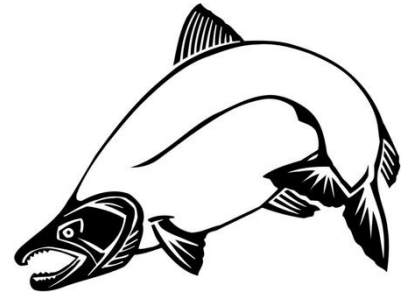

What is a Watershed?



Purpose:

- Students will create a basic watershed model with tin foil or paper. After adding water to their models, students will observe how the physical shape of the land determines how the water flows. This activity is a great introduction for the *Modeling Local Watersheds* lesson.

Objectives:

- Students will work in teams or individually to design a model of a watershed by drawing streams, rivers and lakes in the correct creases of their crumpled piece of paper or tin foil.
- Students will use observations to explain that the creases on their watershed models signify streams, rivers and lakes.
- Students will use observations to hypothesize how the erosion of soil and addition of pollutants affects the watershed.

Materials:

- Rogue River Basin Maps PowerPoint (provided)
- Spray water bottle (provided)
- Tin foil (heavy-duty recommended) or pieces of scrap paper (not provided)
- Water-based markers (not provided)
- Paper towels (not provided)

Time Required: 30 - 45 minutes

Appropriate grades: 2-8

NGSS and Common Core Standards:

2-ESS2-2: Develop a model to represent the shapes and kinds of land and bodies of water in an area.

3-5-ETS1-3: Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

4-ESS2-2: Analyze and interpret data from maps to describe patterns of Earth's features.

5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

MS-ESS2-4: Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

Activity:

Introduction	<ul style="list-style-type: none">• Begin with a brainstorming session about ways that we use water. Ask students where their water comes from.• Introduce the term “watershed”, then ask students what they think this
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	<p>word means. A simple definition is: “an area of land where water flows to a common area”. Ask students if they have ever seen or been in a watershed.</p> <ul style="list-style-type: none"> • Explain to students that they will be building their own watersheds.
Body	<ul style="list-style-type: none"> • Pass out pieces of tin foil (or paper) to each group or individual. Go through the steps below with the students as you demonstrate. <ol style="list-style-type: none"> 1. Have students draw the shape of a country (it could be imaginary) on the paper towel. This will serve as a “base” to form their watershed on. 2. Slightly crumple a piece of tin foil (or paper) so that it resembles mountain ridges and valleys. 3. Fit the tin foil/paper watershed into the “country” on the paper towel. 4. Have students look at their landscape from above and from the side. Explain that you will be coming around to “make it rain” on top of their landscape. Ask students to talk with their group, or with a partner, about how they think the water will flow. 5. Using a blue water-based marker, have students mark where they think water would run down the “mountains”. These blue lines mark streams and rivers on their map. Have them also mark where they think water will collect as it runs downhill. (This could represent a lake). 6. Using brown water-based markers, have students draw exposed soil that could erode or wash away into the lake as the water flows through the watershed. 7. Using red water-based markers, have students draw in some pollutants that may be found in their watershed. Ask students what kinds of pollutants these might be. (Examples could be soap from washing cars, pesticides from lawns, animal waste from a nearby farm, chemicals from a factory, etc.). 8. Keeping the model on the desks, go around with a spray bottle and spray a very light mist of water over each watershed. 9. Observe where water runs down and collects. 10. Optional: if students were incorrect in their predictions about where the water would flow, and they did not draw their streams, rivers, and lakes in the creases of their model, they could have an opportunity to make another.



<p>Closure</p>	<ul style="list-style-type: none"> • Have the students discuss where their water ran down and collected in their landscapes. Some discussion questions could be: <ol style="list-style-type: none"> 1. Where did the water flow? Why does the water flow down the creases? 2. What happened to the soil (brown marker)? How is this a problem? 3. What happened with the pollutants (red marker)? How is this a problem? • Pull up the PowerPoint slide with the Rogue River Basin. Explain that this is our watershed. Point out the small streams that start up in the mountains, flow into the rivers, and eventually lead to the ocean. Work with the students to figure out how a drop of water would move from the top of a mountain all the way to the ocean. • Discuss as a class what the word “basin” means. Point out on the map where the mountains are, and show how the mountains surrounding valleys create bowl shapes. Explain that the Rogue River Basin is made up of five smaller basins, or “sub-basins” (see PowerPoint slides for maps of sub-basins). • Instruct students to look at their landscapes again and have them count the number of basins on their landscape.
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Modifications:

- **Lower Elementary:**
 - Stick to the basic model of a watershed, rather than showing the more complicated map of the Rogue River Basin.
 - Focus on pollution rather than pollution *and* erosion: discuss what pollution is and how we can help our watershed in our daily lives.
- **High School:**
 - Expand the discussion about erosion and pollution.
 - Research specific areas in the watershed that are eroding at an alarming rate, and/or specific sources of pollution near your school.
 - Use this lesson as a jumping off point for the *Modeling Local Watersheds* lesson.

