

# ENERGY EXCHANGE

A publication of the National Energy Education Development Project

May 2008

## Have a Great Summer

NEED thanks its teachers, student leaders, partners and sponsors for another great school year! We wish everyone a happy and energizing summer.



NEED students pose with EIA's Energy Ant at the WWII Memorial in Washington.

## 28th Youth Awards Celebration

NEED's 2008 Youth Awards for Energy Achievement is **June 20-23, 2008** at the Hyatt Regency Crystal City in Arlington, Virginia. This celebration of student leadership and excellence in energy education recognizes student and teacher efforts and allows groups from across the country to network and share ideas. The \$525 registration fee includes lodging, local transportation, most meals, a dinner cruise on the Potomac River and tours of sites in Washington, DC.

## Summer Energy Conferences

NEED Energy Conferences for Educators are designed to energize participants by providing training and materials to implement hands-on energy units in their classrooms. The 2008 conferences are scheduled for Galveston, Texas (July 13-17) and Las Vegas, Nevada (July 20-24). Great field trips are part of an exciting agenda. The registration fee of \$1,100 includes double occupancy lodging, most meals, and classroom materials. Registration forms and information are available by emailing [info@need.org](mailto:info@need.org) or on the NEED website at [www.need.org/summertraining](http://www.need.org/summertraining). Register today to attend. Spaces are still available!

## Renew for 2008-2009

Interested in jump-starting your energy curriculum this fall? Email NEED over the summer at [info@need.org](mailto:info@need.org) to confirm your address and request updated curriculum materials when they are hot off the presses.

## Help us Make NEED Better

Please take a few minutes to complete the Evaluation Form on page 7 and return it to us. Your suggestions and feedback on NEED materials and training programs are so important in helping us design the NEED program to meet your curriculum requirements.

This year, NEED is making five hands-on kits available to teachers who participate in the evaluation process. All Evaluation Forms received before June 1 will be entered into a random drawing to win a NEED hands-on kit of the teacher's choosing.

## Passport to Energy Careers

The Passport to Energy Careers Fair will be held on Friday, June 20, 2008 at the Hyatt Regency in Crystal City. The career fair is an excellent opportunity for students, parents and teachers to learn about companies that are leaders in the energy industry. Previous participants include American Electric Power, BP, Dominion, National Ocean Industries Association, U.S. Energy Information Administration, and U.S. Department of Energy.

The registration fee of \$200 supports the NEED Youth Energy Leadership Scholarship Award.

Companies, agencies or organizations interested in participating should contact Rebecca Lamb at 800-875-5029 or at [rlamb@need.org](mailto:rlamb@need.org).



A NEED student explores energy careers with Dominion during a Passport to Energy Careers.

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## The NEED Project

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The NEED Project is a 501(c)(3) nonprofit education association providing professional development, innovative materials correlated to the National Science Education Content Standards, ongoing support and recognition to educators nationwide.

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A list of NEED sponsors is available at [www.need.org](http://www.need.org) and in our Annual Report.

*Energy Exchange* is published five times a year by NEED for educators and students, and is available at [www.need.org](http://www.need.org).

NEED welcomes questions, comments, and suggestions. Please contact [info@need.org](mailto:info@need.org).

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# Calendar of Events

For more information, email [info@need.org](mailto:info@need.org) or call 800-875-5029.

## May 2008

- 3 PG&E Solar Schools Workshop—Eureka, CA
- 5 Mississippi Energy Workshop sponsored by ConocoPhillips—Jackson, MS
- 3-8 NEED Sessions at Solar 2008, American Solar Energy Society Conference—San Diego, CA
- 6 Tennessee NEED Youth Awards—Nashville, TN
- 6 Kentucky NEED Youth Awards for Energy Achievement—KY
- 9 Offshore Technology Conference NEED Teacher Workshop—Houston, TX
- 12 Congratulations! BP A+ for Energy Grant Award Winners Announced
- 12 California Energy Workshop sponsored by ConocoPhillips—San Luis Obispo, CA
- 12 California Energy Workshop sponsored by ConocoPhillips—Rodeo, CA
- 15 Illinois Energy Workshop sponsored by ConocoPhillips—Roxana, IL
- 21 Wisconsin Energy Workshop sponsored by Dominion Kewaunee Power Station—Monitowoc, WI

