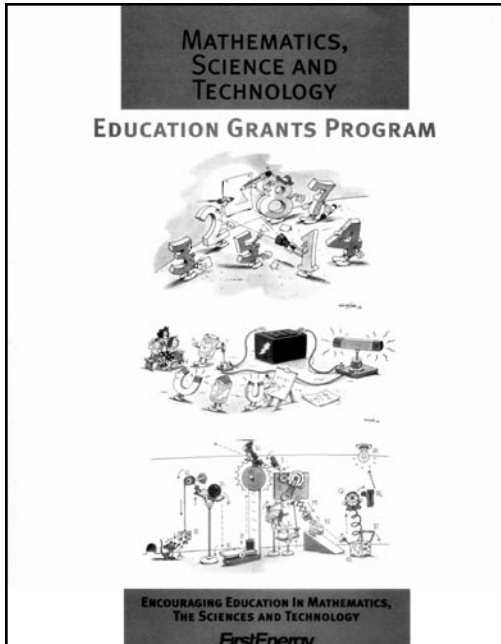


# **ENERGY Education** newsletter

May/June 2007



## **To Champion Our Teachers FirstEnergy's Educational Grants Support Mathematics, Science and Technology Education**

It's hard to imagine that the 2006-07 school year will soon come to a close. Before that happens, FirstEnergy is reminding educators and youth group leaders to fill out and submit applications for its 2007-08

are located in communities served by the FirstEnergy electric operating companies (Ohio Edison, The Illuminating Company, Toledo Edison, Penn Power, Met-Ed, Penelec and Jersey Central Power & Light) or where we have facilities.

### **An Updated Application**

The application was developed by a panel of educators who make up the FirstEnergy Educational Advisory Council. It has been updated for the 2007-08 school year to reflect the importance of teachers' aligning their projects with the math, science and technology education standards in Ohio, Pennsylvania and New Jersey.

Council members in those states evaluate the applications and make recommendations on those that should be funded. Among other things, they assess how well teachers complete and professionally prepare the application; whether they have provided all of the information requested; and whether the items requested for funding are instrumental to the successful completion of the project.

### **Important Deadlines**

Though the deadline for submitting applications for the next school year isn't until Friday, September 28, we encourage educators to submit them as far in advance of that date as possible. Recipients will be notified by Friday, October 26.

Mathematics, Science and Technology Education Grants.

An application is enclosed with this issue of the Energy Education Newsletter, and it will be available in May on our website at [www.firstenergycorp.com/education](http://www.firstenergycorp.com/education). The online application has been revised to allow teachers to complete it in a writable Adobe Acrobat format. Educators must then print out the application, enter the required signatures and mail or fax it to FirstEnergy.

FirstEnergy has championed the efforts of more than 1,000 educators and youth group leaders by awarding grants of up to \$500 since 1986 for creative projects that focus on mathematics, science or technology. The grants support classroom projects and teacher professional development initiatives. We award grants for all kinds of innovative projects related to the targeted subjects, but we tend to favor those that incorporate electricity and teacher training.

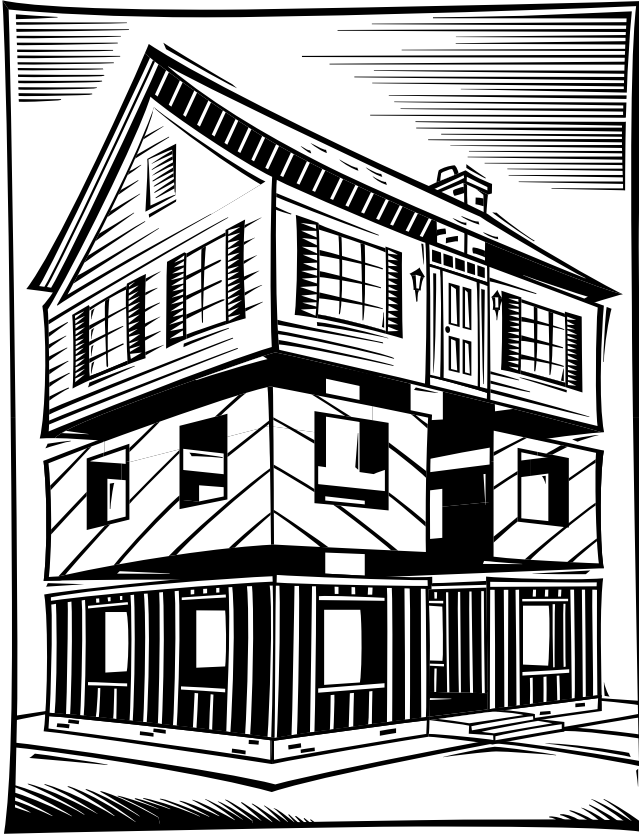
Pre-K through 12 teachers or youth group leaders are eligible for the grants if they

