

Teacher and Activity Guide

Water Wonderful

*Helping Students and Teachers Learn
About Water in Their World*

Edited by Kelley Staggs
Illustrated by Holliday Hutson-Thompson

Water Wonderful: An Activity Book for Grades K-3
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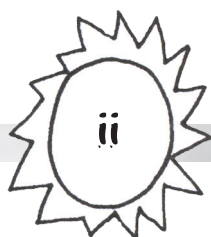
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Introduction

Water Wonderful: Teacher and Activity Guide explores the world of water, particularly drinking water and its sources, in an educational and fun manner. Use the book as a stand-alone or with *Water Wonderful: An Activity Book for Grades K-3*, American Water Works Association's picture book for students in kindergarten through third grades.

Intended for educators who must meet national science standards, *Water Wonderful: Teacher and Activity Guide* provides educational background information for each of the 26 activities, along with the cognitive taxonomy and science process standards that each activity targets. The taxonomy and processes for each activity are also outlined in easily accessible tables. At the end of the book are a glossary of water-related terms, a list of additional online resources, a list of water-related jobs, and a table of the water content of selected foods.

This book takes and updates what was best and most scientifically applicable of AWWA's previous teacher's guide, *Water Magic*, and combines it with new activities and a colorful new children's story that replaces the 1991 book, *Splash!* The primary author of *Water Magic* was Mary Haberman, kindergarten teacher for Discovery School in Spokane, Wash., and the activities were tested by teachers at the 1990 National Science Teachers' Association regional conference.

The primary contributor for this book is Kelley Staggs, a K-6 Curriculum Specialist with a Master's degree in curriculum and instruction from the University of Colorado and earth science certification from Colorado School of Mines. Reviewers were Sheri Shea, former Workforce Programs Manager for AWWA; Gay Porter DeNileon, AWWA Publications Manager; Jan Hutton, first grade teacher at Prospect Valley Elementary School in Wheat Ridge, Colo.; and Tammy Nesvold, second grade teacher at Prairie Ridge Elementary School in the St. Vrain School District of Colorado. Lori Irvine, Public Relations Director for OMI, also reviewed *Water Magic*.



TABLE 1. Cognitive Taxonomy

Activity Number and Name	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
1. Water: It's What We Eat*	X	X				
2. Where Does the Water Go?		X	X			
3. Keep a Water Diary*	X	X				
4. Every Living Thing	X		X			
5. Pocket Garden		X	X	X		
6. Water Creates Weather*	X	X	X	X		
7. Solid Language		X				
8. Water Cohesion	X	X	X			
9. The Water Go-Round*	X	X	X		X	
10. Water Evaporation	X	X	X			
11. Water Cycle			X		X	
12. Water Is a Gas		X	X			
13. Rainfall Graph*	X	X		X		
14. Clouds Hold Water	X			X		
15. Groundwater Race	X		X			
16. Pour It On	X	X		X		
17. Clean Water Maze*	X	X				
18. Fresh Water	X	X				
19. Oceans		X	X			
20. Water Treatment	X	X				
21. Water: It's What We Use*	X	X	X			
22. Water Distribution		X	X	X		
23. All in a Day's Work	X	X				
24. Be Water Smart*	X	X	X		X	
25. Wise Water Use		X		X		
26. Bike Wash			X	X		

* Activities in *Water Wonderful*

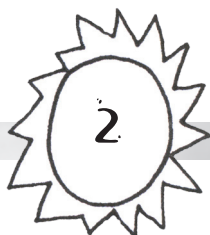


TABLE 2. Science Process Standards

Activity Number and Name	Questioning	Predicting	Making observations	Reading graphs, maps and tables	Data collecting and measurement	Communicating and explaining
1. Water: It's What We Eat*				X		X
2. Where Does the Water Go?		X	X		X	X
3. Keep a Water Diary*			X		X	X
4. Every Living Thing	X	X				X
5. Pocket Garden			X		X	X
6. Water Creates Weather*	X	X		X		
7. Solid Language	X	X	X			X
8. Water Cohesion	X	X	X		X	X
9. The Water Go-Round*		X	X	X		X
10. Water Evaporation		X	X		X	X
11. Water Cycle			X		X	X
12. Water Is a Gas			X		X	
13. Rainfall Graph*	X		X	X		X
14. Clouds Hold Water		X	X		X	X
15. Groundwater Race	X	X	X		X	X
16. Pour It On		X	X		X	X
17. Clean Water Maze*	X			X		X
18. Fresh Water	X	X			X	
19. Oceans			X		X	X
20. Water Treatment	X		X		X	X
21. Water: It's What We Use*	X			X	X	X
22. Water Distribution	X		X		X	X
23. All in a Day's Work	X	X	X			X
24. Be Water Smart*	X				X	X
25. Wise Water Use		X	X		X	
26. Bike Wash						X

* Activities in *Water Wonderful*



Lesson 1 What Do We Know About Water?

