

If I am a petrologist...
I study the origin and composition of rocks.

Experiment 1

Rock Detective

You will need the rock collection (A) and magnifying lens (I).

Things To Know:

Rocks are a natural, solid, nonliving material made of two or more minerals. Rocks can be identified by physical properties such as color, luster (glassy or dull based on the glow from reflected light), and texture (rough or smooth based on grain size). You can be a rock detective and discover the name of each rock in your collection using a dichotomous key, a key used for the identification of objects based on a series of choices.

What To Do:

1. Select one rock from your collection.
2. Use the dichotomous key to answer questions and match characteristics of the chosen rock.
3. Repeat steps 1-2 until all the rocks have been identified.
4. Write your answers on the student answer sheet.

WARNING!

Handle rocks carefully to avoid injury from sharp edges. Never leave the magnifying lens in the sun. Fire danger! Never look directly into the sun, either with your naked eye or through the lens. You could blind yourself.

Types of Rocks

Igneous rocks are formed when magma from volcanoes cools and turns into a solid rock.

Metamorphic rocks are formed when existing sedimentary or igneous rocks are subjected to increased heat and pressure.

Sedimentary rocks form from small pieces of rock and sand called sediment. The sediment and other materials, such as plants and animals, are buried deep below ground where they are subjected to increased heat and pressure and change to sedimentary rock.

Rock Identification

Dichotomous Key

1. Inspect the rock without the magnifying lens. Are there large holes or pores?
 - A. Rock has visible holes or pores Go to step 2
 - B. Rock has small or unseen poresGo to step 3

2. What is the overall color of the rock?
 - A. Rock is gray or light grayPumice (Igneous)
 - B. Rock is reddish-brown, dark brown, or black Scoria (Igneous)

3. What is the overall color of the rock?
 - A. Rock is black in colorGo to step 4
 - B. Rock is not blackGo to step 6

4. Is the rock glassy or not?
 - A. Rock is smooth and glassyObsidian (Igneous)
 - B. Rock is not glassy Go to step 5

5. Does the rock show layering?
 - C. Rock has layers..... Shale (Sedimentary)
 - D. Rock does not have layersCoal (Sedimentary)

6. Look closely at the rock with a magnifying lens. Does the surface sparkle or have crystals?
 - A. Rock sparkles or appears crystalline Go to step 7
 - B. Rock is dull and doesn't sparkle Go to step 8

7. Is the rock multicolored?
 - A. Rock color is multicolored or speckled Go to step 9
 - B. Rock is the same color throughoutMarble (Metamorphic)

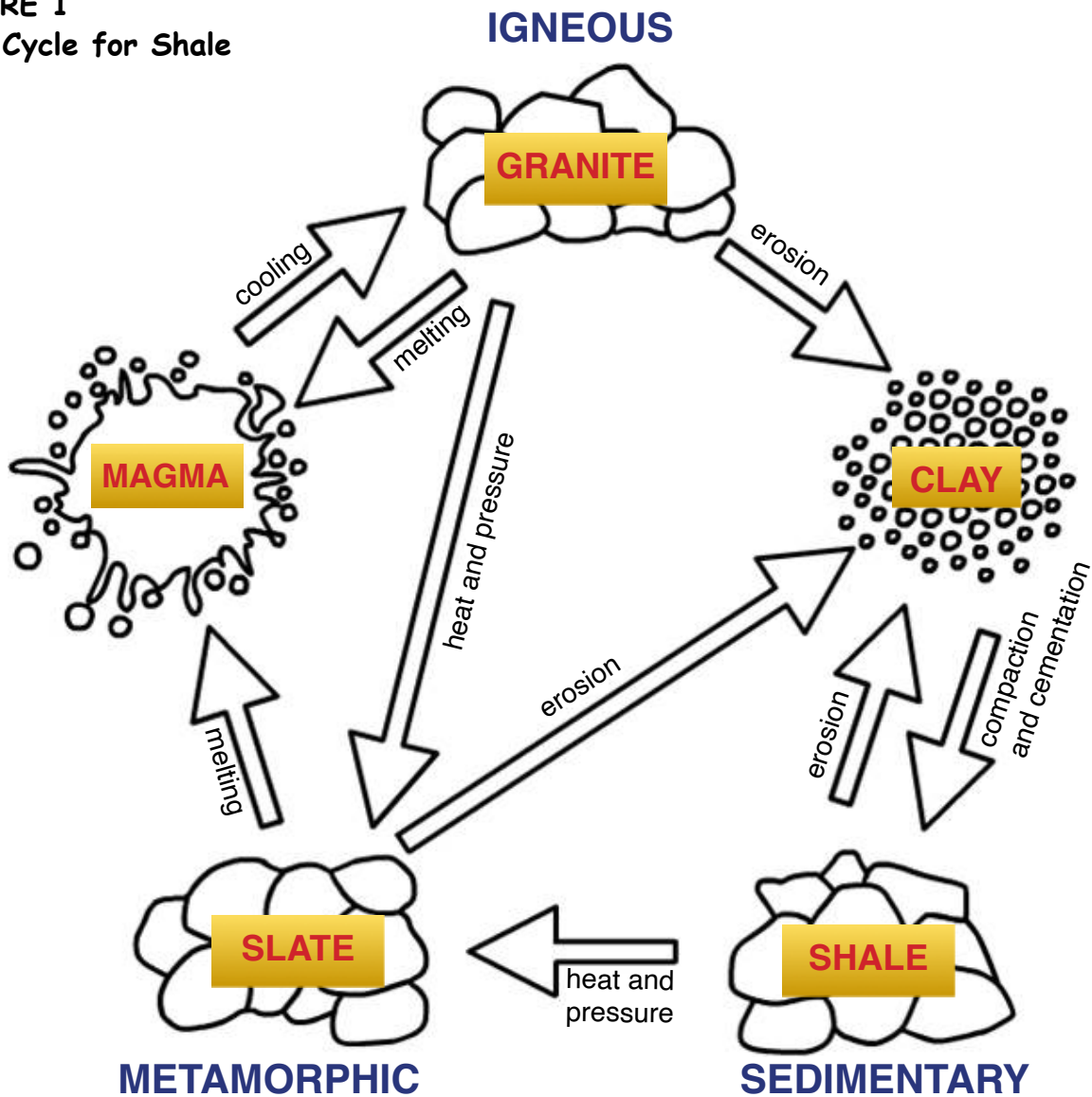
8. Look closely at the rock with a magnifying lens. Are the grains large or small?
 - A. Rock grains are pebble size and/or mixed sizesConglomerate(Sedimentary)
 - B. Rock grains are mostly sand sizeSandstone (Sedimentary)

