

Details



Completion Time: About 1 period

Permission: Download, share, and remix

Where is the World's Water?

Overview:

Students will calculate and measure out equivalent amounts of water to model the distribution of the world's water supply.

Objectives:

Students will be able to compare the amounts of water and the states of water in different geographic locations.

Lesson Preparation:

This activity shows students the relative amount of the Earth's water in different sources- glaciers, oceans, etc...

Before beginning the activity have the class brainstorm where on Earth the Earth's water can be found. Write these on the board and have students write them in the Note section of their notebook. They should include oceans, ground water (which is actually underground water like aquifers), surface water- (lakes, rivers, streams), glaciers and icecaps, salt lakes, and the atmosphere.

Discuss that the amount of water on Earth stays the same that it just is recycled, reused and moves from place to place.

You may need to help them with how to make these calculations using percentages.

Materials

For each group:

- A large sink or container that can hold 20 liters of water
- A 1000 ml beaker
- A graduated cylinder
- 4-5 small containers
- An eyedropper
- A source of water

**Procedure:**

WHERE IN THE WORLD IS THE WORLD'S WATER?

1. The Earth has been called the water planet. About 75% of the Earth's surface is covered in water. The amount of water on Earth remains basically same. It just recycles through the water cycle. You are drinking the same water the dinosaurs drank (and peed), you're bathing with water that was in the ocean, and watering your yard with water that was in the glaciers in Antarctica.
2. Put a plug in your sink's drain. Using a 1000-milliliter beaker, add 20 liters of water to the sink. (Remember that 1-liter equals 1000 milliliters.) This water represents all of the water on Earth. As you know this water is located in a number of places, but each of these sources don't contain the same amount of water. This activity will show you how much water is located in each source compared to the Earth's total water supply.
3. The world's water is divided into these sources in approximately the following percentages.

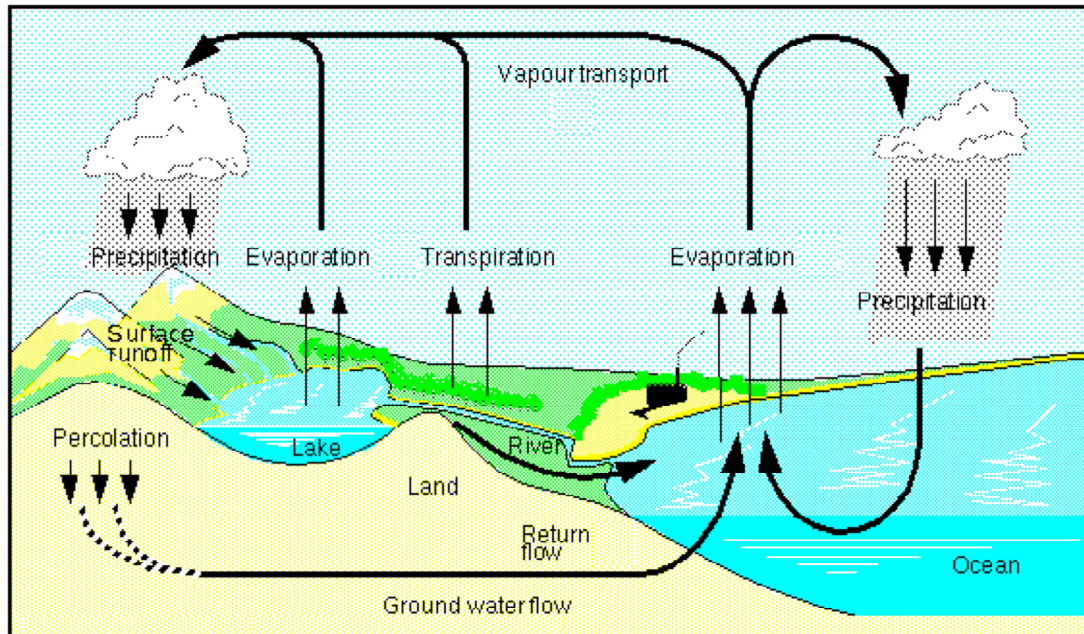
Oceans-	97.2%
Ice in Antarctica-	1.8%
Arctic and other glaciers	0.2%
Atmosphere-	0.001%
Lakes/Rivers-	0.01%
Groundwater-	0.62%
Salt Lakes-	0.008%

