



# Rock Detectives Classroom Activity



## SYNOPSIS

Students will use simple tests to examine and identify several common rocks and minerals.

## OBJECTIVES

Students will be able to:

- state the Mohs hardness rating for two rocks or minerals
- explain the use of the streak test in identifying rocks and minerals

## VOCABULARY/CONCEPTS

- geology
- rocks
- minerals
- hardness

## MATERIALS

- One hardness kit for each team of 3-5 students
  - one penny
  - one steel washer
  - one porcelain tile w/ one unglazed side
- Mineral/rock samples:
  - quartz
  - mica schist
  - feldspar
  - granite
  - actinolite
  - calcite
  - gypsum

## PROCEDURE

1. Divide students into teams.
2. Hand out enclosed “Rock and Mineral Investigation” sheet to each student.
3. Ask the students the scientific name that describes the study of the earth and its structure, rocks, minerals, history, and forces that affect it over time (geology).
4. Explain that geologists look at the characteristics of rocks and minerals to identify them.
5. Ask the students to define a rock (an inorganic substance that is made up of a variety of different materials).

## **PROCEDURE** (continued)

6. Ask the students to define a mineral (an inorganic substance that is the same throughout).
7. Tell the students that they will be conducting simple tests on rocks and minerals to identify them, just like geologists do.
8. Demonstrate the following tests to the students using quartz as an example.
9. After demonstrating the tests, give the students several samples to identify.

### **Color**

- One way of identifying rocks and minerals is by color.
- Write the color of the sample in the column labeled “Color.”

### **Streak test**

- The streak test shows the color that a mineral leaves behind on unglazed porcelain or a streak plate.
- Scratch the rock on the back side of the tile. The quartz will leave a white line.
- Write the color of the streak in the “Streak” column.

### **Hardness test**

- The hardness of rocks and minerals can be determined by scratching them with various substances.
- The Mohs hardness scale goes from one to ten. The softest rocks can be scratched easily and have the lowest hardness number.
- When a rock or mineral is scratched, part of it is removed, so a scratch mark is not always visible on the sample.
- The students should start with #1 below (this information is also on their worksheet) and proceed until their sample can be scratched by the stated item. If the sample can be scratched by the item, then the sample’s hardness equals the number of the statement. For example, the quartz has a hardness of seven, so it will not be scratched by any of the objects 1-6, but it will be able to scratch the glazed side of the tile as it states in #7 on the following page.

1. Scratch the sample lightly with a fingernail.
2. Scratch the sample harder with a fingernail.
3. Scratch the sample with a copper penny.
4. Scratch the sample lightly with a steel washer.
5. Scratch the sample harder with a steel washer.
6. Scratch the sample with the glazed side of the tile.

- If the sample can not be scratched by the tile, then determine the hardness of the sample by investigating which surfaces the samples can scratch.
7. Scratch the glazed side of the tile with the sample. If it scratches the tile, the hardness of the sample is a seven.
    - None of the samples have a hardness greater than seven.
    - If the sample could scratch quartz, the hardness would be 8, if it could scratch topaz, the hardness would be 9, and if it could scratch corundum, the hardness would be 10.
    - A diamond is the hardest mineral known and has a hardness rating of 10.
  8. After completing the hardness test, write the rating in the “Hardness” column.
  9. Use the Answer Key to identify the name of the sample.
  10. Allow the students to identify as many minerals and rocks as time permits.

### **CHECK FOR UNDERSTANDING**

- Hold up a sample and have the students show with their fingers the corresponding hardness rating.
- Hold up a sample and have the students identify its name.

The following questions may help guide discussion:

- Which samples would be most affected by weathering?
- Which samples might make the best soil for the foundation of a house?
- How is the streak test used to identify a rock or mineral sample?

### **ROCK AND MINERAL SUPPLY RESOURCES**

**Burminco** has rock and mineral samples. Burminco, 128 S. Encinitas Ave., Monrovia, CA 91016 or call them at 626-358-4478, [www.burminco.com](http://www.burminco.com)

**Carolina Biological Supply Company** has rock and mineral samples, fossils, and other geology materials, [www.carolina.com](http://www.carolina.com)

**Delta Education** has rock and mineral samples, crystal-growing kits, charts, and guides, [www.delta-education.com](http://www.delta-education.com).

**Ward’s Natural Science Establishment** has rock and mineral samples, fossils, and many other materials, [www.wardsci.com](http://www.wardsci.com). You may also call them toll free at 1-800-926-2660.

# ROCK AND MINERAL INVESTIGATION

## Answer Key

<b>NAME</b>	<b>COLOR</b>	<b>STREAK</b>	<b>HARDNESS</b>
<b>Quartz</b>	white	white	7
<b>Mica Schist</b>	shiny black	white, gray	7
<b>Actinolite</b>	dull green	white, green	7
<b>Calcite</b>	white	white	3
<b>Feldspar</b>	pinkish red	white, pink	6
<b>Granitic rock</b>	different colors	white	7
<b>Gypsum</b>	clear	white	2

# ROCK AND MINERAL INVESTIGATION

## Worksheet

COLOR	STREAK	HARDNESS	NAME	HARDNESS TEST
Rock 1				<b>The rock can be scratched by . . .</b>  <b>1. fingernail</b> <i>(lightly)</i>  <b>2. fingernail</b> <i>(strongly)</i>  <b>3. penny</b>  <b>4. steel washer</b> <i>(lightly)</i>  <b>5. steel washer</b> <i>(strongly)</i>  <b>6. glass</b>
Rock 2				
Rock 3				
Rock 4				
Rock 5				
Rock 6				
Rock 7				<b>The rock can scratch . . .</b>  <b>7. steel washer and glass</b>  <b>8. quartz</b>  <b>9. topaz</b>  <b>10. corundum</b>
Rock 8				