

Science teachers get ideas for school year at CU engineering workshops

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Boulder Valley science teachers got to play at the University of Colorado on Monday before school starts later this week.

They designed paper airplanes, created a coating to protect candy from dissolving and used SparkFun materials to collect data with barometric pressure sensors — all engineering activities they can use with students.

"It's fun to tinker around," said Platt Middle School physical science teacher Erin Greenwood. "It's giving us ideas we can take back. We can build connections for students and show them how science applies to real life."

About 70 middle and high school science teachers spent Monday at CU learning ways to include engineering in their classes as part of the district's professional development program.

"When you look at where science education is headed, integrating engineering is really critical," said Sam Messier, Boulder Valley's science director. "It's a way to increase the relevance for students and teach them the skills they need to address the challenges that face the world today."

The day started with presentations on various programs and resources at CU, including how to find lesson plans through the [TeachEngineering digital library](#) developed by CU's College of Engineering.

Another campus organization offering resources was [CU Science Discovery](#), which works with K-12 students and teachers.

"We want to share what we've been doing to integrate engineering," said Science Discovery Director Stacey Forsyth. "We have experiences and connections that teachers can tap into."

Teachers also heard from two CU engineering students and two incoming seniors at Lafayette's Centaurus High School. The students said personal connections and teacher support helped them choose and stick with engineering.

Erick Peña, who graduated from Centaurus and is now at CU, said he got hooked on engineering because "it was like a big puzzle."

Centaurus incoming senior Natalie Gofran added that she likes the format of engineering classes, with students working in teams on projects and the teacher as more of a guide.

"Engineering is very hands-on and about creating a solution to a problem," she said.

Next up were workshops covering topics like engineering on a budget, integrating engineering in biology using digital tools and CU Science Discovery's photo origami project.

"It gets you excited for the year," said Casey Middle School teacher Kendra Kimmel, who's teaching an elective class on the engineering design process. "This is a gift."

In one session, teachers tried out a lesson from TeachEngineering.

They used cornstarch, flour, sugar and oil to make a coating for a Skittle, mimicking the coating used for pills. The goal was to keep the candy from dissolving in soda, standing in for stomach acid.

In another session, New Vista High School teacher Mike Thomas asked teachers to design and test paper airplanes to help them learn the steps of the engineering design process.

He offered tips that included making sure students first have time to research the problem they're trying to solve and giving them time for redesign after they test their prototypes.

"They design the first one and then they just want to play with it," he said. "But redesign is such a hugely important step."

Steve Wozniak, who teaches International Baccalaureate chemistry and physics at Fairview High, said he's always looking for ways to add more hands-on activities.

Many of his students, he said, are mathematically gifted, but need more experience with lab work.

"It's a weakness for some students," he said. "I want to be as hands-on and interactive as possible."

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Boulder Valley teachers Kathy Briggs, left, and Susan Kennedy, center — her daughter, Caillin is at right — work to assemble and program scientific instruments for a weather balloon during a breakout session led by SparkFun Electronics as part of a teacher training on engineering at the University of Colorado on Monday. (Dana Gooding / Fox