

# Lesson Plans



# MOSS

McCALL OUTDOOR SCIENCE SCHOOL

University of Idaho

College of Natural Resources



**Title:** Water for People  
**Grade Level:** 5th or 8th

<b>Topic:</b>	How does water quality affect humans and how do human activities affect water quality?
<b>Background:</b>	Look up your watershed address for the place your school is, or where your students live. This would look like your immediate drainage and the drainages that lead out to the closest ocean or large reserve. Also look at the USGS water quality website and get acquainted with navigating the pages to search for streams or bodies of water within your watershed.
<b>Next Generation Standards:</b>	<b>ESS 2.C, ESS 3.A, ESS 3.C</b>
<b>Goals:</b>	Students will participate in discussions and activities to understand their place in the water cycle. Students will firstly talk about how they use water and understand where their drinking water comes from. Students will then do an activity to learn how pollution moves through surface-water in a watershed. Finally, students will discuss ways in which their actions can affect other organisms that use water in their watershed, including other people. Where does drinking water come from? How do humans affect the water cycle? How does pollution move through a watershed?
<b>Objectives:</b>	<ul style="list-style-type: none"> <li>• Students will be able to explain where the water they use in their day-to-day lives comes from somewhere- not just out of the faucet (etc.)</li> <li>• Students will understand how pollution moves through water systems</li> <li>• Students will apply their understanding of how their actions (good or bad) can affect water and others who depend on it.</li> </ul>
<b>Materials:</b>	<ul style="list-style-type: none"> <li>• Plastic water/milk jug or spray bottle</li> <li>• One rectangular pan or cooking sheet</li> <li>• Paper cups</li> <li>• Aluminum foil</li> <li>• Food coloring</li> <li>• Topographic maps of your area</li> </ul>
<b>Set up:</b>	Have materials on each group of tables to be able to

	start activity quickly.
<b>Classroom Time:</b>	1 hour 30 minutes; 1 class day
<b>Introduction (Engage):</b>	<p>Tell your students that water is a valuable resource. 70% of their bodies is made up of water, and is vital for all life on earth.</p> <p>Firstly, have your students draw a picture of they use water at home and in their everyday lives. Come up with a class list of how students use water. Categorize them under these labels, and ask students if they have any other ideas of how humans use water. How do their parents use water?</p> <ul style="list-style-type: none"> <li>• Drinking Water</li> <li>• Sewage</li> <li>• Bathing</li> <li>• Industry- instructor may need to list this one</li> <li>• Recreation</li> <li>• Agriculture and irrigation</li> </ul> <p>Ask your students to get with a partner and draw one of these categories (you assign) and show what a healthy reserve of water would look like. Then have them draw an unhealthy version. What is different about these two drawings? Remind them that if they have no water at all, it would be unhealthy.</p> <p>2 main categories affect use of each of these: Quality, and Quantity</p> <p>What would affect the quality? Ask your students to brainstorm using the Think Pair Share model.</p> <ul style="list-style-type: none"> <li>• Agriculture</li> <li>• Waste Management</li> <li>• Geology/ substrate</li> <li>• Level of Filtration</li> <li>• Source</li> <li>• Natural bacteria or critters living in it</li> <li>• Point sources from agriculture, industry, playing in water</li> </ul> <p>What would affect the quantity? Ask your students to brainstorm using the Think Pair Share</p> <ul style="list-style-type: none"> <li>• Precipitation</li> <li>• Reserves- reservoirs, aquifers</li> <li>• Location within a watershed</li> </ul>

