

GREENTIMES TEACHER GUIDE

Forces of Nature

June 2005

This guide includes suggested cross-disciplinary activities, background information, and reproducible pages of discussion questions that relate to *Greentimes: Forces of Nature*. We hope that these suggestions will help you incorporate *Greentimes* into your classrooms! Please feel free to tell us what you want to see in these guides in the future – just e-mail Heather at hfreeman@greenscreen.org!

Hands-on Science Experiments

- Make your own **volcano** with instructions from:
http://www.ehow.com/how_7938_make-volcano.html
Simulate a volcanic eruption using simple household materials such as a 2-liter bottle, dishwashing soap, baking soda, food coloring and white vinegar.
- Create a **tornado** in the classroom at:
<http://www.ucar.edu/40th/webweather/tornado/tornadoes.htm>
Although a more complex experiment, this will help students to visualize what the creation of a tornado looks like and how it happens in nature. The instructions are simply written, and additional supplemental information is offered.
- Show how density affects **how magma moves**:
Materials: tap water, quart (liter) jar with lid, red food coloring, spoon, 1 cup of vegetable oil, timer
Put water in jar, add 10 drops of food coloring and stir. Slowly add the oil. Secure the lid and hold the jar by a window so that the light shines through. Slowly turn the jar upside down and then turn it back to its original position. Observe and record the movement of the liquids for around 30 seconds. Explain that the water sinks because it is denser than the oil. Magma is less dense than the rock that surrounds it, and therefore rises.

Art Projects

- Have students draw **maps** of Pangaea, Laurasia and Gondwanaland.
- Students can express their knowledge of the **layers of the Earth** by drawing a diagram and labeling each layer. Remind them that each layer should reflect their relative depths and sizes.
- Have students create a 3D model of a **volcano** using clay or play dough or an empty container as a base. Use paint and tissue paper to cover the base. Other common items, such as pipe cleaners, glitter or cotton balls can be used to simulate the different characteristics of a volcano.

Reading Suggestions

- “Hurricane and Tornado” by Jack Challoner
- “Dangerous Planet: Natural Disasters That Changed History” by Bryn Barnard
- “Eyewitness: Volcano & Earthquake” by Susanna Van Rose

Writing Exercises

- Have students write a **newspaper article** relating to any of the featured *Greentimes* articles. For example, a student could report on a mock earthquake and in the article describe how an earthquake happens.
- Have students write a **first person** account of any of the natural disasters discussed. They could write about a real or imagined experience.
- Ask students to **compare and contrast** any 2 of the forces of nature discussed.

Language Arts

- Students can **broaden their vocabulary** by choosing 10 terms from *Greentimes* that they do not know the definition of. Have them try to determine meanings through the context, and then by looking words up in the dictionary. This activity can be expanded by asking students to write sentences using these words, or by compiling a class vocabulary list.
- Have students practice reading skills by taking turns reading the articles out loud, in front of the class, or in small groups.

Geography

- Identify areas (states, countries, bodies of water) where different forces of nature are common. Discuss why the given weather or a geological event is prevalent in that area. *Example, Florida is hit by hurricanes seasonally because it is a peninsula surrounded by warm waters.*

Math

- Create problems asking students to determine **probabilities**. *If Florida experienced 14 hurricanes last year and 5 of them occurred in August, what is the probability that Hurricane Joan occurred in August?*
- Practice finding the **mean, median and mode** of a set of numbers. *If California is hit by 4 Earthquakes that register 4.3, 2.5, 1.9 and 4.4 on the Richter Scale, what is the mean number? Mode? Median?*
- Make problems that require students to use the **order of operations**. *If in 2004, a town experienced 2 landslides in September, 1 in October, 5 in November, 3 in December, 7 in January, 3 in February, 2 in March, 2 in April, 1 in May, 4 in June, 2 in July, and 3 in August, what was the average amount of landslides in 2004?* Students can also practice making **graphs** and **charts** with similar groups of data.

Background Information

- <http://skydiary.com/kids/> research, visuals and links on **weather and storms**.
- <http://www.w3.weather.com/education/> can be used as a **weather** resource for teachers and students alike. Additionally, there are interactive tools for students to present their own 5-day forecasts, and learn about professions.
- <http://www.kidinfo.com/Science/Geology.html> a comprehensive list of websites directing you to anything you could ever want to know about **geology!**
- http://www.geology.sdsu.edu/how_volcanoes_work/ aimed at geology students and teachers, this website provides a comprehensive explanation of the causes and effects of **volcanoes**.
- <http://kids.earth.nasa.gov/archive/pangaea/evidence.html> information about the super continent **Pangaea**, and evidence supporting its existence.
- http://www.prh.noaa.gov/itic/library/about_tsu/faqs.html the International **Tsunami Information's** site provides information on how tsunamis are formed and various other facts.
- <http://pubs.usgs.gov/gip/earthq1/> anything you could ever want to know about **earthquakes** is answered here.