AGENDA

Academic Standards and Assessments Subcommittee

Monday, May 21, 2012

10:00 a.m.
201 Blatt Building

I.	Welcome and Introductions	Dr. Merck
II.	Approval of the Minutes of March 19, 2012	Dr. Merck
III.	Recommendations for Changes to the Science Standards	
	A. Outline of the Process for Standards Review	Mrs. Barton
	B. Presentation of the Advisory Groups Recommendations	Mrs. Gossett
	C. Action: Approval of the Recommendations	Subcommittee
IV.	Palmetto Gold and Silver Award Criteria	
	A. Review and Options for Amending Criteria	Mrs. Barton
	B. Action: Approval of Changes	Subcommittee
V.	Longitudinal Analysis of Three Years of PASS Achievement Data	Dr. Andrews
VI.	Update:	Mrs. Barton
	Innovation Initiative	Dr. Gerrita Postlewait
VII.	Adjournment	Dr. Merck

<u>Academic Standards and Assessments Subcommittee Members:</u>
Dr. Danny Merck, Chairman
Mr. Terry Brown
Sen. Mike Fair
Mrs. Barbara Hairfield
Sen. Wes Hayes
Ms. Ann Marie Taylor

Neil C. Robinson, Jr.
CHAIR
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Ann Marie Taylor
John Warner
David Whittemore
Mick Zais

Melanie D. Barton
INTERIM EXECUTIVE DIRECTOR

SOUTH CAROLINA EDUCATION OVERSIGHT COMMITTEE
Subcommittee on Academic Standards and Assessments

Minutes of the Meeting
March 19, 2012
10:00 AM, Room 201 Blatt Building

Subcommittee Members Present:	Dr. Danny Merck (chair), Sen. Fair, Barbara Hairfield, Sen. Hayes, Ann Marie Taylor
EOC Staff Present:	Kevin Andrews, Melanie Barton, and Hope Johnson-Jones

Welcome and Introductions
Dr. Merck welcomed members and guests to the meeting.

Information Item:
Dr. Andrews provided further information regarding the impact on school growth ratings under the alternative growth table options considered. He first clarified that while changing the value table was important, maintaining consistency in the percentages of schools receiving each rating (Excellent through At Risk) was always a goal. The EOC staff had asked school officials to provide input on the growth table options. Public input from educators was provided to the subcommittee members. The members discussed the options. Staff recommendation and public input were both to utilize alternative value table 3 for future computations of the growth index. This would entail using different conversions from growth rating indices to growth ratings. Motion to present results to the full EOC at the April meeting was made by Ann Marie Taylor, seconded by Sen. Fair. Motion carried.

Members then asked questions about South Carolina's application for a waiver under the Elementary and Secondary Education Act (ESEA) and the South Carolina Department of Education's role in implementation of the Common Core State Standards. Concern was raised that the state is not sufficiently assisting districts in the implementation, resulting in districts spending local resources in duplicative efforts. The subcommittee asked Mrs. Barton to invite Dr. Zais to update the EOC on these two issues at the April meeting of the full EOC.

There being no further business, the Subcommittee adjourned.

Report on the Review of the South Carolina Science Academic Standards

SC EDUCATION OVERSIGHT COMMITTEE

Reporting facts. Measuring change. Promoting progress.

Presented to the
Academic Standards and
Assessments Subcommittee
May 21, 2012

INTRODUCTION

The South Carolina Education Accountability Act of 1998 establishes an accountability system for public education that focuses on improving teaching and learning so that students are equipped with a strong foundation in the four primary academic disciplines and a strong belief in lifelong learning. Academic standards are used to focus schools and districts toward higher performance by aligning the state assessment to those standards. The implementation of quality standards in classrooms across South Carolina is dependent upon systematic review of adopted standards, focused teacher development, strong instructional practices, and a high level of student engagement. Pursuant to Section 59-18-350(A) of the Education Accountability Act, the Education Oversight Committee (EOC) and the State Board of Education are responsible for reviewing South Carolina's standards and assessments to ensure that high expectations for teaching and learning are being maintained.

> The State Board of Education, in consultation with the Education Oversight Committee, shall provide for a cyclical review by academic area of the state standards and assessments to ensure that the standards and assessments are maintaining high expectations for learning and teaching. At a minimum, each academic area should be reviewed and updated every seven years. After each academic area is reviewed, a report on the recommended revisions must be presented to the Education Oversight Committee and the State Board of Education for consideration. After approval by the Education Oversight Committee and the State Board of Education, the recommendations may be implemented. However, the previous content standards shall remain in effect until approval has been given by both entities. As a part of the review, a task force of parents, business and industry persons, community leaders, and educators, to include special education teachers, shall examine the standards and assessment system to determine rigor and relevancy.

In March of 2012, the EOC activities under the cyclical review of the South Carolina Science Academic Standards were completed. This document presents recommendations for modifications to the 2005 South Carolina Science Academic Standards from the Education Oversight Committee. These recommendations were compiled under the advisement of three review teams: a national review team of science educators who have worked with national or other state organizations; a parent, business, and community leaders' team drawn from various geographical areas in South Carolina; and a team of educators and parents of students with disabilities and students with limited English proficiency. At the same time that these three committees were meeting, the State Department of Education assembled a team of SC science educators from around the state to review the standards.

It is important to note that the adopted South Carolina Science Academic Standards represent the work of many educators, and that this review of the standards was undertaken to identify ways in which their work could be strengthened and supported. The Education Oversight Committee expresses its appreciation to those educators and commends their utilization of national source documents and their belief in the achievement of all students. The Education Oversight Committee intends to enhance the work of school level educators and, ultimately, to ensure that all students are knowledgeable and capable.

I. CYCLICAL REVIEW PROCESS

The review of the South Carolina Science Academic Standards began with focus on the accomplishment of goals articulated in the Education Accountability Act (EAA) of 1998. The law, as amended through 2008, specifies: "The standards must be reflective of the highest level of academic skills with rigor necessary to improve the curriculum and instruction in South Carolina's schools so that students are encouraged to learn at unprecedented levels and must be reflective of the highest level of academic skills at each grade level." (Article 3, 59-18-300)

The Standard Operating Procedures for the Review of Standards (SOP) agreed upon by the State Department of Education (SDE) and the Education Oversight Committee (EOC) during the summer 2003 were followed for this review. A time line established during the fall of 2011 outlined the time frame in which the required review teams were to review the standards adopted in 2005 by the end of spring 2012. The SOP also outlines the steps to be taken to revise the current standards should the completion of the reviews indicate that revision is needed.

A. CRITERIA DESCRIPTIONS

The South Carolina Science Academic Standards Review Process followed by all four review teams emphasized the application of the criteria addressing comprehensiveness/balance, rigor, measurability, manageability, and organization/ communication. SDE representatives, district and university curriculum leaders, and EOC staff collaborated to identify the standards review criteria. Decisions on the criteria to be used were based on a comprehensive review of professional literature, and the goals for the standards review as specified in the Education Accountability Act of 1998. The identified criteria were each applied through the four review panels: (1) leaders in the discipline drawn from across the nation; (2) science educators from South Carolina's education community; (3) special educators from the South Carolina's education community; and (4) parents, business representatives, and community leaders.

CRITERION ONE: COMPREHENSIVENESS/BALANCE
The criterion category for Comprehensiveness/Balance is concerned with how helpful the South Carolina Science Academic Standards document is to educators in designing a coherent curriculum. The criterion is directed at finding evidence that the standards document clearly communicates what constitutes Science content, that is, what all students should know and be able to do in science by the time they graduate. The criterion includes consideration of the following areas:

- The standards address essential content and skills of science;
- The standards are aligned across grades as appropriate for content and skills;
- The standards have an appropriate balance of the content and skills needed for mastery of each area in science; and
- The standards reflect diversity (especially for ethnicity and gender) as appropriate for the subject area.

CRITERION TWO: RIGOR
This criterion calls for standards that require students to use thinking and problem-solving skills that go beyond knowledge and comprehension. Standards meeting this criterion require students to perform at both national and international benchmark levels.

- Standards should focus on cognitive content and skills (not affect);

- Standards should be developmentally appropriate for the grade level;
- Standards should include a sufficient number of standards that require application of learning (application, analysis, synthesis, and evaluation);
- Standards should be informed by the content and skills in national and international standards; and,
- Standards should be written at a level of specificity that will best inform instruction for each grade level.

CRITERION THREE: MEASURABILITY
Knowledge and skills presented in the standards are assessable for school, district and state accountability. The primary element of measurability is:

- The content and skills presented in the standards should be assessable (are observable and demonstrable).

CRITERION FOUR: MANAGEABILITY
This criterion applies to instructional feasibility, that is, whether the complete set of science standards at a particular grade level can reasonably be taught and learned in the class time allotted during one year. The primary element of manageability is:

- The number and scope of the standards for each grade level should be realistic for teaching, learning, and student mastery within the academic year.

CRITERION FIVE: ORGANIZATION/COMMUNICATION
The Organization/Communication criterion category stipulates that the expectations for students are to be clearly written and organized in a manner understandable to all audiences and by teachers, curriculum developers, and assessment writers. Organization includes the following components:

- The content and skills in the standards should be organized in a way that is easy for teachers to understand and follow;
- The format and wording should be consistent across grades;
- The expectations for student learning should be clearly and precisely stated for each grade; and,
- The standards should use the appropriate terminology of the field but be as jargon free as possible.

B. PANEL MEMBERSHIP

The EOC's cyclical review of the 2005 South Carolina Science Academic Standards was conducted by the following three panels during February and March 2012.

The national review team members consisted of recognized leaders in science education, who have participated in the development/writing of national and state science standards. As national leaders on science standards all have reviewed a number of state science standards. Comments and recommendations included in this document are based in part on *The State of the State Standards 2012* from the Fordham Institute, *International Standards Benchmarking Report* (2010), *A Framework for K-12 Science Education* (2012), *Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads* (2011), *Surrounded by Science: Learning Science in Informal Settings* (2010), and *Project 2061* (1989)

along with additional current research documents, classroom experiences, knowledge of students' developmental stages and an understanding of expectations for student learning in the area of science. Members of the team received the materials for the review in early January and received communications concerning the process of the review through March. After an independent review period, the members of the panel participated in a telephone conference call that produced through consensus, a set of findings listed later in this document. Members of the National Review Panel included:

- Dr. Melanie Cooper, Department of Engineering and Science Education, Clemson University
- Dr. Robert T. Dillon, Jr., Associate Professor, Department of Biology, College of Charleston
- Dr. Bert Ely, Professor of Biological Sciences, University of South Carolina
- Dr. Ursula Goodenough, Professor of Biology, Washington University, St. Louis, MO
- Dr. Lawrence S. Lerner, Professor Emeritus, Department of Physics and Astronomy, California State University, Long Beach, CA
- Dr. Christine Lotter, Associate Professor, Instruction and Teacher Education, Department of Education, University of South Carolina
- Dr. James Wanliss, Department of Physics and Computer Science, Presbyterian College

The EOC contacted all school district superintendents and instructional leaders in the state as well as EOC members for nominations to the following panels. Approximately 162 names were provided to the EOC. First, the Science Parent/Business/Community Leader Review Task Force was composed of twenty one parents, business representatives and community leaders. Task force members provided individual responses to the standards review and attended a one-day session on March 30, 2012 conducted by Kay Gossett, EOC review coordinator and Melanie Barton, Interim Director of EOC. The task force reached consensus on insights and specific recommendations about the 2005 South Carolina Science Academic Standards. Members of the task force included:

Libby Baker, Pageland
George Brown, Hemingway
Patricia Caldwell, Newberry
Rose Choice, Estill
Dave Coggins, Spartanburg
Mike Fair, Columbia
Adrian Grimes, Summerville
Jennifer Hawthorned, Monks Corner
Hugo Linares, Greer
Edward Lott, Florence
Collette McBride, Salters
Robert McClinton, Greenwood
Jerome McCray, Bishopville
Jordana Megonigal, Greer
Robert Oliver, Pinewood
Scott Owens, Horatio
Angela Peters, Orangeburg
Khushru Tata, Columbia
Mike Taylor, Batesburg-Leesville
Jamie Thon, Summerville
Kim Williams-Carter, Clinton

The Community/Business panel represented policymakers, clergy, engineers, organization leaders, state educators, industry representatives, and business leaders.

