

PULL-OUT SECTION

SCIENCE TEACHERS' GRAB BAG



Inside this Convenient Pull-Out Section you will find:

Freebies for Science Teachers

4SciFunFree. Targeted for preK–6 students, this iPad app presents simple but intriguing hands-on science experiments that kids can do (with parental supervision) using materials found in and around the house. The experiments address Biology, Chemistry, Physics, and Space topics and include activities like making a Canister Rocket, Balloon Kebab, Bottle Tornado, Slime, and Solar Oven. Each experiment features “How-To” instructions, a “Why” explanation, and a follow-up “Quiz” that reinforces understanding. See <http://apple.co/1DuaCsB>.

Geoscience Careers Videos. Two new videos for high school students from the National Ground Water Association (NGWA) spotlight the diversity and potential of careers in groundwater science. In the animated *Groundwater Is Cool*, students learn about the importance of groundwater as a freshwater resource for humans and the environment through arresting facts and statistics. In *Geoscience Careers*, students, professors, and professionals in the field discuss the benefits and unique qualities of groundwater careers. Both videos reflect the key factors that research has shown to influence students in pursuing careers in geoscience: i.e., taking a geoscience course or lab, having an influential teacher/professor, and desiring to work outdoors. Watch them online at www.NGWA.org/CareerCenter.

Journey to Pluto. This interactive course from Versal, a platform for online course creation, brings the excitement of the NASA New Horizons mission to Pluto to the classroom. Open to all, but most appropriate for the high school level, the course features 12 lessons covering everything from mission launch in 2006 and spacecraft and instrumentation to the Jupiter flyby, the history of Pluto, and early discoveries from New Horizons. The course can be easily embedded into most websites and includes both public domain and Creative Commons–licensed content from NASA. The course also includes original content and interactive exercises, such as timelines, diagrams, flashcards, and quizzes. Visit this website: <http://bit.ly/1KbqaGu>.



NASA/JHUAPL/SWRI

ActivEpi Web. This multimedia electronic textbook for high school and college students and health professionals presents the fundamentals of epidemiology while emphasizing the links between health and medical sciences and mathematics and statistics. Developed by David

Kleinbaum, professor of epidemiology at Emory University, the interactive resource includes 15 narrated lessons with video and animation; interactive study questions and quizzes; and homework exercises. Topics include study designs, measures of frequency and effect, potential impact, overview of validity, selection information and confounding bias, effect modification, analysis of 2x2 tables, options for control of variables, stratified analysis, matching, and introduction to logistic regression. Refer to www.activepi.com.

Mosa Mack Science. The latest tool for educators interested in addressing gender and cultural diversity in science, technology, engineering, and mathematics (STEM) learning is this library of inquiry-based science units for middle level students. The units begin with an interactive cartoon starring Mosa Mack, an ultracool African American heroine who models scientific thinking and processes and breaks the mold of the “average” scientist. Each cartoon presents a mystery and ends with a question that challenges students to solve the mystery using evidence from the cartoon. Students are then launched into a series of hands-on science and engineering activities to help them do just that. Topics include Climate Change, Food Chains, Adaptations, Diabetes, and Cells. Download the units at <http://bit.ly/1U2yehk> (free registration is required).

FunScienceDemos. Imagine a YouTube channel with nothing but attention-grabbing science demonstrations exploring the Big Ideas in science that every elementary and middle level student should know. Produced by George Mehler, Jared Hottenstein, and the science education lead teachers of the Central Bucks (Pennsylvania) School District, the channel offers demonstrations in Physical Science (Matter, Motion/Forces, Energy, Sound, and Light), Earth/Space Science (Weather, Rocks, Our Solar System, Water on Earth, and The Changing Surface of the Earth), and Life Science (Organisms, Habitats, Life Cycles,

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Recyclers, The Human Body). Each demonstration connects to a concept from the *Next Generation Science Standards (NGSS)*. The videos can be used as stand-alone presentations or a professional development platform for elementary and middle level teachers. Consult <http://bit.ly/16zEpWc>.

Nobel Conferences. Every year, Gustavus Adolphus College in St. Peter, Minnesota, hosts a conference on a selected theme featuring speakers who are among the world's best in their fields, including one or more Nobel Laureates. The talks are streamed live and archived. Accompanying conference materials prepare high school and college students for the content of the talk (e.g., background information), and post-conference activities summarize understanding afterward. This year's conference explores the science behind addiction; however, educators can also access materials from past conferences, which have examined topics like The Universe at Its Limits, Our Global Ocean, The Brain and Being Human, and Where Does Science Go From Here? (click on Past Years at the website <http://bit.ly/1h3PqVD>).



