

Water, Water Everywhere

Level



Grades 3-4

Overview:

Students explore the location of water on Earth using a terrarium to model the water cycle. (NOTE: This lesson requires two separate days.)

Objectives:

The student will:

- identify the various locations of water on Earth; and
- explain that water exists in various forms.

Materials:

- Wide-mouth glass jar
- Small rocks
- Sand
- Soil
- Small plant
- Plastic wrap
- Globe
- 1 gallon container
- 2 beakers
- Water
- 100 pennies (or other small items, such as beans)
- Small mirror, or plastic bag and tape, see “Critical Thinking Question” (one per student)
- STUDENT INFORMATION SHEET: “Model Earth”
- STUDENT WORKSHEETS: “Terrarium Model Earth” and “Water, Water Everywhere”

GLEs Addressed:

- [3-4] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.
- [3] SD1.2 The student demonstrates an understanding of geochemical cycles by describing the water cycle to show that water circulates through the crust, oceans, and atmosphere of Earth.

Activity Preparation:

Build a model terrarium as outlined in the STUDENT INFORMATION SHEET: “Model Earth” to show the class as an example.



Activity Procedure:

Day 1

1. Display a globe. Ask students how much of Earth’s surface is covered in water. Explain that two-thirds of Earth is covered with water. Remind students that matter on Earth is found in solid, liquid, and gas form.
2. Ask students to describe solids, liquids, and gases. Brainstorm words that describe each state of matter. Make sure students know that a solid is something that keeps its shape, a liquid is something that takes the shape of the container it is in, and a gas is something that changes its shape easily.

3. Ask students what solid water is called. (*ice*) Ask students what liquid water is called. (*water*) Ask students what water as a gas is called. (*vapor*)
4. Tell students that most of Earth's water is in the oceans. Show students a gallon container filled with water. Pour 1/8 cup of water into a beaker and 1/3 cup of water into a second beaker. Explain that if the gallon container represented all the water on Earth, the beaker with 1/3 cup shows all the ice, and the beaker with 1/8 cup shows all the fresh water. The water left in the gallon container is all the water in Earth's oceans.
5. Ask students if they can drink the water from the oceans. Explain that the water in the oceans contains salt, and is not drinkable by people. Explain that only 1% of Earth's water is usable by people (the amount represented by the 1 1/2 cups of water in the beaker). Show students 100 pennies (beans, grains of rice, or anything small can be used instead). Remove one penny and explain that 1% is 1 item out of a 100. If the 100 pennies were all the water on Earth, the drinkable amount would be just one penny.
6. Ask students where liquid water can be found on Earth (*lakes, rivers, oceans, etc.*). Ask students where solid water can be found on Earth (*glaciers, sea ice, ice caps, etc.*). Ask students where water vapor can be found on Earth (*clouds*). List student ideas on the board. If necessary, explain that liquid water is found in lakes, rivers, and oceans; and solid water is found in ice from glaciers, sea ice, and ice caps.
7. Display the "Earth's Water" section of the *Global Climate* Interactive DVD. As a class, explore the sections that are appropriate to the level of knowledge in the class.
8. Inform students that they are going to build a terrarium as a model of Earth. Show students the class example that was created during the Activity Preparation. Distribute the STUDENT INFORMATION SHEET: "Model Earth" and ask students to divide into pairs; an older student with a younger student works well.
9. Explain that the jar is a model of Earth. If necessary, explain that all living things on Earth contain water. Water is also in the soil and in the air. Water is in the air in the form of clouds. As rain falls from the clouds, or snow on the ground melts, the soil absorbs some of the water and plants in the soil use the water to grow. Animals eat the plants and also drink water from rivers and lakes.
10. If necessary, explain that water is not in all things. Some items, such as rocks, metal, and man-made items, such as plastic, do not contain water.
11. Ask students to follow the instructions on the STUDENT INFORMATION SHEET to build their model Earth. Assist as necessary. Make sure student terrariums are done correctly and set them under a lamp or near a window.
12. Distribute the STUDENT WORKSHEET: "Terrarium Model Earth" and ask students to draw and label their terrarium.

