

#9379

# THE ROCK CYCLE

EDUCATIONAL ACTIVITIES

1998

Grade Levels: 7-10

20 minutes

## DESCRIPTION

Rocks, a naturally formed material that covers the earth, are classified by their origin. Discusses rocks' composition, three types (igneous, sedimentary, and metamorphic), how they are formed, and how they are changed. The rock cycle is a slow, ongoing process.



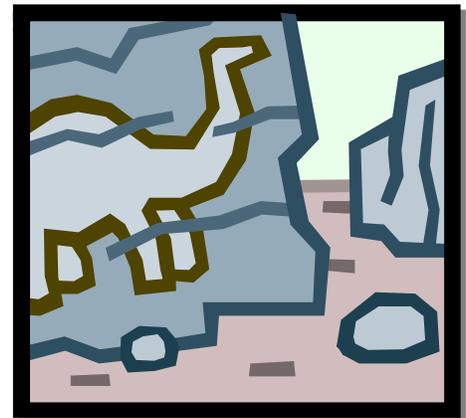
## ACADEMIC STANDARDS

### Subject Area: Science: Earth and Space Sciences

- Standard: Understands Earth's composition and structure
  - Benchmark: Knows processes involved in the rock cycle (e.g., old rocks at the surface gradually weather and form sediments that are buried, then compacted, heated, and often recrystallized into new rock; this new rock is eventually brought to the surface by the forces that drive plate motions, and the rock cycle continues)
  - Benchmark: Knows that sedimentary, igneous, and metamorphic rocks contain evidence of the minerals, temperature, and forces that created them
  - Benchmark: Knows how successive layers of sedimentary rock and the fossils contained within them can be used to confirm the age, history, and changing life forms of the Earth, and how this evidence is affected by the folding, breaking, and uplifting of layers

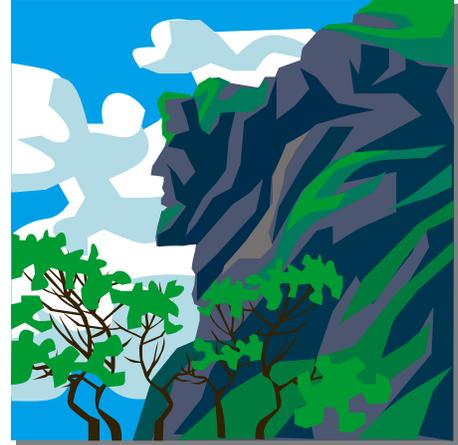
## INSTRUCTIONAL GOALS

1. To name the three different types of rocks.
2. To explain the process by which each type of rock is formed: sedimentary, igneous and metamorphic.
3. To describe the *rock cycle* and explain how it relates to the different types of rocks.
4. To distinguish between *intrusive* and *extrusive* igneous rocks.
5. To describe the difference between *magma* and *lava*.
6. To explain why fossils are found in sedimentary rocks.
7. To provide examples of metamorphosed rocks.
8. To develop a check to identify types of rocks.



## VOCABULARY

1. clastic rocks
2. extrusive rock
3. fossils
4. geology
5. igneous rocks
6. intrusive rock
7. lava
8. magma
9. metamorphic rocks
10. pumice
11. rock
12. sedimentary rocks



## BEFORE SHOWING

1. Display samples of different types of rocks. Ask your students, on the basis of observing certain traits, to categorize the specimens.
2. Ask the students to explain the basis by which they set up the groups of rocks.
3. Show the students samples of fossils. Ask them to predict how the fossils were formed and preserved.
4. Ask the students to suggest how rocks were formed.
5. Have students compare and contrast the different samples of rocks you provided to them.
6. Tell the students to prepare a list of characteristics which could be used to distinguish between the sample rocks, e.g., weight or density, color, texture, etc.
7. Ask the students to react to the statement: when we learn about the origin of rocks, we also learn about the history of the earth.
8. Use the technique of Semantic Mapping to elicit from students the knowledge they already have about geology. Write the word "Geology" on the board and draw a circle around it. Ask students to give you as many ideas as they can about geology and cluster them around the circle. Add to the map after the program.

## AFTER SHOWING

### Discussion Items and Questions

1. Assign students to bring a variety of rocks found in their community. Based on their knowledge of geology and the material covered in the video, ask them to classify each rock as igneous, metamorphic or sedimentary.
2. Have your students explain why it is possible to find a sedimentary rock composed of pieces of igneous rock.
3. Distribute samples of igneous rocks and a hand lens. Ask your students to classify the rocks by color and texture.



