

## Sorting Rocks Using Properties

**Lesson Concept** Rocks can be identified by their properties.

**Link** In the previous lesson, students learn that weathering and erosion are processes of the rock cycle. In this lesson, students learn that rocks can be identified by their properties. In the next lesson students learn that rocks can also be identified based upon how they are formed.

**Time** 60 minutes

**Materials**

Whole class

A set of nine rocks consisting of the following:

Granite

Obsidian

Conglomerate

Gneiss

Limestone (with fossils embedded if available)

Sandstone

Basalt

Shale

Slate

A bottle of White out

Fine Line permanent marker

A bottle of clear nail polish

1 egg carton for each set of rocks

apple

Per Group (groups of 4)

A set of nine rocks as described above

1 index card

4 magnifying lenses

1 blank sheet of paper

3 paper plates

## Individual

### Science Notebook

#### **Advance preparation**

##### Preparing Class Sets of 9 Rocks

1. Separate all samples of the same type into 9 small piles.
2. Place a small (~1/4 in. in diameter) of white correction fluid on the smoothest clean surface of each sample. Allow at least 2 hours for drying.
3. After the fluid is dry, use a fine line permanent marker to number the white spots on individual samples. For example, all granite samples would be numbered 1.
4. Coat each number with a dab of clear nail polish.
5. Prepare a Rock Identification Key showing the number and name of each rock type. Make copies for each set.
6. Create sets of rocks by placing one of each sample into an egg carton. Adhere a copy of the Rock Identification Key into each carton.

#### **Procedure:**

##### ***Engage (10 minutes) Matter can be identified by properties (color, relative density, hardness, and composition).***

1. Hold up an apple, ask students to describe the apple. [Expected Student Response (ESR): the apple's color, shape, size, hardness, composition, and texture]. Record their responses on the board.
2. Explain to students that "properties" are physical characteristics that help us distinguish one object from another. Ask students to brainstorm some general properties. For example, if the student's response was red, the general property is color. Have students create a data table to record their observations of the physical properties of rocks.

##### ***Explore (30 minutes) Rocks can be distinguished by their physical properties.***

3. Organize students into teams of four and distribute a rock set to each group. Give each group a name, for example Team A, Team B, etc.
4. Direct students to look at the samples with and without the use of magnifying lenses.
5. Instruct teams to sort their samples into two to three groups based upon a single property. Have students place each groups of rocks on a separate paper plate. Have students think about the rationale for their groups based on direct observation of the rocks.
6. Direct students to record the property they used to group their rocks on an index card, e.g., make of smaller rock. Have students place the index card face down, under the appropriate paper plate.

7. Have each team observe the other teams' groupings. Instruct students to infer the property that was used for sorting. Direct students to record the Team Name and their inferences on the recording sheet: *Sorting Rocks Using Properties*.

**Explain (10 minutes) Physical properties can be used to identify rocks.**

8. Have students share the ways that they chose to sort or classify the samples and record the properties on the board. [(ESR): color, composition, air holes, small rocks inside, black pieces, texture – smooth, bumpy, shapes- triangular or size- large, small.]

*Teacher Note: Be sure to discuss why shape and size are not valid properties to use to sort rocks and minerals because the materials break and the size and shapes will vary.*

**Extend/Evaluate (10 minutes) Rocks can be classified using their physical properties.**

9. Remind students that they have used their observations to classify materials collected from the Earth's crust. Have students draw a "line of learning" in their science notebook. Under the line of learning have students write what they now know about the properties of rock.
10. Have students share out their entries and discuss and clarify as needed. Then have students record any new information they wanted to add under the "line of learning."

*Teacher Note: A "line of learning" is simple strategy to help students be metacognitive about their learning.*

Adapted from Lawrence Hall of Science, Stories in Stone

Name: \_\_\_\_\_

### Recording Sheet: Sorting Rocks Using Properties

Team Name	Inferred Property