The Rock Cycle Activity with Delilah!

2nd Grade

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Activity Objective:
This activity is designed to educate students on the processes that take place during the rock cycle and the duration of these processes. It is also designed to educate students on the formation of the different rock types i.e. igneous, metamorphic, or sedimentary. This activity takes about an hour to complete.

Core Standard Application:
2-ESS1-1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.]

2-ESS2-2 Develop a model to represent patterns in the natural world

2-ESS2-3 Obtain information using various texts, text features, and other media that will be useful in answering a scientific question.

ESS1.C: Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe

ESS2.C: The Roles of Water in Earth's Surface

RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text

W.2.8 Recall information from experiences or gather information from provided sources to answer a question

Materials Needed (If the Nevada Division of Minerals (NDOM) is giving the presentation NDOM will supply the materials):
Rock cycle summary for instructors (attached)
Pre-Activity Reading Material (attached)
Animated Powerpoint (contact Lucia Patterson-Nevada Division of Minerals)
½ a tube of play-doh per student
Coloring/Observation activity (attached)

Pre Activity Reading:
Teachers may read "Delilah's Rock Cycle" to the students in preparation for the Rock Cycle activity. Teachers themselves may want to read attached summary of the rock cycle before giving the activity.

The Activity:

Review the rock cycle with the students once without the play-doh explaining the basic processes taking place. Then go back through the rock cycle a second time having the students use the play-doh to model the processes taking place.

1. **Igneous**-have them erupt (squeeze) the play-doh out of their volcanoes (their hand)
2. **Erosion**-have them cut their play-doh into smaller pieces or sediments
3. **Deposition/compaction**-have the students stack their sediments into layered like pile (the pile being the layered sedimentary rock)
4. **Metamorphism**-have the students squish their rock pile (their hands are the heat and pressure of metamorphosis)
5. Have the students draw what their rocks looked like in the space provided on the coloring activity
6. If possible have real examples of each rock type proposing different scenarios that could happen to each rock in the rock cycle and what it would become

Rock Cycle Summary for Instructors

Please read the following for an overview of the rock cycle. MOST of the following summary was taken from http://www.ck12.org/book/CK-12-Earth-Science-Concepts-For-High-School/section/3.8/

Rocks change as a result of natural processes that are taking place all the time. Most changes happen very slowly. Rocks deep within the Earth are right now becoming other types of rocks. Rocks at the surface are lying in place before they are next exposed to a process that will change them. Even at the surface we may not notice the changes. The rock cycle has no beginning or end.

Rocks are classified into three major groups according to how they form.

1. *Igneous rocks: form from the cooling and hardening of molten magma in many different environments. The chemical composition of the magma and the rate at which it cools determine what rock forms. Igneous rocks can cool slowly beneath the surface or rapidly at the surface. These rocks are identified by their composition and texture.*
2. *Sedimentary rocks: form by the compaction and cementing together of sediments, broken pieces of gravel, sand, silt, or clay. Those sediments can be formed from the weathering and erosion of preexisting rocks. Sedimentary rocks also include chemical precipitates which are the solid material left behind after a liquid evaporates.*
3. *Metamorphic rocks: form when the minerals in an existing rock are changed by heat or pressure below the surface.*

Several processes can turn one type of rock into another type of rock. The key processes of the rock cycle are crystallization, erosion and sedimentation, and metamorphism.

Crystallization

Crystallization is the process where magma cools either underground or on the surface and hardens into an igneous rock. As the magma cools, different crystals form at different temperatures undergoing crystallization. For example, the mineral olivine crystallizes out of magma at a much higher temperature than quartz. The rate of cooling determines how much time the crystals will have to form. Slow cooling produces larger crystals.

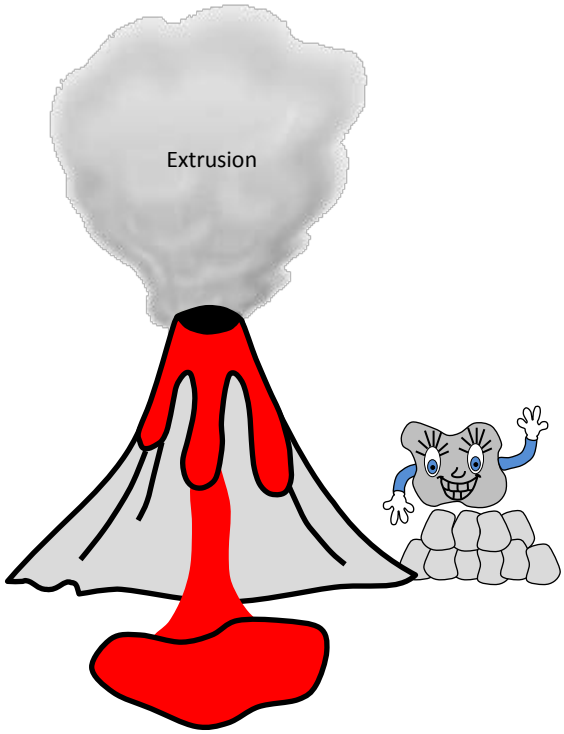
Erosion and Sedimentation

Weathering wears rocks at the Earth's surface down into smaller pieces. The small fragments are called sediments. Running water, ice, and gravity all transport these sediments from one place to another by erosion. During sedimentation the sediments are laid down or deposited. In order to form a sedimentary rock, the accumulated sediment must become compacted and cemented together.

Metamorphism

When a rock is exposed to extreme heat and pressure within the Earth but does not melt, the rock becomes metamorphosed. Metamorphism may change the mineral composition and the texture of the rock. For that reason, a metamorphic rock may have a new mineral composition and/or texture.

Delilah's Rock Cycle



I am a rock all shiny and new;

There are many different rock types that are important to you.

I am found almost everywhere, which means I am rife;

Come let me tell you about the cycle of my life.

Right now I am igneous, I come from melted rock;

I'm erupted to Earth's surface because rocks cannot walk.

Surface wind and the rain will break me apart;

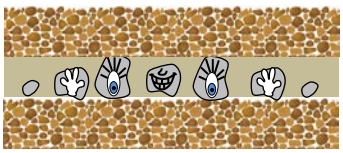
And that's where my life as a sedimentary rock will start.

Weathering

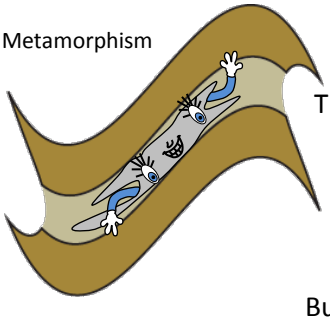
Out to the ocean I'll be laid to rest

Burial and compaction my layers will be pressed.

Deposition



Compaction/Cementation



Then the day comes when I meet great heat and pressure

Which will make me metamorphic…what a refresher!!

But, then I could wait for millions to billions of years in idle,

Until again I'm melted down, and begin a brand new rock cycle.