

“Awesome Eyeballs” – an amazing group of students visit Y-12 and ORNL, part 1

When I first heard that a group of students had found a way to remove mercury from fish, I thought surely we have a group of post doctoral students here. What I learned was these students who have invented a fish food that pulls mercury from fish are actually five youngsters who are part of the Young Innovators Society.

Four of the five students were able to attend the visit to Y-12 National Security Complex and the Oak Ridge National Laboratory. Their ages range from 10 – 12 years old! They were amazing!

The Young Innovators' Society is a non-profit organization of volunteers who inspire K-12 students to pursue STEM (Science, Technology, Engineering, and Math) learning and become gracious, professional leaders. The society encourages students to engage in programs that foster STEM literacy, 21st century skills, and how to work as a team to solve unique challenges.

The students (and advisors) were from a Cleveland, Ohio suburb (Solon) where, through the Young Innovators Society, they developed a process that removes mercury from the filets of fish. This project so intrigued certain Y-12 and ORNL personnel familiar with the mercury concerns here that they offered to help the students develop an experimental plan for a feeding study with fish food containing the same component used for the filets that would absorb the mercury while the fish are still alive and later perform biopsies to analyze for mercury.

I was proud to have the opportunity to interact with these fine young people as we introduced them to Y-12. What follows are excerpts from an email sent by Nadine Otterman, an adult leader for the group, reporting on their experience.

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I want to sincerely thank you all for a truly amazing and insightful time at Y-12 and ORNL. I could not have envisioned a better two days with this team.

I knew we were in good hands with Ray Smith when he started in the museum with a "scavenger hunt" for facts. The twinkle in his eye when one of the kids pointed out that the bomb dropped on Nagasaki was plutonium rather than uranium sealed our fate. You couldn't have had a better combination. His stories were great and the kids were glued to every word he said. I probably should warn people that ten year olds don't use their eyes to communicate. Kids may even have their back to you when you are talking (drives me crazy), but then they will turn around and ask a relevant question. Ray must know this age well. I will assure you that my son in particular can pretty much tell every story word for word. He forgot the name of that "physicist with Niels Bohr" and "that island in New York where the uranium was stored." Everything else, down to the Lithium 6 separation process and the strategy for code naming buildings is forever remembered. I was asked later by the kids if I wrote down how to find out more information. Thank you, Ray!

On our way to fishing, Mark Shedden showed the kids Lake Reality and a few other points of interest. He also discussed the processes of how they remove Mercury from the environment and implement ideas in the field. I think the kids were mostly looking out the window, but they knew all the information later as if they had known it all along.

I have to admit that electroshocking fish was something the kids were looking forward to doing before they came. So, it was no surprise that they enjoyed this part. Kelly Roy was amazing with the kids. He had them measuring and weighing the fish and took the time to show the kids the detailed differences between the types of fish. The kids were jockeying to be near so they could hear what he had to say, because he talked to them like adults and what he had to say was very relevant to their interests. I greatly appreciated that everyone took a little extra time to let the kids use the equipment and explore the stream area. They loved the crawfish and the snake!! It was very hot in those waders, but the kids were not ready to leave when it was time to go. We only had one fall in, and it was not the one I would have guessed.

On our way out the door, Vicki gave the kids a bag of gifts (Thank you!) The kids tore into them and played with the “uranium” balls that evening. I don't think much “uranium” powder candy made it back to Ohio. That evening we relaxed at the hotel for some time, then had dinner at Big Ed's pizza. We returned to the hotel and the kids swam in the pool.

On Wednesday morning, Mark Shedden and Ben Stephens met us in the lobby of the New Hope Center at Y-12. Mark had great pictures of his work with the storm water sewers. The kids learned how ideas are developed and implemented in the field. They were quite surprised at the magnitude of the problems. I could tell that they found the cup solution quite interesting. Those types of challenges are the type that they have to solve in the robotics portion of their competitions. Thank you!

The mercury lab tour was absolutely fantastic. Teresa gave the kids an overview of the lab to start and the kids were able to feed the sturgeon some shrimp (Thank you, Kitty). Michael got a good splashing from one of the sturgeon which brought some laughs. They also took Dean Little's food and fed the fish in several of the tanks. We found that the little minnow-sized fish (...were they stonerollers?) really liked Dean's food.

Teresa introduced the kids to the variety of organisms in the lab. The CICHLID's used to check on PCBs drew a lot of interest. They also liked the turtles. Michael, still wet from the sturgeon, got a present from the turtle too (and more laughs). The tour of the equipment in the lab was very impressive. Teresa had the kids calibrating and/or using each piece of equipment to the extent possible ensuring safety. She taught them to pipette with water, showed them the chemical hood, and ran some samples with the spectrometer to show them how everything works. This was tremendously valuable.

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The second half of Nadine's report on the students' visit to Y-12 will be published in the next Y-12 Oak Ridge treasure – national resource article.