

# Energy Teachers Community News

All the ideas we have the energy to print

Newton, MA October/November, 2005

A free service of EnergyTeachers.org Inc., the network for curriculum development in energy production and use.  
Sponsored in part by the Massachusetts Technology Collaborative, Renewable Energy Trust

## Dear Readers

### From the Editor

November 1 I attended Educators' Night at the Museum of Science in Boston. Brilliant, novel, exciting! I met several retired teachers, scientists, and engineers who dazzled me with demos on light and with new interdisciplinary projects, or just with a healthy attitude of sharing ideas in science education. I also discussed with employees several of the Museum's projects that are developing new curriculum, including Engineering is Elementary, Engineering Today, Engineering the Future, and Power Up. I learned about day trips and overnight stays for students; you can take a class to the Museum for several hours, learning from experiences like design challenges where students build wind turbines or efficient birdhouses.

No, I haven't been asked to write about MOS, I just was so excited about the experience last week, I had to tell you. If you didn't get to attend, go next year.

One thing not so obvious (but definitely there) at the Museum is that the curriculum developed there is based on the research and literature of STEM (Science, Technology, Engineering, and Mathematics) education. For example, Engineering is Elementary was developed after research that found what keeps young girls and minorities from leaving the pipeline to engineering.

If you haven't before, I encourage you to visit the Lyman Library and its Educator Resource Center. As a teacher, you can visit it gratis. There, you can read about these curricula, along with many outside works, many reviewed by teams of educators. You can also work with the Educator Resource Center online to determine what you can do with students at the Museum, and you can correlate activities and curricula with state and national standards.

<http://mos.org>

Go to the web site, and click the button "for educators" near the top right.

### If this is your first newsletter from us

Welcome! I've been running this network since February of 2004. Here are some things you should know about EnergyTeachers.org:

You can download copies of earlier newsletters online. The printed newsletter started with a circulation of 100 and now reaches over 1000 teachers/schools, mostly in Massachusetts.

Our services are geared towards MA teachers, but educators from many other states find some of our resources useful.

Many timely news items show up in the online edition. Check it frequently for announcements related to energy education.

There are no advertisements on our web site.

EnergyTeachers.org is a  
501(c)(3) nonprofit organization.  
Contributions are tax-deductible.

We are a public charity, an educational nonprofit, incorporated in Massachusetts. I am the sole officer, but I answer to a board of directors made of science teachers.

Our web site contains more than 500 links relevant to energy and energy education. The links are organized and searchable, and most come with short notes on how the links might be useful.

There is a section called **Teachers' Goals** that presents planning items in an organized manner. You ask the site for something specific, like an idea for your after-school group, and it lists ideas and links to relevant sites. I think this is the most powerful and under-utilized tool for planning. We need your help to make it better.

We've got a library of dozens of energy-related books. Online, we have a bibliography of a hundred

references, and we'd like teachers' comments on each.

There is a calendar with notes and links for every energy-education-related event we notice. Please help us if you know of something we don't.

Google can be your friend, but it can easily become your enemy. Enough said.

It is our intention to have everything we know be organized and freely available on our web site.

It is my personal intention to get us out of our shells and into the light. I know so many good teachers with so much good curriculum. I also know so many struggling teachers with little or no connection to support-systems; I was one. If I could, I'd like to travel to every school in the state, and then some, and just chat about what we're teaching, about the students, about what they think about the curriculum, about why they aren't choosing careers in science and engineering.

### EnergyTeachers.org as a model for studying curriculum

Please let me know whether you think it is valuable to share ideas in curriculum and planning. If you would like to discuss building a similar tool for topics besides energy, I've got a good bit of experience now in creating and maintaining such a network.

I've been thinking about improvements and additions, also. One request I've heard recently is to make more correlations with state-standards. I'll keep you posted...

-Shawn Reeves  
shawn@energyteachers.org  
39 Noble Street  
West Newton, MA 02465  
<http://energyteachers.org>

If you would like to continue to receive this free newsletter, and if you received this newsletter anonymously (as "Science Teacher" or "Physics Teacher"), please contact us. If your name appears on the label, you will continue to receive the news for free.

# One New Way to Share

## How, or really why, to use the new Online Forum at EnergyTeachers.org

Teachers...We plan our lessons, units, trips, and labs many ways. We modify last year's plans; we make up new units; we make new mini-units at summer workshops; we read the guides that come with the textbook; and, some rare times, unless we're talking about some kind of superhero planner, what gets done in class today was invented early this morning at the computer and the copy machine. [I know, not you, that's not you!]

