A Compendium of Selected Educational Resources for You and Your Students

- Earth2Class:  
  www.earth2class.org/site

Archived workshops presented by Lamont-Doherty Earth Observatory research scientists

- Curriculum units for teaching Earth Science

- Educational resources (slideshows, lesson plans, teaching tips, images, etc.)
Earth2Class (Earth to Class)

E2C is a unique science/math/technology resource for K-12 teachers, students, the general public, and geoscientists. It is a collaboration among researchers and an Earth Science educator at the Lamont-Doherty Earth Observatory of Columbia University; technology integration specialists from Colégio Bandeirantes, São Paulo, Brasil; and classroom teachers from New York, New Jersey, and elsewhere.

E2C centers around "Saturday Workshops for Educators" held at Columbia's Lamont Campus in Palisades N.Y. One key feature to E2C is involvement of LDEO scientists. Their availability through workshops, web site postings, and e-mail allow teachers and students access to cutting-edge research which can be used to develop learning activities directly linked to "real-world problems," and provide scientists with an effective format to disseminate their discoveries more broadly. Since 1998, we have provided more than 120 Workshops featuring over 80 LDEO scientists.

EARTH2CLASS IS HOSTED AT THE LAMONT-DOHERTY EARTH OBSERVATORY OF COLUMBIA UNIVERSITY

Lamont-Doherty Earth Observatory
COLUMBIA UNIVERSITY | EARTH INSTITUTE

Directions to the Lamont Campus

2015 - 2016 Workshops and Related Classroom Resources

19 Sep -- Arthur Lerner-Lam (LDEO Deputy Dir.) -- Trends in Frontier ES Research

3 Oct -- "The Hackensack River Past, Present, and Future" as an Example for Developing Innovative Lessons

14 Nov* -- Allison Wing -- Developing Better Understanding of Hurricanes

Quality-Climate-Vegetation Interactions
“Impact of Ocean Acidification” with Taro Takahashi (19 Mar 2016)

Originally presented 19 Mar 2016
Workshop funded in part by NOAA Award Number NA15NOS0080223 through the National Ocean Service

We are honored to welcome back to E2C Dr. Taro Takahashi, the Ewing Lamont Research Professor and one of the world’s most prominent investigators in the field of Geochemistry. For more than six decades, Dr. Takahashi has investigated the Carbon Cycle, especially the behavior of carbon dioxide in the ocean. His work has contributed significantly to crucial questions and answers in understanding global climate change.

In this program, Dr. Takahashi will share results of recent projects that advance these understandings.

Learn more about Dr. Takahashi and the LDEO Carbon Dioxide Research Group.
Earth Science Curriculum Units and Teaching Tips

Click for the background of this project and more information.

- Key Vocabulary Terms for High School (PSE) and Middle School (ILS) courses
- Key Ideas
- Selected Labs and Activities
- Selected Websites
- Links to NYS Earth Science Reference Tables
- State Standards for NYS High School (PSE) and Middle School (ILS). + Others

NESTA Fall 2014 Workshop slideshows — For all NESTA/Windows to the Universe workshops presentations

- How Weird Can It Get Fall 2014 Long Beach
- Earth Science Rocks Workshop Fall 2014 NSTA Orlando (1)
- Harnessing ESS Fall NSTA 2014 Long Beach
- Using Data Workshop NSTA Fall 2014 Long Beach

Note: This is a continuous work-in-progress. If you have suggestions for additions or find problems, please notify micheal@earth2class.org.
NESTA—NATIONAL EARTH SCIENCE TEACHERS ASSOCIATION

www.nestanet.org

- Largest professional society focused on supporting K – 12 Earth Science education
- Website provides online teacher resources, links to PD opportunities, and more
- Quarterly journal, *The Earth Scientist*, provides peer-reviewed articles of value to K – 12 teachers
- Monthly E-News with timely information for ES educators
- Conference workshops, rock raffle, other programs
Welcome to NESTA

Welcome to NESTA has been updated.

- Clone content

FINISH THE SCHOOL YEAR STRONGLY!

Join us at NESTA PD Workshops across the country at the NSTA Nashville National Conference next spring! Preview the NESTA workshops planned for the 2016 Nashville program and browse presentations from the Fall 2015 Area Conferences.

Have ideas for student projects and need some funding support? NESTA announces the opportunity to apply for a Harold B. Stonehouse Mini-Grant. Find out about rules and requirements.

For breaking news and interesting discussions, join the NESTA Facebook group. Follow the link in the upper right to learn more.

Concerned about proposed changes in State Assessment and Standards? NESTA is coordinating with other leaders in Earth Science Education to monitor potential decisions that will affect ES teaching. Here is one example of how NESTA can support efforts to influence the Decision Makers.