	<ul style="list-style-type: none"> <li>• Time of Year</li> </ul>
<p><b>Activity (Explore):</b></p>	<p>Create a Model Watershed</p> <p>In this activity you are going to create a watershed that represents the one in your area to see how water quality/ quantity may affect your school.</p> <p>What you will need:</p> <ul style="list-style-type: none"> <li>• A plastic water/milk jug or spray bottle.</li> <li>• One rectangular pan or cooking sheet</li> <li>• Paper cups</li> <li>• Aluminum foil</li> <li>• Food Coloring</li> </ul> <p>The first thing you need to do is to cut the paper cups into different heights. These will represent the mountains and hills in your area. The next step is to place them on the tray, bottom up, and arrange them according to how you would best represent the mountains in your watershed. Then, take the aluminum foil and roll it out over your cups. Make sure you have enough to create high and low areas around your mountains, where valleys, streams, and lakes might be. Remember to tuck the aluminum foil into the bottom of the pan so that water stays in the pan and you avoid creating a mess. Next, place food coloring on the aluminum foil where you think pollutants may be introduced into your watershed.</p> <p>Create your rain maker by punching some small holes into the side of your plastic jug and filling it with water and let the “rain” sprinkle out of the holes. If you have a spray bottle, this could work more effectively and a “rain” maker.</p> <p>Watch how the food coloring, or “pollution,” enters and travels through different parts of your watershed. Encourage students to predict prior to adding the rain and explain their observations after it rains.</p>
<p><b>Explanation</b></p>	<p>Generate discussion of how these pollutants may affect water quality in different parts of your watershed.</p> <p>Ask your students:</p> <ol style="list-style-type: none"> <li>1) Did pollution stay where it entered into the</li> </ol>

	<p>stream?</p> <ol style="list-style-type: none"> <li>2) Where did the pollution end up? Did it collect or diffuse (maybe define diffusion)</li> <li>3) How does pollution upstream of one spot affect that spot?</li> <li>4) Where might people live within this watershed?</li> <li>5) How would their water have been polluted?</li> <li>6) Did any areas not have water at all?</li> </ol> <p>Tell your students that humans have developed different ways of dealing with polluted water, such as wastewater treatment plants, filtration through the soil, and getting their water shipped in from elsewhere.</p> <p>Humans have also come up with ways to provide water for areas that do not typically have large reserves of water. What places do your students know of that might not have much water (deserts, mountain communities, islands)? Water is shipped in to these areas via pipelines and trucks, aquifers under the ground are being drained, and water costs a lot of money by the gallon.</p>
<p><b>Elaboration:</b></p>	<p>Split students up into groups of three, and give them each a topographic map of their area. Help them identify their watershed.</p> <p>Ask your students:</p> <ol style="list-style-type: none"> <li>1) Where might pollutants or drains be introduced?</li> <li>2) How does your community help to clean up polluted water?</li> </ol> <p>Show your students that they can look up data of how polluted their water is in their area on the USGS Water Quality website! They can also contribute information!</p> <p>Show a map of the United States. Explain how some arid communities get their water (Los Angeles, Las Vegas, Phoenix, Tucson, Denver) from the Colorado River, and the river no longer reaches the Pacific Ocean because so much water is taken out for drinking water, irrigation, and industry in far away places. If time allows, students can create a Clean-up Plan for their model, listing ways in which</p>

	<p>residents can reduce the impact on their watershed.</p>
<p><b>Evaluation:</b></p>	<p>Ask your students to refer back to how they use water.          Ask them to how those uses might pollute or deplete the water for other people in their watersheds. These answers can be apart of a journal entry or assignment to be turned in before the end of the day.</p> <ol style="list-style-type: none"> <li>1) In what ways can your day-to-day actions affect water quality?</li> <li>2) How can you help to keep your water plentiful and clean?</li> </ol> <p>End on a positive note that they can really do great things to positively impact their water!!</p>

**Additional resources:**

- USGS Water Quality site: <http://waterdata.usgs.gov/nwis/qw>
- Print or order topographic maps for your area:  
[http://store.usgs.gov/b2c\\_usgs/usgs/maplocator/\(ctype=areaDetails&xcm=r3standardpitrex\\_prd&care=%24ROOT&layout=6\\_1\\_61\\_48&uiarea=2\)/.do](http://store.usgs.gov/b2c_usgs/usgs/maplocator/(ctype=areaDetails&xcm=r3standardpitrex_prd&care=%24ROOT&layout=6_1_61_48&uiarea=2)/.do)
- Project WET (activity): <http://projectwet.org/>
- <http://water.epa.gov/polwaste/nps/watershed/concept.cfm>
- <http://water.epa.gov/type/watersheds/index.cfm>
- [http://www.watershedatlas.org/fs\\_indexwater.html](http://www.watershedatlas.org/fs_indexwater.html)