

Franklin Mountains 5-E style lesson Elementary Lesson

Objective: The students will identify the sedimentary rocks found in the Franklin Mountains

Materials: Photos of the eastern and western Franklin Mountains, play dough or clay in at least three different colors, paper clips.

Engage: (5 minutes or less) **Show** the students a photo of the Franklin Mountains. **Ask** the students to describe what they see. **Guide** the discussion to include (1) the different colored rocks (layers); (2) the orientation of the layers (dip or tilt); (3) the thickness of the different layers

Exploration: (5-8 minutes) **Divide** the students into small groups. **Give** each group play dough or clay in at least two different colors. Instruct the groups to make a play dough or clay model of the Franklin Mountains. Allow time for each group to show the class their model.

Example:



Explanation: (15 -20 minutes) **The** Franklin Mountains are located in West Texas. Near El Paso. **Show** a picture of the eastern Franklin Mountains. **Explain** that the

- dark colored rocks that you see on the lower slopes of the eastern Franklin Mountains are **Precambrian-age rocks** (really old...they were made before dinosaurs lived on the earth) They are mostly **volcanic rocks** (rocks associated with volcanoes), **granites** (igneous rock with coarse crystals of quartz and feldspar), and **sedimentary rocks**, which are most commonly rocks deposited in layers. Sediments are deposited in layers as particles that fall to the seafloor.
- These rocks have been so deeply buried that the heat and pressure of the deep Earth have changed them. They have been "**metamorphosed.**"

Show a picture of the western Franklin Mountains. **Explain** that

- the rocks that you see in the western Franklin Mountains, along the ridge crest at the south end of the range and overlying the old dark-colored rocks of the east part of the range, are mostly light colored rocks—tans and grays. They are mostly layered, suggesting that they **are sedimentary rocks**, and they are mostly inclined to the west (geologists would say the bedding planes “dip” to the west). These are **sedimentary rocks** that were formed in ancient oceans—limestones and dolomites. Other kinds of rocks are there too—a little sandstone (composed of sand grains) and mudstone (made up of tiny grains of silt and clay and perhaps some sand).

Explain that some rocks form in layers. Scientists call rocks that form this way **sedimentary rocks**. That means that they were once soft sediments, sand or silt or other particles, usually deposited in water such as a lake or an ocean. Most of the layered rocks in the Franklin Mountains were deposited in an ancient ocean. We know this because geologists find fossils of ancient marine life in these rocks.

Give each group a few paper clips. Tell the students that the paper clips represent fossils of ancient marine life. **Ask** the students to use their play dough and paper clips to make a mountain model that includes fossils.

Example



The different colors of play dough represent sedimentary rocks - limestone, dolomite, sandstone or even mudstone. The paperclips represent marine fossils.

Explain that sediments are deposited in layers as particles that fall to the seafloor. As long as conditions don't change, the same processes continue, and the same kinds of particles are deposited to form a layer of sediment that is pretty homogeneous. But suppose there is a storm. Imagine that the rivers flood and sands and clays are carried into the ocean by the floodwaters. Conditions change. Now sands and clays

from the flood are deposited, and the layers are different. Everyplace you see a change from one layer of sedimentary rock to another layer means that the conditions of deposition of the original sediments have changed. You may see thin layers, or you may see layers that are several feet thick.

Elaboration: (5 minutes) Give each group a new color of play dough or clay. **Explain** that there has been a big storm and ask them to add the play dough or clay to their mountain. **Ask** one of the groups to explain their placement choice. (The new play dough should be added on the top of their model.) **Ask** the students to explain why some layers of sediment are thin and some are thick? (Everyplace you see a change from one layer of sedimentary rock to another layer means that the conditions of deposition of the original sediments have changed. You may see thin layers, or you may see layers that are several feet thick. **Ask** the students to explain why different layers of sedimentary rocks have different colors? (different types of sediment)

Evaluation: Show the class the pictures of the eastern and western Franklin Mountains. **Ask** the class to explain what they see when they look at the pictures. (Answers should include: layered sedimentary rocks, different colored sedimentary layers, thin and thick sedimentary layers.) **Ask** the students to draw a picture of the Franklin Mountains. **Have** students identify the sedimentary rocks in their drawing. If possible allow the student time to label the layers as limestone, sandstone, mudstone or sandstone. Encourage the students to add marine fossils to their drawings.

Extensions: Share examples of sedimentary rocks with your students if you have access to them. **Brainstorm** other locations in Texas where sedimentary rocks may be found. Be sure to point out any local examples of sedimentary rocks.