Each school district also was invited to recommend members of their respective special education communities to the Science Special Education and English Language Learners Review Task Force. Twenty seven special education teachers, English Language Learners teachers and parents participated in the cyclical review process. After reviewing the science standards according to the cyclical review criteria, the task force members attended a one day

meeting on March 26, 2012 facilitated by Kay Gossett, EOC review coordinator and Melanie Barton, Interim Director of EOC. The task force through discussion determined a series of findings and recommendations about the 2005 South Carolina Science Academic Standards. Members of the task force included:

Kyle Blankenship, Aiken
Sharon Jackson, Anderson 4
Lauren McClellan, Anderson 5
Wanda Coleman, Barnwell 29
Robin Boyleston, Barnwell 45
Rachel Amey, Charleston
Nicole Adams, Charter Schools
Melissa Cruse, Dorchester 2
Mary Atkins, Hampton, 2
Marie Fernandez, Jasper
Casey Spain, Laurens 56
Carla Stegall, Lexington 1
Emmylou Todd, Lexington 2
Debra Hall, Lexington 3
Pauline Morris, Marlboro
Cheryl Parr, Newberry
Liana Calloway, Orangeburg 3
Juliett Stoute-White, Orangeburg 5
Sandy Frazier, Richland 1
Teisha Hair, Spartanburg 2
Teresa Brown, Spartanburg 3
Sharon Glenn, Spartanburg 6
Vaughn Vick, Spartanburg 7
Albertha Bannister, Sumter
Barbara Greene, Williamsburg
Susan Conrad, York 3
Carmen Belei, York 3

The State Department of Education also gathered a panel of science educators from around the state to review the SC science standards. This group consisted of classroom teachers from all grade levels, university professors, curriculum specialists, administrators, and State Department of Education personnel. Meeting in March and April 2012, the state department's review team followed the same criteria as the three review teams conducted by the EOC and reached consensus on their recommendations.

C. THE STANDARDS DOCUMENT

The 2005 South Carolina Science Academic Standards are organized by grade levels for grades kindergarten through the eighth grade to include discipline areas of life science, earth science, and physical science and five high school core areas: physical science, biology, chemistry, physics, and earth science. An overview describing specific subject matter and themes is provided on the first page of the standards' document for each grade and high school core area.

http://ed.sc.gov/agency/pr/standards-and-curriculum/documents/sciencestandardsnov182005_001.pdf.

The statements of the academic standards themselves are newly constructed. Each standard is now stated as one full sentence that begins with the clause "The student will demonstrate an understanding of …" and goes on to specify the particular topics to be addressed by that standard. The area from which each of the content standards is drawn is specified in parenthesis immediately following the statement of the standard. Following each of the academic standards are indicators, which are intended to help meet teachers' needs for specificity. The main verbs in the indicators are taxonomic – that is, they identify specific assets of the cognitive process as described in the revised Bloom's Taxonomy. The term *including* appears frequently in parenthetical statements in the science indicators to introduce a list of specifics that are intended to clarify and focus the teaching and learning of the particular concept.

In addition to the content standards, each grade and high school core area has a separate scientific inquiry standard, with indicators that are now differentiated across grade levels and core ideas. The skills, processes, and tools specified in the scientific inquiry indicators are also embedded in the content standards and indicators wherever appropriate.

Fifth Grade Example:

Scientific Inquiry

5-1 The student will demonstrate an understanding of scientific inquiry, including the foundations of technological design and the processes, skills, and mathematical thinking necessary to conduct a controlled scientific investigation.

5-1.3 Plan and conduct controlled scientific investigations, manipulating one variable at a time.

The State Department of Education developed a curriculum support document providing in-depth content information, prerequisite skills and prior knowledge needed for the content after the State Board of Education adoption of these standards.

II: ISSUE WITH THE STANDARDS PRIOR TO THE REVIEW

As stated earlier, South Carolina Science Academic Standards are well-regarded by national experts and has been the model for standards development in many other states. However, the reality of the science standards is found in the student performance results. Unfortunately, too few students have reached the expectations set for them causing us to determine issues to be addressed as the current standards are reviewed. The following table documents the percentage of students scoring Not Met, Met and Exemplary on the Palmetto Assessment of State Standards (PASS) test in science in 2011. The percentage of students scoring Not Met on the PASS science exam fluctuates from a low of 28.3 percent in seventh grade to a high of 39.2 percent in third grade. By law, the student performance levels are defined accordingly:

> Not Met means that the student did not meet the grade level standard;
> Met means that the student met the grade level standard; and
> Exemplary means that the student demonstrated exemplary performance in meeting the grade level standards. (Section 59-18-900)

Table 1
2011 PASS Science, % of Students Scoring:

Grade	Number of Test Takers	Not Met	Met	Exemplary
03	26,828	39.2	36.8	24.0
04	55,006	29.1	54.8	16.0
05	27,683	35.1	46.5	18.5
06	27,018	35.1	50.5	14.4
07	53,464	28.3	44.7	27.0
08	25,952	29.9	33.2	36.9

Source: South Carolina Department of Education, http://ed.sc.gov/data/pass/2011/.

A concern found in reviewing the SC science standards revolves around the breadth of the standards versus the depth. National science standards and input from state science educators provided the content to be included in the 2005 science standards. The science standards provide a wealth of content to be learned from kindergarten through high school. All science content is considered important because science builds on prior background knowledge. In order for students to obtain a true understanding of science concepts, a determination needs to be made as to what content is essential for the students to be successful in their school careers as well as in the work careers

Another concern deals with how students learn science best. In order to grasp an understanding of science concepts and skills, students must be engaged in science. Currently, inquiry standards are separate from the content standards in all grades and high school courses. In order for students to be sufficiently prepared for post-secondary science work, students must move beyond recall and memory-work in the science classes. They must be engaged in the "doing" of science. Science must promote current science practices, modern science content, and an infusion of the most current technological instruments.

III: FINDINGS

The discussion below summarizes reviews of panel members, and presents consensus findings and examples for each criterion.

A: COMMENDATIONS

1. The SC science standards are well-written and highly regarded. According to *The State of State Science Standards 2012* by the Fordham Institute, South Carolina has "produced a set of workmanlike standards of consistent, high quality." In this review of the science standards, Fordham Institute granted South Carolina an A- grade for providing "science standards that are clear and succinct, but that also outline most of the essential K-12 content that students need to learn."

   http://www.edexcellencemedia.net/publications/2012/2012-State-of-State-Science-Standards/2012-State-of-State-Science-Standards-FINAL.pdf.

2. The standards are consistent across grade levels and increase in appropriate complexity. The standards develop appropriately through advancing grades with clear and logical progression.

3. The science standards are clearly written using Bloom's verbs that show the level of performance required of students; thus, they are observable and assessable.

4. The standards are informed by content and skills in national standards developed in 1996 and additional science education research documents from the early 2000's.

5. The standards are easy to follow and user friendly for teachers. A logical progression is followed throughout the standards, building science concepts from grade to grade and defining what students should know.

   .

6. The science support document provides teachers with additional content and instructional information. The standards are presented clearly and are linked to support documents, providing for teachers specific details of the content and clarifying what students should know and be able to do.

   http://ed.sc.gov/agency/pr/standards-and-curriculum/Science.cfm

B: CONCERNS COMMON TO ALL REVIEW PANELS

1. SC must improve the learning of science by going deeper rather than broader with standards.
2. Students do not appear to be appropriately prepared for postsecondary education as reflected by state and national evaluators of the science standards. This may be a result of a shallow understanding of science content due to the number of standards or even from the lack of student engagement in learning science.
3. SC should use the most recent and relevant information when amending the standards which includes the new science framework as well current research on international science standards.
4. The standards must be incorporate engineering and real-life applications.
5. Inquiry must be integrated with the content standards to bring meaning to science.

C: ADDITIONAL FINDINGS OF THE NATIONAL REVIEW TEAM

1. The standards provide clear content and skills learning objectives from the early grades through high school but are based on prior research from the 1990's. Current emphases in more recent national and international research is on the use of key core ideas in developing science standards and a focus on combining content and practices to make it explicit what it is that students should be able to know and do. In a recent publication, *A Framework for K-12 Science Education* (NRC 2012), national science experts recognize that *"although the existing national documents on science content for grades K-12 (developed in the early to mid-1990s) were an important step in strengthening science education, there was much room for improvement. Not only has science progressed, but the education community has learned important lessons for 10 years of implementing standards-based education, and there is a new and growing body of research on learning and teaching in science that can inform a revision of the standards and revitalized science education."*

2. Use of big core ideas in the standards would decrease the scale of standards and indicators and allow depth of content to be the focus, not the breadth. Standards using "recall, summarize, know, etc…." should be removed and combine these ideas to formulate higher level standards.

3. Revisit the use of Bloom's taxonomy in the standards which is not intuitive to teachers. Use performance verbs that say exactly what science knowledge students should have.

4. For teachers to successfully implement the standards, the learning progressions must be made clearer and show teachers how to integrate content and practices in performance.

5. Inquiry skills can only enhance student learning if they are meaningfully linked to content. The current separate inquiry skills need to be integrated into the content standards to ensure inclusion of science practices into the knowledge of science.

6. The science indicators and support documents should be revised to include engineering terminology and make engineering instruction more explicit.

7. Assessment needs to align with the level of thinking wanted from students in order for true instructional change to occur. Move away from multiple choice tests which measure lower level learning from students.

8. Based on the need to assess student performance in science, investigate the use of adaptive computer assessments that incorporate simulations and critical thinking applications needed to assess the higher level standards.

9. Review the standards for redundancy such as found in the population and ecology sections and other areas.

10. The standards need to be checked for consistency in wording and review glossary terms for accuracy.

11. To address diversity in the standards, the standards could state "using appropriate examples that include a variety of cultures, genders, and ethnicities…." to build connections between curriculum and students' cultures especially in standards that address human impact on the environment.

12. Introduce some basic concepts earlier (ex. Move DNA to 7th grade) which would free more time to focus on genetic engineering and more cutting edge genetic applications in biology.

13. Physiology content is lacking and needs to be included throughout the upper grades. For example, physiology has strong coverage in the seventh grade standards; nothing appears after that year on this important topic and is completely omitted from high school biology materials.

14. All standards must be treated equally. Only once in the standards is the phrase "critically analyze" found which is in B-5.6 on biological evolution. Recommendations made during the review of the 2005 SC standards included using the phrase in additional indicators to Standard B-5. Most of the recommendations were not accepted leaving standard B-5 slightly weaker than any other science standard in the K-12 curriculum.

15. Chemistry standards do not reflect how chemistry is practiced by modern chemists. Students taught in this manner will merge with a surface level understanding of chemistry that will not be useful to them in future studies.

D. ADDITIONAL FINDINGS OF THE PARENT/BUSINESS/COMMUNITY LEADER REVIEW PANEL

1. The world is changing at an ever-increasing pace, especially as it relates to issues taught through science and an ongoing review seems necessary to keep pace with the changes. The review would prioritize what is best to teach during the limited time available.

2. The standards/indicators need to address the rapid changes in science-based careers and prepare students to be adaptable to fit jobs that have not been created at this time.

3. Engineering based scientific argument and engineering skills need to be added and connected to the science standards.

4. Math is a critical component in learning science concepts and practices. Science and Common Core math should be aligned for appropriate learning opportunities.

5. Emphasis needs to be placed on technology beginning in early grades and continuing through high school. Knowledge of different technological instruments is essential to the understanding of science.

6. Content and skills should be written into one document to appropriately inform instruction. Incorporating science practices and content with scientific concepts will make expectations much clearer.

7. An essential part of science is laboratory based. An active laboratory component can provide engagement and motivation for science leading to extended interest in post-secondary education and careers. Schools must be provided the resources and equipment for a viable science laboratory focus.

8. Measurability of the science standards are constrained by use of standardized tests.

9. Instructional time for science needs to be mandated in order for adequate time to be allocated to science.

10. Standards are necessary to ensure that all SC students are receiving the same basic education but the key to improved student performance is execution of the standards. Teachers who teach science without a science background will hinder successful implementation of the standards.

E. ADDITIONAL FINDINGS OF THE TEACHERS AND PARENTS OF STUDENTS WITH DISABILITIES (SPED) AND ENGLISH LANGUAGE LEARNERS (ELL)

1. The number of application standards needs to be increased to address diversity among the student population. By integrating inquiry standards in with the content standards, SPED and ELL students would gain from the hands on approach to learning.

2. The standards document needs a simplified continuum of standards added to inform teachers, especially SPED and ELL teachers, of the prerequisite skills and application level of the standards across grade levels.

3. The relationship between the science standards and other content areas needs to be investigated. A cross over document would benefit SPED and ELL teachers in thematic or integrated instruction.

4. Standards sometimes contain verbiage that can be confusing. More specific language which uses explicit and direct words as well as words that do not have multiple meanings is needed by instructors of and students with disabilities or language limitations.

5. More inquiry skills need to be built into the standards to support the use of hands on learning for SPED and ELL students. These students especially need additional examples, models, and visuals to be used in the standards.

6. Performance based assessments which allow students' drawings to indicate understanding could be used to assess students. Current assessments are not appropriate for mainstream, ELL, or special education students.

7. Some standards are not repeated often enough while others are taught only once at a specific grade level. The standards need to be built on a progression of learning to meet the needs of students of all abilities.

