

Investigation One – Where is Water Found?

Standard I Students will understand that water changes state as it moves through the water cycle.
Objective 1 Describe the relationship between heat energy, evaporation and condensation of water on Earth.
Intended Learning Outcomes <ol style="list-style-type: none">1. Use science process and thinking skills2. Manifest scientific attitudes and interests

**Standard
I**

Objective

Background Information

Water covers 70% of Earth's surface and is found in different locations on Earth. The amount of water in the oceans, atmosphere, and on land is hard to comprehend. Approximately ninety-seven percent (97%) of it is found in the oceans. The atmosphere holds less than 0.001%. About two percent (2%) is found frozen on Earth in glaciers, and one percent (1%) is freshwater found in lakes, rivers and groundwater.

In the western United States, water is a valuable resource that comes and goes with the seasons. During the winter the snow falls and accumulates in the mountains. As the snow melts in the spring and during the summer, the water is absorbed into Earth and forms small streams that flow down the mountains. Groundwater is all the water that penetrates the soil and underlying rock layers. water that flows off the surface is called runoff.

Using water wisely is the responsibility of every member of society. It is a valuable resource, and we are responsible for its management and reasonable consumption.

Pre-Assessment/Invitation to Learn

In small groups, ask students to brainstorm a list of all the places where water is found on Earth. Have them write this list in their journals.

Instructional Procedure

1. Discuss how students might group or classify the items in their lists. Write the classifications oceans, glaciers, and freshwater on the board. Tell students these are the classifications (categories) that water experts have developed. Discuss each category, and then have the students write these headings in their journals. Have students sort the items they wrote in their journals into three categories.

Materials

- 100 pennies for each group
- Earth globe

2. Have students engage in a group discussion estimating the percentage of Water found in each of the categories. *Note: Based on the category lists most Students will probably estimate that most water is found as freshwater.* Have
3. Distribute 100 pennies to each group. Have them show their estimate using the pennies.
4. Provide students with the actual percentages: Oceans 97%, Glaciers 2%, and Freshwater 1%. As a class, compare group estimations to the actual percentages.
5. To help students conceptualize what 97% as ocean water, 2% as glaciers, and 1% as freshwater means, ask the students to recreate these percentages by stacking 97 pennies (97% oceans), 2 pennies (2% glaciers), and 1 penny (1% freshwater). Have students record the true percentages in their journals. discuss these proportions.
6. Review appropriate science language as the class discusses the various water sources. Looking at the globe of Earth, describe the difference between how much land you see compared to water. Point out that 70% of Earth's surface is covered by water.
7. Because water in air was less than one penny, it is not represented numerically. Point out to students that this 0.001% of water in air is very important.

Curriculum Extensions

Fine Arts/Visual Arts –

- Create a mural of the locations of water on Earth. Be sure that this mural graphically represents the relative amount of water in each of the areas (oceans, glaciers, freshwater) (*Standard III, Objective 2*)

Language Arts –

- Describe in detail the places where water can be found around your home, school, or community. (*Standard VIII, Objective 6*)

Assessment Suggestions

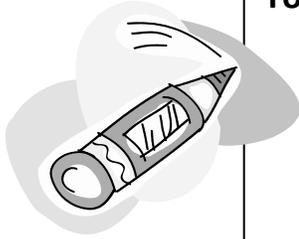
Check for students' understanding with the answers they recorded in their journals.

Homework & Family Connections

Discuss and have students do the Home Activity Student Worksheet, "Where is All the Water?"

HOME ACTIVITY

Where is All the Water?



Today I learned that:

- 97 % of Earth's water is Found in the ocean
- 2% of Earth's water Is found in glaciers
- 1% of Earth's water Is freshwater



For Review:

Demonstrate these facts by doing the penny activity from class with your family members. (You will need 100 pennies.)



Fun Focus:

The following home activity will demonstrate the amounts of water we find on Earth.



Materials:

- 2-liter pop bottle
- Measuring cup
- Water
- 2 clear plastic cups

Procedure:

- 1** Fill a pop bottle with 2000 ml. (2-liters) of water. This represents all the water found on Earth.
- 2** Pour 40 ml (about $\frac{1}{4}$ cup) from the 2-liter bottle into a cup and place it in the freezer. This represents the water on Earth contained in glaciers.
- 3** Pour 20 ml (about 2 tablespoons) from the 2-liter bottle into a cup to represent the fresh water on Earth.
- 4** The remaining water in the bottle represents the water in the oceans. Water in the ocean consists of 3.5% salt. To represent saltwater, add 68 ml (about $\frac{1}{3}$ cup) to the remaining water in the 2-liter bottle.

