

South Carolina



Introduction

This study linked data from the 2002 and 2006 administrations of South Carolina’s reading and math tests to the Northwest Evaluation Association’s Measures of Academic Progress (MAP) assessment, a computerized adaptive test used in schools nationwide. We found that South Carolina’s definitions of proficiency in reading and mathematics are relatively difficult, compared to the cut scores set by the 25 other states in the study. In other words, South Carolina’s tests are well above average in terms of difficulty.

Yet the difficulty level of South Carolina tests’ decreased somewhat from 2002 to 2006—the No Child Left Behind era—and quite dramatically in a few grades. South Carolina’s current reading test is easier in third, fourth, and fifth grades than it was in 2002, as is the math test for sixth and eighth grades. There are many possible explanations for these declines (see pp. 34-35 of the main report), which were caused by learning gains on the South Carolina test not being matched by learning gains on the Northwest Evaluation Association test. One finding of this study is that South Carolina’s reading cut scores are relatively easier in the early grades than they are for eighth graders (taking into account the differences in subject content and children’s development). State policymakers might consider adjusting their cut scores to ensure equivalent difficulty at all grades so that parents and schools can be assured that elementary school students scoring at the proficient level are truly prepared for success later in their educational careers.

What We Studied: South Carolina Palmetto Achievement Challenge Tests (PACT)

South Carolina currently uses an assessment called the South Carolina Palmetto Achievement Challenge Tests (PACT), which tests mathematics, English/language arts, science, and social studies in grades 3 through 8. The same set of tests was used in spring 2002 to test students in mathematics and English/language arts in grades 3 through 8. The current study linked reading and math results from spring 2002 and spring 2006 administrations in a group of elementary and middle schools to a common scale also administered in the 2002 and 2006 school years.

To determine the difficulty of South Carolina’s proficiency cut scores, we linked data from South Carolina’s tests to the NWEA assessment. (A “proficiency cut score” is the score a student must achieve in order to be considered proficient.) This was done by analyzing a group of schools in which almost all students had taken both the state’s assessment and the NWEA test. (The methodology section of this report explains how performance on these two tests was compared.)

Part 1: How Difficult are South Carolina’s Definitions of Proficiency in Reading and Math?

One way to evaluate the difficulty of a standard is to determine how many people attempting to attain it are likely to succeed. How do we know that a two-foot high bar is easy to jump over? We know because, if we asked 100 people at random to attempt such a jump, perhaps 80 would make it. How do we know that a six-foot high bar is challenging? Because only one (or perhaps none) of those same 100 individuals would successfully meet that challenge. The same principle can be applied to academic standards. Common sense tells us that it is more difficult for students to solve algebraic equations with two unknown variables than it is for them to solve an equation with only one unknown variable. But we can figure out exactly how much more difficult by seeing how many eighth graders nationwide answer both types of questions correctly.

Applying that approach to this assignment, we evaluated the difficulty of South Carolina’s proficiency standards by estimating the proportion of students in NWEA’s norm group who would perform above the South Carolina standard on a test of equivalent difficulty. The following two figures show the difficulty of South Carolina’s proficiency cut scores for reading (Figure 1) and mathematics (Figure 2) in 2006 in relation to the median cut score for all the states in the study. The proficiency cut scores for **reading** in South Carolina ranged between the 43rd and 71st percentiles nationally, with the eighth grade cut score being most challenging. In **mathematics**, the proficiency cut scores ranged between the 64th and 75th percentiles, with eighth grade again the most challenging.

Across grades 3 through 8, South Carolina’s cut scores in both reading and mathematics are consistently more difficult than the median cut scores of the other states in the study, and

above the performance of the average student of that grade within the NWEA norm group. Note, though, that South Carolina’s cut scores for reading are generally lower than for mathematics. (This pattern was spotted in the majority of states studied.) Thus, reported differences in achievement between the two subjects may be more a product of differences in cut scores than in actual student achievement. In other words, South Carolina students may be performing worse in reading and better in mathematics than is apparent by just looking at the percentages that pass state tests in those subjects.

