

# New Jersey



## Introduction

This study linked data from the 2005 and 2006 administrations of New Jersey’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 New Jersey’s definitions of proficiency in reading and mathematics are less difficult than the cut scores set by the majority of the other 25 states in this study, at least in the lower grades. In other words, New Jersey’s tests are generally below average in terms of difficulty.

The level of difficulty changed some from 2005 to 2006, but the direction of that change varied by grade and subject. New Jersey’s reading tests have grown harder to pass, while the mathematics tests are now easier to pass, although not for all grades. One finding of this study is that New Jersey’s cut scores are easier for third-grade students than for middle-school students (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: New Jersey Assessment of Knowledge and Skills (NJ ASK) and Grade Eight Proficiency Assessment (GEPA)**

New Jersey currently uses an assessment called the New Jersey Assessment of Knowledge and Skills (NJ ASK), which tests language arts literacy and mathematics in students in grades three through seven, the New Jersey Grade Eight Proficiency Assessment (GEPA), which tests language arts literacy, mathematics, and science in students in grade eight, and the New Jersey High School Proficiency Assessment (HSPA), which tests language arts literacy and mathematics in students in grade 10. The same tests were used in spring 2005. The current study linked data from spring 2005 and spring 2006 NJ ASK and GEPA administrations to a common scale also administered in the 2005 and 2006 school years.

To determine the difficulty of New Jersey’s proficiency cut scores, we linked data from New Jersey’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’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 New Jersey’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 percent would make it. How do we know 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.

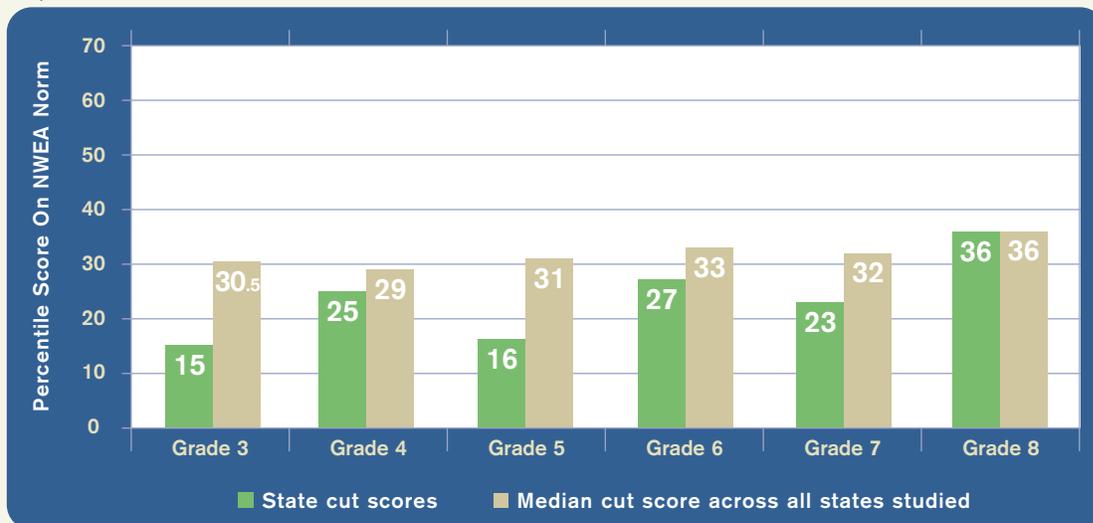
Applying that approach to this assignment, we evaluated the difficulty of New Jersey’s proficiency cut scores by estimating the proportion of students in NWEA’s norm group who would perform above the New Jersey cut score on a test of equivalent difficulty. The following two figures show the difficulty of New Jersey’s proficiency cut scores for reading (Figure 1) and mathematics (Figure 2) in 2006 in relation to the median cut score for all states in the study. The proficiency cut scores for **reading** in New Jersey ranged between the 15th and 36th percentiles of the NWEA norm group, with eighth grade being most challenging. In **mathematics**, the proficiency cut scores ranged between the 13th and 43rd percentiles, with seventh grade being most challenging.

For most grades, New Jersey’s reading cut scores fall below the median difficulty among the states studied. This is also true at the lower grades for mathematics, although the math cut scores in grades six and seven equal the median difficulty. Note, too, that in grades five, six, and seven, New Jersey’s cut

scores for reading are lower than those for mathematics. (This was the case in most grades in most states.) Thus, reported differences in achievement on the NJ ASK between reading and mathematics might be more a product of differences in cut scores than in actual student achievement. In other words, New Jersey students may be performing worse in reading, or better in math, in grades five through seven than is apparent by just looking at the percentage of students passing state tests in those subjects.

