			
5-2.2	17		0.261538			
5-2.3	9		0.138462			
5-2.4	24		0.369231			
5-2.5	11	65	0.169231	0.769231	yes	yes
5-3.1	27		0.369863			
5-3.2	6		0.082192			
5-3.3	8		0.109589			
5-3.4	11		0.150685			
5-3.5	5		0.068493			
5-3.6	16	73	0.219178	0.744292	yes	yes
5-4.1	1		0.018519			
5-4.2	9		0.166667			
5-4.3	9		0.166667			
5-4.4	9		0.166667			
5-4.5	10		0.185185			
5-4.6	7		0.12963			
5-4.7	5		0.092593			
5-4.8	4	54	0.074074	0.810185	yes	yes
5-5.1	8		0.177778			
5-5.2	6		0.133333			
5-5.3	10		0.222222			
5-5.4	9		0.2			
5-5.5	7		0.155556			
5-5.6	5	45	0.111111	0.9	yes	yes
Total	285					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	9
2-1.2	2
2-1.4	3
3-1.4	1
3-1.5	3
3-1.6	3
4-1.3	2
4-1.4	4
4-1.5	1
4-1.6	32
4-2.1	1
4-2.2	1
6-1.5	1
6-3.4	1
6-3.5	1
8-3.6	1
Total	66

**Table C-22 Science
2009 PASS Science Alignment to Standards and Indicators
Grade 6**

Science Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
6-1.1	6		0.206897			
6-1.2	2		0.068966			
6-1.3	7		0.241379			
6-1.4	8		0.275862			
6-1.5	6	29	0.206897	0.868966	yes	yes
6-2.1	5		0.05			
6-2.2	14		0.14			
6-2.3	8		0.08			
6-2.4	10		0.1			
6-2.5	19		0.19			
6-2.6	8		0.08			
6-2.7	17		0.17			
6-2.8	15		0.15			
6-2.9	4	100	0.04	0.794444	yes	yes
6-3.1	15		0.254237			
6-3.2	6		0.101695			
6-3.3	11		0.186441			
6-3.4	7		0.118644			
6-3.5	8		0.135593			
6-3.6	5		0.084746			
6-3.7	7	59	0.118644	0.845036	yes	yes
6-4.1	11		0.13253			
6-4.2	10		0.120482			
6-4.3	9		0.108434			
6-4.4	5		0.060241			
6-4.5	5		0.060241			
6-4.6	20		0.240964			
6-4.7	10		0.120482			
6-4.8	6		0.072289			
6-4.9	7	83	0.084337	0.829987	yes	yes
6-5.1	8		0.123077			
6-5.2	14		0.215385			
6-5.3	7		0.107692			
6-5.4	3		0.046154			
6-5.5	11		0.169231			
6-5.6	5		0.076923			
6-5.7	17		0.261538	0.782418	yes	yes

Science Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
6-5.8	0	65				
Total	336					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	7
2-1.2	1
3-1.5	5
4-1.1	4
4-1.3	3
4-1.4	2
4-1.6	15
5-1.2	8
5-1.3	3
5-1.5	1
5-1.6	4
7-1.2	1
7-1.5	1
7-2.1	1
7-2.5	2
7-4.1	1
Total	395

**Table C-23 Science
2009 PASS Science Alignment to Standards and Indicators
Grade 7**

Science Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
7-1.1	7		0.189189			
7-1.2	3		0.081081			
7-1.3	5		0.135135			
7-1.4	9		0.243243			
7-1.5	6		0.162162			
7-1.6	7		0.189189			
7-1.7	0	37		0.878378	yes	yes
7-2.1	14		0.237288			
7-2.2	10		0.169492			
7-2.3	5		0.084746			
7-2.4	7		0.118644			
7-2.5	6		0.101695			
7-2.6	12		0.20339			
7-2.7	5	59	0.084746	0.818402	yes	yes
7-3.1	8		0.140351			
7-3.2	28		0.491228			
7-3.3	12		0.210526			
7-3.4	9	57	0.157895	0.758772	yes	yes
7-4.1	14		0.2			
7-4.2	16		0.228571			
7-4.3	7		0.1			
7-4.4	4		0.057143			
7-4.5	15		0.214286			
7-4.6	14	70	0.2	0.82381	yes	yes
7-5.1	4		0.038095			
7-5.2	11		0.104762			
7-5.3	10		0.095238			
7-5.4	7		0.066667			
7-5.5	16		0.152381			
7-5.6	11		0.104762			
7-5.7	6		0.057143			
7-5.8	7		0.066667			
7-5.9	17		0.161905			
7-5.10	16	105	0.152381	0.82381	yes	yes
Total	328					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	1
2-1.1	1
3-1.5	2
4-1.1	1
4-1.4	3
4-1.6	2
5-1.2	2
5-1.3	2
5-1.6	2
8-1.2	1
Total	17

