

PULL-OUT SECTION

SCIENCE TEACHERS' GRAB BAG



Inside this Convenient Pull-Out Section you will find:

Freebies for Science Teachers

Project Noah. Project Noah missions provide opportunities for students in grades 4–12 to participate in citizen science and share their observations and experiences with wildlife in a meaningful way. By contributing to Project Noah missions, students are not only learning about the environment, but also taking action to protect it. Teacher-tested lesson plans—e.g., Tracking Alien Species, Writing Goes Wild, and a Self-Guided Tree Tour—will help you get started with Project Noah in the classroom. Download these materials and learn more at the website www.projectnoah.org/education.

Ancient Technologies, New Tomorrows. Check out AntiquityNOW's blog for students in grades 3–8. This blog highlights ancient inventions and ideas and shows how influences and events from the past are shaping our lives today. Recent posts include Blowing Their Tops: The Destructive History and Amazing Science of Volcanoes; Ancient Weather, Modern Predictions; and the blog's number-one, most-read post, The Invention of the Wheel, which through its accessible content and follow-up student activities that reinforce understanding, both engages and educates. See <http://bit.ly/1EbeKQW>.

Training on Digital Dissection Software. Teachers can receive personalized interactive online training on computer-based animal dissection software. Sessions will cover educational efficacy, economic benefits, ethical considerations, and current laws and policies regarding the use of animals in science education. Participants will gain hands-on experience with popular digital dissection software programs. Training sessions are led by Samantha Suiter of People for the Ethical Treatment of Animals (PETA), who teaches biology at Trident Technical College in Charleston, South Carolina. To schedule a training session, contact Suiter at SamanthaS@peta.org or 843-771-2394.

The National Agricultural Literacy Curriculum Matrix. This collection of classroom-ready educational resources for K–12 teachers aim to increase students' awareness and understanding of agriculture issues. Developed as part of the Agriculture in the Classroom website, the matrix includes standards and objectives, lesson plans, companion resources, and assessments on numerous agriculture topics, from identifying plant parts to knowing where food comes from to understanding our role in food safety. Teachers can search lesson plans by grade level, location, or content area (science, health/nutrition, or



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social studies); teachers also can submit their own successful agriculture lessons to the matrix at <http://bit.ly/1zx3YhV>.

STEM Jobs for the Classroom. A video series tackles the top challenges educators face in encouraging middle and high school students to pursue careers in science, technology, engineering, and math (STEM). These challenges include defining STEM in the classroom setting (*Flipping the Script on STEM*), addressing STEM-subject anxiety (*I Hate Math!!!*), and connecting STEM learning within the context of STEM careers (*Do What You Love!*). With plenty of action and practical advice for both students and teachers, each 15- to 20-minute video makes it clear that STEM fields are dynamic and suit diverse skills and interests. Teachers can also download the *STEM Teacher Guidebook*, which presents seven principles to follow to interest students in pursuing STEM careers. Consult <http://classroomseries.stemjobs.com>.

Fight BAC! Teach elementary and middle level students safe food-handling practices and how to avoid foodborne illnesses with games and activities from the Partnership for Food Safety. For example, in BAC Blaster, players clean, separate, cook, and chill foods to keep bacteria from contaminating their picnic feasts. In BAC Drop, students learn about core food safety practices and the "10 least wanted pathogens," then complete a story template to show what they know. Visit <http://bit.ly/1Fi0JDx>.

SciGirls. This public television series for students ages 8–12 highlights tween girls who are putting science and engineering to work in their everyday lives. Each 30-minute episode follows a different group of middle school girls as they solve their own design and engineering problems, such as how to design shoes for safer walking on icy streets and how to program and control the LED lights sewn into dresses at a local fashion show. The program's website offers hands-on activities related to the episodes, as well as tips and resources for teachers to spark girls' interest in STEM. Refer to <http://to.pbs.org/1Fi1A7a>.



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STEM on TV. At www.stemon.tv, you'll find four STEM education video channels, each with a different focus to serve the complete K–12 learning community of students, teachers, and administrators. Channel One presents videos for teachers based on trainings from the National Center for the Advancement of STEM Education. Channel Two, The Science Center for Inquiry, features videos such as *Exploring Magnets*, *Some Cloudy Questions*, and *Gravity Car*, which get students excited about thinking and doing science. Channel Three, the Physics Pharm, offers an online learning adventure for anyone who can multiply and divide with decimals. Channel Four, named STEMon Episodes, highlights resources, demonstrations, and events of interest to STEM educators and learners everywhere.