All this planning should be based on common ideas, goals, research, and our students' needs. Students' needs are up to each teacher to assess, but the rest are things we can share, and that is the purpose of EnergyTeachers.org

Also, we should document our planning, not just the products but the reasons we made those products and what our goals are. Finally, we need to tell our future selves what worked and what went wrong. I don't always remember that this or that lesson was such a train-wreck, even if there was an explosion and limbs were flying. In summary, we need some retrospection, a dash of introspection, and two parts cross-pollination.

You might have seen or even used an online bulletin board, usually used for technical service issues or discussion of how unreal the physical effects are in Star Wars. In each forum, or general topic, e.g. "Star Wars psychology," a user can start a new topic, e.g. "Darth Vader...Tell me about your mother." Each topic can then have a thread of replies. Each contribution is called a "post." Posts that everybody should read can be made "sticky," keeping them on the top of the list.

These bulletin boards can be very useful for customer support because they provide a place for unpredictable questions that can be addressed any time, and then any solutions will be documented for future reference.

Thanks to support from the Renewable Energy Trust run by the Massachusetts Technology Collaborative, we now have such a bulletin board at EnergyTeachers.org

In this Online Forum, we can swap ideas on books, carpools, energy science, equipment, field trips, and lesson plans. If there are any other general topics you can imagine, we can start new forums.

You can participate either anonymously, or as a registered user. As always, anonymous users are welcome to browse any part of EnergyTeachers.org, and are even allowed to post in some forums. However, it's best for you if you log in before posting anything, so that you can edit or delete your posts later. There are no fees to register, just like the rest of our free services. Also, we will never sell your names to a third party.

### If you don't register/don't log in

Anonymous users (or those who don't log in) can read and post messages. You can't retract or edit a post. If you find yourself in a sticky situation regarding an anonymous post, you can send a message to Shawn. We reserve the right to edit/delete inappropriate messages.

### If you register/log in

Registered users have extra privileges and features: The ability to send one-to-one messages or email; your email address is masked from senders when they send you a message, so you don't have to worry about spambots gathering your address.

Messages you write can include a signature.

You can reply to topics.

You can edit your posts after they are posted.

You can delete your posts if they no longer relate.

You can add a poll to a topic, such as asking readers to rate a book.

You can vote in polls.

As with anonymous users, we reserve the right to edit/delete inappropriate messages.

We created the forum so that you can contribute quickly and easily. It's important to note that this is not the only part of the web site to which you can contribute. If you have an idea for other parts of the site, such as a news article or a calendar item or a "Teachers' Goal," just drop us a line.

<http://energyteachers.org/ETOForum>

Our Services Teachers' Goals Bibliography Calendar Links Community

Massachusetts, USA. All of the material on this site is copyrighted, but visitors have permission to print copies of anything inside this site for their own use. Please send comments or inquiries to help@energyteachers.org

**EnergyTeachers.org Online Forum**  
For educators interested in teaching about energy production and use

FAQ Search Memberlist Usergroups  
Profile You have no new messages Log out [ Shawn ]

MASSACHUSETTS TECHNOLOGY COLLABORATIVE  
RENEWABLE ENERGY TRUST  
Thanks to MTC and the Renewable Energy Trust for their support

You last visited on 07 Nov 2005 03:55 am  
The time now is 07 Nov 2005 04:41 pm

View posts since last visit  
View your posts  
View unanswered posts

Forum		Topics	Posts	Last Post
<b>Educators</b>				
	<b>About these forums</b> How to use this online tool. Whether you should register or use anonymously. Other help topics.	5	5	20 Oct 2005 01:39 am Shawn
	<b>Books</b> Book reviews, book requests, swaps, libraries. Are you looking for a book that covers a specific topic or is appropriate for a certain grade level?	1	1	19 Oct 2005 09:28 pm Shawn
	<b>Carpools</b> Swap contacts for carpools to professional development, conferences, other events. Include the date, location, and title of the event in your topic, then your location in the message body.	1	1	19 Oct 2005 09:35 pm Shawn
	<b>Energy Science</b> Discuss topics in energy science, like thermodynamics, peak oil, electricity, conversions...	0	0	No Posts
	<b>Equipment</b> Describe and/or review kits and lab equipment.	0	0	No Posts
	<b>Field Trips</b> Ideas, requests for help, reviews about field trips.	1	1	20 Oct 2005 12:21 am Shawn
	<b>Lesson Plans</b> Reviews, ideas, or complete lesson plans. Please include the subject and perhaps the appropriate grade level in your subject line.	1	1	02 Nov 2005 07:24 pm Shawn
	<b>Open Forum</b> Create your own topics. Make sure that they don't belong in the above forums.	0	0	No Posts