- 1 To Champion Our Teachers**
- 2 Construction Materials Change with the Times**
- 3 The Cutting Edge**
- 4 Educational Resources**

FirstEnergy Corp.  
Community Initiatives Dept.  
76 South Main Street  
Akron, Ohio 44308  
(330) 384-5022

Electric Operating Companies:

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



## **Construction Materials Change with the Times**

### **Today's "Green" Buildings**

The global energy crunch has had a significant effect on construction materials, favoring those called "green." Even as new housing starts in the U.S. have fallen more than 14 percent from the previous year, sales of green building materials are rising rapidly. Houses built with green materials are more expensive than those constructed traditionally, but some buyers expect energy cost savings over the long term. Other buyers seek to minimize the impact of their own houses on the environment.

#### ***The Meaning of "Green"***

The effort to save energy, however, takes many forms, and materials take on the label of green for a range of different reasons. When they enter the job market, construction trades students may be installing roof shingles formed of recycled

rubber, building walls with concrete, or even reverting to the most "green" of all materials, wood.

In general, the building industry refers to materials as green when they help reduce energy use more than conventional materials do, or when they are manufactured in a way that minimizes the effect on the environment. For example, green expanding-foam insulation is denser than fiberglass and therefore more energy-efficient, its manufacturers claim. Green doors, which are made of a special dense plastic, are more effective than conventional doors in reducing loss of heat in winter and loss of cooling in summer.

Can concrete be considered a green material? In the south, thick concrete walls reduce the cost of air conditioning. In addition, concrete is stronger than wood and stands up better to damage from storms and hurricanes. Because it simply lasts longer, concrete is said to be green by its advocates. Wood-product companies disagree, pointing to the harmful effect of concrete plants on the environment and to the fact that trees absorb carbon dioxide, a greenhouse gas implicated in global warming.

#### ***People and the Environment***

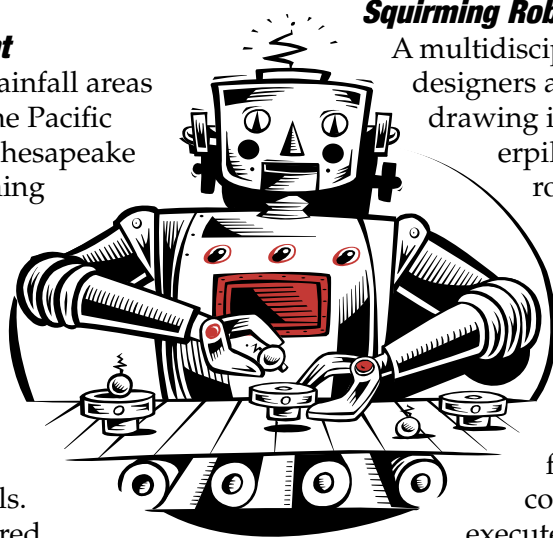
Individuals who are concerned with protecting the environment have many choices to make. Today's consumers are choosing green materials, and it is likely that the future will bring an even wider range of materials that minimize our effect on the environment. Staying current with green building materials and technologies is one way of preparing for a career in the construction trades.

## Urban Turbines

Traditional wind turbines are so big that they need large areas of open space and are therefore typically located far from the urban areas where most power is consumed. Majid Rashidi, an engineering professor at Cleveland State University, has designed a wind-driven generator for urban locations. Called the SmartEnergy Spire, the structure is shaped like a corkscrew and incorporates numerous small turbines. The corkscrew shape acts like a wind tunnel, forcing wind around the structure to drive the turbines, regardless of wind direction. The structure also harnesses the Bernoulli principle, effectively increasing the wind speed so that the turbines will spin in relatively low-wind conditions. Cleveland State University plans to build the first of these spires. *wcpn.com*, February 22, 2007

## Permeable Pavement

Developers in high-rainfall areas of the U.S., such as the Pacific Northwest and the Chesapeake Bay area, are welcoming a new technology: water-permeable concrete. Polluted runoff from streets, driveways and parking lots is currently directed to storm drains and then to drainage pools. Developers are required by building codes to put in the costly drainage systems and to create drainage pools where they could otherwise build. Permeable pavement, which requires twice-yearly vacuum sweeping, promises to be a cost-effective and environmentally friendly innovation. *Columbian.com*, February 19, 2007

