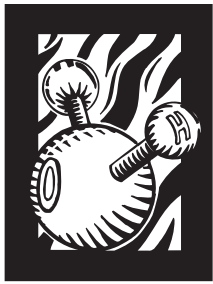


# Water Match



## ■ Grade Level:

Lower Elementary

## ■ Subject Areas:

Earth Science

## ■ Duration:

Preparation time:

Part I: 30 minutes

Part II: Completed for Part I

Activity time:

Part I: 50 minutes

Part II: 30 minutes

## ■ Setting: Classroom

## ■ Skills:

Organizing (matching)

## ■ Charting the Course

Students can explore their feelings about water in “Idea Pools.” Students can learn how water changes states in “Molecules in Motion.” The three states of water play an important role in the water cycle (“The Incredible Journey”).

## ■ Vocabulary

solid, liquid, gas, pollution, sublimation

*There's no ace in the hole in this game; just water under the bridge, and in the lake, and in the sky . . .*

## ▼ Summary

Students match up pairs of water picture cards and in the process learn to distinguish the three states of water—solid, liquid, and gas.

## Objectives

Students will:

- identify the three states of water: solid, liquid, and gas.
- recognize that water can become polluted and that some water can be cleaned.

## Materials

- Ice cube
- Glass of water
- Cold spoon
- A set of water match cards (Photocopy the page of cards 2 times for each group of players. Each deck should have 22 cards including 1 Washer Wild Card and 1 Polluter Joker.)

## Making Connections

Young students have observed water in two states in their environment such as ice cubes (solid) or rain showers (liquid). They may not have recognized water in its gaseous state—water vapor in air or their breath. Young children are usually aware of the types of water pollution that they can see. Provided with a basic understanding of the three states of water, students have the information to learn other water-related concepts.

## Background

Water is found throughout our planet in one of three states: solid, liquid, and

gas. It is the only substance on Earth that is able to exist naturally in all of these forms.

Water that is in a solid form is either in an ice or crystal formation. Ice forms include ice cubes, hailstones, and frozen surface water. Crystallized water is better known as snowflakes. To form ice or crystals, water requires freezing temperatures (32 degrees F [0°C] or lower).

Water in its liquid form is found in rivers, lakes, streams, and underground. It requires temperatures above the freezing point, but below the boiling point (212 degrees F [100°C]) to remain in a liquid state.

