

EnviroScape

Investigating water quality in our watershed

<p>Time: 45 min- 1 hr. Grade: 5-6 Lesson Plan Outline: Lesson procedure Standards alignment Summary: Students explore human impacts and pollution using their local watershed as a guide. Students design and apply solutions to pollution to model EnviroScape watershed. Field extension activities available.</p>	<p>Objective: Students will be able to:</p> <ul style="list-style-type: none"> • Students identify features which create a watershed. • Students identify a variety of sources or pollution present in their watershed. • Explain how a pollutant can enter our waterways • Identify solutions for reducing pollution in their community
<p>Materials:</p> <ul style="list-style-type: none"> • Vocabulary words • Paper • Colored pencils • Clipboards • EnviroScape and materials 	<p>State benchmarks:</p> <p>Science standards (grade 1)- Standard 1, benchmark 1, 4 Standard 4, benchmark 1,4 Standard 5, benchmark 4 Standard 6, benchmark 2 Science standards (grade 2)- Standard 1, benchmark 1,4 Standard 2,benchmark 1 Standard 4,benchmark 4 Standard 5, benchmark 1,4 Standard 6, benchmark 2 Science standards (grade 3)- Standard 1, benchmark 1,3,4 Standard 4, benchmark 4 Standard 5, benchmark 4 Standard 6, benchmark 2,3 Science standards (grade 4)- Standard 1, benchmark 1 Standard 5, benchmark 1,2,3,4 Standard 6, benchmark 2,3 Science standards (grade 5)- Standard 1, benchmark 4,5,6 Standard 5, benchmark 2,4 Standard 6, benchmark 3</p>

Activity:

To begin, engage students by brainstorming definitions for core-concept vocabulary: watershed, pollution, hazardous, waterway, aquifer, waste, and runoff. Educator uses EnviroScape model to demonstrate concepts of watershed, waterway and runoff. Students place different human impacts on the watershed model to identify sources of pollution in their community. Educator uses EnviroScape model to develop definitions for pollution (point and non-point), hazardous, runoff, and waste. Students generate ideas for how pollution can make its way into our waterways. Educator uses EnviroScape to

demonstrate how both non-point and point sources of pollution are added to our waterways. Students divide into small groups and are challenged to create a solution for one specific source of pollution on the model using the materials provided. Allow groups 15 minutes to develop their ideas as educators circulate to advise each group. Allow for 10 minutes of idea presentation and demonstration from groups. End with having students sharing questions they have about pollution in their watershed. Explain that these questions can be explored with science and distribute extension reading for future.

Extension options:

Storm Drain Stenciling, Extension non-fiction, *Creeks in the Classroom Edible Aquifer activity*

Core Concept Vocabulary:

Watershed: and area of land where water from rain or snow melt drains downhill into a body of water. The watershed acts like a funnel, collecting all the water within the area- called a basin- and channeling in into a common waterway.

Pollution: the introduction of a harmful substances or products -called pollutants- into an environment.

Hazardous: any industrial byproduct, especially from manufactured chemicals, that is destructive to the environment or dangerous to the health of people.

Waterway: a river, canal, or other body of water through which surface water travels.

Aquifer: and underground layer of water-bearing permeable rock, rock fractures, or unconsolidated materials- gravels, sand, silt- though which ground water can move or be removed.

Waste: materials that are eliminated or discarded as no longer useful or required.

Runoff: the overland flow of water that occurs when excess storm water, meltwater, or other source flows over the earth's surface.

Storm Drain Data Collection Protocol

- Safety First. AT all time use the highest safety precautions. **NO Horse play or entering the street!** Cross only at designated corners and crosswalks. Designate one team member to watch for cars approach on the street or in parking lots.
- Assign your group a name. This name will be used to identify your Drain ID's- so keep it short and sweet. Acronyms work well. Record this information on your data sheet.
- Record the street name and address where you begin your survey. Use a new data sheet for each street! Make observation on one side of the street before switching to the other.
- Indicate the orientation, or direction traveling, at the beginning of you survey. Example: If you are traveling North record S -> N.
- Begin survey. Look for storm drain on your route. Record a complete row of information for each drain surveyed.
- Drain ID= your group's name and the number of that drain. Number drains in order of observation.
- Mark each drain as closely as possible with a red dot on the map.
- Record the location, either street or parking lot, of each drain. For parking lot drains record the nearest business in the description.
- Record the condition of each drain. If the pavement appears generally clean the drain is "clean." If the area surrounding the drain has much debris/ sediment record "dirty." If the drain itself is >25% cover it is obstructed or "obst."
- As a group decide on a hazard rating for each drain. Consider traffic, visibility, and parking, option to paint on the sidewalk when considering hazards. For example: a drain located on a quiet residential street where oncoming traffic is visible for several blocks, with no vehicle parking, and a sidewalk available for stenciling might be a 1. A drain located on a multiple lane road with constant traffic and on street parking might be an 8. If sidewalk space is available for stenciling this eight may become a 5. All parking lot drains automatically receives a rating of 3 or more.
- As a group decide on a recommendation for each drain: to be stenciled or not to be. Any drain with a hazard rating over 6 cannot be recommended.