SO MUCH WATER, SO LITTLE TO DRINK

K-2

OBJECTIVES

At the end of this lesson, the students shall be able to do the following:

1. Discuss water concepts;
2. Observe, record, and compare, orally or in writing, the amount of the Earth's surface covered by land and by water;
3. Observe, record, and compare, orally or in writing, the amount of fresh water vs. salt water;
4. Give an oral or written definition of the new terms: fresh water, salt water, and surface.

BACKGROUND INFORMATION

All living things on this planet are dependent on water for survival. In fact, every living organism is composed of more than 60 % water. Water is necessary for the production of food and maintenance of life. It is also used to produce energy, manufacture goods, transport goods, and provide recreational opportunities.

Because water covers 71% of the Earth's surface, it is often thought of as an endless resource. The fact is that 97% of the Earth's water is the salt water of the oceans. Only 3% of the Earth's water is fresh water and about two-thirds of that is frozen in glaciers, ice caps, and snow. Of the remaining 1%, half is in aquifers beneath the Earth's surface.

Terms

fresh water: inland water that has a low concentration of minerals, salts, and dissolved solids found as surface water or ground water.

SUBJECTS:
Science, Geography, Math, Language Arts

TIME:
3 or 4 30-minute sessions

MATERIALS:
2 pieces of butcher paper
1 egg
1 apple
standard globe
"balloon" or pillow" globe
2 colored labeling dots
12-3" squares of green construction paper
12-3" squares of blue construction paper
half sheet of copier paper per child
1 sheet graphing paper per child
1 blue crayon per child
1 green crayon per child
3 sheets 12"x18" green construction paper
7 sheets 12"x18" blue construction paper
1 student booklet per child "So Much Water, So Little to Drink"
United States map
state map
1/2 cup salt water solution
1 Q-tip per child
100 1-inch cubes, all same color
1 or more pkgs. small self-stick removable notes
magazines with pictures of outdoor scenes and/or water usage (optional)
calendars with pictures of outdoor scenes (optional)
2 extra pieces butcher paper

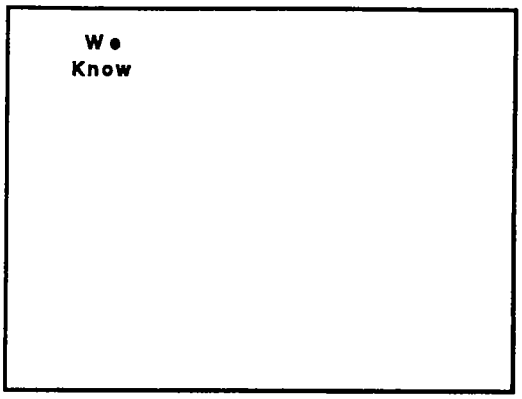
salt water: water that has a high level of dissolved salts (oceans, seas).

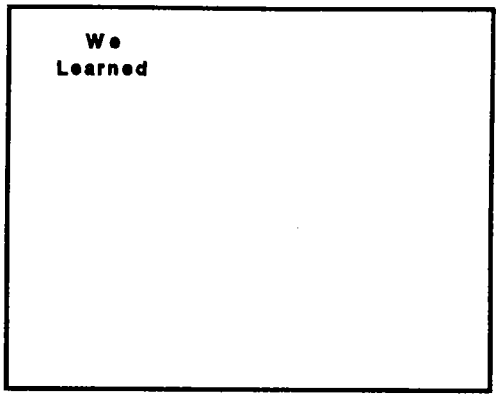
surface: the outside layer of an object or organism.

ADVANCE PREPARATION

A. Gather materials listed above.

B. Prepare charts:





C. Cut twelve 3-inch squares each of blue and green construction paper.

D. For the "Globe Toss" tally activity, cut sheets of copier paper in half (4 1/4" x 5 1/2"); one sheet per student.

E. For the "Globe Toss" graphing activity, copy one graphing sheet per student (included).

F. Copy student books "So Much Water, So Little to Drink" (included).

G. Prepare salt solution by mixing 1/2 teaspoon salt with 1/2 cup water.

H. Prepare classification charts for extension activities "Land/Water" and "Fresh Water/Salt Water" (optional).

PROCEDURE

I. Setting the stage

A. Ask the students to tell what they know about water. Record their responses on prepared butcher paper titled "We Know."

