

Delaware



Introduction

This study linked data from the 2006 administration of Delaware’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 Delaware’s definitions of proficiency in reading and mathematics generally ranked below average compared with the standards set by the 25 other states in this study.

Moreover, Delaware’s proficiency cut scores in math are relatively lower in early grades than in later grades (taking into account the obvious differences in subject content and children’s development). Therefore, reported results may overestimate the number of elementary students on track to be proficient in math by the eighth grade. Delaware policymakers might consider adjusting their math standards 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: Delaware Student Testing Program (DSTP)

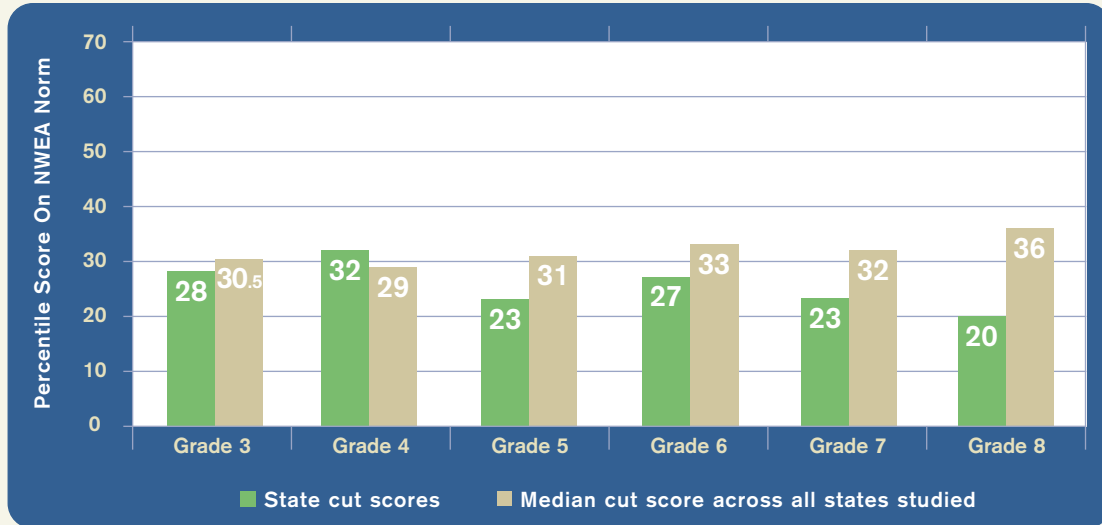
Delaware currently uses an assessment called the Delaware Student Testing Program (DSTP), which tests reading, writing, and mathematics in grades 2-10. The current study analyzed reading and math results from a group of elementary and middle schools in which almost all students had taken both the state assessment and MAP, using the 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 Delaware State Assessment. (A “proficiency cut score” is the score a student must achieve in order to be considered proficient.)

Part 1: How Difficult are Delaware’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 leap? 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? We know because only one (or perhaps none) of those same 100 individuals would successfully meet that level of 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.

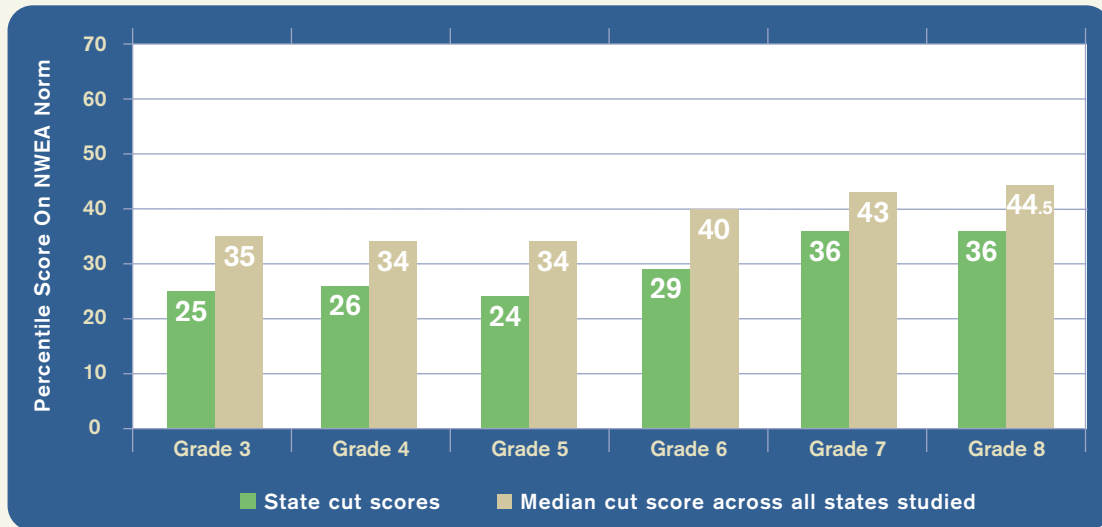
Applying the concept to this task, we evaluated the difficulty of the Delaware proficiency cut scores by estimating the proportion of students in NWEA’s norm group that would perform above the Delaware standard on a test of equivalent difficulty. The following two figures show the difficulty of Delaware’s 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 Delaware ranged between the 20th and 32nd percentiles for the norm group, with the fourth-grade standard being most challenging. In **mathematics**, the proficiency cut scores ranged between the 24th and 36th percentiles with seventh and eighth grade being most challenging.

