

December 18, 2009

Amendments made in 2008 to the Education Accountability Act of 1998 directed the creation of a new statewide assessment program for students in grades three through eight. The new assessment, the Palmetto Assessment of State Standards (PASS), was first administered to students in Spring 2009. The Education Oversight Committee (EOC) is charged with establishing the criteria for school and district ratings for elementary and middle schools based on the changes from PACT to PASS. (values, methods, and performance levels.):

The enclosed document contains background information and models for consideration for both the Absolute and Growth ratings. Simulations using 2009 PASS data, and for the Growth rating 2008 PACT data, are included for each proposed model. Detailed tables show the distribution of schools statewide (number and percentage) in each academic performance rating (Excellent, Good, Average, Below Average, and At-Risk) utilizing each model.

Opportunities for public comment on the models and simulations include:

- Written comments can be submitted online ([www.eoc.sc.gov/Simulations.htm](http://www.eoc.sc.gov/Simulations.htm)) or by mail: EOC, P.O. Box 11876, Columbia, SC 29211. All written comments will be shared with EOC members prior to January 15, 2010;
- A public hearing will be held on Friday, January 15, 2010. Individuals who wish to speak must sign up online at [www.eoc.sc.gov/Simulations.htm](http://www.eoc.sc.gov/Simulations.htm). We ask that attendees bring 2 canned goods to the hearing. Harvest Hope Food Bank will collect the donations following the hearing.
- Questions about the models or simulations should be submitted online. Responses will be posted online on or after January 13.

The EOC will meet on Friday, January 22 to consider public comments, testimony, and impact prior to approving ratings methodology and criteria.

Sincerely,

  
Jo Anne Anderson

Enclosure

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## **2009 Ratings Simulations Based on PASS**

### **Simulations of Absolute Rating Indexes**

Absolute ratings provide an indicator of the overall level of student achievement in a school or district at the end of the year. In elementary and middle schools the ratings are based on the results from the state standards-based Palmetto Assessments of State Standards (PASS) tests taken by students in grades 3 through 8 in the spring of the school year. In addition, middle school Absolute ratings are also based on student achievement on the state End of Course assessments administered to students taking courses for high school credit. The simulations reported below were calculated using results from the 2009 PASS and End of Course assessments administered to students in grades 3 through 8. The data reported for each simulation include the range of cut scores for each rating level and the results from applying those cut scores to the data. For each model simulation, three sets of index cut points for assigning Absolute ratings are reported: cut points based on intervals of  $\pm 0.5$  standard deviations from the mean of the state distribution of school indexes; cut points based on intervals of  $\pm 0.75$  standard deviations from the mean; and cut points based on intervals of  $\pm 1.0$  standard deviation from the mean.

Two models for calculating Absolute ratings were simulated. Both models use the same methodology for calculating Absolute ratings as has been used for determining elementary and middle school ratings from 2001, but different point weights corresponding to student achievement levels are used in the models.

#### **Model A-1: Absolute Indexes Based on 1- to 5-Point Weights for Performance Levels**

In this model point weights are assigned to each student's PASS performance level (Not Met 1, Not Met 2, Met, Exemplary 4, or Exemplary 5), the point weights are aggregated across subjects and grades, and the mean point weight for the school is calculated to create the absolute rating index. The index is then compared to the range of indexes corresponding to the various school ratings to assign an Absolute rating of Excellent, Good, Average, Below Average, or At Risk to the school. In Model A-1 the point weights assigned to each student's scores are based on a 5-point system. The point weights for PASS and the End of Course tests are listed in the Table 1.

**Table 1**  
**Point Weights For PASS and End of Course Tests, Model A-1 (1- to 5-Point Model)**

Performance Level on PASS / End of Course Test	Point Weight Assigned to Test Score
Exemplary 5 (PASS) or "A" (End of Course)	5
Exemplary 4 (PASS) or "B" (End of Course)	4
Met (PASS) or "C" (End of Course)	3
Not Met 2 (PASS) or "D" (End of Course)	2
Not Met 1 (PASS) or "F" (End of Course)	1
PASS Test Should Have Been Taken by Student But Was Not	0

Five PASS performance levels for each subject and grade level were adopted by the Education Oversight Committee on October 5, 2009. The PASS scale scores associated with each performance level (Not Met 1, Not Met 2, Met, Exemplary 4, and Exemplary 5) are listed in Table 2.

**Table 2**  
**PASS Cut Scores (Scale Score Scale)**

<u>Subject</u>	<u>Grade</u>	<u>Not Met1/ Not Met2</u>	<u>Not Met2/ Met</u>	<u>Met/ Exemplary4</u>	<u>Exemplary4/ Exemplary5</u>
Reading & Research	3	563	600	643	659
Reading & Research	4	569	600	649	670
Reading & Research	5	574	600	661	679
Reading & Research	6	565	600	648	669
Reading & Research	7	566	600	644	666
Reading & Research	8	569	600	649	678
Math	3	566	600	642	666
Math	4	580	600	658	688
Math	5	579	600	659	688
Math	6	582	600	658	682
Math	7	585	600	652	687
Math	8	585	600	657	684
Science	3	537	600	649	664
Science	4	564	600	674	689
Science	5	566	600	676	699
Science	6	560	600	669	688
Science	7	571	600	664	686
Science	8	562	600	651	672
Social Studies	3	580	600	653	680
Social Studies	4	590	600	668	693
Social Studies	5	570	600	658	672
Social Studies	6	585	600	671	688
Social Studies	7	562	600	646	663
Social Studies	8	571	600	656	675
Writing	3	544	600	638	666
Writing	4	546	600	648	669
Writing	5	550	600	649	683
Writing	6	547	600	651	676
Writing	7	547	600	647	673
Writing	8	538	600	651	676

For the simulation, school Absolute indexes were calculated for each school based on Model A-1.

