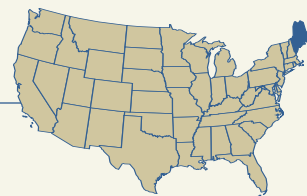


Maine



Introduction

This study linked data from the 2004 and 2006 administrations of Maine’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 Maine’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, Maine’s tests are above average in terms of difficulty.

Yet the difficulty level of Maine’s tests decreased dramatically from 2004 to 2006—the No Child Left Behind era. This is not a surprise, as Maine adopted a new scale for both the reading and math tests for the 2005-06 academic school year, and publicly reported lowering the cut scores on those tests.

Not well known, however, is that Maine’s cut scores in reading and math are easier for third-grade students than for eighth-grade pupils (taking into account the differences in subject content and children’s development). Plus, as is true for the majority of states studied, Maine’s cut scores for reading are lower than those for mathematics. Maine 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. Furthermore, state leaders need to be aware of the disparity between math and reading standards when evaluating differences in teacher and student performance across these domains.

What We Studied: Maine Educational Assessment (MEA)

Maine currently uses an assessment called the Maine Educational Assessment (MEA) which tests reading and mathematics in grades 3 to 8, writing in grades 5 and 8, and science in grades 4 and 8. The current study linked reading and math results from spring 2004 and spring 2006 MEA administrations to a common scale also administered in the 2004 and 2006 school years. Sample sizes for the 2004 testing season were not sufficiently large to meet the inclusion criteria for the national findings sections of the overall report (at least 700 students per grade, whereas in the Maine 2004 sample, only about 400 per grade were available for math, and about 300 for reading). Consequently, the findings in section 2 of this Maine report are not included in the national report. They are included in the state report for informational purposes, but because of the small sample sizes upon which they are based, they should be interpreted with caution.

To determine the difficulty of Maine’s proficiency cut scores, we linked data from Maine’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 elementary and middle schools in which almost all students took both the state 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 Maine'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 jump 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 jump 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.

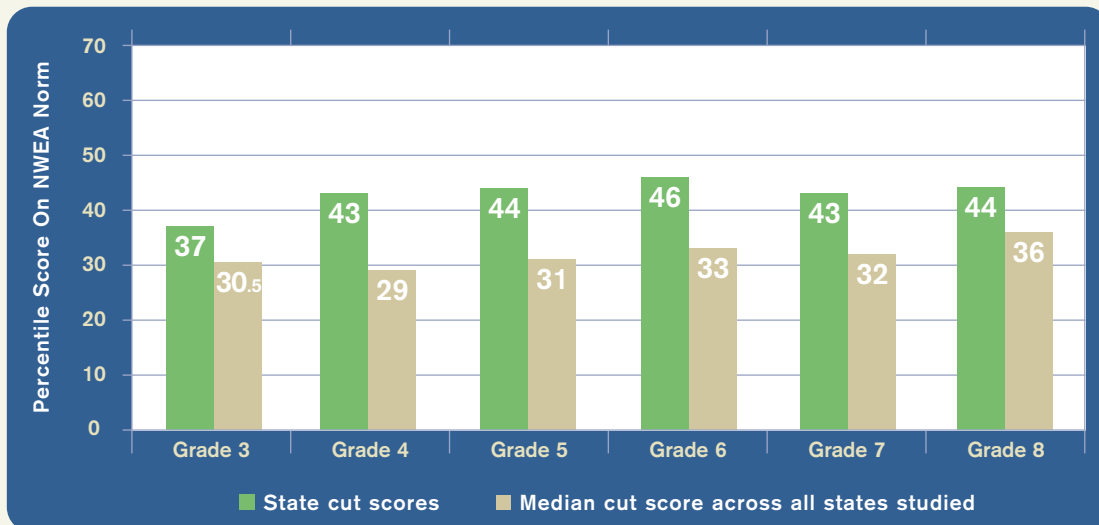
Applying that approach to this task, we evaluated the difficulty of Maine's proficiency cut scores by estimating the proportion of students in NWEA's norm group who would perform above the Maine cut score on a test of equivalent difficulty. The following two figures show the difficulty of Maine's proficiency 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 Maine ranged between the 37th and 46th percentiles in the norm group, with the sixth-grade cut score being most challenging. In **mathematics**, the proficiency cut scores ranged between the 43rd and 54th percentiles with seventh grade being most challenging.

