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"Earth Underfoot"

Teacher Resource Guide

***Virginia Living Museum's* Natural Science Education Program**

- **Grade:** 5
- **Length of Session:** 45 minutes
- **Number of Students:** 60 maximum
- **Fee:** (includes self guided tour of exhibits)
  - Contract schools: Please call for information
  - Non-contract schools: $9.75 per student ($360 minimum)

For more information or to make a reservation, call the Reservations Coordinator at 757-595-9135 Monday-Friday, 9 a.m. - 4:30 p.m. or fill out the on-line request form.

Program Description

Our fascinating Earth constantly recycles itself! From igneous to metamorphic to sedimentary - the dynamic geologic forces illustrated by the rock cycle and Earth's structure are explored and explained in this engaging hands-on Earth science program. Fun student activities reinforce important interrelated elements of Earth's geologic processes.

Virginia Standards of Learning Correlations

Science: 5.1 5.4 5.7

Program Objectives

The Student will:

- Name the Earth's layers from crust to core;
- Provide a simple description of what materials are found in each layer (solid rock, magma, metal – liquid or solid, etc.);
- Describe formation differences between igneous, sedimentary and metamorphic rocks;
- Reproduce a simple rock cycle diagram.

Exhibit Tie-ins

The Museum's indoor and outdoor exhibits provide a wide variety of ways to connect your students to important SOL-correlated learning opportunities. Here are just a <u>few</u> examples:

<u>Virginia Underground Gallery</u>:
Virginia Caves: What processes created the caves in Virginia? What type of rock are Virginia caves made from? How do you know?
Treasures from Morefield Mine: Virginia is rich in mineral resources. What are some of these minerals and what are their uses?

<u>Virginia Underground Discovery Center</u>:
Pull-out Specimens: How do geologists use a "core sample"? Describe "mica" – what are its uses?

(Continued)

Vocabulary used in Program

Compression: earth materials being pressed or forced together.
Crust: the Earth's outermost layer, mostly rocky, averaging 5 miles (8 km) thick under the oceans and averaging 35 miles (56 km) thick under mountain ranges.
Crystal: A mineral with a specific geometric shape (i.e., a cube or a prism).
Erosion: the transport and redeposit of sediment and rock fragments.
Igneous rocks: Rock formed after molten rock (magma) solidifies. They can form at or below Earth's surface. How fast or slow the magma crystallizes determines the size of mineral grains found in the rock.
Inner core: the solid iron/nickel center layer of Earth, about 1540 miles (2440 km) across.
Lava: magma which breaks through to the surface of the Earth from underground and eventually cools to solid rock.
Magma: molten rock that remains underground and occurs where heat melts parts of the Earth's upper mantle and lower crust.
Mantle: A layer of rocks 1800 miles (2900 km) thick between the Earth's crust and its core. Parts of the mantle are semi-molten and flow in sluggish currents.
Melting: the process of turning from a solid to a liquid or liquid-like state.
Metamorphic rocks: Rock formed by the extreme pressures and temperatures associated with plate movements and magma chambers deep below Earth's surface.
Minerals: Elements or compounds that occur naturally in Earth's crust; building blocks of rocks.
Outer core: A layer of dense molten rocks about 1380 miles (2222 km) thick between Earth's mantle and inner core – high content of iron and nickel.
Rock cycle: All of the processes of rocks forming, breaking down, reforming and transportation taken together.
Sediment: Muds, sands and other earth debris washed off the land's surface.
Sedimentary rocks: Rock formed when layers of sediment compact. They also form by chemical depositing of minerals dissolved by water. Sedimentary rocks form at low temperatures at or very close to Earth's surface.
Weathering: the wearing down of rocks by physical or chemical processes.

Recommended Websites

Interactives Dynamic Earth
http://www.learner.org/interactives/dynamicearth/

United State Geological Survey's Learning Web
www.usgs.gov/education/

American Geological Institute
4220 King Street
Alexandria VA 22302
(703) 379-2480
publications and curricula
www.agiweb.org
www.earthscienceworld.org
www.earthsciweek.org

National Earth Science Teachers Association, P.O. Box 2194
Liverpool, NY 13089-2194
www.nestanet.org
Rock Cycle Interactive:
www.classzone.com/books/ml_sci_earth/page_build.cfm?id=none&u=1##

National Science Digital Library Refreshers
www.nsdl.org/refreshers/science