

The Water Game



Photographs by Jennifer Baron

by Jennifer Baron

Grade levels: 2-3

Subject area: science

Key concepts: water has three states, but many forms; clean water is an increasingly scarce resource; water conservation and protection are everyone's responsibility

Skills: water conservation and protection habits

Location: outdoors

Time: 90-120 minutes

Materials: class set of water-form game cards (see instructions below); 12 10-centimeter-square (4-inch-square) pieces of plywood, acrylic board, or sturdy cardboard for making placards; 2 wooden craft sticks per student; 2 brightly colored sports vests; 14 orienteering punches or a class set of pencils.



Children universally know that water is important. If asked what all living things need to survive, even the youngest school-aged child would include water. Yet as the science curriculum becomes more demanding across North America, young children are expected to understand more complex concepts about water. They are expected to be able to identify water's three states and many forms. They are expected to know that the same amount of water

has existed on the planet for billions of years; and that while close to three-quarters of the Earth's surface is covered by water, the world's supply of clean fresh water is diminishing. They are expected to gain an awareness of the need to use water wisely, which means to conserve it and not pollute it. While all of these concepts are important, they are abstract to most young children. Some children, especially those who live near large bodies of fresh water such as the Great Lakes, may find it difficult to understand that fresh water is scarce.

The Water Game described here is a fun, interactive means of teaching and reinforcing these concepts about water. Through playing the game, students become familiar with different forms that water can take and gain an understanding of how water pollution reduces the amount of fresh water available for human use. The Water Game is ideally suited for students in Grade 2, but I have played it with students up to Grade 8.

Game overview

Players are each given a game card with 16 squares on it (see page 138). Twelve water-form placards, each with a word and symbol denoting a form of water (e.g., rain, snow, vapor), are hidden at eye level on trees, bushes, and posts around the playing area. Attached to each placard is an orienteering paper punch on a rope (see note below). Players must find each hidden placard

and punch the corresponding square on their game card (or, if punches are not used, draw the symbol of the water form in the square).

Note: Orienteering punches are sets of paper punches that have different pin configurations so that each punch makes a different mark on the game card. Using these ensures that students go to each placard and eliminates the danger of carrying sharp pencils. The punches can perforate even laminated game cards. (See the Resource list for suppliers.)



Orienteering punches can be attached to water placards with a short piece of rope.

Earning points

- ⦿ For each water-form square that is correctly punched, players earn two points.
- ⦿ At any time during the game, players can earn one point by telling the leader, or “Conservation Officer,” a fact about water. This fact may come from players’ prior knowledge of water or it may be something new they have learned from the lesson, but it cannot be a simple statement of the obvious, such as “water is wet.” An appropriate fact would be: “Water exists in three states: solid, liquid, and gas.” (See also “Quick Water Facts” sidebar.) To record the point, the Conservation Officer writes “+1” in the Conservation Officer box on the player’s game card.

Losing points

- ⦿ If students go out of bounds (“down the drain”) and are caught by a boundary patroller, or “Drainpipe,” they lose one point. To record this, the Drainpipe writes “-1” in the Drainpipe square on the game card.
- ⦿ If a player is not playing safely or fairly, the Conservation Officer may deduct a point by writing “-1” in the Conservation Officer square.
- ⦿ If a player is caught by a Toxic Substance (oil spill and pollution, introduced in the second half of the game), the player loses one point. The Toxic Substance records this by writing “-1” in the appropriate Toxic Substance square on the game card. (Alternatively, Toxic Substances can use orienteering punches.)

Preparation:

Making game cards: To make the water-form game card, begin with a piece of paper 8½ by 5½ inches. Leave space at the top of the card for entering the student’s name and the number of points earned. Divide the rest of the card into 16 rectangles of equal size. Label the 12 rectangles around the outside of the card with the names of water forms, such as Rain, Dew, Snow, Frost, Vapor, Sleet, Hail, Fog, Ice, Slush, Mist and Steam. If orienteering punches are to be used, include a symbol for each water form on the game card (e.g., a snowflake

for snow, a raindrop for rain, as in the example shown); otherwise, put only the words on the card and have the players draw the symbols as they find the placards. Label the four inner rectangles as follows: Conservation Officer, Drainpipe, Oil Spill, and Pollution. Make a photocopy of the card for each student.

