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### June 2009: Free For All!

Who doesn't like free stuff? With summer upon us, we want to give you as many free resources as we can to help you plan for next year. This annual Free For All issue of *Science Class*—the online companion to *The Science Teacher (TST)*, NSTA's journal for high school teachers—brings you free stuff from NSTA, the government, and more. So take a seat, have a look, and click away!

### Free For All from NSTA

NSTA offers many resources and services at no charge—some are available only to NSTA members, but many are available to all. See what NSTA has to offer:

#### [Science Teachers' Grab Bag](#)

Need a classroom resource—at little or no cost? The online NSTA Science Teachers' Grab Bag lists free or inexpensive ones for teachers. From lesson plans to online activities to videos, teachers can find an array of resources for their classrooms. These resources can be searched by keyword, cost, or type, and are listed in the order they are posted. Short descriptions and website links accompany each listing.

#### [NSTA Calendar](#)

If you're looking for science education events or programs, visit the online NSTA Events Calendar. Opportunities can be searched for by date range, ongoing events, location, category, or grade level. Short descriptions accompany each opportunity, with links to the event or program website.

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### [Blick on Flicks](#)

We all love watching movies. But we also love science. And sometimes the two do not mix! To help us sort the good science from the bad in movies and other visual media, Jacob Clark Blickenstaff provides expert commentary, pointing out where the physics is twisted, the chemistry fudged, or the biology stretched on behalf of the story—without losing sight of the fact that movies are meant to entertain. Blickenstaff helps turn "bad science" into teachable science for middle level and high school students.



### [NSTA Recommends](#)

Read reviews of the latest science-teaching materials, and take the guesswork out of purchasing. NSTA's online review service, NSTA Recommends, helps you find the best supplemental books, videos, DVDs, and computer software on the market. Our reviewers evaluate each product on the basis of classroom applicability, standards connections, and overall value. Search more than 3,000 reviews by grade level, subject, or keywords.

### [Evolution Resources](#)

Looking for books and articles on evolution? NSTA has compiled a wealth of print and online resources on this very subject. There is even a Q&A section on teaching evolution in the classroom!

### [Science Objects](#)

You are teaching a subject for the first time, or for the first time in a long time. You need a content refresher now. Where can you find help that is engaging, high-quality, easy to access—and affordable, too? From NSTA's latest ready resource: Science Objects! Science Objects provide all teachers of science open access to these valuable new resources—at no cost. The resources can be filtered by subject and grade level.

### [NSTA Press Books](#)

Did you know that you can access a chapter of many new NSTA Press books online for free? Simply click on the book of your choice, and scroll down to the "Read a sample chapter" link.

### [NSTA Reports](#)

NSTA Reports, NSTA's newspaper published nine times a year as a free member service, is the Association's timely source of news and information for and about science educators of all levels. It includes national news on science education and education in general; information on teaching materials; announcements of programs for teachers; and advance notice about all NSTA programs, conferences, and publications.

### [Lab Out Loud](#)

In this biweekly podcast, hosts and science teachers Brian Bartel and Dale Basler, discuss science news and science education with leading scientists, researchers, science writers, and other important figures in the field. A selection of links and notes accompanies each episode, enabling the listener to dig deeper into the topics discussed.

### [SciPacks](#)

SciPacks are 10-hour, online learning experiences that you can use to help you better understand the content you teach. SciPacks are aligned with the National Science Education Standards. Each SciPack contains:

- Up to five self-paced interactive online learning experiences called "Science Objects" that use an inquiry-based approach with engaging simulations and embedded questions.
- An e-mail content Wizard to address your individual questions; these knowledgeable content experts respond via e-mail within 48 hours.
- A pedagogical component to assist you in translating the content for your classroom.
- The opportunity to pass a final assessment and print a certificate from NSTA demonstrating your understanding of the content addressed within the SciPack.

Teachers are encouraged to seek approval in advance from their district for continuing education credits that may be ascribed for passing the final assessment. NSTA is establishing relationships with the department of education in states across the United States to formalize the recertification value for completing a SciPack, or series of SciPacks—and select SciPacks are available for free!