B. Develop an understanding of the term "surface" as being the outside layer of something. Ask, "What is on the surface of:

an egg? (shell)
an apple? (skin or peel)
a person? (skin or hair)"

II. Activities

A. Show the students a globe. Explain they they will examine how much of the Earth's surface is covered by land and by water.

1. Students will identify land masses and water masses on the globe.

2. Rotate the globe slowly and ask students if they see more land or more water.

3. Using an inflated globe or stuffed cloth globe, play "Toss the Globe."

a. Select two students to be "Globe Tossers." Put a colored sticker on each student's right thumbnail.

b. The remainder of the class will record whether the "Tosser's" right thumb is on land or water as he/she catches the globe. The globe will be tossed a total of ten times. Choose the recording technique that best complements the math skill of your class:

1) Divide the class into two teams. One team will record each time a catcher's thumb touches land by placing a 3" green square in their recording area. The other team will record each time the thumb touches water by placing a 3" blue square in their recording area.

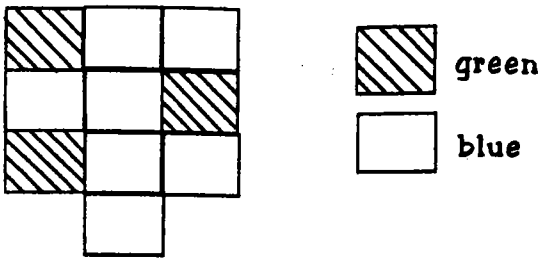
2) Each student will make a tally mark on his/her own paper using a green crayon to represent land and a blue crayon to represent water. At the end of ten throws, each student compares the green and blue tally marks. At the end of ten throws, compare results.

3) Each student will record his/her observations on the attached graph sheet. At the end of ten throws, compare results.

c. Students will discuss the results of their recordings. (The results of this activity could be different than the actual percentages of land and water. This can be discussed after the next section of this lesson. At a later time you may want to repeat the "Globe Toss" and compare results of each trial.)

B. Tell the students that you will use colored paper to better see how the amount of land and water compare.

1. Using 3" squares, place seven blue and three green squares as shown:



   a. Tell students to imagine that these papers represent the whole Earth and that it has been cut into equal pieces. Count the total number of pieces (ten).

   b. Imagine that all the water could be moved to one side and all the land to the other. (Separate the water and the land.) Ask students to describe the comparison.

   c. Count the land pieces, vocalizing the results. "Three of the ten parts are land."

   d. Count the water squares. Vocalize the results. "Seven of the ten parts are water."

   e. Move the 3" squares aside but still in full view of the students.

2. Using 12" x 18" pieces of construction paper, place three green pieces beside each other and seven blue pieces beside each other. Ask students to describe the contrast they see now.

C. Give each student a copy of the student book, "So Much Water, So Little to Drink."

   1. Read the text on page 1. Draw and color the earth.

   2. Read the text on page 2. Using blue and green crayons, color the appropriate number of spaces to represent land and water.

D. Review what was learned about the proportion of land to water on the Earth's surface in the lesson. Locate bodies of water on the globe. Encourage students to look for bodies of water other than the oceans. Is it easy to see these smaller bodies?

E. Using a large map of the United States, locate bodies of water. Identify these bodies as lakes or rivers. Compare bodies of water within your state to those located in other states. How does your state compare?

F. Examine a state map. How do bodies of water on your state map compare in size to those found within your state on the U.S. Map? Locate the body of water closest to where you live. Discuss the size of the body of water in real life compared to its size on the map.

G. Introduce the terms "fresh water" and "salt water."

   1. Ask, "Has anyone gone swimming in an ocean? Did any of the water get in your mouth? How did it taste?"

2. Give each student a Q-tip. (Caution the students to hold one end of the Q-tip but not to touch the other end since everyone is sharing the same solution and will be putting the Q-tip in their mouth). Have students dip their Q-tip into a container of "ocean" (salt) water. Taste it. Would this be good to drink? Explain that ocean water is salt water and cannot be used for drinking unless the salt is removed.

3. Explain that our drinking water comes from lakes, rivers, creeks, or bodies of water under the Earth's surface. It has relatively no salt and is called "fresh water."

H. Show the students a container in which you have placed 100 one inch cubes, all the same color.

1. Tell them to imagine that you have emptied all the water from the entire Earth (oceans, lakes, rivers, ponds, and swimming pools from the surface, and pockets of water under the surface). You have all the water from the whole Earth in this container. You have divided it into equal pieces as we did with the land and water yesterday.

