

Science Evolves in Classrooms

'No Child' Test May Reestablish Emphasis on an Often-Neglected Subject

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Fourth-graders Lora Metrey, left, and Kayla Wood check an ecosystem experiment at Cashell Elementary School in Rockville. The school scored well on a national science test. (Bill O'Leary - The Washington Post)

In the past six years, science has slipped as a priority in public schools while reading and mathematics have grown dominant.

But in coming years, experts say, the same federal law that elevated reading and math could spark a resurgence of science in the classroom.

The 2002 No Child Left Behind law required states to test students in science starting in the 2007-08 year, on top of reading and math assessments mandated from the start. Virginia has given science tests since 1998, but the exams are new for Maryland and the District. (Separately, Maryland tests high school students in biology as a graduation requirement.)

Unlike the reading and math test results, science scores won't be used to grade schools for accountability. But education leaders predict that the scores will matter when disseminated to the public.

At least six states, including Maryland, released their first science scores this fall. The first science scores from D.C. schools will be released later this year.

Overall results from the new tests "are not very good," said Francis Q. Eberle, executive director of the [National Science Teachers Association](#) in Arlington. "As a matter of fact, they're pretty dismal. And it really shouldn't surprise anybody," he said, because science as a topic "has really gone off the instructional radar."

In New Hampshire and Rhode Island, according to news reports, three-quarters of students failed the first science exams.

But in Maryland, more than three-fifths of those tested passed inaugural science tests in grades 5 and 8. Mary Thurlow, state coordinator for science, said she was "pleasantly surprised," considering that many schools "were not teaching science as often as they should."

Science advocates recommend 45 minutes to an hour of science instruction daily starting in upper elementary grades. But many elementary and middle schools now offer half as much science as they did before the law was enacted. Middle schools that used to teach a full year of science and social studies now may offer a half-year of each. Elementary schools have squeezed the two subjects into one block of time to make room for more reading and math.

An informal survey shows what may be a low ebb of science instruction in the region's public schools. Many Maryland schools offer students two hours or less of science studies a week. Virginia schools offer more, which may point to a benefit of continuous state testing. Virginia outperformed Maryland in science scores on the most recent National Assessment of Educational Progress.

Science advocates predict that school systems in Maryland and elsewhere, under pressure from the new tests, will begin to restore lost hours of instruction.

In 2006, [Prince George's County](#) schools raised daily science instruction from 30 to 60 minutes in the lower elementary grades and from 45 to 60 minutes in the upper grades, in anticipation of the new state test.

Montgomery and Prince George's counties have issued new science textbooks in elementary grades. Many schools lacked elementary science texts, resulting in lessons that were heavy on hands-on experimentation and lighter on academic content, according to teachers.

"You have to make sure you're doing the content with the experiences; they're both important," said Tina Holmes, a fifth-grade science teacher at Tulip Grove Elementary School in Bowie. "Three to four years ago, I would have been really worried if the students had taken this test."

Not surprisingly, schools that fare well on the Maryland test tend to offer relatively large chunks of daily science class work.

With the new textbooks and 60 minutes of daily, uninterrupted science instruction, Tulip Grove attained among the highest results in the state on the new test. Forty-six of 47 fifth-graders passed.

Cashell Elementary School in Rockville offers three hours of science instruction weekly in the upper grades, as well as blocks of language arts instruction devoted to scientific topics.

"We didn't back off from it, as a lot of schools did," said Principal Maureen Ahern-Stamoulis.

One morning this month, fourth-graders at Cashell peered into their latest projects: terrariums encased in plastic soda bottles.

"We're going to try to identify who are the producers in our terrarium. Who are our consumers? And who are our scavengers?" asked teacher Lucy Vigil.

Fifty-five of 58 fifth-graders at Cashell passed the test this year, one of the best results in Maryland.

Elements of Good Elementary Science

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Kristina Toscano, left, and Alyssa McFadden conduct an experiment on mass and weight at Cashell Elementary. (Bill O'leary - The Washington Post)

Time: Science educators recommend at least three hours a week, on average, in upper elementary and middle grades. Individual lessons should be long enough to allow for in-depth experiments.

Inquiry: The heart of science instruction, hands-on experimentation, teaches students how to solve scientific problems.

Content: Students should learn science from books and articles, especially in upper grades. Hands-on science is great, but it's not enough.

Fairs: Many schools have phased out exhibitions of science talent to focus on reading and math, but they generate interest in the subject.

Journals: Students should keep a log of scientific inquiry, particularly in upper grades, to reflect on discoveries.