The Pitsco NETWORK
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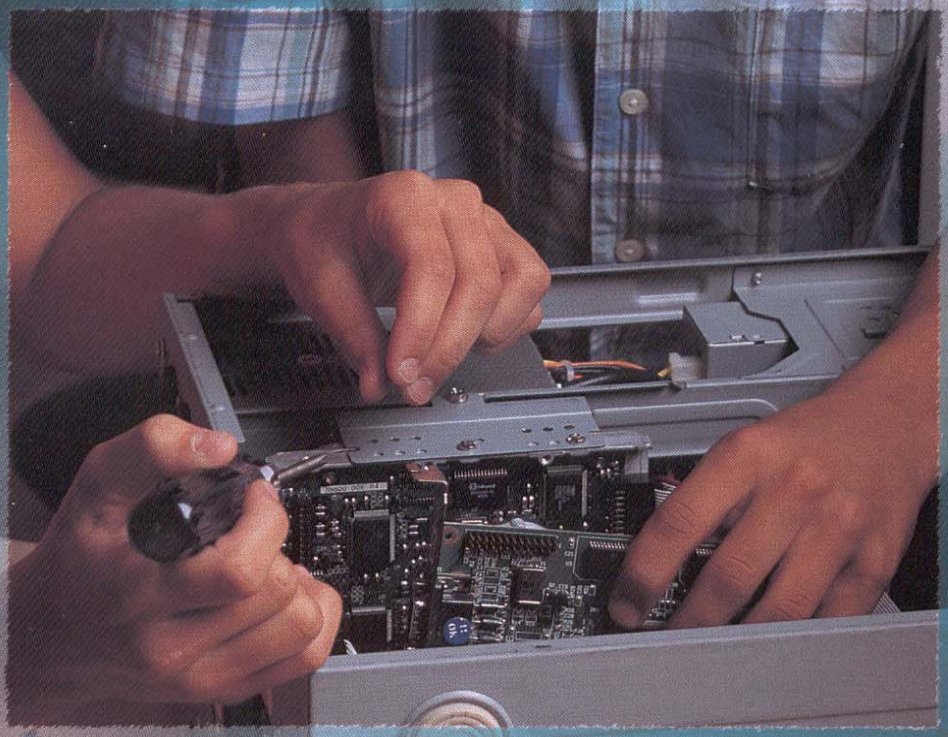
Serving Teachers of Pitsco's Systemic Solutions

Hands-On Learning

Also in this issue:



Activities set in career context

Hands-on approach within CareerPorts unveils relevance of content to students

CareerPorts infuse career-related, core academics with a variety of hands-on activities. Students explore and apply concepts in math, science, and language arts by completing real-world assignments.

The hands-on component of CareerPorts helps to promote high-level, critical thinking skills and foster independent learning among high school students.

In each assignment, students complete hands-on activities appropriate to the career context of the CareerPort. This includes using software and equipment. In CareerPorts such as *Marketing* and *Teaching Methods & Management*, students use common business and education software, such as the *Microsoft Office* suite of applications, to create memos, reports, lesson plans, presentations, and so on.

Students are also exposed to career-specific software. They use *TurboCAD* to complete 2-D and 3-D drawings in *Engineering Communication*. In *Health Information*, a medical charting application, *Soapware*, is used to record patient information and to generate medical reports. Computer technology tools, such as digital cameras, enable students to create multimedia elements in many of their assignments. Students gain experience and become proficient with the software applications and technology tools that drive today's varied business world.

In other CareerPorts, students use career-specific equipment to complete experiments and activities. For example, in *Therapeutic Health*, students learn how to measure a patient's vital statistics (blood pressure, temperature, and pulse) using a sphygmomanometer, thermometer, and stethoscope. Neuron simulators and temperature sensors are used to help design and build a functional prosthetic arm in *Engineering Systems & Controls*.

As you can see, CareerPorts give students access to career-related equipment and materials that they might never have the opportunity to work with in a traditional classroom. They are using the same tools and applying the same techniques the professionals use.

This hands-on approach makes the application of core academics relevant to students. It places math, science, and language arts in a tangible, career context for students ready to enter the job market or continue their education in institutions of high learning. CareerPorts help answer the age-old student lament, "Why do I have to know this?"

Senior Curriculum Specialist Gina Sanmiguel, gsanmiguel@pitsco.com

Demonstrator provides simple means of learning about simple machines

Pulleys, levers help explain application of physics

In the *Engineering Prototyping & Analysis* CareerPort, students use the Pitsco Simple Machines Demonstrator to design and build a scale model of a lever-activated pulley system. Students are instructed to research and design a scale model of a farm lift that can raise a 250-gram weight to a height of approximately two centimeters.

