



Bright Ideas Light up Classrooms

32 Winning Projects Receive FirstEnergy 2002-2003 Mathematics, Science & Technology Education Grants

Creative teachers throughout Ohio, Pennsylvania and New Jersey are bringing bright ideas to the classroom! We're pleased that 32 educators in our service areas have received FirstEnergy Mathematics, Science & Technology Education Grants for the 2002-03 school year.

Every year FirstEnergy makes grants of up to \$500 to teachers and youth group leaders who develop innovative classroom projects or teacher professional development initiatives. Since 1986, more than 850 educators have been awarded grants to support innovative teaching in math, science and technology — subjects that are crucial to the futures of our students, our company, and the communities we serve.

This year's winning projects cover a wide range of activities and grade levels. Children are learning about oceans and lakes, plants and animals, electricity and robotics. And teachers are designing innovative programs that spark students' imaginations, build their critical thinking skills, and promote collaborative work. Several of the projects reach beyond the school building to involve parents and the community.

Fostering Scientific Thinking

Many of this year's projects focus on scientific thinking. One example is a program designed by Pamela Mock of Mansfield, Ohio, to help her tenth-grade culinary arts students learn scientific

methods in the context of food preparation and storage. The students will participate in a food science fair, and to prepare for it each student will design and conduct an experiment following scientific principles. Possible topics for the student projects include "Compare and Contrast Induction, Convection, and Conduction Cooking Methods," "Making Leavening Agents Rise to the Occasion," and "How Cool! Refrigeration and Its Effect on Bacteria."

Tina Kovach, a sixth-grade science and language arts teacher in Cleveland, Ohio, is encouraging her students to organize their science material in notebooks — and students who keep their notebooks up to date qualify to participate in the Science Club. Students organize their notebooks according to the 17 Ohio Proficiency Objectives, and as the school year progresses they see their proficiencies grow.

Tenth-grade chemistry students in Fairport Harbor, Ohio, expect to teach local government officials and other community members a lesson on water quality. Christian D. Barrus, a teacher at Fairport Harding High School, will work with his students to research the history of a local site that was formerly a chemical plant, and to measure its impact on local water quality. The students will team with biology classes to evaluate the effects of pollution on local marine life, and they will present their findings — in the form of a technical report — to local leaders.

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Catch New Information on the Internet

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

2002-2003 FirstEnergy Mathematics, Science & Technology Education Grant Recipients

Akron, OH

Kathy Devus
Essex Elementary School
"Super Scientists"

Amherst, OH

Kathy Loos
St. Joseph School
"The Jason Project"

Ashland, OH

Rick Geiser
Crestview High School
"Geometry for the Real World"

Bright Ideas Light up Classrooms

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Neil Gupta

Bryan Parsons

Ashland High School

“Bridging Math and Science”

Athens, PA

Vicki L. Walters

Lynch-Bustin Elementary School

“Electricity Board Game”

Barto, PA

Dr. George Giovanis

Washington Elementary School

“The Washington Elementary School
Outdoor Classroom”

Bedford Heights, OH

Kim Rado

Aurora Upper Intermediate School

“Shore to Sea”

Berkeley Heights, NJ

Michael G. Brader

Columbia Middle School

“Science & Literature: An Uneasy (?)
Marriage”

Cleveland, OH

Tina Kovach

Clara E. Westropp Fundamental Educa-
tion Center

“Science in the Sixth”

Corry, PA

James Yovich

Kay Black

Columbus Elementary School

“Teaming with Nature”

Euclid, OH

Sandi McClave

Thomas Jefferson Magnet School

“Building Bat Boxes”

Fairport Harbor, OH

Christian D. Barrus

Fairport Harding High School

“Fairport Harbor Water Quality Testing”

Industry, PA

Dawn Schwarz

Western Beaver County School District

“Empowering Students with Math Skills”

Long Branch, NJ

Rosemary L. Beales

A.A. Anastasia Marine/Environmental
Science Magnet School

“Oceanarium”

Mansfield, OH

Pamela Mock

Madison Comprehensive High School

“What’s Cooking in Science?”

