

Nevada



Introduction

This study linked data from the 2003 and 2006 administrations of Nevada’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 Nevada’s definitions of proficiency in reading and mathematics are relatively difficult at the early grades and about at the mid-point in the later grades, when compared to the 25 other states in the study. In other words, Nevada’s tests are above average in terms of difficulty in the earlier grades and about average in the later grades.

The difficulty level of Nevada’s tests remained constant from 2003 to 2006, except for a decline in third-grade reading expectations. Nonetheless, one striking finding of this study is that Nevada’s cut scores are more difficult, relatively speaking, for third-grade students than they are for eighth-grade pupils. (In most states studied, the opposite is true.) Nevada policy-makers 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: Nevada Criterion-Referenced Assessment (Nevada CRT) and Iowa Test of Basic Skills (ITBS)

Nevada currently uses the Nevada Criterion-Referenced Assessment (Nevada CRT), which tests mathematics and reading in grades 3, 5, and 8, and the Iowa Test of Basic Skills (ITBS), which tests math, reading, language, and science in grades 4, 7, and 10. The same tests were used in spring 2003 in mathematics and reading: Nevada CRT in grades 3 and 5, and ITBS in grades 4 and 7. The current study linked reading and math data from spring 2003 and spring 2006 administrations to a common scale also administered in the 2003 and 2006 school years.

To determine the difficulty of Nevada’s proficiency cut scores, we linked data from Nevada’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 took both the state’s assessment and the NWEA test. (The methodology section of this report explains how performance was compared.)

Part 1: How Difficult are Nevada'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.

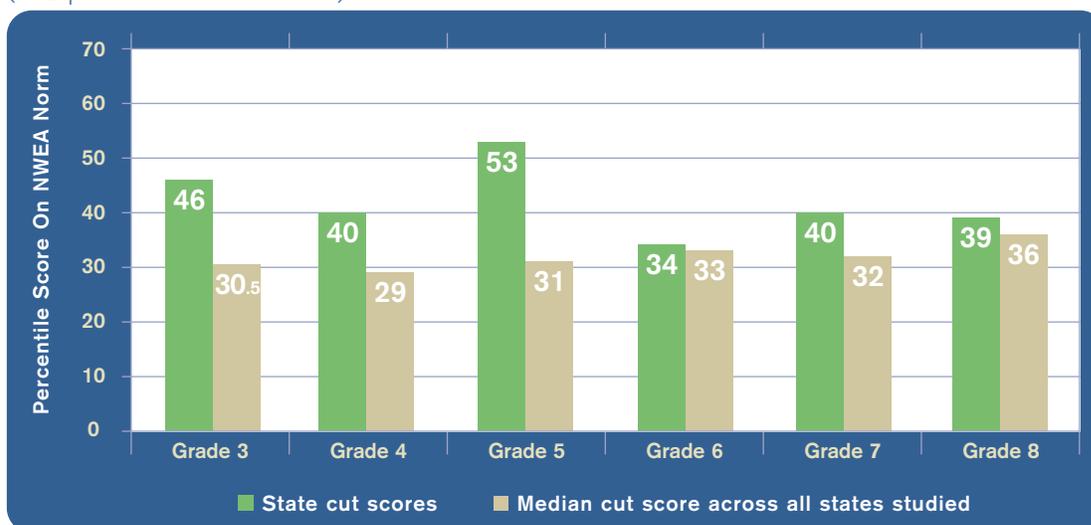
Applying that approach, we evaluated the difficulty of Nevada's proficiency cut scores by estimating the proportion of students in NWEA's norm group who would perform above the Nevada cut score on a test of equivalent difficulty. The two figures that follow show the difficulty of Nevada's proficiency

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 Nevada ranged between the 34th and 53rd percentiles for the norm group, with fifth grade being most challenging. In **mathematics**, the proficiency cut scores ranged between the 35th and 50th percentiles, with third grade being most challenging.

Nevada's reading cut scores are consistently above the median difficulty level, compared to the other states studied. For mathematics, Nevada's cut scores are above the median difficulty in grades 3 through 5 and below the median difficulty in grades 6 through 8.

