

Grade: 3-5

What Are Minerals?

Lesson #1A: Rock Game

Time: 1-2 class period

Overview:

Students describe rocks in detail using new and common terminology, in a game where teams try to identify the rock being described.

Essential Questions:

- What are properties of rocks and minerals?
- How and why do scientists describe things?

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Source: Adapted from Previous AMEREF Curriculum

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Assessment

Can students:

Give an accurate and detailed description of a rock?

Vocabulary

- luster
- texture
- vein
- grain
- stratification
- rock composition

Alaska Standards

Addressed:

Science GLEs

The student demonstrates understanding of:

-the processes of science by:

[3] SA1.1 asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring and communicating. [3] SA1.2 observing and describing their world to answer simple questions. [4] SA1.1 asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring and communicating.

-the structure and properties of matter by: [3] SB1.1

classifying matter according to physical properties (i.e., color, size, shape, weight, texture, flexibility)

Writing GLEs

[4] 2.2.2 Writing in a variety of nonfiction forms using appropriate information and structure (i.e., personal letters, recounts, descriptions or observations)
[5] 2.2.2 Writing in a variety of nonfiction forms using appropriate information and structure (i.e., step-by-step directions, descriptions, observations, or report writing)

Teacher information and Procedure

Prior knowledge for students: None

Materials needed:

- 30-70 rocks of any kind
- chart paper
- markers
- Mineral sample set from the kit

What to do in advance:

Set up enough stations to allow 2-4 students per station. Place 5-10 rocks, chart paper, and markers at each station.

What to do during the lesson:

- **Gear up:**

Show samples from the rock and mineral set to demonstrate vocabulary for describing rock properties:

Luster: The way in which the surface of a mineral reflects light. Show samples of obsidian (glassy), talc (dull), pyrite or galena (metallic), graphite (waxy). Students may also use words such as "shiny" or "sparkly" to describe luster

Texture: General appearance of the rock surface in terms of its minerals or crystals. Show samples of gabbro, granite (coarse) halite, shale (fine), obsidian (smooth) Pyrolusite might show "fibrous" texture.

Stratification: The accumulation of material as layers in rocks. "Stratified" is another term for "layered". Samples of sandstone or shale in your mineral set may or may not show stratification. If not, try to find a layered rock elsewhere as an example.

Composition: Describes "ingredients" of the rock. Students will describe this in terms of what they see in the rock: Big white grains, small black shiny grains, little holes, white "veins" or lines, etc.

Use conglomerate, granite, and other rocks that you find to practice describing composition. Encourage students to use other, more familiar terms for describing the rock samples as well. They can describe the color, the way it feels (soapy, rough), whether it is heavy or light for its size. In terms of preparing for future identification and classification of rocks and minerals, it's helpful if students don't use "size" as a descriptor. Discuss the idea that most smaller rocks come from the breaking and weathering of larger rocks as part of the rock cycle.

- **Explore:**

This exploration may be done one to three times.

Arrange the students in groups of 2-4 and place each group at a different station with 5-10 rocks, chart paper and markers. Within each group assign a recorder.

Have each group secretly select one rock from a group of many. They should not pick it up or indicate their selection in any way. Give students 5-10 minutes to write adjectives describing their rock on chart paper.

Switch stations and have each group read the previous group's description and try to guess the original group's rock. Give the reading group 5 minutes to come to a consensus.

Have each group present which rock they think was described by the previous group and what clues helped them the most. Why?

- **Generalize:**

What did all of the rocks have in common? What were some of the observable characteristics that helped you to identify one rock out of many?

Why might it be important for scientists to observe and describe things carefully? Why do rocks sometimes have the same characteristics, even though their sizes and shapes are different?

- **Assess:**

Students describe a rock in detail, orally or in writing. If this is a written assessment, students could make a brochure to sell their rock or write a poem about their rock.

Assessment criteria include:

- Describe at least five observable properties of the rock (not including size).
- Use vocabulary accurately

Related Resources in the AMEREF Kit:

- On the AMEREF CD:
 - Rocks & Minerals Overview
 - Rocks & Minerals Game
- Mineral Identification Overview-AMEREF
- Alaska Rock and Mineral Collection (40 specimens): Scott Resources
- Rocks and Minerals: A Study Guide Book: Scott Resources
- The Magic School Bus: Inside the Earth
- Everybody Needs a Rock
- Hidden Treasures: Alaska Minerals Poster and Information Poster: Juneau
 - Mineral Information Center
- Rock Odyssey Video

Extensions, adaptations, and more resources:

Have the students:

Develop a way to depict luster, color, texture, opacity, porosity, stratification, and composition and then draw a picture of a specific rock.

Estimate the weight of several different rocks and check the answer with a balance.

Estimate the volume of a rock and explain your answer to the teacher.

Organize 3 rocks into a still life and draw them with specific attention to at least 3 of their properties.

Classify rocks into piles using properties such as luster, texture, and composition.

