

Erosion*

Cognitive Demand:

Interpreting
Concepts (C)

Science Literacy (D)

Technological Design (T)

Recalling Science (R)

Overview:

Students will investigate different factors that cause and prevent water-induced erosion.

Materials:

- Two stream tables
- Sand or soil
- Various types of mulch such as hay, pine needles, shredded newsprint or wood chips will also be needed (materials will differ based on what your students decide to test)
- Blocks of wood (or books) of different sizes to elevate stream table
- Small pebbles
- Water

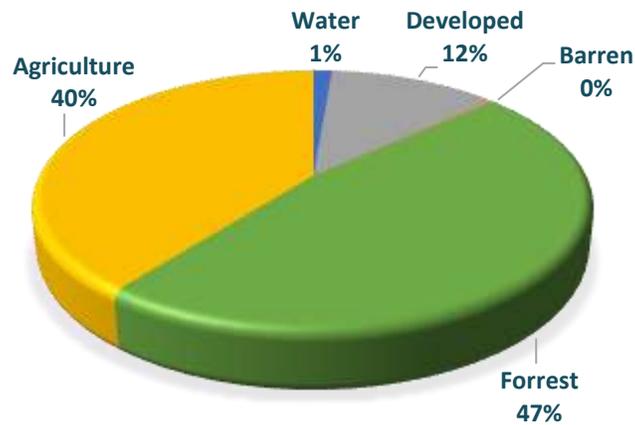
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Teacher Background:

Erosion is the wearing away of the soil by water, wind, and/or ice. This lab activity will consider only erosion caused by the runoff of liquid water. This type of erosion accounts for about 2/3 of all topsoil (surface) and subsoil (subsurface) loss.

About 40% percent of the land in the Muskingum watershed is dedicated to agriculture. While tilled soil can be beneficial to crops, it becomes a pollutant when water from irrigation and precipitation washes it into local waterways. Farmers that use conservation practices such as nutrient management plans, cover crops, vegetative buffers, conservation tillage and animal manure and poultry litter controls help to improve the water quality of the watershed.

Muskingum Watershed Land Use



Setting the Stage:

Show your class a small jar or beaker filled with water. Have a student put a few teaspoons of soil into the container and stir. Would it be a good habitat for sea grasses to grow? Explain that during this lesson the students are going to investigate how soil, salt and sand can enter the water and they are going to try to figure out some ways to prevent it.

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Acquisition of Learning:

1. Divide your students into cooperative groups.
2. Show the students the stream table and explain that the model represents a stream traveling to a larger body of water like the Muskingum River.
3. Each student group is going to come up with a stream design. The goal is to have the least amount of erosion on the stream banks.
4. Each design must include some elevation so the water will flow- and the sand or soil.
5. After the group has completed the design, they will present their idea to the class. The class will vote on two of the designs that will be constructed and tested in the stream tables.
6. In each test, roughly the same amount of "rain" should be allowed to fall on the soil so the results obtained will have some degree of consistency.

Closure:

After both streams have been constructed and tested, discuss the results:

- ◆ What worked?
- ◆ What did not work?
- ◆ What would you change?

Extensions:

Have students visit the website below to watch the animation: Sedimentation Blues
<http://www.cacaponinstitute.org/Benthics/stream%20sediment%20-%20v.html>

Afterwards ask them what happens when too much sediment enters a stream.

Use the stream table to test effects of slope, dams, contour plowing, and different soil types on erosion.