Figure 1 – Delaware 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 fourth grade does Delaware surpass the median; by eighth grade, its reading cut score is 16 percentiles below the median.

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



Note: Delaware’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. The proficiency cut scores are consistently 7 to 11 percentiles below the median.

Table 1 – 2006 Delaware 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	14	10	20	18	22	22
Mathematics	20	21	20	20	18	16

Note: This table ranks Delaware’s cut scores relative to the cut scores of the other 26 states in the study where 1 is the highest rank and 26 is the lowest.

Delaware’s cut scores in reading and math are below average in difficulty for most grades, compared with other states in the study. The reading proficiency cut scores are also lower than those for mathematics. (This was the case for the majority of states studied.) Thus, reported differences in achievement between the two subjects may be more a product of differences in cut scores than in actual student achievement. In other words, Delaware students may be performing worse in reading and/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 Delaware’s proficiency cut scores rank relative to other states. Table 1 shows that the Delaware proficiency cut scores generally rank in the middle to lower third in difficulty among the 26 states studied for this report; its cut scores are especially low for seventh- and eighth-grade reading.

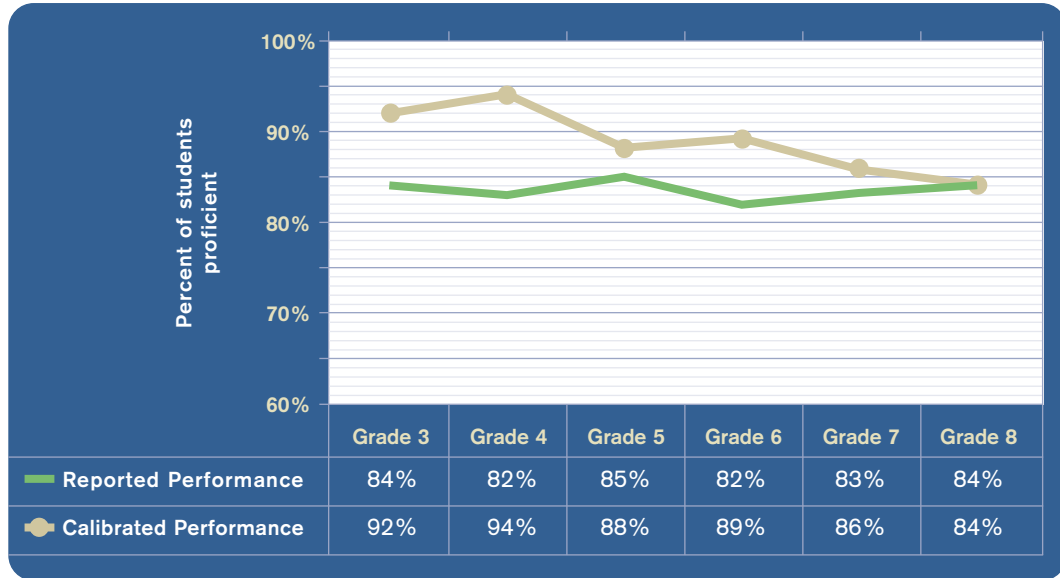
Part 2: Calibration across Grades*

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 Delaware’s cut scores, we find that they are not well calibrated across grades. Figures 1 and 2 above showed that Delaware’s reading and mathematics proficiency cut scores in 2006 differed across grades in terms of their relative difficulty. The two figures that follow show Delaware’s reported performance on its state test in reading (Figure 3) and mathematics (Figure 4), compared with the rates of proficiency that would be achieved if the cut scores were all calibrated to the grade-8 standard. When the differences in grade-to-grade difficulty of the cut scores are removed, student performance is more consistent at all grades, at least in math.

