



HIGH TECH AT NEW TECH

Cal Poly alumni bring math to life at a new high school with a project-based curriculum.

Fun. That's what you wish math class had been. If you have the good fortune to be a student of Dara Stepanek (B.S., Mathematics, 2012; Single Subject Credential, Mathematics, 2013) or Ben Woodford (B.S., Mathematics, 2012; Single Subject Credential, Mathematics, 2014) at Central Coast New Tech High School (CCNTH), that wish would come true.

Stepanek (DStep to her students) and Woodford teach algebra and geometry at CCNTH, a new high school in Nipomo, Calif., that uses a project-based curriculum. In its second year, the school had 203 students and an average class size of 17.

At first glance, CCNTH classrooms resemble any other classroom, with white boards on the walls and backpacks strewn around the floor. Until you realize that everything is mobile, from the wheeled tables and chairs to the laptops that every student has open in front of them.

"Feel free to plug in and work," Stepanek says after giving

directions to her Algebra I class. Friday is a work day. There will be no traditional lecture. Instead, students dig into a typically interdisciplinary, real-world project: designing floor tiles for the new science building on the CCNTH campus.

"Instead of lecturing continuously and occasionally doing a fun little project at the end of the unit, New Tech turns that model upside-down," Stepanek said. "We hinge everything around a fun, authentic, engaging project and have the students start on solving or modeling or analyzing it."

As students progress through the projects, they find out what they don't know and begin exploring, using their teachers as resources. They finish each project with either a written or oral presentation explaining what they've learned and done.

The approach resonates with students in Stepanek's class. "I can't explain how much it's helped me. I love coming to school every day," said Brittany Judy, a ninth grader. "Hands-on stuff helps me learn better. I have straight As. Without project-based learning, I would not have the grades I have right now."

In the geometry class that Woodford teaches, mathematics is getting a little wild. Students learn how to find

the center of gravity the hard but entertaining way — by doing wheelchair wheelies.

Woodford has used a wheelchair since breaking his back in a skiing accident. He was shopping for a new chair when he realized, “This is a three-dimensional geometry problem. I’m not going to do it. I’m going to have my students do it.”

The center of gravity lesson is part of a larger unit in which students design a custom wheelchair, either for themselves or for Woodford. The groups that aren’t doing wheelies are taking each other’s body measurements, which they

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will use to construct three-dimensional diagrams of their chairs. Some will then create computer models of the chairs.

The class will complete the project by designing a consumer information website for Living Spinal, the company that sells the wheelchairs. The website will provide information on different ways to design and customize manual wheelchairs, including blueprint-like diagrams created by the students.

“The thing we really try to do here is make the projects authentic. They’re doing something that matters. They feel like it has real meaning,” Woodford said.

“The school is a lot about learn by doing,” said Matthew Read, a ninth grader in Woodford’s class. “We put a lot of things into real-life perspective. It was a hard transition, but it fits me better than the regular methods.”

Woodford sees Cal Poly’s Learn by Doing approach as an ideal preparation for project-based teaching. “Cal Poly taught me to use research and standards to guide my teaching, while keeping learning student-centered and relevant,” Woodford said.

Stepanek agreed. “Having completed math and physics degrees at Poly, I feel I was well-trained to teach in a Learn by Doing style,” she said.

“Ben and Dara do a great job of exuding a passion for student learning in their content area as well as just a love of learning itself,” said CCNTH principal Dan Neff (B.S., Plant Protection Science, 2000; M.S. Agriculture, 2002; M.A., Education, 2008). “Their ability to connect students to relevant and real-life learning opportunities contributes to the overall uniqueness of our school.”

Woodford, Stepanek and Neff are just three of the 11 Cal Poly alumni currently working at CCNTH. //



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Top Ben Woodford coaches a student on how to find the center of gravity when doing a wheelchair wheelie.

Middle Students design floor tiles for CCNTH’s new science building. **Bottom** A group of students considers the body measurements they’ve taken. They will use the measurements to design a personalized wheelchair.