### [NSTA List Server](#)

We want to help you keep in touch with your colleagues. NSTA's lists are group e-mail discussions that allow members to exchange information in a peer-to-peer forum. NSTA members who subscribe (at no extra cost) can now select from 12 topic areas: biology, chemistry, computer science, Earth science, elementary, environmental science, general science, physical science, physics, technology education, new teacher, and retired teacher. The lists remove geographical boundaries from member communication and are available to NSTA members—right now.

Colleagues on the list server can share ideas, get information, and ask questions on important issues. The list server is quick and simple to use, so you can easily stay current on trends in science education. The lists are available 24 hours a day, 7 days a week, so information from your peers is available when you need it.

### [Ms. Mentor](#)

Do you have a question you would like to ask a veteran science teacher? Try our newest blogger, Ms. Mentor! Ms. Mentor was a middle school life and physical science teacher for 16 years and a high school computer science teacher for 11. She had a brief stint in higher education and recently retired as a regional administrator. "Retired" is a misnomer, however—Ms. Mentor continues blogging, reviewing technology, and birding wherever and whenever her fancy takes flight. Blog topics have included science kits, writing in science classes, and formative assessments.

### [SciGuides](#)

NSTA's online resource, SciGuides, will transform the way you use the internet to plan and provide science instruction to your K–12 students. SciGuides enable you to quickly and easily locate targeted science content information and teaching resources from NSTA-approved websites and provide instructional tools and strategies to put them into practice.

### [NSTA News Digest](#)

Looking for the top stories in science and education? NSTA News Digest has the day's leading news at the click of your mouse! Search by News Categories (i.e., Top Stories, Science, Education, or Legislative News) or Science and Education Topics. Click on a story's link, and it will take you straight to the source for easy printing and class distribution.

### [SciLinks](#)

SciLinks is an exciting partnership between progressive U.S. textbook publishers and NSTA. If your textbook has SciLinks, you and your students will have the best internet science sources at your fingertips, including

- websites to extend and expand students' understanding;
- science news to add context to classroom learning;
- activities to bring science alive; and
- experts to answer questions and satisfy curiosity.

SciLinks is a free service to those with SciLinks-enabled textbooks and to NSTA members. And SciLinks is easy to use—just log on to the SciLinks site and enter a SciLinks number from the margin of your textbook. You will be offered a smorgasbord of teacher-approved internet resources tied to that specific point in your book.

### **Free For All from the U.S. Government**

Various government agencies offer free programs, resources, lesson plans, and more. Here's what's new from the U.S. government:

### [Federal Aviation Administration's Educators Corner](#)

The Educators Corner website includes interdisciplinary activities for the K–12 classroom, fun experiments, and more. Students can learn about careers in aviation and read biographies of famous pilots.

### [Schools Chemical Cleanout Campaign](#)

The Environmental Protection Agency's Schools Chemical Cleanout Campaign (SC3) aims to ensure schools avoid hazards associated with mismanaged chemicals. SC3's online resources can help K–12 schools develop a successful management plan for chemicals found everywhere from the maintenance closet to the chemistry lab. Download the public service announcement PDFs "You Work Hard to Keep Your Students Safe from Bullies and Drugs, But What About Chemicals?" and "Is Chemical Safety Part of the Equation?"

### [National Institute of General Medical Sciences Materials](#)

The most recent issue of *Findings*, the National Institute of General Medical Sciences (NIGMS)' online magazine, focuses on evolution. It features in-depth profiles of an evolutionary geneticist and an evolutionary biologist, including a video interview and podcast; short pieces describing NIGMS-funded medical research projects; and interactive games to download for use in the high school classroom, such as Jeopardy-style evolution trivia and Who Wants to Be an Evolutionary Biologist? Browse the archives by topic to access the contents of all previous issues, which typically contain profiles of working scientists, research highlights, and a puzzle or game. Downloadable slide kits reinforce the science concepts presented in each issue.

