

ENERGY Education newsletter

November/December 2003



OH, PA and NJ Teachers Receive 2003 Math, Science and Technology Education Grants from FirstEnergy

FirstEnergy is proud to announce this year's Mathematics, Science and Technology Education Grant winners – dedicated teachers and administrators with outstanding approaches to energy education. Our grant recipients have created dynamic, engaging programs to help teach students in all grades, and members of the community as well, about mathematics, science and technology, topics that are so important in today's high-tech world.

Here is just a sampling of the bright ideas that won awards this year:

- 1 **OH, PA and NJ Teachers Receive Grants**
- 2 **Grant Recipients**
- 3 **The Cutting Edge**
- 4 **Educational Resources**

Project TINKER

Laura Janus of Secrest Elementary in Warren, Ohio, created project TINKER (To Investigate Neat Kinetic Return) for her kindergarteners. A range of manipulatives will engage children's love of building things. The different activities are designed to help the children grasp physics concepts as outlined in the Ohio Science Content Standards, from understanding that objects are made of parts, to exploring different ways – straight, zigzag, fast and slow – that objects can move.

Rube Goldberg Inventions

Students from three middle schools in Warren, New Jersey, will have a chance to compete in a Rube Goldberg Invention competition. Using technological devices such as a wheel and axle, a lever, a cam, a screw, and so on, each student inventor will draw a machine using one or more of the types of energy. The invention can also include "supporting characters" made of ordinary household items and two types of animals: reptiles, birds, amphibians, mammals, fish and insects. The action of the machine – a maximum of eight steps – will be illustrated in separate drawings. Judging will be on the basis of artistic creativity, best essay (describing what is happening in one of the steps), and best use of materials and scientific principles.

Parade of Homes

Fifth-graders at Portage Elementary School in Barberton, Ohio, will create their own Parade of Homes under the guidance of teacher Melissa Gunsett. Each model will have four rooms, to be lighted individually with parallel circuits. The student electricians will discuss their structures and share their knowledge of the wiring process with other students, parents and community members as the homes are displayed in the school auditorium. Additional elements of this project include work with the Barberton Schools' Energy Bike and classroom visits by a professional electrician.

Science Detectives

Melissa McMullen has created fictional scenarios that will transform seventh and eighth graders at Saint Patrick School in Newry, Pennsylvania, into Science Detectives. The student detectives will use real forensic science skills such as fingerprint and hair analysis, blood typing, chromatography and DNA, to "solve" a crime, and they will present the results of their investigations to their classmates in the form of charts, tables, graphs and pictures. Then, as a joint English-science project, they will write a crime story using some of the methods they have learned.

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Electric Operating Companies:

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

2003-2004 FirstEnergy Mathematics, Science & Technology Education Grant Recipients



OHIO Winners:

Akron, OH
Kathy Devus
Essex Elementary School
"ElectriCenters"

Barberton, OH
Melissa Gunsett
Barberton City Schools
"Parade of Homes"

Boardman, OH
Jeanne Riser
Boardman Center Middle School
"Flying Higher – Pressurized Rockets"

Boardman, OH
Karen Ferguson
Stadium Drive Elementary School
"Journey Through Our Galaxy"

Cleveland, OH
Sheila Hughes & Andrea Kitchen
Louisa May Alcott Elementary School
"Simple Machines in Motion"

Cleveland, OH
Lucy Komichak
Gracemount Elementary School
"Got Energy"

Fremont, OH
Trisha Prunty
Fremont Middle School
"Connecting Real Life Skills With Science"

Lisbon, OH
Jodi McCullough
Lisbon Exempted Village School District
"Teaching Electricity Through Inquiry"

North Ridgeville, OH
Christine Bopp
St. Peter School
"Jason XV: Rainforest at the Crossroads"

Ravenna, OH
Mathew Prezioso
Southeast Local Schools
"Mission to Mars"

Toledo, OH
Skot Herr
Aurora Academy
"Everyday Science on the Go!"

