



PRESS RELEASE

FOR IMMEDIATE RELEASE
June 7, 2013

CONTACT:
B&W Y-12 Public Affairs
865-241-4937

The leg bone is connected to the hip prosthesis: Students analyze artificial implants at ASM Materials Camp

OAK RIDGE, Tenn. – Fifteen high school students and one college freshman recently got up close and personal with lab equipment worth nearly a half million dollars at the ASM International Materials Camp. During the weeklong camp, students performed failure analyses on prosthetic implants including a hip prosthesis, pelvic clamps, a tibial nail and tibial component. An area surgeon provided the sterilized implants, along with X-rays showing the implants before they were removed from patients.

The ASM Materials Camp is organized and sponsored by Y-12, Oak Ridge National Laboratory, Tech 2020 and UT Knoxville. Steve Dekanich, an engineer in B&W Y-12's Quality Assurance, is the camp co-chairman. Both Dekanich and B&W Y-12 have worked with the camp since 2006 to introduce students to materials science, which involves the properties of materials and their application. "This is a technology-savvy generation," Dekanich said. "We put these kids in front of the scanning electron microscope, and within 30 minutes they are taking photos and analyzing data – it's amazing."

During the first two days of camp, students met at Tech 2020 and worked in teams using a precision cut off saw, hot mounting press and a specimen grinder/polisher — all located in a mobile metallography lab provided by Mager Scientific — to prepare material samples of the prosthetic implants. The students then moved to a scanning electron microscope to identify the elements in each sample and capture images. The students also used a state-of-the-art optical microscope to capture digital images and perform 3D renderings of the samples, looking for the telltale signs of material failure.

Sitting in front of the scanning electron microscopes, Justin Zanoni, a freshman at The University of Tennessee, was asked what he liked most about using the microscope. "Bragging rights," he said. "We've heard about electron microscopes but have never had the chance to see them or use them." Hitachi and Keyence provided the microscopes for the camp, and Hitachi sent a representative to set up the instruments and guide the students.

The camp itinerary for the remainder of the week included a visit to Y-12's New Hope Center, a tour of ORNL, including the Spallation Neutron Source, and a day at UT touring the Materials Science Engineering labs.



PRESS RELEASE

Like most of the students, Hunter Stombaugh, a student from William Blount High School, had no prior knowledge of materials science. Standing in the metallography lab, Stombaugh said, "It would be awesome to do something like this for a living."

Follow [Y-12](#) on [Facebook](#), [Twitter](#), [YouTube](#), and [Flickr](#).

B&W Y-12, a limited liability enterprise of The Babcock and Wilcox Company and Bechtel National Inc., was selected to operate the Y-12 National Security Complex for the National Nuclear Security Administration in 2000. Y-12 maintains and enhances the safety, security, effectiveness, and performance of the U.S. nuclear weapons stockpile; reduces the global danger from weapons of mass destruction; provides the U.S. Navy with safe and effective nuclear propulsion; and provides expertise and training to respond to nuclear and radiological emergencies in the U.S. and abroad. Visit <http://www.y12.doe.gov/> for more information.

-###-

PHOTO CAPTIONS:

600718 – Student Hunter Stombaugh loads a material sample into the Saphir 550.3, a laboratory instrument used to grind and polish samples before placing them in an electron microscope for analysis.

600724 – Student Patricia Edou loads a material sample into an Hitachi electron microscope while fellow student, Justin Zaroni, prepares another sample.