

A Drop in the Bucket

Revised October 2011

SUMMARY:

Through a visual presentation, the students will learn the different sources of freshwater, and the relative ratios of these water sources on the earth.

BACKGROUND:

Approximately 75% of the earth is covered with water. Sources of water are oceans, icecaps and glaciers, groundwater, freshwater lakes, inland seas and salt lakes, the atmosphere, and rivers.

Although the earth appears to have a plentiful supply of water, it is important to realize that fresh water is a limited resource. See the table below for the percentage of each water source in relation to the total amount, and the appropriate measurement for each source.

Not all of the freshwater is available for humans to use. Water in the atmosphere and in the icecaps and glaciers is not available for humans to use. We also cannot access all the ground water.

Therefore, only the water in rivers, freshwater lakes and a portion of ground water can be used by humans. The percentage of usable freshwater is reduced by pollution and contamination. Therefore, the actual amount of water that is useable by humans is very small (approximately .00003 %).

Grade Level

K-6th Grade

Subject Areas

Science
Math

Duration

15-25 minutes

Setting

Classroom
Outdoors



Water Source	% of the Total Amount	Measurement
Oceans	97.2%	All water left in bucket
Icecaps/Glaciers	2.0%	1 Cup
Groundwater	0.62%	1/3 Cup
Freshwater Lakes	0.009%	1/8 teaspoon
Inland Seas/Salt Lake	0.008%	1/8 teaspoon
Atmosphere	0.001%	One drop
Rivers	0.0001%	One flick

MATERIALS:

- Map of world or globe
- 5-gallon water container
- Measuring cups
- Eye dropper
- 5 gallons of water
- Small, clear container
- Water distribution worksheet (found at end of lesson)

PROCEDURE:

1. Show students the globe or map of the world and ask them what the blue represents (water). Ask them what percentage is covered by water (75%). Ask the students if all the water is available for humans to use.
2. Show the students the 5 gallons of water in the container. Explain that the 5 gallons represents all the water on the earth.
3. Ask the students to think about the different places we find water. In what area do we find the majority of the water on earth (oceans). Tell them that because the majority of the water is in the ocean, we will leave that water in the bucket. We will be taking out all the water that is from a source other than the ocean.
4. Ask students to name sources of water. As they give you answers, remove the correct amount of water for the area (refer to chart in the background section), and place it into the clear container.
5. After you have removed all the different water sources (other than oceans), ask the students if all the water you have removed is useable by humans.
6. Discuss the sources, and put the water back into the bucket with the ocean water if it is not usable by humans (icecaps/glaciers, some of the groundwater, inland seas/salt lakes and the atmosphere). Show the students the small amount of water that is left for humans to use.

WRAP-UP:

Review the sources of freshwater on the earth, and how little water is available for human use. Discuss ways students can conserve water in their homes, schools, and communities.

- 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 and ask your parents to fix them.
- 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.
- Discuss ways students can help reduce pollution to the already small amount of water available to humans.
- 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 litterbug. 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.

EXTENSIONS:

- Hand out copies of the worksheet to have students fill in the percentage they think is in each location before going through it as a class. They can work in groups or individually.
- Ask the students if we can make more water. Discuss the water cycle (this can lead into the Incredible Journey lesson).
- Talk about how pollutants or contaminants would affect our water supply (this can lead into the Water Quality and Aquatic Macroinvertebrates lesson found at extension.usu.edu/waterquality).

*Adapted from the "Drop in a Bucket" lesson found in Project WET.
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Water Distribution Worksheet

Name: _____

Estimate the percentage and measurement of water in each reservoir. (Remember that the total amount is 5 gallons).

Reservoir	Approximate % of the total amount	Measurement
Oceans		All water left in bucket
Icecaps/Glacier		
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/Glacier		
Groundwater		
Freshwater Lakes		
Inland Seas/Salt Lakes		
Atmosphere		
Rivers		