

Math Activities

[How Much Water is There?](#)

[Sense of Scale](#)

How Much Water Is There?

Objectives:

Students will:

- be able to calculate the fresh water available for human consumption
- make inferences about the importance of using water resources responsibly

Materials:

- 5 gallon aquarium
- water (enough to fill tank)
- measuring spoons (tsp, tbs)
- measuring cups
- eye droppers
- paper towels
- calculators

Background:

Even though 75% of earth's surface is covered by water, not all of it is available for consumption by humans. In fact, very little of the water is considered potable, or available for consumption.

Procedure:

1. Have the students brainstorm the sources of water on the planet. Create a list on the board. After allowing students to reveal all sources, complete the list for them, and provide the following information:

Water on Earth

Oceans	97.2%
All icecaps/glaciers	2.0%
Groundwater	0.62%
Freshwater Lakes	0.009%

Inland seas/salt lakes	0.008%
Atmosphere	0.001%
All rivers	<u>0.0001%</u>
Total	99.8381%

(Figures are from [The Cousteau Almanac](#))

2. Break the students out into small working groups.

3. Have the students determine which of the water sources could be used for human consumption. Students should calculate the amount of freshwater potentially available for use. (**Groundwater, Freshwater Lakes, Rivers, and Icecaps/glaciers**). And of course, not all of this would be readily available due to pollution contamination.

4. Have the students turn their attention to the water filled 5 gallon tank, which will represent the volume of all the water on the earth. Have the students calculate the amount of water in the tank, in tablespoons. The students should now calculate the equivalent volume of the quantities on the "Water on Earth" table below. They should obtain figures similar to the following values:

<u>Water on Earth</u>	
Oceans	1244.16 tbls
All icecaps/glaciers	25.60 tbls
Groundwater	7.93 tbls
Freshwater Lakes	0.11 tbls
Inland seas/salt lakes	0.10 tbls
Atmosphere	0.0128 tbls
All rivers	<u>0.0012</u> tbls
Total	approx 1280 tbls

Note: 5 gallons = 1280 tablespoons

5. Have each team remove 34 tbls of water from the tank and place into a container to bring back to their workstations. (The 34 tbls of water represents the total possible amount of fresh water available for human consumption.)

6. Have the students calculate and remove all of the water representing Rivers. Place the water in a small container and label "Rivers" (**approximately 1 drop**). Have the students calculate and remove all of the water representing Freshwater Lakes. Place the water in a small container and label "Freshwater Lakes" (**approximately 1/10 of a tablespoon**). Have the students calculate and remove all of the water representing Groundwater. Place the water in a small container and

label "Groundwater" (approximately 8 tablespoons). In the container originally containing the 34 tbs, the students should now have approximately (25 tablespoons), which is representing the Ice caps and Glaciers. Label the container "Ice caps and Glaciers".

7. The students should now have a good visual understanding of how little water is available for human consumption. Remind the students that much of the water in the Ice caps is "locked in" and unavailable for immediate use, and that pollutants are being discharged everyday, further decreasing the amount available for human consumption.

Assessment:

- Explain why it is so important for humans to use water responsibly. Give statistics to prove your position.