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SmartLabs Provides Hands-on Physics Experience

The physics department at Andrews University conducted its second annual SmartLabs workshops for high school teachers and students from June 14–18. The workshops—co-sponsored by Andrews University, the Lake Union Conference, and the Berrien County Intermediate School District—welcomed teachers and students from Hinsdale, Indiana, Peterson-Warren, Battle Creek, and Puget Sound Adventist academies, as well as local area high schools, for five days of intense physics training.

Nine teachers and 11 students attended the program in order to enrich their physics classes. The students were handpicked by their teachers for their scientific potential, with the anticipation that they would function as laboratory assistants when they returned to school. As a team, the teacher-student pairs participated in demonstrations and lectures, and worked on projects that helped to expand their knowledge in areas such as rotational motion, forces and equilibrium, electricity and magnetism, wave mechanics, and nuclear physics.

SmartLabs began when a growing need was recognized. “Technology moves so fast, and oftentimes teachers just can’t keep up with it. They need help to learn what’s new in the area of physics, and they need assistance to present it to their classes,” explained Margarita Mattingly, physics department chair and director of SmartLabs. “SmartLabs expands the horizon of teachers and gives them more options. Bringing a student with them makes it possible to have help when they are ready to teach the whole class,” she said.

While in their labs, participants also got a taste of what it was like to use high-tech equipment that is not readily available in their classrooms. “Some of the things we’ve gotten to use in the labs are just out of sight,” Eau Claire High School teacher Les



Carl Bandy (right), Hinsdale Adventist Academy science teacher, and Anna Park study wave mechanics.

Knickerbocker said. Participants gained familiarity with high-tech computer data acquisition equipment such as force sensors, motion sensors, and digital video capture equipment. They analyzed their data using several powerful graphical software packages.

While some lab demonstrations require expensive equipment, SmartLabs included many experiments that were “low-tech” and less expensive, but still taught the same lesson as more expensive aids. To illustrate the Rutherford Scattering Experiment, the experiment which discovered that atoms have a nucleus, common hackey sacks were thrown at Styrofoam plates taped on the wall. There were eight demonstrations similar to this in which teachers were given the materials used so they could repeat the lab for their students at home.

Teachers and students who attended the workshops were enthusiastic about the time spent there. Carl Bandy, a teacher from Hinsdale Adventist Academy, was confident about his first year at SmartLabs. “The experience we have had here has been great; you just can’t beat it. We are able to visualize the concepts and then translate them to the young people we will be instructing. Rather than giving them formulas, I can now give them more experiments and hands-on material,” he said. “Being able to present subject matter that is outside of the normal textbook material is a benefit to teachers and students.” Monica Hardesty, a junior at Puget Sound Academy, also liked having the hands-on experience. “I can see what it is that I’m learning, rather than just reading it in a book,” she said.



Monica Hardesty (left), from Puget Sound Adventist Academy in Washington, and teacher Colleen Brundula, analyze data from standing waves on a wire.

The Andrews University physics department and its faculty are dedicated to expanding the minds and learning opportunities of teachers and young people. They look forward to the third annual SmartLabs and the new material they can present.

Erin Heldstab, University Relations news writer