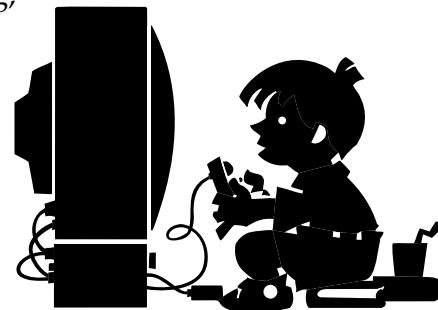


## Squirming Robots

A multidisciplinary team of robot designers at Tufts University is drawing inspiration from caterpillars. Conventional robots have hard joints that restrict the range of motion, and each additional joint adds exponential problems of control. The multiple-jointed arm of the space shuttle, for example, demands complex planning to execute apparently simple movements. Impressed by the flexible locomotion of caterpillars, the Tufts researchers are using tough flexible materials based on spider silk – and thus biodegradable – to build simple but flexible robots. They hope eventually to produce robots that could wriggle into hazardous, inaccessible places to repair nuclear reactors or clear minefields. *The New York Times*, March 27, 2007


## Next-Generation Video Game Controller

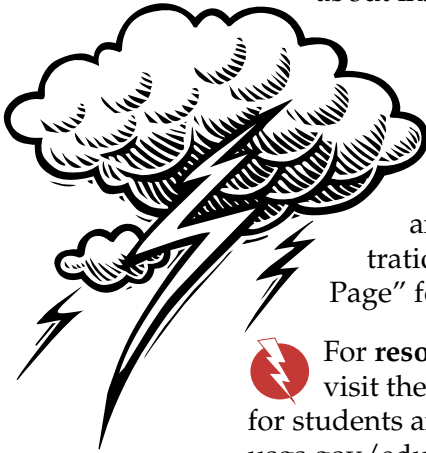
California companies Emotiv Systems and NeuroSky expect the next generation of video game controllers to read the player's mind. Both companies are developing headsets that detect electrical activity in the brain as well as muscle movements associated with blinking, winking, raising eyebrows, smiling and frowning. The headset then translates these inputs into activities in the game. For example, the system can associate a particular emotion, such as anger, with a specific movement, such as lifting an object, so that, to lift an object in the game, the gamer simply expresses anger. *SiliconValley.com*, March 7, 2007




Visit our website at  
[www.firstenergycorp.com/education](http://www.firstenergycorp.com/education)


## Educational Resources Available


 Today's **women scientists** are the focus of [www.iwaswondering.com](http://www.iwaswondering.com), a National Academy of Sciences website for middle and high school girls. Accompanying the site is a series of 10 books about inspiring women scientists.





 For **safety information about lightning**, visit [www.lightningsafety.noaa.gov](http://www.lightningsafety.noaa.gov) on the National Oceanic and Atmospheric Administration's website. Click on "Kids Page" for puzzles, games and links.


 For **resources on water science**, visit the U.S. Geological Survey site for students and teachers: <http://water.usgs.gov/education.html>.


 The U.S. Census Bureau offers **free teaching materials** related to the 2000 census. The materials include maps and grade-appropriate teaching kits. To order, call 1-800-396-1167 or email [CIS@census.gov](mailto:CIS@census.gov).


 For directions on how to **disassemble a Furby** and learn how it works, go to [www.phobe.com/furby/auto1.html](http://www.phobe.com/furby/auto1.html).


 Drexel University offers **math ideas for science fair projects** at <http://mathforum.org/teachers/mathproject.html>.


 For an engaging **demonstration of levers** for K-3 from the Franklin Institute, visit <http://sln.fi.edu/tfi/activity/physics/mech-1.html>.

 Sign up for Cogno's Challenge, a **free weekly science challenge** for grades 3-10 at [www.cogno.com/challenge.shtml](http://www.cogno.com/challenge.shtml).

 Big Wind Kite Factory offers instructions on how to **make a simple kite** out of inexpensive materials at [www.aloha.net/~bigwind/20kidskites.html](http://www.aloha.net/~bigwind/20kidskites.html).

 NASA Glenn Research Center shows students how to **make a wind tunnel** in the classroom: [www.lerc.nasa.gov/WWW/K-12/WindTunnel/build.html](http://www.lerc.nasa.gov/WWW/K-12/WindTunnel/build.html).

 Introducing students to the study of **archaeology**? To find resources from the Archaeological Institute of America, go to [www.archaeological.org](http://www.archaeological.org) and click on "Education."

 For directions on building a **solar oven** out of a pizza box, go to [www.solarnow.org/pizzabx.htm](http://www.solarnow.org/pizzabx.htm), the website of Solar Now, Inc.



*"What lies behind us and lies before us are small matters compared to what lies within us."*

-Ralph Waldo Emerson