Week of August 24, 2009

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From the Science Teachers Grab Bag: Ten Freebies as You Head Back to the Classroom

1. NASA Blast Back to School Page
   NASA offers educational resources for all grade levels, kindergarten through college, as well as resources for the informal education community. Visit the website to find educational resources to bring the space agency's missions into your classroom and details about NASA events taking place in your area.
2. Example of Standards-Based Grade Book
   Virginia Malone, a retired senior science project director from Hondo, Texas, shares resources for teachers on the website www.wetheteachers.com, which is free but requires registration. She offers this advice to teachers using the grade book: "I would suggest not trying to do every single standard, but put several together, or you may drive yourself crazy. The added advantage to keeping a grade book by standards is that you can easily see where you missed some things or overkilled others."
3. *Testing the Robotic Hand*
   NASA engineer Larry Li built a robotic hand that can catch a baseball and grasp a wrench. Show students how it works with this short film from The Futures Channel. A hands-on math/algebra activity for grades 5–7 accompanies the film.
4. Ready Classroom Emergency Preparedness Site
   With hurricane season beginning, you'll want to learn about the science of hurricanes and how they are predicted. Prepare your classroom with free emergency preparedness resources, and use the National Preparedness Map to find out about severe weather that could hit your area and what precautions to take.
5. Online Science
   This site contains videos, activities, and podcasts for all ages from the Museum of Science and Industry, Chicago. Classroom activities, such as building an electric motor, are aligned with learning standards. Videos depict baby chicks hatching, for example, while podcasts feature interviews with science experts.
6. One Million Acts of Green
   The One Million Acts of Green Program works closely with the National Wildlife Federation, The Climate Project, and its website partner GreenNexxus to provide high-quality, age-appropriate

resources to teach students in grades K–12 about climate change. Resources include teacher and parent guides and slideshows.

7. Teaching the Process of Science
   This module was created by Stanford University's Anne E. Egger and addresses practical teaching questions like "what is the process of science," "why should I teach it," and "how do I teach it." The module also includes several how-to examples and a list of additional resources for integrating the process of science into teaching at all levels, using different techniques.
8. The KidWind Project
   The KidWind Project is a team of teachers, engineers, and scientists committed to innovative energy education. Their website provides information about wind energy, lesson plans for all grade levels, and ideas for building an educational wind turbine.
9. Plant Talking Points
   The Botanical Society of America designed this classroom tool for sharing ideas and concepts highlighting the role plants play in our lives and in the world around us. Teachers can use it to get students thinking about and exploring plant-related topics.
10. *Pulse of the Planet*'s Educator Resources
    K–12 lesson plans use *Pulse of the Planet* radio programs and sounds as a focus for learning activities on a range of subjects. The lesson plans are aligned to national education standards and accompanied by downloadable audio files. (Free registration is required.)

Want more free resources? Schedule regular visits to the NSTA Science Teachers Grab Bag.

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Coverage of Evolution in State Standards Better, Says NCSE

Evolution is receiving better coverage in state science standards compared to 10 years ago according to a review of all 50 state science standards and the District of Columbia by the National Center of Science Education (NCSE). Louise S. Mead and Anton Mates of NCSE conclude that "[t]he treatment of biological evolution in state science standards has improved dramatically over the last ten years." Nine states and the District of Columbia received an A for their treatment of evolution, However the study authors point out that five states--Alabama, Louisiana, Oklahoma, Texas, and West Virginia-- received a grade of 'F' for their treatment of evolution and there are others that didn't include key concepts such as the Big Bang Theory. "It's almost surprising to us that we are having this discussion about inclusion of evolution," given that the theory is well-accepted by scientists," said NSTA Executive Director Francis Eberle to *Education Week* reporter Mary Ann Zehr in her August 12 article.

- Read the NCSE report (PDF)

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Science Store Freebies

Science educators are often looking for ways to uncover students' preconceptions, strategies for building student literacy in science, and techniques that simplify the teaching of tough concepts. Take advantage of these downloads from NSTA's Press bookstore.

Elementary teachers:
"Catching a Cold," free chapter from *Uncovering Student Ideas in Science, Volume 4*

Middle school teachers:
"Determining the Size and Shape of the Blind Spot," free chapter from *Activities Linking Science With Math, 5-8*

High school teachers:
"Flow of Energy and Matter: Photosynthesis," free chapter from *Hard-to-Teach Biology Concepts*

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Organizing K–12 Science Education Around Core Ideas

On August 17, 2009, the National Academies of Sciences Board on Science Education (BOSE) held a meeting on core ideas in K–12 science education. According to BOSE, the meeting was "a first step in a multi-stage, multi-partner process to develop new frameworks for standards in science education." NSTA, the Council of State Science Supervisors, and many other organizations provided representatives to the meeting. Read more about the meeting, including the agenda and several papers commissioned for the meeting.

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What Makes a Difference in Teacher Professional Development?