9. Does the rock show layering of grains?
 - A. Rock grains are in layersGneiss (Metamorphic)
 - B. Rock grains are scattered with crystals Granite (Igneous)

The Rock Cycle

The rock cycle is a basic concept in geology that describes changes that occur over time among the three main rock types: sedimentary, metamorphic, and igneous. The rock cycle is driven by two forces: (1) Earth's internal heat engine, which moves material around in the core and the mantle and leads to slow but significant changes within the crust, and (2) the water cycle, which is the movement of water, ice, and air at the surface, and is powered by the sun. Study the rock cycle for shale, Figure 1, and complete the activity on the student answer sheet

FIGURE 1
Rock Cycle for Shale





Name _____

Date _____

Experiment 1: Rock Detective

<p>Rock #1</p> <p>Size of Pores: _____</p> <p>Color of Rock: _____</p> <p>Luster: _____</p> <p>Feel/Texture: _____</p> <p>Grain Size: _____</p> <p>Identity of Rock: _____</p>	<p>Rock #4</p> <p>Size of Pores: _____</p> <p>Color of Rock: _____</p> <p>Luster: _____</p> <p>Feel/Texture: _____</p> <p>Grain Size: _____</p> <p>Identity of Rock: _____</p>
<p>Rock #2</p> <p>Size of Pores: _____</p> <p>Color of Rock: _____</p> <p>Luster: _____</p> <p>Feel/Texture: _____</p> <p>Grain Size: _____</p> <p>Identity of Rock: _____</p>	<p>Rock #5</p> <p>Size of Pores: _____</p> <p>Color of Rock: _____</p> <p>Luster: _____</p> <p>Feel/Texture: _____</p> <p>Grain Size: _____</p> <p>Identity of Rock: _____</p>
<p>Rock #3</p> <p>Size of Pores: _____</p> <p>Color of Rock: _____</p> <p>Luster: _____</p> <p>Feel/Texture: _____</p> <p>Grain Size: _____</p> <p>Identity of Rock: _____</p>	<p>Rock #6</p> <p>Size of Pores: _____</p> <p>Color of Rock: _____</p> <p>Luster: _____</p> <p>Feel/Texture: _____</p> <p>Grain Size: _____</p> <p>Identity of Rock: _____</p>

Use the rock cycle to answer the questions below.

1. What are the three classes of rocks?
2. Follow the arrow from sediments (clay) to sedimentary rock. How do sediments become sedimentary rock?
3. Follow the arrow from sedimentary rock to metamorphic rock. What is necessary to change a sedimentary rock into a metamorphic rock?
4. How is magma formed?
5. How does magma become igneous rock?
6. How does igneous rock become sediments?