Catalyst 2004
Idea Exchange

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Rock Families
Science 8

I did this activity using a collection of rocks and minerals from Ward's Biology. It can be adapted to your school rock collection. The number of stations can be reduced or increased depending on the amount of rock samples. I had 8 stations with the same 12 rocks. There were four from each of the rock "families": Igneous, Metamorphic and Sedimentary.

Before the activity, students learned about the formation of each type of rocks and were given some clues about how to classify rocks into each family. These clues are the following: (adapted from a Prentice-Hall textbook, Dynamic Earth)

Characteristics of Sedimentary Rocks

-Made up of fragments of other rocks. Some have big particles, some smaller.
-Often show distinct parallel layers.
-Often appear dull or earthy.
-Some may have fossils.

Characteristics of Igneous Rocks

-Some may contain crystals which can be visible.
-Some may appear glassy from fast cooling.
-Some may have different colors not organized in bands.

Characteristics of Metamorphic Rocks

-Some may look like igneous rocks but show bands of colors.
-Some may show signs of bending.
-Crystals may appear flattened.

I gave 12 rocks and told the students that I expected correct classification into their proper families for at least 6 of them. The rocks were on a big chart (size increased on copier) with names on it. Students received the handout and had to copy down the rock chart with each name and describe each rock while observing them. This was to be included in their report.

A more challenging alternative is to not give them the names of the rock but give them a table with a description. So they would have to identify the rocks and put them into the correct family. However, I think I would reduce the number of samples for this.

I have also included a small activity called the Melting Ice Paradox. Very simple and best done when it is a snowy day.

Science 8 Rock Families Name:
Period:
Date:

You have now learned that there are three main rock families: Igneous Rocks, Sedimentary Rocks and Metamorphic Rocks. You have also learned that there are characteristics for each families. It is now time to observe a rock collection and classify the rocks in their proper families.

Materials: Magnifying lens, Rock samples

Procedure: -Obtain rock samples from your teachers.
-Using your knowledge of the characteristics of each families, describe each rock sample and classify it in one of the families.
-Use the magnifying lens if necessary.
-Answer the discussion questions.

Results: Your results should include a short description of each rock. You should also have the rocks divided into each families.

Discussion: 1. List the name of rocks that are in the following families:

a) igneous b) sedimentary c) metamorphic

2. What characteristics were more useful to describe the rocks?

3. Fossils are remains of living things. Which type of rocks would most likely to have some? Explain why.

4. Metamorphic rocks are formed with the two other types of rocks.
Can you find, in your samples which "parent" rock is more likely to become :

a) Gneiss? b) Slate?

c) Explain why.

Slate	Sandstone	Basalt	Conglomerate
Marble	Pumice	Limestone	Granite
Shale	Obsidian	Schist	Gneiss

Science 8W

Name:
Period:

The melting ice paradox experiment

Salt is used in winter to melt the ice and snow covering roads. Usually, ice melts when the temperature rises. This experiment will demonstrate what happens when we speed up the melting of ice with salt.

Purpose:

To measure the rate of temperature change of ice melted with salt.

Materials:

Crushed ice (or snow)		Thermometer
Stopwatch	Stirring rod	Safety Goggles
100 ml (or 150 mL)	Beaker	Salt (about 15 mL)

Procedure:

1. Obtain some crushed ice from the teacher and put it in the beaker.
2. Bring the all the materials to your lab station.
3. Put the thermometer in the ice and measure the temperature when it stops going down. Note it in the results under A. Leave the thermometer in the ice
4. Pour the salt over the ice and start timing with the stopwatch. Use the stirring rod to mix. Look at the thermometer. Touch the beaker. What do you notice?
5. When the temperature is stable again, stop timing. Note the temperature in the results under B and note the time under C.
6. Calculate the rate of temperature change.

Observations:

Results:

A_____ Temperature of the ice before the salt was added.

B_____ Temperature of the ice after the salt was added.

C_____ Elapsed time (in seconds).

Calculations:

1. Temperature difference: Count how many degrees the between temperature A and B. (Look at the thermometre).

Temperature difference _____° C

2. Calculate the rate of change (how fast it changes in degree Celsius per second):

Rate of temperature change = Temperature difference ÷ Elapsed time

Rate _____ ° C/second

Questions.: Full sentences please

1. What did you notice when touching the side of the beaker?

2. What did you notice about the temperature after the salt was added?

3. What was the rate of temperature change?

4. Was this a cooling rate or a heating rate? Explain.

Bonus . Do some research to explain why the temperature did what it did even though the ice melted.