CONNECTICUT STATE DEPARTMENT OF EDUCATION
NEWS
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Commissioner

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NAEP Grade 8 Science Results: No Improvement for Connecticut

The National Center for Education Statistics (NCES) released results today from the 2011 Grade 8 Science component of the National Assessment of Educational Progress (NAEP). Similar to NAEP Mathematics reports released in November 2011, Connecticut student achievement in science has not shown any signs of improvement since results were last reported in 2009. Although Connecticut's overall performance remains higher than the national public average, other states are showing gains. In 2009, eight states earned an average scale score higher than Connecticut. The 2011 results show that 15 states now outperform Connecticut.

"Connecticut can no longer afford to tread water as other states demonstrate real progress in overall science achievement," said Commissioner of Education Stefan Pryor. "In addition to slipping in relation to other states, Connecticut continues to struggle to confront performance gaps, this time in science, between students who are economically disadvantaged and their peers. These results provide further evidence of the urgent need for education reforms produced by Governor Malloy and the General Assembly, which will address our largest-in-the-nation achievement gap and elevate teaching and learning in every classroom."

NAEP 2009-2011 Science Grade 8 Performance: Connecticut and National Public Schools

	Year	Average Scale Score	Percent of Students At/Above Proficient
Connecticut	2009	155	35
	2011	155	35
National Public	2009	149*	29*
	2011	151*	31*

** indicates a statistically significant difference when compared to Connecticut performance.*
For an explanation of statistical significance and why it is used in NAEP reporting, see Appendix A.

Again, NAEP results clearly show considerable disparities in student achievement across our state. Gaps in performance based on race/ethnicity and eligibility for free or reduced-price lunch exceed 30 scale score points in every case. Connecticut's achievement gaps continue to be among the largest reported for any state.

2011 NAEP Science: Selected Grade 8 Achievement Gaps

Subgroup Comparison	Size of selected gaps in scale score points		
	Connecticut 2011	National Public 2011	Range Across States
White-Black	37	35	14-45
White-Hispanic	36	27*	11-45
NSLP[1]	36	27*	13-36

** Indicates a statistically significant difference when compared to Connecticut's performance difference in 2011.*

[1]*NSLP is the National School Lunch Program. The NSLP category compares the performance of students eligible for free or reduced price lunch to the performance of their peers who are not eligible. Eligibility for free or reduced price lunch is used as a proxy for poverty.*

Although NAEP does not provide results at the district or school level, performance reports include average scale score by school location. The NAEP 2011 results show large performance differences between schools within our cities and schools located in other community types throughout the state.

NAEP 2011 Grade 8 Science Average Scale Scores by School Location

School Location	Connecticut	National Public
City	137	142*
Suburb, Town, Rural	161	154*

** indicates a statistically significant difference when compared to Connecticut performance.*

"Science achievement on NAEP and on state assessments will not improve without substantial changes to how and when science is taught," said Elizabeth Buttner, Science Curriculum Specialist for the State Department of Education. "Adoption of Next Generation Science Standards, currently under development, is an important step toward addressing this problem. The new standards will be designed to provide greater coherence K-12 and will focus on the application of science knowledge and skills in real-world contexts. This approach will be more engaging for our students and will prepare them for advanced studies and science-related careers."

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Statistical Significance and the National Assessment of Educational Progress

NAEP provides us with performance results for large groups of students without testing every student. Instead of testing every student, NAEP uses a complex sampling design to select representative groups of students for testing. So, in Connecticut, not every school is selected for NAEP, and within the schools selected for NAEP, it would be unusual to test every student. Even though NAEP tests a sample of Connecticut students, the program is able to report results for the state and subgroups of students within the state. This process of sampling schools and students reduces the burden on schools and increases the efficiency of the test administration overall.

By testing representative samples of students, NAEP is able to provide performance estimates for the nation, states and subgroups. However, it is important to understand that whenever we select a sample and report results for a population, there will be variability from the total population value, depending on the sample selected. This variability is referred to as statistical error. For example, political polling is designed to determine what a population thinks about an issue or candidate. The polling is conducted with a sample of the population and results typically are reported along with a *margin of error*. NAEP also uses a *margin of error* but presents the information in a slightly different manner. Rather than provide an interval or range of performance (e.g., the average scale score is 280 plus or minus five points), NAEP reports *standard error* values with all results.

In NAEP, the standard error values help people determine the amount of variability in the results that are reported. NAEP goes one step further in clarifying the information for the public by reporting all results in terms of statistical significance. Therefore, when NAEP states that one group of students is achieving proficiency at a higher rate than another group, the reader can be confident that there is a statistically significant difference (i.e., the reported results exceed the margin of error). NAEP does not make statements claiming performance differences unless there is a statistically significant difference. In other words, NAEP will not highlight an apparent difference unless the difference exceeds what we would expect, due to variation (or error), that is a result of testing a sample of students rather than the entire population. This means that two states could have different average scale score values (e.g., 275 and 277), but there may not be a statistically significant difference because of the standard errors. As a result, NAEP will not claim that the average scale score of 277 is higher than the 275 value. Instead, the reporting will indicate that the states are performing at the same level or that the results are not statistically different.

All NAEP reports issued by the Connecticut State Department of Education (CSDE) follow the same reporting conventions as the official NAEP reports issued by the National Center for Education Statistics. The CSDE will not claim changes in performance unless there are statistically significant differences.