2. Have the class count the cubes. (100)

3. Let individual children estimate how much of the total "water" is fresh vs salt by separating the cubes into two piles.

4. After students have made their guesses, move three cubes away from the other 97. Identify the three cubes as drinkable fresh water and the 97 as undrinkable salt water. Have students verbalize that 97 out of every 100 parts of water is salt water and that three parts of every 100 is fresh water.

I. Point to the three "fresh water" cubes. Explain that these three cubes represent fresh water, but not all of it is drinkable.

I. Set two cubes aside and identify them as fresh water but undrinkable. Ask children what happens to water when it gets very cold. (It freezes). Locate areas on the globe that are very cold. What happens to the water in these areas? (It freezes).

2. Point to the one remaining cube. Out of all the water on the Earth, only this much is fresh water that is drinkable.

3. Verbalize the quantities of total water, salt water, frozen fresh water, and drinkable fresh water.

J. Complete the final pages in the student book, "So Much Water, So Little to Drink." Color the correct number of squares on the graph of each page. Students may also draw a graphic to illustrate undrinkable water, drinkable water, and icebergs.

III. Follow-Up

A. Record student responses on "We Learned" chart.

B. Have students read "So Much Water, So Little to Drink" to classmates, older students, and parents.

C. Have students make a class big book of "So Much Water, So Little to Drink."

IV. Extensions

A. Place 1 1/2" x 2" self-stick removable notes near the maps. Students can draw a glass with a happy face for drinkable water or glass with an "X" through it for undrinkable water on the sticky notes. These notes can then be placed on appropriate bodies of water on the maps.

B. Prepare a wall display by cutting pictures of a variety of activities and environments out of magazines. Categorize the pictures by placing them under the label "Land" or "Water."

C. Cut a variety of water scenes, usage, and sources out of magazines and old calendars. Place them on a chart with labels of "Fresh Water" and "Salt Water."

RESOURCES

Keinath, Thomas M., World Book Encyclopedia, Vol 22.

Tejada, Susan Mondshein, Geo-Whiz!, National Geographic Society, 1988.

Toss the Globe activity was taken from a workshop at Kilby School, University of North Alabama, sponsored by the Alabama Geographic Alliance.

So Much Water, So Little to Drink

by

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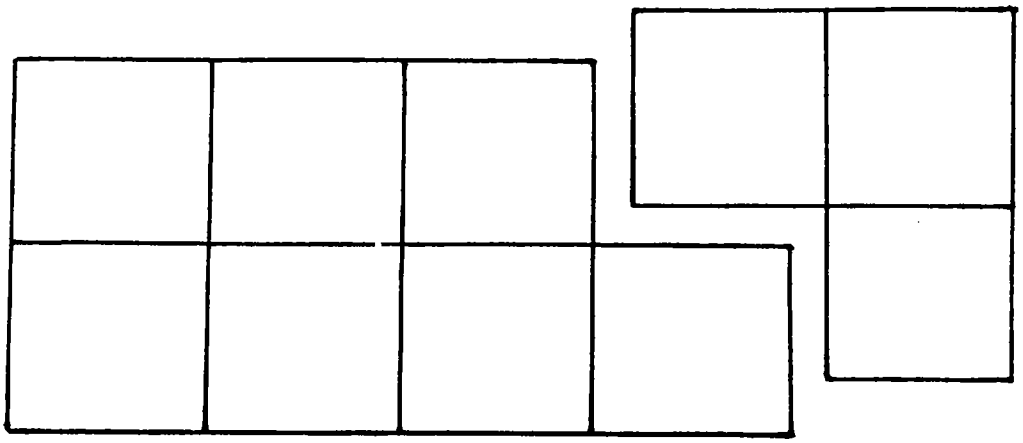

Three out of ten parts of the surface is land. Seven out of ten of the surface is water.