Making and setting up placards: On each of the 12 placards, write the name of one of the 12 water forms that appear on the game card. Next to the word, draw the symbol for the water form (the same symbol that is used on the game card). Placards should be about 10 centimeters (4 inches) square — small enough that students must look for them, but large enough to be visible from several meters away.

Marking boundaries: Mark off a playing area in the schoolyard. The area must be large enough for the class to run around in, and must have hiding spots for the 12 placards. You may wish to use pre-existing and

obvious boundaries on your site, such as fences or sidewalks. Alternatively, mark boundaries using pylons or brightly colored flagging tape. Choose a site in the middle of the playing area as the home base or “Hydroelectric Dam.” If there is no natural landmark for this, designate the home base by placing a hoola hoop on the ground.

Setting up placards: Hide the placards on trees, bushes, posts, or other structures within the playing area. Place them at the students’ eye level so that when they find the placards they will be able

Quick Water Facts

- ⦿ Water exists in three states: solid, liquid, and gas.
- ⦿ Water appears in many forms in the environment (e.g., dew, snow, fog, frost, rain).
- ⦿ Approximately three-quarters of the surface of the Earth is covered by water.
- ⦿ Approximately three-quarters of the human body is water.
- ⦿ Less than 1 percent of the Earth’s water is fresh, accessible, and clean enough for human consumption: approximately 97 percent is salt water and 2 percent is in the polar ice caps.
- ⦿ Water is essential for the health of all living things.
- ⦿ Fresh water is not evenly distributed on the planet.

to see clearly the words and symbols written on them. This is possible to do even in the most urban and asphalt-covered schoolyard, as duct tape will stick to just about any surface, even concrete walls and metal posts. If you have a set of orienteering punches, attach a punch to each placard with a short piece of strong rope or wire. If you are not using orienteering punches, the students will need to carry pencils to draw the symbols onto their game cards.

Note: To adapt this game for older students, hide the placards in more difficult places, or change the height of the hiding spot from eye level to below the knees or just above the head. (Students must still be able to read the placards.)

Prior knowledge

Before playing, introduce the concepts of the game by reading aloud a book that explains the water cycle. (See the children's books listed in the Resources section for recommendations.)

Procedure:

1. Before the game begins, walk the boundaries with the students so that they know exactly where they can and cannot play.

















2. Assign a few students or parent volunteers to be the boundary patrol, and explain that the boundary patrolers play the role of Drainpipes. If players go out of bounds, they go down the drain and lose one point.

3. Gather students at the Hydroelectric Dam. Introduce yourself as the Conservation Officer, and explain the following rules of the game (detailed in Game Overview, above):

- Ⓞ They must find as many of the 12 water-form placards as they can and punch the matching squares on their game cards.
- Ⓞ They can win extra points for telling a fact about water to the Conservation Officer.
- Ⓞ They can lose points for going out of bounds or playing unsafely or unfairly.

Explain that during the game, students can come back to the Hydroelectric Dam if they are hurt or need help, and that they must return whenever the teacher (Conservation Officer) blows the whistle.

4. Begin the game. Allow enough time in the first round for students to find several, but not all, of the water-form placards.

The Water Game		Name:	Points:
Rain 	Mist 	Sleet 	Hail 
Snow 	Pollution 	Drainpipe 	Vapor 
Fog 	Oil Spill 	Conservation Officer 	Slush 
Frost 	Dew 	Steam 	Ice 

Note: A player who finds a placard may draw the attention of other students to that hiding spot. With young children, this is often more of a help than a hindrance in the game. When playing the game with older children, swear them to secrecy when they find a placard. Older students enjoy this competitive element.

5. Before any student finds all of the game placards (usually after 10 to 20 minutes), blow the whistle and bring all of the students back to the home base. Check to make sure that everyone is safe and accounted for before beginning the next round of the game.

6. Choose two students to represent oil spills and pollution, two Toxic Substances in the water supply. Have these two students don colorful sports vests so that they will stand out.

