Sedimentary Rocks

The rocks in Badlands National Park are sedimentary rocks.

Grade: 5 and 6
Length: 50 minutes
Presenter: Teacher

Materials: small plastic bottles with lids, sand, silt, mud, gravel; toothpicks

South Dakota Content Standards
Fifth Grade Earth/Space Science:
Students will investigate and describe how Earth's surface is constantly changing.
Students will relate natural forces to fast and slow changes in Earth's surface.
Sixth Grade Earth/Space Science:
Students will investigate and describe major geological processes that have shaped the South Dakota landscape.

Badlands National Park Primary Theme
The Badlands fossil and geological record reflects changing climates and the diversity of life; its study provides insight into the survival of species.

Background Information
The rocks at Badlands National Park are sedimentary rocks. Different environments- a sea, a tropical terrestrial environment, an open woodland with meandering rivers, and a thick frosting of wind-blown and water born volcanic ash - all deposited *sediments* here at different times. The sand, silt, and mud piled up layer upon layer. Over time the sediments were consolidated (or compressed) into the sedimentary rocks we see today. The oldest rocks are at the bottom, and the youngest at the top, illustrating the *law of superposition*. Within these rocks, many fossils from ancient animals are discovered.

Procedure
Discuss the Rock Cycle. Define the three types of rocks. Show students an illustration of the rock cycle. Discuss each step of the rock cycle.

Student Activity

Materials: A small plastic bottle & lid; masking tape; sand, silt, gravel, soil, mud; water; toothpicks.
1. Measure 2 inches up from the bottom of the bottle. Use the masking tape to mark the 2 inches.
2. Use a variety of sand, soil, mud, gravel, and pebbles. Fill the bottle with these sediments up to the masking tape line.
3. Slowly pour water into the bottle. Fill the bottle about ¾ full with water. Be sure to leave about a ¼ of the bottle unfilled. Twist the top onto the bottle, securely.
4. Now, SHAKE, SHAKE, SHAKE the bottle. After it is all shook up, quickly set it on the table and leave it undisturbed. Watch what happens.
5. Open your bottle and add: 1 full toothpick, 1 toothpick broken in half, 1 toothpick broken up into small pieces
6. Repeat the SHAKE SHAKE SHAKE step. Can you see where the toothpicks end up?

Science Journal

Imagine that your bottle was like a river carrying sediments (sand, soil, mud, gravel, pebbles). What happened when the river slowed down, or in this experiment, when you left the bottle undisturbed? Did the sediments settle out and pile up? This is similar to how the Badlands were formed. Of course it took large rivers and many millions of years! What if those toothpicks were animal bones? Which ones do you think might become fossils?