

Geology Rocks!



Geology

The word "geology" is derived from two Greek words; Gia-earth and Logos- talk

The Approach

Billy utilizes comprehensive sensory integration through song, dance, audience participation and a multi-dimensional backdrop to engage performance attendees in an introduction to some of the major concepts of the science of geology. Both the backdrop and the presentation material convey scientific concepts relating to geology such as; the earth's composition, volcanoes, plate tectonics and erosion in an accurate manner.

Geology is brought alive during this show. Students are given the opportunity to become part of the performance and through song and dance relate to the dynamic energy, movement, and dimension involved in the study of geology.

Suggested Pre-Performance Activities

1. Discuss the concepts of the sun, planets, and solar system.
2. Encourage student awareness of "man-made" surfaces (cement, asphalt, etc.) as opposed to natural surfaces and land forms (mountains, plains, valleys, beaches, etc.).

The Objective

Students will develop an active interest in geology, how it is studied and why it is important. Student knowledge of natural geologic processes, geologic history, and the land around them expands to enhance their understanding of the earth.

Student vocabulary will expand with age appropriate terminology related to the geological concepts covered in depth during the performance.



The Result

A fabulous lesson, presented with great enthusiasm, talent and fun. He adapted each program well for the higher/lower grades. The Principal was very pleased as were the teachers and students. We will book him again in the future.

PTA Representative

Geology Rocks! In the Classroom

Vocabulary Words

GRADES K - 2

continent - Any of the seven large continuous land masses that constitute most of the dry land on the surface of the Earth.

crust - Pertaining to geology; the thin outermost layer of Earth.

cycle - A sequence of events that is repeated again and again.

erosion - The transportation of products of weathering by water, gravity, wind or ice.

layers - A single thickness of something that lies over, under or between something.

mountain - A high and often rocky area of a land mass with steep or sloping sides.

planet - An object in orbit around a star.

plate - Any segment of the Earth's crust that moves in relation to other segments.

rock - An aggregate of one or more minerals.

shift - To move something to a different position, or be moved to a different position.

soil - A complex mixture of organic and inorganic materials.

star - A gaseous mass in space that generates energy by thermonuclear reactions.

sun - The star around which Earth revolves.

valley - A low lying area of land.

volcano - A naturally occurring opening in the surface of the Earth through which molten, gaseous, and solid material is ejected.

weather - The state of the atmosphere with regard to temperature, cloudiness, rainfall, wind, and other meteorological conditions.

weathering - the disintegration and decomposition of rocks and minerals by natural processes such as the action of frost or percolating ground water.



GRADES 3 - 5

aggregate - Composed of mineral fragments or crystals mixed in one rock.

crystal - A solid object with flat sides (called faces) that meet in straight lines and sharp points.

element - A substance composed entirely of one of the more than 100 different types of atoms.

erosion - The transportation of products of weathering by water, gravity, wind or ice.

fault - A break in the rocks there has been movement.

igneous rock - Rock that has cooled from a molten condition.

lava - Molten rock on the surface of the ground; also the name for rock formed this way.

magma - Molten rock below the surface of the earth.

metamorphic rock - A rock that has been changed by heat or pressure— or heat and pressure together.

mineral - A naturally occurring solid composed of an orderly arrangement of one or more chemical elements.

sedimentary rock - Rock composed of sediments that have been deposited by water, wind, or ice.

weathering - the disintegration and decomposition of rocks and minerals by natural processes such as the action of frost or percolating ground water.

Post Performance Activities

1. Plot the locations of active volcanoes and recent earthquakes on a world map. Scan newspapers, periodicals and the internet for reports of recent eruptions and earthquakes to add to your map. Take note of any patterns of occurrence that might result. Do these new earthquakes and eruptions occur along plate boundaries?
2. Prepare a small package of jello according to package directions. Pour into a shallow flat pan (roughly 11" X 7"). Refrigerate and allow to set. Make some cuts through the layer, both curves and straight lines. Place pan briefly in warm water to loosen the bottom. Now try pushing from both ends. How does the jello react? What happens at the "faults"?
3. Hard-boil an egg and slice it, complete with the shell, through the center. How is the cross-section of the egg similar to a cross-section of the Earth? How is it different? Math extension: Measure the thickness of each layer of the egg. Utilizing a diagram of a cross-section of the Earth with the dimensions of each layer given direct students to answer the following question; If the Earth were reduced to size of the egg, would its layers have the same proportions?
4. Build and paint a paper mache model of a volcano around

a small baby food jar. Fill the baby food jar with vinegar. Add baking soda to make the volcano erupt! Food coloring can be added. Corn syrup added to the vinegar can make the mixture a little thicker but the reaction will be slower.