Mark all forums read

**Who is Online**  
All times are GMT

Our users have posted a total of 9 articles  
We have 2 registered users  
The newest registered user is [Spnon](#)  
In total there is 1 user online :: 1 Registered, 0 Hidden and 0 Guests [ Administrator ] [ Moderator ]  
Most users ever online was 2 on 19 Oct 2005 04:12 pm  
Registered Users: [Shawn](#)

A peek at the online forum

# Curriculum Focus: Mathematics to Study Energy

“Curriculum Focus” is a periodic look at resources described in reviews at MTC’s *Guide to Teaching Renewable Energy and Global Warming*, [www.masstech.org/cleanenergy/curriculum/about.htm](http://www.masstech.org/cleanenergy/curriculum/about.htm)

<p><b>The Application Explosion</b> <b>Topics:</b> Energy Crisis, Energy Consumption</p> <p><b>Source:</b> The Alliance to Save Energy</p> <p><b>Web address:</b> <a href="http://www.ase.org/uploaded_files/educatorlessonplans/wasting.pdf">http://www.ase.org/uploaded_files/educatorlessonplans/wasting.pdf</a></p> <p><b>Grade Levels:</b> 5-9</p> <p><b>Learning Strategies:</b> Conducting a survey, data collection, data analysis</p> <p><b>Frameworks Connections:</b> <i>Science and Technology/Engineering</i> * Physical Sciences, Grades 3-5 Forms of Energy</p>	<p>* Technology/Engineering, Grade 6 4. Manufacturing Technologies <i>Mathematics</i> * Grades 5-6, 7-8 Data Analysis, Statistics, and Probability</p> <p><b>Cost:</b> Free</p> <p><b>Description:</b> In conducting a home energy survey, students will learn about the energy crisis our world is in, how we are affected by it, and what we can do to change energy consumption in the home.</p> <p>Students will collect data of their own uses of appliances and an adult’s use of similar appliances when they were the student’s age. As a class, the students</p>	<p>will create a graph to compare the use of appliances now with the use of appliances during an earlier time period (exemplified by the data of the adults), and they can then conclude about the need for increased conservation in the home.</p> <p>There is a complete section for both students and teachers, that include worksheets with step-by-step guides, as well as diagrams, and charts to help complete the assignments in each part of the activity.</p> <p>The survey can help to foster communication between the school and the home, which is a strong and beneficial connection.</p>
--	---	--

<p><b>Photovoltaics</b> <b>Topic:</b> Photovoltaics</p> <p><b>Source:</b> The National Energy Education Development (NEED) Project, a nonprofit association sponsored by many energy-related organizations across the U.S.</p> <p><b>Web address:</b> <a href="http://www.need.org/guides.htm">http://www.need.org/guides.htm</a> Labeled Secondary Solar Energy Guide under “Hands-On Science Activities.”</p> <p><b>Grade Levels:</b> 8-12</p> <p><b>Learning Strategies:</b> Read and comprehend; learn by hands-on investigations; cooperative learning.</p> <p><b>Frameworks Connections:</b> <i>Science and Technology/Engineering</i> * Earth and Space Science, Grades 9, 10</p>	<p>1. Matter and Energy in the Earth System 2. The Earth’s Sources of Energy</p> <p>* Chemistry, Grades 10, 11 1. Properties of Matter 2. Atomic Structure 4. Chemical Bonding</p> <p>* Physics, Grades 9, 10 2. Conservation of Energy and Momentum</p> <p>* Technology and Engineering, Grades 9, 10 1. Engineering Design <i>Mathematics</i> * Patterns and Relationships, Grades 7, 8 * Geometry, Grades 7, 8 * Number Sense and Operations, Grades 9, 10 * Data Analysis, Statistics and Probability, Grades 9, 10</p> <p><b>Cost:</b> Project kit (for one classroom) is \$350. Teacher and student guides are free to download.</p>	<p><b>Description:</b> This guide and materials kit is used to teach a five-class unit on photovoltaics. The unit consists of “hands-on investigations to teach secondary students the scientific concepts of photovoltaics.” Activities explore how light intensity, light angle, distance from the light source, shadows, color of light, light-concentration, and air temperature affect the electrical output of a photovoltaic (PV) cell, and the effect of combining PV cells in parallel. The activities are very detailed, and most involve elaborate set-ups. The activities in the student guide are blank; the teacher’s guide contains the procedures.</p> <p>The teacher’s guide provides sufficient materials and procedural information, but no additional support. The unit is based around several investigative activities, and the teacher is expected to take the initiative in connecting aspects of photovoltaics to the curriculum.</p>
--	--	--

