



WALK, DON'T RUN

GRADE LEVEL: K-1

SUBJECT: Science

NATIONAL STANDARD(S)

(K-2) SC: 1.1, 6.1, 8.1, 10.2, 12.5, 14.1, 15.1, 16.1

THEME: Soil, Water

FOOD AND FIBER TOPIC: III-D

LEARNER OBJECTIVE:

Students will learn how water moves soil.

VOCABULARY

bare—Without covering

nutrients—Substances in soil which are important for growing plants

soak—To draw moisture in

soil erosion—Removal of soil from the land surface by wind or water

soil particles—An individual component in the makeup of soils; generally sand (largest), silt and clay (smallest)

topsoil—Soil on the surface in which plants can grow

BACKGROUND

"A Nation that destroys its soil destroys itself."--*President Franklin D. Roosevelt in a letter sent to Governors on February 26, 1937.*

Water is of prime importance for all living things. All plants and animals need water to grow healthy and strong. As good as water is for us, it can serve as a force in altering and even destroying the health and structure of what we depend on most for survival—our soil. We must constantly be aware of our cropping practices or risk the chance of increasing the loss of our topsoil.

Most soils hold water like a sponge. The water is found in little spaces or voids between soil particles—the soil pores. The ability of soils to conduct, or move, water through is a function of pore size and the degree to which the pores are filled with water. The less water and more air space in the pore, the harder it is for water to make its way through. Conversely, the more water and the less air space in the pore, the easier it is for water to move through.

As was previously mentioned, water can be good for the soil or bad for the soil. When it moves slowly over the soil, the soil has time to soak it up (water moves downward through the soil profile). When water runs fast over the surface, it can carry the soil along with it. The movement of soil in surface water is called, water erosion and is one of two forms of soil erosion. The other is wind erosion.

Water runs quickly over soil that is bare. When the soil is covered with grass, trees and plants, the water is forced to slow down and 'walk'. The slower moving water allows for it to soak into the soil.

Water erosion of topsoil is of concern to most agriculturalists. Good topsoil is only eight inches deep and it contains the many nutrients needed to grow healthy plants and crops.

It takes about 100 years for nature to make and replace one inch of lost topsoil. When water washes topsoil away, it may wash nutrients away with it. The soil that is left is less likely to grow as healthy plants as it did before. It is important to use protective measures to insure that topsoil is conserved. There are many practices followed by farmers and ranchers to reduce the amount of soil erosion.

STEP-BY-STEP INSTRUCTIONS

1. Bring two quarts of moist soil, a cake pan, a sprinkling can of water and a quart of grass clippings to class.
2. Share background material, and introduce the word “erosion.”
3. Prepare a small model hill by mounding the soil in the cake pan. Explain that the mound represents a hill and that you will make it rain by pouring water from the sprinkling can. Ask students to observe so they can report when the rain “walks” down the side of the hill and when it “runs.”
4. Pour water from the sprinkling can over the mound of soil, first gently, and then faster, to simulate harder rain.
5. Discuss what happened to the soil when you poured the water slow and what happened when you poured it fast. Ask students if they have observed places in your community that look like the eroded mound of soil.
6. Cover the mound of soil with the grass clippings, and repeat the demonstration. Ask students to discuss what they observed.

RELATED ACTIVITIES

1. Provide students with drawing paper, and ask them to draw pictures illustrating walking water and running water.
2. Take students outdoors to a paved area. With the sprinkling can, produce “rain” on the pavement. Make sure students observe the resulting splash. Move to a grassy area close by and produce rain there. Ask students to compare the resulting splash with the one they observed on the pavement. Why is there less splash on the grass than on the pavement? (The grass catches the rain so it can soak into the soil, but it can’t soak into the pavement.)

RESOURCES

Student Books

- Cherry, L. (1992). A River Ran Wild. San Diego; Harcourt Brace Jovanovich.
Law, F. (1986). Old Farm, New Farm! Gareth Stevens Publishing.
Parsons, A. (1992). Why is Grass Green? The Disney Company.
Taylor, B. (1992). Green Thumbs Up. Random House.

Teacher Resources

- Lambert, M.. (1991). Farming and the Environment. Steck-Vaughn.
Soil, A Follett Beginning Science Book. Follett Publishing Co. (1967).
Plaster, E. J. (1996) Soil Science and Management 3rd Edition. DelMar Publishers.

Related Internet Websites

“Soil Erosion: Not Just a Rural Problem” Article submitted by: Jeri Shafer on 4/29/96. Brief Description: Soil erosion is not just a rural problem. The expense incurred demands better management in both the rural and urban settings. <http://tgl.geology.muohio.edu/Focus/SoilErosion.html>

“Water Erosion”—short paragraph with links describing and relating water erosion to agriculture. http://pasture.ecn.purdue.edu/agen521/epadir/erosion/water_erosion.html

EVALUATION

Were students able to understand the effects of water erosion after watching the demonstration?

ACKNOWLEDGMENT

This lesson was adapted from Minnesota Ag In The Classroom, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107.