Environmental Science Institute
UNIVERSITY OF TEXAS AT AUSTIN

How Rocks Tell a Story

Subject: Geology

Grade Level: 8th – 10th

Rational or Purpose: This lesson is designed to help students understand how rocks form and the rock cycle. Students will learn more about what geologist do and use the data given to understand the history of the Earth.

Materials: Rock Chart

Lesson Duration: 40 minutes

TEKS Objectives:
112.49. Geology, Meteorology, and Oceanography.
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Sources:
USGS Geology: Rocks and Minerals Site Content
http://wrgis.wr.usgs.gov/parks/rxmin/index.html

Franklin Institute: Discover How Rocks Are Formed
http://www.fi.edu/fellows/payton/rocks/create/index.html

Background Information:
We know that dinosaurs once existed on Earth. Amid much debate over their extinction, at a definite point in Earth's history, all dinosaurs went extinct. Some scientists suspect that the extinction is caused by meteor, while other scientists believe that violent volcanic activities are to blame. Since the event happened such a long time ago, scientists must rely on some physical evidence to help them complete the history of the Earth. The best piece of physical evidence that can survives over time, and reveals the past is rocks. Geologists, scientists who focus on the study of rocks, obtain and examine rock samples from different regions of the world. By analyzing rocks' chemistry and pattern, geologists are able to predict major events of the past in a geologic time scale. It is also geologists, who are leading the research on the history of Mars.

Procedure:

1. Students will divide into several groups (2-3 students per group). Teacher will first introduce them the rock cycle and three types of rock.

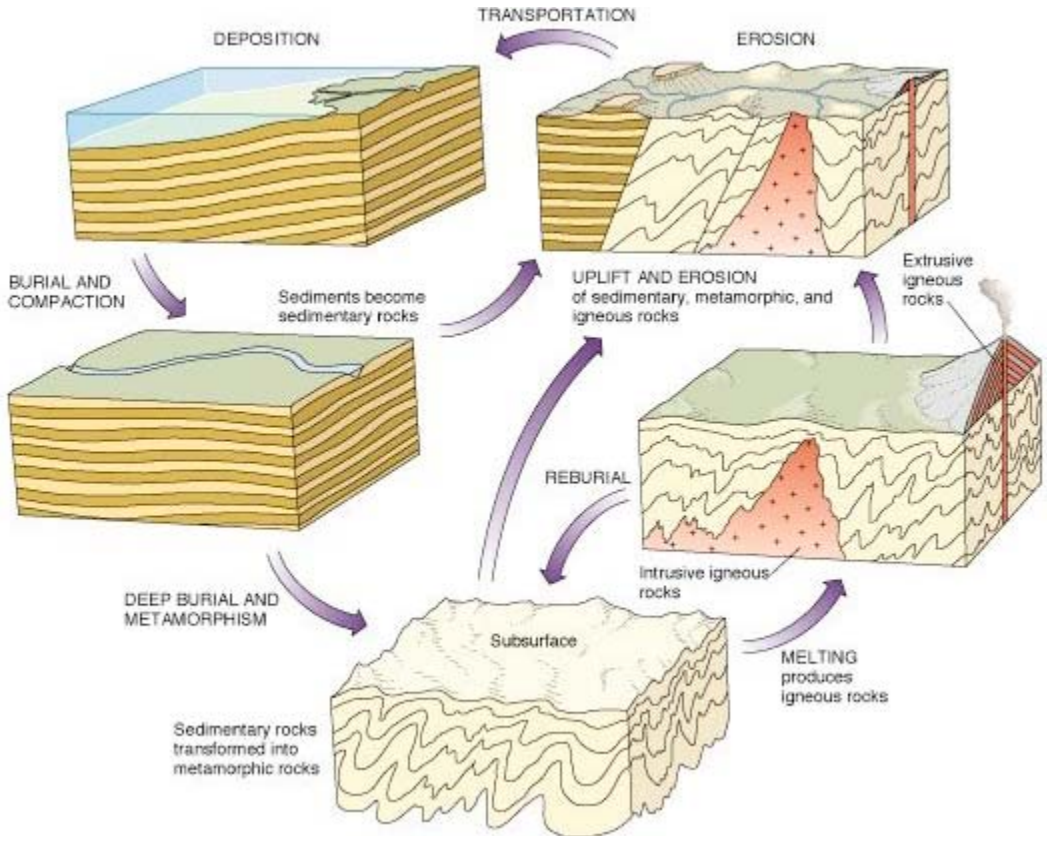
2. Students will be given a chart of the common rock types. Teacher can also show students the following website for rock images:

USGS Geology: Rocks and Minerals Site Content
http://wrgis.wr.usgs.gov/parks/rxmin/index.html

Franklin Institute: Discover How Rocks Are Formed
http://www.fi.edu/fellows/payton/rocks/create/index.html

It is also recommended that the teacher brings several rock samples to class so that students can closely observe the difference between rocks.

