



Geology Rocks: Investigating Local Geology

Grade Level: Upper Elementary-Middle School

Duration: Several class periods

Purpose: This lesson explores the three types of rock—sedimentary, igneous, and metamorphic, and gives students the opportunity to investigate the geology that is found in their home region and at Water Canyon.

Objective: The student will be able to describe the rock cycle. The student will be able to use research materials to explore what types of rock are common in their home region. The student will be able to record observations of rocks in a scientific journal and make an educated guess as to what type of rock they observed.

Nevada State Department of Education Standards:

Earth's Composition and Structure (Unifying Concept C) Earth is composed of materials that move through the biogeochemical cycles. Earth's features are shaped by ongoing and dynamic processes. These processes can be constructive or destructive and occur over geologic time scales.

Materials:

Research materials on rock formation and different types of rock
Computer with Internet access
Class set of scientific journals

Anticipatory Set: Begin the lesson by reviewing with students what they know about the three types of rock—sedimentary, igneous, and metamorphic. Make a list of what the students already know about the rock cycle. Update this list at the end of the lesson, adding new information that they have learned.

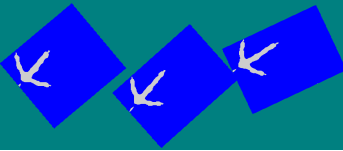
Developing the Lesson: Explain to students that rocks are constantly changing. The changes, however, happen very slowly over time; the rock cycle occurs over a million years. Share the information below about the rock cycle with your class. Discuss any questions that your students may have and define any unfamiliar words. Give examples whenever possible.

The Rock Cycle:

1. Wind, rain, ice, tiny animals, and plants damage rocks on the earth's surface.
2. An acid, made of gases in the air and rainwater, can cause certain kinds of rocks to dissolve.
3. Lichen is an organism made up of a fungus and an algae that grows slowly on rocks. As it

grows, it produces an acid that breaks down the rocks that they are growing on.

4. Rocks are broken by moving water that eventually turns them into sand.



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4. Rocks are broken by moving water that eventually turns them into sand.
 5. When rocks on the earth's surface are broken up and wear away, it is called weathering.
 6. Erosion is the term used to describe all of the different ways that earth's materials are moved on the surface by wind and water.
 7. Streams carry small pieces of rock, called sediments, into lakes and oceans where it begins to build up into thick layers.
 8. Sedimentary rocks are formed when the sediments are pressed tightly together with the water removed.
 9. Pressing, squeezing, and folding cause by the earth's movements form metamorphic rocks. Occasionally this process destroys minerals and creates new ones.
 10. Igneous rocks are formed underground when the melted rock, called magma, deep within the earth becomes trapped in small pockets. As these pockets of magma slowly cool, it becomes igneous rocks.
 11. Igneous rocks are also formed after a volcano erupts; the magma rises above the earth's surface (Magma is called lava when it appears above the earth's surface.) and forms Igneous rocks as the lava cools.

Have students investigate the types of rocks and rock formations that are common in northern Nevada. This information can be found at the library, on the Internet, or from a knowledgeable person in the community. Optional: Have a guest speaker, such as a geologist at the BLM, come to your classroom and share information with your students about the local geology. Have students record their findings in a scientific journal.

Take your class on a field trip to Water Canyon. Have students record observations and make drawings of nearby rock formations in their journals. Once they get back to the classroom, ask them to determine, to the best of their ability, what types of rocks they observed. Have them conduct further research to learn how those formations were most likely created. Optional: Have students photograph the rock formations they observe at Water Canyon. When the pictures are developed, have the students write captions describing their pictures. Put the pictures and captions into a "Water Canyon Geology Portfolio" to share with parents or other classes.

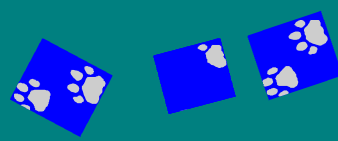
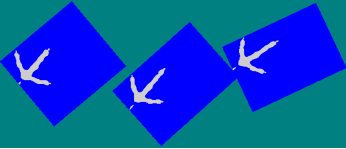
Conclusion: Refer back to the list made at the beginning of the lesson. Add any new information that the students learned to the list. Have students rewrite the list to make their own personal "Geology Rocks Fact Sheet." Place a copy in the front of the "Water Canyon Geology Portfolio."

Evaluation: Assess student knowledge by grading the students' scientific journals and entries for the Geology Portfolio. Informally assess student knowledge by observing students as they search for rocks and rock formations at Water Canyon and by their contributions to class discussion.

Suggested Reading:

The Magic School Bus: Inside the Earth by Joanna Cole

Birth of the Grand Canyon by Margaret H.



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The Magic School Bus: Inside the Earth by Joanna Cole

Brightly of the Grand Canyon by Marguerite Henry

Suggested Websites:

Rock Hounds with Rocky at <http://www.fi.edu/fellows/fellow1/oct98/index2.html>

Nevada Mining Association at <http://www.nevadamining.org/> click on Mining & Education for a fun geology "Project of the Month."