8. Science should make connections to the "real world." There is a need to explain "why" students are being instructed on these standards and "how" they will be relevant to the students now and in the future and is particularly beneficial to students with disabilities.

9. There is a need for more examples and visuals within the standards instruction highlighting the cultural diversity and disabled population found in the community, families, state, nation, and world.

F: CRITERIA-BASED FINDINGS AND RECOMMENDATIONS

Listed below are the specific findings based on the criteria presented earlier in this report. Findings were reached by the National Review Panel, the Parent/Business/ Community Review Panel and the Special Education/English Language Learners Review Panel. The complete Criteria description may be found on pages 2 and 3 of this document.

Criterion One: Comprehensiveness/Balance
Findings/Recommendations

1. *The standards reflect essential science content and skills.*
2. *The standards should address the low level standards and redundancy in the content across grade levels in an effort to reduce the number of standards.*
3. *The standards need to reflect current research in science education and how students learn.*
4. *The standards should include current people of note and engineering.*

Criterion Two: Rigor
Findings/Recommendations:

1. *Indicators are written at a low level of Bloom's Taxonomy (cognitive demand) and needs to move to the application level (or higher).*
2. *Currently the inquiry standards are separate and need to be integrated into the content standards.*
3. *Develop a means for spiraling standards across grade levels to increase rigor.*
4. *The standards are informed by content and skills in national standards but should include recent research on incorporating science practices into the standards.*
5. *Balance the specificity of standards within and across standards.*

Criterion Three: Measurability
Findings/Recommendations:

1. *Indicators are written so that they are easily understandable and assessable. Use of high level performance verbs (cognitive demand) in the standards will allow for assessments items at a higher level.*
2. *Investigate adaptive computer assessments capable of assessing high level standards for students of all abilities.*

Criterion Four: Manageability
Findings/Recommendations:

1. *The numbers of standards should be reduced to allow for more in-depth teaching and depth of student understanding.*
2. *An adequate amount of time needs to be given to science instruction.*

Criterion Five: Organization/Communication
Findings/Recommendations:

1. *The format is easy to understand and follow for all teachers.*
2. *Consider using themes or disciplines for organization which will lead to integration of standards and content areas.*
3. *Currently, teachers are using the standards as check-off lists instead of understanding the value of using activities to integrate the standards.*
4. *The standards need to be checked for consistency of wording.*

IV. EOC RECOMMENDATIONS

The EOC stands firmly behind the premise that students must learn science at the highest level in order to be prepared for college and successfully compete in careers today and those to be created in the future. The recommendations that are listed below are based on the detailed review of the South Carolina Science Academic Standards and are supported by the evidence and detailed comments that appear in the criteria-based and individual task force findings included in this report.

1. According to national and international research, science standards should be built upon key core ideas in science; limiting the breadth of "good to know" content and focusing on the depth of the standards for increased student understanding. Limit the number of key

ideas explored each year while increasing their depth and revisiting the concepts periodically.

2. Decreasing the scale of standards and indicators of standards allows for removal of "recall" standards by combining the ideas to formulate higher level standards. By using explicit performance verbs, a progression of learning is established from grade to grade providing all students with exactly what it is that students should be able to do.

3. Science is innately an activity based content area. Students are more engaged and motivated through hands-on opportunities. The inquiry standards must be integrated into the science standards to ensure inclusion of science practices in instruction.

4. As standards are written at a higher level, assessments must appropriately measure the performance of students at higher levels. New adaptive computer assessments that incorporate simulations and critical thinking applications are needed to adequately measure these standards.

5. Science should make connections to the "real world." There is a need to explain to students of all ability levels "why" students are being instructed on the standards and "how" they will be relevant to all students now and in the future. Therefore teachers must be aware how modern science is addressed in the work world.

6. Alignment of standards with other content areas is greatly needed. In elementary grades, teachers face the dilemma of more content to be taught in a given year than there is time. In all grades, math is a critical component of learning science concepts and practices. Cross-over documents need to be developed to align standards for appropriate learning opportunities.

7. Engineering skills and technology are integral components of modern science education. Deliberate inclusion of these skills and materials into the standards should be addressed.

8. Attention should be given to teacher preparation for all teachers instructing in the science areas. The key to improved science performance is execution of the standards. Teachers who teach science without a science background hinder successful implementation of the standards. Efforts should be made to work closely with post-secondary science educators in providing a student based instructional model for pre-service opportunities.

9. The ongoing implementation of these revised standards must be accompanied by:
    a. Changes in state assessment to reflect that what is assessed is aligned with what is to be taught;
    b. Sample demonstrations of what students should be able to do based on the explicit standards for assessment purpose;
    c. An intensive set of professional development activities for both teachers and administrators that broaden both awareness of and capacity to implement these standards and includes video examples of science activities;
    d. Widespread encouragement and support to adopt newer curriculum materials that are better aligned with the content and process standards; and
    e. Development of supplemental/support documents and materials for use in the classroom to assist teachers in instructing all students towards learning the

stands; this would include a curriculum guide and an adaptability document for special education teachers and teachers of English Language Learners.

EDUCATION OVERSIGHT COMMITTEE

Subcommittee: Academic Standards and Assessments

Date: May 21, 2012

INFORMATION/RECOMMENDATION

Revising Palmetto Gold and Silver Award Program

PURPOSE/AUTHORITY

The statutory authority for the Palmetto Gold and Silver Awards is from the EAA, as amended in 2008 (Act 282 of 2008):

> Section 59-18-1100. The State Board of Education, working with the division and the Department of Education, must establish the Palmetto Gold and Silver Awards Program to recognize and reward schools for academic achievement and for closing the achievement gap. Awards will be established for schools attaining high levels of absolute performance, for schools attaining high rates of growth, and for schools making substantial progress in closing the achievement gap between disaggregated groups. The award program must base improved performance on longitudinally matched student data and may include such additional criteria as:
> (1) student attendance;
> (2) teacher attendance;
> (3) graduation rates; and
> (4) other factors promoting or maintaining high levels of achievement and performance. Schools shall be rewarded according to specific criteria established by the division. In defining eligibility for a reward for high levels of performance, student performance should exceed expected levels of improvement. The State Board of Education shall promulgate regulations to ensure districts of the State utilize these funds to improve or maintain exceptional performance according to their school's plans established in Section 59-139-10. Funds may be utilized for professional development support.
> Special schools for the academically talented are not eligible to receive an award pursuant to the provisions of this section unless they have demonstrated improvement and high absolute achievement for three years immediately preceding.

CRITICAL FACTS

The last time that the EOC recommended revisions to the criteria for the Palmetto Gold and Silver program was December of 2008. The EAA had just been amended during the prior legislative session to add closing the achievement gap between historically lower- and higher-achieving demographic groups of students as a criterion for receiving a Palmetto Gold or Silver award.

TIMELINE/REVIEW PROCESS

March 20, 2012– Staff from the Accountability Division and from the Department of Education met to review the 2011 Palmetto Gold and Silver award winners

April and May, 2012 Staff from the Division developed options for amending the criteria. Staff from the Department of Education ran simulations. The results are in the attached report.

ECONOMIC IMPACT FOR EOC

Cost: Absorbed in EOC operating budget

Fund/Source:

ACTION REQUEST

☒ **For approval** ☐ **For information**

ACTION TAKEN

☐ **Approved** ☐ **Amended**

☐ **Not Approved** ☐ **Action deferred (explain)**

2012

PALMETTO GOLD AND SILVER AWARD

Review and Options for Amending Criteria

SC EDUCATION
OVERSIGHT COMMITTEE

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PALMETTO GOLD AND SILVER AWARDS CRITERIA

Introduction

The Palmetto Gold and Silver Awards Program was established by the Education Accountability Act (EAA) of 1998. Beginning in 2002-03 the EOC also recognized schools that closed the achievement gaps between historically lower- and higher-achieving demographic students. When the EAA was amended in 2008, the General Assembly included in the definition of the Palmetto Gold and Silver Awards program the recognition of schools that closed the gaps in achievement between historically lower- and higher-achieving demographic groups of students.

The current statutory authority for the Palmetto Gold and Silver Awards is below:

> Section 59-18-1100. The State Board of Education, working with the division and the Department of Education, must establish the Palmetto Gold and Silver Awards Program to recognize and reward schools for academic achievement and for closing the achievement gap. Awards will be established for schools attaining high levels of absolute performance, for schools attaining high rates of growth, and for schools making substantial progress in closing the achievement gap between disaggregated groups. The award program must base improved performance on longitudinally matched student data and may include such additional criteria as:
> (1) student attendance;
> (2) teacher attendance;
> (3) graduation rates; and
> (4) other factors promoting or maintaining high levels of achievement and performance. Schools shall be rewarded according to specific criteria established by the division. In defining eligibility for a reward for high levels of performance, student performance should exceed expected levels of improvement. The State Board of Education shall promulgate regulations to ensure districts of the State utilize these funds to improve or maintain exceptional performance according to their school's plans established in Section 59-139-10. Funds may be utilized for professional development support.
> Special schools for the academically talented are not eligible to receive an award pursuant to the provisions of this section unless they have demonstrated improvement and high absolute achievement for three years immediately preceding.

The law requires the State Board of Education, working with the Division of Accountability within the EOC and the Department of Education, to establish the criteria for the program. The law expressly also states that schools will be awarded for academic achievement and for closing the achievement gap with awards established for schools:

1. Attaining high levels of absolute performance and high rates of growth (general performance); and
2. Making substantial progress in closing the achievement gap.

In 2008 the EOC revised the criteria for the program accordingly. Schools meeting the criteria for general performance may receive a Palmetto Gold or Silver Award for general performance based on the criteria in use since the inception of the Palmetto Gold and Silver Award program. However, schools meeting the criteria for closing the gap may receive a Palmetto Gold or Silver

Award for closing the achievement gap. The EOC in 2008 projected that approximately 356 schools would receive awards based on the new criteria.

Palmetto Gold and Silver Awards for General Performance Criteria

The criteria used to recognize Palmetto Gold and Silver awards for annual ratings in 2009 through 2011 were as follows:

- A school with an Excellent rating in Absolute performance received a Gold Award for high levels of academic performance as long as its Growth Rating was equal to or above Average.
- A school with an Excellent rating in growth received a Gold Award for high levels of growth as long as its absolute performance rating was above At Risk.
- A school with a Good rating in growth received a Silver Award for good growth results as long as its absolute performance rating was above At Risk.

In addition schools qualified for a Silver Award for steady growth over at least two consecutive years:

- Growth index of Good or better for two years
- Growth index of Average or better for two years

Table 1
Gold and Silver Awards Criteria

Absolute Performance Rating	Growth Rating	Award Designation	Steady Growth
Excellent	Excellent	Gold	
Excellent	Good	Gold	
Excellent	Average	Gold	
Good	Excellent	Gold	
Good	Good	Silver	
Average	Excellent	Gold	
Average	Good	Silver	
Below Average	Excellent	Gold	
Below Average	Good	Silver	
		Silver	Good or better Growth for **2** Years
		Silver	Average or better Growth Rating for **3** years

<u>Palmetto Gold and Silver Award for Closing the Achievement Gap</u>

An elementary or middle school earns a Silver award if the end of year performance in English language arts (ELA) <u>or</u> mathematics or growth in achievement by at least one historically underachieving group meets or exceeds the performance of historically high achieving students. A high school that has a growth in the graduation rate by at least one historically underachieving group meets or exceeds the annual growth rate needed to meet the state high school graduation rate goal of 88.3% by 2014 may earn a Silver award.

An elementary or middle school earns a Gold award if the end of year performance in <u>both</u> English language arts (ELA) and mathematics by at least one historically underachieving group

meets or exceeds the performance of historically high achieving students. A high school earns a Gold award if the graduation rate of at least one historically underachieving group of students meets or exceeds the statewide graduation rate of historically high achieving students.

Results and Questions

Table 2 and 3 document the number of schools that received a Gold or Silver Award or EOC Closing the Gap Award since 2001 by category.

The number of schools qualifying for Palmetto Gold and Silver in 2011-12 as compared to the number of schools qualifying in 2008-09 has doubled. In 2011-12 approximately 72 percent of all schools qualified for the award. There were 1,180 school report cards issues in 2011. The primary reason for the increase was due to the “steady growth” criteria. Schools that had a Good or better Growth rating for two years or schools and schools that had an Average or better Growth for three years qualified as Silver Award winners. Is the increase also due to more schools having an absolute rating of Below Average yet Excellent growth ratings? In 2011-12 there were three schools that were a Palmetto Gold award winner in 2011 for having a growth rating of Excellent and an Absolute rating of Below Average. Finally, the number of schools qualifying for Closing the Gap is relatively consistent over time. In 2011-12 39 of the 852 schools received an award solely due to meeting the Closing the Gap criteria.