Maine's cut scores in both reading and mathematics are consistently above the median difficulty level among the states studied. In other words, Maine's tests are harder to pass than the average state test. Note, though, that Maine's cut scores for reading are lower than for math. Thus, reported differences in achievement between the two subjects may be more a product of differences in cut scores than in actual student achievement. Maine students might be performing worse in reading and better in mathematics than is apparent by just looking at the percentage of students passing state tests in those subjects.

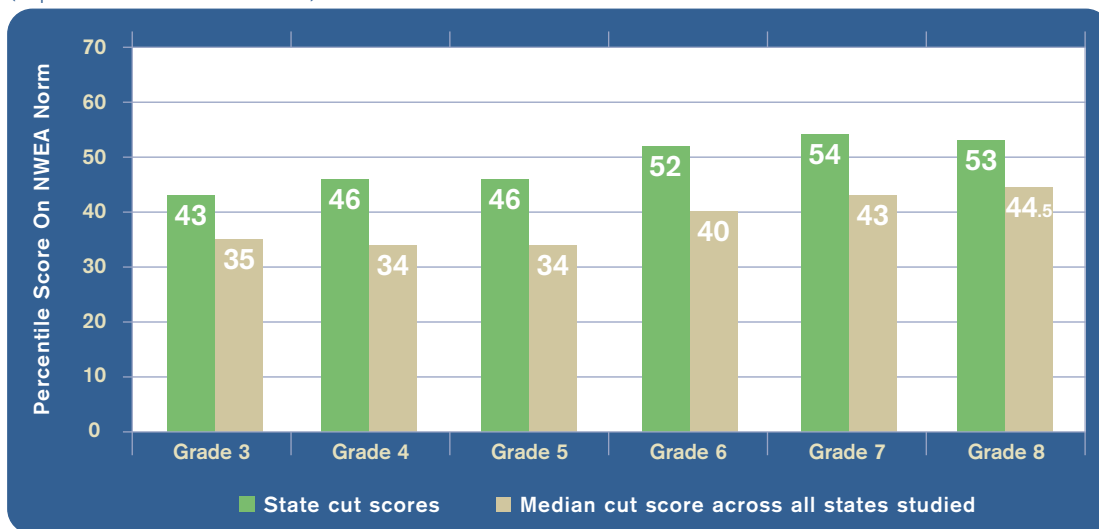
Another way of assessing difficulty is to evaluate how Maine's proficiency cut scores rank relative to other states. Table 1 shows that the Maine cut scores generally rank in the upper third in difficulty among the 26 states studied for this report. Its reading cut scores are particularly high, ranking third among the states in grades 4 and 6.

Figure 1 – Maine 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 scores of other states reviewed in this study. Maine's cut scores are consistently above the median.

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



Note: Maine'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. Maine's cut scores are consistently above the median.

Table 1 – Maine 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	5	3	5	3	5	6
Mathematics	6	5	8	6	6	6

Note: This table ranks Maine's cut scores relative to the cut scores of the other 25 states in the study, with 1 being highest and 26 lowest.

Part 2: Differences in Cut Scores over Time

In order to measure their consistency, Maine’s proficiency cut scores were mapped to their equivalent scores on NWEA’s MAP assessment for the 2004 and 2006 school years. Cut score estimates for reading and mathematics were available for both years for grades 4 and 8.

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. This occurred in Maine in the 2005-06 academic year, when the state adopted new scales and publicly lowered cut scores for both the reading and math tests.

Is it possible, then, to compare the proficiency scores between earlier administrations of Maine’s tests and today’s? Yes. Assume that we’re judging a group of fourth graders on their high-jump prowess and 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. MEA in 2004 and MEA in 2006 can both be linked to the 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 MEA in 2004 and 2006 on the MAP scale and ascertain whether the test may have changed in difficulty—and whether those changes are consistent with what the state reported to the public.

Figure 3 – Estimated Differences in Maine’s Proficiency Cut Scores in Reading, 2004-2006 (Expressed in MAP Percentiles)



Note: This graphic shows how the difficulty of achieving proficiency in reading has changed. For example, fourth-grade students in 2004 had to score at the 68th percentile with respect to the NWEA norm group in order to be considered proficient, while by 2006 fourth graders had only to score at the 43rd percentile to achieve proficiency.