**Table C-24 Science
2009 PASS Science Alignment to Standards and Indicators
Grade 8**

Science Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
8-1.1	11		0.366667			
8-1.2	4		0.133333			
8-1.3	6		0.2			
8-1.4	1		0.033333			
8-1.5	1		0.033333			
8-1.6	4		0.133333			
8-1.7	3	30	0.1	0.719048	yes	yes
8-2.1	10		0.217391			
8-2.2	8		0.173913			
8-2.3	3		0.065217			
8-2.4	4		0.086957			
8-2.5	6		0.130435			
8-2.6	7		0.152174			
8-2.7	8	46	0.173913	0.854037	yes	yes
8-3.1	7		0.076923			
8-3.2	7		0.076923			
8-3.3	7		0.076923			
8-3.4	10		0.10989			
8-3.5	5		0.054945			
8-3.6	26		0.285714			
8-3.7	17		0.186813			
8-3.8	3		0.032967			
8-3.9	9	91	0.098901	0.749695	yes	yes
8-4.1	7		0.102941			
8-4.2	6		0.088235			
8-4.3	3		0.044118			
8-4.4	15		0.220588			
8-4.5	9		0.132353			
8-4.6	5		0.073529			
8-4.7	5		0.073529			
8-4.8	4		0.058824			
8-4.9	5		0.073529			
8-4.10	9	68	0.132353	0.811765	yes	yes
8-5.1	8		0.153846			
8-5.2	9		0.173077			
8-5.3	11		0.211538			
8-5.4	8		0.153846			

Science Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
8-5.5	12		0.230769			
8-5.6	4	52	0.076923	0.884615	yes	yes
8-6.1	4		0.070175			
8-6.2	6		0.105263			
8-6.3	5		0.087719			
8-6.4	18		0.315789			
8-6.5	6		0.105263			
8-6.6	3		0.052632			
8-6.7	7		0.122807			
8-6.8	8	57	0.140351	0.79386	yes	yes
Total	344					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	8
2-1.2	5
3-1.5	2
3-1.6	13
3-3.2	1
4-1.1	3
4-1.4	4
4-1.6	3
4-3.8	1
5-1.2	3
5-1.4	1
5-1.6	8
5-2.3	1
6-1.1	1
6-1.2	2
6-1.3	1
6-1.4	2
6-2.7	1
6-3.1	1
6-3.2	1
7-1.1	2
7-1.2	1
7-1.5	2
7-1.7	1
7-5.9	1
Total	69

**Table C-25 Social Studies
2009 PASS Social Studies Alignment to Standards and Indicators
Grade 3**

Social Studies Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
3-1.1	3		0.073171			
3-1.2	8		0.195122			
3-1.3	16		0.390244			
3-1.4	14	41	0.341463	0.768293	yes	yes
3-2.1	6		0.12			
3-2.2	4		0.08			
3-2.3	4		0.08			
3-2.4	8		0.16			
3-2.5	9		0.18			
3-2.6	6		0.12			
3-2.7	13	50	0.26	0.828571	yes	yes
3-3.1	10		0.222222			
3-3.2	9		0.2			
3-3.3	8		0.177778			
3-3.4	18	45	0.4	0.85	yes	yes
3-4.1	9		0.163636			
3-4.2	7		0.127273			
3-4.3	8		0.145455			
3-4.4	12		0.218182			
3-4.5	3		0.054545			
3-4.6	7		0.127273			
3-4.7	9	55	0.163636	0.880519	yes	yes
3-5.1	7		0.162791			
3-5.2	6		0.139535			
3-5.3	5		0.116279			
3-5.4	6		0.139535			
3-5.5	5		0.116279			
3-5.6	7		0.162791			
3-5.7	7	43	0.162791	0.940199	yes	yes
Total	234					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	2
Total	2