7. Give each of the players two wooden sticks and explain that each stick represents a raindrop. Together, all of the raindrops represent the world's total fresh water supply. Tell the students (or have them calculate) the total number of raindrops that have been handed out. This number will be needed in the follow-up at the end of the game.

8. Explain that in the second round of play, the task of the players is twofold: to continue finding the water-form placards and punching or drawing the symbols on their game cards, and to avoid being tagged by a Toxic Substance. Should a Toxic Substance tag a player, the player must give the Toxic Substance one raindrop (wooden stick) and lose one point (the Toxic Substance writes “-1” in the appropriate Toxic Substance square or punches the square with an orienteering punch). A student who loses a raindrop by accident can get a replacement by going to the Hydroelectric Dam and telling the Conservation Officer a water fact.

Note: It is important to wait to introduce the Toxic Substances until part way through the game, as students may otherwise become so preoccupied with avoiding being tagged that they neglect to collect water-form symbols.

9. At the end of the game, check the punches or symbols and tally the points on the students' game cards

(a pre-punched answer card makes this faster). Then make an analogy between the number of points and the water cycle. For example,

- ⊗ 0 to 9 points: you got stuck in a glacier for thousands of years as ice
- ⊗ 10 to 20 points: you have gone through the water cycle a few times
- ⊗ 20 or more points: you have traveled very quickly through the water cycle many times



A player is tagged by a Toxic Substance and must hand over one of her raindrops (wooden sticks).

10. Collect the raindrops (wooden sticks) from the players, noting how many of the sticks were captured by the Toxic Substances. The total number of sticks at the end of the game should equal that at the beginning. This represents the fact that water never disappears, but just changes form as it goes through the water cycle.

11. Do some quick mental math to determine the percentage of the total water supply that has been polluted with toxic substances during the game. Discuss the fact that water usage and water pollution are increasing, and these factors reduce the amount

of fresh water available to humans and other organisms. You may wish to debrief these concepts with a read-aloud story, such as *The Water Hole* by Graeme Base (see Resources, next page).

12. Follow up the game with activities that reinforce the message that it is everyone's job to conserve fresh water and not to pollute it. Some examples are:

- ⊗ Create a fictional story of a raindrop as it goes through the water cycle and changes form.
- ⊗ Make a list of many different ways to conserve water and keep it clean.
- ⊗ Organize a cleanup of a section of the local watershed.
- ⊗ Create a pictorial journal entry to illustrate the following poem. Put two or more lines of the poem on each page and draw a picture to represent the meaning of those lines. (The poem can be copied on the back of the water-form cards in advance.)

Air and Water in the Environment

There are two things that we all must get:
Air that's pure and water that's wet.
They help us to live every day,
But there's a problem in the way.
Pollution gives me quite a scare,
If it gets in the water and the air.
Smog, oil spills, garbage, too,
But there are things that you can do.
Change your habits; use your wit,
And our environment will benefit.
So make a plan and stick to it
Because every step helps a little bit. ♪

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Resources

Water activities and experiments

Lambert, Sue, and Sandi Rickerby. *Water: Grades 2-4*. Solski Group, S&S Learning Materials, 1999.

Murphy, Bryan. *Experiment With Water*. Scholastic Press, 1991.

Project WET <www.projectwet.org>. Excellent resources on water education for teachers.

Wick, Walter. *Drop of Water: A Book of Science and Wonder*. Scholastic Press, 1997.

Children's literature

Base, Graeme. *The Water Hole*. Doubleday Canada, 2001.

Greenaway, Theresa. *The Water Cycle*. Raintree, Steck-Vaughn Publishers, 2001.

Jeunesse, Gallimard, and P.M. Valat. *Water*. Moonlight Publishing, 1991.

Locker, Thomas. *Water Dance*. Harcourt Brace & Company, 1997.

Orienteering punches

Go Orienteering – Orienteering Supplies, 1920 Schiller Avenue, Wilmette, IL 60091, 866-424-8377 / 847-293-4253, <<http://my.core.com/~gdt/Catalog.htm>> (or search the Internet for “orienteering supplies”).