A research team at CCSSO has completed a new meta-analysis study of teacher professional development and the effects of quality professional development on improving student achievement. The study, funded by the National Science Foundation, answers two questions that education research has not often been able to answer:

1. What is the scientific evidence that investing in improving teacher knowledge and skills makes a difference for student learning?
2. What types of professional development for teachers in math and science really do produce change in teaching and learning?

CCSSO analyzed only study findings based on research that met rigorous criteria for study design, data quality, and significant effects. Of over 700 studies initially identified (1990 to 2007), 16 of the studies met the high standards used by CCSSO to judge effectiveness of professional development.

Three major factors stand out in the professional development programs that had positive effects in improving student achievement:

a. More time (average 91 hours) was spent in providing teachers with content-based teacher development;
b. Active methods of teacher learning; and
c. Multiple follow-up activities over a 6-month to 1-year period were conducted in the schools where teachers work.

"Professional development is gaining a research base, and this study seeks to identify characteristics of professional development that support teachers and improve student learning," says Francis Eberle, NSTA executive director. "The evidence confirms that sustained and coherent professional development is essential, and it supports that using multiple strategies and forums leads to positive student achievement."

To review the full report—*Effects of Teacher Professional Development on Gains in Student Achievement: How Meta Analysis Provides Scientific Evidence Useful to Education Leaders*—and read the recommendations of CCSSO regarding research and design for professional development based on the study, go to the study webpage.

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Inspiration for Those Who Attend the Minneapolis Conference on Science Education

For science educators in every discipline, PreK–16, principals, and administrators, the best in professional development is scheduled for your region in Minneapolis, Oct. 29–31. Join us at NSTA's Conference on Science Education for renewing your teaching spirit, learning strategies and techniques for student assessment and inquiry-based learning, and for raising student performance. We offer hour long workshops, presentations from the experts, in depth day long programs and more. Check out just a few that may be of interest:

Science Assessment Through a Mixed Curriculum (Ticketed Short Course)—Integrated hands-on activities to help students understand how relating rocks and minerals to everyday life will enable them to better understand the interaction of science in our world and how it affects all phases of life. Learn how to use creative writing, language arts, social studies, and math to test students' knowledge of earth science. All activities are aligned with the National Science Education Standards and offer more ways to present earth science and better understand the interaction of science in our world.

What Are They Thinking? Using Formative Assessment to Improve Opportunities to Learn- (General Audience)—Past NSTA president, author and senior program manager Page Keeley will present on need to change our assessment practices and increase our awareness of students' preconceptions in ways that can help build a bridge from where students are in their understanding to where we want them to be.

Inquiry Instruction in High School Chemistry and Its Effect on Students' Proportional Reasoning Ability (Middle–College/Supervision)

Active Science in a Changing World (Elem–High)—Learn about two NASA education projects that can help you teach about the world while making connections across the curriculum.

Ecological Footprints (Elem–Middle)—Examine sustainability in a shrinking world and life styles.

Award-winning Inquiry Lab Activities for High School Biology—Learn how to conduct three high-interest lab activities that give students experience in hypothesis formation, experimental design, data collection, and interpretation.

Add another 300 sessions along with field trips, socials, the Exhibit Hall, and networking with the some of the best science educators in the industry. Inspirational? Yes, and you'll learn and share your passion for science. Visit www.nsta.org/minneapolis for more details. The earlybird deadline is **September 18**, so register early.

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Short Takes

- Neither high temperatures nor 100% humidity could keep NSTA's bloggers from posting throughout the summer:
    - The Early Years blog has an extensive, link-filled entry on "citizen science: collaborative projects for teachers and their class," among others.
    - Ms. Mentor offers her thoughts on "getting to know your students," "perseverance and 'failure,'" and other challenges you face every day.
    - The SciLinks blog reports on its visit to the Galileo exhibit at the Franklin Institute in Philadelphia.
- NSTA's media critic Jacob Clark Blickenstaff gives tips on how to use Hollywood products in your classroom.

- Heads up: the *Lab Out Loud* podcast returns in September. Prepare for Season 3 by signing up for the RSS feed or e-mail notification at the *LoL* home page. There you'll also find a link to iTunes, where you can get *LoL* episodes free of charge.

Have you visited the new NSTA Communities yet? It's where NSTA members meet to share—asking questions, offering answers, uploading files, or just talking with one another. The matching tool helps you find others who share *your* interests and concerns.

And Don't Forget…

Visit our member services web page to ensure that NSTA has your current contact information. And when the time comes to renew—select the "Autorenew" option!

Visit the NSTA Science Store for an outstanding array of bestselling books and teaching resources. Receive 30% off the price of the August featured book, *NSTA Ready-Reference to Safer Science*.

Professional development courses in your future?
Online options give you a world of choice.
Take a look at these groups offering courses for science educators!

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1840 Wilson Boulevard
Arlington, VA 22201-3000
Phone: 703-243-7100