Watershed Model

Language Arts: 3.1.7 F.1 – 3, 3.1.12.F.1 & 2, 3.3.12.A.1 – 3, 6.1.12.C.3.a

Science: 5.3.2.C.3, 5.3.6.C.1, 5.3.6.C.2, 5.3.12.C.2, 5.4.12.G.4, 5.4.12.G.5, Extension 6.1.4.B.1

SS: 6.1.4.A.3, 6.1.4.A.12, 6.1.P.B.2, 6.1.4.B.4, 6.1.4.B.5, 6.1.4.B.8, 6.1.4.B.9

 6.1.12.A.5.a, 6.1.12.B.6.b, 6.1.12.C.11.b (opt.), Extension 5.4.12.G.5

Teachers who have access to a plastic watershed model called the *Enviroscape,* can use the [EnviroScape Water Pollution Lesson Plan](http://www.cleargeneseewater.org/assets/EnviroScape/EnviroScape_Water_Pollution_Lesson_Plan.pdf) instead of this lesson.

Subjects: Earth Science, Environmental Education

Grades: 3-8; with variations for K-2 and 9-12

Teaching Time: 30 minutes

Focus: Watershed, Non-point pollution

Rationale

Students will understand the concept of a watershed.

Learning Objective

Students will:

· Observe the a watershed model

Teacher Background

Wetlands are a part of the total picture of water’s journey over the surface of the land and throughout the ground, and eventually to the ocean. It is critical that students understand the connection between a wetland and the rest of the watershed. The watershed is the entire land area drained by a stream or river.

Materials

· Large, light colored plastic trash bag

· 2’ x 3’ board · Spray bottle

· Towel · Newspaper

· Colored drink mix crystals

Learning Procedure

1 Create a simple water model by draping a large, plastic trash bag over some crumpled newspaper ‘‘mountains’’ on a slightly slanting board. (The mountains should be at the top of the board and down along the sides, forming a ‘‘valley’’ in the center. Allow the plastic to extend off the lower end of the board where it is flat. Place a rolled-up towel in a U-shape at this end of the model.) Use a spray bottle to make it ‘‘rain’’ in the mountains. Have students observe how precipitation collects in low spots in the mountains, forming lakes when ‘‘deep’’ and swamps or bogs when shallow. Also observe how water eventually flows down into the valley, again collecting in certain areas to form ‘‘marshes.’’ You may need to adjust the plastic to help make a river channel that eventually flows to the ‘‘sea.’’

**2** Explain that a watershed is all the land that drains to the same place (in this case, the ‘‘bay’’ at the end of the board). Discuss where different types of wetlands would likely be found in a watershed. Where would a saltmarsh/estuary be located? (In this model it would be the ‘‘bay’’ that forms in front of the towel.) Discuss how this model is the same and different from a real watershed. (This model obviously doesn’t show ground water activity.)

**3** Discuss where people would likely live in a watershed and why. What activities would people do to make a living or for recreation? How would these activities impact wetlands? (Would farmers desiring the flat land along the river want to drain the marshes or dike the rivers? Would industries want to dredge the estuary to create deeper ports for commerce?)

**4** Sprinkle some colored drink mix crystals in the mountains or other upper sections of the watershed. Spray water onto the landscape again and watch the crystals dissolve and eventually color the streams and even the bay. Discuss how pollution on the land (pesticides, oil from cars, soaps) washes into streams (sometimes through storm drains) and is carried throughout the watershed. Identify sources of non-point pollution in your watershed. (Examples may include animal waste on farm fields, lawn fertilizers and pesticides, oil and gas leaking from cars, and leaking septic systems.)

**Grade level variations:**

**K-2:** Younger students will need simplified descriptions and less information. They will enjoy making the rain.

**9-12:** Use topographic maps as a guide to building scale models of the watershed. Students can do reports on non-point pollution in their watershed.

**Evaluation:**

Students write a paragraph describing water’s journey from the upper regions of the watershed to the receiving water body.

**Extended Learning**

Use a white plastic bag to form the land surface of the watershed. Before spraying ‘‘rain,’’ draw in where your school would be located, along with other land uses in the watershed such as a town, residential development, farm lands, parking lots, malls, etc. When placing colored drink mix crystals, specify what type of non-point source pollutant they represent.

Scale models of the watershed can be built using topographic maps as a guide. They can be assembled using cardboard layers, clay or other materials. A video tape of this process called ‘‘No Water, No Life’’ may be borrowed from your E.S.D. library.

This lesson was adapted from the State of Washington’s *A-Way With Waste* program.

For topo maps, see:

<http://www.mytopo.com/maps/>

<http://www.digital-topo-maps.com/topo-maps.php>

<http://www.mapsport.com/>