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## Computers bring fun to physics

By Bob Waite
Emerald Reporter

Using computers makes learning physics fun and makes teaching physics easier, a University professor said.

Fourteen Oregon secondary teachers will be given a chance to test this theory next summer when David Sokoloff, University physics professor, introduces them to the Scientific Thinking: Implementation and Research program.

But Sheldon High School students are proving Sokoloff's theory true.

Gathering around a MacIntosh computer on one of the seven tables in physics teacher John Garrett's lab, Stephanie Cole, Tanya Browne and Teresa McCabe analyze the physics principles involved when a "car" runs down an inclined plane.

While Browne readies the computer, Cole releases the car — a block of wood with wheels — down a wooden ramp while McCabe waits to catch it. Between the ramp and the computer, Garrett attaches a motion detector to measure the car's velocity and feeds the information into the computer program. The result is a graph on the computer screen and a table of numbers.

Next, the three measure the distance traveled and weigh the car.

Asked if it would not be quicker and easier to just use a stop watch to time the car and figure out the problems with pencil and paper, the three students frown in unison.

Certainly not, they say. That would produce bad data. The idea is to determine the car's velocity at various points on its way down the ramp. Doing the calculations without the computer would take much longer and the potential for human error is greater. Data and calculations to show results would quite likely be inaccurate.

They've already learned to do the calculations, they say. Why not let the computer do the tedious stuff now ?

They enter the remaining measurements into a spreadsheet that contains the data the computer collected, in order to determine the car's time, acceleration, velocity, kinetic energy and potential energy. While they finish up, Chris Ewing plays around because he has finished his tests.

"The gravity of the moon is about 1.6 meters per second," Ewing says, explaining what he was doing to his spreadsheet. He had made a spreadsheet to show the distance, time, acceleration, velocity, force and trajectory of a projectile on Earth. What would happen if it were on the moon?

"The computers make it easier. It gives you a chance to do more. You can actually see what's happening and you don't have to do the calculations over and over on paper," Ewing says.

When the class bell rings, McCabe and Browne are still working on their spreadsheet and want to stay, but Garrett says they can work on it later.

"Using the old way you'd hear a moan when it was time to do this," Garrett says. "And if the data was bad they'd have to start over. It took a long time. I think they enjoy working with computers."

"These are tools that have been available for several years," Sokoloff said. "What this workshop does is introduce teachers to these methods."

Sokoloff and Garrett taught the first workshop to Eugene-area teachers three years ago. This summer the teachers will come from other areas of Oregon.

Participating educators will get the software, a variety of measurement instruments, computer interface hardware and teaching manuals, Sokoloff said.