

Rocks and the Rock Cycle Pocket Guide

Overview:

Volcanic rock, the most common in Hawai‘i, differs from other types of rock in important ways. In this activity, students learn about the three main rock types: igneous, sedimentary, and metamorphic. Students also will create a guide that describes the rock cycle.

Objectives:

The student will:

- describe the transitions between rock types that are part of the rock cycle;
- create a pocket guide that illustrates the rock cycle; and
- explain how different rock types are formed.

Materials:

- Solid chocolate balls
- Sandwich-type cookies
- 8 x 10 sheets of paper
- Colored pencils or markers
- Samples of igneous (granite, obsidian), metamorphic (slate, gneiss), and sedimentary (sandstone, limestone) rocks
- Transparency: “Rock Types”
- Transparency: “Rock Cycle”
- Student Information Sheet: “How to Make a Rock Cycle Pocket Guide”
- Student Worksheet: “Rocks and the Rock Cycle Pocket Guide”

Answers to Student Worksheet:

1. Answers may vary, but should include the idea that igneous rocks are formed from magma that is extruded from Earth or trapped under the surface.
2. Answers may vary, but should include the idea that sedimentary or igneous rocks are subjected to pressure or heat and changed.
3. Answers may vary, but should include the idea that existing material is broken down, layered, and compacted.
4. weathering and compaction
5. subjection to pressure and heat
6. melting and crystallizing

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Activity Procedure:

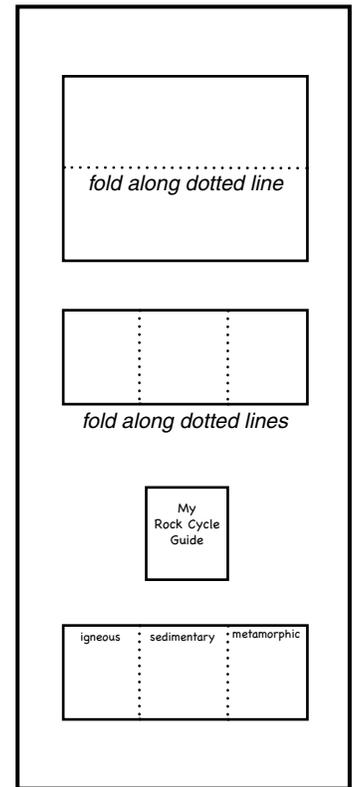
1. Distribute a sandwich cookie and a chocolate ball to each student. Ask students to think about how these sweets are created (the chocolate is created by melting ingredients and pouring them into a mold, while the sandwich cookie is created by layering different substances).
2. Explain that there are three main types of rocks: igneous, sedimentary, and metamorphic. Use the Transparency: “Rock Types” to show the characteristics of the three rock types. Show the actual rock samples as each type is discussed.
3. Ask students which rock type might the chocolate represent (igneous: the chocolate is like hot magma that has cooled), and which type the sandwich cookie might represent (sedimentary). Ask students how these sweets could be used to represent metamorphic rock (if they were flattened, or compressed, they would represent metamorphic rock).
4. Explain that the three rock types are interrelated in what is referred to as the “Rock Cycle.” Use the Transparency: “Rock Cycle” to show the processes involved in rock formation and breakdown. Explain that all rocks turn into sediment through weathering. Thus, a rock can enter the rock cycle as sediment. Rocks can also enter the rock cycle as magma. Rocks can undergo many transitions.
5. Distribute the Student Information Sheet: “How to Make a Rock Cycle Pocket Guide.” Ask students to create their own guide to remind them of what the main characteristics of these rocks are, as well as how the rock cycle works.
6. Distribute the Student Worksheet: “Rocks and the Rock Cycle Pocket Guide” and ask students to complete the worksheet. If necessary, display the transparency again to help remind students about the characteristics of different rocks as students complete their rock cycle pocket guides.

How to Make a Rock Cycle Pocket Guide

Background Information: In Hawai‘i, most rocks are volcanic. However, volcanic rocks represent only one of three main rock types: igneous, sedimentary, and metamorphic. All of these rock types are part of the rock cycle, a process where one type of rock transitions into another through processes such as melting, weathering or pressurizing. This activity explores the different rock types and the rock cycle.

Procedure:

1. Fold a piece of 8”x10” paper in half lengthwise.
2. Fold the paper again along the dotted lines as illustrated below. This will result in a booklet that opens in two directions.
3. Give the booklet a title on the front cover, such as “My Rock Cycle Guide.”
4. Open the booklet so that all three panels are showing. On the first panel, write “Igneous.” Illustrate this panel with symbols, words, drawings, etc., that represent igneous rock.
5. On the second panel, write “Sedimentary.” Illustrate this panel with symbols, words, drawings, etc., that represent sedimentary rock.
6. On the third panel, write “Metamorphic.” Illustrate this panel with symbols, words, drawings, etc., that represent metamorphic rock.
7. On the back of the booklet, draw the rock cycle, including the three types of rocks, magma, and sediment. Include arrows that show transitions between different rock types.
8. Label each arrow with the process associated with the transition. For example, the arrow pointing from metamorphic to igneous should be labeled “melting.”
9. Use this rock cycle pocket guide to help remember the three main types of rock and the processes of the rock cycle.
10. Complete the questions on the following page.



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1. Explain, in your own words, how igneous rocks are formed.

2. Explain, in your own words, how metamorphic rocks are formed.

3. Explain, in your own words, how sedimentary rocks are formed.

4. What are the processes that can cause igneous or metamorphic rock to turn into sedimentary rock?

5. What are the processes that can cause igneous or sedimentary rock to turn into metamorphic rock?

6. What are the processes that can cause metamorphic rock to turn into igneous rock?