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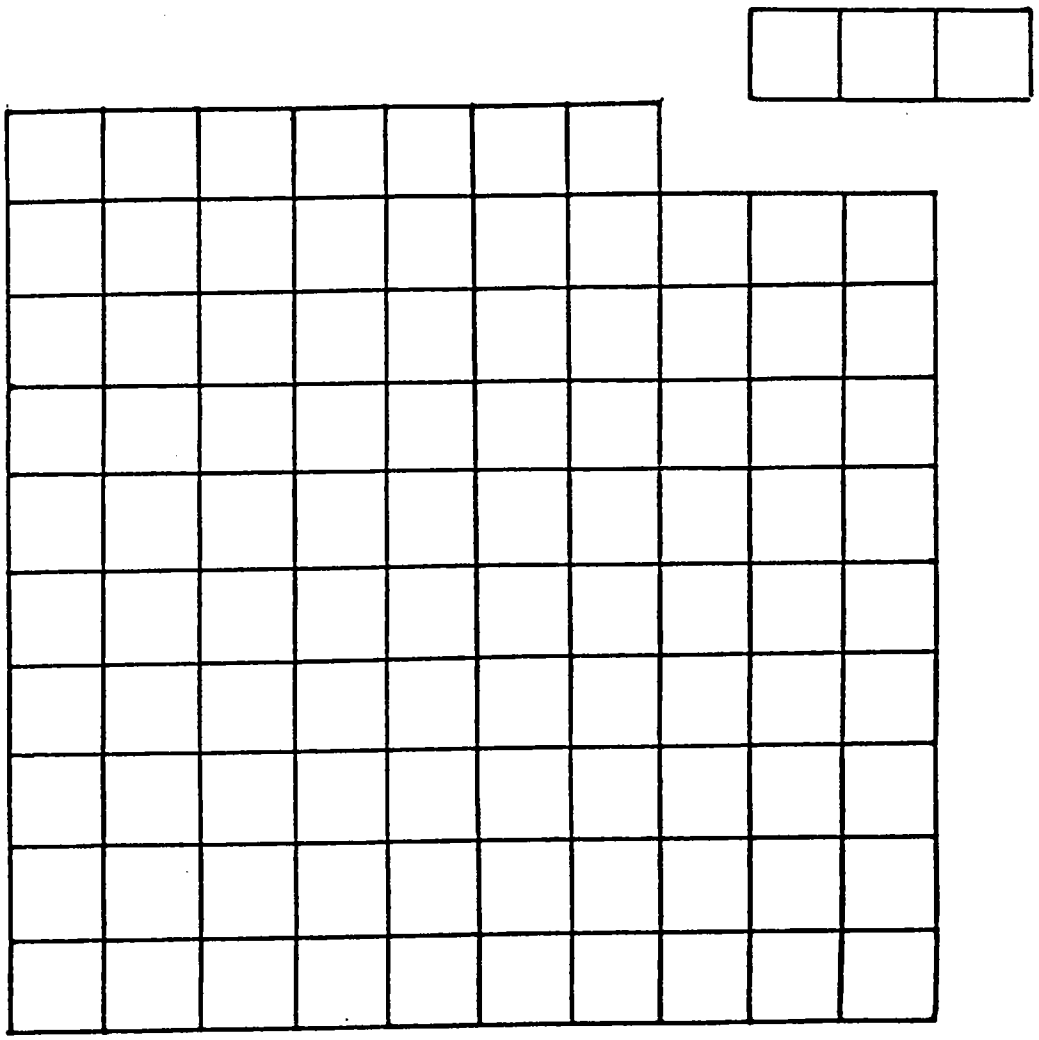

Most of our water is salty water - 97 out of 100 parts. We cannot drink salty water.

