The Wonder of Water
By Karen Ansberry and Emily Morgan

Water is an extraordinary substance that we often take for granted. Not only is it what makes our planet uniquely habitable, water is the only substance on Earth that naturally occurs in three different forms. In this month’s column, students will explore some of water’s fascinating properties.

This Month’s Trade Books

I Get Wet
By Vicki Cobb.
ISBN 0688178383
Grades preK–4
This book from the Science Play series poses several questions that can be answered by doing simple activities with household items. It features a young boy who discovers some of the properties of water by pouring it into different containers, observing it drip from a faucet, and sliding it on wax paper. Bold illustrations, lively text, and creative use of typography help to highlight the captivating properties of water.

A Drop of Water
By Walter Wick.
ISBN 0590221973
Grades 4–6
Spectacular color photographs show water in its various forms—droplets, ice cubes, steam, snowflakes—while concepts such as condensation, capillary action, and surface tension are explained through simple text.

Curricular Connections
Young children begin their study of matter by observing and describing objects and their behavior. The important but abstract ideas about matter all begin with simple observations (NRC 1996). In the K–3 lesson, students make observations of the adhesive and cohesive properties of water. They learn that water sticks to itself and some other things. They also learn that water does not stick to things that are greasy or waxy, and then apply that knowledge to explain why ducks don’t get wet when they are in the water.

It’s tempting in the upper elementary grades to introduce atoms and molecules to explain phenomena such as adhesion and cohesion, but according to the National Science Education Standards, the introduction of atoms and molecules is premature for these students and can distract from the understanding that can be gained from observation and description of how matter behaves. So, for grades 3–6, the focus of the lesson is still on developing ideas about matter based on observation, but the lesson becomes more sophisticated with the introduction of the scientific terms adhesion (water being attracted to other things, such as paper towels, glass, etc.) and cohesion (water being attracted to itself). Students make observations of water’s properties by completing the activities at seven water exploration stations, they learn about adhesion and cohesion from nonfiction reading and teacher explanation, and then they use these terms to develop and revise their explanations of the phenomena they observe.

Karen Ansberry (karen@pictureperfectscience.com) is a science curriculum leader at Mason City Schools in Mason, Ohio. Emily Morgan (emily@pictureperfectscience.com) is the Science Leader for the High AIMS Consortium in Cincinnati, Ohio. They are the authors of Picture-Perfect Science Lessons: Using Children’s Books to Guide Inquiry, Grades 3–6; and More Picture-Perfect Science Lessons: Using Children’s Books to Guide Inquiry, Grades K–4, both available from NSTA Press.
For Grades K–3: Sticky Water

Engage: Fill a clear glass with as much water as it will hold before spilling. Then ask your students the question, “How many pennies can this glass hold before any water runs down the side?” (Answers will vary.) Try it! Students will be surprised to see just how many pennies the glass can hold. Close up, they will be able to observe a dome of water forming at the top of the glass. Ask, “How do you think this is possible? Let’s read a book called I Get Wet to find out.”

Explore/Explain: Vicki Cobb suggests that the best way to use her book is to do the activities described in the book as they come up during the reading. Before you begin reading, make sure you have all the necessary supplies at hand. Cobb also suggests not turning the page to the explanation until after the child has made the discovery. That way, the book will reinforce what the child has discovered through experience. After reading page 16, ask students why the glass of water could hold so many pennies. (The surface of the water acts like a skin.)

Elaborate: After reading the rest of the book (stopping to try the activities suggested), ask students what the book said about why ducks don’t get wet. (A duck’s feathers are coated with a kind of grease, and water doesn’t wet grease.) Then, give each pair of students a sterile, dry feather (available at craft stores) and a small container of water. Have them predict what the feather will look like after it has been dipped in water. Try it! Next, give each pair another clean, dry feather and have them cover it lightly with petroleum jelly to simulate how a duck covers its feathers with grease. Have them predict what the feather will look like after it has been dipped in water. Try it! Students will discover that the clean feather gets very wet, but the greased feather does not absorb as much water.

Evaluate: Create a “Water Can…” bulletin board by giving each student a water droplet cutout (see NSTA Connection) on which they complete the sentence, “Water can….” They may write any of the properties of water that they learned from the lesson, such as “Water can… (flow, make droplets, stick to itself, slide off waxed paper without wetting it, roll off a duck’s back, stick together, move up a paper towel),” and so on. Make a picture of a watering can to post on your bulletin board and staple each student’s droplet under the spout.