### Results of Simulations Using Model A-1

Mean of all schools = 2.966, Standard Deviation = 0.4290, Minimum = 1.22, Maximum = 4.77

<b>A-1A: Criteria Based on +/- 0.5 SD</b>			
Simulated Absolute Rating	Range of Indexes for +/- 0.5 SD	Number of Schools	Percent of Schools
Excellent	3.40 or above	137	14.7
Good	3.18 to 3.39	147	15.8
Average	2.75 to 3.17	358	38.5
Below Average	2.54 to 2.74	149	16
At Risk	LT 2.54	139	14.9
Total*		930	99.9
<b>A-1B: Criteria Based on +/- 0.75 SD</b>			
Simulated Absolute Rating	Range of Indexes for +/- 0.75 SD	Number of Schools	Percent of Schools
Excellent	3.61 or above	58	6.2
Good	3.29 to 3.60	146	15.7
Average	2.65 to 3.28	520	55.9
Below Average	2.32 to 2.64	148	15.9
At Risk	LT 2.32	58	6.2
Total*		930	99.9
<b>A-1C: Criteria Based on +/- 1.0 SD</b>			
Simulated Absolute Rating	Range of Indexes for +/- 1.0 SD	Number of Schools	Percent of Schools
Excellent	3.82 or above	23	2.5
Good	3.40 to 3.81	114	12.3
Average	2.54 to 3.39	654	70.3
Below Average	2.11 to 2.53	121	13
At Risk	LT 2.11	18	1.9
Total*		930	100

\* Totals may differ from 100% due to rounding.

SD=Standard Deviation

### **Model A-2: Absolute Indexes Based on 1- to 3-Point Weights for Performance Levels**

In this model point weights are assigned to each student's PASS performance level (Not Met, Met, or Exemplary). The point weights are aggregated across subjects and grades, and the mean point weight for the school is calculated to create the absolute rating index. The index is then compared to the range of indexes corresponding to the various school ratings to assign an Absolute rating of Excellent, Good, Average, Below Average, or At Risk to the school. In Model A-2 the point weights assigned to each student's scores are based on a 3-point system. The point weights for PASS and the End of Course tests are listed in the Table 3.

**Table 3**  
**Point Weights For PASS and End of Course Tests, Model A-2 (1- to 3-Point Model)**

Performance Level on PASS / End of Course Test	Point Weight Assigned to Test Score
Exemplary (PASS) or "A" or "B" (End of Course)	3
Met (PASS) or "C" (End of Course)	2
Not Met (PASS) or "D" or "F" (End of Course)	1
PASS Test Should Have Been Taken by Student But Was Not	0

Five PASS performance levels for each subject and grade level were adopted by the Education Oversight Committee on October 5, 2009. The PASS scale scores associated with the three performance levels described in Act 282 (Not Met, Met, and Exemplary) are listed in Table 4.

**Table 4**  
**PASS Cut Scores (Scale Score Scale)**

<u>Subject</u>	<u>Grade</u>	<u>Not Met/ Met</u>	<u>Met/ Exemplary</u>
Reading & Research	3	600	643
Reading & Research	4	600	649
Reading & Research	5	600	661
Reading & Research	6	600	648
Reading & Research	7	600	644
Reading & Research	8	600	649
Math	3	600	642
Math	4	600	658
Math	5	600	659
Math	6	600	658
Math	7	600	652
Math	8	600	657
Science	3	600	649
Science	4	600	674
Science	5	600	676
Science	6	600	669
Science	7	600	664
Science	8	600	651
Social Studies	3	600	653
Social Studies	4	600	668
Social Studies	5	600	658
Social Studies	6	600	671
Social Studies	7	600	646
Social Studies	8	600	656
Writing	3	600	638
Writing	4	600	648
Writing	5	600	649
Writing	6	600	651
Writing	7	600	647
Writing	8	600	651

For the simulation, school Absolute indexes were calculated for each school based on Model A-2.

### Results of Simulations Using Model A-2

Mean of all schools = 1.957, Standard Deviation = 0.2655, Minimum = 1.05, Maximum = 2.95

<b>A-2A: Criteria Based on +/- 0.5 SD</b>			
Simulated Absolute Rating	Range of Indexes for +/- 0.5 SD	Number of Schools	Percent of Schools
Excellent	2.22 or above	142	15.3
Good	2.09 to 2.21	150	16.1
Average	1.82 to 2.08	353	38
Below Average	1.69 to 1.81	144	15.5
At Risk	LT 1.69	141	15.2
Total*		930	100.1
<b>A-2B: Criteria Based on +/- 0.75 SD</b>			
Simulated Absolute Rating	Range of Indexes for +/- 0.75 SD	Number of Schools	Percent of Schools
Excellent	2.36 or above	58	6.2
Good	2.16 to 2.35	148	15.9
Average	1.76 to 2.15	513	55.2
Below Average	1.56 to 1.75	149	16
At Risk	LT 1.56	62	6.7
Total*		930	100
<b>A-2C: Criteria Based on +/- 1.0 SD</b>			
Simulated Absolute Rating	Range of Indexes for +/- 1.0 SD	Number of Schools	Percent of Schools
Excellent	2.49 or above	22	2.4
Good	2.22 to 2.48	120	12.9
Average	1.69 to 2.21	647	69.6
Below Average	1.43 to 1.68	124	13.3
At Risk	LT 1.43	17	1.8
Total*		930	100

\* Totals may differ from 100% due to rounding.  
SD=Standard Deviation



## **Simulations of Growth Rating Indexes**

There are seven growth models for which data simulations based on 2008 PACT and 2009 PASS data were completed. Following a description of each of the models, the results of the simulation for each model are reported. The data reported for each simulation includes the range of cut scores for each rating level and the results from applying those cut scores to the data. For each model simulation, three sets of index cut points for assigning Growth ratings are reported: cut points based on intervals of  $\pm 0.5$  standard deviations from the mean of the state distribution of school indexes; cut points based on intervals of  $\pm 0.75$  standard deviations from the mean; and cut points based on intervals of  $\pm 1.0$  standard deviation from the mean.

Growth ratings in elementary and middle schools are based on longitudinal student data, with test results from the current year matched to results from the previous year to measure growth. PASS was administered for the first time in Spring 2009, so PASS results from 2008 were not available for matching. The 2009 PASS results were matched to the 2008 PACT results, however. A special study conducted by the Data Recognition Corporation for the EOC provided tables to convert 2009 PASS scores to 2008 PACT scores in reading and research, mathematics, science, and social studies. In the simulations reported here the 2009 PASS scores were converted to PACT scores so comparisons could be made between 2008 and 2009 student performance. The results from the simulations can be interpreted as representing student gains in PACT. In 2010 and in subsequent years, PASS data will be available for both the pretest and posttest years so that student achievement gains can be interpreted as gains in PASS performance.