Toledo, OH
Eric Polesovsky
Glass City Academy
"Electrifying Science Fair"



Warren, OH
Dave Murduck
Champion Middle School
"Gardening Stewardship"

Warren, OH
Stephen Panak
Washington Alternative School
"Static Electricity Discover Center"

Warren, OH
Laura Janus
Secrest Elementary School
"TINKER - To Investigate Neat Kinetic Energy Resources"

Youngstown, OH
Mary Ruthrauff
The Rayen School
"Math/Science Heros"

Youngstown, OH
Terry Franklin
The Rayen School
"Forces - Everywhere You Want To Be"

Youngstown, OH
Zaine Pappas
Hillman Middle School
"Light Up Our Lives"

Youngstown, OH
Ruth Griffis
Zion Christian School
"Let There Be Light"

Youngstown, OH
Eileen Bodendorfer
Industrial Information Institute
for Education, Inc.
"Keepers of the Earth Workshop"

PENNSYLVANIA Winners:

Altoona, PA
Kimberly Salyards & Darin Zimmerman
Great Commission Schools
"Logic Light Boards"

Altoona, PA
Wanda Burk & Susan Holzer
Logan Elementary School
"Math In A Bag"

Altoona, PA
Shelby Hite
Logan Elementary School
"Math Made Fun"



Beaver Falls, PA
Howard Leslie
Blackhawk High School
"Finding Your Way"

Hollidaysburg, PA
Kathleen Moran
Hollidaysburg Catholic School
"You'll Get A Charge Out Of This"

Johnstown, PA
Paul Whinnie
"The Diversity of Vocational Education
– Public Awareness Program"

Newry, PA
Melissa McMullen
Saint Patrick School
"Science Detectives"

Newry, PA
Laura Ford
Saint Patrick School
"Utilizing Technology to Educate
Youth About Energy Conservation
& Alternative Fuels"

Pittsburgh, PA
John Schaefer
Ingomar Middle School
"Solar Cell Electrical Generation"

Reading, PA
Melissa Zech & Shannon Duff
13th and Union Elementary School
"Invent America"

NEW JERSEY Winners:

Farmingdale, NJ
Leigh Shaffer
Farmingdale Public School
"Farmingdale School Web Site"

Lafayette, NJ
Kara Eliason
Lafayette Middle School
"Electricity Gameboard"

Sussex, NJ
Brian Drelick
High Point Regional High School
"Photovoltaic System Design"

Warren, NJ
Susan Cooper
Warren Township Middle School
"Rube Goldberg Invention"

The Cutting Edge

Laptop Batteries Drive High-Performance Car

The Tzero is a high-performance car powered by 6,800 lightweight lithium-ion laptop computer batteries. Built by AC Propulsion of California, the car can go from zero to 60 miles per hour in just 3.7 seconds - and it does it almost silently. After a few hours' charge from a 220-volt outlet similar to that used for a clothes dryer, the car runs for up to 300 miles before it needs a recharge. However, with a price tag of \$220,000 this model may never be among the nation's top-selling vehicles.

The New York Times, September 19, 2003



Study Identifies Need to Promote Engineering

A study by ACT Inc. traces a drop in the number of high school students planning to study engineering in college. Fewer than six percent of the class of 2002 who took the ACT Assessment intended to study engineering, down from nearly nine percent in 1992. In addition, the report reveals a drop in preparation and achievement among potential engineering students. The study's authors recommend that educators and professional engineering organizations highlight career opportunities in engineering and that school districts provide challenging math and science courses.

NSTA Reports, August/September, 2003

Galileo Ends 14-Year Mission

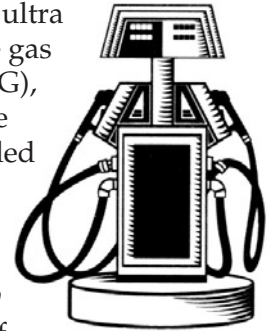
In a spectacular end to its 14-year, \$1.5 billion exploration of Jupiter and its moons, NASA's Galileo spacecraft plunged into the planet's atmosphere, where it broke up and vaporized. Launched in 1989, Galileo sent more than 14,000 images and a treasure trove of scientific data back to NASA's Jet Propulsion Laboratory. The spacecraft discovered the first moon of an asteroid, witnessed the impact of a comet into Jupiter and provided evidence

of salty oceans on three of the planet's moons. To avoid a collision with the moon Europa - and the risk that Galileo could have contaminated the moon's surface - scientists opted to steer it to certain destruction in Jupiter's atmosphere.
msnbc.com, September 22, 2003