Connecting to the Standards

This article relates to the following National Science Education Standards (NRC 1996):

Content Standards

Standard A: Science as Inquiry
- Abilities necessary to do scientific inquiry (K–8)
- Understandings about scientific inquiry (K–8)

Standard B: Physical Science
- Properties of objects and materials (K–4)
- Properties and changes of properties in matter (5–8)

For Grades 4–6: Water Exploration Stations

Engage: Show students two clear plastic cups, one containing water and the other empty, and a wet 50 cm piece of string. Hold the cups about 25 cm apart. (Do not tell the students that the string is wet. Later, they will figure out that the wet string is the secret to the trick in the “Elaborate” section of this lesson.) Tell them that you are going to attempt to pour the water from one cup, down the string, and into the other cup without moving the cups closer together. You may want to add food coloring to the water so that students can see it flow down the string. Try it! Ask students how they think you did it. They may say that you had a special kind of string, a special kind of water, a hole in the middle of the string, and so on.

Explore: Tell students that they are going to do some explorations with water that might help them figure out how you poured water down the string. Set up stations around the room that include some of the activities photographed in Walter Wick’s A Drop of Water (see NSTA Connection).

Explain: After completing the stations, have students discuss their observations and possible explanations for the phenomena they observed. Next, introduce the author and illustrator of A Drop of Water and begin reading. Ask students to look and listen for information that might help explain the things they observed in the water exploration stations. Stop after reading about each of the experiments performed at the stations and discuss how the new information can help them develop/revise their explanations. From the stations and the reading, students should conclude that water droplets are attracted to each other. Tell students that this property of water is called cohesion. Students should also conclude that water is attracted to other things like paper towels, plastic, glass, etc. Explain that this property of water is called adhesion.

Elaborate: Tell students that they are now going to take what they have learned about cohesion and adhesion and try to pour water down the string. Give each pair of students one cup of water, one empty cup, a dry string, and a bucket or bin to catch any falling water. Let them experiment with the supplies. Through experimentation, students will soon discover the “secret” of getting it to work: the string must be wet! Move around the room and help pairs until all have been successful in pouring the water down the string.

Evaluate: Have students write a thorough explanation of what causes water to flow down the string, using the words adhesion and cohesion: e.g., “Water sticks to the string because of its adhesive property. Adhesion counteracts the force of gravity pulling the water down. Water particles stick to each other because of their cohesive property, causing the water to flow without breaking apart. So, the water is sticking to the string (adhesion) as well as the water that is already on the string (cohesion).”

NSTA Connection
A water droplet cutout and directions for seven water exploration stations can be downloaded at www.nsta.org/sc0812.
In The Wonder of Water, biologist Michael Denton delves deep into this grand, untold story and explores how water is specially equipped to allow life to flourish on our blue planet. Find more information on The Privileged Species book series and companion documentaries at www.PrivilegedSpecies.com. About the Author. Michael Denton is a Senior Fellow with Discovery Institute’s Center for Science and Culture. Formerly a Senior Research Fellow in the Biochemistry Department at the University of Otago in New Zealand, he earned his MD from Bristol University and a PhD in biochemistry from King’s Co Winter Wonder. Ocean Waves. Not Found. In 1959, seven hikers traversed the slopes of Pico de Orizaba, the highest mountain in Mexico. Only four returned. The story of the missing three sparked a long standing local mystery—a mystery may now have been solved. Recently a team of climbers took the same trail as the original hikers, and came across a pair of bodies protruding out of the snow. The bodies are completely mummified, and retain remnants of clothing and even hair. Could these be two of Pico de Prizaba’s missing three? "The Wonders of Water: Amazing Secrets for Health and Wellness. Water prevents and helps to cure heartburn. Heartburn is a signal of water shortage in the upper part of the gastrointestinal tract. It is a major thirst signal of the human body. The use of antacids or tablet medications in the treatment of this pain does not correct dehydration, and the body continues to suffer as a result of its water shortage. Not recognizing heartburn as a sign of dehydration and treating it with antacids and pill medications will, in time, produce inflammation of the stomach and duodenum, hiatal hernia, ulcer The Wonder of Water. show list info. Rivers, lakes, waterfalls, wetlands, harbours, fjords, glaciers - the miracle of water on our beautiful planet. 162 users 392 views. made by Leyle1. avg. score: 9 of 50 (18%). required scores: 1, 3, 6, 9, 13. list stats leaders vote print comments. type to search. How many have you visited? Page 1 of 2. 1 2. 1. Swan River. 2. The River Cam. 3. Utah: Colorado River.