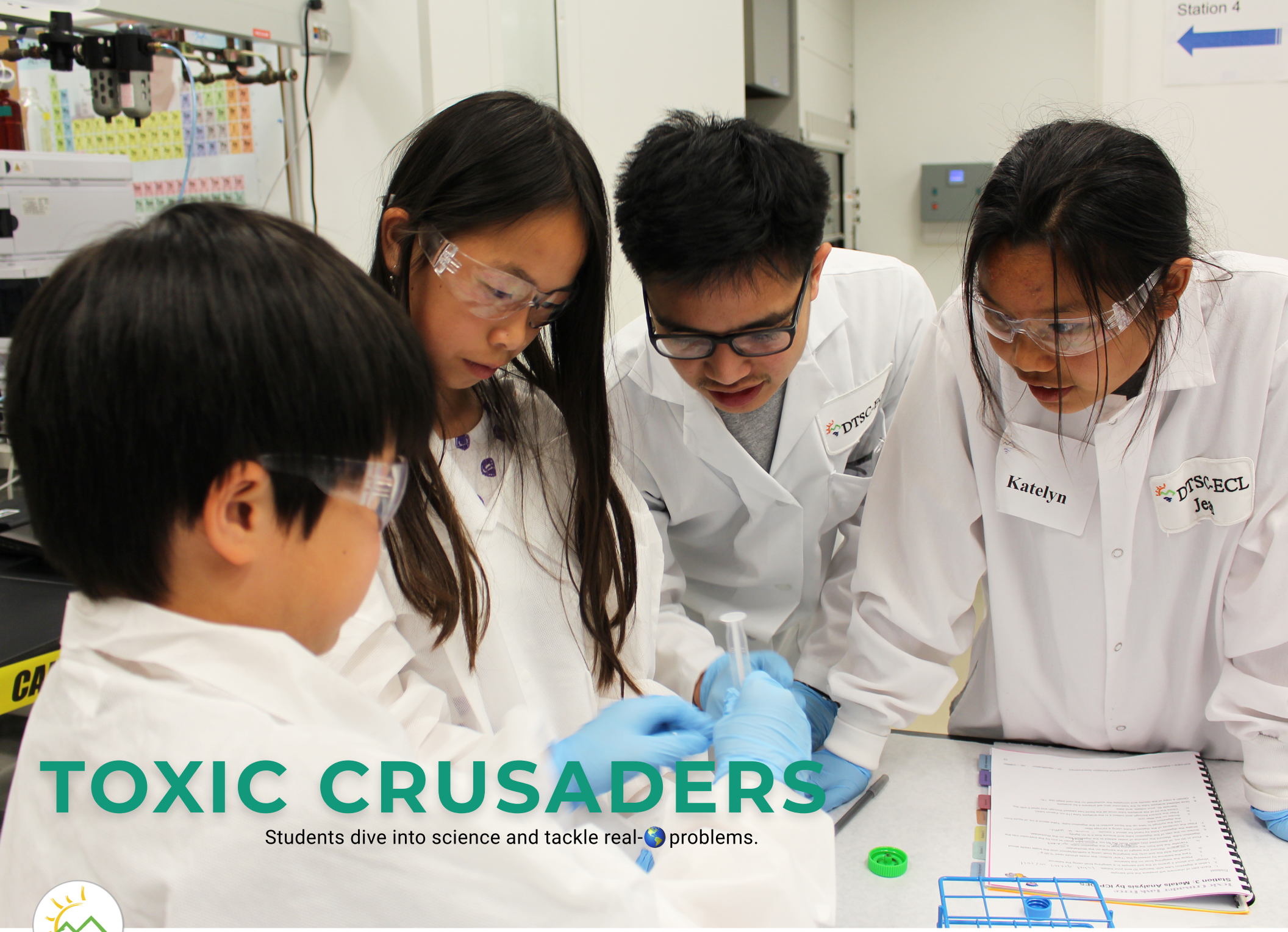
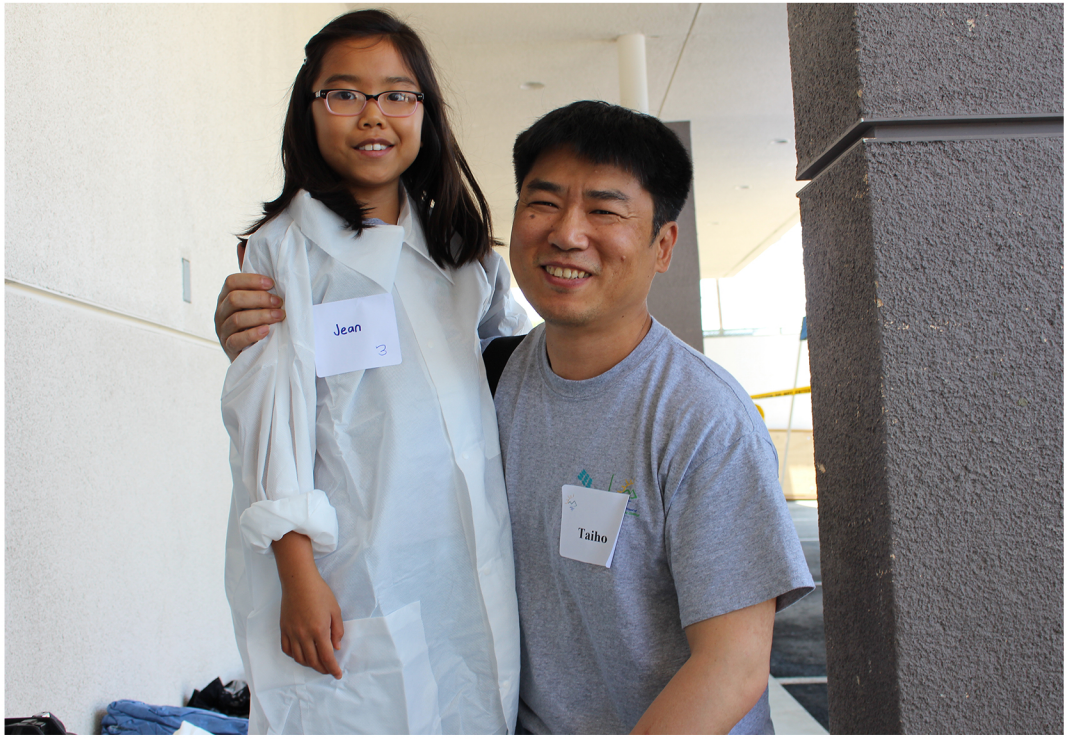
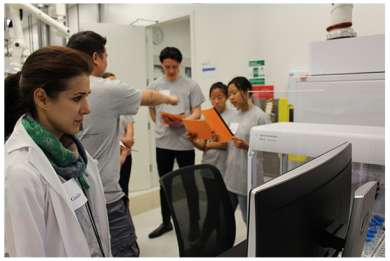