Massillon, OH

Susan Larusso

Washington High School

“Experiments with a C Fern”

Matawan, NJ

Patricia Janover

Lisa Bauer

David Lehman

Ravine Drive Elementary School

“Chicks in the Classroom: Studying the
Life Cycle of a Baby Chick”

Navarre, OH

Sue Triner

Mary Anne Okey

St. Clement School

“Efficient Use of Electricity”

Northwood, OH

Lara Fish

Northwood Middle School

“The Great Lakes Escape: An Eighth
Grade Interdisciplinary Unit”

Norwalk, OH

Barbara A. Doughty

St. Mary Elementary School

“Math & Science Curriculum Enrichment
Program”

Oakhurst, NJ

Gilbert Lloyd

Ocean Township High School

“Robotics Technology”

Pittsburgh, PA

John Schaeffers

Ingomar Middle School

“Pin Wheel Electrical Generation”

Point Pleasant, NJ

Stephanie Franus Smith

Nellie Bennett Elementary School

“‘Write’ Way to do Math”

Ravenna, OH

Jayn Crail

Portage County Educational Service Center

“Light Exploration”

Matthew Prezioso

Southeast Local Schools

“Mindstorms Team Challenge”

Laurie Shaw

Marie Monteville

Sandy Hale

Southeast Primary School

“Science Home/School Learning Totes”

Toledo, OH

Skot Herr

Aurora Academy

“I.M.A.G.I.N.E. (Innovation, Meaning, And
Guidance In Non-Traditional Education)”

Jackie Kane

St. Ursula Academy

“Science Club Electronic Component”

Warren OH

Jill Merolla

Bill Bell

Kathleen Fetcenko

Secrest Elementary School

“Junior Landscapers”

Youngstown, OH

Laura McCloskey

The Rayen School

“How Electricity Is Produced”

Elaine Poklemba

New Hope Academy

“Ohm’s Law and the Relationship between
Resistance, Current and Voltage”

Jeanne Riser

Boardman Center Middle School

“Flying with Stomp Rockets”

Tiny Power Plant Uses Hybrid Technology

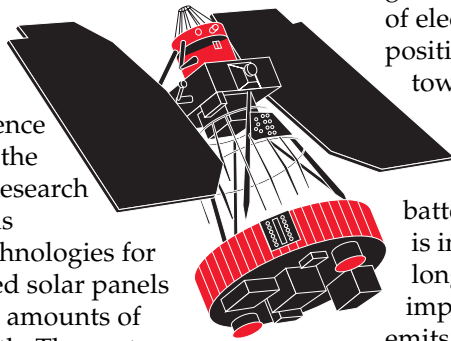
A mini-power plant at the National Fuel Cell Research Center on the campus of the University of California-Irvine is pointing the way to a future of distributed generation. Although no bigger than a small house trailer, the plant produces approximately 190 kilowatts of electricity — enough to power up to 200 homes — using a hybrid technology combining a fuel cell module with a gas turbine. Because the system relies on an electrochemical process and not on combustion, it emits almost no air pollutants and could be located in areas sensitive to air quality. Researchers predict that units like this one could form a network of distributed generation with mini-power plants sited close to consumers.

EPRI Journal Online, October 2002

Space Power

A partnership between NASA, the National Science Foundation and the Electric Power Research Institute (EPRI) is investigating technologies for using space-based solar panels to transmit large amounts of electricity to Earth. The partnership plans to fund research into the network of technologies necessary to make Solar Space Power (SSP) a viable source of electrical power, and into the environmental implications of SSP generation. Researchers hope that SSP could prove a low-cost, clean, sustainable energy source that would meet the needs of rapidly developing nations.

EPRI Journal Online, September 2002



Protecting Raptors from Power Lines

The Predatory Bird Research Group at the University of California-Santa Cruz has launched a study into how hawks and eagles can be protected from electrocution by power lines. While raptors favor the high perches that power lines provide, they can kill themselves and cause power outages when they touch two wires simultaneously.