CareerPorts Hands-on Example

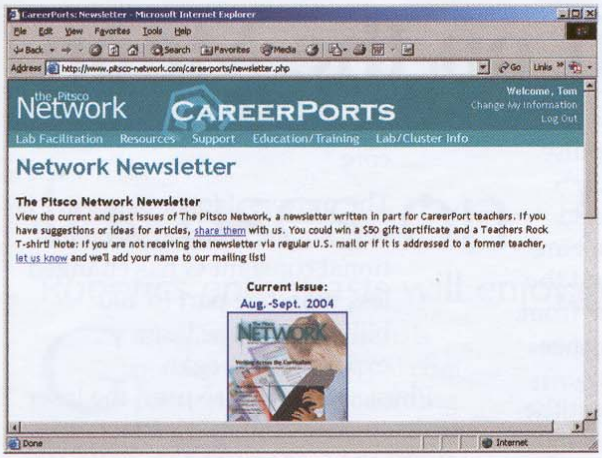
Following their design, students build a scale, working model of the lift using the demonstrator. Finally, students test their model and record and analyze the data to make sure that the lift design meets the given specifications and requirements.

To complete the assignment, students research and apply concepts related to simple machines (especially pulleys and levers), hydraulics, and forces.

This real-world application of physics concepts benefits students because they are required to create and build their own design for the lift system.

Students are compelled to become independent learners and critical thinkers to accomplish the task.

This type of hands-on, student-directed experience goes beyond traditional classroom teacher demonstrations or teacher-led lab activities that might be used to teach the same concepts.



Pitsco-network.com launches CP wing

Pitsco-network.com is undergoing an expansion to include all four of Pitsco's systemic solutions. One of the newest additions to the site is CareerPorts. Let's take a look at a few features of the site.

If you facilitate Pitsco's newest system, CareerPorts, this site should be your No. 1 destination on the Web. We have compiled a variety of information that will serve as great online resources.

Our teacher forums offer an efficient way in which to network with other CareerPort facilitators. At any given time of day, you can post questions or comments and read items posted by other facilitators. Take advantage of this resource that is moderated by a CareerPorts expert.

Another helpful feature of the site is customer service. Darris Lassiter will provide all customer service for your CareerPorts class. You can send Darris an e-mail via the Web site, or you can call him at 888-728-4548 between 7:30 a.m. and 5:30 p.m. CST. He occasionally will post helpful information to the site so check often.

During your first year teaching CareerPorts, you may have questions about the management system, *Collaborator.* Never fear. Our resident CareerPorts expert, Senior Curriculum Specialist Gina Sanmiguel, has compiled a list of frequently asked questions. These will be updated regularly and will be of great help to you. If you have a question that hasn't been posted or addressed, please feel free to submit a comment via the teacher forums or contact customer service.

New items and events will be posted on the opening page of the site and will be updated regularly. If you need a username and password, contact me anytime via e-mail or at 800-828-5787.

Pitsco-Network Web Site Administrator
Kristi Garver, kgarver@pitsco.com

Virtual internships provide sneak peek

Imagine working as a human resources assistant, a teacher, an aeronautical engineer, or a medical records specialist while still in high school! CareerPorts give students a glimpse into these and other diverse, exciting career areas through virtual internships.

Designed around a career scenario, CareerPorts immerse students in the world of work. Students are given a job within a fictional company or school and asked to complete real-world assignments related to the career context of the particular CareerPort.

Students receive the instructions and specifications for the assignments through faux e-mail messages from their virtual supervisors and colleagues. Working within this framework, students become acquainted with the expectations of the workplace. They are faced with creating proper business communication, meeting deadlines, undergoing evaluations, and so on.

In the *Financial Services* CareerPort, students work as a financial

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CareerPorts Customer Service

888-728-4548 dlassiter@pitsco.com

Help is a just a click away

Resist the temptation. The next time one of your students has a question about the workflow or a particular process in CareerPorts, give him or her a chance to find the answer before you instinctively pull it forth from your ever-growing wealth of CareerPorts knowledge.

Give students a hint by telling them to check the online help file – and you can even tell them to access the help via the Help menu – but let them learn about being resourceful by searching for the answers to their queries, which might include "How does the schedule work?" or "Do I have to complete the nine core assignments in sequential order?"