Day 2

13. Distribute the STUDENT WORKSHEET: "Water, Water Everywhere." Instruct students to complete the worksheet individually or in pairs, by circling the pictures that show an item that contains water. (*NOTE: You may also ask students to color just the items that contain water, or color all items.*)

Critical Thinking Concept: Think-Pair-Share Method. As a class, list all the sources of water in the classroom. Remind students that water comes in solid, liquid, and vapor form. Remind students that water is in the air and in plants and animals. To demonstrate, complete one of the following activities: 1) ask students to blow on a mirror (the condensation will demonstrate how there is water in the body), or 2) direct students to place their hand in a plastic bag and secure it by wrapping tape around the wrist (the moisture that forms in the bag is from the student's body).

Extension Idea: Explain to the class that the average person uses 35 gallons of water per day. Ask students how they use water during the day, and list student responses on the board. Distribute one plastic bag (labeled “not used”) filled with 35 sponges, and one empty plastic bag (labeled “used”) to each student. Ask students to keep track of their water use by moving a sponge from the “not used” bag to the “used” bag each time they use water until class the next day. After 24 hours, discuss with students how they used water, how much water they used, and how they can conserve water. Make sure students understand that water is important for humans (we need to drink water, brush our teeth, etc.). Since there is only so much on Earth that is drinkable, it shouldn’t be wasted.

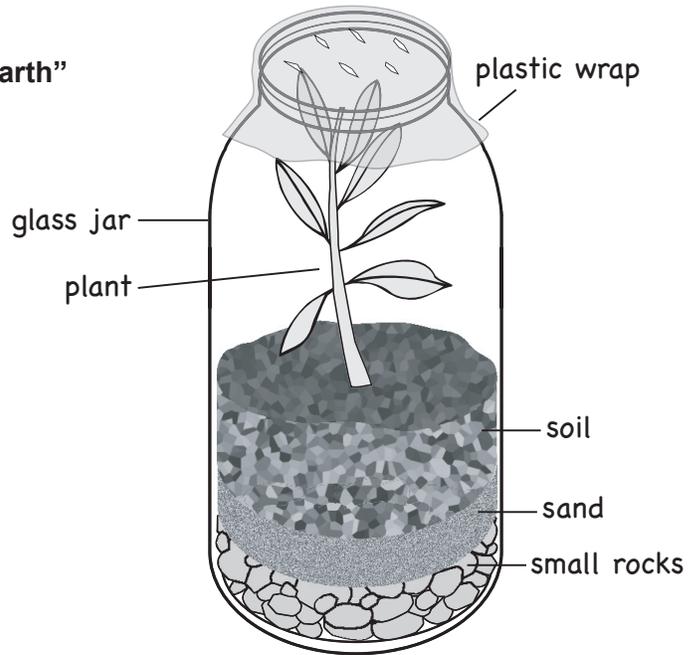
Answers:

STUDENT WORKSHEET: “Terrarium Model Earth”

See illustration at right.

STUDENT WORKSHEET: “Water, Water Everywhere” (Level II)

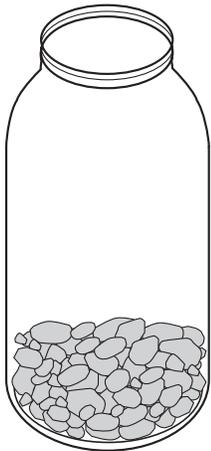
The following items should have a drop of water drawn on them: glass of water, clouds, bird, tree, and grass. (*NOTE: The car also contains water within the radiator.*)



Model Earth

Student Information Sheet

Level



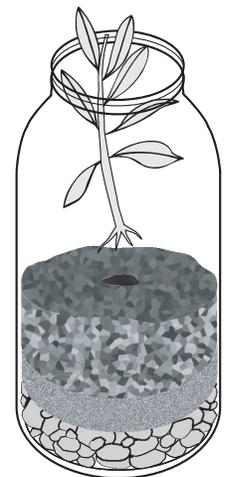
STEP 1. Place a layer of small rocks in the bottom of a glass jar.



STEP 2. Place a layer of sand over the rocks.

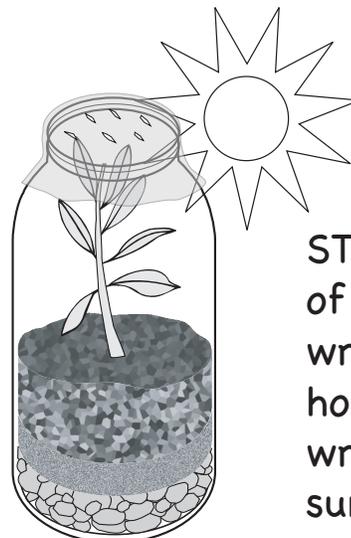


STEP 3. Fill the jar half full with soil. Wet the soil.



