

## **It Really is Rocket Science**

A pilot program gives math skills a boost through technical (real world) applications into the real world

*By Rita Giordano, Philadelphia Inquirer Staff Writer*

Oh, the rigors of the end of school. Exams to take. Papers to write. Rockets to fly.

"Are you ready to do this?" boomed teacher Ross Reger one recent afternoon as his class fanned out on an athletic field at Triton Regional High School in Runnemede.

At his feet was a foot-long blue rocket.

"Three!" Reger called out. "Two, one, blast off!"

Fourteen heads jerked skyward as the rocket took off and zoomed into the clouds to the clatter of applause from its student ground crew.

Who knew trigonometry could be this much fun?

Reger isn't even a math teacher. This year, the technology instructor's freshman students used trig to calculate altitude, then witnessed it. They explored geometry to build cars from mouse traps and worked angles to design solar-powered boats.

The Black Horse Pike Regional School District, which operates Triton, was among 10 New Jersey districts in a pilot study of a model teaching approach. Some Pennsylvania districts already use the curriculum.

The aim: to make career- and technical-education students better at math through real-world applications.

"It makes it more real to them," Reger said. "They can see it. The math and the technology support each other."

Developed by the National Research Center for Career and Technical Education at the University of Louisville, the program is called [Math-in-CTE](#).

It "offers a context for the application of math - a real-life, real-world context," said Donna Pearson, the center's associate director. "We can see from data that more of the same is not working."

Math-in-CTE does not replace traditional math courses. Math teachers team with career-and-technology instructors outside the classroom to identify the math naturally embedded in the vocational material. That goes for culinary arts and health care as well as specialties such as automotive engineering. The CTE teachers give their students explicit math instruction as topics arise.

Research on Math-in-CTE has shown promising results. In a national study done by the center a few years ago, Math-in-CTE students on average scored higher on standardized math tests than peers in regular CTE courses.

Educators also liked the approach. In a follow-up survey, nearly 73 percent of the participating teachers said they continued to use it.

Robert Lacivita, then teaching auto technology at [North Montco Technical Career Center](#) in Lansdale, [took part in the study and was won over](#) (see page 3).

A couple of years later, his school needed to improve student performance under the No Child Left Behind Act. Encouraged by experience, North Montco extended Math-in-CTE to disciplines such as cosmetology, health sciences, and biotechnology in the 2007-08 school year.

"We had to increase our PSSA math scores 10 percent," Lacivita said. "We increased them 11 percent."

The school has met federal progress requirements for the last two years, he said. School officials also have found that enhanced math teaching in the CTE course doesn't get in the way of vocational learning.

Lacivita, now teacher on special assignment at North Montco, is working with educators in Pennsylvania to draft detailed plans to help other teachers enhance math instruction in their vocational classes.

Overall, he said, the state has required CTE teachers to better integrate academics into their courses. The directive reflects studies that warn of the need for a well-educated workforce to handle increasing technology.

"The days of sending a kid to tech school because they can't do anything else [are] over," Lacivita said. "Do you really want a kid with a fifth-grade reading level working on a \$50,000 car?"

The national research center's Math-in-CTE model has been implemented in 12 states, according to officials. Kansas will start a pilot program in the next school year.

New Jersey is looking into expanding its use of Math-in-CTE. While state education officials said it was too early to know if the approach led to higher test scores, math and CTE teachers said they learned from each other, and students developed more math confidence.

Locally, the school districts involved in the pilot were Burlington County Vocational, Camden City, Eastern Camden Regional, Cape May Vocational, and, of course, Black Horse Pike.

There, CTE teachers Reger at Triton and Rebecca Morse at Timber Creek High School in Erial and their math partners, Antonio Taraborelli and Alexis Rabeau, got program training last summer.

"It's been shared throughout the district," said Glenn Smith, district technology supervisor.

Several of Reger's tech freshmen said seeing math concepts at work improved their understanding, not to mention their math grades.

"It actually makes math easier," said Gabe Gittens, 15, of Blackwood. "It helped me get an A."

For others, Math-in-CTE answered an age-old question.

"Usually people say, 'When am I going to use this?' You're using it with this," said Ryan Heintzelman, 15, of Runnemede. "It kind of proves the point."

On liftoff day at Triton, there wasn't a glassy-eyed stare in the bunch as students worked on equations involving the launch and put finishing touches on their rockets. Jake McKelvey of Runnemede was part of the group.

He liked that Math-in-CTE reinforced what he was being taught in math class, and projectiles as a teaching aid do make theoretical concepts more palpable. But, he noted, rocket-assisted learning has other charms.

"What can I say? I'm 14 years old," McKelvey said. "I like to see things blow up."

Tangents, anyone?

Posted on 6/23/2009

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