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ROCK COMPARISONS — ACTIVITY 2 (LP2)

Science Standards of Learning 5.8, 5.1, 4.8, 4.1, 3.1

Question

How can the various features and characteristics of rocks be used to help differentiate among similar appearing samples?

Rationale

Many rocks superficially resemble each other; however, these samples actually may be quite different. In contrast, some rocks that first appear very different may actually have many similarities, perhaps even being an example of the same type of rock. In this investigation students use the observation skills that were emphasized in *Activity 1* to make detailed comparisons of similar appearing rock samples. Being able to discriminate the subtle differences in samples is key to deciphering important information about rocks and their identification. Again as in *Activity 1*, the careful use of descriptive language is critical to systematic investigation.

Objectives

It is expected that students should be able to:

- Make precise observations about rock samples by applying basic understanding of the concepts of density, composition, and texture.
- Record qualitative information about rocks using descriptive language.
- Communicate differences and similarities between given samples.
- Infer the value of careful observation and fine discrimination.

Key Concepts

The concepts developed in this activity include the following:

- Similar appearing rocks actually can be quite different when their characteristics and features are closely examined.
- Color in the same rock type can vary from sample to sample.
- Some rocks are made of both large and small particles.
- If the particles that make up a rock reflect light (little sparkles or flashes) the rock is likely to be made of interlocking crystals or the minerals are exhibiting well defined cleavage.
- Crystalline rocks often have a shiny appearance, even when their constituent particles are very small.
- Rocks vary in density. When similar-sized rocks of different densities are held side by side, a careful observer can detect the difference.

ROCK COMPARISONS — ACTIVITY 2

page 2

Procedure: Description and Directions

As in the previous activity, students will work in groups of two or three, moving in a “round-robin” fashion among the stations set up around the room. The teacher needs to prepare the activity by placing the numbered samples on the appropriate cards prior to the rock lab. Notice that there are five (5) stations, each having two samples. **(It is very important that students not move samples among station cards.)**

- The teacher will need to reinforce procedures from the previous activity including “hefting” to determine relative density, looking for the presence of either crystals rounded grains, and comparing the size and organization of the constituent particles.
- Instruct students not to move the samples from the original station or their matching boxes.
- Instruct students not to damage the samples.
- Pass out the student recording sheets. Each student, regardless of the group size or teaming, should be responsible for keeping a data sheet. Clipboards or cardboard backing are helpful.
- Students will notice that in *Activity 2* each station has several questions related to observation that s/he must make about the paired rock samples.
- Upon completion of the activity, if there are questions about samples, the teacher may consider allowing students to revisit certain stations.
- Students should respond in phrases complete enough to convey and communicate the meaning of their observations.

Class Debriefing /Follow-up

A basic way to debrief is to have individual students respond orally for each station. Students should also describe the procedures they used to make the observation. A range of responses should be expected.

Assessment

Given a pair of similar-appearing rock samples, students should be able to make basic descriptions of how the two samples are similar and different.

The differences and similarities should be described in terms related to the following characteristics

- Size and shape of the constituent particles.
- Whether the particles are most likely grains cemented together; interlocking crystals or cleavage planes of specific minerals (feldspar most notable).
- The color of the constituent particles or the overall rock color
- The relative density of the samples
- The presence of unusual features in the rock.

When comparing and contrasting the rock samples, either orally or in writing, the student should use the basic rock vocabulary developed in this activity.

ROCK COMPARISONS — ACTIVITY 2

page 3

Vocabulary

- Crystal
- Density
- Different
- Grain
- Particles
- Similar
- Mineral
- Luster
- Cleavage