### **Difference Score Growth Models:**

The Improvement and Growth ratings since 2001 have been based on a methodology in which each student's pretest score from year 1 is subtracted from the student's posttest score attained in year 2, resulting in difference or "gain" score for each subject area. The student difference scores are aggregated across all students and subjects tested and averaged to calculate a growth index, which represents the average change in the performance levels on the tests by students from one year to the next. Since the data are based on longitudinally matched student records for both years, the growth index indicates the progress students have made in the current year compared to how the students performed in the prior year. A growth index of zero indicates that students, on average, performed at the same performance levels on both the pretest and posttest. A positive (greater than zero) growth index indicates that students, on average, attained higher performance levels on the posttest than on the pretest; a negative growth index indicates that students, on average, perform less well on the posttest than on the pretest.

Three simulations of the difference score growth models are listed below. All use the same methodology, which has been used for calculating improvement or growth ratings since the beginning of the ratings program in 2001. The three methodologies differ in that different point weights are assigned to the pretest (year 1) and posttest (year 2) scores before the differences are calculated. The simulations are based on 2008 PACT pretest scores and 2009 PASS posttest scores converted to the PACT score scale. Since PACT Writing and PASS Writing scores could not be linked reliably, the simulations are based on growth in Reading and Research, Mathematics, Science, and Social Studies test performance. In 2010 and subsequent years PASS Reading and Research, Writing, Mathematics, Science, and Social Studies scores will be used for the growth rating calculations. The simulations chosen represent advice and recommendations from the field regarding possible methodologies for measuring growth.

**Model G-1: Difference Score Growth Based on 1- to 5-Point Weights:**

In this model an index is calculated which represents the average of the individual student pre-post difference scores in school (across all grades and subjects tested). The difference scores are based on a 5-point scale for both the pretest (year 1) and the posttest (year 2), where Below Basic 1=1, Below Basic 2=2, Basic=3, Proficient=4, Advanced=5 (if a student scored Basic on the pretest and Proficient on the posttest, then the difference score for the student in that subject area is 4-3=1). When PASS scores for both pretest and posttest become available in 2010 and subsequent years, the point weights will be assigned so that Not Met 1=1, Not Met 2=2, Met=3, Exemplary 4=4, and Exemplary 5=5. The difference scores assigned for each pair of pretest and posttest scores are listed in the Model G-1 Table.

**Model G-1 Table**  
**Difference Score Growth Table Based on 1- to 5-Point Weights**  
**(Growth Methodology Same as Methodology Used Through 2008)**

Year One (Pretest)	Year Two (Posttest)				
	Below Basic 1 (PACT) Not Met 1 (PASS) (1 point)	Below Basic 2 (PACT) Not Met 2 (PASS) (2 points)	Basic (PACT) Met (PASS) (3 points)	Proficient (PACT) Exemplary 4 (PASS) (4 points)	Advanced (PACT) Exemplary 5 (PASS) (5 points)
Advanced (PACT) Exemplary 5 (PASS) (5 points)	-4	-3	-2	-1	0
Proficient (PACT) Exemplary 4 (PASS) (4 points)	-3	-2	-1	0	+1
Basic (PACT) Met (PASS) (3 points)	-2	-1	0	+1	+2
Below Basic 2 (PACT) Not Met 2 (PASS) (2 points)	-1	0	+1	+2	+3
Below Basic 1(PACT) Not Met 1 (PASS) (1 point)	0	+1	+2	+3	+4

### Results of Simulations Using Model G-1

Mean of all schools = -0.131, Standard Deviation = 0.1248, Minimum = -0.68, Maximum = 0.59

<b>G-1A: Criteria Based on +/- 0.5 SD</b>				
Simulated Rating	Growth	Range of Indexes for +/- 0.5 SD	Number of Schools	Percent of Schools
Excellent		-0.01 or above	127	14
Good		-0.07 to -0.02	133	14.6
Average		-0.19 to -0.08	398	43.8
Below Average		-0.26 to -0.20	153	16.9
At Risk		LT -0.26	97	10.7
Total*			908	100
<b>G-1B: Criteria Based on +/- 0.75 SD</b>				
Simulated Rating	Growth	Range of Indexes for +/- 0.75 SD	Number of Schools	Percent of Schools
Excellent		0.06 or above	45	5
Good		-0.04 to 0.05	141	15.5
Average		-0.23 to -0.05	572	63
Below Average		-0.32 to -0.24	104	11.5
At Risk		LT -0.32	46	5.1
Total*			908	100.1
<b>G-1C: Criteria Based on +/- 1.0 SD</b>				
Simulated Rating	Growth	Range of Indexes for +/- 1.0 SD	Number of Schools	Percent of Schools
Excellent		0.12 or above	21	2.3
Good		-0.01 to 0.11	106	11.7
Average		-0.26 to -0.02	684	75.3
Below Average		-0.38 to -0.27	76	8.4
At Risk		LT -0.38	21	2.3
Total*			908	100

\* Totals may differ from 100% due to rounding.

SD=Standard Deviation

### **Model G-2: Difference Score Growth Based on 1- to 3-Point Weights:**

In this model an index is calculated which represents the average of individual student pre-post difference scores in school (across all grades and subjects tested). The difference scores are based on a 3-point scale, where Below Basic=1, Basic=2, and Proficient or Advanced=3 (if a student scored Basic on the pretest (year 1) and Proficient on the posttest (year 2), then difference score for student in that subject area is 3-2=1). When PASS scores for both pretest and posttest become available in 2010 and subsequent years, the point weights will be assigned so that Not Met=1, Met=2, and Exemplary=3. The difference scores assigned for each pair of pretest and posttest scores are listed in the Model G-2 Table.

