

Contributor: Bronwyn Young **Grade Level:** 3-5

1. Identify the standards to be addressed:

S3L2. Obtain, evaluate, and communicate information about the effects of pollution (air, land, and water) and humans on the environment.

a. Ask questions to collect information and create records of sources and effects of pollution on the plants and animals.

b. Explore, research, and communicate solutions, such as conservation of resources and recycling of materials, to protect plants and animals.

S4E3. Obtain, evaluate, and communicate information to demonstrate the water cycle.

a. Plan and carry out investigations to observe the flow of energy in water as it changes states from solid (ice) to liquid (water) to gas (water vapor) and changes from gas to liquid to solid.

b. Develop models to illustrate multiple pathways water may take during the water cycle (evaporation, condensation, and precipitation).

(Clarification statement: Students should understand that the water cycle does not follow a single pathway.)

2. Statement of the objective and lesson outcomes:

1. Students will be able to list and explain the steps of the water cycle.

2. Students will be able to describe sources of water.

3. Students will be able to calculate the amount of water they use in a day..

3. Materials, resources, and technology to be used by teacher/students:

Computer with Internet connection, water, food coloring, one liter clear container, five clear cups, eye dropper, table salt.

Websites with excellent information: <https://water.ca.gov/What-We-Do/Education/Education-Materials> ,

4. Introduction of the topic:

Hold up a clear glass container full of water. Ask students to discuss these questions: 1. Why is water "special"?

2. How old is this water? 3. Where does this water come from?

5. Procedure for instruction:

1. Show a video on the water cycle. This website has a good, elementary-level video: <https://www.youtube.com/watch?v=auvGBmlxG08> As the video plays, write the four steps of the water cycle on the board. After the video, discuss the water cycle and emphasize that the water is as old as the Earth (4.5 billion years old) and must be re-cycled to support life on Earth.

2. Do the teacher demonstration on the distribution/source of water. Emphasize the importance of using water wisely. See attachment #1 for instructions on the demonstration.

3. Have each student calculate the amount of water they use. There are many good websites for this activity.

An age appropriate one is found at https://www.mymanatee.org/UserFiles/Servers/Server_7588306/File/Residents/Families/Kid%20Central/Kids%204%20Water%20Conservation/5rs_3_4-4.pdf . See attachment #2 (Attached below).

6. Lesson closure:

Have students summarize the importance of conserving water. Brainstorm specific ways that they can conserve water in their homes.

7. Assessment of student understanding:

1. Ask each student to list the four steps of the water cycle and illustrate each step with an original drawing.
2. Ask each student to list three ways they can conserve water in their home.

Attachment #1 Distribution of Earth's Water Demonstration

(This activity is adapted from Activity 5.1 "A Drop in the Bucket" in the California Coastal Commission Science Activity Guide for Waves, Wetland, and Watersheds.)

1. Teacher Preparation:
 - a. Prepare one liter of colored water
 - b. Obtain a graduated cylinder and droppers
 - c. Obtain 5 clear cups
 - d. Obtain a container of table salt
2. Introduction:
 - a. Ask students to brainstorm sources of water for our use.
 - b. Explain that this demonstration will illustrate how water is distributed among these sources: oceans, groundwater, lakes, ice, swamps, and rivers. List these sources on the board and discuss.
3. Procedure:
 - a. Show the class one liter of colored water. This represents all the water in the world.
 - b. Split the class into six groups. Each group will receive water from one of the sources; this water must provide for all their needs.
 - c. Distribute the liquid to the groups one by one using the amounts listed below. Measure out the portions in clear cups and give each cup to the group that was assigned that source.
 - i. Ice: 20.6 ml
 - ii. Groundwater: 9.0 ml
 - iii. Lakes: 0.08 ml (roughly 40 drops)
 - iv. Swamps: 0.01 ml (roughly 5 drops)
 - v. Rivers: 0.002 ml (roughly 1 drop)
 - d. The last group receives the remainder of the water which is the ocean: 970 ml; before handing this group their water, add a generous amount of salt to the liquid. Explain that while the oceans contain most of Earth's water, it is too salty for humans to use.
4. Discussion:
 - a. Of the water on the Earth, 97% is found in the oceans and is too salty for our use. 3 % is fresh and must be shared by all humans in addition to other animals, plants, and agriculture.
 - b. Tell the students in each group that if they were to drink their water, they would have to share it equally with all the members of their group.
 - c. Many topics of discussion can follow. For example, how can water be equally divided within a group? How can water be distributed from one group to another? How can water from the ocean be made useable?

How Much Water Do You Use?



- 1** Use the chart below to track your daily water use over two days. Put a check in the second column each time you do a listed activity. Calculate each activity's total water use by multiplying the number of checks by the number in the third column. (For showers, multiply the total number of minutes spent in the shower by 5.)

Activity	Number of Times Over 2 Days (✓)	Amount of Water (gallons)	Total Amount of Water Used (gallons)
Washing hands		0.5	
Taking a shower (number of minutes*)	*	5 gal per minute	
Taking a bath		40	
Flushing a toilet		5	
Brushing teeth (water running)		1	
Brushing teeth (water off)		0.25	
Food and drink		0.5 per day	
Total			

- 2** How much water did you use over the weekend?