## Tip: Take Advantage of Your State University

Participate in the marketplace of ideas, such as this departmental colloquium:

**UMass Lowell Physics Colloquium November 16, 2005**

“How Can Physicists Contribute to the (Changing) Oil and Gas Industry?”

Dr. Lawrence M. Schwartz, Schlumberger Corporation

UMass Lowell, Olney Hall 218 4PM-6PM Refreshments at 3:30PM

<http://www.uml.edu/Dept/Physics/colloquia.htm>

# Opportunities for Professional Development

## Highlights from the Calendar and Community News at EnergyTeachers.org

### **Science & Engineering Saturday Seminars Spring 2006 at UMass Amherst**

*Submitted by Mort Sternheim*

Designed for science teachers; new teachers are especially welcome

Five Saturdays in the spring 2006 term; 8:30-1:00

Free educational materials, refreshments, parking, PDPs

Advance registration is required; capacity is limited

4 PDPs per half day session; option for 3 grad credits at reduced cost with extra work

Funded by the National Science Foundation and the University of Massachusetts Amherst

#### **Two of the five Seminars will relate to energy**

**February 4. Solar Cars:** Susan Reyes, NESEA

Energize your students by having them design and build model solar electric cars. Kids through 8th grade are eligible for area competitions. Learn about the program and its role as an engaging interdisciplinary project connecting energy and environmental studies, physical science, engineering, craftsmanship, teamwork, problem solving, and more. Get a free materials kit and try your hand at crafting a model car.

<http://www.nesea.org/education>

**March 11. Transportation Engineering:** Mike Knodler, UMass Civil and Environmental Engineering.

Transportation, commonly defined as the safe and efficient movement of people and goods, has a daily impact on everyone. As part of the seminar learn the basics of transportation engineering, including concepts related to building roadways, timing traffic signals, and planning for new transportation facilities. The class will be hands-on and include several activities to bring back to your classroom.

**April 29:** Weather cancellation makeup date.

**May 6:** Recall for those registered for graduate credit.

**Graduate credit option:** There is a charge of \$225 for 3 Continuing Education credits plus a \$30 registration fee.

Teachers may obtain credit for the seminar as many terms as they wish, but only 3 credits may be applied to UMass Amherst degrees. A lesson plan and a book report will be required for those enrolled for graduate credit. Register with Continuing Education or the UMass Graduate School (see website for details, course number).

Questions: Mort Sternheim, [mort@umassk12.net](mailto:mort@umassk12.net), 413-545-1908

<http://www.umassk12.net/stem/sess>

Online seminar registration, required for everyone whether or not they are registering for graduate credit:

<http://www.umassk12.net/sess/register.html>

### **FREE Hydrogen Fuel Cells Workshop Northampton, MA Dec 10, 2005**

*Submitted by Chris Mason*

#### **Take Home a Model Fuel Cell Car**

- Learn the scientific concepts and technological innovations that make hydrogen fuel cells work.
- Design and build your own model fuel cell car.
- Receive a FREE FUEL CELL KIT and access to additional kits at a discounted price.
- Receive certification of five professional development hours of training.

This is a FREE, hands-on workshop for middle and high school science and technology teachers to learn the concepts that

underlie hydrogen fuel cells and how to prepare student teams to compete in a regional model fuel cell car competition.

#### **Instructors:**

**James Dunn:** Director of NASA's NE Regional Technology Transfer Center and CEO of the Center for Technology Commercialization

**Chris Mason:** Education Director, Northeast Sustainable Energy Association

**For more Information and to Register:**

[http://www.nesea.org/education/H2H\\_Workshop.html](http://www.nesea.org/education/H2H_Workshop.html)

Call NESEA at (413) 774-605