

Indiana



Introduction

This study linked data from the 2002 and 2006 administrations of Indiana'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 Indiana's definitions of "proficiency" in reading and mathematics are somewhat below the standards set by the other 25 states in this study. In other words, Indiana's tests are a bit below average in terms of difficulty.

The difficulty of Indiana proficiency cut scores decreased somewhat from 2002 to 2006—the No Child Left Behind era—although not for all 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 Indiana test not being matched by learning gains on the Northwest Evaluation Association test. One striking finding is that Indiana's reading cut scores are easier for third-grade students than for eighth-grade pupils (taking into account the obvious differences in subject content and children's development). State policymakers might consider adjusting their reading 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: Indiana Statewide Testing for Educational Progress-Plus (ISTEP+)

Indiana currently uses an assessment called the Indiana Statewide Testing for Educational Progress-Plus (ISTEP+), which tests English/language arts and math in grades 3-10, and science in grades 5 and 7. This testing program has been in use since the beginning of the study period; in 2003, test were added in grades 4, 6, and 7. The current study linked results from fall 2002 ISTEP administrations and fall 2006 ISTEP+ administrations to a common scale also administered in the 2002 and 2006 school years.

To determine the difficulty of Indiana's proficiency cut scores, we linked reading and math data from Indiana'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 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 Indiana'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.

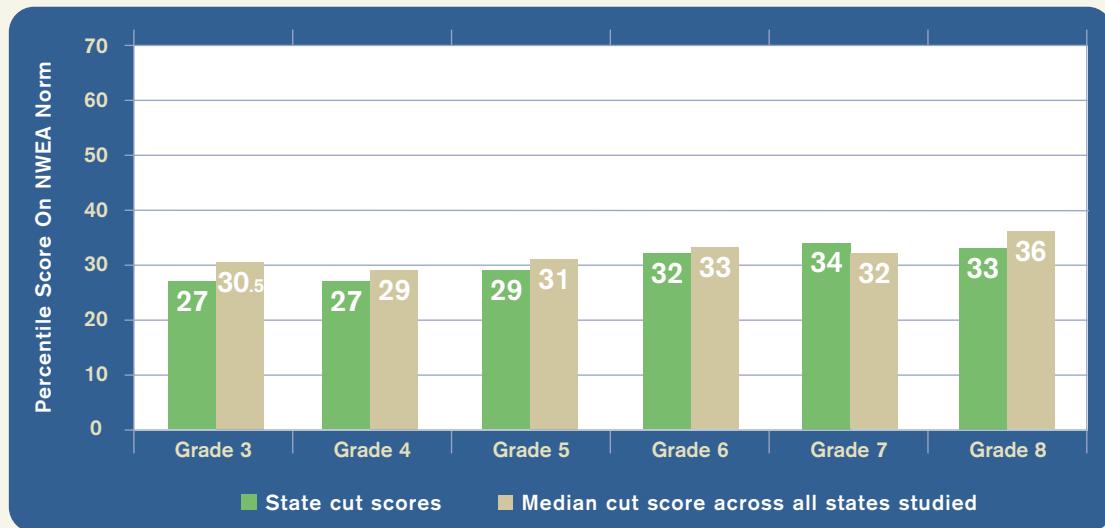
Applying that approach to this inquiry, we evaluated the difficulty of Indiana's proficiency cut scores by estimating the proportion of students in NWEA's norm group who would perform above the Indiana cut score on a test of equivalent

difficulty. The following two figures show the difficulty of Indiana'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 Indiana ranged between the 27th and 34th percentiles for the norm group, with the seventh grade being most challenging. In **mathematics**, the proficiency cut scores ranged between the 26th and 35th percentiles for the norm group, with third grade being most challenging.

For most grade levels, Indiana's cut scores in reading and mathematics are consistently near the median level among the states studied. Math cut scores for grades six through eight, however, are well below the median levels of difficulty.

