

Overview:

Rocks can be sorted by the materials of which they are made.

Objectives:

The student will:

- identify rocks by materials of which they are made
- classify rocks; and
- create a table explaining rocks.

Targeted Alaska Grade Level Expectations:

Science

- [3] SD1.1 The student demonstrates an understanding of geochemical cycles by recognizing that most rocks are composed of combinations of different substances.
- [3] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.

Alaska Content Standards:

Math

- [2] S&P-2 The student demonstrates an ability classify and organize data by collecting, recording, interpreting, and representing data in a variety of ways (M6.1.1)

Vocabulary:

classify - to put into groups or classes; sort

collection - a group of objects collected for exhibition or study

communicate - to have an exchange of thoughts; ideas, or information

examine - to look at carefully

fossil - the remains or traces of a plant or animal of an earlier age

label - a tag or sticker that is attached to something to tell what it is

rockhound - (informal) people who enjoy finding and collecting rocks and minerals

Materials:

- Individual rock collections (washed, cleaned, and dried) 10-12 rocks per student
- Chart paper
- Egg carton (one per student)
- Liquid correction fluid (enough for each student to label 10-12 rocks)
- Permanent marker (fine tip)
- Magnifying glasses (class set)
- Glue
- Index cards (at least two per student)
- Science journals (one per student)
- Geo Safari Rock Collections: Sedimentary, Igneous, Metamorphic, and Fossil
- Rocks in His Head. Carol Otis Hurst. Greenwillow Books. 2001.

Reference Books & Sources:

- *The Best Book of Fossils, Rocks and Minerals*, by Chris Pellant (2007).
- *DK Eye Wonder—Rocks and Minerals Guide*, by Chris Pellant (2002).

- *A Look at Rocks from Coal to Kimberlite*, by Jo S. Kittinger (1998).
- *Houghton Mifflin Dictionary Intermediate An American Heritage Dictionary*. Houghton Mifflin Company Boston. 1986. ISBN 0-395-38392-7.

Activity Preparation:

1. Have students bring 10-12 rocks that have been collected with the location name and date obtained.
2. Prepare vocabulary list on chart paper.

Activity Procedure:

Please refer to the assessment task and scoring rubric located at the end of these instructions. Discuss the assessment description with the class before leading this lesson.

Gear Up

Process Skills- communicating and observing

1. Do a quick pre-assessment by asking students what materials or substances make up rocks. Write student responses on chart paper. The teacher should share a variety of rock samples from each of the following: igneous, sedimentary, metamorphic, and fossil.
2. Read the book *Rocks in His Head* about collecting rocks and discuss the story. Review the vocabulary words and discuss definitions.

Explore

Process Skills- observing, communicating, classifying

3. Ask students to put their individual rock collections on their desk or table, then ask the following:
 - What observations or findings did you make when collecting rocks?
 - What attributes do your rocks have? (size, color, shape, texture, weight, layers, etc.) List attributes on the board.
 - Hold up any rock that has layers. (sedimentary)
 - Why do some rocks have pieces of rock, shell, sand, mud, or organic/plant matter? Hold up any of your rocks that look like this. (sedimentary)
 - Hold up any coarse-grained rocks with white, gray, or pink spots. (igneous-granite)
 - Did any of the rocks feel lighter than others you found? (igneous-pumice)
 - Did you find any rocks made of tiny grains of minerals in black, red, greenish, or purple that splits easily into thin sheets? (metamorphic-slate)
 - Why did you collect the rocks that you did?

Explain they will be organizing their rock collections by labeling and classifying by attributes. Students will work with a partner to help each other organize the rocks in their own egg cartons. Remind them to use the magnifying glass to look for attributes. Organize the rocks

4. Model for students how geologists label each rock by putting a small dot of liquid correction fluid on each clean rock. After the liquid is dry, instruct students to write a number on each dot starting with the number 1.
5. In their science journal have each student write the number from the rock, where and when they found the rock, and the attributes they chose to organize their rocks. The teacher should circulate among the partner groups asking questions about how they are classifying their rocks.

Generalize

Process Skills: classifying, observing, making generalizations

6. Gather students as a group and ask these questions:
 - How did you organize your rock collections?
 - What materials are your rocks made of?
 - Are you a "rockhound?"
 - How can you add to your rock collection?

(Teacher writes student's initials by their responses to the questions above on the chart paper.)

Apply

Process Skills: observing, classifying, and communicating

- Use a rock collecting guidebook or log on to websites with photo galleries and searchable guides to rocks and minerals. Match two or more photos with your rock samples. Write this information on an index card then glue the photo onto the index card. Tell where and when you found the rock and what materials it is made of. Next, store the rock with your collection in the egg cartons.

Extension Idea(s):

- Polish rocks and minerals to a shiny smoothness with the use of a rock tumbler.
- Use your finest specimens to make jewelry.

Assessment Task:

Choose six to ten rocks from a labeled rock collection. In your science journal create a table* with at least three sections that identifies at least six rock samples. One section must describe what material each rock is made of and the other sections must list and describe at least two attributes.

Rubric:

Objective	GLEs	Below Proficient	Proficient	Above Proficient
Identify rocks by the materials of which they are made.	[3] SD1.1	In a science journal the student identifies and describes five or fewer rock samples by the materials from which the rocks are made.	In a science journal the student identifies and describes six rock samples by the materials from which the rocks are made.	In a science journal the student identifies and describes seven to ten rock samples by the materials from which the rocks are made.
Classify Rocks	[3] SA1.1	The student will classify five or fewer rocks by two or more attributes.	The student will classify six rocks by two attributes.	The student will classify seven to ten rocks by three or more attributes.
Create a table explaining rocks.	[2] M-S&P-2	The student creates a table with two or fewer sections with one section identifying what the rock is made of and the other section listing and describing a rock attribute.	The student creates a three section table with one section identifying what the rock is made of and the other two sections listing and describing rock attributes.	The student creates a four or more section table with one section identifying what the rock is made of and the other sections listing and describing rock attributes.

Sample "Proficient" table:

Rock Number	Materials rock is composed of	Attribute _____	Attribute _____