THEME:	Watershed
SCOPE & SEQUENCE UNIT:	Build a 3-D Watershed Model
OBJECTIVE:	To see our watershed is to understand it
ACTIVITY:	Constructing a waterproof watershed model

Notes:	Parent volunteer activity (construction and painting); & in- class activity
Teacher Prep.:	To embark on building a 3-D watershed model requires strong commitment from parents. A carpenter parent with a shop and tools are an advantage. An artist parent to paint the landscape is also advantageous. (Neither is essential if the parents are keen to try something new). A team of high school students could also be useful. Someone (teacher or parent) needs to guide and supervise the project.
Time:	~30 hours to waterproof stage; student house and tree prep. ~2-3 hours; demonstrating the model – endless hours

Skills:

- Critical & creative thinking
- Ecological literacy
- Oral language

Objectives:

- To create a permanent, large 3-D model of the local watershed
- To create painted buildings and trees to contribute to the 3-D model
- To explore the watershed from a bird's eye view
- To create a teaching and demonstration model

Background Information:

The model is not meant to be exact, rather a teaching and demonstration tool. A good waterproofing layer means it can be used repeatedly. The power of this kind of 3-D model as an education tool cannot be understated. It's a big commitment of effort to build, but once done, well worth the effort. The 3-D watershed model becomes a permanent display and an excellent tool for both self-learning and educating others about how a watershed works, particularly a local watershed.

Materials:

Full details of materials required can be found in: <u>Watershed Model Construction</u> <u>Manual</u>, (see Resources below).

There is a cost to the many materials required of \sim \$300-400.

The actual expense is dependent on the amount of supplies donated by local stores (lumber (plywood), styrofoam, glue, paint, paint brushes, sand paper, varathane, bucket for ocean, xactoknives, portable stand for model, etc.) Acquire a large print-out of a topographic map of the watershed (costs \sim \$120) (the map should be the same size as the model will be, allowing immediate transfer of contour lines to the styrofoam model – a local engineer working with Salmon Enhancement Society offered us assistance getting the map printed at the correct size at a local print store, but a local municipality could also assist.

Activity 1. Parent volunteers gather the building materials and construct the model. Ideally a carpenter parent is among the volunteers. Their knowledge, expertise, loan of tools, and possible use of workshop space makes all the difference. Models can be built without a carpenter too. It's best to find workshop space that can be used for the life of the building project – which is a few to several weeks, dependent on how often volunteers are available. The project is best done with a core group of volunteers who understand the project and follow it through its stages: making plywood and Styrofoam base, cutting out Styrofoam, piercing topographic map onto Styrofoam, carving and sanding Styrofoam, layering Styrofoam, gluing Styrofoam, carving the rivers, painting the model, waterproofing the model.

Activity 2. Students add detail to the model. With scrap Styrofoam, parents cut out buildings. Buildings can be generic and also a few as replicas of buildings in area. Students paint several buildings each. (if the building is a replica, let student know to paint as replica). (There is also the option of using toys for houses, cars, farms – it depends on the scale of the model). For trees, students pull apart donated holiday decorations of wreaths for trees. Teacher and volunteer parent(s) assist students gluing buildings and trees in place. A designated student with neat printing can label the roads with an indelible ink pen.

Introductory Discussion:

Activity 1: Set the model up in a spacious area and out of the way of the flow of traffic. Present the watershed model to the students explaining how it was constructed and who assisted in its creation. Explain where the materials came from (its not unlikely that a parent may have influenced the donation of materials). Have the large topographic map handy to show them the transfer from map to model. The map is also useful to look at the elevations in the watershed. Allow the students plenty of time to scan the model – there will be

lots of new detail to take in and an exchange of information as they explore the model with their eyes.

Activity 2: Prepare an area for painting the houses. We chose to do this in small groups. Each group individually left the classroom to paint. Once the houses dried they were glued on. Students concurrently create trees from wreaths. Have others glue on sand and gravel for the ocean shoreline, make and paint docks. Some students may choose to make boats or cars from Fimo at home and add them to the model.

Activity 3: Small groups of students prepare to demonstrate the model to other classes of students in the school. A ¹/₂ litre poop bottle is filled with water and tiny holes are made in its lid. Red food colouring is used to denote pesticides. Students refine their understanding of a watershed by having a clear and accurate definition of a watershed for their presentation. Students in the small group work as a team, self-organizing as to who will do the speaking, who will demonstrate rain, demonstrate pesticide application to the land, etc. Then the magic starts to happen as they present their learning to others using the model.

Resources:

<u>Watershed Model Construction Manual</u>, by The Stream Team Society Contact Angus Steward at: <u>angstewart@shaw.ca</u>