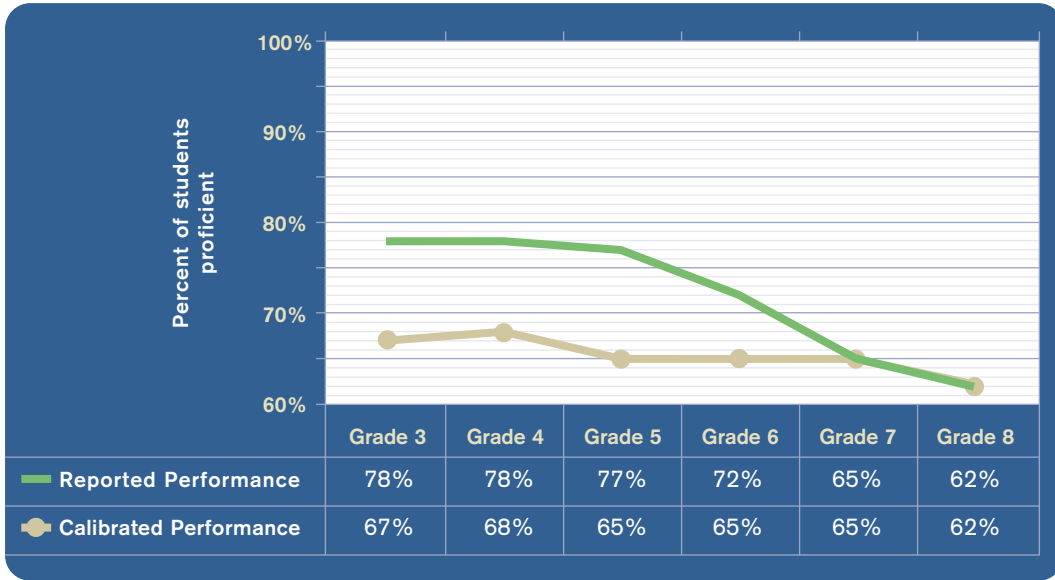
*Delaware was one of seven states in this study for which cut score estimates could be reported for only a single year (2006). Eighth-grade cut score estimates for math and reading for the 2005 year were computed for Delaware, but it was determined that this single-grade estimate would be insufficient to draw overall conclusions about changes over time for the state. Consequently, changes over time are not included in Delaware’s state report.

Figure 3 – Delaware Reading Performance as Reported and as Calibrated to the Grade-8 Standard, 2006



Note: This graphic shows, for example, that if Delaware's grade-3 reading standard were set at the same level of difficulty as its grade-8 standard, 92 percent of third graders would achieve the proficient level, rather than 84 percent, as reported by the state.

Figure 4 – Delaware Mathematics Performance as Reported and as Calibrated to the Grade-8 Standard, 2006



Note: This graphic shows, for example, that if Delaware’s grade-3 mathematics standard were as difficult as its grade-8 standard, 67 percent of third graders would achieve the proficient level, rather than 78 percent, as was reported by the state.

Policy Implications

Delaware’s proficiency cut scores are in the middle to lower end of the pack when compared with the other 25 states in this study. (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 Delaware’s reading standards to be in the bottom half to the bottom third of the distribution of states studied and its math standards to be about in the middle.) In addition, Delaware’s expectations in math are not smoothly calibrated across grades; students who are proficient in third-grade math are not necessarily on track to be proficient by the eighth

grade. Delaware policymakers might consider adjusting their math 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. Furthermore, state leaders need to be aware of the disparity between math and reading standards when evaluating teacher and student performance across these domains.