



THE RETURNING RAINDROP

BACKGROUND:

Did you know that some of the water molecules you drank today may have been around when dinosaurs walked the earth thousands of years ago? This is true because water is continuously recycling in a process called the hydrologic cycle. Heat energy from the sun causes liquid water to change into its gaseous form, water vapor, through evaporation. The water vapor rises up into the atmosphere. Evaporation happens constantly from lakes, rivers, oceans, etc. When water vapor enters the atmosphere, it cools as it rises. Particles of dust and salt attract the water molecules. These microscopic particles are light enough to remain suspended indefinitely in the air. The water gathers together in larger and larger droplets and forms clouds. This change from vapor back into a liquid is called condensation. Condensation will occur whenever warm air comes in contact with a cold surface. When enough water droplets collect, the water will fall back to earth in some form of precipitation such as rain, sleet, hail, or snow only to have the process start all over again.

This view of the hydrologic cycle is rather simplistic. Heat energy directly influences the rate of motion of water molecules. When the motion of the molecule increases because of an increase in heat energy, water will change from solid to liquid to gas. With each change in state, physical movement from one location to another usually follows. The simple view of the water cycle fails to look at groundwater, melting ice or snow, animals, plants, and the roles each play in the water cycle.

VOCABULARY: groundwater, evaporation, transpiration, and precipitation/condensation and conservation

OBJECTIVE: To make a simple terrarium. The terrarium offers a simple way for students to watch the water cycle as it operates on a small scale: groundwater, evaporation, condensation & precipitation. Although there is little control over the hydrologic cycle, and the primary water supply is firmly fixed, water must be managed and conserved to meet the ever-increasing human uses of water



AQUARION

Water Company

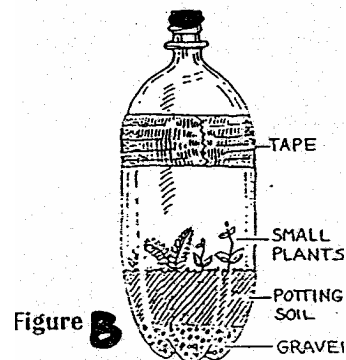
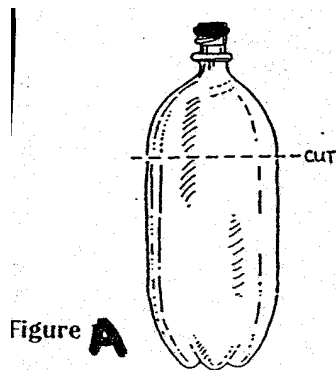
MATERIALS:

2-liter clear soda bottle with cap	Tape
Potting soil	Ruler
Gravel	Scissors
Small plants or moss	Water

PROCEDURE: Put the students into groups of 4 or 5. Have them assign a job to each person in the group. Have the students record on their worksheet what they are doing.

1. Cut the bottle as shown in figure A. (TEACHER SHOULD DO THIS WITH A UTILITY KNIFE.)
2. Place ½” of gravel in the bottom of the bottle.
3. Cover the gravel with approximately 2” of potting soil.
4. Place the small plants in the soil.
5. Gently add water until the soil is moist. (Use misting bottles)
6. Place the top back on the bottle and tape it securely. (Have adult check for seal)
(See figure B)
7. Place the terrarium in a well-lighted (But not too sunny) area. The plants will thrive and the water cycle will be demonstrated year-round.

Use the attached discussion questions when the small groups come back together as one group.





AQUARION

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Teacher Answer Sheet

Student NAME: _____

DISCUSSION QUESTIONS

1. **What will keep the plants moist/how will they get watered?**

The Water Cycle

2. **The plant will draw moisture through the soil and release it through their leaves.**

What is this process called?

Transpiration

3. **What will happen next?**

Evaporation and Condensation

4. **How will “rain” get back into the soil?**

Precipitation

5. **Why do we seal the bottle?**

It the water gas (evaporation) from escaping from the bottle.

6. **Will we ever need to add more water to the terrarium?**

If the seal is tight you will not need to add water. However, if the seal is not tight or the bottle is put where there is excessive heat water may need to be added.

7. **What happens if Precipitation does not occur in an area for a long time?**

If rain does not occur in an area for a long time we experience a drought. Lower levels of water are dangerous to the life and safety of humans and animals.



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3. What will happen next?

4. How will “rain” get back into the soil?

5. Why do we seal the bottle?

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Fill in the labels. Write on the bottom of the page what you learned about the Water Cycle.

