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STATEMENT ON THE NATION'S REPORT CARD:
NAEP 2009 Reading and Mathematics Grade 12

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It's wonderful to have some good news to report this morning.

As Dr. Kerachsky has told you already, the national averages are up in both reading and mathematics compared to the last time 12th graders were assessed by NAEP in these subjects, which was in 2005. The increases are modest, not spectacular. We clearly have a long way to go before we can be satisfied with what our 12th graders know and can do in reading and mathematics.

But the gains have occurred on both sides of the high school curriculum—quantitative as well as verbal, and not only in average scores but also in the percentage of students reaching the NAEP standard for *Proficient*.

I am a high school mathematics teacher in central Maine, and my remarks will focus on the mathematics assessment. My fellow Board member, Superintendent Paine, will focus on reading.

In mathematics there have been gains at both the *Basic* and *Proficient* achievement levels. All major racial/ethnic groups have made gains since 2005. And the results by percentiles indicate that the largest increases occurred at the lower end of the achievement distribution. One factor that may well have produced the improvement is that more students are enrolled in tougher mathematics courses, while the proportion of high school seniors who have taken only geometry, algebra I, or less advanced courses has dropped from 20 percent in 2005 to 15 percent last year.

On the other hand, the achievement gap between male and female students remains—though in terms of average scores it is fairly slight. And racial/ethnic gaps persist. In some cases they are disturbingly large.

In the comparison between males and females, the point with proportionately the greatest disparity is at the very high end of the achievement distribution. Nationwide, 4 percent of male students reach NAEP's very demanding standard for *Advanced* achievement, compared to 2 percent of female students.

The racial/ethnic gaps are more pervasive, and often much larger, than those between genders. For example, 52 percent of Asian/Pacific Islander students nationwide reach the *Proficient* achievement level in 12th-grade mathematics, compared to 33 percent of Whites, 11 percent of Hispanics, and 6 percent of Blacks. Some 10 percent of Asian/Pacific Islander students reach *Advanced*, compared to just 3 percent of Whites and such small proportions of Blacks and Hispanics that they round down to zero.

NAEP's achievement levels are not defined as markers of preparation for college or work. On that topic, the Governing Board is conducting research for a separate report, which we plan to release next year. Nonetheless, the disparities between different demographic groups in reaching the *Proficient* and *Advanced* achievement levels in 12th-grade mathematics are strikingly similar to the differences in college enrollment and graduation rates in demanding mathematics and engineering programs. Clearly, students are not likely to succeed in such programs in college unless they've mastered the mathematics they need in high school. And the NAEP data illustrate the very wide racial gaps in high school mathematics achievement. Unfortunately, these gaps have been persistent, despite some narrowing of the racial/ethnic gaps in the NAEP mathematics assessments at grades 4 and 8.

In part, the racial and gender differences in mathematics achievement reflect the differences in enrollment rates in advanced mathematics courses. For example, 46 percent of Asian/Pacific Islander students report taking calculus, compared to 20 percent of Whites, 10 percent of Hispanics, and 9 percent of Blacks. The gender differences are much smaller—19 percent of male students take calculus, compared to 17 percent of female students, which is not statistically significant.

Among all groups the students taking more advanced mathematics courses score higher than those who do not but, unfortunately, the gaps in achievement do not disappear. For example, among students taking calculus, the average score for Blacks is 38 points lower than that for Asians and 32 points lower than the average score for Whites. The average score for Hispanics taking calculus is 25 points below that of Asians and 19 points below that of Whites. And in all cases the racial/ethnic gaps for students taking calculus are greater than the gaps among students whose high school mathematics coursework stopped at geometry or algebra I or less advanced courses.

There also are wide differences in the average score of students taking the same courses in different states. And the state-to-state differences among students taking calculus are about as wide as—or even wider than—the differences among those whose coursework stopped earlier in the progression of mathematics instruction.

Obviously, just because they are taking a course called calculus does not mean that all students are developing mathematics reasoning and analytical skills to a comparable degree. We certainly should encourage more students to take a rigorous set of mathematics courses, but we must make sure that the substance—not just the label—of the courses is advanced.

For the first time, today's NAEP report allows us to make state-to-state comparisons at grade 12. For the 11 states that volunteered to participate, there are substantial differences not only in the overall average score but also between students in the same

demographic group. For example, there is a 25 point difference between the average scores for Whites in Massachusetts and Whites in West Virginia—and this is just 4 points less than the gap between Whites and Blacks in public schools nationwide. The scores for Whites in New Jersey average 9 points higher than those of Whites in Florida.

There is a considerable body of social science research that all of these differences reflect economic circumstances and family background as well as what happens in school. But a much higher proportion of White students in New Jersey than White students in Florida take advanced mathematics courses. Undoubtedly, this is one important factor explaining the difference.

As a mathematics teacher, I like to look at specific mathematics problems to gain some insight into student achievement. The published NAEP 12th-Grade Report Card contains four sample problems from the 2009 NAEP mathematics assessment. There are about 30 other released items on the NAEP website.

I would like to discuss two of the problems and how students handled them. The first is a rather easy multiplication question on page 34 of the report card. The second question, which is available on the NAEP data explorer, asks for a much harder geometry proof. This was one of the topics added to the NAEP Mathematics Framework for 2009 to measure preparedness for college. [The two problems are discussed in the oral presentation.]

The results released today show some of the strengths and some of the weaknesses in student mathematics achievement, some of what's been accomplished, and some of what we have to do. The fairly high proportion reaching the *Basic* achievement level indicates that most students leave high school able to solve routine problems in familiar settings. But the low proportions at *Proficient* and *Advanced* indicate that relatively few students can deploy more sophisticated mathematics or decide which mathematics concepts and procedures to use in unfamiliar situations.

As I said at the beginning, it's great to be able to talk about progress and to see from these new NAEP results that achievement in mathematics is improving. But there clearly are serious deficits; there clearly are serious gaps that we must do a better job of addressing.

Thank you very much.