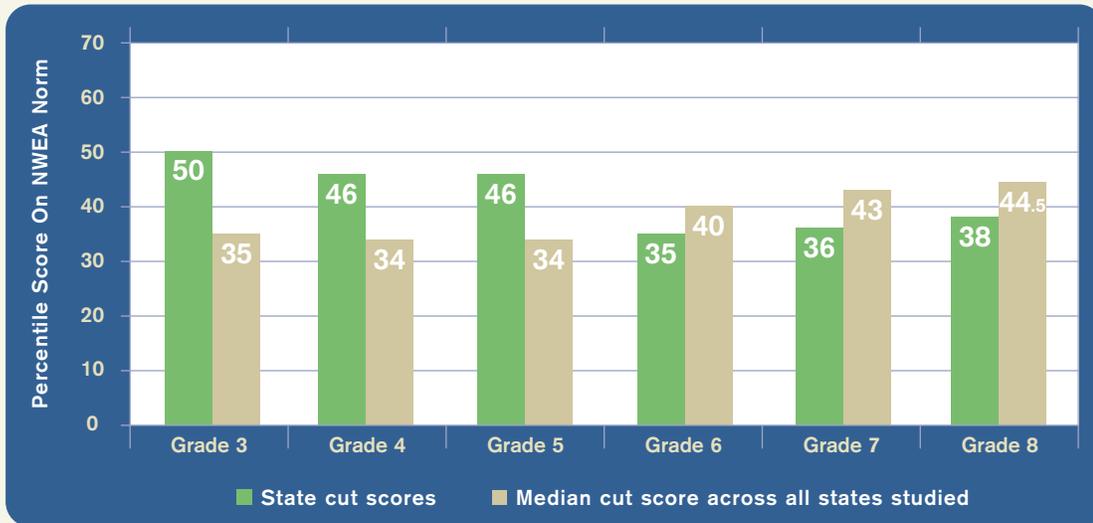
Another way of assessing difficulty is to evaluate how Nevada's proficiency cut scores rank relative to other states. Table 1 shows that the Nevada cut scores generally rank in the upper third in difficulty among the 26 states studied for this report. Its reading cut score in grades 3 and 5 and math cut scores in grade 3 are particularly highly ranked: among the top two or three states in difficulty.

Figure 1 – Nevada Reading Cut Scores in Relation to All 26 States Studied, 2006 (as 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. Nevada's cut scores are 1 to 22 percentile points above the median.

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



Note: Nevada's math test cut scores are shown as percentiles of the NWEA norm and compared with the median cut score of the 26 states reviewed in this study. The cut scores are 12 to 15 percentile points above the median in grades 3 through 7 and 5 to 7 percentile points below the median in grades 6 through 8.

Table 1 – Nevada Reading and Mathematics Proficiency Cut Scores Among 26 States for Reading and Mathematics, 2006

	Ranking (Out of 26 States)					
	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Reading	3	5	2	12	7	8
Mathematics	3	5	8	16	18	14

Note: This table ranks Nevada'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, Nevada'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 reading and mathematics were available for both years for grades 3 and 5.

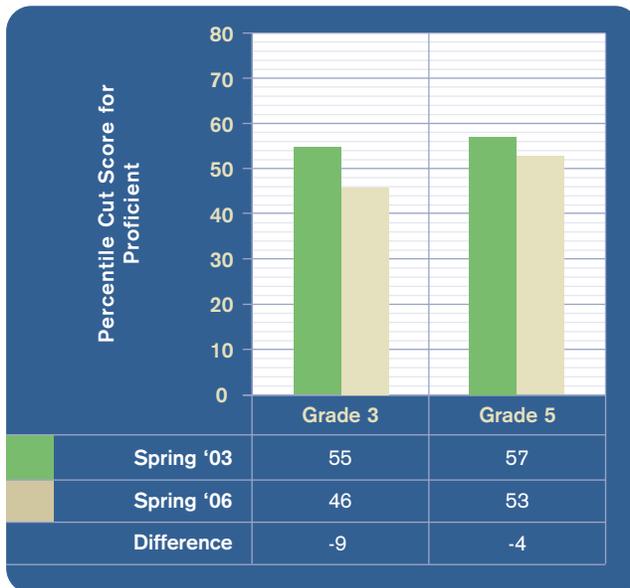
States may periodically re-adjust the cut scores they use to define proficiency in reading and math or may update the exams used to test student proficiency. Such changes can impact proficiency ratings, not necessarily because student performance has changed, but because the measurements and criteria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

