

California



Introduction

This study linked data from the 2003 and 2006 administrations of California’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 California’s definitions of “proficiency” in reading and mathematics are relatively difficult compared with the standards set by the other 25 states in this study. In other words, it’s harder to pass California’s tests than those of most other states.

Yet, according to NWEA estimates, the difficulty level of California’s tests declined between 2003 to 2006—the No Child Left Behind era. In a few grades, these declines were dramatic, calling into question some of the achievement gains previously reported by the state. There are many possible explanations for these declines (see pp. 34-35 of the main report), which were caused by learning gains on the California test not being matched by learning gains on the Northwest Evaluation Association test. Another interesting finding from this study is that California’s mathematics proficiency cut scores are less stringent for third-grade students than they are for middle-school pupils (taking into account the obvious differences in subject content and children’s development). California policymakers might consider adjusting their math cut scores to ensure equivalent difficulty at all grades so that elementary school students scoring at the proficient level are truly prepared for success later in their educational careers.

What We Studied: California Standardized Testing and Reporting (STAR) Program

California currently uses a spring assessment called the California Standards Test (CST), which tests English/Language Arts and mathematics in grades 2 through 11. Students are also tested in science in grades 5, 8, and 10, and history in grades 8, 10, and 11. The current study analyzed reading and math results from a group of elementary and middle schools in which almost all students took both the state’s assessment and MAP, using the spring 2003 and spring 2006 administrations of the two tests. (The methodology section of this report explains how performance on these two tests was compared.) These linked results were then used to estimate the scores on NWEA’s scale that would be equivalent to the proficiency cut scores for each grade and subject on the CST (A “proficiency cut score” is the score a student must achieve in order to be considered proficient.)

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

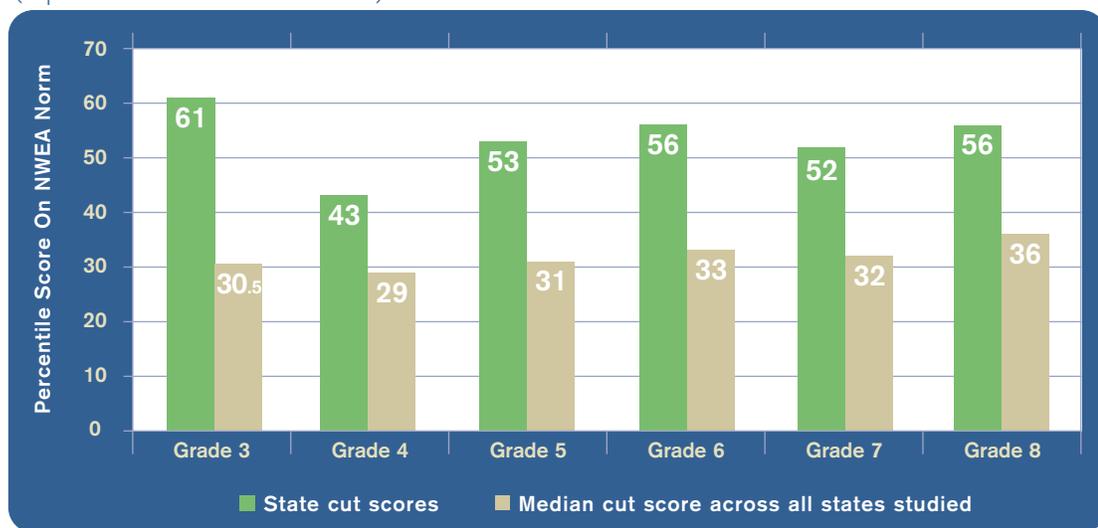
One way to assess the difficulty of a standard is to determine how many people attempting to attain it are likely to succeed. How do we know that a two-foot high bar is easy to jump over? We know because, if we asked 100 people at random to attempt such a jump, perhaps 80 percent would make it. How do 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 task, we evaluated the difficulty of California’s proficiency cut scores by estimating the proportion of students in NWEA’s norm group who would perform above the California standard on a test of equivalent difficulty. The following two figures show the difficulty of California’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 California ranged between the 43rd and 61st percentiles for the norm group, with the third-grade cut score being most challenging. In mathematics, the proficiency cut scores ranged between 46th and 62nd percentiles, with sixth grade being most challenging. As is clear from Figures 1 and 2, California’s cut scores in both reading and mathematics are consistently above average in difficulty among the states studied.

Note, too, that California's cut scores for reading tend to be slightly lower than the corresponding cut scores for mathematics at each grade, except for third grade. Thus, reported differences in achievement on the CST between reading and mathematics might be more a product of differences in cut scores than in actual student achievement. In other words, California students may be performing worse in reading or better in mathematics than is apparent by just looking at the percentage of students passing state tests in those subjects.

