

## Scanning Electron Microscope Lets Students See World in “Different Light”

“Wow! That really looks like that?”

That’s the reaction from most students -- and even teachers -- after using the newest, state of the art piece of technology that the Whitesboro Central School District has to offer.

In March, the high school’s science teachers participated in a training on how to use the district’s new scanning electron microscope. The powerful microscope, which is located in the science wing of the high school, is a type of electron microscope that produces images of a sample by scanning it with a focused beam of electrons. Samples can be magnified up to 20,000 times or to as small as 300 nanometers. The Whitesboro Central School District is also one of only four school districts in the entire country to have its own scanning electron microscope for students to use.

Mr. Dwight “Buzz” Putnam, a science teacher at Whitesboro High School who teaches physics and Introduction to Nanotechnology, marvels at the opportunity to utilize such a potent tool.

“There are a few other high schools across the country that have access to a scanning electron microscope, but most of the microscopes are located on and owned by college campuses,” said Putnam. “Whitesboro High School is now one of the elite high schools in the United States to actually have its own scanning electron microscope, just a few feet outside of the science classrooms.”

Whitesboro’s scanning electron microscope was purchased through a grant from Oneida County Executive Anthony Picente’s office. The funding is part of the initiative, “Partners in Prosperity: Partnerships for STEM Education,” which is designed to enhance education opportunities for students enrolled in science, technology, engineering and math classes.

So far, Whitesboro’s students -- who just started using the scanning electron microscope -- have studied samples like a record, cd, dog hair and light bulb filament. Before, students could only view those samples, and others, using older, light based microscopes with a magnification power of 400 times, not 20,000 times or 300 nanometers.

To put that into perspective, consider that just one nanometer is one one-billionth of a meter and that if all of the people on planet earth were the size of one nanometer, everyone would fit inside a Hot Wheels car.

“What we have and what we are now able to incorporate into the classroom, is taking science to the next level,” said Putnam. “A scanning electron microscope used to be the size of a wall and take a long time to produce an image. Now, it’s the size of a computer and it only takes 30 seconds for images to appear.”

Starting next school year, Putnam says high school teachers will have the ability to stream images to every school building in the district, allowing elementary and middle school students to reap the benefits of the scanning electron microscope, as well. The images can also be archived.

“Our students are using something that many colleges don’t even have, so it gives them a big edge,” said Putnam. “It may even be enough to put one of our Nanotechnology students, who is on Harvard’s waiting list, over the top.”

All while getting to see the world in a different light.