Is it possible, then, to compare the proficiency scores between earlier administrations of Nevada tests and today's? Yes. Assume that we're judging a group of fifth 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. Nevada CRT and ITBS in 2003 and Nevada CRT and ITBS in 2006 both can be linked to the 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 scores needed to pass the Nevada CRT and ITBS in 2003 and 2006 on the MAP scale and ascertain whether the state's tests may have changed in difficulty.

Nevada's estimated **reading** cut scores showed a moderate decrease over this period in the third 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 third-grade reading proficiency rate in 2006 to be 9 percent higher than in 2003. (Nevada reported a 3-point gain for third graders over this period.) The proficiency cut score for fifth-grade reading remained essentially unchanged, as were all estimated **mathematics** cut scores (see Figure 4).

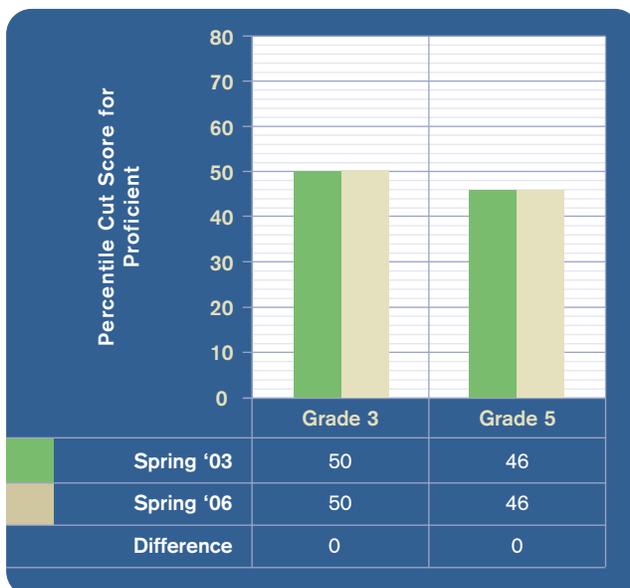
Thus, one could fairly say that Nevada's third-grade reading test was easier to pass in 2006 than in 2003, while the other tests stayed about the same. As a result, some apparent improvements in state-reported third-grade reading proficiency rate during this period may not be entirely a product of improved achievement.

Figure 3 – Estimated Difference in Nevada's Proficiency Cut Scores in Reading, 2003-2006 (as Expressed in MAP Percentiles)



Note: This graphic shows how the difficulty of achieving proficiency in reading has changed. For example, third-grade students in 2003 had to score at the 55th percentile on NWEA norms in order to be considered proficient, while in 2006 third graders had only to score at the 46th percentile to achieve proficiency. The changes in grade 5 were within the margin of error (in other words, too small to be considered substantive).

Figure 4 – Estimated Difference in Nevada's Proficiency Cut Scores in Mathematics, 2003-2006 (as Expressed in MAP Percentiles)