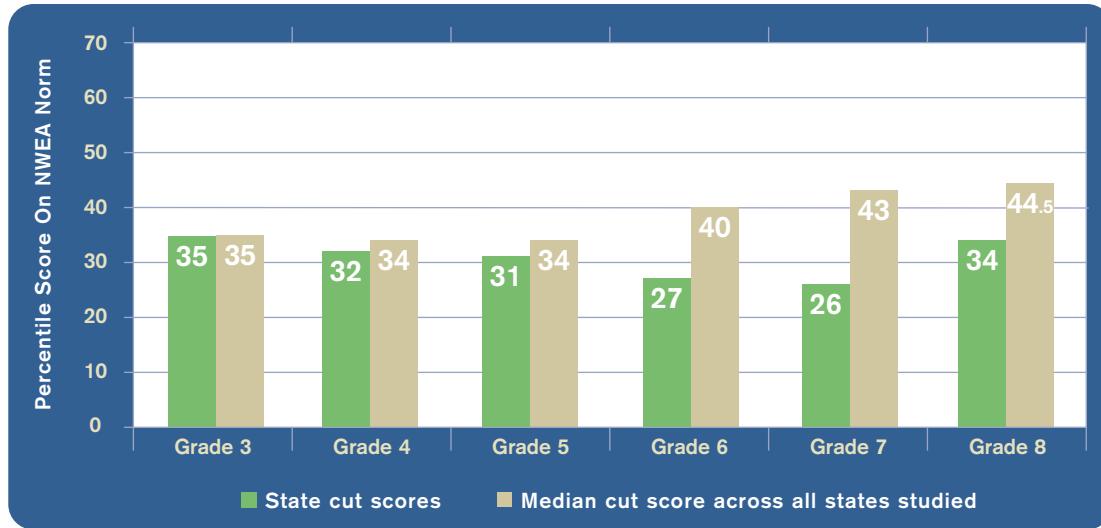
Another way of assessing difficulty is to evaluate how Indiana's proficiency cut scores rank relative to other states. Table 1 shows that Indiana cut scores generally rank in the mid- or bottom third in difficulty among the 26 states studied for this report.

Figure 1 – Indiana 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. Only in seventh grade does Indiana's cut score reach above the median. Grades 3-6 and grade 8 scores are 1 to 3.5 percentile points below the median.

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



Note: Indiana'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. Only in third grade does Indiana's math cut score reach the median; otherwise, it is 2 to 17 percentile points below.

Table 1 – Indiana's 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	15	15	16	14	12	14
Mathematics	13	16	17	21	22	17

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

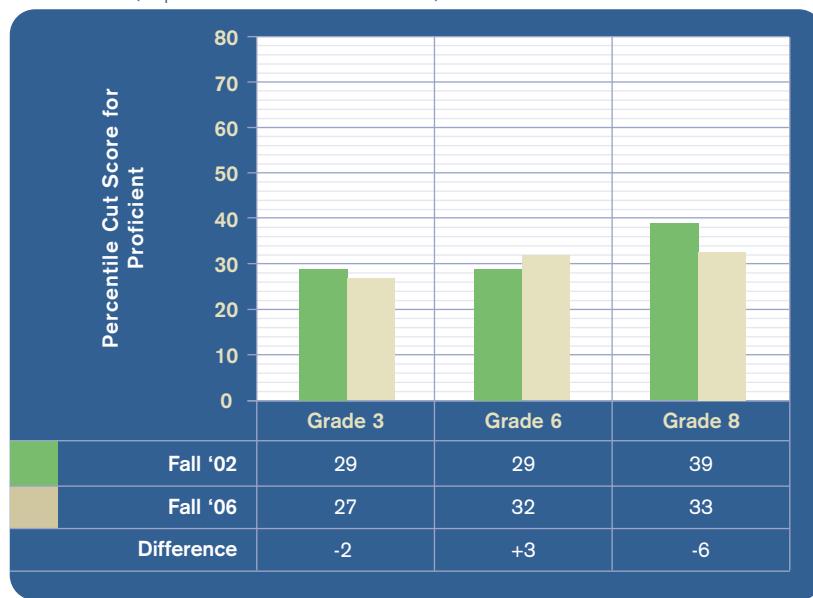
Part 2: Differences in Cut Scores over Time

In order to measure their consistency, Indiana's proficiency cut scores were mapped to their equivalent scores on NWEA's MAP assessment for the 2002 and 2006 school years. Cut score estimates for both years were available in both reading and mathematics for grades 3, 6, and 8.

States may periodically re-adjust the cut scores they use to define proficiency in reading and math, or may update the assessments 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.

