

OAKLAND

Blind students study cow's eyeball hands-on Techbridge expands free after-school science program normally limited to girls

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The inside of a cow's eyeball feels like Jello coating the skin of a frog. The optic nerve resembles spaghetti. The lens is sort of like a marble.

"It's pretty nasty, but in a cool sort of way," said Arianna Sepulveda, 14, digging carefully manicured nails into the gelatinous innards of a bloody eyeball.

Dissecting eyeballs is a slimy rite of passage for high school science students, but it took a new turn Thursday when seven students with a unique perspective on eyes participated in the biological ritual at Chabot Space and Science Center in Oakland.

Each is blind or visually impaired, and it was their first chance to explore an eye, feel the parts and understand how they work. The irony was not lost on the students.

"Does everyone feel the iris?" teacher Stan Fukunaga asked as the students poked fingers into the eyes.

"I don't even have an iris," exclaimed Robin Patche, 15. "My eyes are black. I can't look at lights."

"I don't have an iris either," added classmate Jot Purewal, 14. "I

can't see anything, actually."

The students are enrolled at the School for the Blind in Fremont and attended the Chabot class as part of a free after-school program through Techbridge.

Techbridge usually restricts its classes to girls, as a way to bring more women into the science fields. But because the blind are not well represented in science either, the staff decided to make the School of the Blind program co-ed.

"It's not that they can't do those jobs, it's that they don't have the opportunities," said Linda Kekelis, Techbridge project director.

With scissors in one hand and a golf ball-size bovine eye in the other, the students carefully cut around the cornea and felt mucousy fluid ooze onto the cutting board. Chabot workers guided the students through the cutting, but left them alone to do everything else, allowing them to learn biology in a hands-on way most of their sighted cohorts are too squeamish to pursue.

"There's probably a lot of students, even sighted students, who respond better to touch," said Jeri Countryman, an adviser for Techbridge, a nonprofit organization.

Fukunaga said the lesson plan, which was altered to accommodate students who can't see, was so effective he'll use it with sighted students as well. Using other senses besides sight is a great way to absorb and remember information, he said.

In previous classes, Techbridge has invited blind engineers and

physicists to talk to the students about college and careers. The students also have built solar cars, designed their own Web pages and assembled robots.

"When they made the robots, I saw all those nuts and screws and bolts and thought it would never work," Kekelis said. "But they worked together as a group, worked very slowly and methodically, and when they finished, their robot actually worked. We now try to get our other groups to work that way."

Teaching science to students with poor vision is a particular challenge because so much of it is abstract, said Marcia Vickroy, a teacher at the School for the Blind. But Vickroy finds tactile ways to convey scientific ideas.

To demonstrate the concept of force, she poured cream in a jar and had the students shake it until it became butter. They could feel and taste the cream as it transformed, and note that it changed faster as they shook the jar harder.

She taught them about evaporation by melting soap, letting the students add scents to it and feeling it harden. That allowed them to feel and smell a substance as it changed states, moving from solid to liquid and back again.

"You can see their brains suddenly click, and they get really into it," she said. "It makes it real for them."

At least one of the students at Thursday's class is preparing for a career in science. Patche, who has four dogs and three cats, is taking science classes by correspondence and hopes someday to

be a veterinarian or work at an SPCA shelter.

"You know how most kids are scared of snakes and bears and stuff? I'm not," she said, as she plunged her hands into the bloody, pulpy mass of eyeball tissue. "I'm pretty independent. Things like that don't bother me."

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