

ENERGY Education newsletter

March/April 2005



Generating Tomorrow's Workforce

FirstEnergy's Award-Winning Training Program Now Available on Two Pennsylvania Campuses

FirstEnergy's award-winning Power Systems Institute (PSI), an educational program that prepares students for a career as an electrical line worker or substation electrician, is coming to two Pennsylvania colleges. Beginning in the fall, students at Clarion University-Venango Campus in Oil City and Reading Area Community College in Reading will participate in the line worker program. PSI has proved to be a success at four Ohio colleges and at Raritan Valley Community College in New Jersey.

Filling a Real Need

The two-year PSI program provides graduates with an Associate of Applied Science degree with a focus on electrical utility technology. Graduates are eligible for employment as mid-level line workers. "As skilled journeymen and craftsmen retire, there's a real need for their replacements," said Victor Bowser, chairman of the Department of Applied Technology at Clarion University-Venango Campus.

Each of the two new locations can accept 12 students per year. They will learn the essentials and build the hands-on skills necessary for becoming an electrical line worker. They will also study economics, applied physics and English composition. Students earn certification in first aid and CPR and will receive a Class A commercial driver's license.

A Top Training Program

In 2001, the Corporate University Xchange, a leading education research organization, recognized PSI as one of the top training programs in the country. The program was awarded an honorable mention in the "Developing Learning Alliances with Universities" category.

With 115 graduates, FirstEnergy's PSI is meeting its goal of helping address a nationwide shortage of line workers and substation electricians. Of these gradu-

ates, 103 are qualified line workers, and 94 have found jobs with FirstEnergy. Of the 12 substation workers to graduate from the program, 11 are now working for FirstEnergy.

For more information about FirstEnergy's PSI, visit our Web site at www.firstenergycorp.com/employment and click on "Power Systems Institute."

The Power Systems Institute welcomes the opportunity to present the program to high school students. Contact LaMinda Nichols at 440-604-9803 or 1-800-829-6801 for details.

Attention 2003-04 FirstEnergy Math, Science and Technology Grant Recipients!

As the school year is winding down, you'll soon receive an evaluation form to tell us about your project. Your feedback is vital to the effectiveness of the grant program, and it allows us to share what you've done with other educators. We appreciate your including photographs, hand-outs, tests or other material with your evaluation form. Look for it soon. Thank you!

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- Electric Operating Companies:
- Ohio Edison
 - The Illuminating Company
 - Toledo Edison
 - Metropolitan Edison
 - Pennsylvania Electric
 - Penn Power
 - Jersey Central Power & Light

Summer Fun, Summer Safety Help Kids Stay Safe This Summer

Spring is in the air, and as the weather warms up and the days get longer, kids will be spending more time outdoors. Now is a good time to remind students of the rules for outdoor electrical safety.

In Your Neighborhood

The substations, transmission lines and power lines that bring electricity to homes and schools are not safe places to play. Make sure your students know what a substation looks like and are aware of these safety rules:

- Stay away from substations and power lines.
- Don't climb trees nearby.
- Keep ladders away from power lines.
- Keep kites and kite-strings clear of power lines.

Storms and Accidents

Storms and accidents can damage transmission equipment and make it hazardous. Students of all ages should know the SKIS rules for what to do when they find a fallen power line:

- Stay away.
- Keep others away.
- Inform the police or power company.
- Stay in your car if a power line falls on it.

Water and Electricity

Your students may already be aware of the importance of keeping electrical appliances dry inside the home. But it is important to remind them of these outdoor rules for electrical safety:

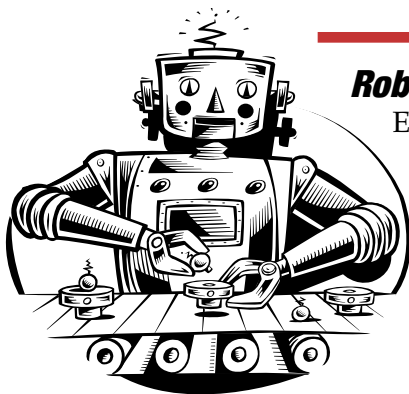
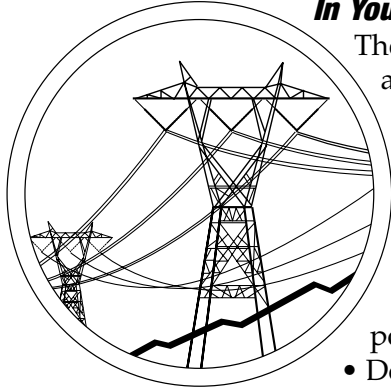
- Keep radios and other appliances well away from pools and sprinklers.
- Do not use electric-powered tools in wet weather.
- Never touch a wet wire, switch or outlet.
- Never play in a pool or lake during an electrical storm.