**Model G-2 Table**  
**Difference Score Growth Table Based on 1- to 3-Point Weights**  
**(Growth Methodology Same as Methodology Used Through 2008)**

Year One (Pretest)	Year Two (Posttest)		
	Below Basic (PACT) Not Met (PASS) (1 point)	Basic (PACT) Met (PASS) (2 points)	Proficient or Advanced (PACT) Exemplary (PASS) (3 points)
Proficient or Advanced (PACT) Exemplary (PASS) (3 points)	-2	-1	0
Basic (PACT) Met (PASS) (2 points)	-1	0	+1
Below Basic (PACT) Not Met (PASS) (1 point)	0	+1	+2

Results of Simulations Using Model G-2

**Results of Simulations Using Model G-2**

Mean of all schools = -0.091, Standard Deviation = 0.0826, Minimum = -0.46, Maximum = 0.35

<b>G-2A: Criteria Based on +/- 0.5 SD</b>				
Simulated Growth Rating	Range of Indexes for +/- 0.5 SD	Number of Schools	Percent of Schools	
Excellent	-0.01 or above	128	14.1	
Good	-0.05 to -0.02	153	16.9	
Average	-0.13 to -0.06	396	43.6	
Below Average	-0.17 to -0.14	124	13.7	
At Risk	LT -0.17	107	11.8	
Total*		908	100.1	
<b>G-2B: Criteria Based on +/- 0.75 SD</b>				
Simulated Growth Rating	Range of Indexes for +/- 0.75 SD	Number of Schools	Percent of Schools	
Excellent	0.03 or above	47	5.2	
Good	-0.03 to 0.02	140	15.4	
Average	-0.15 to -0.04	552	60.8	
Below Average	-0.22 to -0.16	122	13.4	
At Risk	LT -0.22	47	5.2	
Total*		908	100	
<b>G-2C: Criteria Based on +/- 1.0 SD</b>				
Simulated Growth Rating	Range of Indexes for +/- 1.0 SD	Number of Schools	Percent of Schools	
Excellent	0.07 or above	24	2.6	
Good	-0.01 to 0.06	104	11.5	
Average	-0.17 to -0.02	673	74.1	
Below Average	-0.26 to -0.18	90	9.9	
At Risk	LT -0.26	17	1.9	
Total*		908	100	

\* Totals may differ from 100% due to rounding.  
SD=Standard Deviation

**Model G-3: Difference Score Growth Table Based on Multiple Point Weights:**

In this model a growth index is calculated which represents the average of individual student pre-post difference scores in the school (across all grades and subjects tested). This model has been used for calculating report card Improvement and Growth ratings since 2003. The difference scores are based on an expanded 5-point scale, where Below Basic 1=1, Below Basic 2=2, Basic=3, Proficient=4, Advanced=5, but students are awarded an additional 0.25 points for each pretest (year 1) or posttest (year 2) scale score which is one-fourth of distance between lower bound of scores for the performance level and the lower bound of next higher performance level, awarded an additional 0.5 points if the score is halfway to next performance level, and an additional 0.75 points if the score is three-fourths of way to next performance level. The tables of points to assign to PACT scores for the growth rating are listed on pages 30-33 in

the 2007-2008 School and District Accountability Manual, available on the EOC web site (eoc.sc.gov). The additional fractional points based on the location of a student's scale scores are awarded to both the pretests and posttests prior to calculating the difference score. When PASS scores for both pretest and posttest become available in 2010 and subsequent years, tables listing the expanded point weights may be developed if this model is chosen for implementation. The difference score ranges assigned for each pair of pretest and posttest scores are listed in the Model G-3 Table.

**Model G-3 Table**  
**Difference Score Growth Table Based on Multiple Point Weights**  
**Scale Score Range Within Performance Levels Divided Into Fourths**  
**(Growth Methodology Same as Methodology Used 2003-2008)**

Year One (Pretest)	Year Two (Posttest)				
	Below Basic 1 (PACT) Not Met 1 (PASS) (1.0 to 1.75 points)	Below Basic 2 (PACT) Not Met 2 (PASS) (2.0 to 2.75 points)	Basic (PACT) Met (PASS) (3.0 to 3.75 points)	Proficient (PACT) Exemplary 4 (PASS) (4.0 to 4.75 points)	Advanced (PACT) Exemplary 5 (PASS) (5 points)
Advanced (PACT) Exemplary 5 (PASS) (5 points)	Range of -3.25 to -4	Range of -2.25 to -3	Range of -1.25 to -2	Range of -0.25 to -1	0
Proficient (PACT) Exemplary 4 (PASS) (4.0 to 4.75 points)	Range of -2.25 to -3	Range of -1.25 to -2	Range of -0.25 to -1	Range of -0.75 to +0.75	Range of +0.25 to +1
Basic (PACT) Met (PASS) (3.0 to 3.75 points)	Range of -1.25 to -2	Range of -0.25 to -1	Range of -0.75 to +0.75	Range of +0.25 to +1.75	Range of +1.25 to +2
Below Basic 2 (PACT) Not Met 2 (PASS) (2.0 to 2.75 points)	Range of -0.25 to -1	Range of -0.75 to +0.75	Range of +0.25 to +1.75	Range of +1.25 to +2.75	Range of +2.25 to +3
Below Basic 1 (PACT) Not Met 1 (PASS) (1.0 to 1.75 points)	Range of -0.75 to +0.75	Range of +0.25 to +1.75	Range of +1.25 to +2.75	Range of +2.25 to +3.75	Range of +3.25 to +4

Results of Simulations Using Model G-3

**Results of Simulations Using Model G-3**

Mean of all schools = -0.119, Standard Deviation = 0.1133, Minimum = -0.60, Maximum = 0.60

<b>G-3A: Criteria Based on +/- 0.5 SD</b>				
Simulated Growth Rating	Growth	Range of Indexes for +/- 0.5 SD	Number of Schools	Percent of Schools
Excellent		-0.01 or above	126	13.9
Good		-0.06 to -0.02	120	13.2
Average		-0.18 to -0.07	432	47.6
Below Average		-0.23 to -0.19	121	13.3
At Risk		LT -0.23	109	12
Total*			908	100
<b>G-3B: Criteria Based on +/- 0.75 SD</b>				
Simulated Growth Rating	Growth	Range of Indexes for +/- 0.75 SD	Number of Schools	Percent of Schools
Excellent		0.05 or above	49	5.4
Good		-0.03 to 0.04	119	13.1
Average		-0.20 to -0.04	558	61.5
Below Average		-0.29 to -0.21	132	14.5
At Risk		LT -0.29	50	5.5
Total*			908	100
<b>G-3C: Criteria Based on +/- 1.0 SD</b>				
Simulated Growth Rating	Growth	Range of Indexes for +/- 1.0 SD	Number of Schools	Percent of Schools
Excellent		0.11 or above	21	2.3
Good		-0.01 to 0.10	105	11.6
Average		-0.23 to -0.02	673	74.1
Below Average		-0.35 to -0.24	89	9.8
At Risk		LT -0.35	20	2.2
Total*			908	100

\* Totals may differ from 100% due to rounding.

