A Drop in the Bucket

Grades: K-3

Subject, Science, Language Arts

Time required:20 minutes

Plus 30 mins. extension

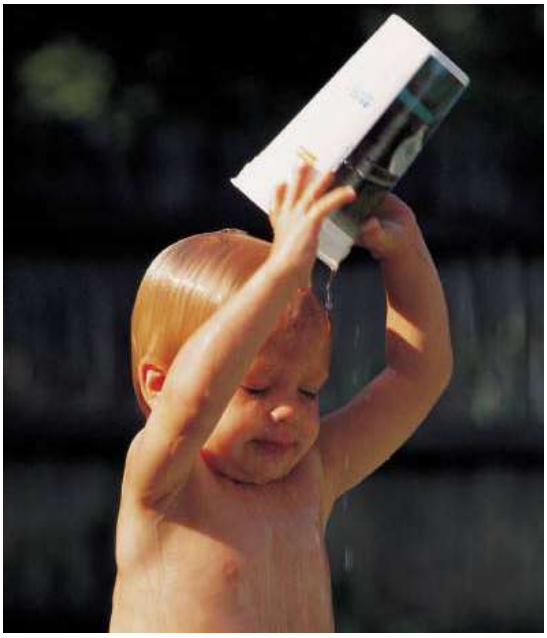
Key Concepts:
All life must have enough clean water

Objectives:
Students will recognize the limited amount of fresh water that is available to living things

SQUAMISH RIVERS

Key Words:
Salt water, fresh water, water conservation

Skills:
Observing, gathering information, interpreting

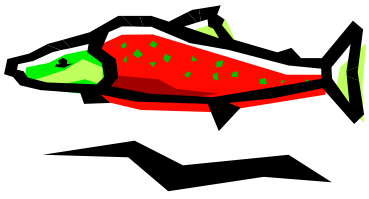


Background:

There is only so much water available on earth at any given time. The amount of water safe for human consumption (potable water) is very limited. It is interesting that on a planet extensively covered in water (71%), this resource is one of the main limiting factors of life on earth. The earth is essentially a closed system in which the water cycle operates with no deletions or additions. With our West coast abundance of freshwater rivers, streams, and lakes, one may easily forget the very small proportion of this limited resource which is actually accessible and usable to us. By observing the following demonstration, students can learn that although the Earth is covered mainly by water, only a small amount is available for human consumption. Water is a limited resource and should be used wisely.

Materials

- water
- 1000 ml beaker or measuring cup
- 50 ml beaker/cup
- 10 ml measure
- Dish & Dropper
- Small metal bucket



A Drop in the Bucket

Procedure:

1. Study a globe or map of the Earth and have students guess how much of the Earth's surface is covered in water. (71% of the earth's surface is covered with water.) Record the guesses on the board.
2. Read the following information:

- 95% of the world's water is ocean water
- 3.4% is ground water
- 1.6% is frozen
- .005% is water in lakes, streams & rivers

3. Show the class a beaker with 1000 ml of water. Tell them it represents all the water on Earth.
4. Ask where most of the water on Earth is located? (Refer to the globe or map.) Pour out 28 ml of water into a 100 ml cylinder or container. This represents the Earth's fresh water, about 3% of the total. Put salt in the remaining 972 ml to simulate the water found in oceans, unsuitable for human consumption.
5. Ask students what is at the Earth's poles? Almost 80% of the Earth's fresh water is frozen in ice caps and glaciers. From the 28 ml, pour out 5 ml into a dish and place the rest into a nearby freezer or ice bucket. The water in the dish (around 0.6% of the total) represents the non-frozen fresh water, while the water in the freezer represents the water frozen in ice caps and glaciers.
6. From the 5 ml, pour out 4 ml to present the ground water in aquifers and underground streams. That leaves 1 ml of water that is surface water, found in lakes, rivers, streams, marshes, and wetlands.
7. From the remaining 1 ml, use an eyedropper to remove a single drop of water. Release this drop into a small metal bucket. Make sure students are very quiet so they can hear the sound of the drop hitting the bucket. This drop represents clean, fresh water that is not polluted or otherwise unavailable for use, about 0.00003% of the total! This precious drop must be cared for very carefully!
8. Refer students to the recorded guesses about the Earth's water. Have students explain their reasoning for their initial guesses. How would they adjust their estimates now?