Is it possible, then, to compare the proficiency scores between earlier administrations of Indiana's 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 ISTEP in

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



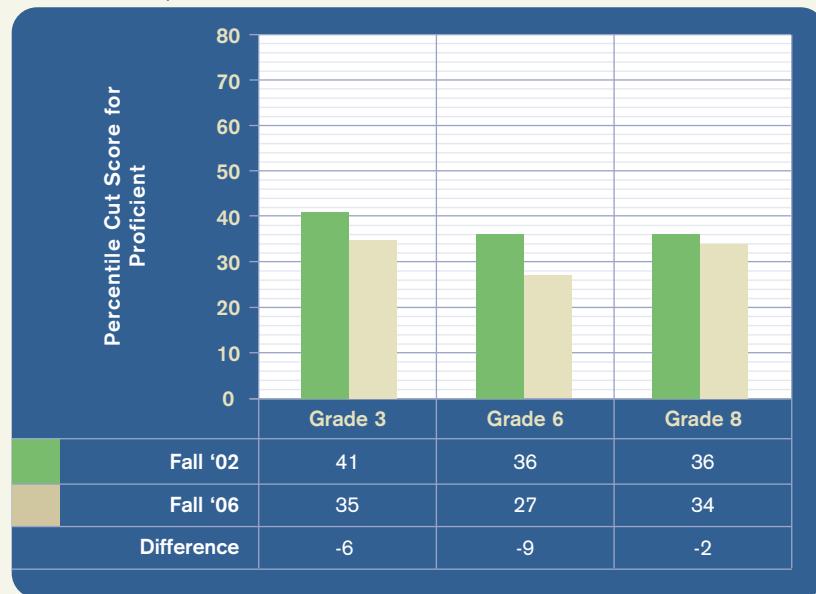
Note: This graphic shows whether the difficulty of achieving proficiency in reading has changed. For example, eighth-grade students in 2002 had to score at the 39th percentile of the NWEA norm group in order to be considered proficient, while in 2006 eighth graders had only to score at the 33rd percentile of the NWEA norm group to achieve proficiency, although this change is not substantive. The changes in grades 3, 6, and 8 were within the margin of error (in other words, too small to be considered substantive).

2002 and the ISTEP+ in 2006 can both be linked to the MAP, which has remained consistent over time. This allows us to estimate whether the ISTEP+ in 2006 was easier to pass, harder, or about the same as the ISTEP in 2002. 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 Indiana's assessments in 2002 and 2006 on the MAP scale and ascertain whether the test may have changed in difficulty.

In **reading**, no substantive differences are visible in grades 3, 6, and 8 (the observed changes were smaller than the margin of error for the estimate, see Figure 3).

Indiana's estimated **mathematics** cut scores decreased moderately for sixth grade (see Figure 4). Consequently, even if student performance stayed the same on an equivalent test like NWEA's MAP assessment, one would expect to see a 9 percent increase for sixth graders. (Indiana reported a 12-point gain for sixth graders over this period.)

Figure 4 – Estimated Difference in Indiana'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 36th percentile of the NWEA norm group in order to be considered proficient, while in 2006 third graders only had to score at the 27th percentile of the NWEA norm group to achieve proficiency. The changes in grades 3 and 8 were within the margin of error (in other words, too small to be considered substantive).

