

# Mineral Magic

**Science Standard III:**

Students will understand the basic properties of rocks, the processes involved in the formation of soils, and the needs of plants provided by soil.

**Objective 1:**

Identify basic properties of minerals and rocks.

**Intended Learning Outcomes:**

1. Use Science Process and Thinking Skills
3. Understand Science Concepts and Principles

**Content Connections:**

Social Studies VI-1, VII-2

## Science Standard III

### Objective 1

#### Connections

## Background Information

A *mineral* is a naturally occurring inorganic chemical substance having a definite chemical composition and a characteristic crystal structure. Minerals are the building blocks of rocks. A *rock*, therefore, is a naturally occurring solid material composed of one or more minerals.

There are three types of rock: *igneous*, *sedimentary*, and *metamorphic*. They are classified into one of these categories because of the way in which they were formed.

*Igneous* rocks are those that solidify from a molten or partially molten state. They include such rocks as basalt, granite, pumice and obsidian.

*Sedimentary* rocks are formed from erosion and deposition. Wind, water, ice, and chemicals break down existing rock into sediment that is then transported and deposited by wind, water, and glaciers. As sediment accumulates with time (thousands of years), it becomes compacted and cemented, eventually forming rock. Over a period spanning hundreds of millions of years, oceans, rivers, and great deserts covered Utah and deposited the sediment that has formed into the sedimentary rocks we see today. Some common sedimentary rocks are shale, sandstone, limestone, and conglomerate.

*Metamorphic* rocks are any rock type that has been altered by heat, pressure, and/or the chemical action of fluids and gases. Metamorphic rocks are classified by their structure and their dominant minerals.

## Invitation to Learn

Show students a set of rocks and minerals. Ask them to look at what may be similar between each one. What are some of the differences they observe? Ask if they might be able to put them in groups according to

what they look like, how they feel and any other characteristic they observe.

## ***Instructional Procedures***

### **Day 1**

#### **Materials**

- A group of assorted school supplies (e.g., pencil, marker, paper clip, ruler, scissors, etc.)
- Pasta in assorted shapes
- Rock and mineral samples
- Hand lenses

1. Ask questions to the students as to what they like, what they don't like, statistics about their family, themselves, etc. Point out that they are certainly different; that no two students answered the questions the very same. Ask them how they are alike. Discuss with the class the reasons why they are members of the same class.
2. Show the students a collection of school supplies. Ask how the supplies are the same and how they are different.
3. Classify the school supplies and record them on a simple chart on the board.
4. Divide the students into small learning groups of three to four students each.
5. Distribute a plastic bag filled with pasta to each group. Ask the students to look at each kind of pasta. What similarities and differences do they observe? Have them place the pasta into two groups.
6. Working with the entire class, discuss how the pasta can be classified into groups. Have each group create a classification sheet, classifying each piece of pasta.

### **Day 2**

1. Give each group a bag of rocks and minerals and a hand lens.
2. Have students look at the rocks and minerals, noting any characteristics they observe. Have them share their findings with the rest of the group.
3. Using group input, what characteristics did they come up with? Guide students to discovering the characteristics they might use.
4. Ask the students to put the rocks and minerals into groups according to what they see and feel, putting those of similar characteristics in the same group. (These groups of rocks and minerals will be quite varied.)
5. Ask each group to classify their rocks and minerals according to their individual characteristics.
6. Have them share their charts with other groups. Can the new group follow the previous group's classification chart?

## ***Possible Extensions/Adaptations/Integration***

- Ask the students to identify the rocks from the minerals in their collection. Knowing the characteristics of igneous, sedimentary and metamorphic rocks, have the students place the rocks in their respective groups.

## ***Assessment Suggestion***

- Students should be able to communicate the characteristics they observe in rock and mineral samples using correct scientific language. They should be able to make a simple classification outline using a minimum of five objects.

## ***Family Connections***

- Have the family start a rock collection. Classify objects around the house. Visit the national parks in southern Utah and look at the rock formations.

## ***Additional Resources***

### **Video**

*Rocks and Soil*, by Bill Nye

### **Web sites**

Utah Geological Survey web site:

<http://www.ugs.state.ut.us/surveynotes/gladasked/gladrocks.htm>

SURWEB [www.surweb.org](http://www.surweb.org)

### **Other Resources**

Rock and Mineral Kits (The Bug House 435-864-2402,  
350 E. 300 S., Delta, UT 84624)