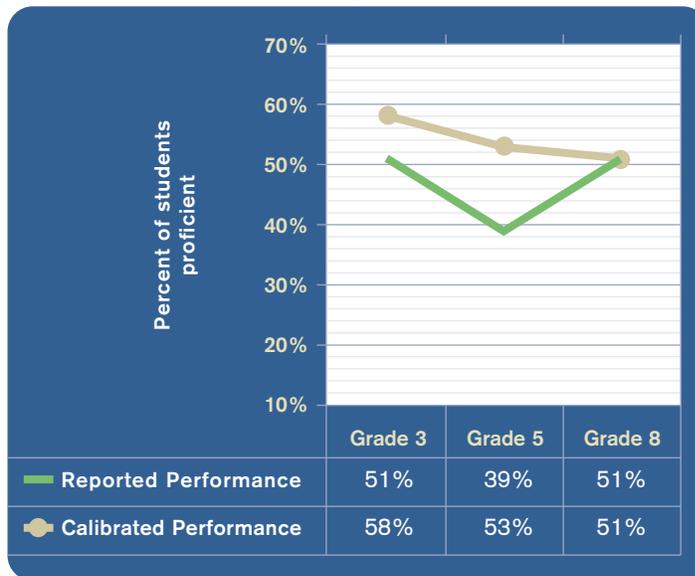
Note: This graphic shows that the difficulty of achieving proficiency in math has not changed. For example, third-grade students in both 2003 and 2006 had to score at the 50th percentile on NWEA norms in order to be considered proficient. The changes in grades 3 and 5 were within the margin of error (in other words, too small to be considered substantive).

Part 3: Calibration across Grades

Calibrated proficiency cut scores are relatively equal in difficulty across all grades. Thus, the eighth-grade cut score is no more or less difficult for eighth graders to achieve than the 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.

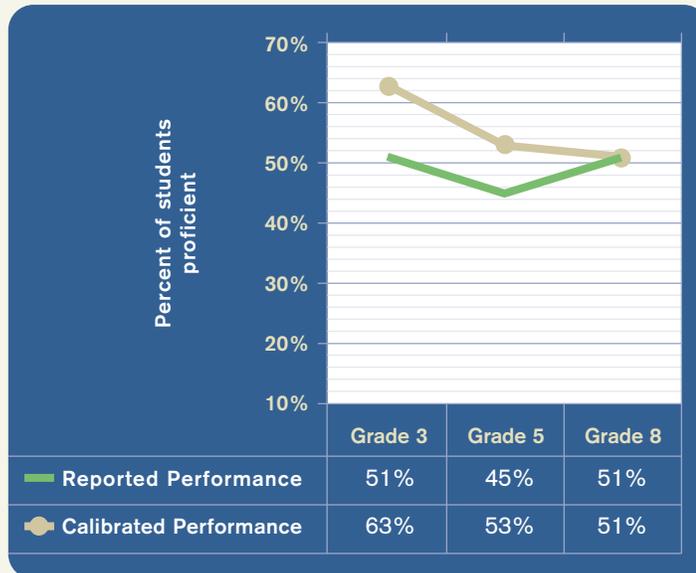
Figures 1 and 2 illustrated the relative difficulties of Nevada’s cut scores for reading and mathematics, showing that the upper-grade cut scores in reading and mathematics were less challenging than in the lower grades. The following two figures show Nevada’s reported performance in reading (Figure 5) and mathematics (Figure 6) on the state test and the rate 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 across grades. This would lead to the conclusion that the more difficult standards at the lower grades may result in underestimating the proportion of third-grade students who are actually on track to meet the easier proficiency standards of the later grades.

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



Note: This graphic shows, for example, that, if Nevada’s grade-3 reading cut score were 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 51 percent, as was reported by the state.

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



Note: This graphic shows, for example, that, if Nevada's grade-3 mathematics cut score were set at the same level of difficulty as its grade-8 cut score, 63 percent of third graders would achieve the proficient level, rather than 51 percent, as was reported by the state.

Policy Implications

When setting its cut scores for what students should know and be able to do in order to be considered proficient in reading and math, Nevada is relatively high at the lower grades and at about the mid-point for the upper grades, at least compared to the other 25 states in this study. This finding is roughly consistent with the recent National Center for Education Statistics report, *Mapping 2005 State Proficiency Standards Onto the NAEP Scales*, which found Nevada's standards to be in the upper half for the early grades. In recent years, the difficulty of the third-grade reading cut score has decreased

while other tests and grades have held roughly constant. Furthermore, Nevada's proficiency cut scores are not smoothly calibrated across grades; some students who are not proficient in third grade actually may be on track to be proficient by the eighth grade. Nevada policymakers might consider adjusting their cut scores across grades so that performance at the early grades accurately predicts proficiency at the higher grades.