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“What If There Were No Moon?” poster. Spark high school students' interest in STEM fields with this information-packed poster and lesson plan that highlight ways to use math, physics, and geology to calculate the mass of the Moon. Created by the Florida Institute of Technology, the poster emphasizes the interdisciplinary nature of STEM fields. Access this and other STEM-themed posters with student appeal—e.g., “Gridiron Science,” which explores the math and physics of football, and “The Power of Math,” which looks at the science and math behind speedboat design—at the website www.fit.edu/stem-poster.

Looking at Data and Education. Last year, the Education Development Center's Oceans of Data Institute convened a panel of experts to determine the skills and knowledge required of a big data-enabled specialist. The ability to think critically, apply statistical methods, and understand algorithms, as well as a desire to seek patterns, were among the key skills identified for success in the field. The blog at <http://bit.ly/1CtzgaA> examines the occupational profile and presents a vision for building K–16 students' abilities over the course of their schooling to achieve data literacy by the time they graduate.

BookMentors. Connecting teachers, librarians, and students in need of books with donors supporting literacy, reading, and education, BookMentors uses *micropatronage* (i.e., directly supporting the work of others by making donations via the internet) to solve book access problems in high-poverty schools. At the site, educators from all levels and disciplines request books they need. Donors can select a request to fulfill or create an “offer page” highlighting the book or books they want to donate. A site feature called virtual book drives allows teachers, parents, and community organizations to request and donate books, using leaderboards as a charitable gamification incentive. Learn more at www.bookmentors.org.

Rising Stargirls. This site offers *Universe: More Than Meets the Eye*, an interactive astronomy workshop for middle school girls (grades 6–8) from traditionally underrepresented groups in science. The National Science Foundation-funded workshop integrates creative strategies such as theater and writing to connect students' individual life experiences to the universe they learn about. The workshop explores constellations in the night sky, planets in and outside of our solar system, and the universe's unseen mysteries. It can complement an existing curriculum or be completed in an after-school program. Learn more at the website www.risingstargirls.org/news, or e-mail

program founder Aomawa Shields at ashields@astro.ucla.edu.

Hank Green, Internet Guy. Need some “zip” for your middle and high school science lessons? Check out the Green Brothers' educational video-based platforms on YouTube: SciShow (see <http://bit.ly/1DLOg5l>, grades 5–8) and Crash Course (<http://bit.ly/1fgbch0>, grades 7–11). These high-energy educators have created and posted hundreds of videos on science, history, and other topics. The videos, which range anywhere from 2 to 15 minutes in length, exemplify the motto “learning should be fun,” and are meant to be incorporated into lessons or viewed at home to reinforce classroom learning. Titles include *Do Plants Get Cancer?*, *How Do Fingerprints Form?*, and *A Brief History of Robotics* (SciShow) and *Water: Liquid Awesome*, *The Periodic Table*, and *Cycles in the Sky* (Crash Course).

STEM Connections. The International Technology and Engineering Educators Association's (ITEEA) monthly electronic newsletter (formerly known as *Inside TIDE*) features news, professional development opportunities, information about legislative efforts, and networking opportunities for K–college educators that highlight the importance of a STEM education for all students. ITEEA seeks to increase students' technological literacy and help schools include technology and engineering education to fully prepare today's students for the 21st-century workplace. Register to receive the newsletter, or read archived issues at <http://bit.ly/1PflW3P>.

The Wolfram Demonstrations Project. This database of interactive applets created in 2007 is the largest open repository of professionally vetted, instructional interactive content online. With more than 10,000 demonstrations representing a wide variety of grade levels and disciplines—from elementary math counting games to medical image processing and more—the site has something for every educator, K–12.

Teachers can search the resources by topic or by Common Core-supported learning standard; registered teachers can join the Demonstrations Project and submit their own interactive resources to the site. Visit the website <http://demonstrations.wolfram.com>.



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Global Competency Lessons. View and download lessons designed to develop students' global competency skills. The interdisciplinary lessons were created by National Education Association (NEA) Global Learning Fellows and offer numerous possibilities for integration with science, social studies, and language arts classes. Lessons are available for all levels along the K–12 spectrum. Selected titles include *Environmental Portraits: More than Face Value!* (elementary); *Lifeboat Earth*, a *Global Perspective* (middle); and *Magnetic Levitation Train* (high school). An annotated list of all the lessons can also be found at this website: <http://bit.ly/1I41RqA>.

Teaching With Documentaries. High school educators and film aficionados of every level can access a large collection of nonfiction films in science, the environment, and other teaching disciplines. Uniquely browsable—i.e., teachers can search the resources by topic but also by “featured” picks, highest rated, most shared—the website encourages educators to rate and share comments about the films. Set aside time to peruse the site; a search of science categories turned up numerous titles of interest, such as *Space Station Tour*; *Tesla: Master of Lightning*; *Cancer: The Forbidden Cures*; and *Living Among the Gorillas*, to name a few. Watch them at <http://topdocumentaryfilms.com>. ●