What Are the Properties of Rocks?

Estimated Time:
Prep: 10 min.
Activity: 20–30 min.

Introduction

Overview

Experiment: Students sort and **classify rocks**.

Key Concepts: Students will learn about rocks and **minerals**. They will explore their **properties** and classify samples based on shared properties.

Lead-In

Show the class selenite and sandstone. How are they similar? How are they different? Explain that both are naturally occurring rocks, but the selenite is also a pure mineral. All rocks are made up of one or more minerals. Explain how scientists classify rocks based on properties. Ask students to describe the color, **texture**, and size of the sandstone and selenite. Explain that they will be classifying rock samples based on similar properties.

Teacher Preparation

Lead-In Materials:
- Selenite*
- Sandstone*

Teacher-Provided Experiment Materials:
- Penny
- Metal nail file
- Old glass picture frame or drinking glass
- Crayons or colored pencils

Try This! Materials:
- Materials from experiment
- Rocks from outside

Prepare:
- Make copies of the Experiment Sheet.

**included in kit*

Vocabulary

- **classify** to arrange into groups based on similar characteristics
- **mineral** a naturally occurring solid substance that takes the form of a crystal and forms different rocks
- **property** a special quality or characteristic of something
- **rock** a naturally occurring solid substance made up of one or more minerals; it makes up Earth's surface
- **texture** the feel or look of a surface

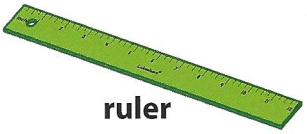
You Will Need

12 rock samples

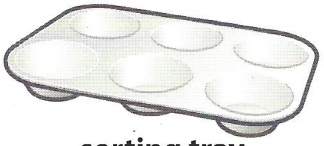
tweezers

rock reference card

magnifier



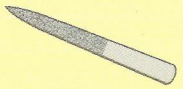
ruler



sorting tray

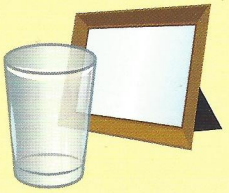
Teacher-Provided Materials

crayons or colored pencils

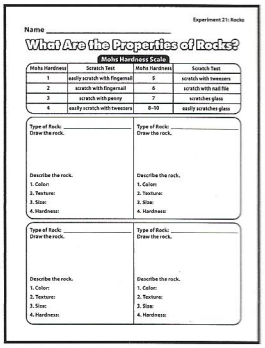


metal nail file

penny



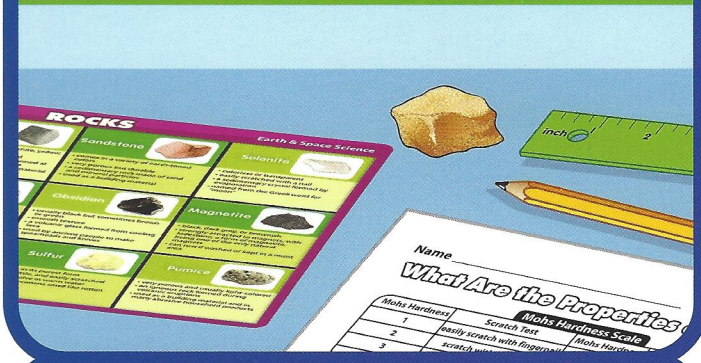
drinking glass or picture frame



Experiment Sheet

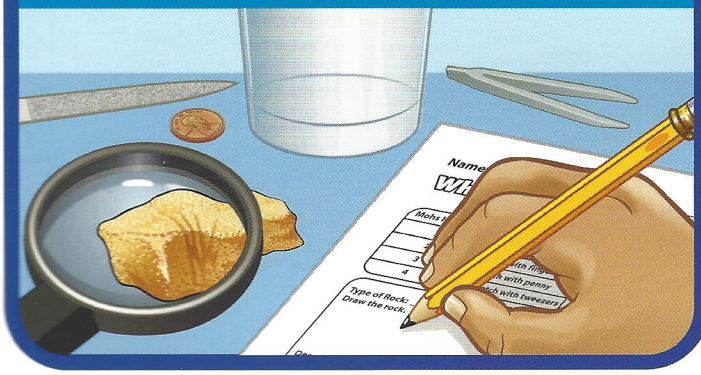
Procedure

1 Choose a rock. Use the reference card to identify the type of rock. Describe the rock's color and texture. Measure the rock and record the size.