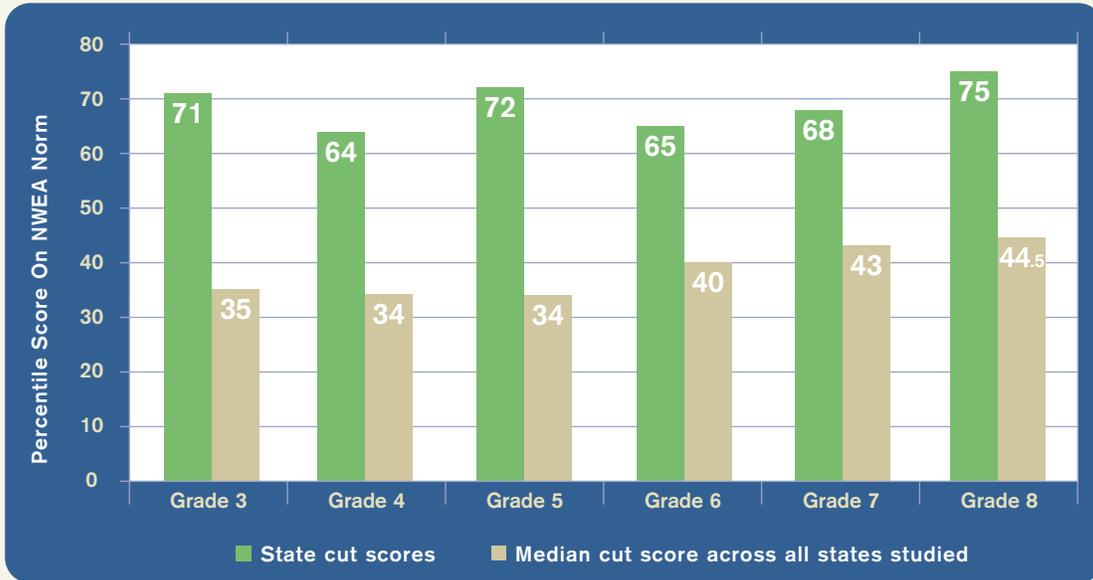
Another way of assessing difficulty is to evaluate how South Carolina’s proficiency cut scores rank relative to other states in the study. Table 1 shows that the South Carolina cut scores generally rank among the very top of the 26 states studied for this report.

Figure 1 – South Carolina Reading Cut Scores in Relation to All 26 States Studied, 2006 (Expressed in MAP Percentiles)



Note: This figure compares reading test cut scores (“proficiency passing scores”) as percentiles of the NWEA norm. These percentiles are compared with the median cut score of all 26 states reviewed in this study. South Carolina’s cut scores across all grades are above the median, ranging from 12.5 to 37 percentile points above.

Figure 2 – South Carolina Mathematics Cut Scores in Relation to All 26 States Studied, 2006
(Expressed in MAP Percentiles)



Note: South Carolina's math test cut scores are shown as percentiles of the NWEA norm and compared with the median cut score of all 26 states reviewed in this study. Across all grades, the state's cut scores surpass the median by 25 to 38 points.

Table 1 – South Carolina Rank for Proficiency Cut Scores Among 26 States in Reading and Mathematics, 2006

Ranking (Out of 26 States)						
	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Reading	4	2	1	1	1	1
Mathematics	1	2	1	2	2	1

Note: This table ranks South Carolina's cut scores relative to the cut scores of the other 25 states in the study. South Carolina ranks number one in four grades for reading and in three grades for mathematics.

Part 2: Changes in Cut Scores over Time

In order to measure their consistency, South Carolina's proficiency cut scores were mapped to their equivalent scores on NWEA's MAP assessment for the 2001-2 and 2005-6 school years. Cut score information for reading and mathematics were available for both years in grades three through eight.

States may periodically re-adjust the cut scores they use to define proficiency in reading and math, or may update the tests used to measure student proficiency. Such changes can impact proficiency ratings, not necessarily because student performance has changed, but because the measurements and criteria for success have changed. Plus, unintentional drift can occur even in states, such as South Carolina, that maintained their proficiency levels.