4. If the water you have in the sink represents all of the water on Earth how much of the 20 liters would represent the water in the oceans and how much would represent the water in the atmosphere, etc.? You are going to find out.
5. Using the percentages, calculate the number of liters and milliliters to complete the following chart (Remember that 1 liter equals 1000 milliliters.) The oceans have been done for you. Once you have these calculated use the beakers and graduated cylinders to actually measure out the different amounts of water into separate containers. For small amounts of water, beakers are not very accurate so use the graduated cylinder, or an eyedropper. Leave the ocean water in the sink.



WHERE IN THE WORLD IS THE WORLD'S WATER?

LOCATION	PERCENT OF EARTH'S WATER	LITERS IF EARTH HAS 20 LITERS OF WATER	MILLITERS IF EARTH HAS 20 LITERS OF WATER
EARTH	100%	20 liters	20,000
OCEANS	97%	19.4 liters	19,400 milliliters
ANTARCTIC ICE	1.8%		
GROUND WATER	.62%		
GREENLAND AND OTHER GLACIERS	.2%		
SURFACE WATER-LAKES, RIVERS	.009%		
INLAND SEAS AND SALT LAKES	.008%		
ATMOSPHERE	.001%		



Courtesy Erich Roeckner, Max Planck Institute for Meteorology

WHERE IS THE WORLD'S WATER?

- 1) Scientists often use models to represent and study the real world. In this activity you used a model of the world's water. What are two advantages of using a model rather than the real thing?
- 2) What is a disadvantage?
- 3) Where is most of the world's water? If you are in north Texas trying to grow corn why does this water not help you much?
- 4) Based on this activity are most of the world's aquatic ecosystems marine (saltwater) or freshwater?
- 5) If you are in north Texas how do you get ocean water to grow your corn? (Look at the Water Cycle diagram.)
- 6) Where is most of the world's freshwater?



- 7) From which of all of these sources of water, do humans get most almost all of the water that we use- to drink, bath, wash things with, water our food crops, our lawns, etc.?
- 8) Based on this activity and the activity on human population, why do you think that a lot of people think future wars will be fought over water?
- 9) Based on what you observed about the location of water on Earth, explain why would it be important to understand what is occurring to glaciers in Antarctica and Greenland.
- 10) Antarctica is a desert, which means it receives very little precipitation. Based on the water cycle diagram and what you know about the weather on the ice, why do you think it does not snow or rain there very much?
- 11) Water is recycled through the Earth's ecosystems, (you're drinking dinosaur pee). How is this different than the flow of energy through an ecosystem?

Extension:

- Design an experiment to determine how melting sea ice, compared to melting ice sheets will affect sea level.
- Make a model comparing the amount of water contained in West Antarctica, East Antarctica, Greenland, and sea ice in the Arctic Ocean, sea ice around Antarctica.

Resources:

N/A

Assessment:

N/A

Credits:

This is a modified an assignment, probably from *Project Wild Aquatic*. For more information, contact Kirk Beckendorf, kbeckendorf@polartrec.com.



National Science Education Standards (NSES):

NSES Content Standards, Grades 5-8

Content Standard A: Science As Inquiry

- a. Abilities necessary to do scientific inquiry
- b. Understandings about scientific inquiry

Content Standard D: Earth and Space Science

- a. Structure of the earth system

Content Standard E: Science and Technology

- a. Abilities of technological design
- b. Understandings about science and technology

Other Standards:

N/A