



# PRE-MISSION ACTIVITIES

# CLASSIFYING ROCKS

## TEACHER NOTES



### Background

At your Challenger mission, the Remote team will study several rocks to determine the best choice for a colony location on the Martian surface. The term "rock" is often used to mean either a rock or mineral. Actually, rocks are made up of minerals. Astronomers gather rock samples from Mars to identify the minerals making up the Martian surface.

*The three types of rocks are:*

#### **Igneous** -

formed from cooled molten material. They often appear to have crystals and do not have layers.

#### **Sedimentary** -

formed by the deposits of minerals left by moving water. They are layered in appearance, feel gritty, and break easily.

#### **Metamorphic** -

an igneous or sedimentary rock that has been changed by pressure, heat, water or contact with hot lava. They are very hard, and have more crystals than igneous. Crystals of each mineral are lined up in bands or layers.

These tests are used by geologists to help identify rocks by their characteristics:

**Hardness Test** - Minerals are scaled for hardness from 1 to 10, with 1 being the softest, and 10 the hardest. The ability to scratch the surface of the rock determines hardness. Fingernails have a hardness of 2.5, a penny 3.0, a nail 5, and quartz 7.

**Color streak Test** - Different rocks will make distinctive color marks on porcelain, tile, or paper.

**Acid Test** - Rocks that contain calcium carbonate will fizz in the presence of an acid such as vinegar.

**Magnetism Test** - Rocks which contain iron will respond to a magnet or compass.

### Activity Preparation

1. Gather materials and assign students to cooperative groups.
2. Conduct a class discussion on the three types of rocks, and the tests used to identify specific characteristics of various rock samples.

### Process Skills

Observe                      Interpret data                      Experiment                      Infer

### Manipulative Skills

Choose and use materials.

### Science Content

Gr. 5 Change through natural processes.  
Gr. 7 General properties of matter.

Gr. 6 Magnetic fields of substances. Rock cycle.  
Gr. 8 Landforms through geologic time.

### Extensions

1. Work together as a class to create a dichotomous key for identifying the class rock collection.
2. Invite a geologist or members of a gem and mineral club to speak to the class, and demonstrate their collections.
3. Study crystal structures and "grow" crystals. Rock candy can also be made to show crystallization.



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**Objective:** You will identify rock samples by using various classification tests.

## Materials

rock samples	plastic cup	penny	magnet	nail	ceramic tile
quartz	vinegar	reference materials		black marker	

## PROCEDURE

1. Label each of your rock samples 1 - 5.
2. Test each rock sample for hardness. Select two of your rocks and try to scratch one with the other. The rock that makes a scratch on the other is harder. Continue testing each of your samples to identify the rocks from hardest to softest.
3. Test the rocks for hardness rating. If the sample can be scratched with a fingernail, the rating is 2.5 or lower. If the rock scratches the fingernail, the hardness rating is greater than 2.5. Some additional hardness ratings are; penny = 3, nail = 5, glass = 5.5, quartz = 7. Record the hardness on your **Data Collection Sheet**.
4. Test each rock sample for a possible color streak. Try to make a streak on the tile with the rock. Record the color of the streak on your **Data Collection Sheet**.
5. Test each sample using the acid test. Fill your plastic cup half full with vinegar. Put the rock sample in the cup. Observe the rock for fizzing or bubbles and record your results.
6. Test each sample for magnetism. Touch each of the rock samples with a magnet. Record your results.
7. Use reference books to identify each sample based on the characteristics.

Data Collection Table					
Sample Number	Hardness Rating	Color of Streak	Acid Test (Yes/No)	Magnetism Test (Yes/No)	Rock Identification
1					
2					
3					
4					
5					