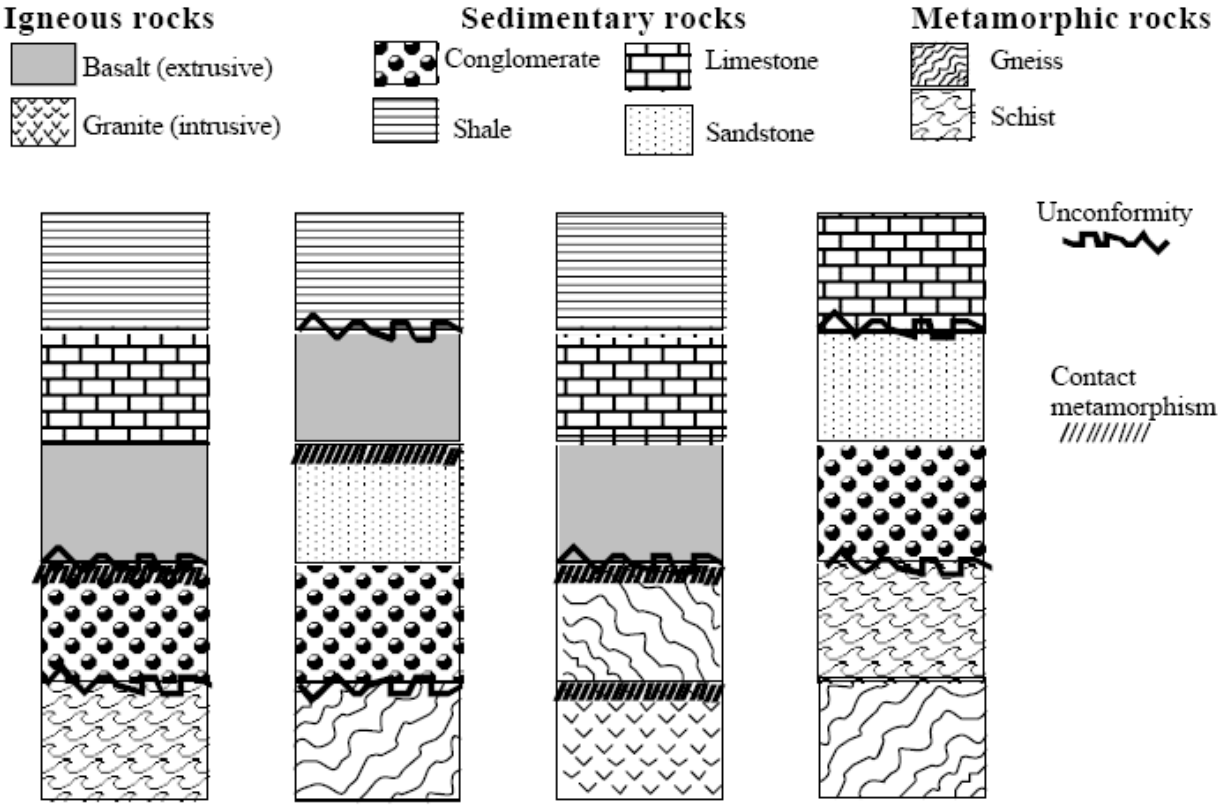
3. Rock Cycle – Teacher will then explain the formation of rocks and their place in the rock cycle with the aid of the following diagram. It is important for students to understand the rock cycle before moving on to the next task.



4. Teacher can spend about 10 minutes introducing stratigraphy, or the study of rock layers. An analogy to help students understand is a laundry basket. The clothes that are put in the basket from a long time ago are always at the bottom. This will be analogous to the sedimentary rock that was formed long ago. The newer rock will be locate on top of the older rock.

5. There are four diagrams below. Each group will receive one diagram and try to imagine what has happened in the past. (For example, when schist is formed at the

bottom of the rock, students may propose that there was heavy pressure by sedimentary rocks located above.) Since there are only four diagrams, some groups will have the same diagram. Groups can compare and contrast their stories.



Rock Chart

Igneous Rock

Granite (intrusive)

Basalt (extrusive)

Sedimentary Rock

Mudstone

Shale

Siltstone

Limestone

Sandstone

Conglomerate

Metamorphic Rock

Slate

Schist (from basalts, graphite, etc)

Gneiss (from igneous or sedimentary)

Quartzite

Marble

Amphibolite

Mylonite