

November 23, 2008

Science gets short shrift

With subject lost amid No Child's emphasis on reading, math, Metro schools earn D's, F's

*By Jaime Sarrio
and Natalia Mielczarek*

In a nation where high-stakes testing focuses on reading and math, one subject's being left behind — science.

The 2007-08 school year marked the first time the federal No Child Left Behind law required school districts to test students in science. And while the scores must be released, there aren't any punishments built into the law like for failures in math and reading.

If there were, Metro Nashville's nine years of earning a districtwide D in the subject would be drawing attention. More than 65 percent of individual Metro schools earned a D or F based on spring testing.

That, paired with low performance by the U.S. in general, is disconcerting to organizations with an eye on America's future.

On a recent round of international tests, the U.S. students rated below average in science literacy. That's especially troubling because innovative minds will be needed to solve the world's worsening energy crisis, food shortages and oil dependency, said Shirley M. Malcom, director of education and human resources for the American Association for the Advancement of Science.

"We've been lulled into thinking everything's OK," Malcom said. "We have to get real about providing a quality science education to young people."

Across the country, educators are advocating for science to get its place during the school day, even if the law doesn't require students to pass it. According to the Center on Education Policy, students in the No Child Left Behind era are getting about two hours of science per week, compared with nearly four hours in 2001-02, the year before the law went into effect.

Francis Eberle, executive director of the National Science Teachers Association, said the trend is especially problematic in elementary school, where many teachers don't feel as prepared to teach science as other core subjects.

"Science doesn't have the value that other subject areas have — it doesn't seem to be a basic," Eberle said. "It's being pushed off the schedule because of mathematics and literacy."

President-elect Barack Obama promised to make math and science a top priority by beefing up the science curriculum and by recruiting more teachers with math and science degrees. Obama has not picked a secretary of education or released details about how his administration would fund that initiative.

Eberle's group will ask legislators to dedicate money for teacher training in science and to make science scores a required part of state accountability law.

Well before No Child Left Behind mandated it, Tennessee tested students in science and reported the

scores. The scores started being posted to the school-by-school report card in the mid-90s.

Statewide, students earned a B average in science for the past two years, and more than 60 percent of schools earned A's or B's. All of Metro's surrounding districts earned an A, except for the B in Murfreesboro City Schools.

But in high school, only four schools in the entire state earned ACT scores high enough to show readiness for college science: Hume-Fogg and Martin Luther King Jr. magnet schools in Metro, Merrol Hyde Magnet in Hendersonville and Gatlinburg-Pittman in East Tennessee.

Make science a priority

Metro schools officials said they are optimistic that tougher state standards, more professional development and new science textbooks will give the district a boost. The state Department of Education next year will roll out new, more difficult lesson plans in hopes to better prepare Tennessee students for college and the workplace. Students will have to pass end-of-course exams to advance.

"We've shown great improvement in reading and math, and we hope to see similar gains in science," said Olivia Brown, a spokeswoman for the district. "While science is important, the major focus has been on math and reading because of No Child Left Behind requirements."

Last school year, state officials rearranged Metro's central office staff and curriculum because the district failed to meet academic benchmarks for several years.

But state agents say there's not much they can do about the district's dismal science scores because they're not regulated under No Child Left Behind.

Some educators believe setting requirements would pressure schools to improve test scores, but others believe the answer is as simple as making science a priority at the local level.

Preston MacDougall, a chemistry professor at Middle Tennessee State University who also hosts an occasional radio segment called "Chemical Eye," said the schools that have the most successful students are those with science coaches to coordinate enrichment opportunities for students.

"Part of the solution is to encourage students to see that science is fun," he said. "Science is about discovery, not about memorizing things. Science is about solving problems, intellectual problems, not filling in work sheets that are often given in science classes."

Educators also say the key is to work reading, writing and math skills into science courses. For example, on a science test, students might have to answer in complete sentences rather than by filling in a bubble.

That's how Debra Smith, a seventh-grade science teacher at Neely's Bend Middle School, does it.

When Smith grades science papers, she pays attention to grammar and spelling. When her students study cells, they calculate surface to volume ratios and talk about parameters — concepts they first encounter in math.

"In lower grades, you do see more time spent on reading and math, and science and social studies kind of get the back burner," said Smith, who used to teach lower grades and whose son attends first grade.

She said she understands the big push for math and language skills in the early grades because students have to know how to read and do math to excel in other subjects.

"By the time you get to middle school, because we're departmentalized, everything gets equal time," Smith said. "But there's a difference between equal time and equal attention. We have math and reading

specialists, but we don't have social studies and science specialists."

Metro parent MaryEllen Pickrell thinks elementary school teachers who don't feel confident teaching science should team-teach with those who do.

"It's not fair to expect a teacher who is not extremely strong in science to be as good in it," she said. "I think the better teachers recognize their own strengths and weaknesses and the administrations can work with them."

The stakes are high

Local school districts, businesses and universities are working to provide unique science opportunities where they can.

Metro schools and Vanderbilt University partnered last year to open the School for Science and Math at Vanderbilt, a lab-based science program for Metro students held on VU's campus.

The program targets public school students who have a desire to excel in science, letting them come to Vanderbilt one day a week to conduct cutting-edge science and technology experiments. Students have to make up the coursework they miss while they're out.

Organizers believe this model is the key to science education because it teaches multiple disciplines, such as biology and chemistry, at once and allows students longer sessions to conduct experiments.

Professor Virginia Shepherd, director of Vanderbilt's Center of Science Outreach, said when it comes to improving science education, the stakes are high.

"Science and technology is going to be critical to everyone in this coming century, and if we don't have a firm understanding of those subject areas, we're not going to be able to make informed decisions for ourselves or as citizens," she said. "I'm really sad we're ignoring this critical piece of education."
