Freshwater Resources Demonstration

Adapted from http://www.groundwater.org/kc/activity6.html

This demonstration will give students a real sense of how little water on our planet is fresh.

Before class

Assemble the materials listed below on a demonstration table or cart.

* Large map of the world or globe model (preferably one which depicts clouds, the beach ball globe is best, available from http://www.planetearthgifts.com/index.html and http://www.celestialproducts.com/Products/Earthball.asp)
* 1 Five-gallon container (a clear aquarium is best, but a bucket or trash can will work) filled with water (*Optional:* use a few drops of blue food coloring to tint water for improved visibility)
* 2 clear containers (cups, jars, or beakers). size – approximately 2 cups or 400 ml
* 1 Petri dish or watch glass.
* 4 labels, made from folded notecards, to stand in front of the containers; All Earth’s water, Earth’s Salt water, Earth’s Freshwater, Earth’s Groundwater, Earth’s Surface water - Rivers and Lakes.
* 1 Tablespoon or several graduated cylinders, 10 ml -100ml in size
* 1 Eye dropper
* Blue food coloring

1. Fill the empty bucket or aquarium with 5 gallons or 18.93 Liters of water.

During Class

2. When students arrive and ask them why the Earth is called the blue planet. For interest, you can toss the beach ball around the room or pass the globe.

3. Once you have their attention, see if they can guess what the bucket of water represents.

*Answer: this is all the water on Earth including the water that is contained in the atmosphere, glaciers, ice caps, lakes, rivers, oceans and streams.*

Place the appropriate label in front of the bucket.

4. Next, take out 25 tablespoons (or 369.7 Milliliters) of water from the bucket and place it in the large, clear jar. Again, ask them what this represents.

*Answer: This represents all the freshwater on Earth (water contained in the atmosphere, icecaps, rivers, ponds, lakes, and groundwater).*

Place the appropriate label in front of the container.

5. Next, take out 8 tablespoons (or 118.3 Milliliters) from the freshwater supply and place it in the smaller clear container.

*Answer: This represents all the groundwater on Earth.*

Place the appropriate label in front of the container.

6. Finally, take out about 25 drops with an eye dropper (or 1.48 Milliliters) and pour it in a small watch glass or petri dish

*Answer: This water represents all the water in rivers and lakes on Earth, this is our surface water.*

Place the appropriate label in front of the container.

7. Discuss the demonstration with the class. Ask questions about accessibility of this water, residence time in the varying containers. How this represents the water cycle and so on.

The topics that will emerge will vary but it is important to note that what remains in the “freshwater” container now represents all the water contained in the atmosphere (clouds, rain, snow) and all the water on the planet that is frozen (polar ice caps and glaciers). This water is not easily accessed for human consumption.

As an alternate challenge, have the students calculate the volume of water needed to represent each reservoir. Once they have completed the calculation give the students the water, containers and labels and let them set up the demonstration. Additionally, students can calculate the amount of moisture in the crysophere (ice), and atmosphere and set up two more containers.