# A Time For Change

**Suggested Curriculum links (Grade 4)**

**104-4:** Compare the results of their investigations to those of others and recognize that results may vary

**104-6:** Demonstrate that specific terminology is used in science and technology contexts

**204-3**: State a prediction and a hypothesis based on an observed pattern of events

**301-6:** Demonstrate a variety of methods of weathering and erosion

**301-5:** Describe effects of wind, water, and ice on the landscape

**301-7:** Describe natural phenomena that causes rapid and significant changes to the landscape.

***Overview***

*Soil erosion can be a very serious problem. In this activity, students will learn some of the causes, consequences and solutions to soil erosion. As well, a word search to introduce further changing landscapes vocabulary can be found at fluvarium.ca*

**Objectives**

- To introduce some soil erosion causes and consequences.
- To investigate vegetation as a solution.

**Materials Per Station**

- Approx. 1/2 square foot of sod, root system intact (preferably no plant)
- Equivalent quantity of dry sandy soil, no root structures (not clay–soil)
- 2 Plastic shoebox sized containers / tupperware
- A slope for each container
- Water jug + capacity to refill with water

**Set Up**

1. Label the containers as Soil and Sod
2. To one side of each container place the soil and sod separately (If there's grass or other plants attached, place the grass side down)
3. Place each container on a slope (45 degrees should be plenty).
4. Have a filled water jug ready at each station.
5. If possible, do not visibly set up sod container.

**Background & Procedure**

Soil erosion is a naturally occurring event that can be caused by all the elements. It involves the loss or displacement of soil. What do you think could cause the displacement of soil in nature?

- Possible answers: wind, rain, snow, ice, waves, fire or generally weather.

Accelerated soil erosion is the loss or displacement of soil *at a faster rate than it is naturally created;* this is often due to human actions such as farming, deforestation, or construction.

What do you think will happen if we blow or pour water **slowly** into the container of just soil? (Make sure it is on a slope)

- Generate a hypothesis on the board.
- First have students try to blow the soil down the slope.
- Rearrange the soil to have it back at the top of the slope and then have water poured slowly on the soil.
- Jot down the students' observations on the board.

**At the Fluvarium**
Join us for *A Time For Change!* Students will explore the changes that have occurred to the landscape in Newfoundland and Labrador, specifically the processes of erosion, movement and deposition of rock. They will determine how wind and especially water reshape the landscape.

Why did this happen? Why wouldn't the soil stick together to form mud? Do you think there is any way to make sure the soil does not erode (get displaced)?

- Possible answers: Vegetation, rocks, barriers, mulch (plant material), soil composition (sandy soil verses clay)

Would vegetation (plants) work? What difference would they make? (Reveal second container). What do you think will happen this time?

- Generate a hypothesis on the board.
- First have students try to blow the sod down the slope.
- Have water poured slowly on the sod.
- Jot down the students' observations on the board.

Why didn't the soil travel down the slope this time? What can we conclude?

- Generate a conclusion statement on the board.

The landscape has a huge effect on the rate of soil erosion. As we just saw, the slope of the land can contribute to soil displacement or erosion. Do you think the soil would displace as much if we didn't have the container on a slope?

- It would still displace, though not as quickly. Think of a puddle, the rain doesn't spread out evenly over the entire ground; it makes indents and gathers in certain places, pushing soil to other places. You can also notice this at the end of a rain gutter.

One of the most beneficial landscapes to combat soil erosion is actual wetlands, marshes or swamps. What are wetlands?

- An area usually overgrown with grass and moss that is waterlogged / has a lot of soil moisture. They are also a habitat for a lot of wildlife like ducks and a nursery ground for aquatic life like dragonflies and frogs.

Think of wetlands like the earth's sponge; if we put a sponge under a sink tap, water can flow into it more rapidly then it will flow out. If we slow down the water through a sponge or a wetland, this will slow down or stop soil erosion as soil will fall to the bottom.

**Resources**
Find more information about soil erosion & wetlands from the following sites:

Soil Erosion:

http://soilerosion.net/

How Stuff Works:

http://science.howstuffworks.com/environmental/green-science/wetland.htm