

# Where's the Water?

## Objective

Students will understand how water is used in their home and community, water conservation principles, the relative amounts of fresh and salt water and how much water is available for human use.

## Curriculum Focus

Math  
Science

## Materials (per team or for demonstration)

- 100 small cups
- 2 even smaller cups
- Markers
- *Water Poster* from the National Energy Foundation (NEF)

## Key Vocabulary

Conservation  
Consumption  
Contamination  
Fresh water  
Groundwater  
Nonpotable  
Potable

## Next Generation Science Correlations

5-ESS2 - 2



## Introduction

Earth is the water planet but fresh water is very limited. In this activity, students will see the tiny percentage of the earth's water that is actually usable and the importance of using it efficiently. Transporting and heating water also uses energy, as does treating waste water. By using water efficiently we also use energy more efficiently.



## Procedure

You may have an NEF *Water Poster*. Display the poster for students to review.

1. Ask students to help you list all the ways that water is used in their homes. Write answers on the board as students give them. Make a list of 10 or more ways that water is used in homes. Examples:
  - Shower
  - Brush teeth
  - Flush toilet
  - Cook
  - Wash dishes
  - Clean the floor
  - Wash clothes
  - Wash the car
  - Water the lawn or garden
  - Pool
2. Share that on average only about half of the community's water is used indoors and the rest is used outside.
3. Ask students if they ever worry about using water. Are there any water rules in your community? (For example, some communities have lawn watering rules.)
4. Almost three-quarters of the earth's surface is covered with water. There is so much that it is sometimes hard for students to understand why it is important to conserve water. Do the following as a demonstration to discover how much water on earth is available for human consumption.
  - a. Line up 100 small cups. Tell students that you are going to imagine that all of the water in the world will fit in these 100 cups. Each cup will be labeled with the type of water it represents.
    - 97 cups will be labeled Ocean
    - 2 cups will be labeled Icecaps and Glaciers
    - 1 cup will be labeled Groundwater
  - b. Put an ice cube into each of the cups labeled Icecaps and Glaciers.

Visit [thinkenergy.org/centerpointenergy](http://thinkenergy.org/centerpointenergy) to learn more.

- c. Mix a pitcher of salt water by adding approximately 1 cup of salt to a gallon of water. Fill the Ocean cups with the saline solution.
  - d. As you fill the cups with the appropriate water, ask students if they know about groundwater. Explain that groundwater is water that is below the surface trapped in layers of rock and clay. Energy is used to pump the water to the surface and bring it to our homes. Water is also found in rivers and lakes. This water is very important to people but makes up less than a tenth of a percent of the water on the planet.
  - e. Pour clean, fresh water into the last cup. Lift the cup labeled Groundwater and explain that less than one percent of all of the water on the earth is available for people to drink, cook, bathe or wash dishes.
  - f. Pour approximately half of the water from the Groundwater cup into the two smaller cups. Contaminate the water of one with dye or dirt or something visible to your students. Show the contaminated cup and explain that of the small amount of the earth's water available for use, not all of it is potable (Potable means fit to drink and nonpotable means not fit to drink.)
  - g. Hold up the last small cup and take a sip. Say, "that is really good water!" Help students to understand that this small percentage of water is all that is available for everyone to drink and use.
  - h. Discuss the following points:
    - This small amount of water out of the earth's big supply is the reason that it is important for us to conserve our fresh, potable water. Water conservation means being careful about how much water we use and it also means protecting our water from contamination.
    - Would you believe that one of the largest users of energy in your home is water? In fact, you can use just as much energy heating and pumping water from the ground as you use to power all of the lights, appliances and electronics in your home.
    - We can save water and the energy used to pump it and heat it by using technologies such as faucet aerators and high efficiency showerheads and with simple behaviors such as fixing leaks quickly and taking short showers.
5. Assess student learning by asking students to put together a collection of 100 items (it can be anything portable like buttons, candy, pebbles, grains of rice, etc.). From their collection of items, ask students to identify the number that represents the amount of ocean water (97%). Ask students to identify the number that represents the amount of potable water available (a portion of one).



## To Know and Do More

Do the activities on the back of the *Water Poster*.

Read *A River Ran Wild* by Lynne Cherry.

Create a mini water cycle in a clear, quart size plastic bag. Draw some of the major processes of the water cycle: precipitation, condensation, evaporation. Pour 2 ounces of water (60 mL) into the bag. Mark the water line using a permanent marker. Tightly seal the bag and hang it in a sunny, hot area for daily observations. Discuss how energy from the sun transforms water in the hydrologic cycle. What happens when the sun is present? (heat energy transforms water from liquid to vapor/gas) What happens when the sun goes down? (heat energy decreases, water transforms from vapor/gas to liquid)

