

# ROCK DETECTIVES



## **BENCHMARK and TASK**

**SC.A.1.1.1** The student knows that objects can be described, classified, and compared by their composition (e.g., wood or metal) and their physical properties (e.g., color, size, and shape).

- The student observes, describes, and classifies rocks according to their observable properties.

## **KEY QUESTION**

What are some properties of rocks?

## **BACKGROUND INFORMATION**

Rocks are solid earth materials that compose the bulk of the Earth. The oldest rock known is approximately 3.7 to 3.9 billion years. Minerals are chemical elements found naturally in or on the Earth. Rocks are made up of minerals, but rocks themselves are not minerals. Rocks come in all shapes, sizes and colors. They can be found almost everywhere. Throughout history, rocks have been used as tools, weapons and building materials.

Soil, a thin blanket covering the bedrock of the Earth, is created as part of the rock cycle. Erosion is the wearing away and movement of rocks and soil by natural forces. Rocks slowly break apart and weather into small, jagged bits and pieces, eventually becoming smooth. Soil, however, is much more than bits of rocks. Soil also contains air, water, humus, and recycling organisms, such as earthworms. It takes hundreds of years to build just a few centimeters of topsoil.

## **MATERIALS**

### **Per class**

1 container of assorted rocks (at least 1 rock per student)  
cover for the container (towel or cloth)  
chart paper  
marker

### **Per student**

magnifier

## **TEACHING TIPS**

It is important for students to observe properties (size, shape, and color, etc.) of rocks. Do not be concerned with having students try to identify rocks according to their names (e.g., limestone, marble).

**NOTE:** Scientists may compare properties by naming one property and the opposite of that property as a *not* statement (examples include smooth/*not* smooth, big/*not* big, shiny/*not* shiny).

## **ENGAGE**

1. Place the container of rocks, covered with a cloth or towel, on a table. Give the following clues and have students try to guess what is under the cloth:
  - *These objects are all solids.*
  - *They come in little or huge pieces.*
  - *Sometimes we like to have one in our pocket.*
  - *They come from the earth.*
  - *We often call them stones.*
2. Tell the students that you have some rocks in the container and ask them what they know about rocks. Allow time for discussion. You may want to record student responses on a circle map.
3. Ask: *Where do rocks come from?*

## **EXPLORE**

1. Distribute a rock to each student. Ask students to closely examine their rocks.
2. Next, the students should share their observations with a buddy (think/pair/share).
3. Ask several students to share their observations with the class.
4. Challenge one student to describe a rock using only one word.
5. Ask all students whose rocks have the same property as that given by the first student to stand.  
*Ask: What do we know about the rocks of the students who are still sitting?*  
(Example: If the word given was smooth, the students who are still sitting should have rocks that are not smooth.)
6. Write the descriptive word on the board (smooth) and also write on the board the words that describe the other rocks (not smooth).
7. Have all of the students take their rocks and stand under the word that describes their rock. (Everyone should be standing under one of the descriptive words.)
8. Have the students sit down. Repeat this process with a different descriptive word given by another student. (If a student gives a quantitative description, such as big or little, the class may need to discuss a way to define those terms so everyone can agree on what they mean. For example, to be small, must a rock fit under your hand?)

## **EXPLAIN**

1. Ask: *Did you stand with the same classmates each time?*  
*Why not?*
2. Continue questioning, helping students discover that rocks may have some properties that are the same as those of other rocks and some properties that are different.

## **EXTEND/APPLY**

Ask various students:

*How did you decide if your rock was smooth?*

*How did you decide if your rock was not shiny?*

(Use student descriptive words given during the **Engage** section of the lesson.)

Continue questioning as students discover that it is only through using the senses that we can observe and describe objects.

## **ASSESSMENT**

Ask students to draw a picture of their rock, showing some of the many properties that they have discovered about their rock.