Extensions:

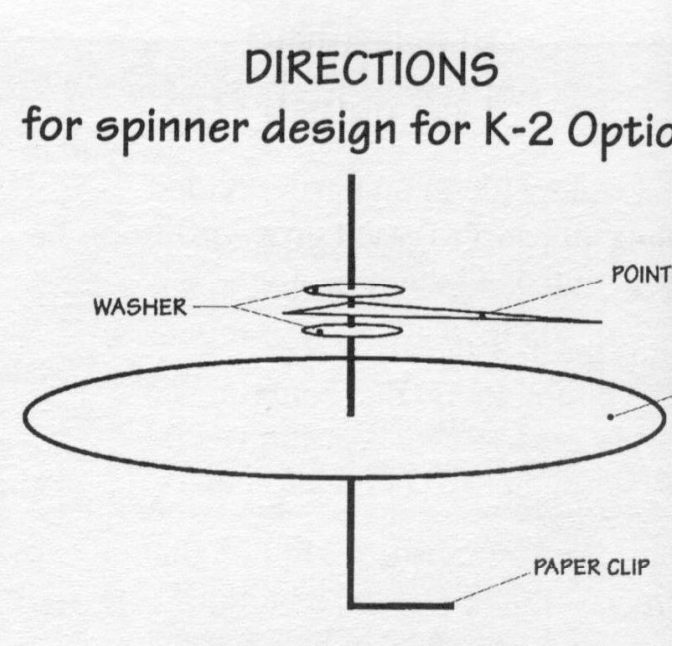
1. Make a spinner out of sturdy cardboard using the disk pattern supplied. Have students colour in the disk. Make the spinners with a disk, pointer, washer and paper clip (teachers may want to make this ahead of time). Give each student a copy of the Water Chart. Students spin the pointer and then colour a box in the chart on the row where the pointer lands. Which row of the chart will fill up first?
2. Use the "A Drop in the Bucket" Word Search for a fun way to reinforce vocabulary with students.

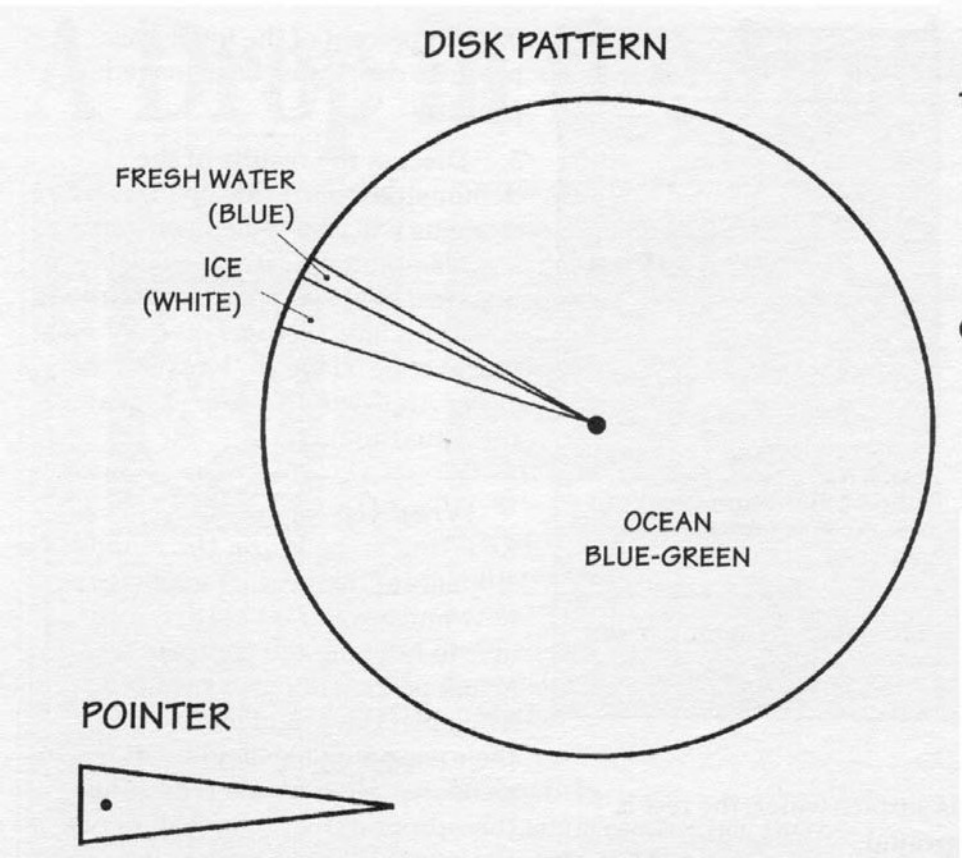
Evaluation:

1. Have students:
    a. Describe the relative amount of fresh water that is available for living things.

Community Connections:
1. Have some one from the Squamish Regional District water utility come in to speak to the class about the community water supply and water conservation.

