



One Well

The Story
of Water on
Earth

WRITTEN BY
Rochelle Strauss

ILLUSTRATED BY
Rosemary Woods

About One Well

Water has the power to change everything — a single splash can sprout a seed, quench a thirst, provide a habitat, generate energy and sustain life. How we treat the water in the well will affect every species on the planet, now and for years to come. All living things depend on Earth's One Well. Life would be impossible without it. But the water in the Earth's well is threatened by our growing population and increased demands. What can we do to protect it?

One Well answers this important question while telling the eye-opening story of water on Earth.

About the Author

Rochelle Strauss, author of the award-winning *Tree of Life*, is an environmental education consultant in Toronto, Canada. She has designed and developed numerous education programs and consulted on international environmental projects, including a biodiversity museum in Panama, a river museum in the United States and a national park in Canada. Rochelle combines her love of nature and passion for stories to teach children about the wonders of the natural world.

About the Illustrator

Rosemary Woods is an illustrator and fine artist with a diverse portfolio. Her commercial clients include United Airlines and Visa, and she has illustrated covers and done editorial work for many publishers. Among the children's books Rosemary has illustrated are *The Lighthouse That Ran Away* and *Ali Hassan and the Donkey*. She has exhibited her paintings at the Royal Festival Hall in London, England. She lives in London and has a studio in Ireland.

Discussion Questions and Activities

The following discussion questions and activities are suitable for classes in language and literature, science, visual arts and social studies. Please note that some of the activities in the learning resource require students to visit their local library or use the Internet for research.

Visit www.kidscanpress.com to download more questions and activities for *One Well*.

1. The Weight of Water

A. Demonstrate to your class what a liter of water looks like and how much it weighs. Fill a one-liter container, such as a milk carton, with water. (In the U.S. use a one-gallon milk jug). Now, fill a bucket of water (1 bucket = 10 L or 2.6 gal.). Have students take turns lifting the bucket and walking around the classroom with it to get a sense of its volume and weight.

Remind students that people around the world have to walk many kilometers (miles) just to collect the water they need — just a few of these buckets is all they have to last them the day.

As part of an individual assignment, ask students to estimate how much water (in liters or gallons) they think they use each time they do the following daily activities: wash hands, brush teeth, take a shower or bath, flush the toilet, drink water and wash dishes. Have students keep a water journal for one week and record the amount of water they use to complete daily activities. After the week is over, ask students to compare their estimates with the national averages as shown below in the chart.

As part of a class discussion, ask students to answer the following questions in paragraph format: In each category, did you use more or less water than the national averages? Were you surprised by how much water you used? What area might be easiest for you to conserve water? What area might be hardest for you to conserve water?



National Averages (approximates)

	Liters	U.S. Gallon
Washing hands	5	1.5
Brushing teeth	5	1.5
A 10-minute shower	150	33
Taking bath	113-150	30-40
Flushing toilet	13	3.5
Drinking per day	2.5	0.75
Doing dishes by hand	18	5
Using dishwasher	55	15
Watering lawn for 10 minutes	300	80
Washing car	300	80

*Sources: <http://www.kama.com.au/crc/water/wateruseactivity.html>; *Saving Water: Our World Our Future*. Written by Sharon Dalgleish, 2002; *One Well*. Written by Rochelle Strauss and illustrated by Rosemary Woods, 2007; *Water: Almost Enough for Everyone*. Stephanie Ocko, 1995.

B. With your class, brainstorm 10 ways to conserve water (for example, turn off the water while brushing your teeth, flush the toilet only when necessary, use a rain barrel to catch rain water for watering plants). Ask students to discuss each idea with their families and to implement as many of them as they can for one week. During that week, have students record their own personal water usage, as well as any water-saving ideas that their families have implemented. At the end of the week, have students draw conclusions about their water-saving initiatives by comparing individual water uses before the water audit as recorded in their water journal in part A and after the water audit. What was the overall amount of water saved?

As part of a class discussion, ask students to answer the following questions: What would happen if you only had access to one half of your daily water supply? What would you do differently? What could you do without? What would happen if the water supply ran out?

2. Charting Water

As part of a classroom activity, work with your students to create a rain gauge.

You will need the following materials: a glass or plastic jar, pebbles and a ruler.

Directions: Place a layer of pebbles at the bottom of your rain gauge. This will help weigh the gauge down. Next, fill the gauge with enough water to cover the pebbles — the water should sit about 2.5 cm (or 1 in.) above the pebbles. Take a black Sharpie and mark the height of the water. This is your baseline. Next, use the Sharpie and the ruler to mark the measurements along the outside of your container (in inches or centimeters). Start measuring from your baseline — not from the bottom of the jar — to the top of the jar.

