

Science Concept:

Rocks can be made up of different substances.

Objectives:

The student will:

- describe how rocks are made of different substances;
- ask and answer questions about what rocks can be made of; and
- write complete sentences about 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] SA1.2 The student demonstrates an understanding of the processes of science by observing and describing the student's own world to answer simple questions.

Writing

[2] W1.1.1 The student writes about a topic by writing complete sentences with a subject and a predicate.

Vocabulary:

clay – a firm kind of earth made up of small particles

collect – to bring or come together in a group

erosion – the process of carrying weathered rock from one place to another

mineral – a material that is found in nature and that has never been alive

mud – wet, sticky, soft earth

particle (*dust, grain of sand, and grit*) – a very small piece or amount; speck

pebble – a small, round stone

press – to put steady force against

sand – loose grains of worn rock

sedimentary – rock that forms when sediment is pressed together and hardens

sediment – sand and stones deposited by water, wind or a glacier

substance – physical matter or material

weathering – the breaking up or wearing away of rock

Materials:

- Chocolate chips, melted
- Peanut butter chips
- Nuts
- Coconut
- Chow mien noodles
- Paper cups (8-ounce)
- Napkins
- Rocks that include different substances (mud, clay, shells, wood, fossils and pebbles)
- Science journal (one per student)
- Chart paper
- Bailey, J. and Lily, M. (2006). *Cracking up: A story about erosion*. Minneapolis, MN: Picture Window Books.

Activity Preparation:

1. Prepare a KWL on chart paper. [Teacher's NOTE: A KWL chart is a three-column chart to be filled in during student discussion. The first column should be labeled "K (What I KNOW)," the second column "W (What I WANT to Know)," and the third column "L (What I LEARNED)."]
2. Melt chocolate chips and keep warm before Explore activity.
3. Prepare a vocabulary list with definitions on chart paper.

Activity Procedure:

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

Gear Up

Process Skills: communicating, describing, inferring, observing and predicting

1. Ask students what they think rocks are made of? Fill in KWL chart with students' answers.
2. Take students for a walk and collect rocks. Ask students to make observations about their rocks. Place rocks together in the classroom.
3. Read Cracking Up: A Story About Erosion to the class. Ask students to add comments to the KWL chart. Discuss the word "substances." Review the vocabulary list and discuss definitions.

Explore

Process Skills: observing and describing

4. Explain students will make cookie "rocks" to model how rocks are made from different substances.
5. Divide students into pairs. Students will choose which foods and the amounts to use to make their rock cookie. Mix all the ingredients with the melted chocolate.
6. Instruct students to place melted chocolate chips in the bottom of their cups. Next, they should add chow mien noodles, coconut, nuts, and peanut butter chips to their cups. While their "rock" is cooling, ask students to draw and label the different substances used to make their cookie rock in their science journal.
7. The teacher circulates between the groups asking questions and observing.
8. Students observe the cookies when hard and draw the completed cookie in science journals. Have partners share the cookie and enjoy!

Generalize

Process Skills: communicating, observing, questioning, describing and observing

9. Gather students as a group and ask students the following questions.
 - a. What different substances did you observe in your cookie rock?
 - b. How could you tell the different substances apart after the rock cookie cooled and became hard?
 - c. Describe some of the different substances in your cookie rock?
 - d. What kind of substances could be found in a real rock?
 - e. Complete the KWL chart.

Apply

Process Skills: observing, communicating, predicting, inferring, describing and classifying

10. Ask students to choose several rocks from the class collection that contain various substances. Ask students to describe all of the substances they observe in the rocks. Students should record this information in their science journal by drawing the rocks and labeling the parts.

Extension Ideas:

1. Find rocks in other areas and compare what they are made of.
2. Read the book *Everybody Needs a Rock* by Byrd Baylor. Discuss the book.

Assessment Task:

Task 1:

Choose one rock from the collection of rocks collected by the class. In your science journal, describe at least two of the different substances in the rock that you can see. You must write at least five complete sentences with a subject and a predicate when writing your description.

Task 2:

In your science journal, create at least two questions (with an answer key) that another student in your class will answer about what rocks are made of.

Rubric:

Objectives	GLEs	Below Proficient	Proficient	Above Proficient
The student describes how rocks are made of different substances.	[3] SD1.1	The student describes how rocks are made of less than two different substances in their science journal.	The student describes how rocks are made of two or more different substances in their science journal.	The student describes how rocks are made of three or more different substances in their science journal.
The student asks and answers questions about what rocks can be made of.	[3] SA1.2	The student will ask or answer less than two questions about what rocks can be made of.	The student will ask and answer two or more questions about what rocks can be made of.	The student will ask and answer three or more questions about what rocks can be made of.
The student writes complete sentences about rocks.	[2] W1.1.1	The student will write two or fewer complete sentences with a subject and predicate when describing a rock.	The student will write three complete sentences with a subject and predicate when describing a rock.	The student will write four or more complete sentences with a subject and a predicate when describing a rock.

Resources:

- Baylor, B., and Parnall, P. (1974). *Everybody needs a rock*. New York, NY: Scribner.
- Stille, D. R. (2005). *Erosion: How land forms, how it changes*. Minneapolis, MN: Compass Point Books.