SD=Standard Deviation

**Value Table Growth Models**

Value tables represent a different methodology for measuring growth by individual students from one year to the next. This methodology was suggested for exploration by the EOC's National Advisory Committee. In this methodology, each student's change in test score performance from pretest (year 1) to posttest (year 2) is assigned a value. The assignment of different values for growth categories provides a mechanism for measuring growth differentially based on students' initial performance levels. In the difference score models listed above, a student's gain (or loss) in performance level results in the same value regardless of the student's pretest score. For example, a change from Below Basic 1 to Below Basic 2 in the Difference Score Growth Model Based on 1- to 5-Point Weights (Model G-1) results in net gain of +1 points, and a change from Proficient to Advanced also results in a net gain of +1 points. However, in the

value table models listed below the points assigned for a change from Below Basic 1 to Below Basic 2 or from Proficient or Advanced, for example, are different. The growth index from a value table is the average of all the points from the table awarded to each student for pretest to posttest growth in each subject area tested. Growth value tables can be symmetrical, in which relative value changes from pretest to posttest are the same regardless of the pretest level, or asymmetrical, in which changes from some pretest to posttest levels receive relatively higher values than changes associated with other pretest levels.

Four simulations of value table growth models are listed below. The simulations are based on 2008 PACT pretest scores and 2009 PASS posttest scores converted to the PACT score scale. Since PACT Writing and PASS Writing scores could not be linked accurately, the simulations are based on growth in Reading and Research, Mathematics, Science, and Social Studies test performance. In 2010 and subsequent years PASS Reading and Research, Writing, Mathematics, Science, and Social Studies scores will be used for the growth rating calculations.

**Model G-4: Symmetrical Growth Value Table Based on 1- to 5-Point Weights**

In this model an index is calculated which represents average student growth in achievement based on 5 performance levels on both the pretest (year 1) and posttest (year 2). This value table is symmetrical, in that, for example, the relative changes in values from Below Basic 1 or Below Basic 2 to Basic are the same as changes in values from Basic to Proficient or Advanced. The index is the average of all the values from the table earned by every student's change from pretest to posttest across all subjects and grades tested. Using this value table, a school growth index of 100 indicates that, on average, the performance levels of students on the posttest did not differ from their performance on the pretests. A growth index greater than 100 indicates that posttest performance levels of individual students tended to be higher than their pretest performance levels. Growth indexes less than 100 indicate that individual students' posttest performance levels tended to be lower than their pretest performance levels. The values assigned to each pair of pretest and posttest combinations are listed in the Model G-4 Table.



**Model G-4 Table**  
**Symmetrical Growth Value Table Based on 1- to 5-Point Weights**  
**(Growth From All Pretest Levels Valued Symmetrically)**

Year One (Pretest)	Year Two (Posttest)				
	Below Basic 1 (PACT) Not Met 1 (PASS)	Below Basic 2 (PACT) Not Met 2 (PASS)	Basic (PACT) Met (PASS)	Proficient (PACT) Exemplary 4 (PASS)	Advanced (PACT) Exemplary 5 (PASS)
Advanced (PACT) Exemplary 5 (PASS)	40	60	80	100	120
Proficient (PACT) Exemplary 4 (PASS)	50	70	90	110	130
Basic (PACT) Met (PASS)	60	80	100	120	140
Below Basic 2 (PACT) Not Met 2 (PASS)	70	90	110	130	150
Below Basic 1 (PACT) Not Met 1 (PASS)	80	100	120	140	160

Results of Simulations Using Model G-4

**Results of Simulations Using Model G-4**

Mean of all schools = 98.57, Standard Deviation = 4.8749, Minimum = 79.00, Maximum = 116.85

<b>G-4A: Criteria Based on +/- 0.5 SD</b>				
Simulated Growth Rating	Range of Indexes for +/- 0.5 SD	Number of Schools	Percent of Schools	
Excellent	103.45 or above	134	14.8	
Good	101.02 to 103.44	132	14.5	
Average	96.14 to 101.01	367	40.4	
Below Average	93.70 to 96.13	144	15.9	
At Risk	LT 93.70	131	14.4	
Total*		908	100	
<b>G-4B: Criteria Based on +/- 0.75 SD</b>				
Simulated Growth Rating	Range of Indexes for +/- 0.75 SD	Number of Schools	Percent of Schools	
Excellent	105.89 or above	61	6.7	
Good	102.23 to 105.88	130	14.3	
Average	94.92 to 102.22	521	57.4	
Below Average	91.27 to 94.91	139	15.3	
At Risk	LT 91.27	57	6.3	
Total*		908	100	
<b>G-4C: Criteria Based on +/- 1.0 SD</b>				
Simulated Growth Rating	Range of Indexes for +/- 1.0 SD	Number of Schools	Percent of Schools	
Excellent	108.33 or above	23	2.5	
Good	103.45 to 108.32	111	12.2	
Average	93.70 to 103.44	643	70.8	
Below Average	88.83 to 93.69	107	11.8	
At Risk	LT 88.83	24	2.6	
Total*		908	99.9	

\* Totals may differ from 100% due to rounding.

