

Title: EROSION

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Grade Level: 3-6

Concepts: 1. The Sun
4. Clean Water
6. Natural Resources
12. Stewardship

Disciplines: 1. Social Studies
2. Science

Objective:

Student shall construct and experiment with two or more erosion demonstrations of the processes by which soil is lost to the sea for basic understanding of conservation practices necessary to the protection and management of a watershed.

Rationale:

Mountainous islands in the sea are particularly vulnerable to soil loss during heavy rains. Not only is the resource of topsoil lost but the off shore reef resources are damaged by the fouling of the coral community in the sea.

Altering the course of a stream and stabilizing the stream banks can be shown on the school campus--perhaps you can make a small pond to demonstrate the value of a holding area in heavy rain.

Materials Needed:**Demonstration #1**

Two empty gallon bleach bottles
Knife
Soil
Sod
Water catchment cups
Stick of wood 1" thick and 3' long

Demonstration #2

Several buckets of earth
Stones, large and small
Sticks, large and small
Pieces of Sod
Sled-e or hammer to impact soil
Bottle or watering can

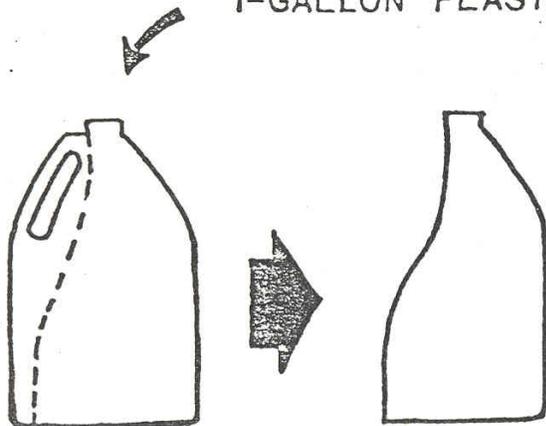
Directions/Activity:

In class: Display pictures of the grand canyon or other canyon and discuss how water, in flowing downhill, carries soil, and over a long time cuts the meandering path of the stream bed, as a result of follow the path of least resistance.

In the first demonstration, cut the bleach bottles in half from top to bottom, so that the neck is preserved. Fill each with soil and place them side by side. Use the wood to raise the former bottom of the bottles.

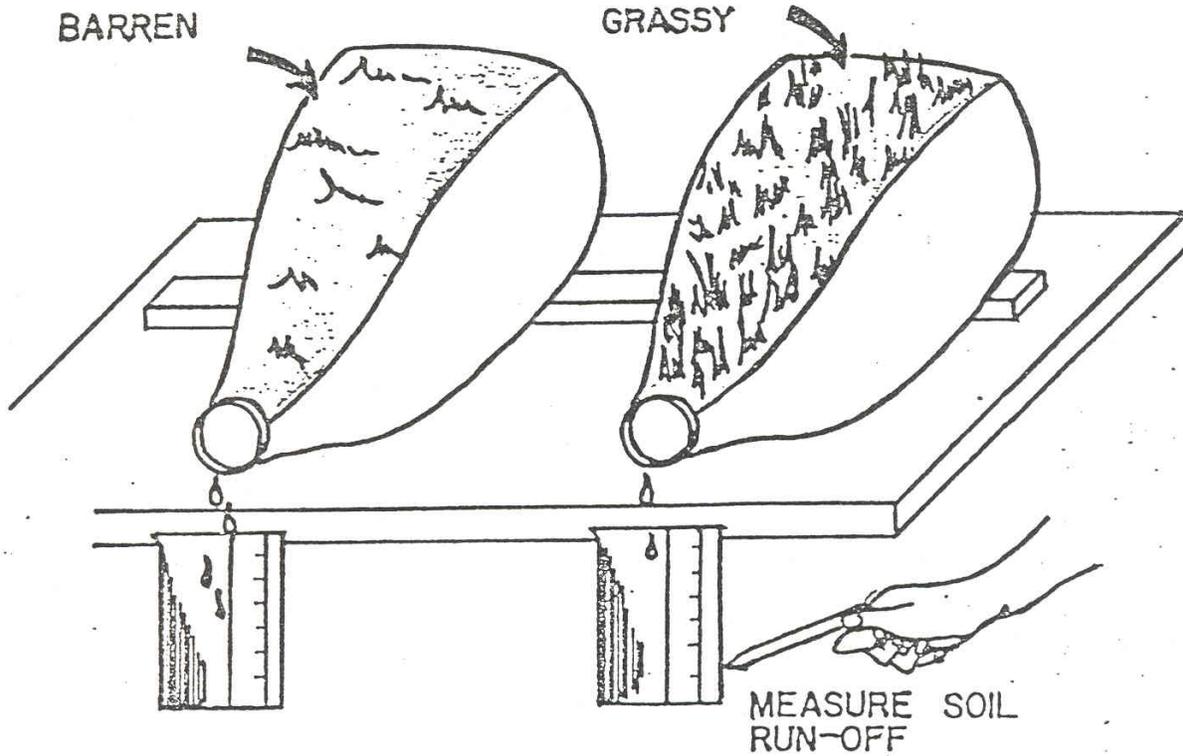
With a pencil make a zigzag pattern in the soil in one bottle; in the other make a series of concentric half circles. Gently pour water at the high end of each bottle onto the soil and note what appears in the water catchment cups. Which cup shows the most soil runoff?

1-GALLON PLASTIC CONTAINER



BARREN

GRASSY



Outdoor Education Equipment: Bachert-Snooks; I-C-E

E.T.

EROSION

Place a layer of sod on the top of one bottle of soil and trim the grass to about one inch in height. Leave the other soil uncovered. Again pour water at the high end, gently, and see the effect of the crass roots in retaining the soil.

Question: What is the end result of topsoil runoff into the sea?

(Answer: 1. Loss of such topsoil which takes years to form
2. Topsoil (silt) runoff impacts on sea life such as coral areas or destroys nutrient balance.)

Outdoors:

In demonstration #2, build a hill with the buckets of soil. Use the rocks and sticks to build dams or impediments to water flowing down hill. Use the sod in other places to impede the soil runoff. Leave some soil loose and in other places, impact it. Use plants with root systems, and rocks tilted into the hill and sticks to hold back the loose soil. Gently, start pouring water over this hill, so that you can observe the effects of your efforts. Is it possible to hold the soil in some places with your strategies?

Now look around the campus to find an area where erosion is taking place. Find a place where soil is just beginning to be lost and you might use minor efforts such as small sticks and pebbles to fill the gulley and plant grass seed or ground cover over the area.

If a larger gulley has already developed, you will probably have to look farther it upstream" to see at what point the runoff could be diverted. Build a dam and force the water to take a new route. Then fill your deep gulley with soil, sticks and rocks and dead plants (leaves or grass clippings). The detour serves to "borrow time" to fill the gulley with dirt catching debris until a new water course can be established, the area planted or contoured.

Plants break the force of raindrops so that the soil is not disturbed by the impact. The plant roots open up channels to let water into the soil. Organic matter furnished by decayed plants also lets water enter more rapidly. Vegetation slows the flow of runoff so that it does not pick up enough speed to disturb the soil and cause erosion.

Resources:

U.S. Department of Agriculture - Soil Conservation Service