Activities Utilizing the Arts

Drama - Divide the class into two groups. One group represents a continental "tectonic plate" while the other group represents an oceanic "tectonic plate." "When these two "plates" come together (converge), the continental plate will create a coastal mountain chain, while the oceanic plate will create a deep water trench. Have the "plates" converge (SLOWLY) and the continental group of kids at the convergent area become a coastal mountain range (arms raised) and the oceanic group at the convergent area will subduct (squat down) and become a deep water trench.

Mime - Imitate a volcano building up pressure from below and erupting.

Visual Arts - Draw the Grand Canyon and emphasize the layers of rock.

Dance/Movement - While reviewing concepts presented in the show allow students to repeat the movements/dances done by Billy B to represent those concepts.

Music - Sing memorable lines from "Geology Rocks!" Also have the students write their own songs using the concepts and vocabulary covered in the performance.

Teacher Resources

Dixon, Dougal, (1992), *The Practical Geologist*. Simon and Schuster.

Erickson, Jon, (1994), *Quakes, Eruptions and Other Geologic Cataclysms*. Facts on File, The Changing Earth Series.

Erickson, Jon, (1992), *Plate Tectonics: Unraveling the Mysteries of the Earth*. Facts on File.

Farndon, John, (1992), *How the Earth Works*. The Reader's Digest Assoc., Inc.

Fodor, R. V., (1993), *Chiseling the Earth: How Erosion Shapes the Land*. Enslow Publishing.

Levy, Matthys and Mario Salvadori, (1995), *Why the Earth Quakes: The Story of Earthquakes and Volcanoes*. W. W. Norton and Co.

Macdougall, J. D., (1996), *A Short History of Planet Earth*. John Wiley and Sons, NY.

Ranger Rick's Nature Scope, (1988), *Geology: The Active Earth*. National Wildlife Federation.

Thomson, Betty Flanders, (1977), *The Shaping of America's Heartland*. Houghton Mifflin Co. (General reading).

Student Resources

Cole, Joanne, (1987), *The Magic School Bus Inside the Earth*. Scholastic, Inc.

Farndon, John, (1992), *How the Earth Works*. The Reader's Digest Assoc., Inc.

Hilston, Paul and Christine Rohn Hilston, (1993), *A Field Guide to Planet Earth*, Chicago Review Press.

Horenstein, Sidney, (1993), *Rocks Tell Stories. Beyond Museum Walls. Rocks and Minerals*. Millbrook Press. Macmillan Publishing Co.

Newton, David, (1993), *Earthquake*, Franklin Watts.

Rauzon, Mark J. and Cynthia Overbeck Bix, (1993), *Water, Water Everywhere*. Sierra Club Books for Children, S.F.

Sattler, Helen Roney, (1995), *Our Patchwork Planet*. Lothrop, Lee and Shepard, NY. Walker, June, (199), *Fascinating Facts about Volcanoes*. The Millbrook Press.

Walker, Sally M. (1992), *Water Up, Water Down: The Hydrologic Cycle*. Carolrhoda Books, Inc., Minneapolis.

National Science Education Standards

Geology Rocks! conveys connections to the following standards:

Science as Inquiry

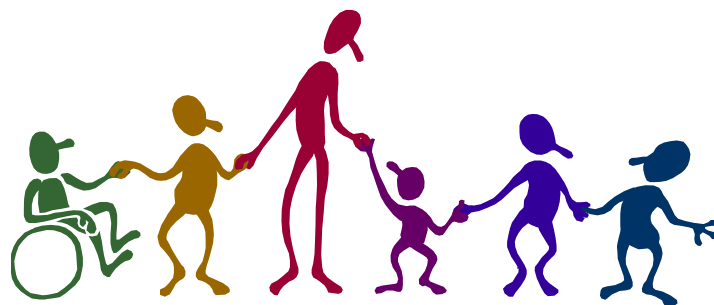
- _ Understanding of scientific concepts
- _ An appreciation of "how we know" what we know in science
- _ The dispositions to use the skills, abilities, and attitudes associated with science

Physical Sciences

- _ Properties of objects and materials
- _ Properties and changes of properties in matter
- _ Position and motion of objects
- _ Motions and forces

Science and Technology

- _ Abilities to distinguish between natural objects and objects made by humans



Unifying Concepts and Processes

- _ Change, constancy, and measurement
- _ Systems, order, and organization
- _ Evidence, models, and explanation
- _ Form and function

Earth and Space Sciences

- _ Properties of earth materials
- _ Changes in earth and sky
- _ Structure of the earth system
- _ Earth's history

National Research Council. *National Science Education Standards*. Washington, D.C.: National Academy Press, 1996.