SD=Standard Deviation

**Model G-5: Symmetrical Growth Value Table Based on 1- to 3-Point Weights**

In this model an index is calculated which represents average student growth in achievement based on 3 performance levels on both the pretest (year 1) and posttest (year 2). This value table is symmetrical, in that, for example, the relative changes in values from Below Basic to Basic are the same as changes in values from Basic to Proficient. The index is the average of all the values from the table earned by every student's change from pretest to posttest across all subjects and grades tested. Using this value table, a school growth index of 100 indicates that, on average, the performance levels of students on the posttest did not differ from their performance on the pretests. A growth index greater than 100 indicates that posttest performance levels of individual students tended to be higher than their pretest performance levels. Growth indexes less than 100 indicate that individual students' posttest performance

levels tended to be lower than their pretest performance levels. The values assigned to each pair of pretest and posttest combinations are listed in Model G-5 Table.

**Model G-5 Table**  
**Symmetrical Growth Value Table Based on 1- to 3-Point Weights**  
**(Growth From All Pretest Levels Valued Symmetrically)**

Year One (Pretest)	Year Two (Posttest)		
	Below Basic (PACT) Not Met (PASS)	Basic (PACT) Met (PASS)	Proficient or Advanced (PACT) Exemplary (PASS)
Proficient or Advanced (PACT) Exemplary (PASS)	40	80	120
Basic (PACT) Met (PASS)	60	100	140
Below Basic (PACT) Not Met (PASS)	80	120	160

Results of Simulations Using Model G-5

**Results of Simulations Using Model G-5**

Mean of all schools = 98.44, Standard Deviation = 6.3014, Minimum = 77.25, Maximum = 119.62

G-5A: Criteria Based on +/- 0.5 SD				
Simulated Growth Rating	Growth	Range of Indexes for +/- 0.5 SD	Number of Schools	Percent of Schools
Excellent		104.74 or above	135	14.9
Good		101.59 to 104.73	141	15.5
Average		95.29 to 101.58	356	39.2
Below Average		92.14 to 95.28	139	15.3
At Risk		LT 92.14	137	15.1
Total*			908	100
G-5B: Criteria Based on +/- 0.75 SD				
Simulated Growth Rating	Growth	Range of Indexes for +/- 0.75 SD	Number of Schools	Percent of Schools
Excellent		107.89 or above	65	7.2
Good		103.17 to 107.88	124	13.7
Average		93.72 to 103.16	514	56.6
Below Average		88.99 to 93.71	130	14.3
At Risk		LT 88.99	75	8.3
Total*			908	100.1
G-5C: Criteria Based on +/- 1.0 SD				
Simulated Growth Rating	Growth	Range of Indexes for +/- 1.0 SD	Number of Schools	Percent of Schools
Excellent		111.04 or above	27	3
Good		104.74 to 111.03	108	11.9
Average		92.14 to 104.73	636	70
Below Average		85.84 to 92.13	119	13.1
At Risk		LT 85.84	18	2
Total*			908	100

\* Totals may differ from 100% due to rounding.

SD=Standard Deviation

**Model G-6: Asymmetrical Growth Value Table Based on 1- to 5-Point Weights, Growth from Not Met to Met Awarded Higher Values**

In this model an index is calculated which represents average student growth in achievement based on 5 performance levels on both the pretest (year 1) and posttest (year 2). This value table is asymmetrical, in that, for example, the changes in values from Below Basic 1 or Below Basic 2 to Basic are awarded relatively higher values than changes in values from Basic to Proficient or Advanced. The index is the average of all the values from the table earned by every student's change from pretest to posttest across all subjects and grades tested. Using this value table, a school growth index of 94.00 indicates that, on average, the performance levels of students on the posttest did not differ from their performance on the pretests. A growth index greater than 94.00 indicates that posttest performance levels of individual students tended to be

higher than their pretest performance levels. Growth indexes less than 94.00 indicate that individual students' posttest performance levels tended to be lower than their pretest performance levels. The values assigned to each pair of pretest and posttest combinations are listed in Model G-6 Table.

**Model G-6 Table**  
**Asymmetrical Growth Value Table Based on 1- to 5-Point Weights**  
**(Growth from Not Met to Met Valued Higher Than Growth Above Met)**

Year One (Pretest)	Year Two (Posttest)				
	Below Basic 1 (PACT) Not Met 1 (PASS)	Below Basic 2 (PACT) Not Met 2 (PASS)	Basic (PACT) Met (PASS)	Proficient (PACT) Exemplary 4 (PASS)	Advanced (PACT) Exemplary 5 (PASS)
Advanced (PACT) Exemplary 5 (PASS)	40	60	80	90	100
Proficient (PACT) Exemplary 4 (PASS)	50	70	90	100	110
Basic (PACT) Met (PASS)	60	80	100	110	120
Below Basic 2 (PACT) Not Met 2 (PASS)	70	90	110	120	130
Below Basic 1 (PACT) Not Met 1 (PASS)	80	100	120	130	140

Results of Simulations Using Model G-6

**Results of Simulations Using Model G-6**

Mean of all schools = 94.29, Standard Deviation = 2.7895, Minimum = 70.00, Maximum = 102.37

<b>G-6A: Criteria Based on +/- 0.5 SD</b>				
Simulated Growth Rating	Growth	Range of Indexes for +/- 0.5 SD	Number of Schools	Percent of Schools
Excellent		97.08 or above	129	14.2
Good		95.69 to 97.07	153	16.9
Average		92.90 to 95.68	386	42.5
Below Average		91.50 to 92.89	106	11.7
At Risk		LT 91.50	134	14.8
Total*			908	100.1
<b>G-6B: Criteria Based on +/- 0.75 SD</b>				
Simulated Growth Rating	Growth	Range of Indexes for +/- 0.75 SD	Number of Schools	Percent of Schools
Excellent		98.48 or above	37	4.1
Good		96.39 to 98.47	168	18.5
Average		92.20 to 96.38	536	59
Below Average		90.11 to 92.19	97	10.7
At Risk		LT 90.11	70	7.7
Total*			908	100
<b>G-6C: Criteria Based on +/- 1.0 SD</b>				
Simulated Growth Rating	Growth	Range of Indexes for +/- 1.0 SD	Number of Schools	Percent of Schools
Excellent		99.87 or above	10	1.1
Good		97.08 to 99.86	119	13.1
Average		91.50 to 97.07	645	71
Below Average		88.71 to 91.49	103	11.3
At Risk		LT 88.71	31	3.4
Total*			908	99.9

\* Totals may differ from 100% due to rounding.