## June 2008

- 1 NEED Wind Workshop at Windpower 2008 Conference sponsored by American Wind Energy Association—Houston, TX
- 3 Pennsylvania Energy Workshop sponsored by ConocoPhillips—Trainer/Mourton, PA
- 9-13 Kentucky Energy Tour—KY
- 17-19 BP A+ for Energy Conference—NM
- 18 NEED Wind Workshop at the JMU Wind Conference—Harrisonburg, VA
- 20-23 NEED Youth Awards for Energy Achievement—Washington, DC
- 25-27 BP A+ for Energy Conference—CA
- 29-Jul 1 Iowa Energy Conference—Ames, IA

## July 2008

- 9-11 West Virginia/Virginia Teacher Conference sponsored by AEP
- 13-17 National Energy Conference for Educators—Galveston, TX
- 18-20 BP A+ for Energy Conference—TX
- 20-24 National Energy Conference for Educators—Las Vegas, NV
- 21-23 BP A+ for Energy Conference—TX
- 25-27 BP A+ for Energy Conference—IL
- 29-31 BP A+ for Energy Conference—IN
- TBA Texas/Louisiana/Oklahoma/Arkansas Teacher Conference sponsored by AEP

## NEED News

### PG&E Solar Schools - Many Thanks!

The PG&E Solar Schools Program continues to grow, with plans to reach over 1,000 teachers in 2008. The PG&E Solar Schools Program Coordinator, NEED's own Barry Scott continues to receive great support from his team of workshop facilitators. PG&E and NEED thank Greg Holman (Paradise, CA), Aaron Vanderwerff (San Lorenzo, CA) and Bob Hodash (Bakersfield, CA) for their support and hard work on behalf of the program. The PG&E Solar Schools Program recently announced the selection of 40 schools to receive solar panels this year. To learn more visit [www.pge.com/solarschools](http://www.pge.com/solarschools).

### 2008-2009 Curriculum Updates Underway

NEED is busy preparing for the 2008-2009 school year, updating the curriculum materials with new data and making adjustments for better effectiveness in the classroom. NEED is always interested in hearing feedback about how activities work in the classroom and any adaptations that may need to be made. Let us hear from you! Email [info@need.org](mailto:info@need.org) if you have recommendations, additions, or suggested edits to any materials in the NEED portfolio.

# NEED News

## Recycle My Old Fridge Campaign

NEED is partnering with the U.S. Department of Energy and ENERGY STAR® in the Recycle My Old Fridge Campaign. NEED developed a teacher guide for the campaign that is available at the campaign website: [www.RecycleMyOldFridge.com](http://www.RecycleMyOldFridge.com).



The campaign's primary timeframe is April 28 through July 28, 2008. One exciting aspect of the campaign is a national video challenge. If your science club or tech students are looking for a fun end-of-year project, check out the challenge at [www.RecycleMyOldFridge.com](http://www.RecycleMyOldFridge.com) and click on "Video Challenge".

## Kentucky Energy Team Recognized

On March 12, 2008, Kentucky State Senator Jack Westwood recognized the energy-saving efforts of Fort Wright Elementary's Energy WISE Team. The students were invited onto the Senate floor while Westwood read a resolution commending the students for their efforts.

It was a very special day for the students and a strong endorsement of their energy activities, which included collecting pledges for the ENERGY STAR® Change A Light campaign and holding an energy assembly for their entire school, where they performed NEED's play about efficient lighting, *Harry Potter and the Quest for the Right Light*.

The photo features, from left to right, Kentucky NEED's Pam Proctor, teacher Barb Freiermuth, the student Energy WISE Team, Kentucky State Senator Dick Roeding, Principal Barb Juengling, and the Kenton County School District energy coordinator, Chris Baker.



## Tennessee Energy Team Wins Award

Connie Bond and her Miser NEED Energy Team for 2006-2007 have won the 2007 President's Environmental Youth Award (PEYA) sponsored by the Environmental Protection Agency (EPA). Connie and her team will represent the EPA Region 4, which includes Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, and Florida.

As stated on the PEYA website, "the program recognizes young people across America for projects which demonstrate their commitment to the environment." The Wisers Misers will attend an awards ceremony at the White House with First Lady Laura Bush on April 17, 2008.

## New Hydropower Program is Launched

With the support of the Hydropower Research Foundation and the National Hydropower Association, NEED's hydropower committee – Don Pruett and Hallie Mills (Sumner School District, Washington) and Doug Keaton (Russell County Tech Center, Kentucky) – are working with NEED to complete the design of new hands-on hydropower modules for primary, elementary, intermediate, and secondary classrooms. The first teacher workshop was facilitated on April 16 in Washington, DC in conjunction with the National Hydropower Association's Annual Conference. Interested in sponsoring a Hydropower teacher workshop? Contact NEED at 1-800-875-5029.