Eagles — with a wing-span of up to eight feet — are especially at risk, but even a large flock of small birds can, by taking off at once, cause a sagging wire to arc and trigger an outage. Electrocuted birds can even cause wildfires when they burst into flame and fall to the ground. Researchers hope that by identifying high-risk areas and concentrating preventive measures in those locations, they can reduce raptor electrocutions.

San Jose Mercury News, October 6, 2002

Decades of Power from a Tiny Battery

Scientists at Cornell University have developed a tiny radioactive battery that could last for 50 years. The battery comprises a thin layer of copper suspended above a layer of the radioactive isotope nickel-63. As the nickel isotope decays it emits electrons that give the copper a negative charge. The loss of electrons means that the nickel becomes positively charged, so the copper bends toward it to make contact. Electrons then flow from the copper to the nickel, equalizing the charge and restarting the process. Researchers expect the battery to be useful in any application that is inaccessible and needs low power for long periods. It could even be surgically implanted since the isotope involved emits beta radiation, the least energetic form of radiation.

New Scientist, October 22, 2002


Color-Changing Polymers Could Save Lives


A team of scientists at the University of Rhode Island is developing heat-sensitive polymers that change color when they change temperature — and that could save lives. The team has already developed a material that changes from red to yellow at 82° C (180° F), the temperature at which a person could suffer a burn. Researchers are looking ahead to numerous potential uses for this and similar polymers. Suggestions include a fire door that changes color when it becomes hot, sports jerseys that show when an athlete is overheating, and markings on food packaging that show when a perishable food has been left unrefrigerated.

Science Scope, October 2002


Visit our website at
www.firstenergycorp.com


Educational Resources Available

 Middle school teachers share their **most successful lesson plans** at www.middleweb.com/MWLSTCONT/MSLbestlesson.html, along with comments on those lesson plans. Science-related topics include material on Antarctica and space exploration, and math topics include percentages and ratios.

 *The Electric Times* is a **free electrical energy newsletter** designed for ninth graders and published by the Ohio Consumers' Counsel. It includes activities for students as well as educational articles on the history of electricity and on recent developments in generation and distribution of electricity. Ohio

principals will receive enough free copies for the ninth-grade enrollment in their schools, and the publication will also be available on the web at www.pickocc.org.

 **NASA offers curriculum support** on topics related to the origins of the universe at its Origins Program web site, <http://origins.jpl.nasa.gov>. The Origins Program attempts to answer the questions, "Where do we come from?" and "Are we alone?" The site features answers to frequently asked questions about the Big Bang and the age of the universe, and online tutorials on topics including the timeline of the universe and infrared astronomy. The "Scrapbook" page contains dramatic images obtained by the Hubble Space Telescope.

 **Examples of play that can lead to inventions** are presented by the Lemelson Center for the Study of Invention and Innovation at www.inventionatplay.org. The site offers imaginative games such as finding shapes in clouds and creating cities from building blocks that encourage us to let our imaginations run free and our creativity blossom.

To teach is to learn twice.

- Joseph Joubert
(1754-1824)



Catch New Information on the Internet

Two organizations that serve teachers and students have just updated their web sites. EEOhio, the Center for Environmental Education in Ohio, offers resources and information to educators. The site now includes:

- A calendar of events and opportunities for educators and students
- A downloadable report on environmental education in Ohio's preservice teacher education programs
- A downloadable directory of programs and organizations that focus on underserved audiences in environmental education
- Multiple links to information that impacts environmental education – in education, community, government, business and industry.

To reach the site, visit www.environmentaleducationohio.org and click on the green and gold EEOhio icon.

The National Energy Education Development Project (NEED) has posted its standards-based curriculum guide on energy, *Blueprint for Success*, on its site. The guide includes multiple-choice quizzes focusing on energy and designed for primary, intermediate and secondary students. To download this resource, visit www.need.org, click on "curriculum guides and activities" and then on "Blueprint for Success."