

Smoothing Out the Rough Spots

Summary

Rock salt is used to model the impacts of water and mechanical action on the erosion of rocks.

Time Frame

1 class periods of 30 minutes each

Group Size

Small Groups

Materials

For the Teacher:

2 jars (approximately 1 quart) of the same size and shape

2 pieces of hard candy of the same size and shape

Tablespoon

For each group of 3-4 students:

4 tablespoons of rock salt

3 baby food jars with lids

1 or more hand lenses

Tablespoon

2 paper towels or newspaper or a paper plate

1 recording sheet per student or group. Fold the recording sheet into fourths.

Background for Teachers

In this activity, rock salt is used to represent rocks in the erosion process. It is important for students to understand that even though rock salt isn't a rock, it will show affects similar to rocks due to friction and/or water exposure. Some rocks are very dramatically affected by water and the minerals in it. Other rocks are affected more by the abrasion of materials carried in the water as it moves over the rocks.

Intended Learning Outcomes

Make observations and predictions.

Identify variables and the relationships between them

Collect, record and analyze data.

Communicate findings verbally and in diagrams.

Instructional Procedures

Prior to the start of the lab:

Place two tablespoons of rock salt in each baby food jar.

Fill the third jar with water.

Store all student equipment in or on a container for easy distribution. Consider a cafeteria tray, shoe box, plastic ice cream bucket, etc.

Hand out materials to student groups.

Have students determine a fair way for them to distribute the sharing of materials and tasks.

Tasks may include:

shaker

recorder

timer

All students should have an opportunity to use the hand lens

Tasks should be rotated during the course of the activity.

Review the proper way to use a hand lens:

Hold the lens on or near the bridge of the nose with one hand and bring the object into focus with the other hand.

Start the lab.

Have students look at a piece of rock salt with and without the hand lens.

Compare the differences.

Discuss and draw the rock salt in the first of four sections on the recording sheet. Label the first diagram as "rock salt - before erosion." Even though rock salt is not a rock, it will serve as the rock for the experiment.

On the first square of the recording sheet, have the students list how rock salt is like a rock and how it is not.

Have the students place one piece of rock salt next to their diagram of rock salt before erosion. This can be used for comparison later in the activity.

Add 1 Tablespoon of water to one jar and add nothing to the second jar.

Tighten both lids.

Have the students predict changes, if any, that may happen to the rock salt in each jar.

Predictions should be recorded in square two of their paper.

Have the students shake the jars in a swirling motion for 2 minutes.

Remove both lids and take out one piece of the rock salt from each jar and place it on the desk.

Observe the differences with the naked eye and with the hand lens.

Have the students sketch the pieces of rock salt and identify which is "with water" and "no water" on the second section of the record sheet.

Ask them,

How are these rocks different from the rock in picture 1?

Does the rock that was shaken with water look different from the rock shaken without water? How?

What might account for this difference?

Place the pieces of rock salt next to the appropriate diagrams.

Have the students predict what will happen with two more minutes of swirling. Record their predictions.

Replace the lids on the jars and repeat the agitation for 2 more minutes using the same motion as before.

Open the lids and remove 1 more piece of rock salt per jar and observe as before.

In the third section of the paper, have students draw and label the next two pieces of salt.

Did their observations match their predictions? Discuss what is happening and why. [The pieces are being changed into smoother and smaller pieces. The water is speeding up this process by also dissolving the rock salt. Water will naturally break down certain types of rocks more quickly than others.]

Repeat the swirling for the final 2 minutes.

Record the results in section four of the recording sheet.

Have students predict what may happen if this continues.

Complete the record sheet by writing a paragraph on the back about the experiment and the relationship of abrasion, movement, and water on the erosion of rocks in nature.

Take the two large jars and place one piece of unwrapped hard candy into each.

Add water to fill one jar about half-way.

Have the students predict what will happen to the candy when the jars are shaken.
Shake each jar for several minutes passing them from child to child.
At the end of the time, observe and discuss what has happened.
Leave the jars on a counter and observe again the next day.
Discuss how this relates to the rock salt experiment and rocks in nature.

Assessment Plan

Ask students to write a paragraph that explains how their rock salt investigation is like erosion.
Evaluate their paragraphs using the Science Writing Rubric.
Assign students to bring in a rock that has been eroded by water and one that shows signs of erosion by abrasion.

Rubrics

[Science Writing Rubric](#)

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