

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

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

CORE CURRICULUM CONTENT STANDARDS

- Language Arts 1(12)
- Science 7(3,4), 8(2,5,6), 13(6,7)
- Social Studies 9(3-6), 10(3,4,6), 11(4), 12(5,7)

VOCABULARY ridge line, 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.

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7. If this model included towns, people, parks, etc. what natural elements 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.*)
8. Have students imagine that the river has flooded into the surrounding towns. What is a man-made way that a river can be blocked (dam)? Ask students if they know what a dam is and what is its purpose is. Name one dam in the Farmington River Watershed.
9. Have students research the reasons (*on Internet or other resources*) why dams are built. (*flood control, reservoirs for drinking water, hydroelectric power*). Present to class.

EXTENSIONS

1. Ask students what is the highest point of elevation in the Farmington River Watershed. (*2,180 feet in Becket, Massachusetts*)
2. Ask students to determine where they want to live in the model watershed and why.
3. Inquire whether there has ever been a flood in the area or surrounding area. Why did it happen and what was done to prevent another flood?
4. Draw a model of a dam and watershed (three dimensional or on paper).

RESOURCES

Rosset, Dale A., 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 a stream
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 line - 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