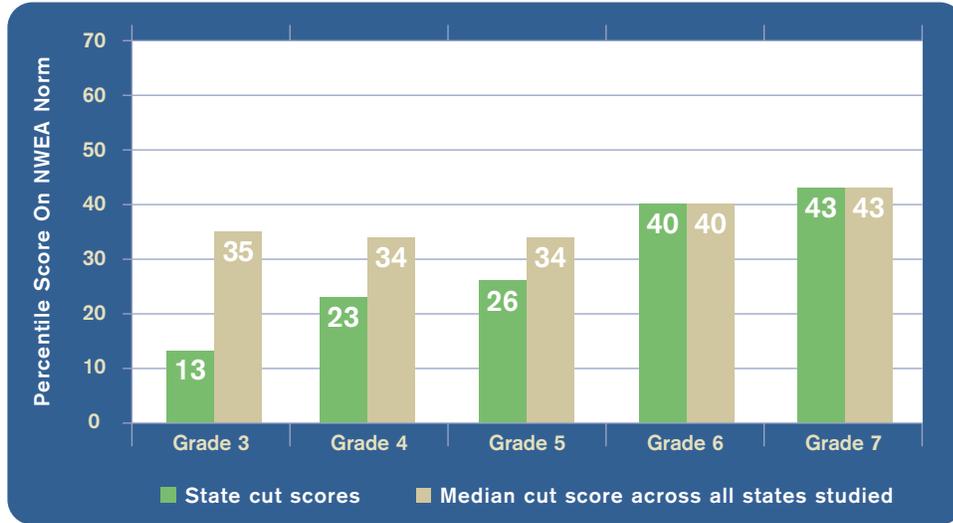
Another way of assessing difficulty is to evaluate how New Jersey’s proficiency cut scores rank relative to other states. Table 1 shows that the New Jersey cut scores generally rank in the lower half in difficulty among the 26 states studied for this report, except for math in the upper grades and reading in grade eight. The standards set for grade-three reading and mathematics are among the lowest: 22nd and 20th of 26, respectively.

Figure 1 – New Jersey 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. Only in eighth grade does New Jersey’s cut score reach the median. Cut scores in grades three through seven are 4 to 15.5 percentile points below the median.

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



**Note:** New Jersey’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. Grades six and seven cut scores reach the median, but those in grades three through five fall 8 to 22 percentile points below the median.

Table 1 – New Jersey 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	22	17	23	18	22	9
Mathematics	23	22	18	12	12	Not Available

**Note:** This table ranks New Jersey’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, New Jersey's proficiency cut scores were mapped to their equivalent scores on NWEA's MAP assessment for the 2005 and 2006 school years. Cut score estimates at both years were available in reading and mathematics for grades three and four.

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 New Jersey, that maintained their proficiency levels.

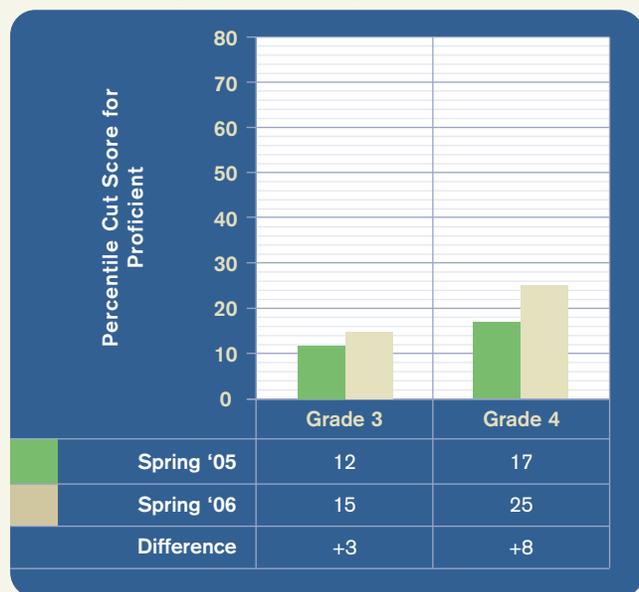
Is it possible, then, to make comparisons of the proficiency scores between earlier administrations of New Jersey tests and today's? Yes. Assume that we're judging a group of fourth graders on their high-jump prowess and that we measure this by finding how many in that group can successfully clear a 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 measures or scales used by the NJ ASK in 2005 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 NJ ASK in 2005 and 2006 on the MAP scale and ascertain whether the test may have changed in difficulty. This allows us to estimate whether the 2006 NJ ASK was easier to pass, more difficult, or about the same as in 2005.

