

Lesson 23

Water Wear

What types of surfaces absorb water and what types do not?
What can farmers do to prevent the land from eroding?

GOAL To understand that different types of surfaces can affect how water run-off flows or is absorbed.

OBJECTIVES Students will:

- ✓ Determine ways farmers can prevent erosion
- ✓ Identify impervious and pervious surfaces

MATERIALS paint trays for 4 or 5 groups, soil (5 lb bag), grass, sticks, rocks and hay (optional), plastic cups (6), plastic wrap (piece to cover trays), various Styrofoam, cardboard and/or plastic pieces, water

CORE CURRICULUM CONTENT STANDARDS

- Science 1(2,7), 7(3,4,7), 8(6), 14(8)
- Social Studies 9(1-3), 10(3,4), 11(4,6-8)
- Arts 1(3,4)

VOCABULARY erosion, cover crops, contour plowing, terrace farming, impervious, pervious, pavement

PROCEDURES

1. Ask students if they are familiar with the term *erosion*. Explain that it is the gradual wearing away of soil or rock by water, wind or ice. Ask if they think this would be good or bad for farmers, the rivers, lawns, etc.
2. Explain that they will be participating in an activity that simulates soil erosion. This activity is best completed outdoors or with a covering placed on desks or tables in classroom.
3. Have students work in cooperative groups. Each group will receive a paint tray or plastic container. The paint tray will be slanted (bricks may be placed underneath paint tray). Soil will be placed in top portion of paint tray.
4. Challenge students to become farmers and prevent erosion on this simulated farm field.
5. Demonstrate soil erosion by pouring water on to the “farm field”. Water may be collected by tilting paint tray and catching water in a plastic cup. Cup may be retained for comparison purposes.

6. Distribute rocks, sticks, grass, leaves and hay, if available to prevent erosion on their field.
7. Have students build up their “farm” to prevent further erosion. Have students add materials, such as grass, hay, sticks, etc.
8. Conduct water demonstrations collectively, so students can compare how much soil eroded. Pour water over students’ build up “farms” to demonstrate techniques to control erosion used by students.
9. Discuss terrace farming (walls or fences built to prevent erosion), contour plowing (furrows or gullies made across field rather than up and down), and cover crops (putting organic material to build up soil).
10. After demonstrations, have students discuss what happens if this area were a park or field and not a farm field. Ask what would happen if trash or a type of pollution is placed on the soil (they may place trash pieces and simulate rain), food coloring to simulate pollution. Have them collect trash pieces.
11. Add plastic wrap on part of soil and pour water on the plastic. Ask how this is different than the soil and the organic materials previously placed on top. Ask if they know what the plastic wrap represents (pavement).
12. Explain that this is called an impervious surface. When water is absorbed into soil, it is called a pervious surface. When water is not absorbed, then it is considered impervious.
13. Have students look around schoolyard. What surfaces are considered pervious? (grass, trees) What are considered impervious? (parking lot)

EXTENSIONS

1. Ask students how they could add pervious surfaces to their schoolyard or any other area.
2. Discuss erosion along a river’s bank. Find out how to prevent erosion.

RESOURCES

Haskin, Kathleen, *The Ways of the Watersheds, An Educators Guide to the Environmental and Cultural Dynamics of New York City’s Water Supplies*, 1995, The Frost valley YMCA, Claryville, NY.

Rosset, Dale A., *A Watershed Approach to Teaching the Ecology of Regional Systems*, 1999, New Jersey Audubon Society, Bernardsville, New Jersey 07924.

GLOSSARY

contour plowing - following the curve lines of uneven terrain to limit erosion of topsoil

cover crops - a crop planted to prevent erosion and to provide humus

erosion - the group of natural processes, including weathering, dissolution, abrasion, corrosion, and transportation, by which material is worn away from the earth’s surface

impervious - incapable of being penetrated

pavement - a hard, smooth surface, especially of a public area or thoroughfare, that will bear travel

pervious - open to passage or entrance; permeable

terrace farming - building a series of steps to prevent erosion