

# Where's the Water?



**Purpose:** To identify the reservoirs of the Earth's water cycle (e.g., ocean, icecaps / glaciers, atmosphere, lakes, rivers, biosphere, ground water) locally and globally and graph or chart relative amounts in global reservoirs.

**Duration:**  
Classroom  
40 minutes

**Setting:**  
Classroom

**Summary:** Students will use 10 liters (approximately 2.5 gallons) of water to represent all the water on the earth. They will be given the percentage for each water source in relation to the total amount, and asked to divide the 10 liters of water to demonstrate this.

**Link to the Utah Core Curriculum:**  
Earth Systems -  
9<sup>th</sup> grade  
Standard  
IV-1a

**Background:** Approximately 72% of the earth is covered with water. Sources of water are the oceans, icecaps and glaciers, groundwater, freshwater lakes, inland seas and salt lakes, the atmosphere and rivers. In this activity, 10 liters of water in a bucket are used to represent all the water on the earth. See the table below for the percentage of each water reservoir in relation to the total amount, and the appropriate measurement for each reservoir.

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RESERVIOR	APPROXIMATE % OF THE TOTAL AMOUNT	MEASUREMENT
Oceans	97.25	All water left in bucket
Icecaps / glaciers	2.0	~ 200 ml
Groundwater	0.7	~ 70 ml
Freshwater lakes	0.006	~ 3 ml
Inland seas / salt lakes	0.004	~ 4 drops
Atmosphere	0.001	~ 1 drop
Rivers	0.0001	~1 flick

The percentage of usable freshwater is reduced by pollution and contamination. Therefore, the actual amount of water that is usable by humans is very small (approximately 0.00003 percent).

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**Materials:** •Map of world or globe

*For each group of students:*

- 2.5 gallon water container (to hold the 10 liters)
- Graduated cylinders

- Eye dropper
- 10 liters of water
- 6 small clear containers (e.g., pint jars)

**Classroom Activity:**

1. Show the students a map of the world or the globe. Ask them what the color blue represents (*water*). Ask them what percentage of the globe/earth is covered in water (72%). Is it all usable by humans?
2. Ask the students to identify the various reservoirs of water on earth other than oceans. As they give answers, make a list on the board in the front of the room. Students' responses may include reservoirs like dams, which would be included with lakes or rivers; wells, which come from groundwater; springs, which may be included in rivers, and so forth. The final list should be icecaps / glaciers, groundwater, freshwater lakes, inland seas / salt lakes, atmosphere, and rivers.
3. When the list on the board is complete, pass out the water distribution worksheet and divide the students into groups.
4. Give each group 10 liters of water in a bucket (approximately 2.5 gallons), graduated cylinders, eye droppers and six small clear containers. Explain that the 10 liters represent all the water on the earth.
5. Have the students label the six small containers with the various water reservoirs (icecaps / glaciers, groundwater, freshwater lakes, inland seas / salt lakes, atmosphere, and rivers).
6. Ask the students to estimate the percentage of water in each reservoir. Have them measure the appropriate amount of water for each reservoir and record their data on the water distribution worksheet. Remind them that they will leave the ocean water in the bucket.

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7. Discuss the results of the groups' estimations. Where did they think most of the water was located? Is there more water in rivers or in the atmosphere?

8. After discussing the initial estimations, demonstrate to the class the actual amounts found in each reservoir (found on the table on the first page of this activity). Be sure to have the class fill in the correct amounts on the student worksheet.

Further Discussion: **1. How much of the water on the earth is actually available for human use?**

*Logically, one would assume if you added the percentage of usable water sources, you would find the total amount of usable water. This does not work out to be true because the amount is reduced by pollution and availability (location). The actual amount is approximately .00003%.*

**2. How can students conserve water?**

*There are many ways students can conserve water. Discuss the following tactics with your students:*

- Don't leave the water running while brushing your teeth.*
- Limit your showers to 10 minutes or less.*
- Look around your house for leaky faucets. Ask your parents to fix them immediately.*
- Keep a pitcher of water in the refrigerator so you don't have to run the faucet and wait for the water to cool.*
- Clean your sidewalks with a broom, not a hose.*
- Wash your car or dog on the lawn instead of the driveway. This way your lawn gets watered too.*
- Only wash full loads of dishes and laundry.*

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### **3. How can students help reduce pollution to the already small amount of water that is available for human use?**

- *Don't use excessive amounts of fertilizers or pesticides around your house. They can wash into the storm drains and end up in a stream.*
- *Never put something down a storm drain that may hurt a fish.*
- *Don't be a litter bug. Always dispose of trash in a proper container, not in the water.*
- *Make sure that your family car doesn't leak oil or antifreeze. This can wash into the water and be dangerous for fish, birds, even cats and dogs.*
- *Walk only on existing trails when near the water to help reduce erosion.*

This activity adapted from Activity D-1: Sources of Drinking Water in the manual *Water Conservation and Nonpoint Source Pollution* by Dr. Kitt Farrell-Poe

# Water Distribution Worksheet

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Estimate the percentage of water in each reservoir. Measure the appropriate amount in milliliters. (Remember that the total amount is 10 liters)

RESERVOIR	APPROXIMATE % OF THE TOTAL AMOUNT	MEASUREMENT
Oceans		All water left in bucket
Icecaps / glaciers		
Groundwater		
Freshwater lakes		
Inland seas / salt lakes		
Atmosphere		
Rivers		

As your teacher demonstrates the true percentages and measurements found in each source, record the data below.

RESERVOIR	APPROXIMATE % OF THE TOTAL AMOUNT	MEASUREMENT
Oceans		All water left in bucket
Icecaps / glaciers		ml
Groundwater		ml
Freshwater lakes		ml
Inland seas / salt lakes		drops
Atmosphere		drops
Rivers		

Conversion hints...  
 1 liter = 1000 ml  
 1 ml ~ 5 drops

# Measurement Conversion to Cups

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If you would like to convert the measurements for this activity to cups, use the table provided below.

RESERVOIR	APPROXIMATE % OF THE TOTAL AMOUNT	MEASUREMENT
Oceans	97.25%	All water left in bucket
Icecaps / glaciers	2.0%	~3/4 cup
Groundwater	0.7%	~1/4 cup
Freshwater lakes	0.006%	~1/8 tsp.
Inland seas / salt lakes	0.004%	~1/12 tsp.
Atmosphere	0.001%	~1 drop
Rivers	0.0001%	~1 flick

# Notes

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# What's in the Water?

