Water in a Watershed

Activity Overview: Students participate and learn about watersheds, storm water runoff and pollution by creating a watershed model.

Source: Adapted from SWEAP: Small Watershed Ecology Assessment Project, Ana Ruesink, Institute of Ecosystem Studies, PO Box R, Millbrook, NY 12545, http://www.ecostudies.org/images/education/sweap/SWEAP.pdf http://www.ecostudies.org/images/education/sweap/.%5CMODULE_1.pdf

Objectives: Students will

- learn a watershed (or drainage basin) is the area of land that contributes water to a stream or pond
- realize the flow of runoff and seepage in a watershed is directed by ridges – high points that separate adjacent watersheds
- know everyone lives in a watershed
- understand land use activities in a watershed can affect water quality and quantity

Subjects Covered: science, environmental science, social studies

Grades: 4 - 9

Activity Time: 25 minutes

Season: Any

Materials: Shallow basin or tub, several sheets of newspaper, white plastic garbage bag, spray bottle, food coloring, and 1 piece of paper towel

State Standards: Science: A.4.1., A.4.2., A.4.3., A.4.4., A.4.5., A.8.1.,A.8.3., A.8.6., A.8.7., C.4.1., C.4.2, C.4.4., C.4.5., C.4.6., C.4.7., C.4.8., C.8.3., C.8.4., C.8.6., E.4.8, E.8.1., F.8.8., Social Studies: A.4.1., A.4.4., A.4.6., A.4.8., A.8.5., A.8.6., A.8.8., A.8.11.

Note: See Governor's Council on Model Academic Standards. (1998). *Wisconsin's Model Academic Standards*. Madison, WI: Wisconsin Department of Public Instruction for detailed descriptions.

Background: See Background Section in *Stormwater Curriculum and Teaching Guide* for information about watersheds and how land use activities in a watershed affects water quality and quantity.

Activity Description: Create a simple watershed model by crumpling up several pieces of newspaper and placing them in the bottom of the basin. Cover the newspaper with plastic: this is the land surface. The uneven distribution of the paper should create a raised relief map with hills and valleys. Ask the students what will happen to rain falling on the land surface. Where will it go? Where will it end up? Spray water on the plastic to test their predictions. (The water will be easier to observe if you add a little food coloring.) The water will flow from the high points to low points in rivulets that represent streams and rivers and will collect in pools that represent lakes or the ocean. Explain that the area draining into each stream, river, or lake is called a watershed. Notice that

every location on the plastic is part of a watershed. Use a tiny piece of paper towel soaked in food coloring to represent a source of contamination like motor oil or lawn fertilizer or a leaky septic system. (Make sure you use a different color of food dye this time.) Ask students to predict what will happen to the contamination when it rains. Place the dyed piece of paper towel on the plastic watershed model and spray to make it rain. Watch as the "pollutant" flows into a stream and then into a nearby lake or ocean. Also, notice that only one "watershed" is polluted unless the pollutant is on a divide.

Assessment:

- Define a watershed.
- Describe how the shape of land forms controls the movement of water.
- Explain how a pollutant might enter lakes and rivers in a watershed and what you would do to stop it.

Extensions:

- Students learn what local watershed they live in and continue to identify watersheds they are in until they identify the largest watershed that feeds into an ocean.
- Students research land use activities in their watershed and present findings.
- Students build a model of their own watershed.
- Students build models of the same watershed but with different land uses and amounts of impervious and pervious surfaces, and compare change in water quality and quantity.

Resources:

About WDNR's Hydrologic Areas
http://www.dnr.state.wi.us/org/gmu/sidebar/whatis.htm#gmus

After the Storm: A video co-produced by EPA and the Weather Channel. US Environmental Protection Agency. Washington, D.C. Publication # EPA 840-V-04-001

Branching Out! *Project Wet: Curriculum and Activity Guide.* The Water Course. Bozeman, Montana: p.129-32.

Holling, Clancy. 1941. *Paddle to the Sea*. Houghton Mifflin Company. Boston, MA.

Locker, Thomas. *Where the River Begins.* Dial Books. New York, NY.

Surf Your Watershed, US Environmental Protection Agency. www.epa.gov/surf

Watershed in a Box, Make Waves for Action, Wisconsin DNR and UW Extension Environmental Resources Center. http://clean-ater.uwex.edu/wav/otherwav/winbox.pdf

Watershed Planning Game, Bell Museum of Natural History
http://www.bellmuseum.org/ecogames.html