

Lesson 5

What Is The Water Cycle?

Key Idea

Water changes to water vapor as the surrounding temperature rises. As the temperature drops, water cools back to a liquid, and may cool still further to form snow or ice. With an increase in temperature, water warms back to a liquid. Water is constantly changing in a never-ending cycle without which we would quickly run out of water.

Activity

Students will study the hydrologic cycle.

Materials

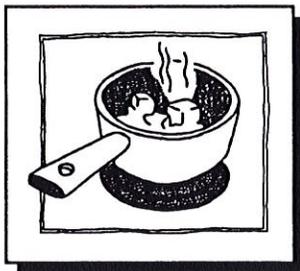
Hot plate
Saucepan
Ice cubes

Procedure

- 1 Ask: How can we use water to make a cloud? What makes the water cycle go around and around?

Put the ice cubes in a saucepan on the hot plate. As the children watch the ice melt, ask:

- What is making the ice turn back into water? (warmth)
- If we let the water from melted ice boil, what third form will water molecules take? (water vapor)
- As the water vapor rises, will it get warmer or cooler? (cooler outdoors) The children may wish to share their experiences of cooler air in the mountains.
- If our water vapor flies very high where it is cooler, would it condense or evaporate? (condense as it cools) If you see a cloud, would water drops have condensed or evaporated to make the cloud? (condensed)



Procedure (cont.)

- If we could catch a cloud and freeze it, what might we make? (snowflakes)

Some of the clouds we see in Arizona make rain because the tiny water droplets in those clouds join hands to make rain. (The water droplets became cooler as they rose, slowed, moved closer together, became heavier, and fell.)

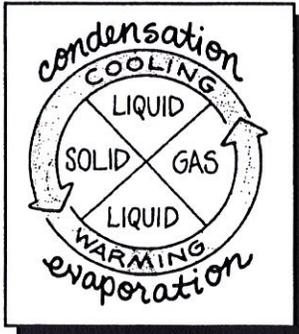
- 2** Write these sentences on the board or read aloud. Ask children to complete them.

"Warmth makes water _____." (evaporate)

"Coolness makes water _____." (condense)

- 3** Materials needed for this activity are: drawing paper for each child and the enclosed color chart of the water cycle.

- a** Draw a large circle on the blackboard and label it as shown.



- Where on this circle do you see the label for solid water?
 - What can change it to a liquid?
 - Where do you see the label for water as a gas?
 - What can change it back to a liquid?
 - Where do you see labels for liquid water?
 - What changed in each place on the circle?
- b** Ask a child to point out solid water on the diagram, then trace and describe its path. Do the same with water in gas and liquid form.
- Where are evaporation and/or condensation happening around us every day? (clothes drying, ice cubes freezing, clouds forming)
 - What if evaporation or condensation didn't happen around us all the time? What if water was only a liquid? (no snow, clouds, or rain)

Procedure
(cont.)

C For children to share their knowledge of the water cycle at home, allow time for them to draw and label a copy of the water cycle to take home. Some children may enjoy drawing examples of water's "changes of costume"

4 To reinforce the children's concepts of the natural everyday operation of the water cycle around them, display the enclosed large color chart.

a Ask the children to examine the chart to tell where evaporation is taking place and what might cause it.

- Where would water freeze and why? Where is water heaviest? Lightest?

b Ask a child to locate on the chart where a raindrop would start and trace its complete path. Follow the same procedure with water as fog or mist, as a snowflake, and as a spring or stream of water.

c Take the children outdoors and have them tell you where they know the water cycle is at work.

(Comment: The earth has the same amount of water today it has always had. The earth gets no new supplies from space; the astronauts found a dry moon.)

5 Explain that the water cycle is powered by changes in air temperature. Our familiar liquid evaporated into the air to form a gas; the gas water vapor cools and condenses back into liquid; or the liquid cools until it becomes solid ice or snow crystals. These crystals warm and melt back into a liquid, providing rain to replenish our water supplies, and snow to store water for our future supplies.

Extension

1 Students will understand how water droplets form as rain in clouds.

Ask: How do water droplets join hands to make rain?

Extension (cont.)

Materials needed: a cup of Koolaid or thin paint, aluminum foil pans or small sheets of foil, and drinking straws

Demonstrate for the children how to use straws to put drops of liquid on the foil. Use the straw to push the small droplets together to make big, heavy drops. When the drops in a cloud get big and heavy enough they are apt to fall as rain.

2 Students will study and draw different kinds of clouds.

Ask: What are some different cloud forms? (If possible, use this activity on a cloudy day.)

Materials needed are: "The Cloud Book" by dePaola, Scholastic Book Services, 1975, or other picture storybooks on clouds, light blue construction paper, cotton and paste.

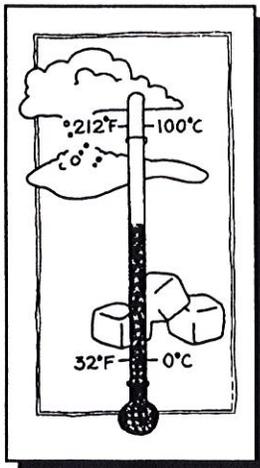
Are all clouds the same? (no) Ask children to describe some they have seen. Show pictures of four main types: cirrus, cumulus, stratus, and nimbus. Weather permitting, let the children make pictures of clouds they see outdoors, using cotton pasted to blue background. Later, display (as in clothesline walkby, Lesson 3).

3 Students will understand how to read a thermometer and know the freezing and boiling points of water.

Ask: At what temperature does water change to a solid? A gas?

A large glass thermometer is needed.

Give the children an opportunity to examine the thermometer. Draw a simplified blackboard sketch showing the boiling point (212 degrees Fahrenheit or 100 degrees Celsius) and the freezing point (32 degrees Fahrenheit or 0 degrees Celsius). Point out what the temperature should be when liquid water turns to gas (high or low?); when liquid turns to ice (high or low?); when water changes to ice; and when water changes to water vapor.



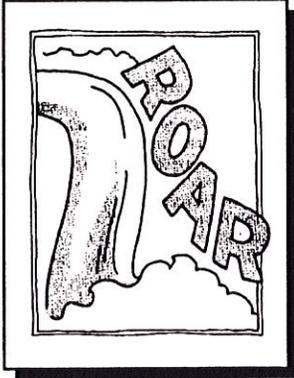
Extension
(cont.)

Ask the children to estimate outdoor temperatures and to compare them with boiling and freezing points.

4 Students will identify water *sounds*.

Ask: What are some sounds of water?

A portable tape recorder is needed.



To afford another opportunity for the children to express their awareness of water in its different guises, ask them to think about a few sounds that water makes.

If you have access to a tape recorder, tape a few sounds of water. Play the sounds back to your class and have them guess what is making the sound. A few examples are: waves washing up on a beach, a dripping faucet, raindrops on a roof, water boiling over on a stove, rumble or roar of a waterfall, whistling teakettle, and the whistle of a steam engine train. Can you name some other examples? (toilet flushing, lawn sprinkling)

Your students may think of other sounds. If possible, record the sounds your students discover and use them in another class.

To continue your students' water cycle studies, review "A Drop In the Bucket" and "An Incredible Journey" activities in Book Two.