National Assessment of Educational Progress
2013 Grade 12 Reading and Mathematics

Commissioner's Statement
National Center for Education Statistics

We are releasing the results of the 2013 twelfth grade mathematics and reading assessments from the National Assessment of Educational Progress—The Nation's Report Card. NAEP administered mathematics and reading assessments in 2013 to students across the country at grades 4, 8, and 12. We released results for students in grades 4 and 8 last November.

Introduction

The grade 12 results being released include both national results and our second set of results at the state level. Our pilot grade 12 program began in 2009 with 11 states (Arkansas, Connecticut, Florida, Idaho, Illinois, Iowa, Massachusetts, New Hampshire, New Jersey, South Dakota and West Virginia). In 2013, Michigan and Tennessee also participated. The pilot is examining the feasibility of conducting NAEP grade 12 assessments at the state level for all states, as is done for grades 4 and 8.

Our participating states vary widely in size of population—from Florida, the fourth most populated state in the nation, to South Dakota, one of the smallest, and they vary in the makeup and characteristics of their populations as well. The range in percentage of Black students is from 1 percent in Idaho to 23 percent in Tennessee, compared to a national average of 15. The range for Hispanic students is from 1 percent in West Virginia to 27 percent in Florida, compared to the national average of 21. We also see a wide range in the percentage of students attending suburban schools, from a percentage that approaches zero in South Dakota to 77 percent in New Jersey, compared to a national average of 35 percent. The range of the percentage of students who reported having a parent who graduated from college is narrower—from 41 percent in Arkansas to 58 percent in Iowa, New Hampshire, and South Dakota, compared to a national average of 47.

The grade 12 assessments were administered between January and February in 2013. About 92,000 twelfth-graders participated in the two assessments. We have national results for both

public and private school students. These national results are based on representative samples for the nation as a whole, not just the 13 pilot states. State results are available for public school students only.

We report student performance on NAEP in two ways: average scale scores and the percentages of students at the NAEP achievement levels. The achievement levels were developed by the National Assessment Governing Board. The Board set standards for what students should know and be able to do. For each subject and for each grade, the Governing Board has established standards for *Basic*, *Proficient*, and *Advanced* performance levels. Ultimately, the goal is to have all students performing at or above the *Proficient* level.

When comparing scores and other NAEP results we only discuss differences that are statistically significant. For the most part, we will be comparing student performance in 2013 with scores from the last assessment, in 2009, and the earliest assessment year: 2005 for mathematics and 1992 for reading.

General Trends in Twelfth Grade

Grade 12 NAEP participation rates vary over years. The school participation rate sagged in the 1990s but has improved since 2002, reaching a new high of 90 percent in 2013. In order for us to report results, the school participation rate must be at least 70 percent, which we have easily achieved in the years following 2002. When looking at student participation rates there was a low of 67 percent in 2005 which has increased to 84 percent in 2013—again, a new high. We also look at the overall participation rate which is obtained by multiplying the school and student rates for a given assessment. For the 2013 overall rate, we multiple the 2013 school participation rate of 90 percent times the student participation rate of 84 percent which gives us a 75 percent overall rate (using unrounded numbers).

When we make comparisons in grade 12 reading between 1992 and 2013, we must remember the extent to which the grade 12 population itself has shifted. Since 1992, the percentages of students in some of the major groups have shifted. For example, the percentage of grade 12 students who are Hispanic has increased from 7 to 20 percent, while the percentage who are White has decreased, from 74 to 58 percent. The percentage for Black students has remained relatively constant at around 15 percent.

The 12th grade student population has also changed in regards to students with disabilities and English language learners. The percentage of grade 12 students identified as students with a disability has increased from 5 to 11 percent, while the percentage identified as English

language learners increased from 2 to 3 percent. At the same time, the percentage of both these groups of students who were excluded from NAEP fell from 5 to 2 percent.

Another change since 1992 is the size of the NAEP grade 12 sample, which has increased from 9,900 to 47,200, significantly improving the precision of our results.

The grade 12 population has also changed because fewer students are dropping out from high school. The averaged freshman graduation rate rose from 74 percent in 1991-92 to 81 percent in 2011-12 indicating that some lower performing students, who in the past might have left school before reaching the twelfth grade, are persisting with their high school education. We do not have 1991-92 graduation rates broken down by race/ethnicity, but for 2011-12 we see a range from 85 percent for White students to 68 percent for Black students.

Mathematics

Let's begin with the results for mathematics. All NAEP assessments are based on content specifications and assessment frameworks developed by the National Assessment Governing Board. The most current framework was developed for use in 2009, incorporating changes made to the previous 2005 framework. Scores for the NAEP grade 12 mathematics assessment are reported on a 0-300 scale.

In 2005, the average score for the mathematics assessment was 150. In 2013, the average score was 153, higher by three points than in 2005. While there have been no overall score changes since the last assessment in 2009, scores have increased since 2005 for many groups. Since 2005, scores have increased for all groups except American Indian/Alaska Native. These increases ranged from 4 points for White students to 13 points for students of two or more races.

We also consider score gaps between groups— none of the gaps changed significantly, compared to either 2009 or 2005. In 2013, the White-Black score gap was 30 points, while the White-Hispanic gap was 21 points. The male-female gap was 3 points where males score higher.