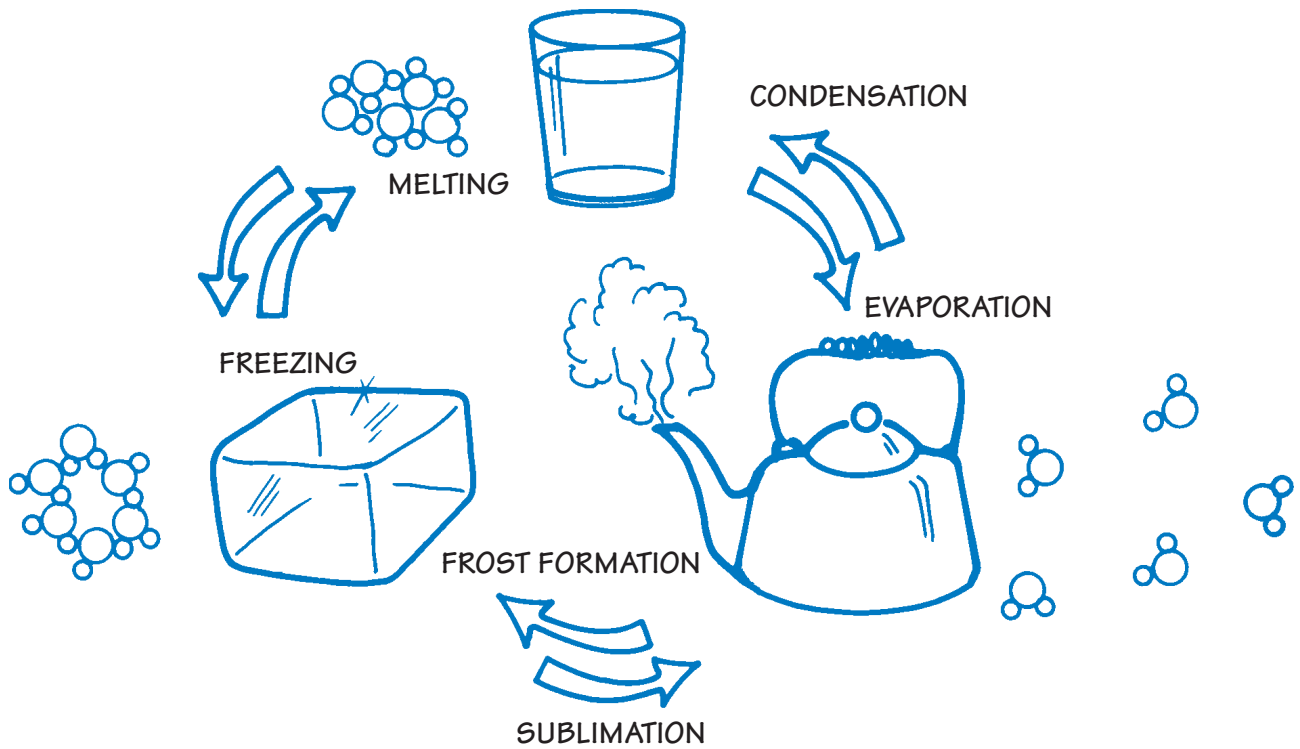
Water, when in a gaseous state, is fine particles of matter (molecules) suspended in the air and invisible to the eye most of the time. We usually identify the vapor as steam. By applying sufficient heat, we can change water from a liquid to a gaseous state. Water evaporates and enters the atmosphere as vapor. Fog and clouds are actually in liquid form; they are composed of tiny water droplets.

Water can be polluted in any form. Pollution can result from an act of nature or from human carelessness. Some types of water pollution can be cleaned up. Certain pollutants are removed from water through the water cycle. When water evaporates, it usually leaves waste materials behind. Contaminants are filtered out as water moves through soil. As water flows through a lake or stream, some pollutants will settle out. Humans have developed ways to speed up the cleaning process through wastewater treatment plants and other forms of technology. However, waste removal may not be a permanent solution. Even though a contaminant is removed, it doesn't disappear. Therefore, it may recontaminate water when it re-enters the water cycle.

## Water Match

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## Procedure

### ▼ Warm Up

Show students the ice cube, glass of water, and indicate their breath while identifying the state of each (solid, liquid, gas). Discuss the characteristics of water in each of these states (e.g., snowflakes and ice are in the solid state, while water vapor in breath is a gas). To demonstrate water vapor in breath, blow on a cold spoon and have students observe the condensed water droplets.

### ▼ The Activity

#### Part I

1. Tell students they are going to match cards that have pictures of water as solid, liquid, or gas (e.g., solid with solid, etc.). Hold up the Water Match Cards (excluding the Polluter Joker and Washer Wild cards) one at a time. Ask students to identify the picture and the state they think the water is in (e.g., a picture of a lake is water in its liquid

state, a picture of hail or a glacier is water in its solid state).

2. Divide the class into groups of four. Give each group a set of cards to be evenly distributed among players. Tell them to look at their cards without letting other players see them.

3. Discuss the rules of the game:

- If any player is holding matching cards, he or she lays them down, face up. (An example of a match is the rain and the wave because both pictures show water as a liquid.)
- Decide who will go first, second, third, and fourth.
- The first player draws a single card from one other player.
- If the card matches, he or she lays the pair down and takes another turn.
- If there is no match, the second player takes a turn and draws from any other player.
- Continue taking turns until all cards are paired.

- The player with the most matches wins!

