

# Eyer students drive electron microscope

By Lisa Mitchell  
Of The Chronicle

Sue Bauer's sixth-graders at Eyer Middle School were the first middle-school students to control Lehigh University's scanning electron microscope May 27 from a computer in their classroom.

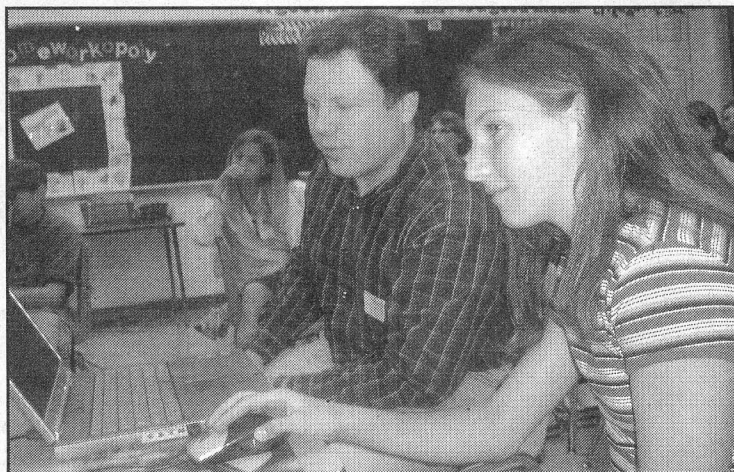
Andrea Harmer, of Lehigh University, created a research study as an outreach program for the university to fulfill her doctorate requirements. Its purpose was to explore the learning process of middle-school students in science.

Bauer used a Web-based program to guide them through a three-step, scientific problem-solving process, observing how they learned.

"In the research we did in November, we introduced them to electron microscopy," said Harmer. "Now, they're actually driving an electron microscope."

Harmer's theory was that real issues make science fun, so she challenged the students to create solutions to the West Nile Virus.

Students viewed 12 articles Harmer had collected over a two-year period, highlighting facts and local issues to provide them with



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Eyer sixth-grader Alisha Huther was the first student to drive the Scanning Electron Microscope located at Lehigh University. Technology Systems Specialist George Motter instructed the class on how to operate the computer system.

more motivation. They also viewed virus cells on the web site, zooming in and out as if they were using the scanning electron microscope themselves.

In conclusion, she discovered that real issues in their local area did motivate students to learn more and create their own solutions.

The final step in the pilot was the creation of a computer program that would allow students to control the SEM from their classroom. Lehigh University Technology Specialist George Motter de-

signed it to link the SEM's controls to a Web-based computer program. He demonstrated how to operate the microscope for Bauer's class and Mary Ellen Coyle's sixth-graders.

Prior to that day's demonstration, the students submitted 25 samples and Harmer chose six with the best topography, including a bee, string, human hair and an eraser.

Motter explained that their samples were placed on a round mounting plate inside an air tight chamber.

A video camera views the sample for the students to see in their classroom.

Normally, Motter said, students view objects through an optical microscope, which uses light to magnify something. The SEM uses an electron beam to scan the sample, which bounces back to a detector and the image is viewed on the screen. This enables them to view smaller items at a higher magnification at 14x to 500x.

"This allows us to get really down and detailed," said Motter.

Sixth-grader Alisha Huther was the first student to operate the electron microscope. She controlled the focus and magnification by clicking on the computer screen. The class tried to guess which sample was being viewed, thinking the black and white hairy image was string or hair. Huther decreased the magnification and they discovered they were looking at the bee. They also viewed the eraser and string.

"I didn't know that the eraser would look like a mountain," said student Marissa Weidner.

Emma Witter thought it was interesting to learn about the electron microscope and see things even closer than she ever thought possible.

"You get to see things that are smaller in different ways," added Alycia Meurlott.

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