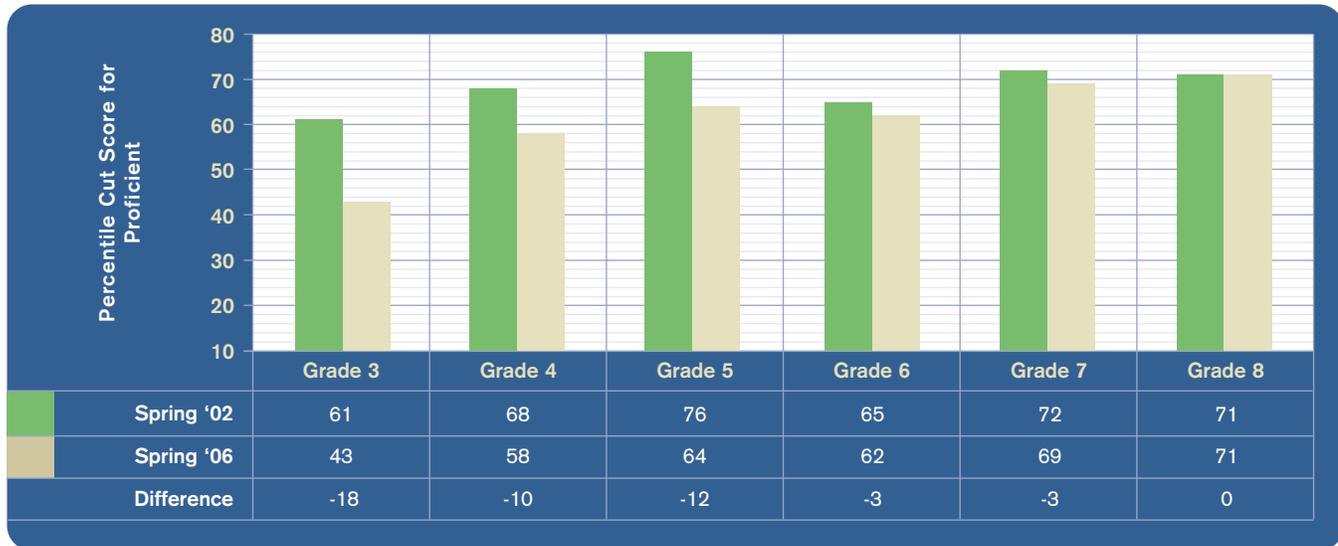
Is it possible, then, to compare the proficiency scores across a four-year period? Yes. Assume that we're judging a group of fourth graders on their high-jump prowess and that we measure this by finding how many in that group can successfully clear a three-foot bar. Now assume that we change the measure and set a new height. Perhaps students must now clear a bar set at one meter. This is somewhat akin to adjusting or changing a state test and its proficiency requirements. Despite this, it is still possible to determine whether it is more difficult to clear one meter than three feet, because we know the relationship between the measures. The same principle applies here. The measures or scales used by the PACT in 2002 and in 2006 can both be linked to the scale that was used to report MAP, which has remained consistent over time. Just as one can compare three feet to one meter and know that a one-meter jump is slightly more difficult than a three-foot jump, one can estimate the cut score needed to pass the PACT in 2002 and 2006 on the MAP scale and ascertain whether the test may have changed in difficulty. This allows us to estimate whether the PACT in 2006 was easier or harder than in 2002.

South Carolina's estimated **reading** cut scores (see Figure 3) decreased over this four-year period for third, fourth, and fifth grades, with no substantial changes in proficiency cut scores at the higher grades. Consequently, even if student performance stayed the same on an equivalent test like NWEA's MAP assessment, one would expect the third-, fourth-, and fifth-grade reading proficiency rates in 2006 to be 18 percent, 10 percent, and 12 percent higher, respectively, than in 2002. (South Carolina reported a 13-point gain for third graders, an 8-point gain for fourth graders, and a 9-point gain for fifth graders over this period.)

South Carolina's estimated **mathematics** cut scores (see Figure 4) showed substantive decreases for grades 6 and 8, with all other grades' cut scores remaining essentially the same. Consequently, even if student performance stayed the same on an equivalent test like NWEA's MAP assessment, one would expect 7 and 5 percent increases in the mathematics proficiency rates reported in 2006 for sixth- and eighth-grade pupils, respectively. (South Carolina reported an 8-point gain for sixth graders and a 3-point gain for eighth graders over this period.)