Alternative Fuel Station Offers Nine Types of Fuel

An alternative fuel station, part of the world's first alternative-fuel vehicle showcase, has opened in San Diego, CA. Pearson Ford's fuel station sells three standard grades of gasoline for use in conventional and hybrid vehicles. In addition it offers six alternate fuels: ultra low-sulfur diesel, liquefied propane gas (LPG), compressed natural gas (CNG), ethanol derived from a cheese waste product, biodiesel made from recycled deep-frying grease, and electricity.

Clean Edge News, August 12, 2003




Quantum Dots Become Predictable


Scientists at the National Institute of Standards and Technology (NIST) have borrowed an existing technique to help predict the position of quantum dots on semiconductor materials. Used for fabricating lasers and other devices that exploit quantum dots' special electronic properties, quantum dots or "artificial atoms" have resisted scientists' attempts to position them precisely on substrate. But NIST researchers using the concept of elastic energy release rate - currently used to trace energy in an earthquake fault and predict the fault's growth - have been able to predict the most "energetically favorable" location for a quantum dot. This breakthrough may bring researchers closer to a new generation of faster, more powerful low-energy electronic and photonic devices.


The Science Teacher, September, 2003

Visit our website at
www.firstenergycorp.com/education


Educational Resources Available

 The Planetary Society offers an engaging way for students to **follow the progress of the spacecraft scheduled to land on Mars** in January of 2004. Visit <http://redrovergoestomars.org> to read the Astrobot Diaries, drive a virtual rover in a Martian landscape and learn about the red planet.


 To help educators **gain a deeper understanding of current science and education issues**, the National Science Teachers Association has added a news analysis area to its Web site. NSTA WebNews Analysis at www.nsta.org/webnewsanalysis is a one-stop source for explanations of issues and a collection of relevant on-line news articles.


 A **two-potato clock** that harnesses electricity created when zinc and copper electrodes are placed in two potatoes is one of a number of educational items offered by the National Gardening Association. To order the clock (\$17.95) contact National Gardening Association, 1100 Dorset St., South Burlington, VT 05403, 1-800-538-7476 or visit the online store at www.kidsgardening.com.





 A **safety poster** – “Act Responsibly: Stay Out – Stay Alive” – that highlights hazards around abandoned, idle and active mines is available from the National Energy Foundation for \$4.95. An eight-page accompanying booklet costs 95 cents. To order, call 1-801-908-5800 or 1-800-616-8326, or shop online at www.nef1.org.



 The **Math and Science Digital Filing Cabinet** is an online source for a range of science and math resources, including Web quests. Visit www.techteachers.com and click on “resources.”

 Kids in grades 5-8 can have fun as they **learn about the stock market** with “Stock Market Simulations.” Using imaginary money and information about real companies, students learn about the vocabulary, history and workings of the stock market. The simulation is available for \$7.99 from Teacher Created Materials 1-800-662-4321 or online at www.teachercreated.com.

 Toyota and the National Science Teachers Association are seeking proposals for their 14th annual **TAP-ESTRY Grants for Teachers Program**. The program offers 50 large grants of up to \$10,000 each and at least 20 mini-grants of up to \$2,500 each for community-based projects in physical science applications, environmental science education, and literary and science education. Learn more at www.nsta.org/programs/tapestry or by calling 1-800-807-9852. The deadline for proposals is January 16, 2004.

 “Your Life, Your World, Your Choices” is a **free resource kit** from the Environmental Protection Agency that encourages students in grades 7-12 to make informed decisions to help protect the environment. To request a kit, call 1-800-424-9346 or visit www.epa.gov/



*Creativity comes
from freedom*

-W. Edwards Deming