

In touch with math and science

STEM makes subjects pertinent for students

BY MARCY MIRANDA • MarcyMiranda
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An increasingly popular trend in education is using real-life situations to explain concepts such as fractions or geometry.

Science, Technology, Engineering and Math educational models use technology and problem-solving skills to show students how the math and science skills they learn in school can be applied to everyday problems.

"The technology and the engineering in STEM help to add the context to which students apply mathematical and scientific principals to solve problems," said Michael De Miranda, a professor of engineering education at Colorado State University.

As an example, he used mechanical robots used by scientists who study volcanoes. Because the robot has a mathematical brain, engineers have to use mathematical measurements, like circumference and pi, to calculate the distance a robot must travel to reach its intended destination.

"You figure out when the wheel rotates once how much ground it will cover and how many rotations you have to have the wheel give to not go past it," he said.

STEM education has been important in United States schools since NASA was formed in the 1960s, but increasing globalization has again given science educators the incentive to encourage students to study math and science and help America maintain its competitive edge in those fields, De Miranda said.

The National Center for Educational Statistics lists eight schools in the United States who have STEM as part of their formal name. More than 250 schools are also listed as science, technology and math schools. Poudre School District briefly expressed an interest in possibly creating a STEM high school last year, although the idea was later dismissed.

Within PSD, two schools have gone out of their way to bring STEM education into the classrooms. Fourth-graders in Shaun Cornwall's class at Shepardson Elementary created an audio slideshow documenting a field trip they took in the fall. They gathered audio using iPods and took digital photos during the field trip, then put both together with a narrative using iMovie, a video editing program.

"It's all about engaging kids," Cornwall said. In classes, he's not teaching anything different, he said, but using technology - such as interactive white boards - when learning graphs and charts helps students connect better with the lessons.

"More engagement ... leads to more learning," he said.

A STEM night held at Shepardson in late January gave the public a chance to see how kids are using STEM philosophies in their classrooms everyday, said Principal Mary Kay Sommers.

"When people are engaged, learning is fun and we enjoy what we're doing more," Sommers said.

The Preston Middle School community is highly influenced by the technology companies in south Fort Collins, such as Hewlett-Packard, Avago, Intel and AMD, said John Howe, the school's assistant principal. The tech-heavy community gave Preston's staff the desire to offer classes that cater to students interested in math and science careers.

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Preston students are introduced to mechanical, civil, environmental and chemical engineering through an elective course. Each week, professional engineers speak to the class about what they do in their jobs.

Howe also plans to get students involved in a project in which they'll be asked to research and find a solution to a real-world problem, he said. Students could potentially study the effects of global warming and try to find solutions.

"With global warming and potential sea-level rise, what are the implications for a 10,000-foot rise in the sea level in the Western Hemisphere?" he asked.

But STEM education is about more than just emphasizing math and science and encouraging engineering, De Miranda said. Technology is becoming an important tool in music and art, as well, and the critical thinking and communication skills encouraged by STEM are beneficial for 21st century learners.

At Preston, even students interested in art or music are benefitting from the school's emphasis on science, technology and engineering.

The school has invested in work stations for electronic composition and for students to create music, Howe said.

Students interested in art benefit from programs like Photoshop, which are increasingly being used in digital art and graphics.

"The reason we're focusing on it is not only the value for our community, but this is the age when kids really start to find out who they are and what their interests are."

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