



The Long Haul

*You plan to go out, but first need to complete your daily tasks: wash dishes, do laundry, bathe, haul 200 gallons (760 l) of water to the house . . .
Hmmm, maybe it will be a while before you can leave.*

■ Grade Level

Pre-K through 2, Upper Elementary, Middle School, High School

■ Subject Areas

Environmental Science, History, Math

■ Duration

Preparation time: 15 minutes
Activity time: 50 minutes

■ Setting

Outdoor playing area with a water source

■ Skills

Gathering information (calculating); Interpreting (drawing conclusions); Organizing (estimating)

■ Charting the Course

In “The Long Haul,” students recognize how hauling water can make them more aware of the need to conserve. In “Water Audit,” students analyze home water use. Students recognize a “Water Footprint” is the measure of water that an individual, business or community uses.

■ Vocabulary

treatment plants, low-flow toilet

Project

WET

▼ Summary

Students work in teams to compete in a water-hauling game.

Objectives

Students will:

- develop an awareness of various volumes of water.
- appreciate the readily available water supplies in the developed world.
- understand how easy access to water can encourage people to use large amounts of water.

Materials

- *Four one-gallon (3.8 l) buckets* (Smaller containers can be used for younger children.)
- *Two 30-gallon (114 l) garbage cans*
- *Water source or outdoor spigots*
- *Containers of different sizes*

Making Connections

Most students have seen pictures of old-fashioned wells and pumps. They may have seen movies or read books in which children’s chores include drawing and hauling water. However, few children in modern-day developed countries have actually experienced water hauling. Becoming involved in carrying a portion of the water they use in a day promotes an appreciation of daily water consumption and modern water distribution facilities.

Background

For most people living in developed countries, water is easily available at the turn of a tap. This was not always so—and is certainly not the case universally today. Less than 100 years ago, even in the United States, many people had to pump and haul their own water for washing, cooking, bathing and other needs. Often, the well was located several feet away from the house. What’s more, throughout the present-day world, searching for and hauling water remains a daily chore for more than two billion people. Girls and women in particular are often tasked with fetching the water for a family, a job that can take as long as six hours per day and which often takes the place of education or other opportunities. Imagine how differently we would feel about water if we had to pump and carry it by hand.



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Technology such as faucets makes using water extremely easy. The average 4-person household uses an estimated 400 gallons (1,514 l) per day.



PHOTO CREDIT: © PhotoObjects.net–Getty Images

Wooden buckets like this were used to carry water from wells to homes.

Today, in the United States, the Environmental Protection Agency estimates that an average family of four consumes about 400 gallons (1,514 l) of water per day. Many people are amazed that a family could use this much water. Contrast those figures with the water consumption of a person living in sub-Saharan Africa, where water can be scarce and difficult to haul. An average person in one of those countries uses just four gallons (15 l) of water per day.

Technology has made using water extremely easy in the United States and other developed countries. We turn on the tap and have all the water we need. A complex system of pipes, storage tanks and towers, treatment plants and pumps collect, treat and convey water. Our homes are plumbed to deliver water where it is needed. Homes with two or more bathrooms are common. If four people flush four times per day, at three gallons (11.4 l) per flush, consuming 400 gallons (1,514 l) per day becomes understandable. (16 flushes \times 3 gallons [11.4 l] = 48 gallons [181.7 l])—and that is before water is used for bathing and showering, cooking or anything else in a household!

Technology has also created ways to save water. To return to the example of toilets, the average flush before the 1950s used seven gallons (26.5 l) or more. That figure had improved to about three gallons (11.4 l) by the 1980s. Today's new, low-flow toilets use no more than 1.6 gallons (6.1 l) of water per flush. Unfortunately, many of the older, less efficient toilets remain in homes, schools and offices.

