

WHAT RAIN WASHES AWAY

OBJECTIVES

At the end of this lesson, the students will be able to do the following:

Describe, orally or in writing, the effects of rainwater runoff.

Conduct an experiment on soil erosion and give an oral or written description of the results.

Give an oral or written definition of the new terms: erosion, nonpoint source pollution, point source pollution, runoff, and sediment.

SUBJECTS: Science

TIME: 1 hour

BACKGROUND INFORMATION

Sediment is one of our most destructive water pollutants. America's water is polluted by more than one billion tons of sediment annually. Every year, Americans lose millions of dollars because of sediment pollution.

Sediment is caused by erosion, which is the gradual wearing down and carrying away of the Earth's material. Soil erosion occurs when soil is moved from one place to another by natural means. Wind blows soil, and moving water washes soil away. Normally, soil erosion occurs slowly over a long period of time because trees and grasses hold the soil in place. Erosion can also occur naturally from forest and prairie fires, hurricanes, or tornadoes, which strip the land of its protective vegetation cover.

Nonpoint source erosion by people also can cause soil erosion to advance much more quickly than normal by allowing over grazing by farm animals and by digging and building on steep slopes, cutting down trees, and plowing the land for crops. The rapid soil erosion that results from such activities is very harmful to the environment.

MATERIALS:

Per Group
*Cookie sheet or large shallow pan
*An object to elevate the pan
*A mixture of dirt and sand (enough to form a small hill on the pan)
*Spray bottle filled with water
*Green, brown & blue crayons

Erosion by water often starts when rain strikes bare soil. Large amounts of rain washing down a sloping area pick up loose soil and carry it away. Harmful pollutants can be washed away with the soil during the runoff event. Substandard agricultural and other land practices often prepare fields and their topsoil to be washed away. Besides making the water less attractive to swim in and drink, the soil kills fish and other organisms living in the water.

TERMS:

Erosion: The wearing away of the Earth's surface by running water, wind, ice, or other geological agents; processes, including weathering, dissolution, abrasion, corrosion, and transportation, by which material is removed from the Earth's surface.

Nonpoint source pollution (NPS): Pollution that cannot be traced to a single point because it comes from many individual sources or from widespread urban, rural or agricultural areas.

Point source pollution: Pollution that can be traced to a single point source, such as a pipe or culvert (e.g., industrial, wastewater treatment plant, and certain storm water discharges).

Runoff: Water (originating as precipitation) that flows across surfaces rather than soaking in; eventually enters a water body; may pick up and carry a variety of pollutants.

Sediment: Eroded soil material (often suspended in water that consists mainly of particles derived from rocks, soil, and inorganic materials).

ADVANCE PREPARATION

- A. Be sure sand and dirt mixture is moist enough to form into a hill. Divide class into groups.
- B. Take students outside to collect vegetative litter. Use caution against collecting inorganic "litter" and animal waste.

PROCEDURE

I. Setting the stage

- A. Explain what erosion is and that rain is important to animal and plant life. Much of runoff is uncontaminated. Runoff waters are necessary to renew many wetlands and habitats. However, erosion, due to running water, can be harmful to our environment. Pollution such as garden insecticides, automobile emissions caked on parking lots, and lead from paints and exhaust, are washed by runoff into surface waters, streams, rivers, lakes, and oceans.
(Science TEKS K.1B, K.2E, K.7A, K.10A,B,

II. Activity

- A. Ask, "What happens to soil on a bare hillside when it rains?"
- B. Elevate the pan on one side to create a slight slope. Use an object that will not be damaged by water.
- C. Have the groups form a hill out of sand and dirt at one end of the pan.
- D. Draw a picture of the hill in the pan marked "BEFORE THE RAIN" on the activity sheet. Color the pan green, and the hill brown. (📖 P.20)
- E. Take the spray bottle filled with water and spray the hill for at least 2 minutes. This represents rain-fall.
- F. Once 2 minutes are up, draw what the pan and hill look like on the activity sheet labeled "AFTER 1st RAIN". Show where the dirt is, what the hill looks like and where the water is located by using the blue, brown and green colors. (📖 P.20)
- G. Do not rebuild the hill. Repeat steps E and F. Draw and color the results on the activity sheet labeled "AFTER 2nd RAIN". (📖 P.20)
- H. Feel the dirt at the bottom of the pan and the dirt at the base of the hill. Is there a difference? Why?

III. Follow-Up

- A. What happens to the dirt when rain falls?
(TAAS Reading—Cause & Effect-Objective 4)
- B. How could the dirt be kept on the hill during a rain?