In 2013, the percentage of grade 12 students at or above *Proficient* was 26 percent, which is an increase over 23 percent in 2005 but not different from the percentage in 2009. The percentage of students below *Basic* was lower in 2013 than in 2005 but not different from 2009.

Students were also asked about their mathematics coursetaking. Higher performing students are more likely to take higher level mathematics courses. Fifty-eight percent of students who scored below the 25th percentile on the assessment reported taking algebra II/ trigonometry as their highest level mathematics course. A small percentage of these students reported their

highest mathematics course as pre-calculus (9 percent) or calculus (3 percent). In contrast, only 15 percent of students scoring above the 75th percentile reported taking algebra II/ trigonometry as their highest level mathematics course. Thirty-four percent of these higher achieving students reported their highest mathematics course as pre-calculus, and 50 percent reported taking calculus.

Grade 12 Mathematics Results for Participating States

To begin with the state results, lets us look at state performance in comparison to the nation. In 2013, the percentages of grade 12 students at or above *Proficient* in mathematics were higher than the national percentage in South Dakota, New Jersey, Connecticut, Massachusetts, and New Hampshire. The percentages were comparable to the nation in Idaho, Iowa, Illinois, and Michigan, and lower than the nation in Arkansas, Tennessee, West Virginia, and Florida.

We can show score changes for the 11 states that participated in the first grade 12 pilot program in 2009. Scores increased in 2013 for four states—Arkansas, Connecticut, West Virginia, and Idaho. In New Jersey, Florida, New Hampshire, South Dakota, Illinois, Iowa, and Massachusetts, there was no significant change.

If we look at state gains according to different groups within the overall student population, we see differing patterns among the four states with overall increases. In Arkansas, scores increased for male students but not for female students; they also increased for White, Black, and Hispanic students. In Connecticut, scores increased for male students but not for female students and scores did not change significantly for any of the three racial/ethnic groups. For Idaho, scores did not change significantly for either male or female students but scores did increase for White students but not for Hispanic students. Note that in Idaho, the sample size for Black students was not large enough to support reportable results. Finally, in West Virginia, we see an increase for male but not female students, as well as increases for White and Black students.

Reading

Now we will look at the results for reading. The NAEP reading scale is set from 0-500, rather than 0-300, as in mathematics. In 2013, the average reading score was 288, unchanged from 2009 but lower than the score of 292 recorded in 1992, the first year of the assessment.

We do not see any changes in reading scores since 2009 for the six racial/ethnic groups identified by NAEP or changes in scores for male and female students. Since 1992, scores declined for Black students, male students, and female students. In 2013, the White-Black score gap was 30 points, wider by 5 points compared to 1992. The White-Hispanic gap was 22

points in 2013 and did not show a change from either prior assessment. The gender gap in reading favored female students, the reverse of the gender gap for mathematics. Female students scored 10 points higher than males in 2013, with no change from either 1992 or 2009.

In 2013, the percentage of students scoring at *Proficient* was 32 percent while 5 percent were at *Advanced*. These were no changes at any of the performance levels compared to 2009. The percentage at *Proficient* in 2013 was lower than in 1992, while the percentage at *Advanced* was higher. The combined percentage—students at or above *Proficient*—was lower than in 1992.

The NAEP assessment asked students how frequently they discussed interpretations of what they read in class. Students who reported they did so every day or almost every day had higher scores than those who reported they did so less frequently.

Grade 12 Reading Results for Participating States

In 2013, the percentage of grade 12 students at or above *Proficient* in reading was higher than the national percentage in seven states—Connecticut, Idaho, Iowa, Massachusetts, New Hampshire, New Jersey, and South Dakota. The percentages ranged from 50 percent at or above *Proficient* in Connecticut to 39 percent in South Dakota, compared to a national average of 36 percent. The percentage was comparable to the national average in Illinois, Michigan, and Florida, and lower than the nation in three states, where the percentages ranged from 33 percent for Arkansas to 28 percent in West Virginia.

Eleven of the 13 states participated in the first grade 12 pilot program in 2009. Overall scores increased in 2013 for two states—Connecticut and Arkansas. There were also increases for several student groups as well. In Arkansas, male students and White students had higher scores. In Connecticut, there were increases for male and White and Black students. While the overall score did not increase in Idaho, scores increased for White and Hispanic students. In West Virginia, scores increased for male students only but not overall for the state.

Summary

In summary, mathematics scores were higher than in 2005 but not significantly different than in 2009. Scores in 2013 for grade 12 reading were 4 points lower than in the first assessment year of 1992, but not significantly different from 2009. Two states—Arkansas and Connecticut—had score increases in both mathematics and reading. Idaho and West Virginia had increases for mathematics only.

There is much more information on student performance, both nationally and for the 13 states that participated in the state-level pilot, on our interactive website,

http://nationsreportcard.gov/reading_math_g12_2013. You can also access released questions through NAEP's Questions Center and run your own analyses using the NAEP Data Explorer, our online data-analysis tool.

In closing, I would like to thank all the students and schools who participated in these assessments and for the 13 states for volunteering to participate in the pilot program.