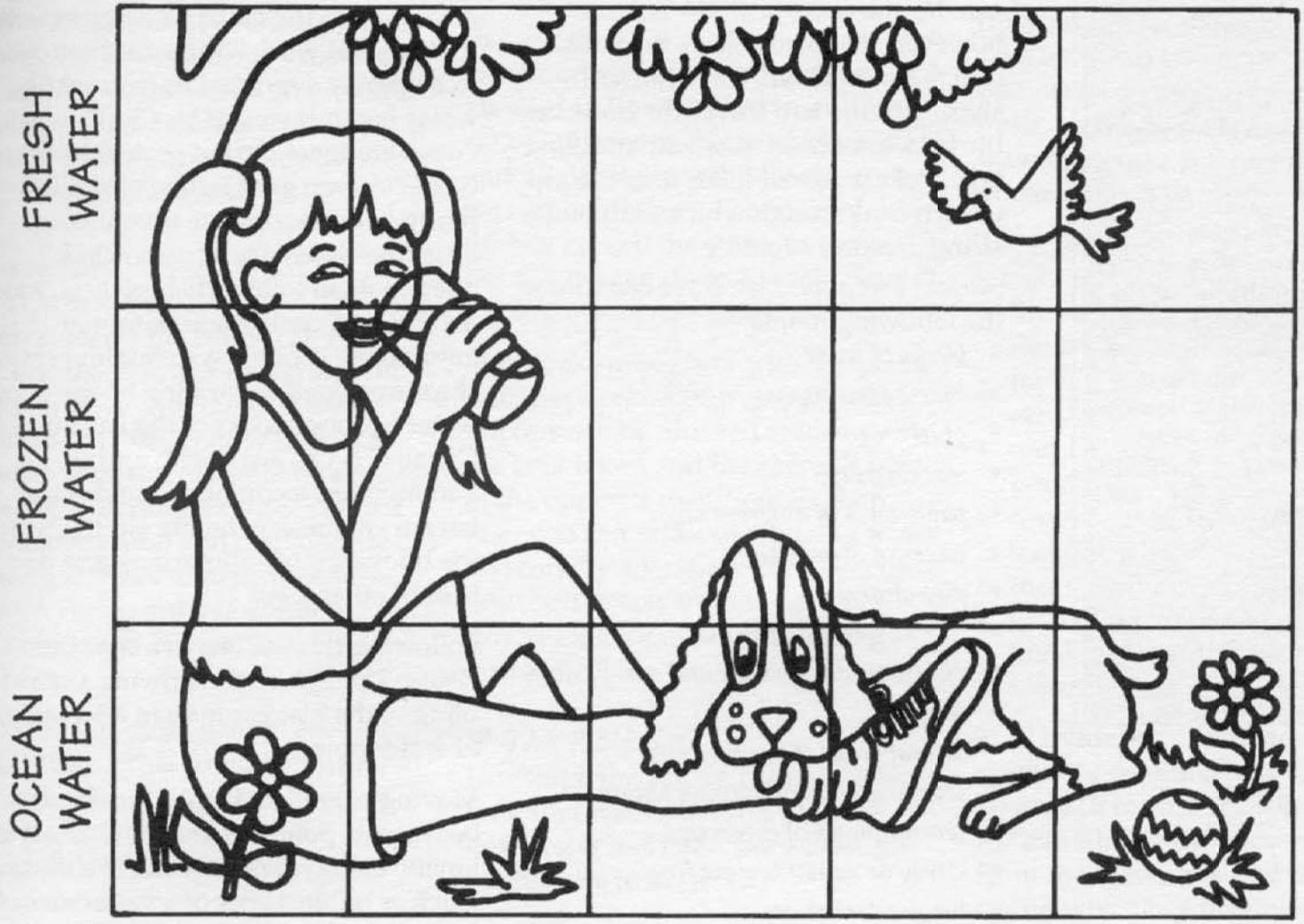
Resource: This activity has been adapted from "A Drop in the Bucket from Project WET (1996) and "Analyzing the World's Water Supply" from Water Stewardship (1995).





Water Chart

K-2 Option



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A Drop in the Bucket Name: _____

Word Search

l n w f s h m n h
e a r a b g w i t
y n k l t o u a r
m o r e n e n r a
z a c s q t r l e
c x e e b i c e i
b h q r a b a k k
n q s i t n r t b
r i v e r s r k e

earth
ice
lake
ocean
rain
river
snow
stream
water