### [Build Your Own Underwater Robot](#)

National Oceanic and Atmospheric Administration (NOAA) scientist Doug Levin's detailed manual explains how to build a remotely-operated vehicle (ROV)—in this case, an underwater robot. The manual lists ROV parts and pieces and where to find them and contains photographs of the assembly.

### [NASA's Do-It-Yourself Podcast](#)

The Do-It-Yourself (DIY) Podcast activity engages students in science, technology, engineering, and mathematics as they combine clips from NASA with their own materials to create an original podcast. NASA provides complete instructions, along with a set of audio and video clips, photographs, and information about space-related topics such as Newton's laws and spacesuits. Students choose a topic, and then select related NASA clips to download, such as scenes of astronauts training for missions or experimenting in space. Using a camcorder, digital audio recorder, or computer, students can record their own audio or images and use readily available free software to combine the recordings with the NASA materials. Students are encouraged to distribute their podcasts through social networks, websites, and other means. The DIY Podcast blog notes when additional

topic modules are available and offers tips and suggestions for incorporating the DIY Podcast into your classroom.

### [Human Genome Project Education Resources](#)

Because the U.S. Department of Energy (DOE) must assess potential health risks from any new energy resources it develops, it has long had an interest in researching the human genome. DOE worked with the National Institutes of Health on the Human Genome Project (HGP), which produced educational resources. Teachers can download publications on the basic science behind HGP, as well as K–12 curriculum modules and lesson plans, teacher guides, software, slide sets, and posters. Links lead to tutorials, videos, webcasts, teacher training and workshop opportunities, and genetics websites in Spanish.

### [Peace Corps Challenge](#)

Teachers can access interdisciplinary lesson plans for grades 3–12 on topics including water contamination, malaria, sanitation and disease, and soil runoff. The Peace Corps Challenge site also describes service learning and enrichment opportunities and offers language lessons.

### [Everyday Mysteries](#)

What's the strongest muscle in the human body? How much water can a camel's hump hold? Find the answers to these questions and more at Everyday Mysteries: Fun Science Facts From the Library of Congress (LOC). This website presents questions asked by researchers and answered by librarians from the Science Reference Services at the LOC. The archived questions and answers are sorted by topic (e.g., astronomy, technology, and zoology), and each answer includes a full explanation, a list of related websites, and suggestions for further reading, as well as references to resources found in the LOC's collections.

### [Fossil Energy Study Guides and Activities](#)

The U.S. Department of Energy has compiled a toolkit for fossil energy education. The materials include printable study guides and classroom activities emphasizing the roles played by coal, natural gas, and petroleum in everyday life and familiarizing students with the science and technologies that can help make using fossil fuels cleaner. The toolkit also contains career information for high school students.

### [The Psychology of Learning: How to Organize Your Teaching](#)

Visitors to the U.S. Department of Education (ED)'s Doing What Works website will find answers to a very important question: What can teachers do to ensure their students are learning? The site's Psychology of Learning section presents research-based instructional strategies aimed at improving students' memory and strengthening their understanding of skills and

concepts. The four strategies described are

- spacing learning over time,
- alternating solved problems with problems to be solved,
- connecting abstract ideas with concrete contexts, and
- asking higher-order questions.

In each case, the research base for the method is explored, examples of the method in practice are provided, and step-by-step instructions for implementing the method, including planning templates, are detailed.

### **Free for All Teachers of Science**

Here are some resources and services that can help you develop your teaching strategies for next year:

#### [Microscopy Workshop](#)

Looking for a new way to excite students about science and get a free microscope? The College of Microscopy's COM900 Microscopy Workshop for Middle and High School Science Teachers—June 22–26, 2009—is designed to help teachers understand and develop microscopy skills, lessons, and experiments for use in classroom instruction.

The five-day workshop includes curriculum assistance, 3.5 continuing education units or 38 professional development units, and a free Motic microscope equipped with a digital camera and software for the classroom. The total cost of the workshop is \$150. Participants are also eligible to register with Concordia University Chicago and earn 3 graduate credits upon workshop completion for an additional \$600.