Procedure

▼ Warm Up

- Discuss with the class ways they use water. Where does this water come from and how does it get to our homes?
- What did people have to do 100 years ago to get their water? Read the story “The Bath” to help students imagine what life was like before running water.
- Discuss with students the reality that many people throughout the world must still haul the water that they need to live. Explain that children are often the ones who must fetch a family's water.
- Ask students to list chores they do after school and estimate how much time each takes. How much free time do they have after school? How much free time would they have if they had to pump their family's water and haul it home?

▼ The Activity

1. **Tell students they are going to play a water-hauling game.** Discuss what they think the purpose of the activity is.
2. **Divide the class into two teams. Each team gets two one-gallon (3.8 l) buckets. The task is to haul water from a source (a stream or pond is ideal, but a water spigot will work fine) to a destination (garbage can) about 150 feet away (45 m).** If doing the activity with younger children, adjust the bucket size, quantity of water that is hauled and the distance between the water source and the destination.

3. Organize the game as a relay race.

Team members line up at the water source. One team member fills the bucket, to represent pumping water or drawing it from a well, then carries it to the destination and pours it into the team's garbage can. If using a spigot, instruct students to turn off the tap between team members. The first “hauler” returns to the water source and gives the bucket to the next team member, who fills and relays it. The first team to fill its garbage can wins the race.

4. Ask students to predict how many trips they think it will take to fill the can. How much time will it take? Record their responses for future reference. Begin the race!

▼ Wrap Up

- Ask students how they felt about the activity. Were their predictions accurate? Based on the activity, have them determine the size, in gallons, of the garbage can. Show students a variety of containers and have them estimate their volumes.
- Discuss ways people in the past used the water hauled to their homes. Compare these uses to modern practices in the developed world. Do students think we use more, less or the same amount of water as people in the past or in countries in which water must be hauled?
- Discuss reasons we use more water now, including the ease of availability. Remind students that in the past and in many places in the developing world today hauling water would be a job for children. How would students feel about hauling the 400 gallons (1,514 l) needed each day by an average family of four? How would this affect how much water they used?

- Involve students in designing a mural or performing a skit conveying the advantages and disadvantages of readily available water. A possible topic of the skit could be the reaction of a person from the past to the way people use water today. Students can present the skit to other classes.

▼ Project WET Reading Corner

Calhoun, Yael. 2007. *Water in the News*. New York, NY: Chelsea House.

This book goes beyond current events and water to the science of the global problems we face when dealing with water issues.

Hollyer, Beatrice. 2009. *Our World of Water*. New York, NY: Henry Holt and Company.

Meet six families on four continents and learn the ways these families and their communities use and share water.

O'Dell, Scott. 2010. *Island of the Blue Dolphins*. 50th Anniversary Edition. Mooloolaba, Australia: Sandpiper Publications.

Stranded on an island off the California coast for 18 years, a young Native American girl strives to learn the skills needed to survive.

Olien, Rebecca. 2005. *First Facts All Around: Saving Water*. Mankato, MN: Capstone Press.

This book discusses how many facets of modern society use and try to save water.

Wilder, Laura Ingalls. 1935. *Little House on the Prairie* (and other books). New York, NY: Harper & Row.

Based upon the true stories of Laura Ingalls Wilder, homesteaders of the northern prairies in the 1800s are featured.

Assessment

Have students:

- estimate volumes of different containers (*Wrap Up*).
- express their feelings about hauling water (*Wrap Up*).
- design a skit demonstrating the positive and negative aspects of easily available water (*Wrap Up*).

Extensions

Have someone from the municipal water service speak to the class about water delivery systems.

Technology has also dramatically enhanced the capabilities of fire departments. Fire hydrants have been added to community water systems. Alter the activity by telling students the garbage can represents a fire that needs to be extinguished. Challenge students to develop the most efficient procedure for using buckets to transport water from the source to the destination. Remember to tell students that no fire hydrants or fire trucks are available—just willpower and buckets of water. Students may have seen movies set in the past, in which a bucket brigade is organized to put out a fire. Have students imagine what firefighting would be like today without modern technology.

