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## Sixth-graders get to look into eye of what bugs them

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By Eleanor Chute, Pittsburgh Post-Gazette



Andy Starnes/Post-Gazette

Connor Colombo, 11, a fifth-grader, studies an enlarged image of a housefly. Students at Winchester Thurston School collected bugs and sent them to the University of Illinois, which puts them under an electron microscope so students can examine them on computers at their school.

Sixth-graders at Winchester Thurston School have learned how to do experiments by studying mealworm behavior. Some have even eaten flavored mealworms and crickets.

But never before had they seen insects thousands of times bigger than in real life.

Until yesterday.

Using remote computer access, the students studied insects, which they had collected and shipped to Illinois, on a \$600,000 environmental electron scanning microscope located at the University of Illinois at Urbana-Champaign.

The university makes time on the microscope available, and professionals to help explain what the students are seeing, at no charge to schools as part of its Bugscope program, an educational outreach of the Beckman Institute's Imaging Technology Group.

Since 1999, Bugscope has hosted about 300 sessions with more than 200 schools.

On Winchester Thurston's Shadyside campus, third-graders used the microscope last week, and time is scheduled on Friday and Monday for more sixth-graders. In addition to the sixth-graders, yesterday's group included some fifth-graders visiting from the

school's North Hills campus.

Teachers Tracy Valenty, for the sixth-graders, and Kelly Vignale, for the third-graders, sent bugs to the university, where microscopist Cate Wallace taped whole pieces of bugs onto a two-inch round aluminum disk called a "stub" that acts as the slide in the microscope

Among the insects prepared for yesterday's session were part of a cricket's antenna, the pincers on an earwig, a mite on an earwig, an assassin bug's head, a darkling beetle, compound eye of a housefly, a plant hopper, a weevil snout and a mealworm.

The stub was placed in the microscope --which is about the size of a desk -- with some presets to help the students go right to the insects.

The students could see large black-and-white pictures of the specimen on their computers while one at a time took turns "driving," using controls to increase or reduce magnification or go up, down or sideways on the sample.

At the same time, the students could type in questions to the experts in Illinois.

The electron microscope can magnify objects about 200,000 times their normal size, but sometimes less is more.

The students didn't magnify anything more than about 20,000 times, and many of the magnifications were between 40 and 5,000. Beyond that it was difficult to identify anything.

But magnified, almost anything looks fascinating. At one point, this exchange was typed in by students:

"What is this?"

"It's a grey blob that will eat us all!!!!!!!"

Then the answer came from lab manager Scott Robinson: "This is the carbon doublestick tape."

There were lots of questions and answers from the experts in Illinois:

"What's that pointy thingy?" (One of the antenna's hair-like setae, which helps insects feel their environment.)

"What materials are bug hairs made of?" (Chitin and proteins, just like the rest of the insect's body)

"What is it like working with bugs?" (Entomologist Annie Ray said she gets to travel to interesting places and work with other scientists.)

"Are those really antenna? They look short and fat and stubby!" (Yes, antenna can be short and stubby or long and filamentous.)

Did you ever get a bug that was unknown? (Yes, sometimes they can't identify them.)

As in any live show, even with dead insects, there are surprises. At one point, the

electron microscopic uncharacteristically needed a bit of help mid-session.

So the class had an unexpected glimpse of the inner workings and Mr. Robinson's hand as he made adjustments.

Max Zissu, 11, of Point Breeze, declared the pictures "cool." He said, "I didn't expect it to be this clear and up close."

Anastasia Landman, 11, of Fox Chapel, said it was much easier to see on a computer screen than peering through a small hole on a classroom microscope.

The school's compound light microscopes will magnify up to 450 times, and its dissecting microscopes 40 times.

But even at the same magnification levels, the students would not have had as detailed a look at a solid insect with the classroom microscopes, said Ms. Valenty.

The teacher said the experience was a fitting bridge between the course's opening lessons on insects and the following lessons on microscopes.

She also hopes it adds to their appreciation of the insect world.

"They look very different close up," she said.

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*Correction/Clarification: (Published Nov. 6, 2008) One of the insects studied in a Winchester Thurston School classroom was a darkling beetle. This story as originally published Nov. 4, 2008 had an incorrect name for the insect.*

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