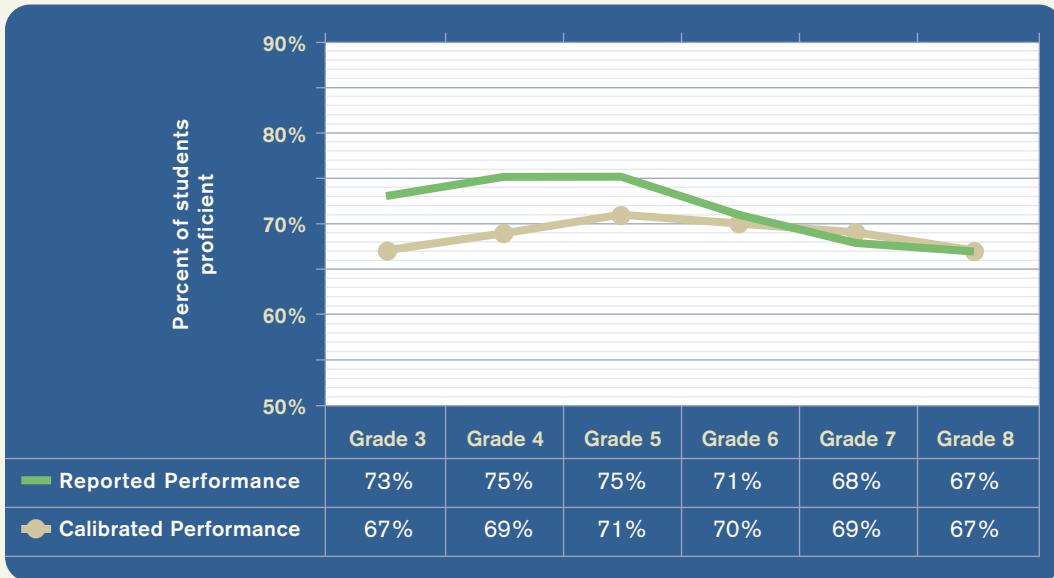
Part 3: Calibration across Grades

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 Indiana's cut scores, we find that they are not well calibrated across grades. Figure 1 showed that Indiana's upper grade cut scores in reading in 2006 were more challenging

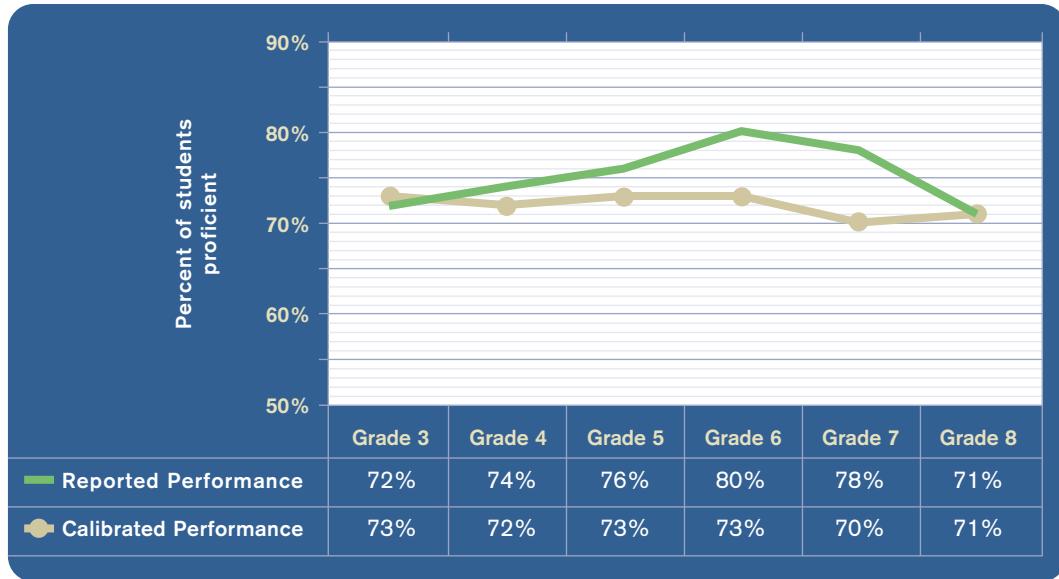
than the cut scores in the lower grades. A different pattern emerged in mathematics, with the cut scores at third and eighth grades being more challenging than the grades in between (see Figure 2). The two figures that follow show Indiana's reported performance on its state test in reading (Figure 5) and mathematics (Figure 6), compared with the rates of proficiency that would be achieved if the cut scores were all calibrated to the eighth-grade standard. When differences in grade-to-grade difficulty of the cut scores are removed, student performance in both reading and math is more consistent at all grades. This would lead to the conclusion that the higher rates of proficiency that the state has reported for elementary school students in reading are somewhat misleading.

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



Note: This graphic shows, for example, that if Indiana's grade-3 reading standard were set at the same level of difficulty as its grade-8 standard, 67 percent of third graders would achieve the proficient level, rather than 73 percent, as reported by the state.

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



Note: This graphic shows, for example, that if Indiana's grade-7 mathematics cut score were set at the same level of difficulty as its grade-8 standard, 70 percent of seventh graders would achieve the proficient level, rather than the 78 percent reported by the state.

Policy Implications

When setting its cut scores for what it takes for a student to be considered proficient in reading and math, Indiana is slightly below average, 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 Indiana's standards to be about average in the distribution of all states studied.) Indiana's cut scores have remained fairly constant over the past several years, although eighth-grade reading and third- and sixth-grade math standards have eased.

However, Indiana's expectations are imperfectly calibrated across grades; students who are proficient in third-grade reading, in particular, are not necessarily on track to be proficient by the eighth grade. Indiana 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.