

PULL-OUT SECTION

SCIENCE TEACHERS' GRAB BAG



Inside this Convenient Pull-Out Section you will find:

Freebies for Science Teachers

Neuroscience Is...Cool. P K12 The American Academy of Neurology's web page at <https://goo.gl/F3Vq2a> offers a wealth of preK–12 activities, experiments, and science fair topics for learning about the brain while having fun. Introduce neuroscience vocabulary and relax with brain coloring pages (all ages); learn about the functions of different areas of the brain through the “Anatomy of the Brain” poster (middle and high school levels); or play a neuroscience virtual reality (VR) game on Google Cardboard, using a set of inexpensive VR goggles you build yourself (middle and high school levels). The site also has classroom lessons ranging from simple sensory activities for grades preK–2 to deeper investigations for grades 3–5 examining how the brain learns. Lessons for older students include Brain Interactive Notebook Activities (grades 6–8) and the Psychology or Health—Neurological and Brain Diseases webquest (grades 9–12).

NGSS Infographics from NSTA. K12 HE NSTA's infographics summarize the essential tenets of the *Next Generation Science Standards* (NGSS) and three-dimensional teaching. Three posters—“Why It's Time for New Science Education Standards,” “How Today's Students Learn Science,” and “A Teacher's Journey to Transition From Scientific Inquiry to 3-D Teaching and Learning”—are the first in a series exploring all aspects of the NGSS. Of interest to K–college teachers and administrators alike, the colorful posters include links for more information and can be printed, shared, and sent among friends and colleagues. Download the posters at <https://goo.gl/KdgqNq>.

The Frogs of Panama. K12 HE Engage K–12 and college students in authentic science research or explore biodiversity and conservation issues in the classroom with outreach materials developed by scientists/educators studying frogs at the Smithsonian Tropical Research Institute in Panama. Mate Choice Activity (for advanced high school and introductory college levels) has students collect data (from videos) to study frog acoustic communication about mate choice in female frogs and guides them through a statistical analysis of the results. The Fabulous Frogs of Panama (for elementary through middle levels) teaches about the diversity of Panamanian amphibians as students identify amphibians using a dichotomous key, examine similarities and differences between frogs and toads, study the frog life cycle, and discover strategies frogs use to avoid predation. Access both resources at <https://goo.gl/Mqyyimc>.



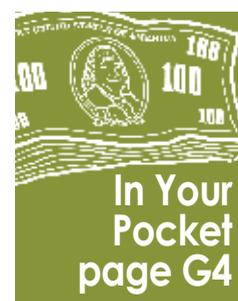
DIRK VAN DER WADE

ISS and Project WET. K12 NASA declared September 2017 to September 2018 as a Year of Education on Station, and to celebrate, they are featuring fun, education-related activities aboard the International Space Station (ISS), including several from Project WET. Students ages eight and up can participate in The Water Use Challenge, a digital trivia interactive. In the challenge, students answer questions about personal water use, learning facts about water use and conservation along the way and comparing their water-use data to the amount of water an astronaut uses in a day. (Hint: Astronauts use a lot less!)

Teachers can download the *Out of This World Lesson Plan*, a 22-page guide featuring suggestions to help teachers relate Project WET activities to the ISS. The guide addresses activities for K–12, and includes standards correlations, NASA videos and resources, and digital games to review learning. Visit <https://goo.gl/Mk1ZuS> (registration is required to download the guide).

Explore Science Digital Kits. K12 The National Informal STEM Education (NISE) Network and partners have produced hands-on activity kits on science, technology, engineering, and math (STEM) topics, including Earth and Space Science, Nano Science, and Chemistry (coming in September 2018). Available in both Spanish and English, the kits offer digital materials on each topic, including hands-on STEM activities, planning and promotional materials, and “teacher training” videos. Although the kits are designed for use in informal education settings (e.g., museums, camps, and university outreach programs), K–12 teachers can do the activities in the classroom.