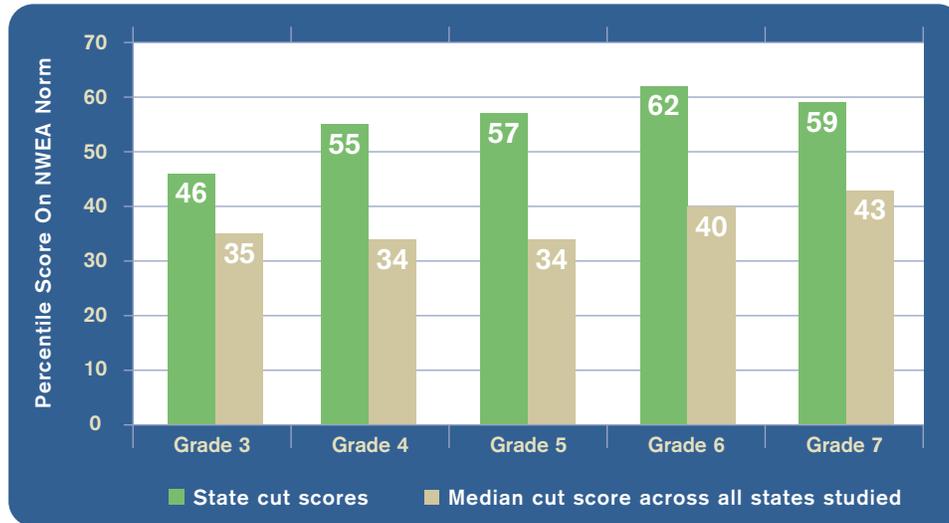
Another way of assessing difficulty is to evaluate how California's proficiency cut scores rank relative to other states. Table 1 shows that the California cut scores generally rank near the top of the 26 states studied for this report. Its reading cut score in grade 3 ranks first across all states within the current study.

Figure 1 – California Reading Cut Scores in Relation to All 26 States Studied, 2006
(Expressed in 2005 MAP Percentiles)



Note: This figure shows California's 2006 reading test cut scores ("proficiency passing scores") as percentiles of the NWEA norm. These percentiles are compared with the median cut scores of all 26 states reviewed in this study. California's cut scores are consistently 14 to 30.5 percentiles above the median in grades 3-8.

Figure 2 – California Mathematics Cut Scores in Relation to All 26 States Studied, 2006
(Expressed in 2005 MAP Percentiles)



Note: California's math test cut scores are shown as percentiles of the NWEA norm and compared with the median cut scores of other states reviewed in this study. California's cut scores in grades 3-6 are consistently 11 to 23 percentiles above the median.

Table 1 – Ranking of 2006 California Reading and Mathematics Cut Scores for Proficient Performance in Relation to All States Studied

Ranking (Out of 26 States)						
	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Reading	1	3	2	2	2	2
Mathematics	4	3	3	3	4	Not available

Note: This table ranks California's cut scores relative to the cut scores of the other 25 states in the study. For third-grade reading, California ranks 1 out of 26, meaning that California's cut scores were the highest of the states studied.