(TAAS Reading-Drawing Conclusions-Objective 7)

C. Why would it be better to keep the dirt on the hill?

IV. Extension

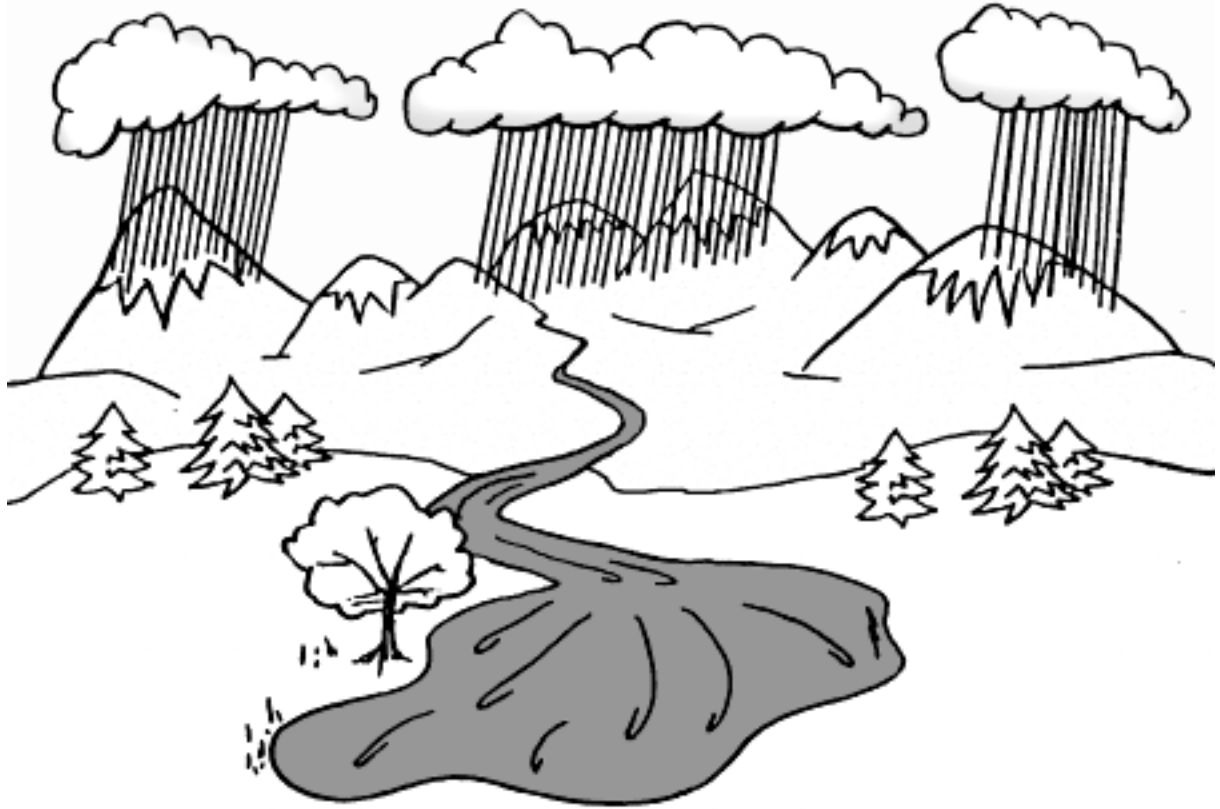
- A. Do the same experiment except in this activity, have the students cover their hills with grass, leaves, sticks and roots to simulate slopes covered with vegetation.
1. What effect did covering the hill with "vegetation" have when it rained?
 2. Why is there more erosion from hillsides after a fire?

(TAAS Reading-Cause & Effect-Objective 4)

RESOURCES

~~"The Water Sourcebook: A Series of Classroom Activities for Grades K-2 Produced for Georgia Water Wise Council," Education Research and In-Service Center, University of North Alabama.~~

What Causes Erosion?



ACTIVITY SHEET
(Storybook P.20)

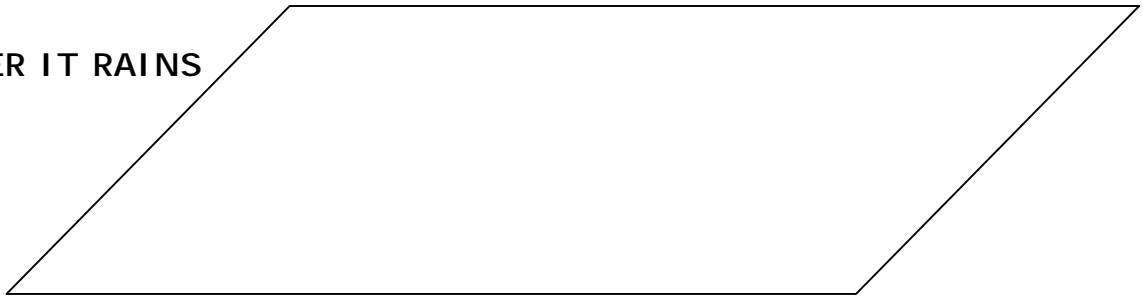
WHAT RAIN WASHES AWAY!

- ☞ Draw what the hill looks like before you begin the activity.
- ☞ After each "rain", draw what the hill looks like using the **blue** and **brown** colors.

BEFORE YOU
BEGIN



AFTER IT RAINS



AFTER IT RAINS
AGAIN