On the next rainy day, fill the gauge with pebbles and water up to the baseline and place the rain gauge outside. Record the rainfall for an hour, several hours or a full day. This gauge can also be used to measure snowfall. Once the snowfall is measured, bring it in to let it melt and measure it again. With your class, discuss the measurements after each rainfall or snowfall.

3. Desalinating Salt Water

Many countries around the world are experimenting with desalination processes (changing saltwater into freshwater) in order to make more water available for them to use. Desalinating water is a very costly and difficult process, but here's one experiment that you can do with your class to show them how the process works.

You will need the following materials: 2 large bowls, a spoon for stirring, a small drinking glass, tape, plastic wrap (such as Saran wrap), a rock, water and salt.

Directions: Add salt to a bowl of water — stirring until it is dissolved. Have each student taste a drop of water to test the salt level using a Popsicle stick. Next, pour the water into the second bowl until it's 5 cm (or 2 in.) deep. Put an empty drinking glass into the center of the bowl. The glass should be tall enough to sit higher than the water but short enough so that it is lower than the height of the bowl. Stretch the plastic wrap over the entire bowl so that it is pulled tightly and seal it with tape. Now place the rock on top of the plastic wrap, above the empty glass. Place the whole thing outside in the sun (or on a very sunny window ledge or radiator) for several hours, a whole day or a couple of days. The longer you leave it, the more water you will collect. When you are ready, remove the plastic wrap. There will

now be water in the glass. Have students taste the water or use a salinity test strip to determine the salt level in the water. Ask students to observe the experiment from beginning to end and keep a record of their observations.

After the experiment, ask students to write a report on what they think happened. Once everyone has recorded their observations, share the following explanation with your class: The sun caused the water to evaporate, leaving the salt behind. The white mark along the bowl's edge is salt. The evaporated water becomes a gas and rises to the top. When the gas hits the plastic wrap, it condenses — turning into purified water droplets. The water droplets then fall back down into the drinking glass.

4. The Role of Wetlands

With your students, discuss the role of wetlands. To help students learn more about the role of wetlands, play the following matching game with your class.

Copy the chart below on the blackboard or on a large piece of Bristol board. Don't forget to mix up the order of the objects and the wetland roles. If possible, attempt to find images of the objects and use them in the first column. Next, ask students to pair the everyday object to a wetland role.

Everyday Object (require images)	Wetland Role
Sponge	Soaks up excess water caused by runoff
Playpen	Acts as a nursery for young wildlife
Bed	Provides resting areas for migratory birds
Soap	Wetlands help clean water and the environment
Strainer	Strains debris (silt, sand, etc.) from the water
Cereal box	Wetlands are a major food source for many species
Whisk	Mixes nutrients and oxygen into the water
Filter	Filters smaller impurities out of the water

Once the game is complete, discuss each wetland role with your class.

As an extension to this activity, divide students into groups of three or four and ask each group to research different types of wetlands and the importance of wetlands using the Internet or at their local library. Have each group present their research to the class once they are done.

5. Water Pollution

With your class, discuss the cause and effect of water pollution on the environment, water, animals, insects, fish and humans.

Conduct the following experiment with your class.

You will need the following materials: a magnifying glass; a newspaper; rubber gloves; five hard-boiled eggs with the shell on; five feathers; and four plastic containers each filled with one of the following: plain water, water with cooking oil, water with motor oil and water with washing detergent.

Before you begin the experiment, ask students to examine the hard-boiled eggs and feathers, making note of their appearances, textures, etc.

Next, add one egg and one feather to each of the containers and let the items sit for thirty minutes. Once the time has elapsed, remove the objects from the containers and peel the eggshells. Lay the eggshells, the eggs and the feathers on newspaper. Have students put on rubber gloves and observe the shells, eggs and feathers.

After each student has taken a turn observing the items, ask your class to answer the following questions: What effects have the different substances had on the shell and on the egg? Examine the feathers again using a magnifying glass — what changes can you note? Does the texture change? Are the feathers smooth or rough? What are the possible effects of oil spills and other pollutants on birds and wildlife? If these pollutants affected the eggs and feathers, how might they affect insects, plants, fish and crustacea living in the water?

As an extension to this activity, create a food web using images that include both land and water-based species. Ask students what might happen to the food web should any one particular water-based species be affected by water pollution or an oil spill.