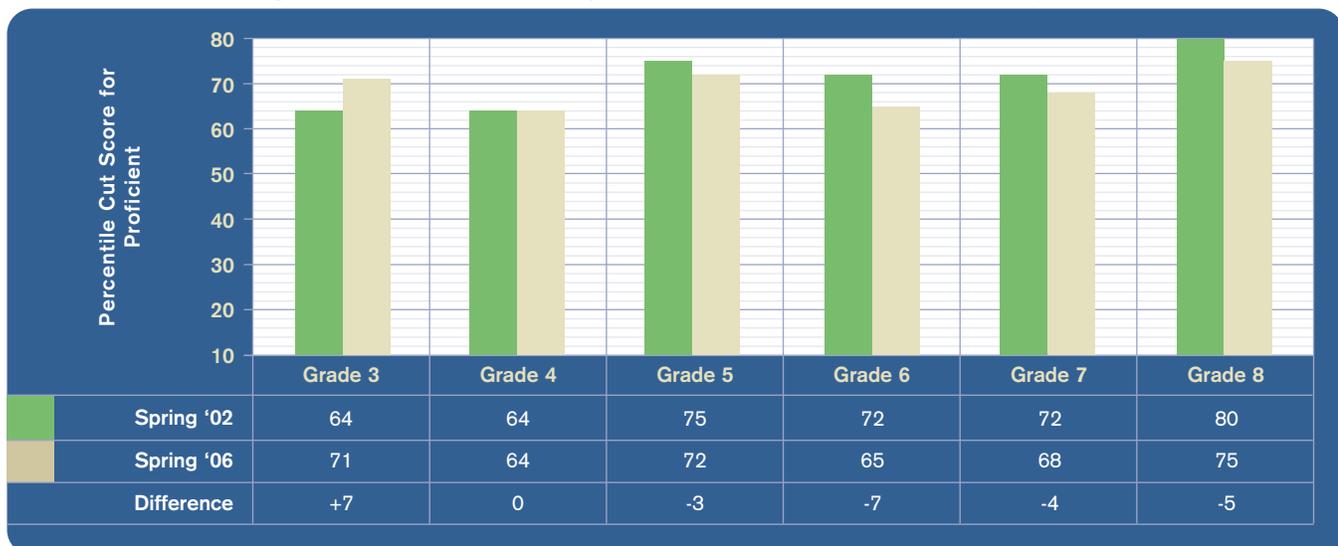
Thus, one could fairly say that South Carolina's reading tests were easier to pass in 2006 than they were in 2002 for the lower grades, but about the same for the higher grades. Similarly, the math tests were easier to pass in grades 6 and 8, but about the same in the other grades. As a result, any increased proficiency rates reported for grades in which the cut scores grew easier may not be entirely a product of improved student achievement.

Figure 3 – Estimated Differences in South Carolina's Proficiency Cut Scores in Reading, 2002-2006 (Expressed in MAP Percentiles)



Note: This graphic shows how the difficulty of achieving proficiency in reading has changed. For example, third-grade students in 2002 had to score at the 61st percentile of the NWEA norm nationally in order to be considered proficient, while in 2006 third graders had to score at the 43rd percentile of the NWEA norm to achieve proficiency. The changes in grades 6, 7, and 8 were within the margin of error (in other words, too small to be considered substantive).

Figure 4 – Estimated Change in South Carolina's Proficiency Cut Scores in Mathematics, 2002-2006 (Expressed in MAP Percentiles)



Note: This graphic shows how the difficulty of achieving proficiency in math has changed. For example, sixth-grade students in 2002 had to score at the 72nd percentile of the NWEA norm group in order to be considered proficient, while in 2006 sixth graders only had to score at the 65th percentile of the NWEA norm to achieve proficiency. The changes in grades 3, 4, 5, and 7 were within the margin of error (in other words, too small to be considered substantive).

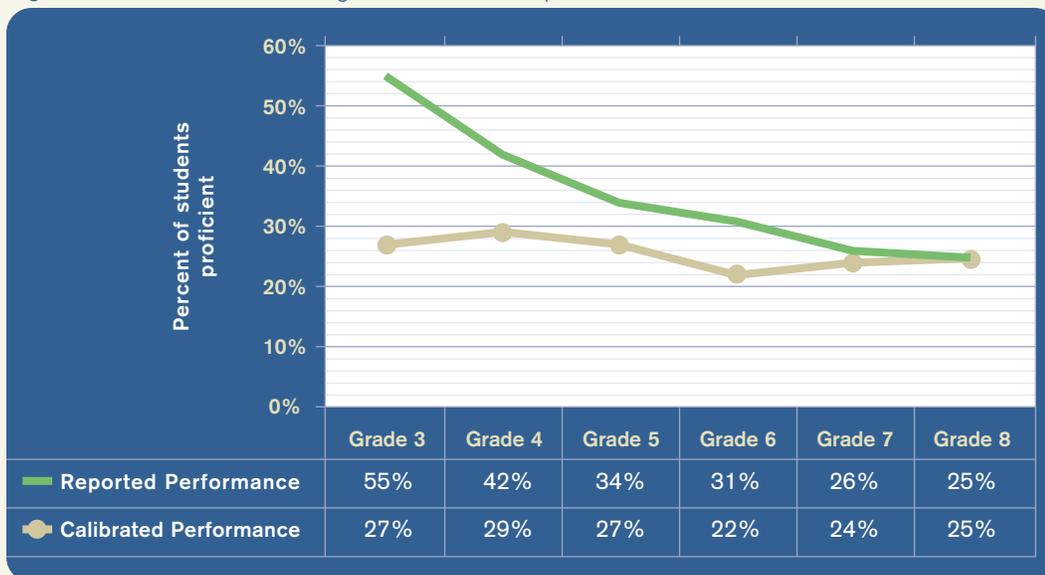
Part 3: Calibration across Grades

Calibrated proficiency cut scores are those that are relatively equal in difficulty across all grades. Thus, an eighth-grade cut score would be no more or less difficult for eighth graders to achieve than a third-grade cut score is for third graders. When cut scores are so calibrated, parents and educators have some assurance that achieving the third-grade proficiency cut score puts a student on track to achieve the standards at eighth grade. It also provides assurance to the public that reported differences in performance across grades are a product of differences in actual educational attainment and not simply differences in the difficulty of the test.