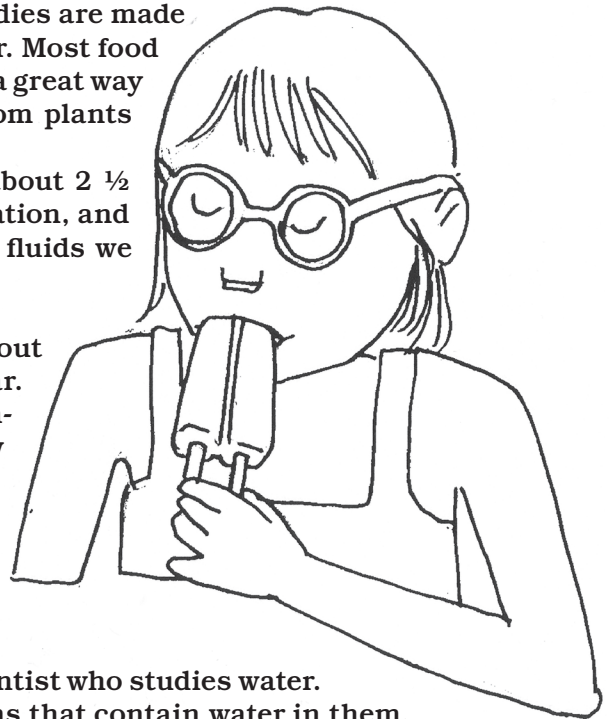
1. Water: It's What We Eat (Water Wonderful pages 2–3)

Objective:	Students will learn that water is necessary for many aspects of their lives.
Grade level:	Kindergarten through third
Curriculum area:	Science, Language arts
Taxonomy:	Knowledge, Comprehension
Science processes:	Reading graphs, maps and tables; Communicating and explaining
Time needed:	20 minutes

Teacher background: The Mayo Clinic recommends that people drink about eight glasses of water a day. Children's bodies are made up of more water than adults, so they need more water. Most food contains water, so consuming fruits and vegetables is a great way to add water to a diet. Vegetables and fruits come from plants that also need water to grow.

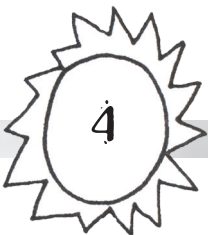
During any given ordinary day, our bodies lose about 2 ½ quarters (2 liters) of water through breathing, perspiration, and excretion. The lost water needs to be replaced by the fluids we drink or the foods we eat.

Water Wonderful text: What do we know about water? We know water is wet. We know water is clear. We know that every living thing needs water. We cannot live without water. Our bodies need water to grow and be healthy. Because much of your body is made of water, you need to drink lots of water every day. You can drink tap water, and you can get some of the water you need from fruits, vegetables, milk and juice.



Water Wonderful activity: A hydrologist is a scientist who studies water. You be the scientist now. Study this graph of food items that contain water in them. Which foods contain the most water? Which foods contain the least? How can you add more water to your diet each day?

Activity directions: Review the pictograph on page 3 with students. Water bars represent the percentage of water content for various foods. Have students read the graph and decide which foods have the most and least water content. List various ways students can add water to their diet each day. A more complete table of the water content of various fruits, vegetables and other foods appears in the Appendix A.



Additional Activities

2. Where Does the Water Go?

- Objective:** Students will discover that food absorbs water, and that some foods are dissolved in water.
- Grade level:** Second and third
- Curriculum area:** Science, mathematics
- Taxonomy:** Comprehension, Application
- Science processes:** Predicting, Making observations, Data collecting and measurement, Communicating and explaining
- Time needed:** 30 minutes

Teacher background: Many foods are made with and of lots of water, but the water is often removed from the food to preserve and store it. Most of these foods need to have their water replaced before they are consumed. Dried foods that are granular usually dissolve in water.

- Materials needed:** Twelve 10- or 12-ounce (300 or 355-milliliter) jars with lids
6 spoons
Measuring cup
6 markers
1 cup (8 ounces or 240 milliliters) each of dried rice, dried beans, sugar, salt, pasta and dehydrated drink mix
8 cups (64 ounces or 1,890 milliliters) of water

Activity directions: Divide the class into six groups and give each group a jar and a spoon. Distribute one food item to each group. Have students feel the food when it is dry. Put $\frac{1}{4}$ cup to $\frac{1}{2}$ cup (2–4 ounces or 60–120 milliliters) of their designated food in their jar, level it off, and mark the level of the food on the outside of the jar. Ask the students to predict what will happen to the food when water is added.

Add $\frac{1}{4}$ cup (2 ounces or 60 milliliters) of water to each jar and seal the lid. Have the students shake the jar for one full minute. Ask the students to observe and mark the new level of food in the jar. Ask the students, “Where did the water go?” Open the jars and have the students touch the food; ask them what it feels like, and if they can tell you more about where the water has gone. Reseal the jars and let them sit over night. What happens to the food overnight?

Extension activity: Repeat the activity with the remaining food, but add one cup (8 ounces or 480 milliliters) of water instead. Discuss the difference in what happens to the water, particularly with the sugar, salt, and drink mix. Discuss the difference in the water absorbance by the beans, rice and pasta overnight.

Questions to ask: Where did the water go? What does the food feel like when it has been mixed with water? What happens to fine food like sugar and drink mix when it is mixed with lots of water? What happens to food like rice and beans?