The Academic Standards and Assessment Subcommittee must determine the following:

1. Since the number of schools qualifying for the Closing the Gap award seem to be relatively consistent over time, should the criteria for determining the general performance of the award be amended? And, if so, how should the criteria be changed?

2. When should any revisions to the criteria be implemented? Should the criteria apply for the next release of the school and district report cards?

3. In the 2012-13 General Appropriation Bill as passed by the House, the EIA line item appropriation for Palmetto Gold and Silver was eliminated. In fact, due to budget restraints, the appropriation for the program has been suspended for the past three years. If no funds are appropriated for the Palmetto Gold and Silver award winners for monetary compensation, how can the recognition program continue to be publicized and evidence of the improvement strategies and programs that led to the student academic gains of the award winners duplicated throughout the state, and at what cost?

To assist the Subcommittee in its deliberations, the Accountability Division, in consultation with the South Carolina Department of Education, is providing the following three alternative models and simulations. All simulations were provided by Dr. Ling Gao, Education Associate, at the South Carolina Department of Education.

Table 2
Schools Receiving Palmetto Gold or Silver Award / EOC Closing the Gap Award

Year	Award Category	Number of Schools Receiving Gold Award	Number of Schools Receiving Silver Award	Total Number of Schools Receiving Award	Total Number of Schools Being Recognized for General Performance and /or for Closing the Achievement Gap	Number of Elementary and Middle Schools Receiving EOC Award for Closing the Achievement Gap
2001-02	General Performance	198	100	298	NA	NA
2002-03	General Performance	198	92	290	NA	87
2003-04	General Performance	229	77	306	NA	107
2004-05	General Performance	285	135	418	NA	132
2005-06	General Performance	187	125	312	NA	138
2006-07	General Performance	163	147	310	NA	135
2007-08	General Performance	114	126	240	NA	141
2008-09	General Performance	162	149	311	403	NA
	Closing Achievement Gap	79	163	242		NA
2009-10 *	General Performance	211	129	340	403	NA
	Closing Achievement Gap	66	150	216		NA
2010-11**	General Performance	297	200	497	551	NA
	Closing Achievement Gap	55	243	298		NA
2011-12***	General Performance	339	476	812	852	NA
	Achievement Gap	76	165	241		NA

* Based on 2009 report card release
** Based on 2010 report card release
*** Based on 2011 report card release

Table 3

Distribution of Award Levels for General Performance and/or for Closing the Achievement Gap, 2009-2010, 2010-11 and 2011-12

Award for		Number of Schools (%)		
General Performance	**Closing the Achievement Gap**	**2009-10**	**2010-11**	**2011-12**
Gold	Silver	59 (14.6)	135 (26.1)	99 (11.6)
Silver	Gold	8 (2.0)	8 (1.6)	7 (0.8)
Silver	Silver	48 (11.9)	64 (12.4)	43 (5.0)
Gold	None	114 (28.3)	93 (18.1)	186 (21.8)
Silver	None	73 (18.1)	126 (24.4)	426 (50.0)
None	Gold	20 (5.0)	19 (3.7)	16 (1.9)
None	Silver	43 (10.7)	31 (6.0)	23 (2.7)
Total School Awards by the Program		**403**	**517**	**852**

Model 1

Performance Criteria:
Gold Award Criteria:

- A school with an Absolute rating of **Excellent** would receive a Gold Award for high levels of academic performance as long as its Growth Rating was **Average** or better.
- A school with a Growth rating of **Excellent** would receive a Gold Award for high levels of growth as long as its absolute performance rating was **Average** or better.
- A school earning a Gold award for Closing the Achievement Gap, with existing criteria unchanged.

Silver Award Criteria:

- A school with an Absolute rating of **Good** would receive a Silver Award if its Growth Rating was **Good** or **Average**.
- A School with a Growth rating of **Good** would receive a Silver Award if its Absolute rating was **Good** or **Average**.
- A school earning a Silver award for Closing the Achievement Gap, with existing criteria unchanged

What is Different:

Gold Award Criteria:

- Excludes schools with an Absolute rating of **Below Average** but **Excellent** Growth rating

Silver Award Criteria:

- Excludes schools with an Absolute rating of **Below Average** but Growth Rating of **Good**
- Excludes schools with **Good** or better Growth for 2 years or **Average** or better growth for 3 years

Model 1 **Number of Schools Recognized** **(with General Performance and Closing Achievement Gap)**			
Number of schools in both lists (Performance & Gap)	Number of schools selected (Performance Only)	Number of schools receive gap award ONLY	Total number of schools that would receive recognition with the program
217	378	43	**638**

Model 1 Distribution of Schools That Would Be Recognized) by Absolute, Growth Ratings, and School Type								
Award Category	Absolute Rating	Growth Rating	Elementary	Middle	High	Career Center	State Special	Total
Gold	Excellent	Excellent	129	45	35	7	3	219
Gold	Excellent	Good	29	7	31	7	3	77
Gold	Excellent	Average	8	1	10	1		20
Gold	Good	Excellent	11	9	5	2		27
Gold	Average	Excellent	12		5			17
Total Gold			189	62	86	17	6	**360**
Silver	Good	Good	52	28	2			82
Silver	Good	Average	61	10	9			80
Silver	Average	Good	44	32	9	1		86
Silver Total			**157**	**70**	**20**	**1**	**0**	**248**
Grand Total			346	132	106	18	6	**608**

Model 1

	GROWTH RATING					
ABSOLUTE RATING	Excellent	Good	Average	Below Average	At Risk	**TOTAL**
Excellent	**GOLD**	**GOLD**	**GOLD**			**316**
	219	**77**	**20**			
Good	**GOLD**	**SILVER**	**SILVER**			**189**
	27	**82**	**80**			
Average	**GOLD**	**SILVER**				**103**
	17	**86**				
Below Average						
At Risk						
						608

Gold	**360**
Silver	**248**
TOTAL:	**608**

Model 2

Performance Criteria:

Gold Award Criteria:

- A school with an Absolute rating of **Excellent** and a Growth Rating of **Good** or **Excellent** would receive a Gold Award.
- A school earning a Gold award for Closing the Achievement Gap, with existing criteria unchanged.

Silver Award Criteria:

- A school with an Absolute rating of **Good** and a Growth Rating of **Good** or **Excellent** would receive a Silver Award.
- A school earning a Silver award for Closing the Achievement Gap, with existing criteria unchanged

Model 2 **Number of Schools Recognized** **(with General Performance and Closing Achievement Gap)**			
Number of schools would be recognized for General Performance AND for Closing Achievement Gap	Number of schools would be recognized for General Performance only	Number of schools receive Closing Achievement Gap only	Total number of schools that would receive recognition with the program
161	**232**	**85**	**478**

Model 2 **Distribution of Schools That Would Be Recognized** **by Absolute, Growth Ratings, and School Type**								
Award Category	Absolute Rating	Growth Rating	Elementary	Middle	High	Career Center	State Special	Total
Gold	Excellent	Excellent	129	45	28	7	3	212
Gold	Excellent	Good	29	7	22	9	3	70
Total Gold			**158**	**52**	**50**	**16**	**6**	**282**
Silver	Good	Excellent	11	3	9	2	0	25
Silver	Good	Good	52	32	2	0	0	86
Silver Total			**63**	**35**	**11**	**2**	**0**	**111**
Grand Total			**221**	**87**	**61**	**18**	**6**	**393**

Model 2

	GROWTH RATING					
ABSOLUTE RATING	Excellent	Good	Average	Below Average	At Risk	**TOTAL**
Excellent	**GOLD**	**GOLD**				**282**
	212	**70**				
Good	**SILVER**	**SILVER**				**111**
	25	**86**				
Average						
Below Average						
At Risk						
						393

Gold	**282**
Silver	**111**
TOTAL:	**393**

Model 3

Gold Award Criteria:

- A school with an Absolute rating of **Excellent** would receive a Gold Award for high levels of academic performance as long as its Growth index was **Excellent** or **Good**.
- A school with a Growth rating of **Excellent** and Absolute **Good** would receive a Gold Award for high levels of growth.
- A school earning a Gold Award for Closing the Achievement Gap, with existing criteria unchanged.

Silver Award Criteria:

- A school with an Absolute rating of **Excellent** and a Growth rating of **Average** would receive a Silver Award.
- A school with a Growth rating of **Excellent** and an Absolute rating of Average would receive a Silver Award.
- A school with a Growth rating of **Good** and Absolute rating of **Good** would receive a Silver Award.
- A school earning a Silver Award for Closing the Achievement Gap, with existing criteria unchanged.

Model 3 **Number of Schools Recognized** **(with General Performance and Closing Achievement Gap)**			
Number of schools would be recognized for General Performance AND for Closing Achievement Gap	Number of schools would be recognized for General Performance only	Number of schools receive Closing Achievement Gap only	Total number of schools that would receive recognition with the program
175	**254**	**71**	**500**

Model 3 Distribution of Schools That Would Be Recognized by Absolute, Growth Ratings, and School Type								
Award Category	Absolute Rating	Growth Rating	Elementary	Middle	High	Career Center	State Special	Total
Gold	Excellent	Excellent	129	45	28	7	3	212
Gold	Excellent	Good	29	7	22	9	3	70
Gold	Good	Excellent	11	9	3	2	0	25
Gold	Average	Excellent	12	0	5	0	0	17
Total Gold			**181**	**61**	**58**	**18**	**6**	**324**
Silver	Excellent	Average	8	1	10	0	0	19
Silver	Good	Good	52	32	2	0	0	86
Silver Total			**60**	**33**	**12**	**0**	**0**	**105**
Grand Total			**241**	**94**	**70**	**18**	**6**	**429**

Model 3

	GROWTH RATING					
ABSOLUTE RATING	Excellent	Good	Average	Below Average	At Risk	**TOTAL**
Excellent	**GOLD**	**GOLD**	**SILVER**			
	212	**70**	**19**			
Good	**GOLD**	**SILVER**				
	25	**86**				
Average	**GOLD**					
	17					
Below Average						
At Risk						

Gold	**324**
Silver	**105**
TOTAL:	**429**

Additional Analysis

The EOC staff looked at several alternative proposals to reward consistent growth improvement. The staff looked at schools that had moved from one absolute rating to another each year for two consecutive years. The staff looked at using an unadjusted growth rating. The simulations only marginally impacted the number of schools that would qualify. The impact was insignificant. In addition, the staff looked at the following: How could the Palmetto Gold and Silver Award program also recognize consistent, outstanding Growth in student achievement? For Models 2 and 3, the following simulations were run:

If Model 2 were amended to also include the following:

Schools would also receive a Silver award for having three years of a Growth rating of Excellent or Good as long as the most recent absolute rating was Average or better. How many additional schools, schools that are not yet recognized under Model 2 would be recognized? Of these schools, how many are elementary, middle, high, vocational center, etc.?

If Model 3 were amended to include the following:

Schools would receive a Silver award for having three years of a Growth rating of Excellent or Good as long as the most recent absolute rating was Average or better. How many additional schools, schools that are not yet recognized under Model 3 would be recognized? Of these schools, how many are elementary, middle, high, vocational center, etc.?

The result was between 11 and 12 additional schools would qualify for a Silver award for having consistent growth improvement.

School Type	ADDENDUM Model 2	ADDENDUM Model 3
Elementary	11	10
Middle	1	1
High	0	0
Career Center	0	0
Special Schools	0	0
TOTAL	**12**	**11**

Summary

1. Table 4 below compares the three models. The staff recommends that the Subcommittee consider these three models for amending the criteria for the Palmetto Gold and Silver Award program along with any input provided by school district personnel. The data demonstrate that the percentage of schools by type that would qualify is consistent across all models.

Table 4
Comparison of Three Models

School Type	Current Criteria		Model 1		Model 2		Model 3	
	# of Schools	% of schools	# of Schools	% of schools	# of Schools	% of schools	# of Schools	% of schools
Elementary	511	60.0	346	56.9	221	56.2	241	56.2
Middle	214	25.1	132	21.7	87	22.1	94	21.9
High	102	12.0	106	17.4	61	15.5	70	16.3
Career Center	19	2.2	18	3.0	18	4.6	18	4.2
Special Schools	6	0.7	6	1.0	6	1.5	6	1.4
TOTAL	**852**		**608**		**393**		**429**	

Additional Silver Award Recipients
Consistent Growth

School Type	ADDENDUM Model 2	ADDENDUM Model 3
Elementary	11	10
Middle	1	1
High	0	0
Career Center	0	0
Special Schools	0	0
TOTAL	**12**	**11**

2. The staff recommends that additional analysis of the Palmetto Gold and Silver Award winners should be conducted by the South Carolina Department of Education. Not only should schools be recognized for academic achievement, but the student achievement of these schools should be analyzed. The analysis should also include looking at schools that close the achievement gap. For example, comparing Palmetto Gold and Silver award winners to comparable schools, “schools like ours” could potentially reveal initiatives, teacher recruitment and retention policies, or resource allocations that support the achievement gains. The information could be used to publicize effective reform strategies and promote statewide learning communities.

