

Lesson Plans



MOSS

McCALL OUTDOOR SCIENCE SCHOOL

University of Idaho

College of Natural Resources



Title: Journey of a Droplet

Grade Level: 5-8th

Topic:	Watershed Quantity and Quality
Background:	Watersheds experience different impacts from natural and human causes. The combination of all these processes comprises “Cumulative Watershed Effects.” Water quantity can be impacted by how water is stored, absorbed, and flows down slopes. Water absorbed by soil can be measured as soil moisture and may be static or flow downstream.
Next Generation Standards:	Dimension 1 (Practices 1, 2, 3, 4, 6, 8) Dimension 2 (Concepts 1, 2, 3, 4, 5, 6, 7) PS2.A, PS2.B, PS2.C, LS2.C, ESS2.C, & ESS3.C
Goals:	Students will conduct a series of simple experiments to evaluate possible connections between the landscape and quantity of water in a watershed at a particular place and time. By relating these experiments to a local watershed, students will consider human impacts on the landscape and their affects on both water quantity and quality.
Objectives:	<ul style="list-style-type: none"> • Students identify their local watershed and some of its features. • Students understand that the covering of a landscape affects its ability to absorb water. • Students make connections between land shape and water flow. • Students extend their knowledge to consider factors in their local watershed that may impact water quality and quantity. • Students hypothesize what human impacts may affect water quality and quantity.
Materials:	<ul style="list-style-type: none"> • Soil samples (from local park, school yard, backyard) • Cups or other containers for water and soil • Plastic food trays (optional) • Rectangular planter or plastic container with drainage • Grass seeds or leaf litter
Set up:	<ul style="list-style-type: none"> • Plant grass seeds in advance • Make drainage holes in boxes or purchase planters • Locate suitable outdoor spaces for

	experiments
Classroom Time:	Experiments can be conducted individually over the course of a week. Total instruction time is approximately 5 hours.
Introduction (Engage):	Ask students to imagine that they are a drop of water in a nearby creek, river, stream, lake, or pond. How do you think you got there and where do you think you will go next? Allow students to view a map of their local watershed. Try to trace the journey of a drop of water together using the map. What are some interesting features of the land you observe? Do you think these features could impact your water droplet journey? How?
Activity (Explore):	<p>Are there things in nature that affect how much water flows in a watershed at a particular time or place? Try these experiments to decide for yourself:</p> <p><u>Soil Porosity</u> Collect some soil samples from your neighborhood, school, or local park. Observe the texture and moisture of the soil. Slowly add water to the soil samples one at a time and watch what happens.</p> <p><u>Slope</u> Use a plastic tray to make different slopes or find areas at your school that are already sloped (playground slide, hills, sidewalk dips). Use a cup of water or a pipette to send water down steep and shallow angles.</p> <p><u>Plants and Leaf Litter</u> Plant some grass seeds in a rectangular container with holes for drainage or place leaf litter on top of bare soil. Fill another rectangular container just with soil. After the grass is long enough to start cutting it, add the same amount of water to each container and see how much water drains and how long it takes. Try the same experiment with the containers at different slopes.</p>
Explanation	Ask the students to draw or write about the results of their experiments. What trends did you observe in the amounts of water absorbed or not absorbed by the soil? How did the flow quantity of the water change from the beginning to the end of the slope? How much water drained from the planter and how long did it take?
Elaboration:	Are there other forces besides nature that affect the

	<p>watershed? How do people use water? Are there ways that humans change the amount and quality of water in a watershed? Can you think of a way to model a part of the local watershed and design experiments to test your ideas? A city map overlaid on a watershed map may help students come up with ideas and examples of water diversion and use in their area.</p>
<p>Evaluation:</p>	<p>Reflect on the experiments performed. What do you know about how the land affects water quantity? Ask students to think back to their own local watershed. Where are some places that you would find the same effects on the water quantity as in your experiments? Can you design an experiment to test this?</p>

Additional resources:

Determine your watershed address at:
<http://water.epa.gov/type/watersheds/address.cfm>

For more watershed basics, see Chapter 3 of:
<http://cwam.ucdavis.edu/>