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## **TEACHERS GET REAL**

### **Seeking to offer students more than just book smarts, educators skip summer vacation in favor of 8-hour days in the work world**

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If Dan Raffa gave a what-I-did-over-the-summer speech, it would go something like this:

"I took a piece of E. coli plasmid, which is a circular piece of DNA, and transformed it into a bacteria and then it grew in a petri dish, but it's not the dangerous kind of E. coli so it's OK, and then I stored the bacterium in vial and it was all so incredibly cool!"

The Belmont high school teacher spent his summer vacation working at Applied Biosystems in Foster City, learning how to manipulate DNA and creating samples for his students to use in the lab.

Raffa, a San Francisco resident, was among 188 Bay Area teachers who chose to work over the summer break, spending eight-hour days at one of 52 local companies and universities -- gaining real-world experience they can take back to their students in the fall.

With a month to go until school starts, Raffa can't wait to tell his Carlmont High School students what he learned and how they can use DNA to make lifesaving medicines.

The training program, sponsored by the nonprofit Industry Initiatives for Science and Math Education, gives math and science teachers insider knowledge about interesting careers, as well as what companies look for in employees.

Their temporary jobs included educational video game development, DNA analysis and statistical analysis.

Raffa, 32, donned a white lab coat and safety goggles each day to learn how to create the DNA samples he will use with his students during the school year.

"I am totally energized," he said, holding up a petri dish with yellowish goo and a squiggly line of E. coli-streaked bacteria. "I can't wait to see the kids. I can't wait to show them this stuff."

He will teach students how transformed bacteria can produce proteins -- an essential process used in the field of biotechnology to develop medicine.

"I wanted to see exactly what industry was doing and how I could better prepare my students for industry," he said.

In the past, Raffa required students to create the gel used to identify the presence of DNA -- a gel that companies buy in bulk. After seeing the premade packets in a real lab, the teacher considered skipping that part of the instruction and buying the premade stuff, too.

But the scientists at Applied Biosystems told him not to change his curriculum: They said the students should know the science behind the experiments, sort of like learning long division by hand before using a calculator.

Aside from the science, Raffa also wanted to learn the "soft skills" industry bosses want in workers -- things like critical thinking, teamwork and office etiquette. For example, earlier this summer he was told that it's impolite to eavesdrop on conversations in nearby cubicles.

"I teach science, but not all those kids are going to be scientists," he said. "I'm trying to teach them life skills as well."

This is the 23rd year of the teacher-training program. Nearly 2,400 teachers from 561 schools have participated in the Bay Area program over the years.

The fellowship pays each teacher \$7,400 for the eight-week program -- about \$20 per hour plus a \$1,000 grant. The fellowship requires each teacher to create a lesson plan incorporating what he or she experienced.

Saratoga community college teacher Alyson Butcher likely had one of the coolest jobs among the 188 fellows.

A lifelong San Francisco 49ers fan, Butcher has spent her summer crunching numbers at the football team's Santa Clara headquarters, analyzing statistics to give the club a competitive advantage on the playing field.

In the fall she will return to West Valley College, where she will tell her students that statistics can help nudge a team to the Super Bowl.

"As a teacher of math, we have a very hard time convincing the students that math is useful," she said. "Even a professional football team uses math."

Butcher, 32, refused to divulge exactly what she was doing with those statistics, saying it was top secret stuff. Instead, she gushed about being at 49ers central every day, with pictures of quarterbacks Steve Young and Joe Montana hanging in the hallways.

"It's hard not to steal everything off the walls," she said.

And then she confessed that she used to deck out her childhood Cabbage Patch Kids in 49ers outfits.

"I'm having a blast," she said. "I can't believe this is my job."

Online resources

For more information about the teacher-training program:

[www.iisme.org](http://www.iisme.org).

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