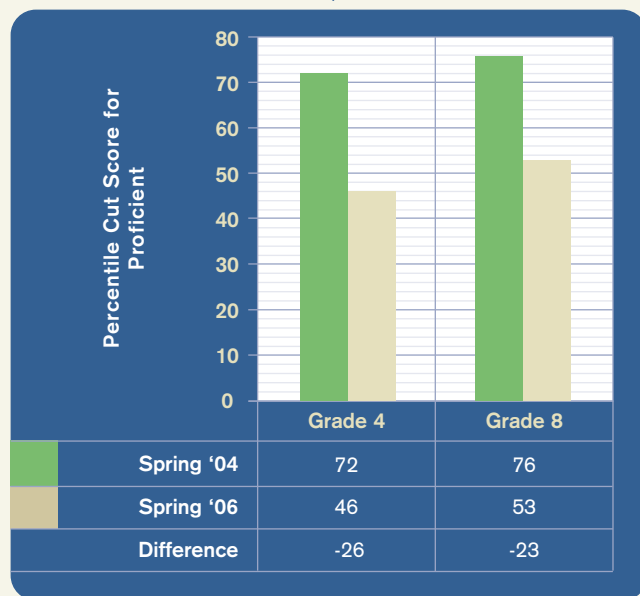
The sample size for the Maine 2004 testing season was not sufficiently large to meet the inclusion criteria for this study (i.e., estimates were based on fewer than 700 students per grade). Consequently, the discussions of “differences over time” that appear in the national sections of the overall report do not include Maine. These findings are reported for informational purposes, and should be interpreted with caution.

Despite the fact (see Figures 1 and 2) that Maine’s 2006 cut scores were among the more challenging in the country, the state’s estimated **reading** cut scores declined over this period in fourth and eighth grade (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-grade reading proficiency rate in 2006 to be 25 percent higher than in 2004. Similarly, one would expect eighth-grade reading proficiency rates to increase by 27 percent. (Maine reported a 11 point gain for fourth graders and a 22 point gain for eighth graders over this period.)

In **mathematics**, Maine’s estimated cut scores show the same pattern as in reading, with visible erosion in the difficulty of the fourth- and eighth-grade cut scores (see Figure 4. Consequently, even if student performance stayed the same on an equivalent test like NWEA’s MAP assessment, these decreases would likely yield 26 percent and 23 percent increases in the reported math proficiency rates for fourth and eighth-grade students, respectively. (Maine reported a 27 point gain for fourth graders and a 23 point gain for eighth graders over this period.)

Thus, one could fairly say that Maine’s reading and math tests were much easier to pass in 2006 than in 2004. It is important to note, however, that even with these decreases in difficulty, Maine’s tests are still harder to “pass” than those of many other states in the study.

Figure 4 – Estimated Differences in Maine’s Proficiency Cut Scores in Mathematics, 2004-2006 (Expressed in MAP Percentiles)



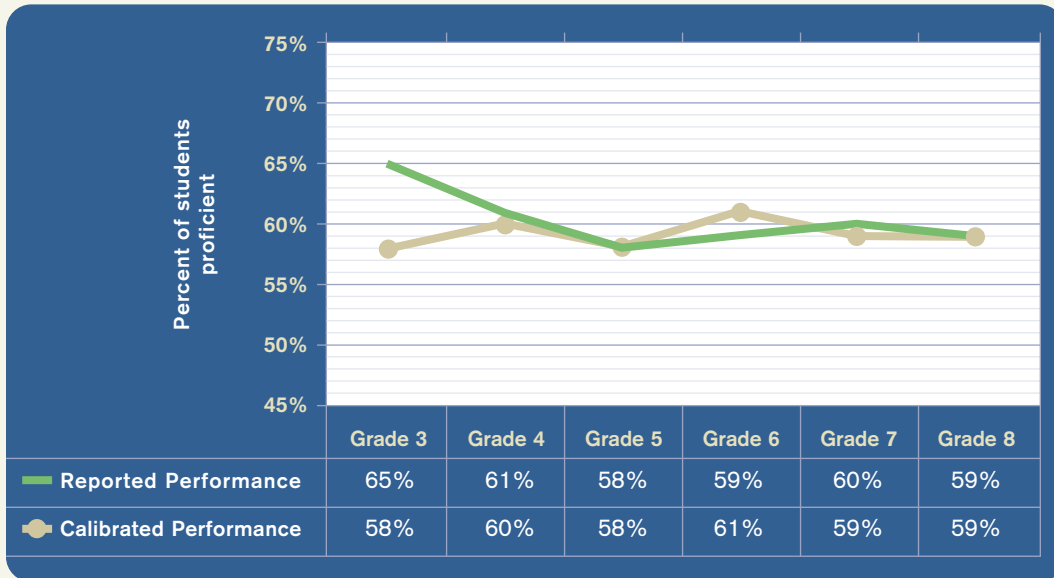
Note: This graphic shows how the difficulty of achieving proficiency in math has changed. For example, fourth-grade students in 2004 had to score at the 72nd percentile nationally in order to be considered proficient, while by 2006 fourth graders only had to score at the 46th percentile to achieve proficiency.