Figures 1 and 2 showed that South Carolina’s upper-grade cut scores in reading in 2006 were considerably more challenging than in the lower grades, while the mathematics cut scores

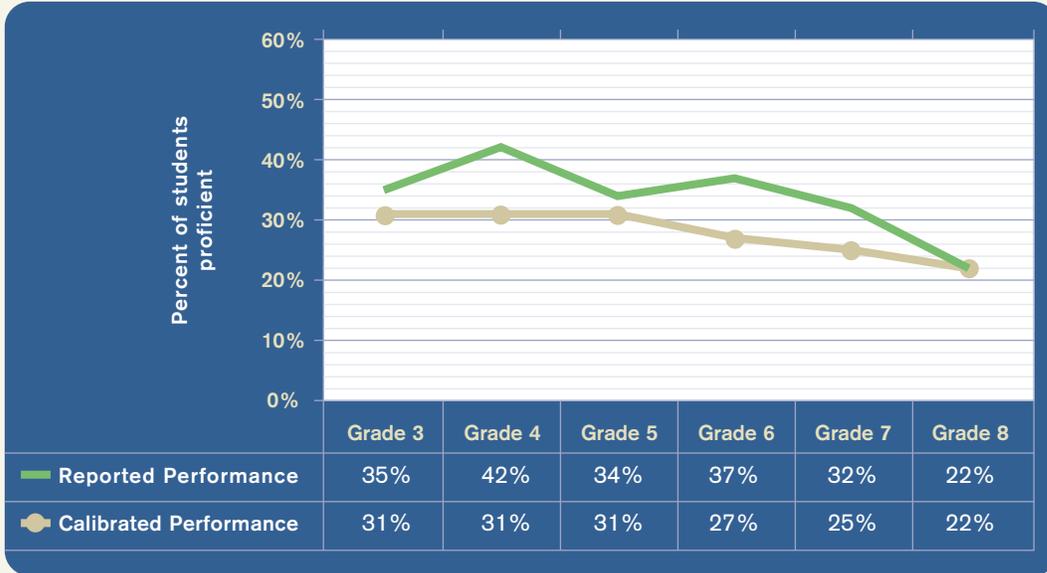
were fairly well calibrated. The two figures that follow show South Carolina’s reported performance in reading (Figure 5) and mathematics (Figure 6) on the state test compared with the proficiency rates that would be achieved if the cut scores were all calibrated to the grade-8 standard. When differences in grade-to-grade difficulty of the cut scores are removed, student performance is more consistent at all grades. This would lead to the conclusion that the higher rates of reading proficiency that the state has reported for lower-grade students are somewhat misleading. Specifically, the apparent decline across grades may be an artifact of differences in the difficulty of the cut scores, and not because of differences in actual student performance.

Figure 5 – South Carolina Reading Performance as Reported and as Calibrated to the Grade-8 Standard, 2006



Note: This graphic shows, for example, that if South Carolina’s grade-3 reading cut score was set at the same level of difficulty as its grade-8 cut score, 27 percent of third graders would achieve the proficient level, rather than 55 percent, as was reported by the state.

Figure 6 – South Carolina Mathematics Performance as Reported and as Calibrated to the Grade-8 Standard, 2006



Note: This graphic shows, for example, that if South Carolina's grade-3 mathematics standard was set at the same level of difficulty as its grade-8 cut score, 31 percent of third graders would achieve the proficient level, rather than 35 percent, as was reported by the state.

Policy Implications

South Carolina's proficiency cut scores in reading and math are relatively high, at least compared with the other 25 states in this study. This finding is consistent with the recent National Center for Education Statistics report, *Mapping 2005 State Proficiency Standards Onto the NAEP Scales*, which also found South Carolina's standards to be among the highest in the country. In the past several years, however, the difficulty of these cut scores has declined, though not in all grades. As a result, South Carolina's expectations are not

smoothly calibrated across grades, at least in reading; students who are proficient in third grade are not necessarily on track to be proficient by the eighth grade. South Carolina policymakers might consider adjusting their reading cut scores across grades so that parents and schools can be assured that elementary school students scoring at the proficient level are truly prepared for success later in their educational careers.