New Jersey's estimated **reading** cut scores indicate increases over this duration in the third and fourth 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 reading proficiency rate in 2006 to be three percent lower in 2006 than in 2005 for third grade, and about eight percent lower in fourth grade. (New Jersey reported a 1-point drop for third graders and a 2-point drop for fourth graders over this period.)

New Jersey's estimated **mathematics** cut scores show a decrease in the difficulty at third grade (see Figure 4). Consequently, even if student performance stayed the same on an equivalent test like NWEA's MAP assessment, this would likely yield an increased proficiency rate of nine percent (see Figure 4). (New Jersey reported a 4-point gain for third graders over this period.) The fourth-grade mathematics proficiency cut score did not change substantively from its 2005 level.

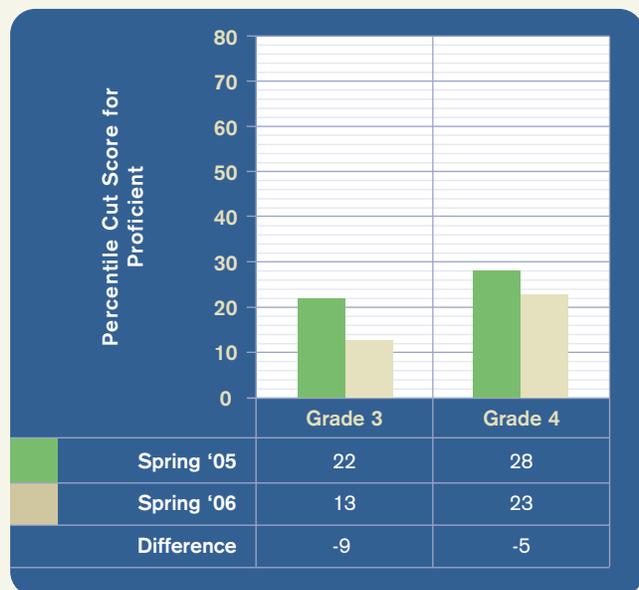
Thus, one could fairly say that New Jersey's reading tests were harder to pass in 2006 than in 2005, while the mathematics test became easier to pass for third graders. As a result, improvements in the state's third-grade mathematics proficiency rate may not be entirely a product of improved achievement, while any actual improvements in reading performance may be masked somewhat by the increased difficulty of the state's proficiency cut scores.

Figure 3 – Estimated Differences in New Jersey's Proficiency Cut Scores in Reading, 2005-2006 (Expressed in MAP Percentiles)



**Note:** This graphic shows how the difficulty of achieving proficiency in reading has changed. For example, third grade students in 2005 had to score at the 12th percentile on the NWEA norm in order to be considered proficient, while in 2006 third graders had to score at the 15th percentile to achieve proficiency.

Figure 4 – Estimated Differences in New Jersey's Proficiency Cut Scores in Mathematics, 2005-2006 (Expressed in MAP Percentiles)



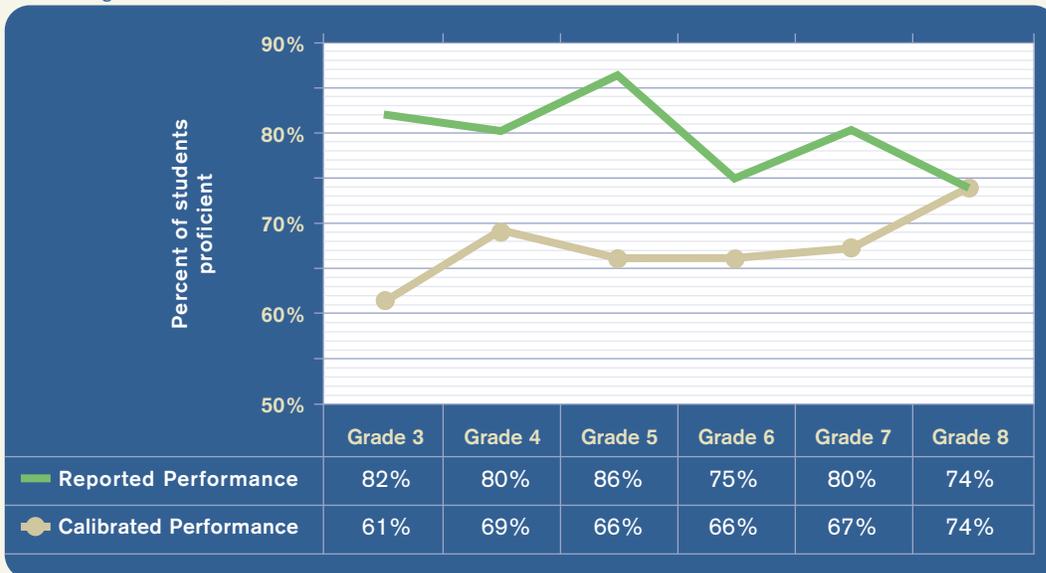
**Note:** This graphic shows how the difficulty of achieving proficiency in math has changed. For example, third-grade students in 2005 had to score at the 22nd percentile on the NWEA norm in order to be considered proficient, while a year later third graders had only to score at the 13th percentile to achieve proficiency. The changes in grade four 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 to achieve for eighth graders 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 cut scores 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.