Free Resources for Teaching Outdoor Safety

The education section of the FirstEnergy Web site (www.firstenergycorp.com/education) offers teachers in our service areas a range of free resources for teaching outdoor electrical safety. For a full list of outdoor safety rules, visit The Electric Avenue and click on "Play It Safe!" and "Outdoor Safety."

The site also provides materials for specific grade levels. For students in kindergarten through grade 4, Louie's Safety Universe offers a safety video and coloring book as well as stickers and a colorful growth chart. The Literature section of the Web site includes material for middle school students. "Don't Get Zapped" is an activity book packed with experiments, games and activities that foster awareness of electrical safety. "What Everyone Should Know About Electrical Safety" is a booklet suitable for grades 6 and up.

The FirstEnergy video library is another place to go for age-appropriate resources on outdoor electrical safety. Go to www.firstenergycorp.com/education and click on "Video Library" for a list of videos and information on how to order them for your school.



Robotics Teams Compete

Every year teams of students ages 9-14 are invited to compete in the FIRST LEGO® League International robotics challenges. Ocean Odyssey is the title of the 2005 challenge. For more information visit www.firstlegoleague.org.

Rooting for Earth Day

National Environmental Education Week (April 10-16) helps teachers and students prepare for Earth Day on April 22. Ideas for classroom readings and activities geared to a range of grade levels are at www.eeweek.org.

The Cutting Edge

The Power of Trash

The California cities of Palo Alto and Alameda have signed contracts to purchase power generated from rotting garbage. Under the agreement, a generating plant will be built at a landfill in nearby Watsonville. Methane, collected from the decomposing trash through a network of pipes, will be burned to generate steam and drive the plant's turbines. The power will not pass directly from Watsonville to Palo Alto and Alameda. Instead the green power will be fed into the national grid, and the purchasing cities will pull the agreed amount of electricity from the grid. Palo Alto's participation helps the city fulfill its goal of deriving 20 percent of its power from renewable sources by 2015. *Mercury News*, December 29, 2004



Moving Closer to Molecular Electronics

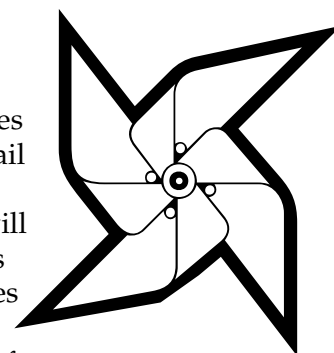
Researchers at Hewlett-Packard have created a molecular-scale alternative to the transistor – and demonstrated that it can perform a type of logic operation essential to computing. The device consists of a wire that is crossed by two other wires. The junctions of the wires operate as switches that are only a few atoms in width and can be programmed by a set of electrical pulses. Standard electronic devices use transistors to perform the same operation. With further development, the new device could make it possible to create ultra-small electronics.

The New York Times, February 1, 2005

Launching a Solar Sail

On March 1, the Planetary Society hopes to launch Cosmos 1, a 30-meter solar sail made of Mylar and shaped like a giant pinwheel. A Russian ballistic missile will take the craft into orbit. Once aloft, this craft does not require an engine. It relies on pressure from the sun's photons to boost its orbital velocity. To move out of Earth's orbit, however, the craft would require more energy than it can gain from sunlight. In a further experiment, physicist and science-fiction author Gregory Benford, working with his brother James, plans to beam 500 kilowatts of microwave energy at Cosmos 1 and measure the resulting change in the craft's velocity.