**Table C-26 Social Studies
2009 PASS Social Studies Alignment to Standards and Indicators
Grade 4**

Social Studies Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
4-1.1	6		0.206897			
4-1.2	12		0.413793			
4-1.3	8		0.275862			
4-1.4	3	29	0.103448	0.810345	yes	yes
4-2.1	6		0.122449			
4-2.2	8		0.163265			
4-2.3	9		0.183673			
4-2.4	9		0.183673			
4-2.5	7		0.142857			
4-2.6	5		0.102041			
4-2.7	5	49	0.102041	0.897959	yes	yes
4-3.1	10		0.222222			
4-3.2	6		0.133333			
4-3.3	6		0.133333			
4-3.4	9		0.2			
4-3.5	6		0.133333			
4-3.6	4		0.088889			
4-3.7	4	45	0.088889	0.863492	yes	yes
4-4	1		0.016129			
4-4.1	13		0.209677			
4-4.2	16		0.258065			
4-4.3	9		0.145161			
4-4.4	6		0.096774			
4-4.5	7		0.112903			
4-4.6	6		0.096774			
4-4.7	5	62	0.080645	0.815668	yes	yes
4-5.1	10		0.140845			
4-5.2	22		0.309859			
4-5.3	10		0.140845			
4-5.4	7		0.098592			
4-5.5	5		0.070423			
4-5.6	10		0.140845			
4-5.7	7	71	0.098592	0.832998	yes	yes
4-6.1	12		0.210526			
4-6.2	10		0.175439			
4-6.3	10		0.175439			

Social Studies Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
4-6.4	9		0.157895			
4-6.5	9		0.157895			
4-6.6	7	57	0.122807	0.938596	yes	yes
Total	314					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	13
2-2.5	2
Total	15

**Table C-27 Social Studies
2009 PASS Social Studies Alignment to Standards and Indicators
Grade 5**

Social Studies Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
5-1.1	3		0.15			
5-1.2	4		0.2			
5-1.3	6		0.3			
5-1.4	4		0.2			
5-1.5	3	20	0.15	0.9	yes	yes
5-2.1	4		0.153846			
5-2.2	3		0.115385			
5-2.3	6		0.230769			
5-2.4	5		0.192308			
5-2.5	8	26	0.307692	0.861538	yes	yes
5-3.1	6		0.122449			
5-3.2	9		0.183673			
5-3.3	8		0.163265			
5-3.4	8		0.163265			
5-3.5	7		0.142857			
5-3.6	11	49	0.22449	0.92517	yes	yes
5-4.1	14		0.269231			
5-4.2	7		0.134615			
5-4.3	6		0.115385			
5-4.4	8		0.153846			
5-4.5	6		0.115385			
5-4.6	7		0.134615			
5-4.7	4	52	0.076923	0.862637	yes	yes
5-5.1	5		0.138889			
5-5.2	6		0.166667			
5-5.3	7		0.194444			
5-5.4	12		0.333333			
5-5.5	6	36	0.166667	0.866667	yes	yes
5-6.1	5		0.185185			
5-6.2	3		0.111111			
5-6.3	7		0.259259			
5-6.4	5		0.185185			
5-6.5	4		0.148148			
5-6.6	3	27	0.111111	0.87037	yes	yes
Total	210					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	2
7-5.5	1
Total	3

**Table C-28 Social Studies
2009 PASS Social Studies Alignment to Standards and Indicators
Grade 6**

Social Studies Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
6-1.1	6		0.076923			
6-1.2	4		0.051282			
6-1.3	19		0.24359			
6-1.4	38		0.487179			
6-1.5	11	78	0.141026	0.669231	weak	yes
6-2.1	20		0.298507			
6-2.2	22		0.328358			
6-2.3	12		0.179104			
6-2.4	5		0.074627			
6-2.5	6		0.089552			
6-2.6	2	67	0.029851	0.69403	weak	yes
6-3	1					
6-3.1	13		0.342105			
6-3.2	7		0.184211			
6-3.3	4		0.105263			
6-3.4	7		0.184211			
6-3.5	3		0.078947			
6-3.6	4	38	0.105263	0.789474	yes	yes
6-4.1	13		0.361111			
6-4.2	4		0.111111			
6-4.3	6		0.166667			
6-4.4	8		0.222222			
6-4.5	5	36	0.138889	0.816667	yes	yes
6-5.1	5		0.135135			
6-5.2	5		0.135135			
6-5.3	5		0.135135			
6-5.4	8		0.216216			
6-5.5	4		0.108108			
6-5.6	10	37	0.27027	0.846847	yes	yes
6-6.1	6		0.333333			

