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
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.