TOXIC CRUSADERS

Students dive into science and tackle real-🌎 problems.





Toxic Crusaders, Unite!

For a day, Pasadena-area middle school students slipped on white lab coats and put on their thinking caps. These "Toxic Crusaders" took a deep dive into science with staff and volunteers at their side. Their task? Assume the roles of environmental scientists at the Environmental Chemistry Laboratory, a place of analytical and environmental chemistry leadership that protects California's people and environment from toxic harm.

Students confronted complex problems facing California — and what they can do about them. Our goal was simple: Teach them how to be environmentally conscious citizens, better civic participants and, perhaps one day, professional "Toxic Crusaders" (DTSC scientists)!

"Toxic Crusaders: Learn How DTSC Protects People and the Environment" was hosted by The Department of Toxic Substances Control and the Association of Public Health Laboratories.

STUDENTS TAKE ACTION!

Activity 1

Toxic Waste Sampling

Scenario

Concerned group of students found leaky drums on school playground with 💀 animals.

Toxic Crusaders' task

Suited up and collected samples of the evidence. ■

Mui Koltunov
DTSC Research Scientist

"We feel what we do here is very important. Not a lot of people, including students and the community, really know what we're doing in the 🔬 This is their chance to go through the lab techniques that we use in what we do everyday. And also give them an opportunity to see the different type of careers available to them."

WHAT DID STUDENTS USE FOR THEIR EXPERIMENTS?

Instrument

ICP Optical Emission Spectroscopy

In ICP-OES, the sample enters the instrument where it is subjected to temperatures that are hotter than the ☀️ by an argon plasma torch. This process reveals what kind of metals are present.

Why it matters

Metal analysis allows DTSC to determine if products or parcels of land have an excess of dangerous substances. These federal and state limits keep us safe by triggering regulatory action.

Prepping students for real-world challenges

Each experiment was designed to excite students about science and career opportunities. The best way to achieve this? Put students in real-world scenarios! Students collected samples of evidence in a mock contaminated-site investigation. Students learned the critical procedures employed by DTSC's Emergency Response Program team, which responds statewide to calls requesting assistance for emergency removals from illegal/ clandestine drug labs and Hazardous Materials emergencies.

"So often, kids say they only think about becoming a nurse or a 👨‍⚕️ or a medical pro, which are very visible careers. Today, we bring them into the lab to open up their horizons about different science careers. And after these activities, you often hear kids say, 'I had no idea that this was an option or that this career even existed.' And they're really excited."

Laura Siegel APHL

APHL works to strengthen laboratory systems serving the public's health.

Toxic Crusader Task Force

Student jobs

- Safety officer
- Sampler
- Photographer 📷
- Quality Assurance (QA) Officer

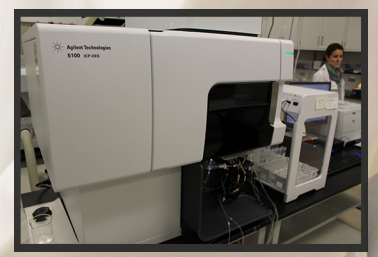
-ON SCIENCE

Students cycled through four different labs and experiments. Here's a little info about each one.

Station 1
Toxic Waste Sampling
Suit up and collect samples of evidence.

Station 2
UV Characterization of Toxin K
Plot the absorbance of the compound of interest and determine the concentration.

Station 3
Metals Analysis by ICP-OES
Measure intensity of light at specific wavelengths using ICP-OES.



Station 4
pH Measurement
Determine if samples are corrosive.

A simple formula: Early education = better citizens.

Early education about environmental issues is not only fundamental to DTSC's mission, but to the future of California and the entire 🌎. Through DTSC's outreach, students will obtain a deeper understanding of the complex problems facing the environment. And more importantly, they'll be able to think about their solutions. DTSC believes **mentorship and learning activities will encourage** students to be environmentally conscious citizens, better civic participants and, perhaps one day, professional Toxic Crusaders (DTSC scientists).

STUDENT Q&A

At the end of the day, students reflected on their experience at the Pasadena Lab. Here's what Noah, Logan, and Oliver had to say about the day's activities.

Q What was your favorite part about today?

Noah: "I really liked the first zone (toxic sampling). I got into the suit and collected samples from the 'hazardous area.' That was really fun! And, yeah, the suit was 🔥!"

Logan: "My favorite experiment that I really enjoyed was the pH testing with all the liquids."

Oliver: "I like the third lab! I got to take samples and then see how much concentration was present in the metals."

Q What did you learn today?

Logan: "Well, I learned about what the different equipment does and how to extract from metals."

Oliver: "I learned evacuation procedures, like when there's a radiation spill or possible poisoning."

Noah: "I learned about all the different kind of jobs in this field, including toxic cleanup. I thought that was pretty cool."

Q In one word, describe today's activities?

Noah, Logan, and Oliver: "Informative!", "Awesome!", "Fun!"

A special thank you! 🙌

DTSC and APHL thank all of the student participants for their enthusiasm about science. The Toxic Crusaders event is a success because of them. California's environmental future is in good hands thanks to these amazing Toxic Crusaders!

TOXIC CRUSADERS

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

June 2, 2018 | Pasadena Laboratory