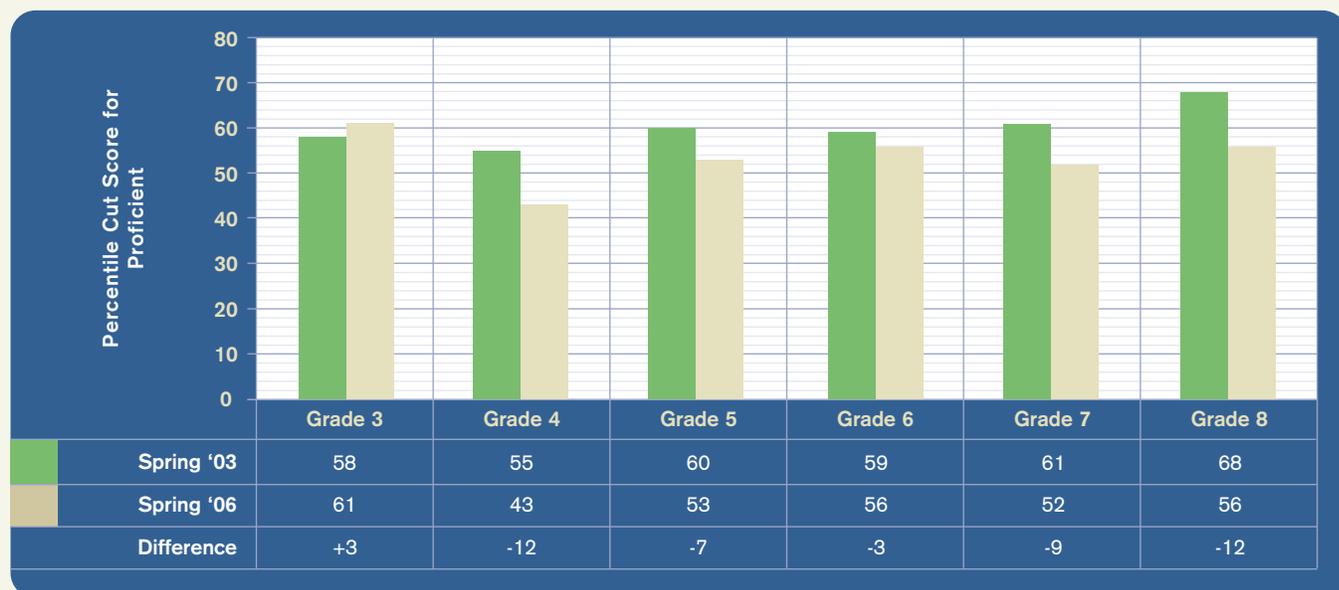
Part 2: Changes in Cut Scores over Time

In order to measure their consistency over time, California's proficiency cut scores were mapped to their equivalent scores on NWEA's MAP assessment for the 2003 and 2006 school years. Cut score estimates for the three-year duration are available for reading in grades 3 through 8, and grades 3 through 7 for mathematics.

States may periodically re-adjust the cut scores they use to define proficiency in reading and math or may update the tests used to test 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 California, that maintained their proficiency levels.

Is it possible, then, to compare the proficiency scores between earlier administrations of California tests with today's? 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 measure or scale used by the CST in 2003 and in 2006 can be linked to the scale used for MAP, which has remained consistent over time. Just as one can compare three feet to a 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 CST in 2003 and 2006 on the MAP scale and ascertain whether the test may have changed in difficulty.

Figure 3 – Estimated Differences in California's Proficiency Cut Scores in Reading, 2003-2006 (Expressed in MAP Percentiles).



Note: This graphic shows how the degree of difficulty in achieving proficiency in reading has changed. For example, eighth-grade students in 2003 had to score at the 68th percentile of the NWEA norm group in order to be considered proficient, while in 2006 eighth graders only had to score at the 56th percentile to achieve proficiency. The changes in grades 3, 5, and 6 were within the margin of error (in other words, too small to be considered substantive).

Despite the fact (see Figures 1 and 2) that California's 2006 cut scores were among the most challenging in the country, the state's estimated **reading** cut scores decreased substantially in fourth, seventh, and eighth grades over this three-year period (see Figure 3). Consequently, even if student performance stayed the same on an equivalent test like NWEA's MAP assessment, one would expect the fourth, seventh, and eighth grade reading proficiency rates in 2006 to be 12 percent, 9 percent, and 12 percent higher than in 2003, respectively. California reported a 10 point gain for fourth graders, a 7 point gain for seventh graders, and a 11 point gain for eighth graders over this period.

California's estimated **mathematics** results indicate a decrease in proficiency cut scores in grades 5 and 7 over this three-year period (see Figure 4). Consequently, even if student performance stayed the same on an equivalent test like NWEA's MAP assessment, the changes in grades 5 and 7 would likely yield increased pupil proficiency rates of 12 percent and 13 percent, respectively. (California reported a 13 point gain for fifth graders and an 11 point gain for seventh graders over this period.) Thus, one could fairly say that California's seventh-grade tests in both reading and mathematics were easier to pass in 2006 than in 2003, while third and sixth grade tests were about the same. As a result, improvements in state-reported proficiency rates for grades whose tests became easier may not be entirely a product of improved achievement.

Figure 4 – Estimated Differences in California's Proficiency Cut Scores in Mathematics, 2003-2006 (Expressed in MAP Percentiles).