Change the size of the buckets or containers or use metric conversions to make a more complex math activity.

Teacher Resources

Journals

Farenga, Stephen J., Daniel Ness, and John A. Craven. 2008. "After the Bell: Water Harvesting, Part 1." *Science Scope*, 31 (5), 58-62.

Farenga, Stephen J., Daniel Ness, and John A. Craven. 2008. "After the Bell: Water Harvesting II: Working Toward Being Green." *Science Scope*, 31 (7), 80-83.

Galiani, Sebastian, Paul Gertler, and Ernest Schargrodsky. 2005. "Water for Life: The Impact of the Privatization of Water Services on Child Mortality." *Journal of Political Economy*, 113 (1), 83.

Hemson, David. 2007. "'The Toughest of Chores': Policy and Practice in Children Collecting Water in South Africa." *Policy Futures in Education*, 5(3), 315-326.

Payne, Deborah, Margaret Nakato, and Caroline Nabalango. 2008. "Building Rain Water Tanks and Building Skills: A Case Study of a Women's Organization in Uganda." *Rural Society*, 18 (3), 174-184.

Websites

Environmental Protection Agency (EPA). WaterSense: Indoor Water Use in the United States. Quantifies the amount of water used for daily household tasks in the United States. www.epa.gov/WaterSense/index.html. Accessed January 31, 2011.



The Bath

Ma took down the wash-boiler from the back-porch wall about three o'clock on Saturday afternoon and summoned her chief water-hauler, a boy about 10 years old. He must fetch four pails of water for the boiler. Though washday was past or coming, whichever way you looked at it, this was Saturday—the night of the bath.

Ma and the girls would start things off with a head-wash every second week. Since their hair was long, it was nice to do that in the afternoon, as it would be completely dry by bedtime.

After supper, the boiler steamed away on the stove. In winter, the steam that collected on the windowpane quickly froze to thick, white frost, but near the stove it was cozy.

Some families had tin bath tubs you could soak in. Some used the round rinse-tub from washday in which you stood and scrubbed; some used a wash basin. It was sort of a matter of tradition and using what you had.

The kitchen was hot with the stove really fired up. Ma brought out a big hooked rug and put it right in front of the open oven door. The turns usually went from the youngest to the oldest, ending with Pa. Sometimes a boy or girl of courting age might have Saturday night plans and they could be worked in the early part of the schedule. During summer, when the whole family went to town on Saturday night, the bath hour was moved up, so the baths came before town.

In winter, Ma laid out neat piles of clean underwear and night clothes for each member of the family. With a pail of cold water at hand to blend with the hot water, it was bath time.

Ma presided over scrubbing the small children until they were considered old enough to manage themselves and then they could bathe alone and be checked afterwards.



A pioneer family with their prized well.

PHOTO CREDIT: © Courtesy USDA Natural Resources Conservation Service

Privacy was honored. No one interfered as one by one the family members took their turn enjoying the nice hot water. It usually wasn't emptied between bathers, but more water could be added to keep it nice and warm. Homemade soap was used for scrubbing, but sometimes there was a bar of town-soap with its good smell.

There would be at least three bath towels for family use. These would be nice, soft, terry cloth, not the hard huck toweling used for everyday. As one towel got wet it could be draped over the oven door to dry and later used again. Ma had likely cut and hemmed the wash rag from a bath towel gone thin in the middle.

There might be a bottle of lotion set on the table to smooth on elbows and rough heels.

Pa, the last one in the bath, took care of emptying the water into slop pails. He would wipe out the tub and hang it on the back-porch wall by the boiler.

Ma would come in quietly wearing her night clothes with her hair braided into one big braid down her back. She picked up the piles of discarded clothes for her wash box and tidied up the kitchen, for tomorrow was Sunday.

Sunday could come. Her family was all clean for another week.

—Marian Cramer, *Lantern Glow*