iScience
Readers

Water:
Watch It Change

by Emily Sohn and Laura Townsend

Science Objective

In this book, children explore the importance of water in our daily lives. They learn about the water cycle and discover how water can change from a solid to a liquid to a gas. Children will observe the processes of evaporation and condensation as they explore how water reacts to heating and cooling. They also learn about the power of water to change the earth, discovering that erosion and weathering result when water wears away rock and soil.

iScience Puzzle: Where Does Water on the Outside of a Glass Come From?

The mystery of how water can form on the outside of a cold glass is solved as children learn about condensation, which occurs when water in the air meets cold glass. This discovery is the first of many children will encounter as they discover that water has three states.

Objectives ➤ Children will:

- learn that water has three states: solid, liquid, and gas.
- learn the properties of water in each of its states.
- describe the water cycle and how water changes states.
- understand how water contributes to erosion and weathering.

Materials

- containers of different sizes
- ice cubes
- two glasses
- water

Lesson Plan

Before Reading

Investigation	Science Concepts
Ask children to tell what they know about water. Ask: *What do we do with water? Is water important in our daily lives? Why or why not?*	Water is needed to sustain life on Earth.
Write the words *water, ice,* and *snow* on the board. Ask: *Are these all forms of water? What happens when snow melts? Where does it go?* Accept all responses, even those that may be incorrect. As children read the book, refer to their answers and ask them to come up with new answers if necessary.	Water has three states: solid, liquid, and gas. It changes form when heat is added or taken away.
Provide an example of evaporation by asking children what happens when they hang wet clothes out to dry. Ask: *How do you think that clothes become dry?* Tell them they will learn the answer to this question by the end of the book.	Evaporation occurs when water turns into vapor.

Explain that children will read about water in its different forms. Children will discover what makes water disappear and learn how to make vapor in the air reappear as water droplets. Encourage them to think about their own personal experiences as they answer the questions in the book.

During Reading

Investigation	Science Concepts
pp. 6–7: Conduct this experiment as you discuss these two pages with children. Let them see for themselves what has happened to the outside of the glass. Create a cause-and-effect chart on the board. In the Effect box, write *Water forms on the outside of the glass.* List children's ideas in the Cause box.	Condensation occurs when water vapor in warmer air hits colder glass.
p. 10: Define the terms *expand* and *contract.* If something expands, it gets bigger; when it contracts, it gets smaller. Ask: *If water expands when it freezes, would it fill more of the container or would it fill less of the container? How would you prevent the container from bursting as the water expanded?*	When water expands, it fills more volume in a container.

During Reading (continued)

Investigation	Science Concepts
p. 12: Make sure that children understand that water can be poured from one container to another and that while the shape of the container may change, the amount of water stays the same. Extend this information to how liquid can be frozen into different shapes. Ask: *Have you ever made popsicles? What shape have you made them in?*	Liquid takes the shape of a container; this is one property of water.
p. 14: Ask: *What might happen if we poured the same amount of water in another, wide pan? Would both containers have the same amount of water left after an hour? What would happen if we put a container of water under a very hot light?*	Water changes state from liquid to a gas through the process of evaporation; temperature and surface area affect the rate of evaporation.
p. 15: Reread the iScience Puzzle. Discuss the answers children gave and ask them to explain what happened now.	When vapor meets a cool surface, it changes to a liquid.
p. 16: You may want to extend the information on the page by explaining that salt is left behind when water evaporates.	Water is a solvent; this is another property of water.
p. 17: Sprinkle drops of water on a volunteer's arm. Explain that it is surface tension that makes the water form beads. Instead of coating the skin, water molecules stick to each other to form drops.	Surface tension is another property of water.
p. 18: Relate the evaporation from the Sun to the information children read on page 14. Water evaporates when the Sun heats it. It becomes clouds when it cools in the atmosphere.	The water cycle follows the pattern of evaporation, condensation, and precipitation.
p. 19: Ask: *Why is water important to us? What would happen to people and other forms of life on Earth if we did not have water?*	Water is necessary to sustain life.
pp. 20–23: Use the information about the Grand Canyon to show the power of water as you discuss these pages.	Erosion and weathering change landforms.
p. 24: Explain that potholes in roads are caused when water seeps into the road surface and freezes and expands in winter. It makes the road surface break apart; holes become bigger.	Water is a powerful force.
pp. 25–27: Explain that as the ocean erodes rocks and sand, the shoreline recedes; waves come farther into the land, endangering buildings that are too close to the shoreline.	Erosion and weathering change landforms and can affect human structures.

During Reading (continued)

Investigation	Science Concepts
p. 29: These questions are answered by understanding the processes of evaporation and condensation. Clothes dry through a process of evaporation; vapor turns to liquid through the process of condensation.	Learning science vocabulary is crucial to achieving a greater depth of understanding of scientific concepts.

After Reading

Restate the key ideas in the book. For example, water has three states and changes states when heat is added or taken away. Water is a powerful force that can change landforms. Encourage children to explain what they learned.

Investigation	Understanding Science
Write the words *water, evaporation, condensation,* and *precipitation* on the board, and ask children to use these words as they describe the water cycle.	Learning science vocabulary is crucial to achieving a greater depth of understanding of scientific concepts.
Now that children understand that the same water is always going through the water cycle and that new water cannot be created, discuss why it is important to conserve water.	Scientific thinking processes help build explanations for scientific observations.