Social Studies Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
6-6.2	7		0.388889			
6-6.3	5	18	0.277778	0.944444	yes	yes
Total	275					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	2
Total	2

**Table C-29 Social Studies
2009 PASS Social Studies Alignment to Standards and Indicators
Grade 7**

Social Studies Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
7-1.1	4		0.16			
7-1.2	4		0.16			
7-1.3	5		0.2			
7-1.4	5		0.2			
7-1.5	4		0.16			
7-1.6	3	25	0.12	0.933333	yes	yes
7-2.1	4		0.210526			
7-2.2	7		0.368421			
7-2.3	8	19	0.421053	0.877193	yes	yes
7-3.1	5		0.15625			
7-3.2	5		0.15625			
7-3.3	5		0.15625			
7-3.4	9		0.28125			
7-3.5	4		0.125			
7-3.6	4	32	0.125	0.885417	yes	yes
7-4.1	4		0.2			
7-4.2	5		0.25			
7-4.3	4		0.2			
7-4.4	3		0.15			
7-4.5	4	20	0.2	0.95	yes	yes
7-5.1	6		0.157895			
7-5.2	6		0.157895			
7-5.3	3		0.078947			
7-5.4	7		0.184211			
7-5.5	11		0.289474			
7-5.6	5	38	0.131579	0.859649	yes	yes
7-6.1	11		0.275			
7-6.2	16		0.4			
7-6.3	6		0.15			
7-6.4	7	40	0.175	0.825	yes	yes
7-7.1	4		0.1			
7-7.2	2		0.05			
7-7.3	7		0.175			
7-7.4	6		0.15			
7-7.5	3		0.075			
7-7.6	9		0.225			

Social Studies Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
7-7.7	9	40	0.225	0.796429	yes	yes
Total	214					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	5
6-6.2	1
6-6.3	1
Total	7

**Table C-30 Social Studies
2009 PASS Social Studies Alignment to Standards and Indicators
Grade 8**

Social Studies Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
8-1.1	5		0.1			
8-1.2	6		0.12			
8-1.3	15		0.3			
8-1.4	14		0.28			
8-1.5	3		0.06			
8-1.6	5		0.1			
8-1.7	2	50	0.04	0.705714	yes	yes
8-2.1	6		0.230769			
8-2.2	5		0.192308			
8-2.3	4		0.153846			
8-2.4	6		0.230769			
8-2.5	5	26	0.192308	0.938462	yes	yes
8-3.1	12		0.292683			
8-3.2	15		0.365854			
8-3.3	5		0.121951			
8-3.4	4		0.097561			
8-3.5	3		0.073171			
8-3.6	2	41	0.04878	0.674797	weak	yes
8-4.1	3		0.125			
8-4.2	7		0.291667			
8-4.3	5		0.208333			
8-4.4	7		0.291667			
8-4.5	2	24	0.083333	0.808333	yes	yes
8-5.1	10		0.344828			
8-5.2	7		0.241379			
8-5.3	4		0.137931			
8-5.4	2		0.068966			
8-5.5	2		0.068966			
8-5.6	4	29	0.137931	0.747126	yes	yes
8-6.1	1		0.058824			
8-6.2	4		0.235294			
8-6.3	5		0.294118			
8-6.4	3		0.176471			
8-6.5	4	17	0.235294	0.835294	yes	yes
8-7.1	6		0.333333			
8-7.2	1		0.055556			

Social Studies Standard & Indicator	No. Items Identified	Total Items Identified for Standard	Proportion of Items in Standard	Balance of Representation Index	Met Balance Criterion?	Met Range of Knowledge Criterion?
8-7.3	3		0.166667			
8-7.4	6		0.333333			
8-7.5	2	18	0.111111	0.733333	yes	yes
Total	205					