2 Use the hardness scale to test the hardness of the rock. Start by trying to scratch the rock with your fingernail.

3 Use the magnifier to examine the rock. If there are no visible scratches, move up to the next scratch test. Record your observations.



4 Repeat steps 1–3 for three more rocks.

Name _____

What Are the Properties of Rocks?

Mohs Hardness Scale

Mohs Hardness	Scratch Test	Mohs Hardness	Scratch Test
1	easily scratch with fingernail	5	scratch with tweezers
2	scratch with fingernail	6	scratch with nail file
3	scratch with penny	7	scratches glass
4	easily scratch with tweezers	8–10	easily scratches glass

Type of Rock: _____
Draw the rock.

Describe the rock.

1. Color:
2. Texture:
3. Size:
4. Hardness:

Type of Rock: _____
Draw the rock.

Describe the rock.

1. Color:
2. Texture:
3. Size:
4. Hardness:

Type of Rock: _____
Draw the rock.

Describe the rock.

1. Color:
2. Texture:
3. Size:
4. Hardness:

Type of Rock: _____
Draw the rock.

Describe the rock.

1. Color:
2. Texture:
3. Size:
4. Hardness:

Why?

Scientists have identified thousands of minerals. About a hundred of these minerals make up the main components of rocks. Rocks and minerals have many important uses. Plants, animals, and humans obtain nutrients from minerals. Rocks like granite and sandstone are used as building materials. We harness energy from coal. And rocks like marble and limestone are often used in sculpture.

Limestone quarry

Discussion Prompts & Questions

- Why are these properties useful for sorting rocks?
- Do any characteristics give clues about how the rock might have formed?
- What words would you use to describe a rock?
- Which rocks had tiny holes? How do you think the holes might have formed?

Sentence Frames

- I sorted the rocks by _____.
- From my observations, most of the rocks were _____.
- From my observations, the _____ looked _____ and felt _____.
- Based on my data, the _____ is the hardest rock, and the _____ is the softest.

Try This!

Have students search for rocks outside. Then use the same procedure for classifying the rock samples from the experiment. Ask students if the rocks they found look similar to the rock samples. What type of rock do they think it could be? Did they find more than one type?

ROCKS

Travertine

- can be found in pastel shades of almost any color
- often contains bands or layers and has pore spaces
- a kind of sedimentary limestone made by deposits of groundwater
- has been used as a building material since ancient Roman times

Limestone

- usually gray but can be white, yellow, or brown
- easily scratched and carved
- a sedimentary rock often formed at the bottom of lakes and seas
- has been used as a building material since ancient Egyptian times

Sandstone

- comes in a variety of earth-toned colors
- very porous but durable
- a sedimentary rock made of sand and mineral particles
- used as a building material

Selenite

- colorless or transparent
- easily scratched with a nail
- a sedimentary crystal formed by evaporation
- named from the Greek word for "moon"

Coal

- black, gray, or dark brown
- often burned for fuel
- a sedimentary rock formed from plant matter often in wet or swampy areas
- graphite, a form of coal, is used to make pencil lead

Calcite

- usually colorless or white but can be red, green, blue, yellow, pink, purple, brown, or black
- a mineral that is found in many kinds of rock, including limestone and marble
- many uses, including building materials and cleaning products

Obsidian

- usually black but sometimes brown or green
- smooth texture
- a volcanic glass formed from cooling lava
- used by ancient people to make spearheads and knives

Magnetite

- black, dark gray, or brownish
- strongly attracted to magnets, with lodestone, a form of magnetite, being one of the only natural magnets
- can rust if washed or kept in a moist area

Pyrite

- nicknamed "fool's gold" because of its shiny yellow color
- a hard mineral that is difficult to scratch
- named from the Greek word for "fire" because it sparks when hit by steel

Talc

- usually green, white, gray, brown, or colorless
- has a pearly shine
- one of the softest minerals and very easily scratched
- used in many powders as well as in making paint, paper, and plastics

Sulfur

- yellow in its purest form
- soft, brittle, and easily scratched
- can dissolve in warm water
- some specimens smell like rotten eggs

Pumice

- very porous and usually light-colored
- an igneous rock formed during volcanic eruptions
- used as a building material and in many abrasive household products