

Lesson 8

Forest Watersheds

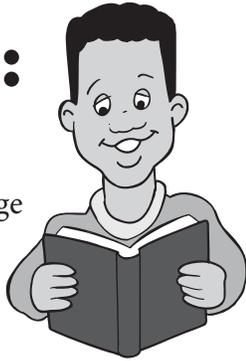


Objectives:

1. To understand what a watershed is.
2. To understand how water moves through the environment—water cycle.
3. To understand the concept of water quality and why it is important.
4. To understand how sustainable forestry practices protect and enhance water quality.

Subjects:

1. Science
2. Reading / Language
3. Art



Vocabulary:

1. **Watershed:** an area of land where water and sediments drain into a common stream, lake or bay.
2. **Evaporation:** the process of liquid water turning into water vapor from water and land surfaces.
3. **Transpiration:** the process of water that has been taken up by plants, evaporating from the leaves of plants.
4. **Condensation:** the process of water vapor in the atmosphere turning into liquid water forming clouds.
5. **Precipitation:** occurs when so much water has condensed that the air can't hold it anymore and it falls back to Earth as rain, snow, sleet, hail, frost, dew, etc.
6. **Infiltration:** the process by which water from the ground surface enters the soil.
7. **Runoff:** water that does not infiltrate the soil, but runs off the surface of the land.
8. **Groundwater:** water that is stored beneath the surface of the land, in spaces between rocks and soil particles—this water often supplies wells or springs.
9. **Erosion:** the natural process by which Earth's surface is worn away by the forces of wind and water—water running downhill is the primary agent in shaping topography.
10. **Spring:** the point where groundwater flows out of the ground.
11. **Buffer:** a wide strip of vegetation along a body of water, retained for the purpose of protecting water quality and aquatic habitat.
12. **Riparian Area:** the area next to a river or stream inhabited by plants and animals that requires constant moisture.
13. **Topographic Map:** a map showing changes in elevation, land features, etc.



Focus:

1. Establish the Concept of a watershed

Ask your students if they know where the water they use every day comes from? **Did you know that 75% of the water in California comes from a forested watershed?** Forests are very important for filtering water that falls as precipitation and allowing it to infiltrate the soil to become stored as groundwater. This is kind of like water going through a coffee filter on its way to the coffee pot. The soil, shade and organic materials under trees help hold moisture so it can be absorbed and replenish groundwater, or be taken up by plants.



VOCABULARY

Activity:

To help students understand the concept of a watershed, have them create their own mini watersheds using a piece of **paper**, **spray bottle with water** and **water soluble markers**.

1. Crumble up a piece of paper.
2. Smooth out the paper, but do not flatten completely. This paper represents a topographic map showing landforms and changes in elevation.
3. Use one color of marker to trace along the highest mountain ridges of your map.



4. Use a second color to draw in where you think creeks, rivers and lakes might be.
5. The teacher will spray the finished maps with “rain” from the spray bottle. Predict how the water will move through the watershed and observe how it flows when it “rains”. Observe how the ink runs down your paper, showing how surface water would flow through the watershed.



6. Have a class discussion regarding the mini watersheds. Point out how numerous watersheds combine to make large watersheds. An example of a very large watershed is the Mississippi River Basin. Ask your students to define the concept of a watershed in their own words. Ask them to identify small watersheds in their neighborhoods or on your school campus.
7. Which watershed do you live in? Use a large map of California and smaller maps that represent your local area to trace where the water that you depend on comes from. Where is the nearest forest? Looking at the topography of your local area, does some of your local water originate in that forest? Do research to find out the source for your community’s water supply. This map of major California watersheds from The California Watershed Portal may help: <http://cwp.resources.ca.gov/browser/>
8. **EXTENSION IDEA:** Visit your local municipal water district facility or ask a representative to come in and be a guest speaker to discuss your local water supply, methods for conserving water in our homes, waste water treatment, etc.

Learn the parts of the water cycle

The water cycle never stops. The earth has a limited amount of water and that same water has cycled through the rivers, oceans, ground water, plants, animals and atmosphere for just about as long as the earth has been around. Have you ever stopped to think where that glass of water that you drank this morning has been? Maybe it was once taken up by the roots of a Redwood tree, transpired from the tree’s leaves into the atmosphere, condensed into a cloud and then fell into a lake?

Approximately 97% of Earth’s water is in the oceans. Only 3% of our water is fresh water and most of this is frozen in ice caps and glaciers. Groundwater is the next largest source of fresh water. You may be surprised to know that only 0.3% of Earth’s fresh water is contained in lakes, rivers and streams!

Study the water cycle diagram below to see how water is constantly moving between the ocean, land, vegetation, atmosphere, groundwater, streams and lakes.