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 Interim Executive Director 803.734.6148.

2012

LONGITUDINAL ANALYSIS OF THREE YEARS OF PASS ACHIEVEMENT DATA

SC EDUCATION
OVERSIGHT COMMITTEE

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

Longitudinal Analysis of Three Years of PASS Achievement Data: 2009-2011

Executive Summary

This report is the first longitudinal study of Palmetto Assessment of State Standards (PASS) achievement data, similar in purpose to previous works that have documented the longitudinal trends of achievement data obtained from the Palmetto Achievement Challenge Test (PACT) assessment (EOC, 2006; EOC, 2005). The two major foci of this investigation are student retention and student academic achievement. The following results were found:

With respect to student retention:

- Retention was studied for grades 3, 4, 5, and 6 from 2009 to 2010.
- Approximately 96 percent of student records from 2009 were associated with records in 2010.
- The retention rate at each grade level is small, approximately 1 percent of students.
- Compared to promoted students, larger percentages of retained students are Male, African-American, have a Disability, and participate in the federal school lunch program.
- Based on the PASS data analyzed, academic benefits of retention for success at the next grade level were present from grade 3 to grade 4, but were minimal for all other grade transitions.

With respect to student achievement:

- Six cohorts were studied. A cohort consisted of students tested in all years, 2009 through 2011. Cohorts contained students tested in grades 3 through 5, 4 through 6, 5 through 7, and 6 through 8. Each cohort contained approximately 50,000 students.
- Differences in achievement by gender are present for Reading, but not for Mathematics.

- Students who receive free lunch achieve at substantially lower levels than do full-pay lunch students. Reduced lunch students achieve midway between these groups.
- Students who receive free lunch gain much less from one year to another than full-pay students. This trend ensures that these students will continue to achieve at lower levels.
- The patterns of achievement for students separated by grade 3 achievement levels are similar to the patterns of achievement obtained from PACT for students identified similarly.

Longitudinal Analysis of Three Years of PASS Achievement Data: 2009-2011

This report is the first longitudinal study of Palmetto Assessment of State Standards (PASS) achievement data, similar in purpose to previous works that have documented the longitudinal trends of achievement data obtained from the Palmetto Achievement Challenge Test (PACT) assessment (EOC, 2006; EOC, 2005). The two major foci of this investigation are student retention and student academic achievement.

Students are retained with the intent of providing additional academic instruction that will improve student academic performance at the current grade level and at subsequent grade levels. When students are retained, however, additional educational costs are incurred because the student will spend an additional year in school. Long term societal costs may be lower, however, if retention does improve academic achievement in a way that enhances employability. Other studies have shown that retention increases the probability that a student will drop out of school. Student retention was investigated in grades 3 through 6 to determine the overall rates of retention, whether students in some demographic groups are retained at higher rates than others, and whether retention appears to be beneficial to student achievement.

Summary information of student achievement as measured by the PASS assessment is used to provide information regarding the relative achievement levels of schools and districts, of groups of students within schools and districts, and to monitor achievement over time. In this investigation, patterns of achievement across grades are presented for all students, and for students with different initial achievement levels. Patterns in student achievement are presented and interpreted with respect to selected student characteristics. To further explain some differences in achievement by demographic group, analyses of changes in PASS scores from one year to another are also presented.

The data used in this study were obtained from PASS assessment administrations in 2009, 2010, and 2011. The data used to investigate student retention differed from the data used to investigate academic achievement. To examine trends of student achievement, four student cohorts were created. A cohort is a group of students who were tested in each year (2009 through 2011) and were promoted each year. Students who were retained were not included in a cohort. The first cohort tested in grade 3 in 2009, grade 4 in 2010, and grade 5 in 2011; the second cohort tested in grade 4 in 2009, grade 5 in 2010, and grade 6 in 2011; the third and fourth cohorts were defined similarly, with Spring 2009 testing in grades 5 and 6, respectively. These cohorts will referred to using the combination of grade levels at which students are tested. For example the first cohort will be referred to as the 3-4-5 cohort, and the second cohort as the 4-5-6 cohort, etc.

To examine student retention, data from 2009 and 2010 were used, so that as much as possible, the same students were used to examine retention as were used to examine academic achievement . For all students tested in grades 3 through 6 in Spring 2009 the grade level at which students were tested in the Spring of 2010 was obtained. Students who tested at the same grade level in Spring of 2009 and Spring of 2010 were assumed to be retained, and students tested at the next higher grade level in Spring of 2010 were assumed to have been promoted. Retention, then, was studied at each grade level from 3 through 6.

Table 1 presents summary information regarding the data used to examine retention and academic achievement. Notice that the cohort 3-4-5 contains fewer students than does the data on which retention was studied in grade 3. Each cohort always contains fewer students than the retention data, because the cohort only includes students for whom PASS assessment information could be obtained from all three years (2009, 2010, and 2011), and who were promoted each year. Although differences between the demographic composition of a cohort differs only slightly from the demographic

composition of the corresponding retention data, the following trends can be observed. The percentage of students identifying their racial/ethnic group as Other is always larger in a cohort than in the corresponding retention data, and the percentages of all other racial/ethnic groups is smaller in a cohort than in the corresponding retention data. Also, the percentage of Female students is consistently higher in a cohort than in the corresponding retention data. Finally, the percentage of students receiving free lunch is smaller in a cohort than in the corresponding retention data and the percentage of students paying for lunch is larger in a cohort than in the corresponding retention data.

Table 1. Demographic Characteristics of Each Grade Group and Cohort.

Racial/Ethnic Group	Retention Grade 3 (55,216)	Cohort 3-4-5 (52,368)	Retention Grade 4 (53,619)	Cohort 4-5-6 (50,572)	Retention Grade 5 (52,821)	Cohort 5-6-7 (49,899)	Retention Grade 6 (52,311)	Cohort 6-7-8 (48,985)
African-American	37.9	36.5	37.1	36.0	37.5	36.1	37.8	35.81
Hispanic	6.0	5.4	**5.4**	4.9	5.4	4.9	5.0	4.4
Other	3.0	6.8	2.8	6.6	2.6	6.6	2.6	6.6
White	53.1	51.3	54.7	52.5	54.6	52.5	54.6	53.1
Gender								
Female	49.2	49.4	48.8	49.0	48.7	49.0	48.4	49.1
Male	50.8	50.6	51.2	51.0	51.3	51.0	51.6	50.9
Lunch Status								
Free	50.2	49.6	48.9	48.5	48.0	47.5	46.7	45.5
Reduced	7.8	7.9	8.1	8.5	8.3	8.5	8.1	8.2
Full Pay	42.0	42.6	43.0	44.1	43.7	44.1	45.2	46.3

Retention

As previously described, to examine student retention all students tested in Spring 2009 were matched with students tested in Spring 2010. Students who were tested at the same grade level in Spring 2009 and Spring 2010 were assumed to be retained, and students who were tested one grade higher in Spring

2010 than in Spring 2009 were assumed to be promoted. Some students were tested in Spring 2009 and could not be identified in the Spring 2010 testing file (attrition). These students may have:

1) Moved to a non-public school in South Carolina;
2) Moved out-of-state;
3) Been tested using alternative assessments in 2010;
4) Been promoted two grade levels for 2010; or
5) Been excluded because inconsistent student information prevented student identification in both 2009 and 2010.

What are the rates of retention among each cohort?

Table 2 presents information regarding retention rates, promotion rates, and attrition rates for each of the four cohorts. Retention rates within the cohorts range from one half of one percent (0.5) for cohort 5-6-7 to slightly more than one percent (1.3) for cohort 6-7-8. The observed differences can be interpreted in different ways. From one perspective, because the largest retention rate among the cohorts is very small, differences among these rates may not be of great consequence, as the number of students retained within any of the cohorts is small. From a second perspective, although the overall retention rate is small, the largest retention rate (1.3 percent) is more than twice the smallest retention rate (0.5 percent).

Table 2. Promotion, Retention, and Attrition by Cohorts

		Promotion		Retention		Attrition	
Initial Grade	N in 2009	Number	Percent	Number	Percent	Number	Percent
3	55216	52158	94.5	606	1.1	2452	4.4
4	53619	50873	94.9	378	0.7	2368	4.4
5	52821	49937	94.5	286	0.5	2598	4.9
6	52311	49204	94.1	659	1.3	2448	4.7

Are larger percentages of students in some demographic groups retained than promoted?

Table 3 presents data that allow comparison between the percentage of each demographic group among retained students to the percentage of the same demographic group among students who were promoted. For example, among students in grade 3 in Spring 2009, the percentage of retained students who are male is 59.9 (+/-4.0), and the percentage of students who were promoted that are male is 50.7. Because the number of retained students is small, the percentage of each demographic group among retained students is presented with an estimate of how much the percentage may be in error. Because the number of students promoted is large, the errors are small and are not presented.

The following summary statements can be made:

- Across grades, a larger percentage of the retained students is male compared to the promoted students.
- Compared to promoted students, a larger percentage of retained students are African-American, are students with disabilities, and receive either free or reduced lunch.
- Smaller percentages of the retained students are enrolled in gifted and talented programs.
- The percentages of retained and promoted students that are Hispanic do not differ.
- The percentages of students who are not native English speakers also do not differ.

Table 3. Percentage of Students Among Retained and Not Retained Students for Each Cohort.

Percent of Students who are…	Initial Grade	Retained	Promoted*
Male	3	59.9 (+-4.0)	50.7*
	4	58.5 (+-5.0)	51.0*
	5	67.5 (+-5.6)	51.1*
	6	71.1 (+-3.6)	51.1*
African-American	3	57.8 (+-4.0)	38.2*
	4	52.5 (+-5.2)	37.4*
	5	52.1 (+-6.0)	37.9*
	6	56.8 (+-3.8)	37.9*
Hispanic	3	5.1 (+-1.8)	5.8
	4	4.2 (+-2.0)	5.2
	5	4.9 (+-2.6)	5.2
	6	3.5 (+-1.4)	4.8
Students with Disabilities	3	26.1 (+-3.6)	14.0*
	4	27.0 (+-4.6)	13.3*
	5	26.2 (+-5.2)	13.2*
	6	16.4 (+-2.8)	12.3*
Student with non-Speech Disability	3	17.8 (+-3.2)	8.9*
	4	19.8 (+-4.6)	9.9*
	5	23.8 (+-5.0)	11.2*
	6	15.0 (+-2.8)	11.5*
Non-English Speaker	3	96.3 (+-1.6)	94.1*
	4	96.3 (+-2.0)	94.6
	5	95.3 (+-2.4)	94.9
	6	96.9 (+-1.4)	95.3*
Gifted-Academic or Artistic	3	0.2 (+-0.4)	9.7*
	4	0.5 (+-0.8)	16.2*
	5	0.0	18.8*
	6	1.5 (+-1.0)	18.7*
Free or Reduced Lunch	3	84.1 (+-3.0)	57.5*
	4	80.3 (+-4.0)	56.7*
	5	74.5 (+-5.6)	56.3*
	6	82.0 (+-3.0)	54.2*

* Indicates a statistically significant difference between percentages for retained and not-retained students.

Does retention increase student achievement the next year at the same grade level?

Students are retained in the belief that providing additional academic instruction will better master the content and skills of the current grade level in order to provide a more firm academic foundation for

future academic work. Table 4 presents information that indicates that students do increase their achievement levels when assessed the second year in a repeated grade. Larger gains are made for Mathematics than for Reading, however, students also initially scored lower for Mathematics than for Reading.

Table 4. Percent of Repeating Students with Each Report Card Weight on First and Second Years in the Same Grade – Reading and Mathematics.

	Reading		Mathematics	
Report Card Weight	2009	2010	2009	2010
	Grade 3		Grade 3	
Not Met 1	21.8	7.2	60.2	15.2
Not Met 2	52.1	29.0	30.9	36.0
Met	25.1	43.7	8.6	38.3
Exemplary 4	0.5	10.1	0.4	7.2
Exemplary 5	0.5	10.0	0.0	3.3
Number of Students	570	572	570	572
	Grade 4		Grade 4	
Not Met 1	39.7	20.0	57.2	25.4
Not Met 2	30.0	25.1	18.1	22.0
Met	26.9	43.7	23.5	45.1
Exemplary 4	3.1	6.2	1.1	3.7
Exemplary 5	0.3	5.1	0.0	3.9
Number of Students	39.7	20.0	353	355
	Grade 5		Grade 5	
Not Met 1	34.1	24.8	57.9	28.3
Not Met 2	25.8	20.2	19.4	27.5
Met	37.7	46.9	21.8	37.6
Exemplary 4	2.0	3.5	0.8	5.0
Exemplary 5	0.4	4.7	0.0	1.6
Number of Students	252	258	252	258
	Grade 6		Grade 6	
Not Met 1	38.6	26.2	60.5	38.8
Not Met 2	33.1	27.2	19.2	18.5
Met	25.6	33.8	18.6	36.7
Exemplary 4	2.0	7.1	1.4	3.6
Exemplary 5	0.8	5.7	0.4	2.3
Number of Students	511	523	511	523

For Reading, 21.8 percent of students scored Not Met 1 in their first year in grade 3, and only 7.2 percent scored Not Met 1 in the second year at the same grade. In grades 4, 5, and 6, 34.1 to 39.7

percent of students scored Not Met 1 in their first year, and 20.0 to 26.2 percent of students scored Not Met 1 in the second year at the same grade. For Mathematics, from 57.2 to 60.5 percent of students scored Not Met 1 in their first year, and from 15.2 to 38.8 percent of students scored Not Met 1 in the second year at the same grade level.