4. Demonstrate how a fossil can be formed by creating a plaster of Paris mold. Ask your students to explain why fossils are almost always found in sedimentary rocks.
5. Guide a debate on the pros and cons of different types of mining.

### Applications and Activities

1. Research the environmental effects of coal mining.
2. Ask the local chamber of commerce to provide you with information regarding the major building materials used in your community. Conduct a field trip through your community to study and classify the different types of structural rocks observed.
3. Challenge your students to create a conglomerate sedimentary rock (use gravel, pebbles, sand, cement, etc.).
4. Make a collection of rocks found in your community. Label each rock (type and name). Explain why certain types of rocks are more common than others in your community.

### SUMMARY

Rock is a naturally formed, solid material that makes up the crust of the earth. Most rocks contain one or more minerals. Some rocks may even contain organic compounds.

Rocks are classified according to their origin. The rock cycle includes the processes by which rocks are made.

Magma and lava are molten material. When they cool, they form different types of igneous rocks. Intrusive igneous rocks are formed when the magma cools beneath the surface of the earth. Magma, upon reaching the surface of the earth is called lava. Extrusive igneous rocks are formed from the cooling of lava on the surface of the earth.

The three major types of igneous rocks include: basaltic rocks which are dense, heavy and dark-colored; granitic rocks which are light-colored and less dense than basaltic rocks; and andesitic rocks which are intermediate between basalt and granite rocks.

Sedimentary rocks are formed when fragments of rocks, minerals and/or organic material are compacted and cemented together. Clastic sedimentary rocks are formed when rocks and sediment are cemented together. Chemical sedimentary rocks precipitate out of solution or are left behind after evaporation has occurred.

Increases in heat and pressure can change both igneous and sedimentary rock into the third major form of rocks, namely, metamorphic rocks. When a rock undergoes metamorphosis, nearly every characteristic is changed, including texture and mineral composition.

Rocks are constantly changing from one type to another in a never ending process known as the rock cycle. For instance, sediments of both metamorphic and igneous rocks, resulting from erosion and weathering, can become sedimentary rock. Sedimentary rock can experience increases in pressure and heat and, thus, become metamorphic rock. Metamorphic rock can melt becoming magma, which in turn, can cool to become igneous rocks.



## RELATED RESOURCES

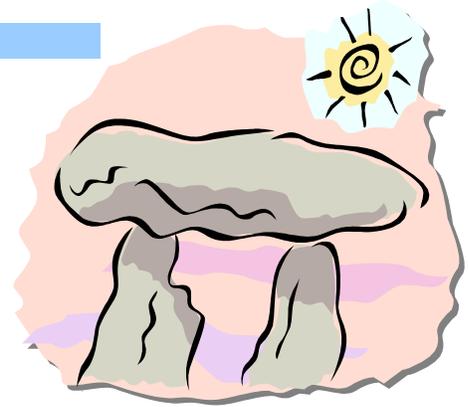


### Captioned Media Program

- Bill Nye the Science Guy: Rocks and Soil #3579
- Every Stone Has a Story #3244
- Rocks and Minerals #3075
- Rocks That Reveal the Past (Revised) #2219



### World Wide Web



The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and “kid safe” sites. However, teachers should preview them before use. The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

#### • **ROCK HOUNDS**

<http://sln.fi.edu/fellows/payton/rocks/index2.html>

Get your hard hats on and go digging for some fun and facts! Build your rock knowledge on the 3 different types, examine rocks, and test your stone smarts by naming the types of rocks. Provides “Teaching Connections” for teachers which includes a lesson plan, activities, and other ideas.

#### • **COLLECTING ROCKS**

<http://pubs.usgs.gov/gip/collect1/collectgip.html>

Extensive textual information on how rocks tell the story of the earth, types of rocks, starting a collection, identifying rocks, and other rock-related information.

#### • **THE ROCK CYCLE**

<http://volcano.und.nodak.edu/vwdocs/vwlessons/lessons/rocks/rocks6.html>

The rock cycle shows how the earth’s rocks are changed again and again. Provides a diagram of the rock cycle, types of rocks, and other graphics. Clicking on the “Next” button presents brief information on the rock cycle.