SD=Standard Deviation

**Model G-7: Asymmetrical Growth Value Table Based on 1- to 3-Point Weights, Growth from Not Met to Met Valued Higher Than Growth Above Met)**

In this model an index is calculated which represents average student growth in achievement based on 3 performance levels on both the pretest (year 1) and posttest (year 2). This value table is asymmetrical, in that, for example, the changes in values from Below Basic to Basic are awarded relatively higher values than changes in values from Basic to Proficient or Advanced. The index is the average of all the values from the table earned by every student's change from pretest to posttest across all subjects and grades tested. Using this value table, a school growth index of 93.33 indicates that, on average, the performance levels of students on the posttest did not differ from their performance on the pretests. A growth index greater than 93.33 indicates that posttest performance levels of individual students tended to be higher than their pretest

performance levels. Growth indexes less than 93.33 indicate that individual students' posttest performance levels tended to be lower than their pretest performance levels. The values assigned to each pair of pretest and posttest combinations are listed in Model G-7 Table.

**Model G-7 Table**  
**Asymmetrical Growth Value Table Based on 1- to 3-Point Weights**  
**(Growth from Not Met to Met Valued Higher Than Growth Above Met)**

Year One (Pretest)	Year Two (Posttest)		
	Below Basic (PACT) Not Met (PASS)	Basic (PACT) Met (PASS)	Proficient or Advanced (PACT) Exemplary (PASS)
Proficient or Advanced (PACT) Exemplary (PASS)	40	80	100
Basic (PACT) Met (PASS)	60	100	120
Below Basic (PACT) Not Met (PASS)	80	120	140

Results of Simulations Using Model G-7

**Results of Simulations Using Model G-7**

Mean of all schools = 92.17, Standard Deviation = 3.4926, Minimum = 77.25, Maximum = 102.42

<b>G-7A: Criteria Based on +/- 0.5 SD</b>				
Simulated Growth Rating	Range of Indexes for +/- 0.5 SD	Number of Schools	Percent of Schools	
Excellent	95.66 or above	143	15.7	
Good	93.92 to 95.65	125	13.8	
Average	90.43 to 93.91	386	42.5	
Below Average	88.68 to 90.42	121	13.3	
At Risk	LT 88.68	133	14.6	
Total*		908	99.9	
<b>G-7B: Criteria Based on +/- 0.75 SD</b>				
Simulated Growth Rating	Range of Indexes for +/- 0.75 SD	Number of Schools	Percent of Schools	
Excellent	97.41 or above	44	4.8	
Good	94.79 to 97.40	164	18.1	
Average	89.55 to 94.78	526	57.9	
Below Average	86.93 to 89.54	110	12.1	
At Risk	LT 86.93	64	7	
Total*		908	99.9	
<b>G-7C: Criteria Based on +/- 1.0 SD</b>				
Simulated Growth Rating	Range of Indexes for +/- 1.0 SD	Number of Schools	Percent of Schools	
Excellent	99.16 or above	13	1.4	
Good	95.66 to 99.15	130	14.3	
Average	88.68 to 95.65	632	69.6	
Below Average	85.19 to 88.67	100	11	
At Risk	LT 85.19	33	3.6	
Total*		908	99.9	

\* Totals may differ from 100% due to rounding.  
SD=Standard Deviation



## Issues and Additional Information

### Rounding of Absolute and Growth Indexes in Simulations

The absolute and growth indexes since 2001 have been rounded to the nearest tenth of a point as the final step before comparing a school's index to the cut scores to assign a rating level. However, the narrow ranges of growth indexes in the 2009 simulation made it difficult to set non-overlapping cut points based on indexes rounded to the nearest tenth of a point. The indexes reported in this simulation are therefore all rounded to the nearest one-hundredths of a point.

### Absolute and Growth Rating Results From 2008

For comparison purposes, the 2008 ratings results for the schools whose data are reported in the simulations in this report are listed in Table I-1.

**Table I-1**  
**2008 Absolute and Growth Ratings for Schools**  
**Whose Data Are Included in 2009 Simulations**

2008 Absolute Ratings	2008 Range of Indexes for Absolute Ratings	Number of Schools	Percent of Schools
Excellent	3.9 or above	36	4.0
Good	3.5 to 3.8	136	15.1
Average	3.1 to 3.4	308	34.1
Below Average	2.7 to 3.0	259	28.7
At Risk	LT 2.7	164	18.2
Total*		903	100.1
No Rating in 2008**		27	
2008 Growth Ratings	2008 Range of Indexes for Growth Ratings	Number of Schools	Percent of Schools
Excellent	0.4 or above	17	1.9
Good	0.3	89	10.1
Average	0.1 to 0.2	130	14.7
Below Average	0.0	314	35.6
At Risk	-0.1 or less	332	37.6
Total*		882	99.9
No Rating in 2008**		26	

\* Percentages may not add to 100 due to rounding.

\*\* Includes new schools in 2009 which did not receive 2008 rating.

Mean 2008 Absolute index for the 903 schools having 2008 data was 3.07, standard deviation=0.4585, minimum=1.22, maximum=4.75.

Mean 2008 Growth index for the 882 schools having 2008 data was -0.022, standard deviation=0.1207, minimum=-0.79, maximum=0.33.

#### Data for Simulation and Final Ratings Data

The simulations reported here follow the rules and procedures for ratings calculations outlined in the *2007-2008 Accountability Manual* where practical given the time available for conducting the simulations. However, the data used for the final calculations of ratings for publication on school report cards may differ somewhat from the simulation data because the usual reviews and editing of the data conducted before reporting the ratings have not yet been conducted. The calculations for the simulations did follow rules specified in the *2007-2008 Accountability Manual*:

Data from students who were not attending the school in which they were tested by the 45<sup>th</sup> day of instruction were not included in the Absolute index calculations;

The End of Course assessment scores were included in the absolute rating index calculations for middle schools;

The subject areas were weighted differently in different grade levels as specified in statute and described in Table I-2.