The Earth and Space 2018 kit, for example, features more than a dozen activities suitable for elementary to adult audiences, covering topics as diverse how the shape of the land and the pull of gravity influence the movement of water over Earth (e.g., Exploring Earth: Paper Mountains) to helping students design and build their own space telescope models (e.g., Exploring the Universe: Pack a Space Telescope).



See Freebies, pg G2

Freebies, from pg G1

Download these and other resources at www.nisenet.org.

Understanding Food and Climate Change. **MH** Two digital publications developed by the Center for Ecoliteracy in Berkeley, California, explore the relationships between our changing climate and what we grow, eat, and discard. Suitable for grades 6–12 and general audiences—and supporting the NGSS and National Curriculum Standards for Social Studies themes—*Understanding Food and Climate Change: An Interactive Guide* (<https://goo.gl/HBDozG>) uses text, video, photography, and interactive experiences to teach climate science and help readers see how food and climate interact and how personal choices can make a difference. A companion publication, *Understanding Food and Climate Change: A Systems Perspective* (<https://goo.gl/r8Eagq>), takes a broader approach to the topic, presenting a collection of essays demonstrating how

seemingly disconnected phenomena are often dynamically linked and can be understood best when viewed in a larger context.

GigaPan in the Garden. **K12 HE** Since 2013, educators at West Virginia University have collaborated with the Create Lab at Carnegie Mellon University to use gigapan technology—i.e., panoramic digital images with billions of pixels combined into a single, zoomable image—for garden-based learning linked to the NGSS. The technology has been used with both inservice and preservice teachers and elementary students. The April 2018 issue of *GigaPan Magazine* showcases examples of some of the gigapan images that have been created, along with stories and descriptions of how the images link to NGSS. Like what you see/read? The issue's Background Section includes a link to register for GigaPan membership (basic level is free) that affords additional capabilities for instruction. Consult <https://goo.gl/AbPwwj>.



NASA AND THE HUBBLE HERITAGE TEAM (AURA/STSC)

New Astronomy Resource Guides. **K12 HE** Visit the Exploring the Universe website (<https://goo.gl/UgXzxm>) to view or download a collection of new or updated astronomy resource guides for K–college teachers and students. Compiled by astronomer/educator Andrew Fraknoi, the online guides present annotated lists of the best books, articles, and websites on several space and astronomy topics, including women in astronomy, Pluto and the Kuiper Belt, sources for astronomical images, free online lab exercises, plays about astronomers,

the Messier Catalog, and debunking astronomical pseudoscience. The lists are hyperlinked, providing quick access to many of the suggested resources, and are downloadable as either PDFs or Word files.

Smithsonian Life Science Resources. **EM** Ditch the lecture and spice up your K–8 biology instruction with engaging resources from the Smithsonian Science Education Center. Students can play games like Showbiz Safari (grades 1–3) and Habitats (grades 3–5) to learn about the diversity of plants and animals in different habitats; watch videos such as *How Do Orchids Attract Pollinators?*, *What Can We Learn from Lion Poop?*, and *How Do Scientists Use Electricity to Study Fish Populations?* (all for grades 3–8) to study plant and animal behaviors; or travel the world to observe six insects in their natural habitats in the animated e-book *Expedition: Insects* (grades 3–5), complete with accompanying coloring pages. Access these and other life science resources at <https://goo.gl/SugHNT>. ●

WANT TO FLY TO AN NSTA FALL CONFERENCE FOR FREE?

RENO, NV
October 11–13

NATIONAL HARBOR, MD
November 15–17

CHARLOTTE, NC
November 29–December 1

Enter to win 1 of 18 round trip tickets on Southwest Airlines.

View details and enter here: nstatravel2018.hscampaigns.com

Contest runs July 9–27, 6 tickets awarded per week

Southwest

NSTA National
Science
Teachers
Association