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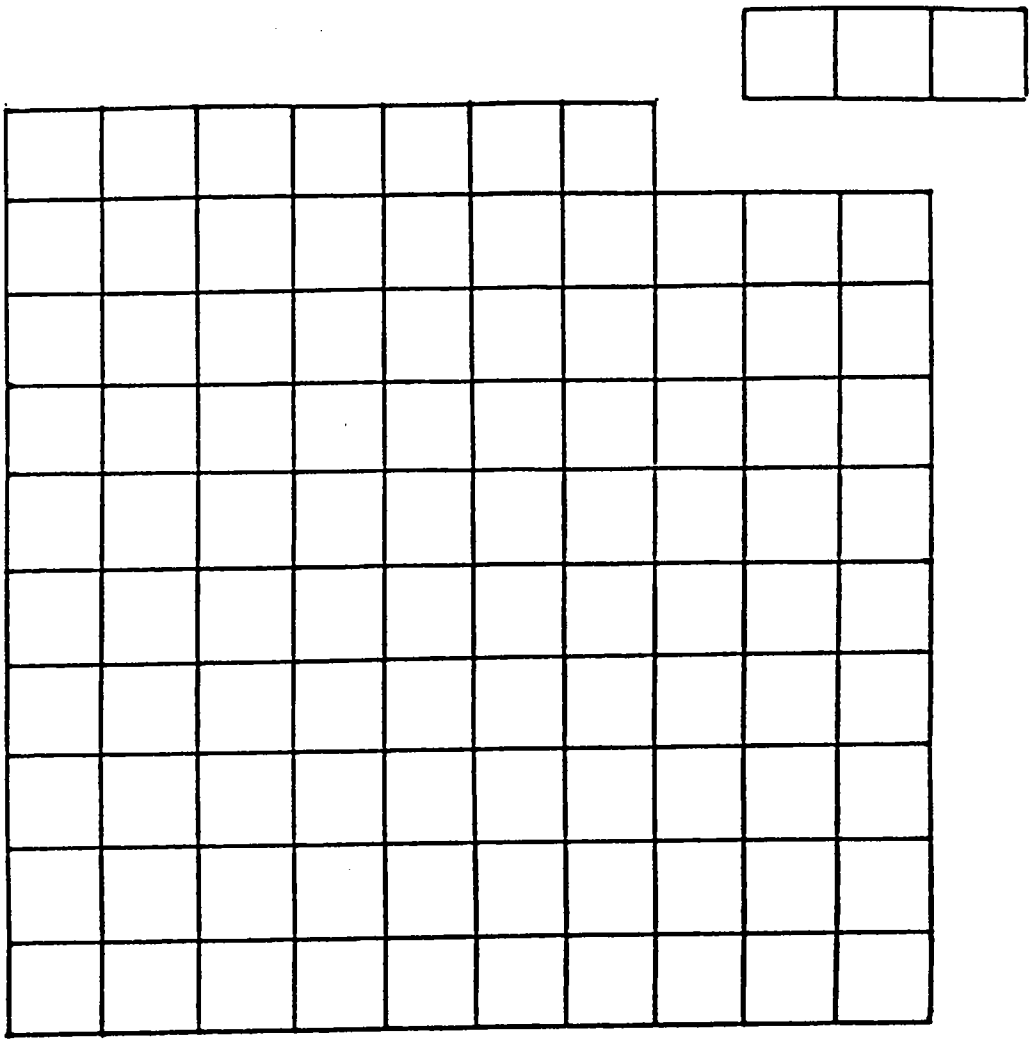

Very little water is fresh water - 3 out of 100 parts. We can drink fresh water.

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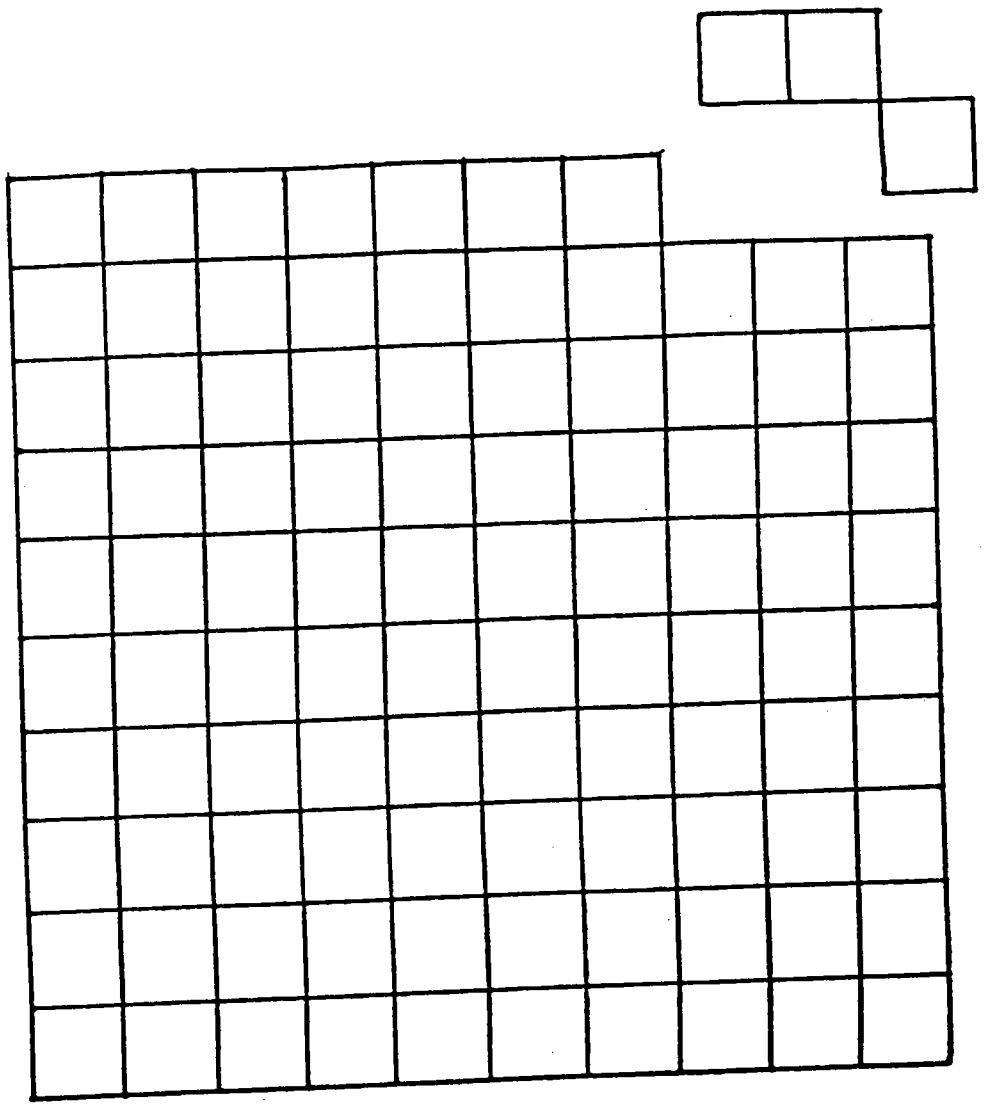