## NEED at OTC

Working with the Society of Petroleum Engineers and the Offshore Technology Conference, 100 Houston area teachers will have the opportunity to train on NEED materials, tour the OTC exhibit floor and learn more about the nation's energy picture on May 9, 2008, in Houston.

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# NEED News

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## Climate Change Curriculum Expansion

As the 2007-2008 school year closes, NEED's climate committee is busy working on classroom lessons and kits to enhance NEED's current materials about climate change – with a special focus on earth cycles and systems. In addition, working with the Carbon Mitigation Initiative at Princeton University, the Stabilization Wedge Game will be edited for use at lower grade levels. Workshops highlighting the new materials will begin this fall.

## ConocoPhillips Workshops Continue

In January, NEED launched a 24-city teacher training program with ConocoPhillips. The workshops are underway and dates and locations continue to be added. Join us for a workshop near you! Thanks to the support of local school districts and local energy museums, the spring workshop series has surpassed expectations. Workshops filled quickly with excited, energized educators from east coast to west coast. For more information or to register, visit [www.need.org/conocophillips/](http://www.need.org/conocophillips/).

## EnCana and NEED partner in Colorado

NEED is pleased to launch a new program providing teacher workshops and curriculum materials to schools in Colorado with the sponsorship of EnCana. EnCana's support provides hands-on kits, teacher workshops and classroom support in several communities in Colorado. Watch the What's New section of the NEED website for the upcoming workshops. NEED and EnCana are also working together on a Teacher Guide to Colorado Natural Gas. It will provide students with background information and activities to understand the formation, exploration, development, and use of natural gas in Colorado, as well as highlight careers in the natural gas industry.

## St. Margaret Science Club Wins Big!

Congratulations to St. Margaret Catholic School in Lake Charles, Louisiana! NEED Lead Teacher Judy Reeves and the St. Margaret Science Club competed in the Lexus Environmental Challenge. The club took first place in four out of five challenges and received the overall prize of \$50,000. The five challenges were in subject areas of land, climate, water, air and energy. Each of the 9 participating students will receive funds to be put toward their education. St. Margaret Science Club students lead NEED activities in their school and in their local Parish. The program took a lot of work, but the students learned so much. Congratulations to Judy and the St. Margaret Science Club. They will attend the 28<sup>th</sup> Annual NEED Youth Awards for Energy Achievement in June. Way to go!!

To learn more about the project, go to <http://stmargaretscienceclub.blogspot.com>.

## Wind Workshop at the Windpower 2008 Conference!

Thanks to the support of the American Wind Energy Association, the 2<sup>nd</sup> annual Wind Workshop for Teachers will be hosted as part of AWEA's Annual Conference. This year's workshop will be held on June 1, 2008, in Houston. Participating teachers will have the opportunity to learn about the science of wind, work with NEED's wind kits, learn from wind industry experts and tour the exhibits. In addition, AWEA will sponsor a NEED wind kit for appropriate grade level for each participating teacher. To register, visit [www.need.org](http://www.need.org).

## Energy Exchange and Career Currents in 2008-2009

In an effort to keep costs low, and reduce use of energy resources for printing and mail, NEED will begin delivering its Career Currents and Energy Exchange electronically. Recipients of the newsletters may elect to receive an email announcing that the newsletters have been posted online. To view the newsletters each month, and to access back issues, visit [www.need.org/newsletters.php](http://www.need.org/newsletters.php). Make sure you can receive email from us – set your spam blocker to accept email from need.org.

## National and State Correlations

As part of NEED's effort toward constant improvement, a State Standards Committee is working on a new and more effective way to align NEED materials to state standards in order to reduce the amount of time needed for the classroom teacher to research activities to fulfill classroom objectives. Watch for new correlation documents this fall on [www.need.org/correlations.php](http://www.need.org/correlations.php).

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# Elementary Activity: Seismic Simulation

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## Goal

To explore how geoscientists use sound energy to find oil and gas deposits.

## Concepts

Sound travels in waves through gases, liquids and solids.

Sound waves travel more easily through some substances than others.

Sound waves can be reflected.

## Background

Seismic technology uses sound waves to reveal what lies deep in the ground. Sound waves travel at different speeds through different types of rocks. A vibrator truck is used to send a signal into the ground. When waves hit something they cannot easily penetrate, they bounce back and return to the surface. Geophones placed on the surface record the returning waves. Geoscientists then interpret the information to create a map of the underground terrain.

