

Rock Cycles, Crayon Cycles

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References:

Richison, Amber. 2003. Rock Cycle Activity. Earth Science Inquiry Activities, Vol VIII. Wright State University, Department of Geological Sciences.

* Note: This activity is adapted from an idea that I got in an assignment from a student in a course I was the teaching assistant for ("Earth Science by Inquiry"). It is used with permission from the student, but changed here so that only the idea is hers.

Benchmarks (For Earth Science in the 3rd to 5th grand band):

- A. Explain the characteristics, cycles, and patterns involving Earth and its place in the solar system.
- B. Summarize the processes that shape Earth's surface and describe evidence of those processes.
- C. Describe Earth's resources including rocks, soil, water, air, animals and plants and the ways in which they can be conserved.
- D. Analyze weather and changes that occur over a period of time.

Related Grade-Level Indicators

3rd Earth Systems

1. 1. Compare distinct properties of rocks (e.g. coloring, layering and texture).
3. 3. Describe that smaller rocks come from the breakdown of larger rocks through the actions of plants and weather.
4. 4. Observe and describe the composition of soil (e.g., small pieces of rock and decomposed pieces of plants and animals, products of plants and animals).
6. 6. Investigate that soils are often found in layers and can be different from place to place.

4th Earth and Space Sciences: Processes that Shape the Earth

9. Describe evidence of changes on Earth's surface in terms of slow processes (e.g., erosion, weathering, mountain building, and deposition) and rapid processes (e.g. volcanic eruptions, earthquakes, and landslides).

Objectives:

Review the rock cycle. Good for learning it (for 3rd graders) or reviewing concepts and vocabulary (4th grade, 5th grade). Practice using some vocabulary.

Materials

- Crayons, crayon sharpener
- Wood (optional)
- Hot plate (alternately, a candle)
- Aluminum pie pan
- Goggles
- Ruler
- Heavy Duty aluminum foil
- Hammer
- Water
- Trivets
- Tongs / oven mitts

Preparation:

1. Cut aluminum foil to 20cm by 10cm rectangles. Use in a double layer, and have one available for each group of students.
2. Pre-shave (or cut) the crayons with a sharpener. Set aside (sorted by color – not combined together).
3. Have enough so that a group can cut their melted and cooled crayons into pieces and have a useable piece each.

Initial Observation/Demonstration:

This lesson is about the rock cycle. This is simply the path that rock and pieces of rock go through to be rearranged in different ways.

INTRODUCE THE FOLLOWING TERMS

Magma – Magma is melted rock. We are used to seeing melted rock in volcanos. This rock cools to form Igneous rock. Students may have heard the word “ignite”, and these words both come from a root meaning “fire”.

Igneous Rock – always is directly cooled from magma.

Metamorphic Rock – is formed when an igneous rock or sedimentary rock has heat and/or pressure applied to it. This changes the rock a little.

Sedimentary Rock – is rock formed from pieces of other rock. Commonly, it is mudstone, sandstone, or conglomerate. If concrete weren't man-made, it would be a sedimentary rock.

Sediment – is a pile of pieces of rock. Like a beach.

Inquiry Procedure:

1. Assign groups of 4, and assign jobs to each student: packer, squisher, heater, runner.

2. Ask for the runners to come to the front table (or wherever the supplies are located). Give the runner a double-thick piece of aluminum foil, and distribute about 2 crayons worth of crayon shavings for each student (multiply appropriately for the size of the group).
3. Have the packer arrange the shavings on one side of the foil (only on half the foil). All students should observe what they see in their notebooks. Explain that this represents sediment, like the tiny pieces of rock we see on a beach or riverbed.
4. Once every group member has written their observations, the packer should carefully fold and seal the packet.
5. The squisher should hit the packet a few times with a hammer. This is to see what happens to our sediment if a little pressure is put on it. This is to show that our tiny sediment can form a crayon-rock!
6. The packer then should unwrap the packet, and all members of the group write their observations. What is the same? What is different? The packer should rewrap the packet.
7. The squisher should hit the packet a few times with the hammer to make more pressure to see what happens to the sedimentary crayon-rock to see what happens. The packer unwraps the package, and all observe. Did the crayon-rock change? The packer should rewrap the packet.
8. The heater then must take the packet, and carefully place it on the hot plate. If the heater thinks the inside may have changed, instruct them to ask for help from the teacher. Teacher: look for a slightly squishy packet (indicating that the crayons have melted). Once it has, carefully remove it to a place it can cool. This shows that once the sediments have been heated up, they may not be the same as they were when we started with sediment (which can easily be seen by looking at the color of the crayon).

As a final step, when the crayon has cooled to room temperature, cut the blocks into equal pieces for the students in the groups to keep.

Discussion/Summary:

Note prompts in procedure above.

Journal Prompts:

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