Does retention increase student achievement at the next grade level?

Students are also retained in the belief that providing additional academic instruction will increase student academic achievement in future grades. A grade 3 student, for example, is retained with the hope and/or belief that an additional year of study in grade 3 will both provide greater mastery of the content and skills associated with the third grade curriculum and allow the student to be more successful with the knowledge and skills associated with the grade four curriculum. The next comparison made was between the levels of achievement obtained in grade 4 for students who were retained in grade 3 and the levels of achievement in grade 4 for students who were promoted after their first enrollment in grade 3. In order to make a fair comparison, students who scored at the level Not Met 1 who were retained were compared to students who scored at the Not Met 1 level who were promoted, and students who scored at the level Not Met 2 who were retained were compared to students who scored at the Not Met 2 level who were promoted. The same comparisons were made for each 2009 grade level. All results are presented in Table 5.

The results presented in Table 5 suggest that while modest gains are made from grade 3 to 4, gains made from grades 4 to 5, 5 to 6, and 6 to 7 are minimal. The percentage of students scoring Not Met at the next grade level is smaller among students who repeated a grade than among students who were promoted. Consider for example student progress from grade 3 to 4 for students who scored at the level Not Met 1 in Spring of 2009 on the Reading test. In grade 4, among retained students 69.1 percent scored at the level Not Met, while among promoted students 88.4 percent score at the level Not Met, a

difference of 19.3 percent. As students move from grade 4 to 5, 74.9 percent of retained students scored Not Met, and 80.0 percent of promoted students scored Not Met, a difference of 5.1 percent. The difference between the percentages of retained and promoted students scoring Not Met is 3.9 from grade 5 to 6. From grade 6 to 7, the difference between the percentages of retained and promoted students scoring Not Met is 9.9 percent. The overall trend is that with each higher grade level the benefits of retention do not appear to be as large.

A slightly different pattern is evident when considering students who initially scored Not Met 2. For Grade 3 to 4 a smaller percentage of retained students scored Not Met 1 (17.9) than did promoted students (25.5); however for all other grade levels the percentage of students scoring Not Met 1 is larger among retained students than among promoted students. The only grade for which any advantage appears for retaining students is grade 3.

Similar results are obtained for Mathematics (Table 6). For students progressing from grade 3 to 4, the percentage of retained students scoring Not Met is 46.8 percent, and the percentage of promoted students scoring Not Met 1 is 80.2 percent, a 33.4 percent difference. From grade 4 to 5 there is an 11.3 percent difference, from grade 5 to 6 there is an 8.5 percent difference, and from grade 6 to 7 there is a 10.5 percent difference.

The pattern for students who initially scored Not Met 2 is the same for Mathematics as for Reading. From grade 3 to 4 a smaller percentage of retained students scored Not Met 1 at the next grade, but for all other grade transitions, the percentage of retained students who scored Not Met 1 at the next grade level is higher.

Table 5. Percent of Students with Each Report Card Weight by Initial Report Card Weight in Spring 2009 and Grade Retention Status – Reading.

	Not Met 1		Not Met 2	
Final Report Card Weight	Retained	Promoted	Retained	Promoted
	Grade 3 to Grade 4			
Not Met 1	32.5	57.7	17.9	25.5
Not Met 2	36.6	30.7	31.3	37.6
Met	29.3	11.0	46.5	34.3
Exemplary 4	1.6	0.4	4.0	1.9
Exemplary 5	0.0	0.2	0.3	0.7
Number of Students	123	2304	297	8671
	Grade 4 to Grade 5			
Not Met 1	50.4	53.1	24.5	22.4
Not Met 2	24.5	26.9	20.8	27.6
Met	23.7	19.1	49.1	46.7
Exemplary 4	1.4	0.5	3.8	2.1
Exemplary 5	0.0	0.4	1.9	1.2
Number of Students	139	4746	106	7191
	Grade 5 to Grade 6			
Not Met 1	63.5	62.9	35.4	30.1
Not Met 2	29.4	26.1	30.8	38.0
Met	7.1	10.5	29.2	29.8
Exemplary 4	0.0	0.3	4.6	1.3
Exemplary 5	0.0	0.2	0.0	0.8
Number of Students	85	4273	65	4760
	Grade 6 to Grade 7			
Not Met 1	60.4	63.9	29.0	26.1
Not Met 2	20.8	27.2	32.0	40.1
Met	16.8	8.0	34.3	30.1
Exemplary 4	1.0	0.7	3.6	2.9
Exemplary 5	1.0	0.2	1.2	0.8
Number of Students	197	4456	169	7730

Table 6. Percent of Students with Each Report Card Weight by Initial Report Card Weight in Spring 2009 and Grade Retention Status – Mathematics.

	Not Met 1		Not Met 2	
Final Report Card Weight	Retained	Promoted	Retained	Promoted
	Grade 3 to Grade 4			
Not Met 1	29.7	54.9	11.9	18.3
Not Met 2	27.1	25.3	16.5	25.3
Met	39.9	19.2	66.5	53.3
Exemplary 4	3.2	0.4	2.8	2.6
Exemplary 5	0.0	0.2	2.3	0.6
Number of Students	343	6576	176	9260
	Grade 4 to Grade 5			
Not Met 1	52.7	59.2	25.0	27.0
Not Met 2	23.9	28.7	26.6	38.5
Met	21.9	11.7	46.9	33.5
Exemplary 4	1.5	0.3	1.6	0.9
Exemplary 5	0.0	0.1	0.0	0.1
Number of Students	201	6489	64	4406
	Grade 5 to Grade 6			
Not Met 1	53.4	67.3	32.7	34.2
Not Met 2	24.0	18.6	20.4	26.2
Met	22.6	13.8	44.9	38.8
Exemplary 4	0.0	0.2	2.0	0.7
Exemplary 5	0.0	0.1	0.0	0.1
Number of Students	146	6981	49	5004
	Grade 6 to Grade 7			
Not Met 1	61.2	70.5	33.7	37.5
Not Met 2	16.2	17.4	22.5	28.4
Met	21.0	11.9	39.8	33.2
Exemplary 4	1.3	0.3	4.1	0.8
Exemplary 5	0.3	0.1	0.0	0.1
Number of Students	309	7360	98	5267

Do these results imply that retention is an effective strategy for low achieving students?

An extensive body of work exists that examines the effectiveness of student retention on both the academic and social/emotional well-being of students at later points in a student's life. Jimerson, Ferguson, Whipple, Anderson, and Dalton examined students who were retained in kindergarten, grade 1, or grade 2 through grade 11[1]. They conclude that retention may be an ineffective strategy to address social/emotional issues of self-esteem and aggression students may have that impact student learning. Wu, West, and Hughes found both academic and social/emotional advantages to retention for three years following the retention, however, warned that longer term effects may not be as clearly advantageous[2]. They describe a "struggle-succeed-struggle" cycle, where retained students struggle when addressing new information, and where social acceptance and student identification/participation with school also follows an inconsistent pattern. Before student retention is accepted as a solution for all struggling students, a more thorough study of the contexts in which student retention is successful should be undertaken. Johnson and Rudolph have also concluded that retention gains are small and tend to diminish within three years[3]. Karweit notes "the consensus of several extensive reviews of grade retention is that there is not a positive effect for grade retention on academic achievement or on student personal adjustment" (p. 4)[4].

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[1]Jimerson, Shane R, Phillip Ferguson, Angela Whipple, Gabrielle E Anderson, and Michael J Dalton. "Exploring the Association Between Grade Retention and Dropout: A Longitudial Study Examining Socio-Emotional, Behavioral, and Achievement Characteristics fo Retained Students." *The Califorinia School Psychologist, Vol. 7*, 2002: 51-62.

[2]Wei Wu, Stephen G. West, Jan N. Hughes. 2010. "Effect of Grade Retention in First Grade on Psychosocial Outcomes." *J Educ Psychol*. 102(1): 135-152.

[3]Johnson, D., and Rudolph, A. (2001). *Critical Issue: Beyond Social Promotion and Retention—Five Strategies to Help Students Succeed*. Naperville, IL: Learning Point Associates, www.learningpt.org.

[4]Karweit, N. L. *Repeating a grade: Time to grow or denial of opportunity?* Baltimore: Center for Research on Effective Schooling for Disadvantaged Students, 1991.

To summarize the findings with respect to student retention:

- The retention rate at each grade level is small, approximately 1 percent of students.
- Compared to promoted students, larger percentages of retained students are Male, African-American, have a Disability, and participate in the federal school lunch program.
- Based on the PASS data analyzed, academic benefits of retention for success at the next grade level were present from grade 3 to grade 4, but were minimal for all other grade transitions.

Academic Achievement

Three aspects of academic achievement were investigated. First overall trends in achievement were obtained for each cohort for both Reading and Mathematics. Patterns in achievement were examined by gender and by participation in the federal school lunch program. Second, patterns in achievement were examined conditioned on first year achievement level. Finally, gains in achievement were examined by lunch program status and are also presented. In this study, academic achievement is measured in two ways; one is by the percentage of students scoring at the levels Met or Exemplary on PASS, and the second is by the mean (average) of the report card weights associated with each student's test score. The report card weights associated with student achievement range from 1 (Not Met 1) to 5 (Exemplary 5).

What are the patterns of achievement for all students, by gender, and by lunch status?

Figures 1 and 2 present the PASS performance for each cohort in Reading and Mathematics, respectively, where the percent of students scoring Met or Exemplary is on the vertical (Y) axis, and the student grade level is on the horizontal (X) axis. Although there is no cohort from grade 3 through 8 for this study, presenting all cohorts on one graph provides a visual that emulates what might be observed for a grade 3 through 8 cohort. For Reading, the percent of students scoring Met or Exemplary appears

to decrease as grade level increase, while for Mathematics the percent of students scoring Met or Exemplary appears to be irregular, increasing from grade 3 to 4, and decreasing from grade 4 through 8.

To determine progress in student achievement over time, each year's cohorts can be compared to the patterns of achievement of these initial cohorts. If achievement increases, cohorts at a later time will have higher percentages of students achieving the level Met, and if achievement decreases, later cohorts will have lower percentages of students achieving the level Met. Analyses that monitor and evaluate differences between future cohorts and the current cohort over time may provide the most insightful evidence for whether student achievement increases or decreases over time. The patterns of achievement observe in the present cohorts, then, may best be viewed as "baseline" achievement patterns to be used as reference for future achievement.

Figure 1. Pass Reading Performance for All Cohorts.