Most fresh water is frozen in icebergs. We cannot drink ice.

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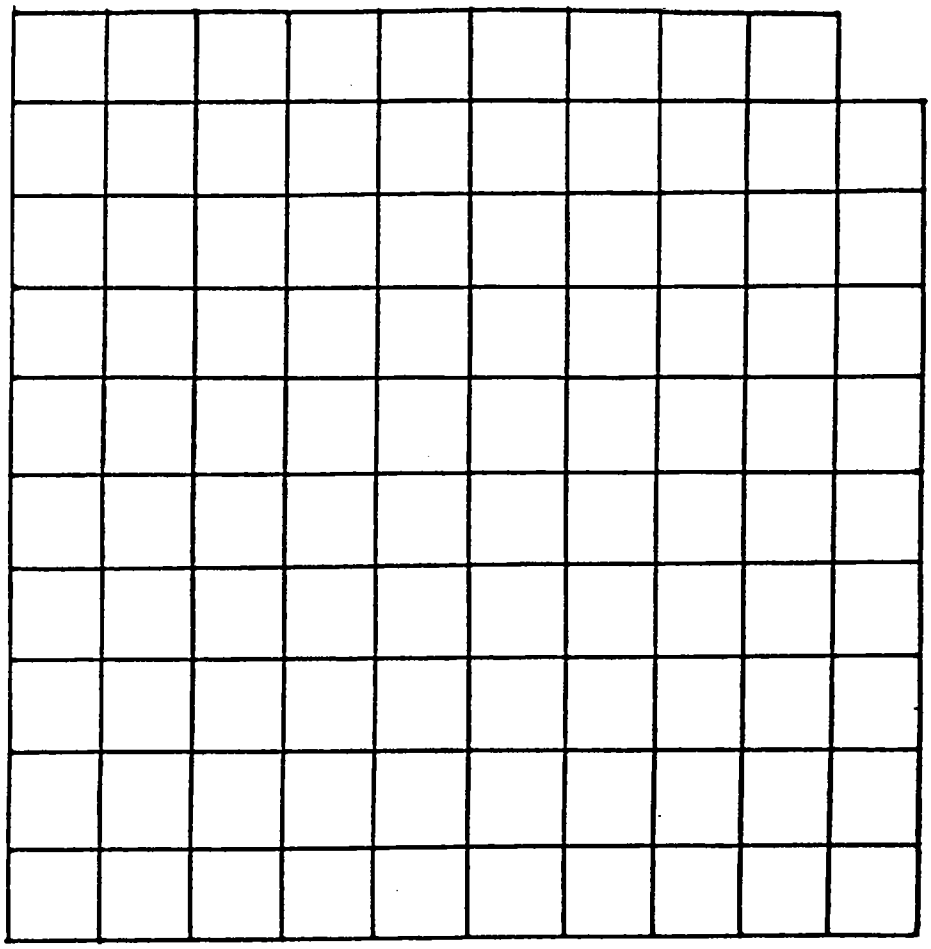

We can drink 1 out of 100 parts of all the Earth's water !