STEP 4. Make a small hole in the middle of the soil and place a small plant in the hole.

STEP 5. Water thoroughly.



STEP 6. Cover the lid of the jar with plastic wrap, poke a few small holes in the plastic wrap, and set in a sunny location.

Name: _____

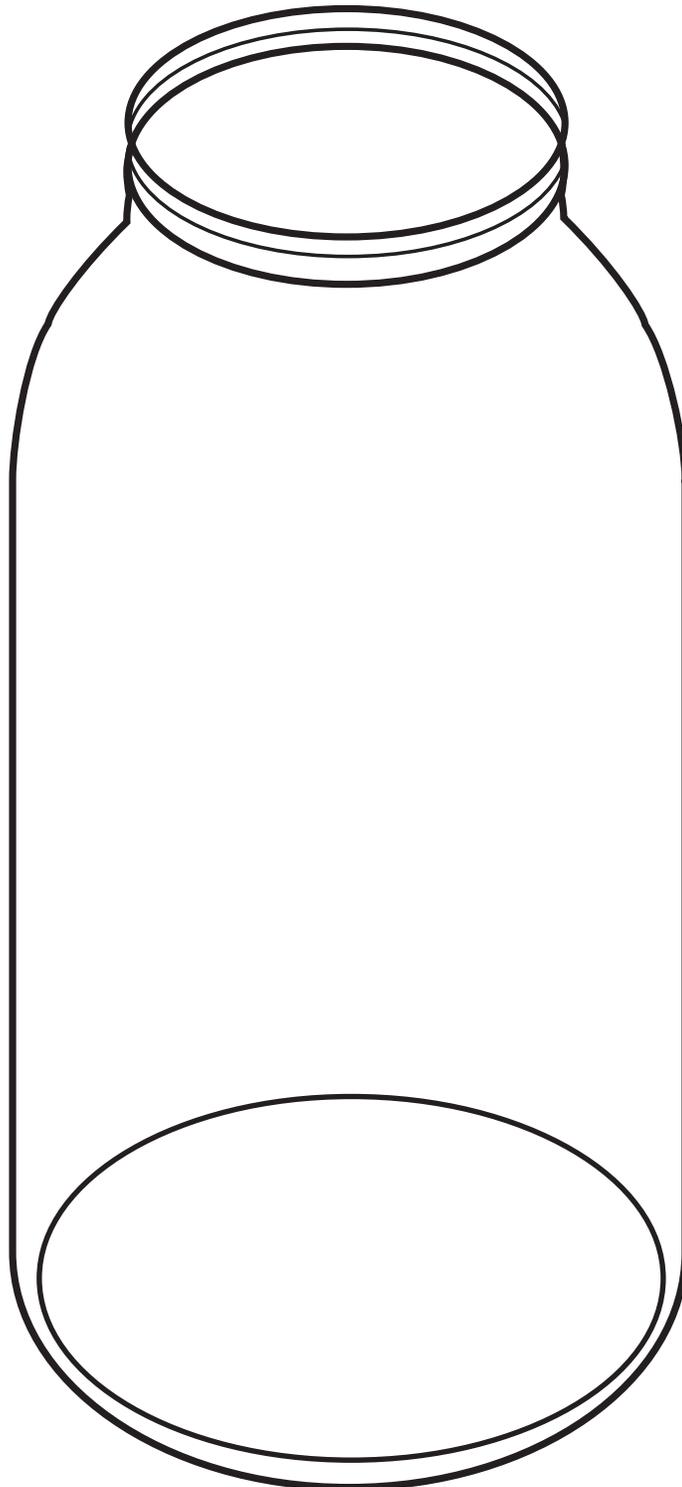
Terrarium Model Earth

Student Worksheet

Level



Directions: Draw your terrarium and label each part. Circle the names of the items that contain water.



Name: _____

Water, Water Everywhere

Student Worksheet

Level



Directions: Draw a drop of water  on each item that contains water in the picture below.

