

ROCKING THE CLASS WITH THE ROCK CYCLE

TEXAS TEKS: 6:14a, 7:14a, 8:12a, GMO 7,8

Do rocks stay the same FOREVER? How do they change? What makes those rocks change anyway? The following set of labs is designed to allow the teacher to choose different activities for students to experience changes that can be related to rocks. These activities are divided into sedimentary, igneous and metamorphic. Even though sedimentary rocks represent the smallest quantity of rocks on the Earth, they provide the greatest number of activities for students.

SEDIMENTARY ROCKS

Activity 1- Making Sediments

Materials

Sandstone (sugar cubes can be substituted for sandstone)
Empty film containers
Triple beam balance or
Rulers
Paper towels

Procedure

1. Measure and describe the rock
2. Place rock in empty film container.
3. Shake about 100 times
4. Pour contents out on a paper towel or sheet of blank paper
5. Measure and describe again

Analysis

1. How much did the rock change after shaking?
2. How does the action of river create sediments?
3. How do the winds on a desert create sediments?

Activity 2- Making Sedimentary Rocks

The sediments that form sedimentary rocks are bound together by two processes. Those processes are *cementation* and *compaction*. Sediments are cemented or glued together by filtering the minerals out of the water as it flows through them. As the layers of sediment pile up, the weight squeezes the sediments together.

Cementation

Materials

Aquarium gravel (nice to have more than one color)
Wood glue
Water
Small paper cups
Tablespoon
Variety of sedimentary rocks

Procedure

1. Put approximately 1 tablespoon of gravel in a small paper cup

(If you have more than one color add a tablespoon of each carefully so that the gravel forms layers.)

2. Mix the glue and water 50/50
3. Cover the gravel with the glue water mixture
4. Allow the substance to dry
5. Once the substance is dry peel the paper cup off.

Analysis

1. What characteristic of this substance simulates a real sedimentary rock? (If you included different colors of gravel, there will be 2 characteristics of sedimentary rocks)
2. Compare the homemade rock with the real sedimentary. Make a chart showing the likenesses and the differences of the real rocks and the homemade rock.

Activity 3

Compaction

Materials

Crayola shavings or wax beads used to make candles
Aquarium gravel
Small paper cup
Plank of wood or a book
Variety of sedimentary rocks

Procedure

1. Put equal amounts of wax and gravel in small paper cup.
2. Fold the edges of the cup over the wax and gravel mixture.
3. Place the book or plank on top of the folded cup and press.
4. Peel the paper cup away from the "rock"

Analysis

1. Describe the "rock".
2. Make a chart to compare the likenesses and the differences of the real sedimentary rocks and the homemade.

Activity 4

Sorting

Water sorts sediments by size. The larger pieces of sediments take more energy to move so the water drops them first. The water will drop the rest of the sediments according to size. The smallest and lightest particles may remain suspended in the water because it takes almost no energy for them to flow along with the water.

Materials

Quart sized glass jar with a tight fitting lid
Rock and gravel mixture
Water

Procedure

1. Put rock and gravel mixture into jar
2. Fill jar with water
3. Secure the lid
4. Shake

5. Set the jar down and let the mixture settle

Hint: The mixture will take time to settle. If the mixture has clay in it, the water may not become clear because the clay particles are so small and light that they may stay suspended making the water look muddy.

Erosion and Deposition

These are hard concepts for students to understand. Stream tables work very well in helping the students to visualize these 2 processes.

IGNEOUS ROCKS

Working with igneous rocks requires heat so a heat source is needed. Overhead projectors and hot plates make good heat sources. Candles are also good heat sources but safety precautions are essential. One of the best ways to demonstrate igneous rocks is to grow crystals. Arkansas quartz crystals were formed in hot water. The Women in Mining website has instructions for growing crystals.

Activity 5

Materials

Wax beads or crayola shavings

2 Aluminum cup cake cups or aluminum pie plates for each student or student group

Hot plate

Variety of igneous rocks including basalt

Procedure

1. Place wax beads or crayola shavings into cup cake cup or pie plate.
2. Turn the hot plate on to a low heat.
3. Put the container and wax on the hot plate
4. Let the wax melt.
5. Pour the melted wax into another pie plate or cup cake cup

Analysis

1. How is the melted wax like lava coming out of a volcano?
2. What happens to the wax as it cools?
3. How is the wax like basalt?

METAMORPHIC-activities to demonstrate rocks metamorphosing are basically the same as the compaction activity in the sedimentary rock section.

Activity 6

Materials

Homemade "rocks" from either the sedimentary activities or igneous activities

Variety of metamorphic rocks

Plank or book

Procedure

1. Describe the homemade sedimentary or igneous before pressure is applied
2. Wrap the “rock” in a paper towel
3. Place it under the book or plank
4. Have students stand on the book or plank for 1 minute
5. Remove the new “rock”

Analysis

1. How did the “rock” change?
2. Compare the new metamorphic rock to real metamorphic rock.