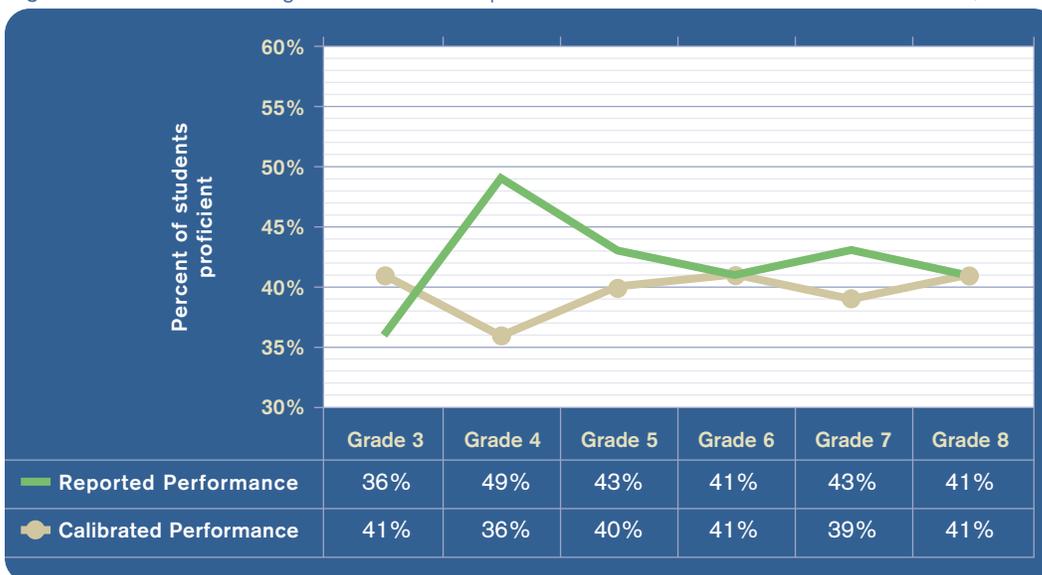
Note: This graphic shows how the degree of difficulty in achieving proficiency in math has changed. For example, seventh-grade students in 2003 had to score at the 72nd percentile of the NWEA norm group in order to be considered proficient, while by 2006 seventh graders had only to score at the 59th percentile to achieve proficiency. The changes in grades 3, 4, and 6 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.

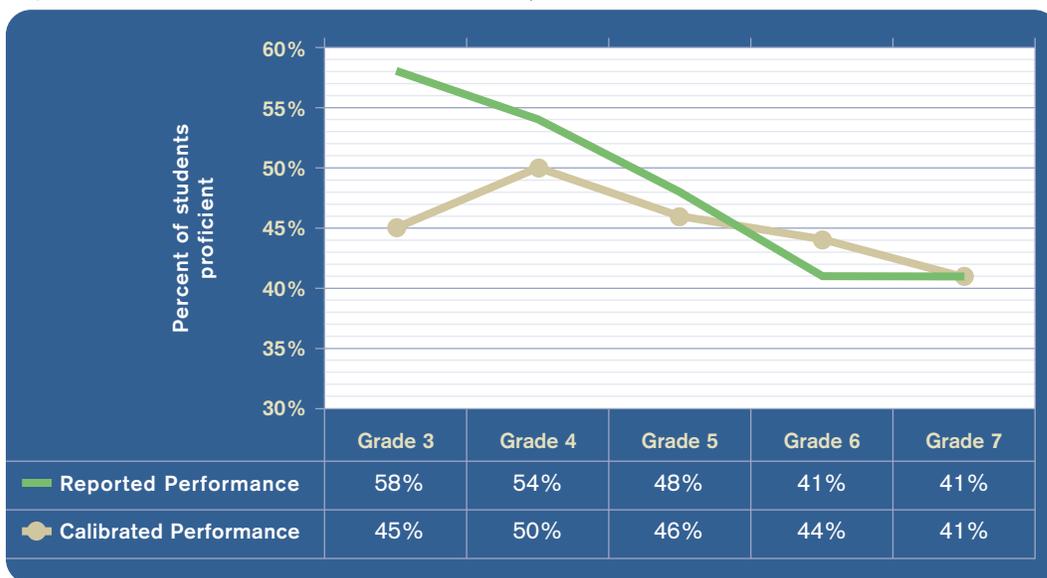
Examining California's cut scores, we find that they are not well calibrated across grades. Figures 1 and 2 showed that California's third-grade reading cut score in 2006 was more challenging than reading cut scores in higher grades, but that the third-grade mathematics cut score was lower than in subsequent grades. The two figures that follow show California's reported performance on its state test in reading (Figure 5) and mathematics (Figure 6) compared with the rates of proficiency that would be achieved if the cut scores were all calibrated to the grade-eight standard. When differences in grade-to-grade difficulty of the cut scores are removed, student performance in mathematics is more consistent at all grades.

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



Note: This graphic means that, for example, if California's third-grade reading standard was set at the same level of difficulty as its eighth-grade reading standard, 41 percent of third graders would achieve the proficient level, rather than 36 percent, as reported by the state.

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



Note: This graphic means that, for example, if California's third-grade mathematics standard was as rigorous as its eighth-grade standard, 44 percent of third graders would achieve the proficient level, rather than 57 percent, as reported by the state.

Policy Implications

California's proficiency cut scores are very challenging when compared with the other 25 states in this study, ranking near the top. This finding is relatively consistent with the recent National Center for Education Statistics report, *Mapping 2005 State Proficiency Standards Onto the NAEP Scales*, which also found California's cut scores to be near the top of the distribution of all states studied. Yet California's cut scores have changed over the past several years—making them generally less challenging, in some cases dramatically so, though not in all grades. As a result, California's expectations

are not smoothly calibrated across grades; students who are proficient in third-grade math, for example, are not necessarily on track to be proficient in the eighth grade. California policymakers might consider adjusting their mathematics 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.