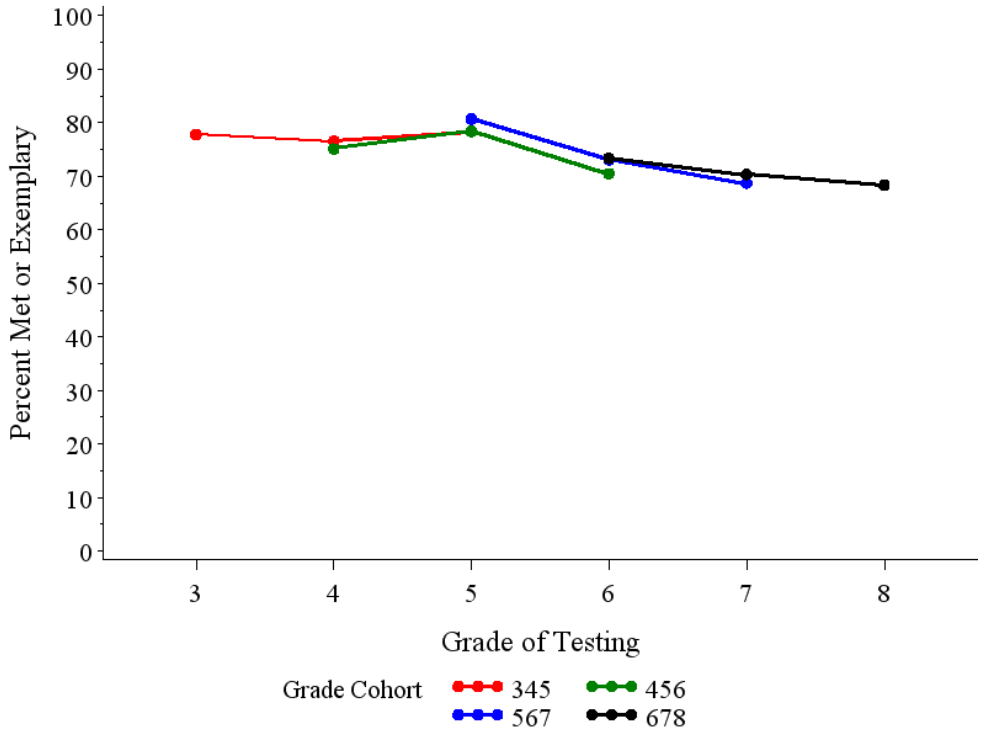
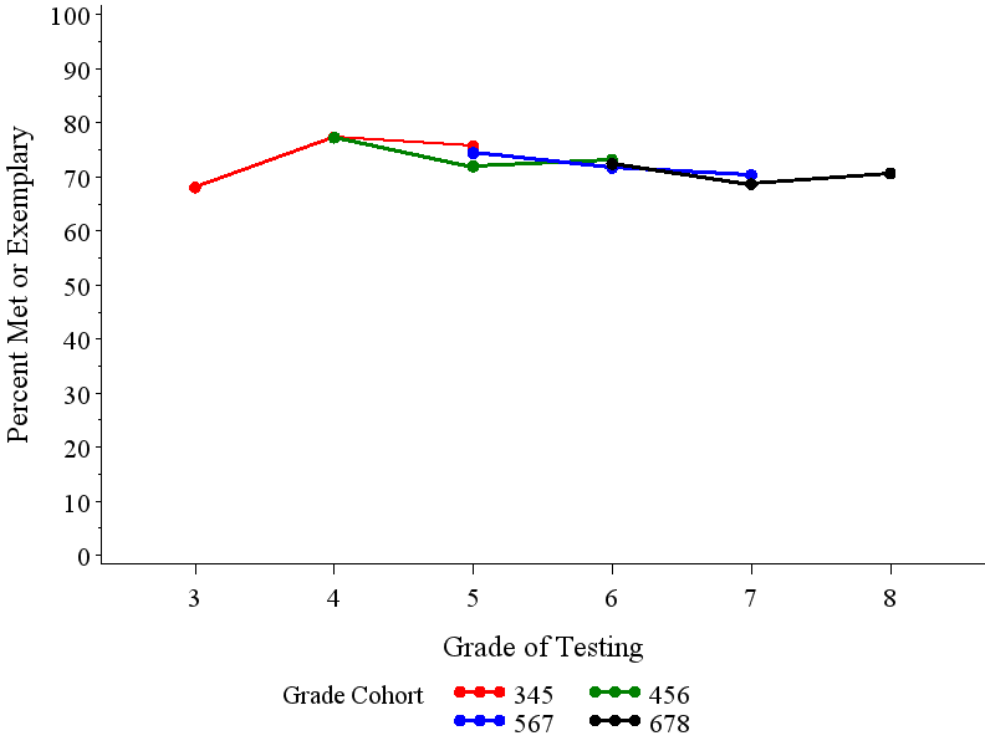


Figure 2. PASS Mathematics Performance for All Cohorts.



The relative achievement levels by gender and lunch status can be observed by graphing the percentages of students Met or Exemplary for each group of students. Approximately 10 percent more females score at the level Met or Exemplary for Reading, and this difference appears to consistent across grade level and cohorts (Figure 3). Differences between males and females are not as consistent across cohorts for the Mathematics test (Figure 4). At grades 3 and 4, differences between males and females appear to be minimal. At grades 5 through 8, females score 5-10 points higher than males, though the pattern differs both within and between cohorts.

Figure 3. PASS Reading Performance for all Cohorts by Gender.

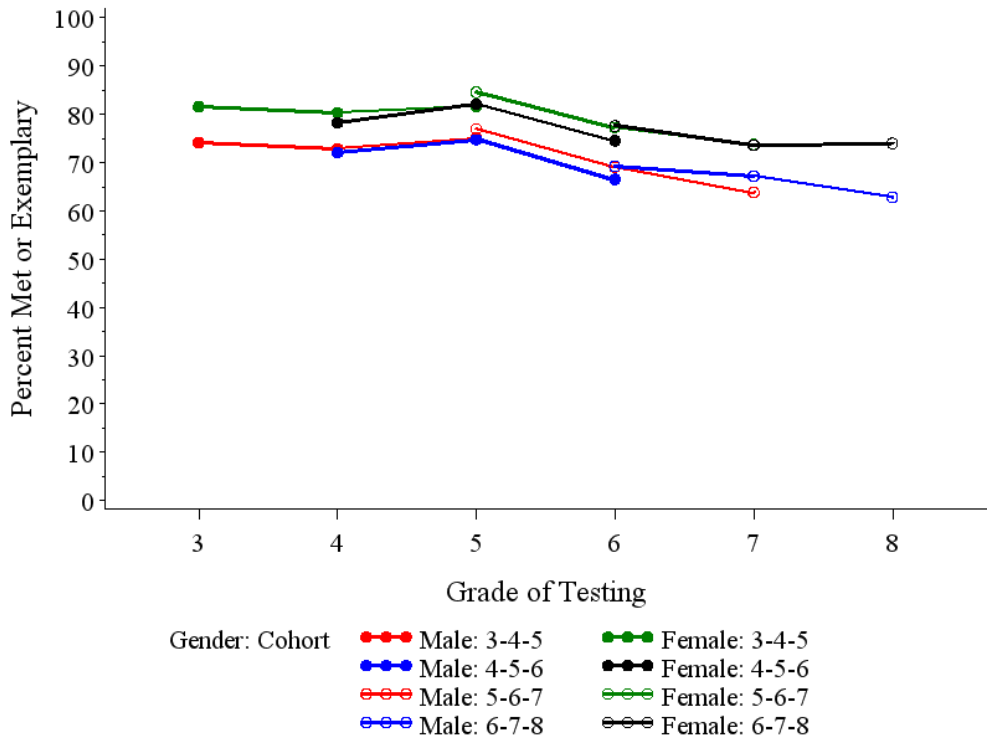
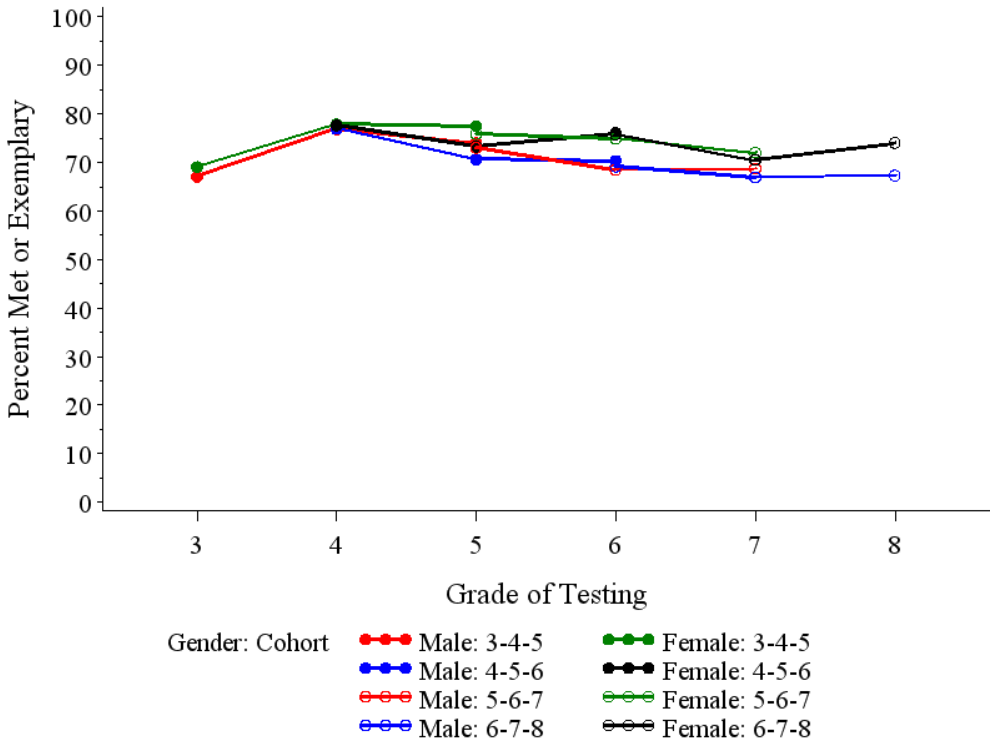


Figure 4. PASS Mathematics Performance for all Cohorts by Gender



Examining the pattern achievement by school lunch program status reveals that full-pay lunch students consistently score the highest, followed by students who receive reduced lunch rates. Students who receive free lunch demonstrate the lowest academic performance. This trend is present for both Reading (Figure 5) and Mathematics (Figure 6), and is consistent for each cohort. Approximately 12 percent more full-pay lunch students score at the level Met or Exemplary than do students who have reduced lunch rates. Approximately 15 percent fewer students who receive free lunch score Met or Exemplary than do students who have reduced lunch rates. The difference between the achievement of full-pay lunch students and students who receive free lunch appears to be slightly more than 20 percent for Reading, and appears to slightly larger for Mathematics.

Figure 5. PASS Reading Performance for all Cohorts by Lunch Status

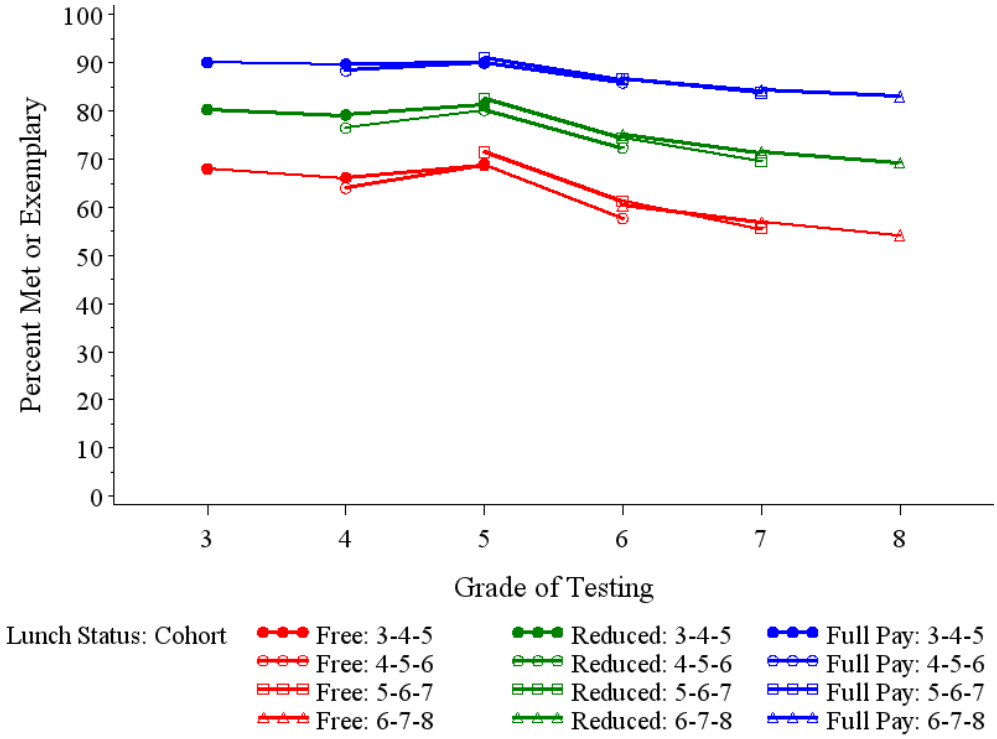
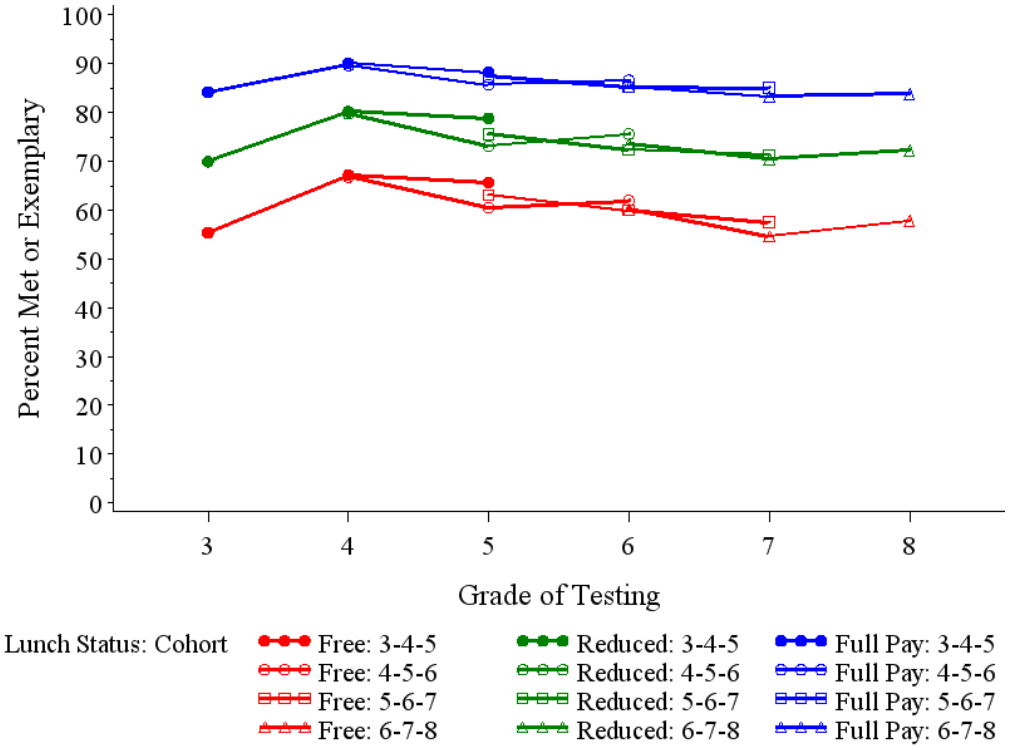


Figure 6. PASS Mathematics Performance for all Cohorts by Lunch Status.