**Table I-2**  
**PASS Subject Area Weights**  
**Elementary and Middle School Absolute and Growth Ratings**

<b>Grades 3-5 (Elementary Schools)</b>				<b>Grades 6-8 (Middle Schools)</b>			
ELA (Includes Reading & Research and Writing Scores)	Math	Science	Social Studies	ELA (Includes Reading & Research and Writing Scores)	Math	Science	Social Studies
30%	30%	20%	20%	25%	25%	25%	25%

In the simulations the PASS reading and research scores were weighted twice as heavily as PASS writing scores in the ELA component of the school ratings, based on a working assumption for the ratings adopted by the EOC in June 2009.

#### Choice of Methodologies Used for the 2009 Simulations

The EOC has received input from the field regarding different possible methodologies to use for calculating absolute and growth rating indexes. The simulations reported here include several of the methodologies proposed. Some other methodologies, while they may be useful for calculating ratings in the future, could not be simulated at this time:

- The SC Department of Education (SCDE), which develops and administers the state assessments, including PASS, attempted to develop a vertical scale on the PASS tests which could be used for measuring growth across grades and years. However, the SCDE has been advised by its technical consultants that the attempted vertical scale for 2009 does not fully meet technical requirements, although further field testing and analysis may result in a useful vertical scale in one or two more years. As a result,

simulations of growth ratings using vertical scales could not be accomplished at this time.

- The PASS score scale is anchored at the Met performance level, which receives a scale score of 600 in all subjects and all grades tested, with a standard deviation of 50 and a range from 300 to 900. It was suggested that the absolute indexes be based on mean PASS scale scores. However, End of Course assessment scores are on a different scale than PASS, and could not be included in the absolute rating indexes if they were based on PASS scale scores alone. Until such time as the End of Course test assessment scores and the PASS scores can be linked, absolute indexes cannot be calculated on the basis of PASS scale scores alone. The use of PASS scale scores for the absolute index also raises questions regarding how the results can be interpreted in terms of achievement of the state performance standards.
- The normative model for measuring growth developed at the National Center for the Improvement of Educational Assessment has been suggested as a model to consider for calculating growth ratings. However, since this methodology requires three years of data to establish growth percentiles, it was not used in these simulations (only one year of PASS data are available at this time). The methodology also requires complex calculations requiring more time than was available for the simulations. Finally, the usefulness of the normative model for measuring growth to academic standards is a matter of debate among experts, and perhaps more useful information about this methodology will become available as more groups explore it.

#### Adjustment to Growth Rating Based on Exceptional Gains by Historically Underachieving Groups of Students (HUG)

As stated in the *2007-2008 Accountability Manual*, school Growth ratings may be increased on the basis of the following:

“A school’s Growth rating may be increased by one level if the improvement in performance of historically underachieving students meets or exceeds a criterion. Historically underachieving groups consist of African-American, Hispanic, and Native American students, those eligible for the free or reduced-price federal lunch program, Limited English Proficient (LEP) students, migrant students, and students with non-speech disabilities.” (page 34)

The HUG calculation has been based on the performance of students in all subject areas tested, including reading and research, writing, mathematics, science, and social studies. In response to the need to increase reading achievement among South Carolina elementary and middle school students belonging to historically underachieving minority groups, a proposal from the field is to base the HUG on growth on the reading and research test alone rather than on a composite of scores from all subject area tests.

#### Growth Ratings for Schools Having Grade Three as the Highest Grade Enrolled

The following methodology for calculating growth ratings for this subset of schools is described in the *2007-2008 Accountability Manual* as follows (references to PASS have been inserted in the text):

“Longitudinal analyses of scores from students enrolled in schools having grade organizations such as kindergarten through grade three, grades two through three, grades one through three, and so on, cannot be performed because these schools will have PACT (PASS) data for grade three only. There is no PACT (PASS) test in grade two administered on a statewide basis to serve as a pretest for the longitudinally matched data. The Improvement rating for schools such as these will be calculated based on the change in absolute performance from year to year. The change in absolute performance is calculated by subtracting the un-rounded absolute index for the previous year from the un-rounded absolute index for the current year. The result is then rounded to the nearest tenth of a point.” (page 35)

It is anticipated that this same methodology can be used for calculating growth indexes for these schools with adjustments as needed to reflect the specific index methodology adopted by the EOC for the 2009 ratings.

#### Growth Ratings for Schools with Absolute Ratings of Excellent in Two Subsequent Years

The methodology for assigning Growth ratings to these high-achieving schools is described in the *2007-2008 Accountability Manual*:

“If a school is rated Excellent for absolute achievement for both years, the school will receive an Improvement rating of Good. If the school's improvement index for all students is a positive number (i.e., greater than zero), the school's Improvement rating will be elevated to Excellent. The performance improvement of the groups will also be reported for these schools. Schools achieving an absolute index of 4.8 or higher for two consecutive years will be awarded an Excellent Improvement rating.” (page 35)

It is anticipated that this same methodology can be used for assigning Growth ratings for these schools with adjustments as needed to reflect the specific index methodology adopted by the EOC for the 2009 ratings.

#### District Ratings

The district Absolute and Growth ratings are based on a composite of performance of the elementary, middle, and high schools in the district. The components of the ratings are listed in the *2007-2008 Accountability Manual* (reference to PASS has been inserted in table):

**Table I-3**  
**Weights for Components of District Ratings**

<b>District Rating Component</b>	<b>Weight for Calculating Rating</b>
Elementary & Middle School Component	
PACT (PASS) Assessments, Grades 3-8	60%
High School Components	
Four-year Graduation Rate	30%
HSAP First Attempt Passage Rate	5%
End of Course Test Results	5%
Total	100%

*2007-2008 Accountability Manual, page 45*

These weighted components will remain the basis for the district ratings following the adoption of ratings methodologies based on PASS. Depending on the methodology adopted and the indexes resulting from those methodologies, appropriate adjustments will be made in the calculation of the district rating indexes so the weightings described in the table are maintained.

**Absolute and Growth Ratings for Special Schools**

EOC staff will work with representatives from special schools to make needed adjustments to their ratings criteria based on the change from PACT to PASS.