## Time

30-45 minutes

## Materials

Each group of students will need:

copy of student worksheet

1 bouncing ball

meter stick

hard surface, such as a wood floor

soft surface, such as carpet

towel

clay

paper plate

Each student will need:

science journal

## Preparation

Divide the students into groups of two or three

Gather the needed materials

Make copies of the student worksheet

## Procedure

1. Review with the students the following concepts:
  - Sound travels in longitudinal waves through a medium, such as a gas, liquid or solid.
  - Liquids and solids transfer sound better than gases because the molecules are denser.
  - Like light, sound waves can be reflected or absorbed.
2. Introduce the background information to the students.
3. Separate the students into groups and allow time to complete the worksheet.

## Extensions

1. Set up three small aquariums filled with water. Add clear gelatin to two of them, with one aquarium receiving twice as much gelatin as the other. Drop a bouncing ball into each aquarium from the same height and measure the rebound. Discuss with the class how this simulates seismic measuring.
2. Have students complete trials at different heights. Determine if the balls return rate changes.
3. Play the virtual oil dig game at [www.earthscienceworld.org/games/index.html](http://www.earthscienceworld.org/games/index.html).
4. Visit [www.shell.com/home/content/eandp-en](http://www.shell.com/home/content/eandp-en) and click on *Learning about Oil and Gas* for an animated look at formation and discovery of oil.
5. Complete activities in *Fossil Fuels to Products* found at [www.need.org/curriculum.php](http://www.need.org/curriculum.php).

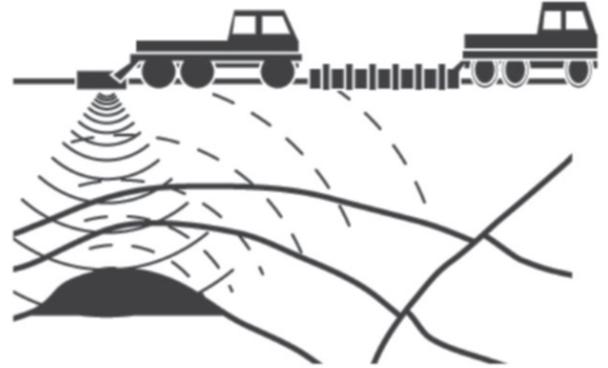
# Seismic Simulation

## Purpose

To explore how geoscientists use sound energy to find oil and gas deposits.

## Materials

bouncing ball  
meter stick  
hard surface (such as wood floor)  
soft surface (such as carpeted floor)  
towel  
clay  
paper plate



## Hypothesis

Read the procedure and record what you think will happen in your science journal.

## Procedure

1. Hold the ball one meter above the hard surface.
2. Release the ball and record how high it rebounds.
3. Repeat for a total of three trials.
4. Place a towel over the hard surface and repeat Steps 1-3.
5. Repeat Steps 1-3 for the soft surface.
6. Repeat Steps 1-3 on the plate.
7. Spread a smooth, even layer of clay on the plate. Repeat Steps 1-3 for the clay.

## Data

Record in your science journal all the data from the trials. When complete, graph the data.

## Conclusions

Answer the following questions in your science journal:

On which surface did the ball rebound the highest?

Why do you think this surface gave a better rebound than the others?

If each type of surface represents a type of underground rock layer, how does this experiment show how geoscientists use sound energy to find oil and gas deposits?

# NEED 2007-2008 School Year Evaluation

Name \_\_\_\_\_ State \_\_\_\_\_

School Name \_\_\_\_\_ Phone Number (\_\_\_\_) \_\_\_\_\_

Fax Number (\_\_\_\_) \_\_\_\_\_ Email \_\_\_\_\_

Number of students taught this year \_\_\_\_\_ Subject(s) \_\_\_\_\_ Grade(s) Taught \_\_\_\_\_

When/How did you find out about NEED? \_\_\_\_\_

What NEED training have you attended? Please circle all that apply.