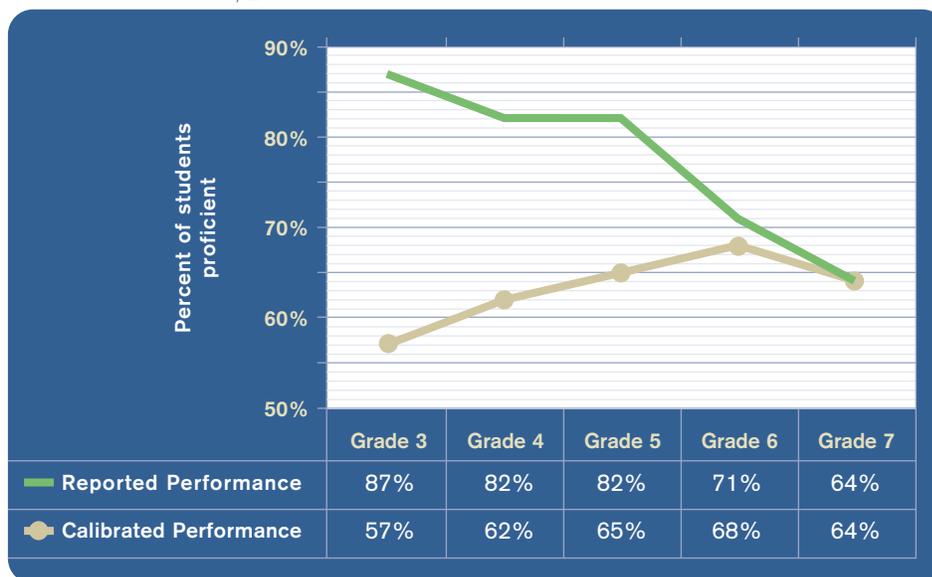
Figures 1 and 2 illustrated the relative difficulty of the reading and mathematics cut scores across grades, showing that the upper-grade cut scores in reading and mathematics were more difficult than the cut scores in the lower grades. The two figures that follow show New Jersey’s reported performance in reading (Figure 5) and mathematics (Figure 6) on the state test, compared with the rates of proficiency that would be achieved if the cut scores were all calibrated to the grade-seven standard (in math) or grade-eight standard (in reading). When differences in grade-to-grade difficulty of the cut score are removed, student performance is more consistent at all grades. This would lead to the conclusion that the higher rates of proficiency that the state has reported for students in the earlier grades are somewhat misleading.

Figure 5 – New Jersey Reading Performance as Reported and as Calibrated to the Grade-Eight Standard, 2006



**Note:** This graphic shows, for example, that if New Jersey’s grade-three reading cut score was set at the same level of difficulty as its grade-eight cut score, 61 percent of third graders would achieve the proficient level, rather than 82 percent, as was reported by the state.

Figure 6 – New Jersey Mathematics Performance as Reported and as Calibrated to the Grade-Seven Standard, 2006



**Note:** This graphic shows, for example, that if New Jersey's grade-three mathematics cut score was set at the same level of difficulty as its grade-seven cut score, 57 percent of third graders would achieve the proficient level, rather than 87 percent, as was reported by the state.

### Policy Implications

When setting cut scores for what it takes for a student to be considered proficient in reading and math, New Jersey is relatively low, particularly in the earlier grades, at least compared to 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 New Jersey's standards to be in the bottom half of the state distribution for the earlier grades (though slightly higher for the upper grades). From 2005 to 2006, New Jersey's proficiency cut scores changed somewhat,

becoming more challenging for reading and somewhat easier for mathematics – though not for all grades. Plus, New Jersey's cut scores are not calibrated smoothly across grades; students who are proficient in third grade are not necessarily on track to be proficient by the end of middle school. New Jersey 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.