HAGERTY RYAN, U.S. FISH AND WILDLIFE SERVICE

Adventures in Ecology. This publication features three environmental science activities for middle level and high school students. Produced by TERC, a nonprofit research and science education organization in Cambridge, Massachusetts, the activities explore what can be inferred from animal skulls (Bony Skulls), the factors involved in an animal's energy use (Moose Are Not Mice), and the effects of predation on communities and ecosystems (Predator and Prey). The activities are drawn from TERC's full-year curriculum, *Ecology: A Systems Approach*,

and include both teacher and student guides. Refer to <http://bit.ly/1fEbq8r>.

EDC Earth Science Activity: Patterns in Surface Currents. Give high school students valuable practice in working with data visualizations while learning about Earth's physical processes. This activity from the Education Development Center helps students understand that uneven heating of the Earth by the Sun provides the energy that drives the ocean currents. Using maps representing average sea surface temperatures during a one-month period, students compare the temperature patterns in April and July, 2011, and relate these patterns to the movement of ocean water via warm and cool surface currents. Then they consider the impact of ocean currents on the climate of coastal communities. See <http://bit.ly/1JReIx3>.

Mysteries of the Brain. An eight-part video series produced by NBC Learn in partnership with the National Science Foundation (NSF) presents the latest research in neuroscience and profiles the scientists who are leading it. Each video segment explores a different aspect of how the wonderfully complex brain functions. For example, viewers will learn about how the brain works to learn and remember, how emotions are formed and processed by the brain, how neural circuits develop, and how the brain works during sleep. Accompanying lesson plans for middle and high school students will be posted soon. Access the videos at www.nbclearn.com/brain.

Living Schoolyard Month Activity Guide. Creating "green" or "living" schoolyards is a growing movement in California and elsewhere that gets students outside to connect with nature, develop curiosity, and become stewards of their school and neighborhood environments. With this guide from Green Schoolyard America, preK–12 educators have more than 40 hands-on explorations that promote outdoor learning. Culled from leading environmental and education organizations in California, the guide presents activities in categories such as Wildlife

Habitat (e.g., Butterfly Habitat Hunt), Watershed Stewardship (e.g., Calculating Rainwater Runoff), Schoolyard Agriculture (e.g., Roots and Shoots), Energy and Climate (e.g., Make a Solar Etching), Thoughtful Use of Materials (e.g., Compost Gourmet), Place-Based Understanding (e.g., Reflection Writing in Your Green Schoolyard), Art (e.g., Creative Painting with Garden Paintbrushes), Recreation (e.g., Photosynthesis Tag), and Health (e.g., Jump Rope Activities). Access them at <http://bit.ly/1O8L6Ob>.

Race ≠ DNA. To speak meaningfully about race, we need to truly understand its various perceptions and definitions—and how they all fit together. This article from Teaching Tolerance.org contains a biological, social, and ancestral breakdown, along with a link to a toolkit that provides a professional development framework for educators for examining common misconceptions surrounding race and ancestry. With these resources, teachers and administrators can begin debunking misconceptions and building identify-safe classrooms and schools. Read the article at the following website: <http://bit.ly/1g1EaZ2>.



LARS KLINTWALL MALMQVIST

Henry's Handwashing How-To. Promote hygiene with Henry the Hand! This short video is a fun way to remind elementary students about the importance of washing hands to reduce the spread of germs and the risk of infection or illness. The video discusses four principles of hand awareness: Wash your hands when they are dirty and before you eat; do not sneeze into your hands; do not cough in your

hands; and do not put your fingers into your eyes, nose, or mouth. In addition, the video shows students the proper technique for handwashing. See <http://bit.ly/1LRJeLA>.

Web Literacy Tools. Mozilla Education offers new tools and curriculum to help learners of all ages—including K–college educators—achieve web literacy, or the ability to read, write, and participate online. For example, Webmaker, an open source Android app at <http://bit.ly/1TSJgWp>, teaches the art of digital storytelling, helping users create content like scrapbooks, photo galleries, memes, and comic strips. In addition, Mozilla offers lesson plans and tutorials on topics such as learning how to code, understanding why privacy matters, and creating open-license content at <http://mzl.la/1Rd910q>.

Careers in Computer Science. Middle level and high school teachers can learn the "dets" on careers in computer science (CS), such as schools with CS degree programs; job descriptions, certification requirements, and salary information; and a personality quiz to discover where you might fit best in the field. See www.computerscienceonline.org. The site also offers guides to encourage specific populations to pursue careers in the field for

- all students (<http://bit.ly/1D93h0f>);
- women (<http://bit.ly/1Cserkx>); and
- African American and Hispanic students (<http://bit.ly/1JxnNPJ>).

Fracking and Energy, a Classroom Guide. *Wall Street Journal* reporter Russell Gold has covered fracking, a drilling technique used to extract oil or natural gas from deep underground, for more than a decade. He recently released *The Boom*, a book on the history of the practice, which presents both the pros and cons. An accompanying Readers Guide provides thought-provoking questions that present various perspectives of this complex energy issue, making it particularly suited for use in high school environmental science and other classes to promote students' critical-thinking skills. Find the guide at <http://bit.ly/1KMiT2Z>. ●