Popular Science, February 2005



New Generation Nuclear Power

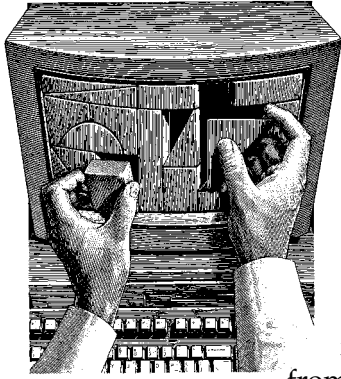
China expects to become the first country to operate a radically new design of nuclear reactor. Known as a pebble-bed reactor, the new type of generator is fueled by spheres the size of billiard balls. At the center of each sphere is a half-millimeter core of low-enriched uranium encased in graphite and silicon carbide and then in an outer layer of graphite. The small core and the dispersal of fuel among hundreds of thousands of spheres are expected to enhance safety. Proponents of the design also point to the modular nature of the reactor as an advantage, permitting expansion as demand for power increases. *Financial Times*, February 8, 2005

Visit our website at
www.firstenergycorp.com/education

Celebrate the Einstein Year

2005 is the World Year of Physics, commemorating Einstein's groundbreaking publication of the Special Theory of Relativity in 1905. For ideas on how to celebrate the Einstein Year in your classroom, visit www.physics2005.org and click through to the teachers' pages. There you'll find physics activities for middle school and high school students. To learn about how today's physicists go about their work, students can read blogs from scientists around the world at www.quantumdiaries.org.

Educational Resources Available

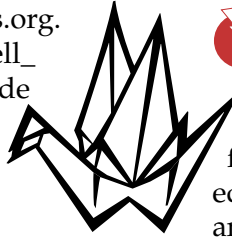


⚡ Scientific American offers a number of **interactive games, puzzles and optical illusions** at www.sciam.com/recreations_directory.cfm.

⚡ Packets of **classroom posters** illustrating topics in minerals and mining are available for \$10 per packet of 4 or 5 posters from the Mineral Information Institute. Visit www.mii.org/posterpackets.html to order online or to print out an order form, or call 303-277-9190.

⚡ High school students interested in the interplay of **mathematics and art** will find information on the subject at http://pass.maths.org.uk/issue33/features/dartnell_art/index.html. Topics include the golden ratio, tessellations, origami and anamorphic art.

⚡ For **inexpensive posters** illustrating a wide variety of topics, visit www.teacherstorehouse.com.



resources for K-12 classrooms including downloadable student tip sheets on topics such as experimenting and problem solving.

⚡ A **downloadable brochure about hydropower** is available from the Idaho National Engineering and Environmental Laboratory Web site at <http://hydropower.inel.gov/hydrofacts/default.shtml>.

⚡ For information about **biomass as a green energy** source, visit the International Energy Agency's Educational Web Site on Biomass and Bioenergy at www.aboutbioenergy.info/.

⚡ San Francisco's Exploratorium offers **free downloads of sample activities** from their math and science activity books. For science activities for ages 6-9, go to www.exploratorium.edu/science_explorer/. Math activities and brain science explorations for middle school students are at www.exploratorium.edu/math_explorer/ and www.exploratorium.edu/brain_explorer/.

"The larger the island of knowledge, the longer the shoreline of wonder."

– Ralph W. Sockman

⚡ The Web site of Iowa Public Television includes a section called "**The Future of Energy**" found at www3.iptv.org/exploremore/energy/. The site provides

⚡ The American Meteorological Society publishes a guide to careers in **meteorology and atmospheric sciences**. Students can call 617-227-2425 or visit the American Meteorological Society's Web site at www.ametsoc.org/atmoscareers/index.html to read or download the society's career guide.

Are You an Unsung Hero?

Have you pioneered new methods and techniques to improve your students' learning? Do you have a new idea you plan to try in your classroom? The financial services company ING has created the Unsung Heroes Awards to recognize K-12 educators who use innovative teaching methods and creative educational projects to have a positive influence on students. One hundred finalists will each receive \$2,000, and the three top teachers will win \$25,000 for first place, \$10,000 for second place and \$5,000 for third place. The deadline for applications is April 30, 2005. For more information visit www.ing.com/us/about/connect/education/unsung_heroes.html.