#### Part II

1. Ask students to describe water pollution. Discuss ways water can be polluted. How do they feel about pollution?
2. Tell students they are going to play the game again, but a new card will be added. Show them the *Polluter Joker* card, and explain that this is a card they do not want.
3. Add a *Polluter Joker* card to each group's set of cards. When the cards are dealt, tell students that the one with the *Polluter Joker* card should not tell anyone she or he has it. The object is to get someone else to draw it. Continue playing until everyone has an empty hand except the one holding the *Polluter Joker*.
4. How did the players feel who ended up with the *Polluter Joker* card? Discuss ways pollution can naturally be removed from water and how humans have developed

## Water Match



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*Students playing Water Match.*

wastewater treatment plants to remove pollutants as well.

5. Show students the *Washer Wild* card and add one to each set of cards. The *Washer Wild* card is a match for the *Polluter Joker*. Have students play the game again. The winner is the player with the most matches.

### ▼ *Wrap Up and Action*

Ask students to identify the three states of water and where they might find water in each state. How did they feel about the *Polluter Joker* and the *Washer Wild* cards? If students are on a field trip to a lake and have just finished eating a candy bar, what should they do with the wrapper? Why?

### Assessment

Have students:

- describe the three states of water and where they may be found (*Wrap Up*).

- express their views about pollution (*Part II*, step 4 and *Wrap Up*).

### Extensions

In a variation of the game, students match cards of different states of water if they can explain how water moves between the two forms. For example, if the card shows rain and the player draws a lake, he or she must explain that rain falls into the lake.

Have students illustrate different water cards to add to the deck.

Divide a poster board into three sections with a broad-tipped marking pen and label each section as solid, liquid, or gas. From old magazines, have students cut out pictures of water in each of these states and glue them to the poster board. Ask students to look for pictures of polluted water. Ask them if they want to add them to the collage. Why or why not?

Do they think water can be polluted in all of the three states?

### Resources

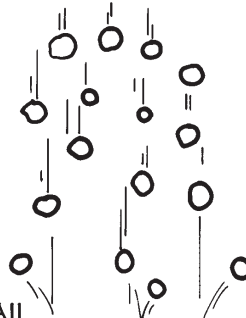




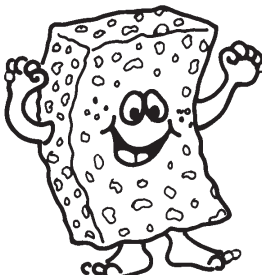

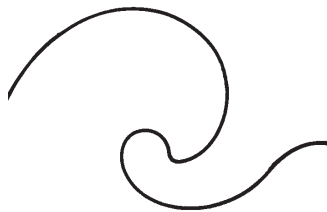
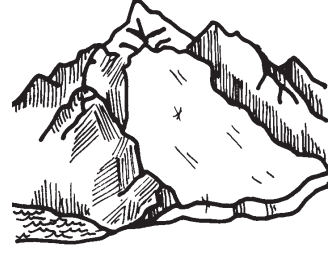
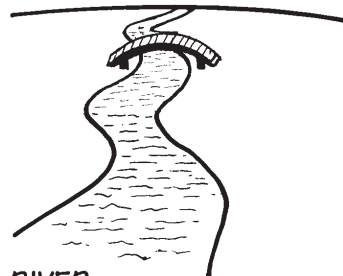

- 🍏 Gunston, Bill. 1982. *Water*. Morristown, N.J.: Silver, Burdett & Ginn, Inc.
- 🍏 Leutscher, Alfred. 1983. *Water*. New York, N.Y.: Dial Books for Young Readers.
- 🍏 Watson, Philip. 1983. *Liquid Magic*. New York, N.Y.: Lothrop, Lee, & Shepard Books.
- 🍏 Webb, Angela. 1987. *Water*. New York, N.Y.: Watts, Franklin, Inc.

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# Water Match Cards

 <p>HAIL</p>	 <p>SNOWFLAKE</p>	 <p>POLLUTER JOKER</p>
 <p>LAKE</p>	 <p>FOG</p>	 <p>WASHER WILD CARD</p>
 <p>RAIN</p>	 <p>WAVE</p>	<p>AIR</p>
 <p>GLACIER</p>	 <p>RIVER</p>	 <p>BREATH</p>