

Water Speed and Erosion

4th Grade

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References:

- CPS Curriculum Guide – 4th Grade Earth Sciences
- United Streaming, <http://www.unitedstreaming.com/index.cfm> Natural Phenomena: Spectacular Canyons
- Brief erosion (and prevention) demonstration: <http://www.atozteacherstuff.com/pages/298.shtml>

Benchmarks:

SLC/GLI #: ES-8

Objectives:

The objective of this lesson is for students to learn that one of the processes that shapes earth's surface is water erosion. This will be done through the use of streaming tables. This lesson also emphasizes the landforms created through water erosion, specifically canyons and deltas, which will be further shown through a United Streaming clip and pictures. Finally, students will learn that the speed of the water affects the amount of erosion the land experiences.

Materials:

- Streaming tables or large disposable foil pans
- Sand or soil
- water and drip bottles (can use water bottles if you don't have anything fancy)
- United Streaming video about the canyons

Initial Demonstration:

Take a potted plant out of the pot, with soil intact. Discuss how the roots of the plant help to hold the soil in place. Ask what would happen if the plant was not in a pot, but in the ground and water keeps running over it. Introduce the term erosion, or if they already know what it means, further elaborate on different kinds of erosion. Discuss how wind, water, and ice can all cause erosion. Ask students if and where they have ever seen the effects of erosion.

Target Observations:

- Students should notice that water causes erosion by carrying soil from one place to another.
- They should also notice that plant roots grab on to the soil and help prevent erosion.

Procedure:

- 1.) First, each group must cover the bottom of their stream table with a thick layer of sand or soil.
- 2.) Have each group position their stream table so that it is at a tilt. Use whatever you have to do this (books work well).
- 3.) Fill the drip bottle with water.
- 4.) Have students draw a before picture of the sand/soil in the stream table.
- 5.) Now slowly let water drip/squirt onto the sand/soil at the top of the stream table.
- 6.) Have the students record water and soil movements on their lab sheet or in their science journal.
- 7.) Refill the drip bottle/squirt bottle, and redo the experiment, this time with a much faster water speed.
- 8.) Have students record new water and soil movements.
- 9.) Finally, show students United Streaming Video clip during closing discussion of all that happened in the lesson.

Target Observations:

- Students should notice from doing the procedure that the water eroded the soil and carried it down the streaming table.
- They should also notice that the water made certain patterns (landforms) in the soil (rivers/riverbeds, canyons, and deltas).
- Finally, they should notice that much more soil was eroded when the water moved more quickly.

Target Revised Model:

- Students should understand that water is an important force in eroding and changing the earth's surface.
- Water erosion causes landforms such as canyons, deep riverbeds, and deltas to be formed.
- Without vegetation to help hold on to the soil, water very easily erodes, or carries large amounts of soil and small rocks downstream.

Summary:

The purpose of this lesson was to teach students about water erosion and its effect on the earth's surface. Water erosion causes landforms such as canyons and river deltas to be formed. Students discovered this fact using inquiry and large streaming tables, where they could create their own rivers and river deltas by causing erosion of the soil in the stream table with water. Students also learned that over time, this continued action of water can create incredible canyons, such as Zion Canyon or the Grand Canyon. Finally, they learned about the importance of plants and trees and impact their root systems have on helping to prevent erosion.