

Lesson 7

Water Lines

How is a river formed?
How do hills direct the flow of water?

GOAL To understand that the elevation of the land determines the flow of water

OBJECTIVES Students will:

- ✓ create a model watershed
- ✓ determine flow of water in a watershed
- ✓ create “pollution” and identify how it flows through the watershed

MATERIALS newspaper (two pieces each student), spray mist bottle, masking tape, permanent markers, water soluble markers

CORE CURRICULUM CONTENT STANDARDS

- Science 7(6,8), 8(2,3), 14(1)
- Social Studies 9(1,3), 10(1-3), 12(1-5)

VOCABULARY ridge lines, topography, flow, model, man-made, dam

PROCEDURES

1. Explain to students that they will be making a simple model of a watershed to simulate or demonstrate river flows. The flow and direction of the water is determined by the elevation of the land. Hills, ridgelines, mountains all influence the flow of water. Students will create a paper watershed (*based on “What is a Watershed?” from Global River’s Environmental Education Network*). Students may work in small groups.
2. Each group will receive two sheets of paper. Instruct students to crumple one sheet of paper, then open it up but do not straighten it all the way. Tape the edges of the crumpled sheet to the surface of the other sheet of paper. The model should resemble a relief map. Show a relief map if available.
3. Identify the land that the model represents. The higher elevations are hills and mountains, and the lower levels represent valleys. Instruct the students to trace the ridgelines (the border) with blue soluble markers.
4. Have the students predict where they think the major rivers might be. Have students mark those areas with permanent markers.
5. Place models on newspaper to absorb water. Provide students with spray bottles. Instruct students to spray mist onto their models. Observe and discuss where the water collected, how it flowed, etc.
6. Ask students how the hills (topography) of the land affected the way the water flowed.
7. If this model were to include towns, people, parks, etc. what natural and man-made elements might these be? (*trees, soil, animals, people are examples of natural elements; buildings, dams, malls, shops, etc. are examples of man-made elements*)

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8. Have students imagine that several towns have developed in the watershed. Have students determine where the school, shopping centers, landfill, trash-to-energy plant, roads, soccer fields and parks would be. Mark the areas with different colored permanent markers.
9. Place a drop of food coloring at each of the sites to represent pollution coming from the particular sites. Have students predict what will happen next time it rains. Have them predict what will happen to the surface water and ground water. Spray mist onto the watershed model to observe.
10. Ask students where they would want to live and why.

EXTENSIONS

1. Ask students what the highest point of elevation in the Farmington River Watershed is (2,180 feet in Becket, Massachusetts). Have students look at the contour lines on map to confirm high elevation.
2. Ask students if there had ever been a flood in their town or surrounding area. Ask why it happened and what can be done to prevent another flood.
3. Ask students how individuals can reduce the amount of pollution made.

RESOURCES

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

GLOSSARY

dam - a barrier constructed across a waterway to control the flow or raise the level of water
flow - to move or run smoothly with unbroken continuity, as in the manner characteristic of a fluid

man-made - made by humans rather than occurring in nature; synthetic

model - a small object, usually built to scale, that represents in detail another, often larger object

ridge lines - a long narrow chain of hills or mountains

topography - graphic representation of the surface features of a place or region on a map, indicating their relative positions and elevations