Can the observed differences in achievement by lunch status be explained by differences in student gains from year to year?

Figures 7 and 8 present information that indicates that the progress students make from year to year differ by lunch status. Students receive a numeric score on the PASS assessment for each year. For each student the change between their scores in 2009 and 2010 was computed. For each 2009 score, the average of these changes was computed. In Figure 7 the horizontal axis indicates the grade 4 score of students in 2009, and the vertical axis is the average change score. Consider students who scored 650 in grade 4 of 2009. For students who receive free lunch the average score change was -5 points, for reduced lunch students the average score change was -3 points, and for full-pay lunch students the average score change was +3 points.

A clear pattern emerges, full-pay lunch students gain the most from year to year, and free lunch students gain the least from year to year. The average score change is smaller for students who receive free lunch than it is for students who receive reduced lunch rates, both of which are less than the average score change for full-pay lunch students.

How do these results inform the question asked? We previously observed differences in overall levels of achievement based on lunch status. These results indicate that students who receive free lunch also gain less from year to year than do reduced lunch students and full-pay lunch students. The consequence of this pattern is that achievement gaps between full-pay and free lunch students will widen each year. In order to decrease differences by lunch status group, free lunch students will instead need to increase in achievement at rates greater than those of full-pay lunch students.

Figure 7. Changes in the Percent Met from Grade 4 to Grade 5 for Reading.

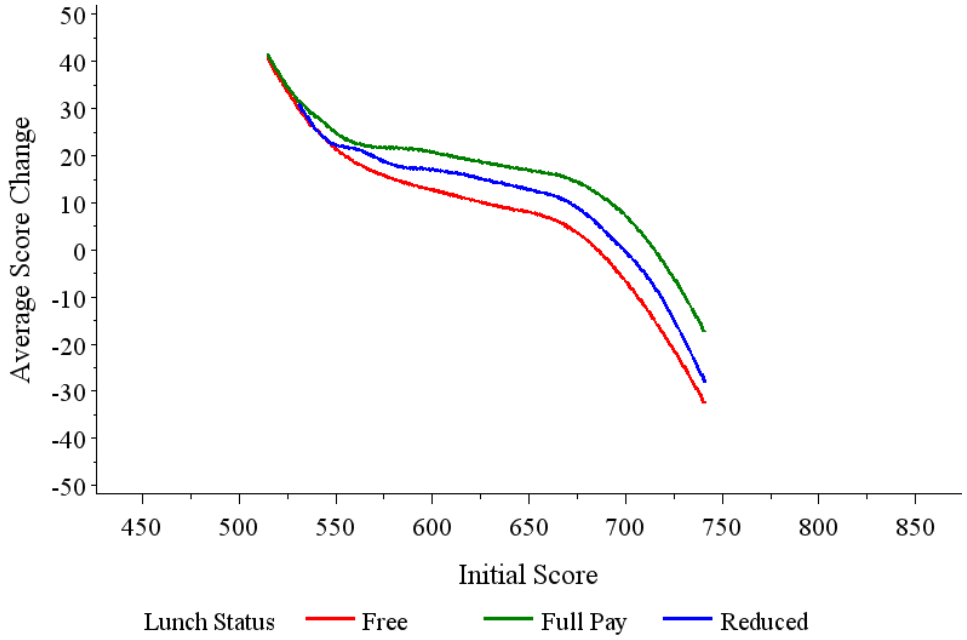
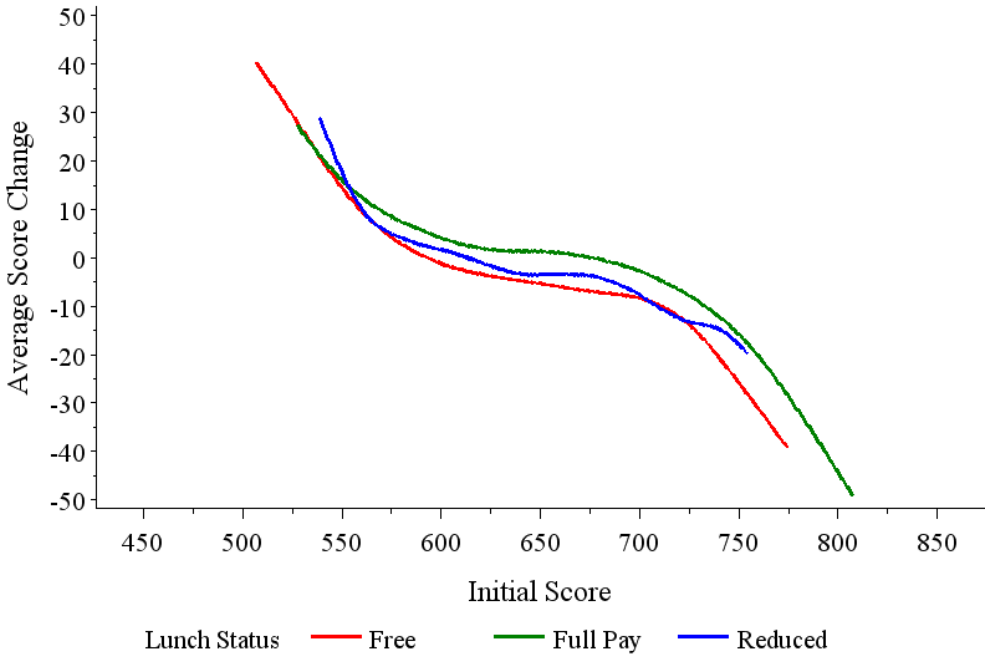


Figure 8. Changes in the Percent Met from Grade 4 to Grade 5 for Mathematics.



How do the observed patterns in achievement compare to patterns of achievement obtained from PACT?

Previous work by the EOC (2006) presented graphs of the mean report card weights in grades 3 through 8 for students initially scoring at each achievement level (Below Basic 1, Below Basic 2, Basic, Proficient, and Advanced) in grade 3. Corresponding analyses are presented in Figures 9 and 10 for the cohort initially tested in grade~~s~~ 3 in Reading and Mathematics.

In grade 3 the mean report card weights are 1, 2, 3, 4, and 5 because each group was selected based on these initial report card weights. In grade 4 the students initially scoring at the lowest report card weight (Not Met 1 increased markedly, and students initially scoring at the highest report card weight (Exemplary 5) decreased markedly. These changes are another manifestation of the "regression to the mean" effect.

Figure 9. Mean PASS Report Card Weight for Groups by Report Card Weight in Grade 3, Spring 2009 - Reading.

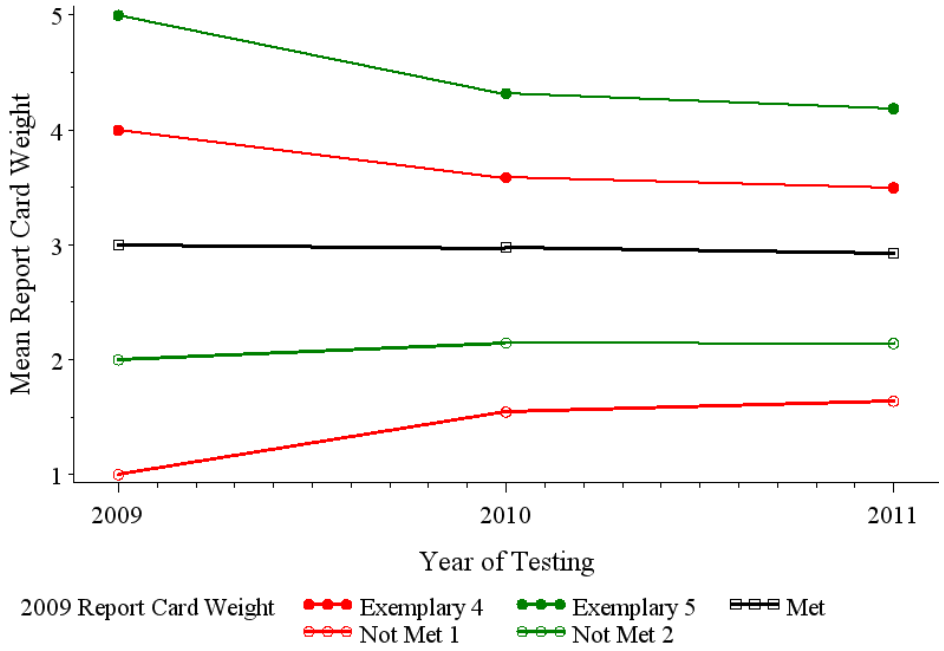
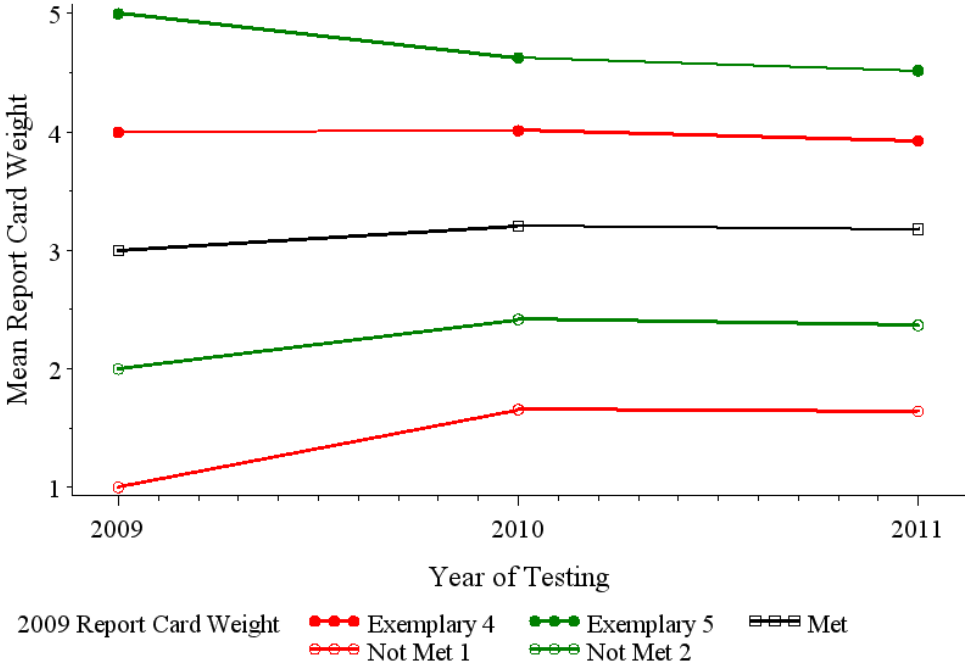


Figure 10. Mean PASS Report Card Weight for Groups by Report Card Weight in Grade 3, Spring 2009 - Mathematics.



Students scoring at Not Met 2 or Exemplary 4 in grade 3 have a more modest “regression to the mean” effect, though it is evident. The pattern observed here for PASS data is similar to that observed for PACT (EOC, 2006).

To summarize the findings with respect to student achievement:

- Differences in achievement by gender are present for Reading, but not for Mathematics.
- Students who receive free lunch achieve at substantially lower levels than do full-pay lunch students. Reduced lunch students achieve midway between these groups.
- Students who receive free lunch gain much less from one year to another than full-pay students. This trend ensures that these students will continue to achieve at lower levels.
- For cohorts of students initially tested in grade 3, PASS achievement patterns appear to be similar to PACT achievement patterns.

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