**How Does Erosion shape the Earth?**

Student Outcome(s):

The students will describe how erosion contributes to the changes always occurring on Earth’s surface.

Brief Description:

In this lesson, the students will use cake pans to demonstrate erosion. They will use soil and water to show how slope affects the rate of erosion.

Background knowledge / teacher notes:

Erosion is the carrying away of weathered rocks. Water erosion is the most common type of erosion. Glacial erosion is the least common.

**Teacher note**: Read through the lab. The students may want to measure mass of run-off. It may be beneficial to teach how to use a triple-beam balance to measure mass.

**Teacher Resources**:

Cake pan erosion lab: [www.teacher.scholastic.com/dirt/erosion/lab.htm](http://www.teacher.scholastic.com/dirt/erosion/lab.htm)

How to make soda bottles for erosion lab: [www.mo14.nc.nrcs.usda.gov/features/erosiondemo.html](http://www.mo14.nc.nrcs.usda.gov/features/erosiondemo.html)

Soda bottle erosion lab: [www.cnr.vt.edu/dendro/Forsite/2004presentations/cathy/ErosionDemo4.htm](http://www.cnr.vt.edu/dendro/Forsite/2004presentations/cathy/ErosionDemo4.htm)

Materials:

* Cake pans/soda bottles
* Dirt/soil
* Watering can
* Textbooks
* Rulers
* Triple-beam balance (possible)
* Picture of Grand Canyon

Lesson Description:

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| **ENGAGE** | Who am I activity: Read the following description and have the students guess what you are referring to.  “I am a large geographical feature. Millions of people have come to visit me. I am located in Arizona. Water has molded me over the years to become the beautiful site I am today. Who am I?” –Grand Canyon  Show a picture of the Grand Canyon and discuss how the Colorado river shaped the canyon. Discuss how the colors of the canyon show the water levels over time. |
| **EXPLORE** | Erosion activity   1. Have the students take an aluminum cake pan and fill the pan with dirt. 2. Have the students use scissors to punch 5 small holes in the pan. 3. Use one textbook to prop the pan up on a slope. Place an empty pan under the dirt-filled pan. The purpose of this is for the students to catch material that is eroded. The students can measure the height of the hill. 4. Have the students discuss how to measure the run-off. Some options are measure mass (would need triple-beam balance) or pouring run-off in a beaker and measuring height of run-off material. 5. Have them complete the activity 2 mores time, each time increasing the height of the slope by one text book. 6. The students should record their data in a data table.   \*Soda bottles cut in half can be used in place of cake pans. See teacher resources. |
| **EXPLAIN** | Discuss and compare lab findings. Discuss if slope did affect the amount of run-off.  Connect back to Grand Canyon. Water erosion is the most common type of erosion and is most likely the cause of the formation of the Grand Canyon.  Connect to weathering. Weathering breaks down the rocks and erosion carries it away. Discuss real-world examples. |
| **EXTEND** | Complete varied forms of the lab experiment. The students could test erosion of other materials like sand. They could also increase the slope of the hill.  Design a hill that is “erosion free” by using large stones or rocks. Build a wall to prevent erosion and test.  Demonstrate wind and ice weathering and erosion. Using a hair dryer and sand, demonstrate how wind can create sand dunes. Place an ice cube in a soil or sand pile and scrap on a soft surface (soap). Observe changes to the soap.  Take a weather walk and observe signs of weathering and erosion. |
| **EVALUATE** | BCR: Describe weathering and erosion. Use details from our lab and demonstrations in your answer.  BCR: Describe how water weathers and erodes land. Use details from your lab observations.  Creative Writing: Pretend you are a raindrop. Describe your travels on Earth. Use weathering and erosion in your writing.  Common Core: W 3a Orient the reader by establishing a situation and introducing a narrator and/or characters; organize an event sequence that unfolds naturally. |