

Usable Water

Grade Level: 4 and 6

Approximate Length of Activity: One class period

Objectives

Teacher

1. Demonstrate the locations of water on earth.
2. Emphasize to students the need for water conservation.

Students

1. Learn the locations of water on earth.
2. Understand the need for water conservation.
3. Discover the ways he/she may begin conserving water immediately.
4. Recognize ground water as the most available source of fresh water.

Michigan Content Standards: (Social Studies) 4-H3.0.8; 4-G5.0.1; 6-W1.2.2; 6-G1.2.1; 6-G5.1.1; 6-G5.1.2; 6-G5.1.3; 6-G5.2.1

Introduction

Water covers more than 70 percent of the earth's surface. Water is in the oceans, rivers, lakes, ground and air we breathe. Water helps regulate the earth's climate. The land quickly absorbs and releases heat from the sun, but the oceans absorb and release the heat slowly. This causes the ocean breezes to cool the land in the summer and warm it in the winter.

The continuous movement of water in and around the earth is called the hydrologic cycle or water cycle. When rain or snow falls on oceans and land as precipitation, the soil will soak up some of the water. Plants will take up some of this water through their roots. Some water will move down the soil and become ground water. Some of the water will also run across the land into streams, marshes, lakes and oceans. The water that remains on top of the earth is called surface water. Surface water will return to the atmosphere through evaporation. Water vapor in the air may form clouds that cause precipitation (rain or snow) to occur again. The precipitation then returns to the earth's surface. This is the hydrologic cycle.

Life is not possible without water. Water is in every living thing. Our body is nearly 65 percent water. An ear of corn is nearly 70 percent water, a potato is about 80 percent and a tomato is about 95 percent. In order for living things to carry out life processes, we must keep our water supply clean and healthy. We can live without food for two months, but we cannot live without water for more than a week.

Many people believe there is not enough water to meet the needs of the peoples of the world. The world will always have the same amount of water because of the water cycle. However, the world's water is unevenly distributed. Some places that have plenty of water go through a drought at times and other places go through a constant drought. We must manage our water quality and supply carefully so it remains safe to use.

Many conservation problems are due to mismanagement of our water supply. Through the years, people have dumped untreated sewage and other wastes into lakes and rivers which contaminate the water. People now realize we have to take special care of our water to ensure its quality, not only for now, but for the future.

Although 70 percent of the earth is water, nearly 97 percent is in the oceans. Ocean water is too salty for drinking, manufacturing, and farming. The fresh water available for us to use is about three percent of the earth's water supply. Three-fourths of the three percent fresh water is unavailable because it is in icecaps and other glaciers.

Materials Needed

- 1 gallon container
- 1/2 cup measuring cup
- Clear bowl
- Eye dropper
- Small plate
- Blue food coloring

Activity Outline

1. This chart shows the distribution of Earth's water supply. Share this information with your students.

Earth's Water Supply

Oceans	97.3 percent
Ice	2.19 percent
Groundwater	0.5 percent
Soil Moisture	0.005 percent
Atmosphere	0.001 percent
Inland Lakes	0.018 percent
Rivers	0.000096 percent

2. To demonstrate how much of the earth's water supply is actually used, ask some students to help you with the following activity. (Make sure students understand this is a demonstration and there is actually more water than this on earth.)
 - a. Pour water into a one-gallon container, such as a plastic ice cream bucket or milk jug. This represents all the water on Earth. (Add a few drops of food coloring for easier viewing)
 - b. Pour a half-cup water out of the gallon container and into a clear bowl. The water in the bowl represents all the fresh water on earth, which is less than three percent of the total water on earth. Fresh water is found in lakes, rivers, groundwater, ice, and living things. The 15 1/2 cups still in the gallon container represent salt water. We cannot use salt water.
 - c. With an eyedropper, drop one drop of water from the half-cup onto a small plate. This one drop represents the freshwater that is available for our use. This water is found in rivers and lakes. The rest of the water in the half-cup is deep groundwater, bound up as soil moisture, biomass water, or water in the atmosphere.

Discussion Questions

1. Describe the water cycle.
2. Where is the least/most water?
3. Which source is the least/most usable by living things?
4. Which source is most readily available?
5. How can you and your family conserve water at home?
6. What can farmers do to conserve water for plant and animal use?
7. Why is water important?

Related Activities

1. Have students make a visual display showing the distribution of water on earth.
2. Introduce the water cycle. Ask students to place the location of water on a diagram they make of the water cycle.
3. Assign individuals or groups of students the task of making a poster to encourage others to practice water conservation. Display these posters in the hallways or in the community (grocery store, bank, library, etc.)
4. Read the books: *The Murky Water Caper*, *And Your Point is?* and *What Is A Watershed?* all written by Deborah Rodney Pex.
5. The lesson "Water: The Incredible Resource" located in the science section of this curriculum guide.
6. The lesson "Rain On" located in the math section of this curriculum guide.