One day workshop                      Inservice                      Multi-day conference                      Short course session

Do you believe that NEED training assists you in delivering a successful classroom program? \_\_\_\_\_

What other training would be helpful to you? \_\_\_\_\_

Do you teach energy in the classroom, as an extracurricular topic, or both? Explain. \_\_\_\_\_

Do NEED correlations to your state standards assist you in planning your energy units? \_\_\_\_\_

Does using the NEED curriculum increase your knowledge and understanding of energy? \_\_\_\_\_

Does using the NEED curriculum increase your students' knowledge and understanding of energy? Please elaborate. \_\_\_\_\_

Is the content level of NEED materials too low, too high, or generally on target? \_\_\_\_\_

What other resources would be helpful to you for your class? \_\_\_\_\_

Did you use NEED materials during the 2007-08 school year? If yes, circle below. If no, why not? \_\_\_\_\_

Biodiesel	Energy House	Exploring Energy	Mystery World Tour	ThermoDynamics
Blueprint for Success	Energy in the Balance	Exploring Magnets	NEED Songbook	This Mine of Mine
Conservation Contract	Energy Jeopardy	Fossil Fuels to Products	Ocean Energy	Transparent Energy
Current Energy Affair	Energy Management Kits	Games & Icebreakers	Primary Science of Energy	Transportation Debate
ElectroWorks	Energy Math Challenge	Global Trading Game	Primary Stories & More	Transportation Fuels Expo
Energy Analysis	Energy on Public Lands	Great Energy Debate Game	Projects & Activities	Transportation Rock
Energy Around the World	Energy on Stage	Greek Mythology	Saving Energy Expo	Today in Energy
Energy Carnival	Energy Rock Performances	H <sub>2</sub> Educate	Science of Energy	U.S. Energy Geography
Energy Enigma	Energy Source Expo	Infobooks & Activities	Solar Kits & Activities	What Car Will You Drive?
Energy Fair	EnergyWorks	Marine Energy	Talking Trash/Museum	Wind Kits & Activities
Energy Flows	Ethanol	Mission Possible	The Future Is Today	Yesterday in Energy

Do you need more NEED materials in Spanish? Which ones? \_\_\_\_\_

Do you use the activities in the *Energy Exchange* newsletter?    yes    no

Do you find the *Career Currents* newsletter valuable?                      yes    no

Would you like to receive the newsletters electronically? (Be sure to include email above)    yes    no

Are there NEED activities or subject areas you would like to see developed? Please elaborate. \_\_\_\_\_

What sections of the NEED website do you use the most? \_\_\_\_\_

What additional resources would you like to see on the NEED website, [www.need.org](http://www.need.org)? \_\_\_\_\_

Do you find [www.need.org](http://www.need.org) easy to use?                      yes    no    (To provide more feedback, email [info@need.org](mailto:info@need.org).)

If you win the NEED drawing, which NEED kit would you like to receive? \_\_\_\_\_

**Thank you! Please attach additional pages as needed and return to NEED:**

**Fax: 800-847-1820**

**Email: [info@need.org](mailto:info@need.org)**

**Mail: 8408 Kao Circle, Manassas, VA 20110**

# Short Circuits

## Sailing the Seven Seas Again

Global trade routes are used mostly by cargo ships that rely on diesel fuel to operate. With the increasing price of petroleum, companies are looking for innovative ways to reduce fuel costs. SkySails, a German company, has just completed a pilot voyage of an auxiliary propulsion system that could save 10 to 35 percent in fuel using wind power. Basically a large kite, a SkySail is deployed from the deck to tow the ship. The maiden voyage showed that the cargo ship outfitted with a SkySail could save up to \$2,000 per day in fuel. *For more information, go to [www.skysails.info/index.php](http://www.skysails.info/index.php).*



Testing SkySails on a cargo ship.  
Credit: WINTECC



Hoover Dam  
Credit: U.S. Bureau of Reclamation

## Ethanol Production Continues to Increase

In 2007, the United States produced 6.48 billion gallons of ethanol, an increase of more than 34 percent over 2006 production. While above the 4.7 billion gallons required by the Energy Policy Act of 2005, the U.S. will need to increase its production in 2008 to eight billion gallons to meet the new Renewable Fuel Standard set forth in the Energy Independence and Security Act of 2007. Almost 60 biorefineries are slated to be built across the nation to help increase renewable fuel production. *For more information, go to [www.eere.energy.gov/news](http://www.eere.energy.gov/news).*

## A Dry Hoover Dam

Researchers at the Scripps Institution of Oceanography recently released a study warning that within the next decade Hoover Dam may not receive enough water to produce electricity, leaving 1.3 million people in Arizona, California and Nevada searching for new power sources. The study concluded that the Colorado River system has an increasing deficit of water caused by growing demand for water in the West and a reduction in water runoff due to climate change. *For more information, go to [www.eere.energy.gov/news](http://www.eere.energy.gov/news).*