Help Support NESTA Today! NESTA works very hard to keep membership costs low, thanks to the efforts of its volunteers and hard working small staff. When it’s time to renew your membership—or whenever you want to support NESTA’s efforts to support strong Earth Science Education— we hope you will consider making a donation to NESTA to help expand the resources and programs we offer for teachers and students. Contributions to the National Earth Science Teachers Association are tax exempt under NESTA’s non-profit IRS designation. We will be glad to provide a letter of appreciation recognizing your donation for tax purposes.

NESTA’S Mission

NESTA aims to increase student interest and achievement in study of Earth Science through the establishment and support of local and state teacher networks, the enhancement and expansion of continuing education opportunities, and the development and enhancement of curriculum resources and support materials.
Windows to the Universe
www.windows2universe.org

- One of the most widely-used online resources for Earth and Space Science (> 12 million users)
- Themes include: Sun, Earth, Solar System, Sciences, Culture, People, Just Fun
- Archived teacher workshops, PowerPoints, pdfs

- “Public” site contains ads, unable to print resources
- “Member” site lacks ad, allows printing, other privileges
The spinning vortex of Saturn’s north polar storm resembles a giant deep red rose surrounded by green foliage in this false-color image from NASA’s Cassini spacecraft. The eye is 2,000 kilometers across with cloud speeds as fast as 150 meters per second. It is not known how long this newly discovered north-polar hurricane has been active. The view was acquired at a distance of approximately 419,000 kilometers from Saturn.

NASA/JPL-Caltech/SSI
When Nature Strikes - Natural Hazards

The United Nations estimated that between 1994-2015, there were 6,873 natural disasters worldwide, which affected 218 million people and claimed 1.35 million lives. The frequency of disasters like earthquakes, tsunamis, volcanoes and landslides stayed fairly constant during that 21 year period whereas climate-related events like floods, hurricanes and tornadoes were on the rise. And, of course, something on Earth is always burning! NASA's Earth Observatory tracks wildfires across the world with maps available for viewing from 2000-present. Some wildfires can restore ecosystems to good health, but many can threaten human populations, posing a natural disaster threat. Finally, you don't normally see space weather forecasted on the evening news, but it does impact life on Earth in many ways. What are the threats posed from all of these natural disasters and how can we work to mitigate those threats beforehand?

Students will be captivated by the material presented in these NBC Learn Videos, and their earth system science connections built up by the related secondary classroom activities. When teaching about natural disasters, there are certainly no lack of teachable moments! These materials are brought to you by Windows to the Universe and the National Earth Science Teachers Association with funding from the National Science Foundation.

<table>
<thead>
<tr>
<th>NBC When Nature Strikes Videos</th>
<th>Related Lesson Plans</th>
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</thead>
<tbody>
<tr>
<td>Earthquakes</td>
<td>Earthquakes Classroom Activity</td>
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<tr>
<td>Volcanoes</td>
<td>Volcanoes Classroom Activity</td>
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<tr>
<td>Hurricanes</td>
<td>Hurricanes Classroom Activity</td>
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<td>Flash Floods</td>
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<tr>
<td>Landslides</td>
<td>Landslides Classroom Activity</td>
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<tr>
<td>Tornadoes</td>
<td>Tornadoes Classroom Activity</td>
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These listservs provide a service where members post questions, responses, and discussion of materials related to the listserv(s) to which you are subscribing. New subscribers should keep in mind that joining a listserv means that you will be receiving ALL of these messages as they are posted. Please be prepared for an increase in the volume of email that you receive when joining a listserv. Also, anti-spamming software and/or settings on your email service provider will adversely affect your subscription to OMNI listservs. We thank you for your interest, and your participation, in OMNI. Look below the subscription form for information on the Math listserv from AMNYC.

To SUBSCRIBE to one of these lists create a new email message addressed to listserv@listerv.oneyonta.edu from the email account you wish the list to use with the following in the body:

```plaintext
SUBSCRIBE listname ANONYMOUS
or
SUBSCRIBE listname Full_Name
```

example: SUBSCRIBE ESPRIT Joe Smith

You will get a confirmation email. *Check your junk mail!

To UNSUBSCRIBE to one of these lists create a new email message addressed to listserv@listerv.oneyonta.edu from the email account you are subscribed under with the following in the body:

```plaintext
SIGNOFF listname
```

example: SIGNOFF ESPRIT
‘Do-Now’ Daily Observations

- Sun/Moon/Rise/Set/Phases

- Current Weather & Weather Hazards
  http://www.weather.gov/
  Use search box to get local conditions

- Teaching Climate
  http://climate.gov/teaching

- Tide Predictions
  http://tidesandcurrents.noaa.gov/tide_predictions.html
“DataStreme” Courses
American Meteorological Society
http://www.ametsoc.org/amsedu/
- Free online courses in Fall & Spring
- 3 grad credits from SUNY Brockport
American Museum of Natural History Educational Programs—Representative for other ‘Informal Science’ institutions