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.

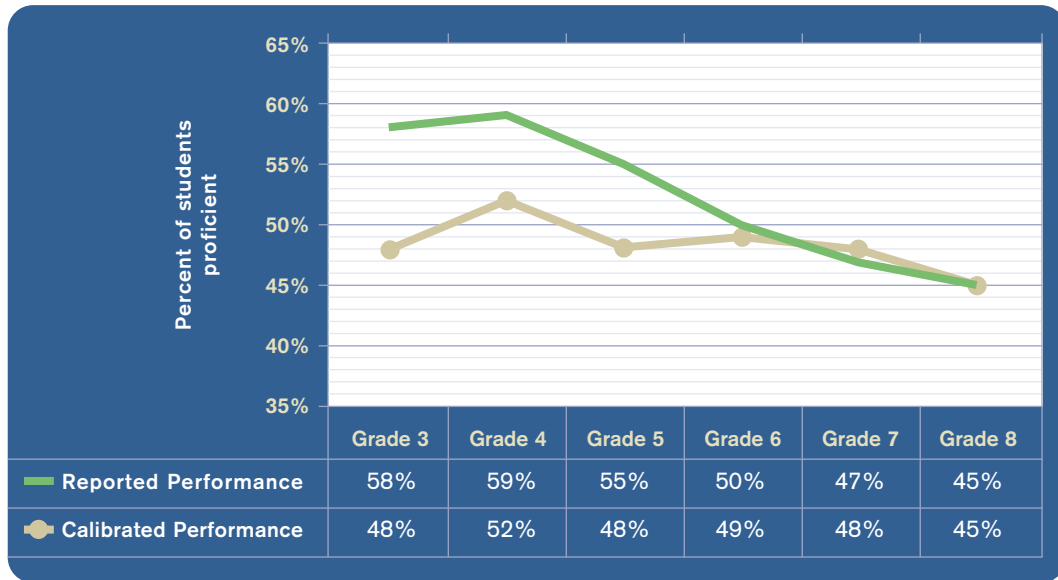
Examining Maine’s cut scores, we find that they are not well calibrated across grades. Figures 1 and 2 above showed that Maine’s upper-grade cut scores in reading and mathematics in 2006 were somewhat more challenging than the cut scores in the lower grades, particularly grade 3. The two figures that follow show Maine’s reported performance on its state tests 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-8 standard. When differences in grade-to-grade difficulty of the cut score are removed, student performance is more consistent at all grades, especially in math. This would lead to the conclusion that the higher rates of mathematics proficiency that the state has reported for elementary school students are somewhat misleading.

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



Note: This graphic shows, for example, that if Maine’s grade-3 reading cut score was set at the same level of difficulty as its grade-8 cut score, 58 percent of third graders would achieve the proficient level, rather than 65 percent, as was reported by the state.

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



Note: This graphic shows, for example, that if Maine's grade-3 mathematics cut score was set at the same level of difficulty as its grade-8 cut score, 48 percent of third graders would achieve the proficient level, rather than 58 percent, as was reported by the state.

Policy Implications

When setting its cut scores for what students must know and be able to do in order to be considered proficient in reading and math, Maine is relatively high, at least compared with the other 25 states in this study. Maine's cut scores have been adjusted over the past several years, however, making them less challenging (although they are still more difficult than the majority of states in the current study). Also of note is the fact that Maine's proficiency cut scores in reading and math are not well calibrated across grades, particularly in math, where

students who are proficient in third and fourth grade are not necessarily on track to be proficient by the eighth grade. Maine policymakers might consider adjusting their 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.