#### [The Point](#)

Interactive, standards-based modules introduce high school students to the world of information technology. Students explore topics online, manipulating simulation tools as they learn the science behind the materials, devices, and processes used in the field. The Optrium, a virtual science center on The Point website, allows students to study numerous related concepts, such as wave interference, ionic bonding, and binary code.

#### [Online Student-Made Videos](#)

Youth Voices Open Call, a program from WGBH's Teachers' Domain, invited students ages 13–18 years old to make a short video based on the Frontline documentary *Heat*, which examines the role that businesses play in global warming. The best shorts created are posted for online viewing.

#### [Resources for English-Language Learners](#)

A teacher from Sacramento, California, has compiled a collection of science-

related links helpful to teachers of English-language learners. Larry Ferlazzo takes a K–12 approach to his daily posts on the latest web-based teaching ideas he has come across. Many of the resources he identifies have all-student applications. His website also contains resources for other subjects.

### [Physics-Review Jeopardy](#)

High school teacher Brendan Noon presents his ideas for using new technologies in the science classroom. Try his approach to reviewing physics concepts by downloading the Jeopardy PowerPoints posted for the Science of Physics and Kinematics units.

### [Social Networking for Green Teens](#)

High school students interested in environmental issues can interact, share ideas, and learn about educational and career opportunities at the Planet Connect website, which presents teen-friendly links to news stories and recent research on environmental topics, how-to ideas for starting school and community environmental projects, and college profiles evaluating how environmentally conscious each school is.

### [STEM Transitions](#)

This website provides access to more than 60 classroom-ready projects in agriculture; health science; information technology; manufacturing; transportation; and science, technology, engineering, and mathematics (STEM). The materials focus on building both academic and career-related skills in college-level classes and can easily be adapted for high school use. Student handouts and assessment tools are included.

### [Science Explorations and Adventures](#)

The Exploratorium's Paul Doherty, a recipient of NSTA's Faraday Science Communicator Award, presents a searchable collection of favorite classroom experiments and activities, covering topics from flying tinsel to a glowing pickle. Doherty also shares a collection of scientific images.

### [Real World Connect](#)

A web portal from the Cleveland Clinic allows teachers to strengthen lesson plans, students to improve research papers, and everyone to find and access the latest online information. Features include an interactive, animated heart-brain connection tutorial for children; a gallery of art created by high school students interpreting scientific research; and an x-ray library.

### [Video-Making for the Classroom](#)

Animoto offers educators a cutting-edge teaching tool: the ability to create (or to have students create) short films for the classroom. Users e-mail their images and sounds to Animoto, and minutes later a customized video has been generated. The video can then be posted and embedded elsewhere or

downloaded for in-class presentations. Examples of how educators have used the service are provided.

### [Join the Year of Science 2009](#)

A national, year-long grassroots effort by more than 800 scientific organizations comes to Washington, DC in June 2009. Discover your inner scientist and learn more about the mysteries of our oceans and bodies of water that support life on Earth. Government agencies, nonprofits, and educational institutions are encouraged to join the celebration. A series of events in the Capital Region are designed to engage the public in "Water Planet" science, raise awareness of our water resources, explain how we depend on and impact them, and what we can do to protect them.

### [Society of Hispanic Professional Engineers Conference](#)

Approximately 5,000 Hispanic students, professionals, corporate representatives, educators, and community leaders throughout the United States are expected to attend the Society of Hispanic Professional Engineers Conference from October 28–November 1, 2009, in Washington, DC. The conference's Advancing Hispanic Excellence in Technology, Engineering, Math, and Science Teacher program brings together approximately 100 middle school and high school science and math teachers who teach in predominantly Hispanic-serving schools. The program provides teachers with the resources and strategies needed to connect Hispanic students to science and mathematics curricula through culturally competent and innovative techniques. Hands-on workshops and supplementary educational materials presented during the program reflect national teaching standards in math and science and provide teachers the opportunity to receive professional development credits.

### **Coming next month...Summer Reading:**

- A Virtual, Shoestring Vacation
- Current Research
- Reading Aloud: A Springboard to Inquiry
- Helping New Science Teachers
- Is the Inquiry Real?
- Talking Science
- PhUn Week: Understanding Physiology

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