In fact, if you haven't already done so, consider increasing your CareerPorts knowledge by reading all of the topics in the help file. Who knows? Perhaps you'll uncover a nugget of wisdom that will help improve the way you facilitate CareerPorts.

Orientation in the works

An online student orientation will soon be available. In addition to using this as a means of training students at the beginning of a course, you may allow students to access the orientation at any time if they need a refresher about a particular component of the system at any point during the semester.

Feel free to contact me anytime for assistance or if you have a question for which you were unable to find an answer in the help file or other CareerPorts documentation.

CareerPorts Customer Service Representative
Darris Lassiter, dlassiter@pitsco.com

What Neil and Buzz left on the Moon

A cutting-edge science experiment left behind by Apollo 11 astronauts is still working today

The most famous thing Neil Armstrong left on the Moon 35 years ago is a footprint. Millions of people have seen pictures of it, and one day, years from now, lunar tourists may flock to the Sea of Tranquility to see it in person.

Will anyone notice 100 feet away, something else Armstrong left behind?

Ringed by footprints, sitting in the moondust, lies a two-foot wide panel studded with 100 mirrors pointing at Earth – the "lunar laser ranging retroreflector array." Apollo 11 astronauts Buzz Aldrin and Neil Armstrong put it there on July 21, 1969, about an hour before the end of their final moonwalk. Thirty-five years later, it's the only Apollo science experiment still running.

University of Maryland physics professor Carroll Alley was the project's principal investigator during the Apollo years, and he follows its progress today. "Using these mirrors," explains Alley, "we can 'ping' the Moon with laser pulses and measure the Earth-Moon distance very precisely. This is a wonderful way to learn about the Moon's orbit and to test theories of gravity."

Here's how it works: A laser pulse shoots out of a telescope on Earth, crosses the Earth-Moon divide, and hits the array. Because the mirrors are "corner-cube reflectors," they send the pulse straight back where it came from. "It's like hitting a ball into the corner of a squash court," explains Alley. Back on Earth, telescopes intercept the returning pulse – "usually just a single photon," he marvels.

The round-trip travel time pinpoints the Moon's distance with staggering precision: better than a few centimeters out of 385,000 kilometers, typically.

Targeting the mirrors and catching their faint reflections is a challenge, but astronomers have been doing it for 35 years. A key observing site is the McDonald Observatory in Texas where a 0.7-meter telescope regularly pings Apollo 11's reflector, reflectors left by Apollo 14 and Apollo 15 astronauts, and a Soviet-era rover, *Lunokhod 2*, left by the Luna 21 crew in 1973.

In this way, for decades, researchers have carefully traced the Moon's orbit, and they've learned some remarkable things, among them:

- The Moon is spiraling away from Earth at a rate of 3.8 centimeters per year. Why? Earth's ocean tides are responsible.
- The Moon probably has a liquid core.
- The universal force of gravity is very stable. Newton's gravitational constant G has changed less than one part in 100 billion since the laser experiments began.

Physicists have also used the laser results to check Einstein's theory of gravity, the General Theory of Relativity. So far, so good: Einstein's equations predict the shape of the Moon's orbit as well as laser ranging can measure it. But Einstein, constantly tested, isn't out of the woods yet. Some physicists (Alley is one of them) believe his general theory of relativity is flawed. If there is a flaw, lunar laser ranging might yet find it.

Time will tell . . . and there's plenty of time. Lunar mirrors require no power source. They haven't been covered with moondust or pelted by meteoroids, as early Apollo planners feared. Lunar ranging should continue for decades, perhaps for centuries.

See related article on light and lasers, page 8

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  - *International Laser Ranging Service http://ilrs.gsfc.nasa.gov/*

Virtual

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services associate for RJR Financial Group. They are expected to complete a myriad of tasks related to servicing the clients of this financial organization, from designing pamphlets on judicious credit use to analyzing mutual funds as potential investment opportunities.

For example, in the Mortgage Options assignment, students prepare documents for two different clients that provide mortgage information based on each client's unique financial circumstances. The request for these documents comes in the form of a message from the students' virtual supervisor, Kelly Gene. She and others in the company send additional messages providing supplementary details, instructions, friendly input, and templates for completing the mortgage documents.

Just as they would in the real world, students use mathematics to analyze each client's finances and use the Internet and other resources to research the best mortgage options for the clients. After completing the documents, they reply to Kelly's messages and submit their final reports. The entire process mirrors the actions taken at a real financial organization to help clients plan fiscal futures.

After completing a virtual internship experience such as the one in *Financial Services*, students come away with an appreciation for a career area and the realities of work in the real world.

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