- [http://www.amnh.org/learn-teach](http://www.amnh.org/learn-teach)
- Experiences for students & families
- Experiences for Educators
Online PD Courses for Teachers

“Seminars on Science”
American Museum of Natural History
http://www.amnh.org/learn-teach/educators/seminars-on-science-online-graduate-courses-for-teachers
6-week courses on a variety of topics

Basic fee to AMNH, with option to earn credit through cooperating institutions
NSTA – National Science Teachers Association

http://www.nsta.org/

Online and print resources and journals

National and Area Conferences

Special STEM conferences
Science Standards & Curriculum Guidelines


“Next Generation Science Standards” - Achieve
American Geosciences Institute
Education Programs

www.americangeoscience.org/education

- Educational resources:
  “Big Ideas in Earth Science”
  “Earth Science Week”
  “Center for Geoscience and Society”
  “Earth Science World Image Bank”, etc.

- Awards
  Edward C Roy Award for Excellence in K-8 Teaching

- Curriculum materials—print, online
GEOPHYSICAL INFORMATION FOR TEACHERS (GIFT) WORKSHOPS

See the topics and presenters for this year’s GIFT Workshop on our GIFT 2014 page.

ABOUT THE GIFT WORKSHOP

Geophysical Information for Teachers (GIFT) Workshops allow science teachers to hear from experts in the Earth sciences and sharpen their knowledge on topics such as gravity, seismology, and above-ground nuclear tests.
### Education & Outreach Programs

#### K-12 Educators
Field experiences, classroom resources, and professional development for teachers.

#### Teacher Advocate Program (TAP)
- Field Experiences
- Professional Development
- Lesson Plans & Resources
- Teacher Awards

#### Students & Recent Graduates
Paid volunteer opportunities, field experiences, short courses, grants, and career resources.

#### Field Experiences
- Bighorn Basin Field Award
- Geocaching
- Field Camp Scholar Award

#### Professional Development
- Workshops
- Webinars (coming soon)
- Short Courses

#### Field Camps
- Geocaching
- Nature of Science
- Geologic Time Scale

#### Teacher Awards
- Outstanding Earth Science Teaching Award

#### College Faculty
Field experiences, professional development, and mentoring opportunities.

#### Professional Development
- Short Courses
- Geocorp™ America

#### Faculty Awards
- Biggs Awards for Excellence in Earth Science
- Field Camp Excellence Award
- Bighorn Basin Field Award

#### Voluntary Opportunities
- Mentor Programs
- Join GSA

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### General Public
EarthCaching events and activities, and geoscience for the general public.

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### Employment
Resources for those seeking employment in the geosciences.

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### Other Student Resources

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### Research Grants
Grad Student Research Grants

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### GSA Store
Visit the GSA Store for additional resources and merchandise.

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### Join GSA
Not a GSA Member? Join today!
NOS Education

Building ocean, coastal, and climate literacy for students and educators.
**The Gold Rush and the 1906 Earthquake**

How did the California Gold Rush and the 1906 San Francisco earthquake help lead to our understanding of plate tectonics and modern seismic science? All is explained in a new, archived public lecture, *The Gold Rush and the 1906 Earthquake*.

This is an especially good lecture for classroom use, with simple descriptions and demonstrations of concepts.

Find educational materials for earthquakes at our Earthquake Hazards Program [Learning site](https://education.usgs.gov).

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**Education Resources**

**Biology, Geography, Geology, Water**, and much more...

- **Grades K–6**
- **Grades 7–12**
- **Undergraduate**

**Frequently Visited Resources**

- Videos and Animations
- Online Lectures
- Citizen Science
- Find a Map!
- Find an Image!
Deep Earth Academy – Education resources based on scientific ocean drilling aboard the JOIDES Resolution

- [http://joidesresolution.org/node/3002](http://joidesresolution.org/node/3002)
- Online educational resources
  - More than 60 downloadable activities
- Teaching kits and core models
- Videos
- Interactives
- “School of Rock” (Teachers at Sea)
Tales of the Resolution Reading Activities

Summary:
Students use these questions to guide their reading of the Tales of the Resolution episodes focused on careers, technology, and science process exploration. They are designed to support Common Core State Standards for English & Literacy in Science.

Downloads and resources:
- Overview
- Teacher's Guide
- Student's Guide
- Supplemental resources:
  - Episode 1: Tales of the Resolution!
  - Episode 2: Re-Fit Madness
  - Episode 3: Resolution Reloaded
  - Episode 4: Arctic Rainforest
  - Episode 5: Choose Your Own Tales of the Resolution - Jobs on the JR
Your suggestions?

☐ This presentation available at:

☐ https://www.nestanet.org/cms/content/nesta-events-nsta-nashville