No Standard Identified or Standards from Other Grades Identified	Number Items
None	2
4-6.1	1
4-6.5	1
5-1.2	2
5-2.3	1
5-3.4	1
Total	8

APPENDIX D

Requested Statistical Data from the SCDE for PASS, 2009

**EOC Requested Statistical Data from 2009 PASS Field Tests
(Writing; Reading; Math; Science; Social Studies)
June 27, 2009; Revised February 20, 2009**

Item data files for each test form (or the combined, calibrated item bank) in Excel, fixed-format text, or other format mutually agreed upon by SCDE and EOC to include:

- Form number;
- Item unique identifier;
- Item position number on test form;
- Item type (MC, ER);
- Standard(s) item assesses;
- Anchor item (Y/N);
- Key for MC item;
- Sample sizes (all students; White; African American; Hispanic; other; free or reduced federal lunch status; pay lunch status; male; female);
- Classical item difficulty (all students; White; African American; Hispanic; other; free or reduced federal lunch status; pay lunch status; male; female);
- Difficulty flags ($p < .3$; $p > .95$) (all students; White; African American; Hispanic; other; free or reduced federal lunch status; pay lunch status; male; female);
- Rasch calibrated item difficulty;
- Standard error of item difficulty;
- Infit mean square error (MSE);
- Infit standardized z;
- Outfit mean square error;
- Outfit standardized z;
- Fit flag if $MSE < 0.7$ or $MSE > 1.3$;
- Adjusted point biserial for item;
- Adjusted point biserial for each response option;
- Biserial flags (< 0.2 for correct response; > -0.05 for distractor);
- Item response distributions separately for categories all students; white; African American; Hispanic; other; free or reduced federal lunch status; pay lunch status; male; female to include:
 - Percent choosing each item response option;
 - Distractor flag (% choosing distractor is greater than or equal to 10% higher than % choosing correct answer);
- Percentage of all students double-gridding item;
- Percentage of all students omitting item;
- Omit flag if % omit GE 5%;
- Percentage of all students not reaching item;
- Not reach flag if % not reaching GE 5%;
- Differential item functioning (DIF) flags for White vs. African American and Male vs. Female;
- Interrater reliabilities for extended response items.

Test form data files to include, for each form:

- Descriptive statistics (including means, standard deviations, reliability coefficients, sample sizes) for the total raw scores;
- Standard errors of measurement for total scores;
- Score frequencies;

- Inter-item correlations;
- Plots of point biserials by p values; frequencies by Theta; cumulative frequencies by Theta;
- Raw score to logit conversion tables.

Student data files in mid-June 2009:

- Student demographic information in same format used for Precode file, including unique ID, SASI ID, school identifying number (BEDS), grade level, student name (Last, First, MI), date of birth, ethnicity, gender, disability status, federal lunch program status;
- Student test information from each of the 5 tests (writing, reading, math, science, social studies) including total raw score, student ability from Rasch calibration, test administration modifications or accommodations.

Student data files by October 10, 2009:

- Same information as in mid-June 2009 files, with the addition of total scale score and overall performance level and performance on individual academic standards for each test.

APPENDIX E

PASS Technical Review Panel

**PASS Technical Review Panel
July 8, 2009
Columbia, SC**

Dr. Christine DiStefano, Chair
Associate Professor
Educational Research
Department of Education Studies
College of Education
University of South Carolina

Dr. Kevin Andrews
Research Specialists
Instruction & Accountability
Rock Hill School District 3

Dr. Janet S. Rose-Baele
Executive Director
Assessment & Accountability
Charleston County School District

Mrs. Missy Wall-Mitchell
Director of Accountability
School District 5 of Lexington & Richland Counties

SC Department of Education Staff

Mr. Joe Saunders
Education Associate
Office of Assessment

SC Education Oversight Committee Staff

Dr. Jo Anne Anderson
Executive Director

Mr. David Potter
Director of Research

The Education Oversight Committee does not discriminate on the basis of race, color, national origin, religion, sex, or handicap in its practices relating to employment or establishment and administration of its programs and initiatives. Inquiries regarding employment, programs and initiatives of the Committee should be directed to the Executive Director (803) 734-6148.