



# THE CASE OF THE MYSTERIOUS RENTERS

*Grades*  
**4 - 6**

► **OBJECTIVES**

- Identify ways in which water is used.
- Determine how much water families use each day.
- Recognize the importance of conserving water.
- Determine ways in which water can be conserved.

► **INTERDISCIPLINARY SKILLS**

Science, Mathematics, Critical Thinking

► **ESTIMATED TIME**

- Part A - 10 minutes to explain the chart; 30 minutes for follow-up discussion after the survey has been completed.
- Part B - 20 minutes



► **MATERIALS**

- ❑ Copies of activity handouts (3)

## BACKGROUND INFORMATION

As we have traveled through this ground water curriculum, students have learned about the inestimable value of water, its characteristics, how it moves through our world and our homes and businesses in a vast cycle, and how it can become polluted. In this final section of the curriculum, we would like students to recognize their own ability to make a difference in conserving and protecting our water resources.

Gifford Pinchot, an American conservationist and politician who served as chief of the U.S. Forest Service between 1898 and 1910, referred to conservation as “The wise use of the earth and its resources for the lasting good of men.” The conservation of our water resources depends on our wise use of these resources. Such wise use, without a doubt, begins at home.

It is only recently that environmental issues and our interrelationship with the natural world have been integrated into school curricula. In this sense, our teachers and our children are our environmental emissaries, getting the word out to families and friends that we are all responsible for protecting and maintaining our earth for today’s and future generations. The final four activities in this curriculum serve as first steps in what we hope will be a life-long commitment to water *stewardship*.

## TEACHING STRATEGY

### Part A-Detective Work

1. Tell students that today they are going to be water detectives who have been called in to solve a case of mysterious renters.
2. Distribute the copies of the case story and survey.
3. Be sure students write down their hypotheses before completing their surveys.
4. Explain how to fill out the survey. Explain how to make tally marks each time the activity takes place. Ask students to ask their families to help complete the survey for one day—families can become more aware of how much water they use in the process. A weekday, when families have more of a routine, will



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### NOTES



provide the best picture of daily water use. (It might be interesting, for extra credit, to compare weekday and weekend water use.)

5. After students have completed the survey, discuss the results.

### Alternate Strategy

- If the story is too complicated for some students, try the previous activity, “Conserving Daily Water Use at Home,” which accomplishes the same purpose and is designed for younger students.

### Part B - Brainstorming About Water Conservation

1. Have students look at their water use surveys. Ask them to consider what their families could do to reduce the amount of water they use. How much water would that conserve? If everyone in the class followed that practice, how much water would it save in a year?
2. Are there ways to conserve water that would not be a good idea (e.g., not brushing teeth or washing)?
3. Give each student a copy of the “Water Conservation Tips” activity handout. Look it over as a group to see how it compares with your list. Suggest that students take it home and post it in the bathroom or kitchen.

### Supplementary Activities

- Have students write an article for the school newspaper listing ways people can conserve water.
- Have students write a brief newsletter for their parents reporting on the results of the survey. (Don’t mention names, except to honor those who used the least amount of water per person.) Include water conservation suggestions.





## THE CASE OF THE MYSTERIOUS RENTERS

### Scenario:

*Mrs. Jackson has called the water detectives to help her solve a serious problem. She has heard that the detectives have an excellent record for solving mysteries.*

“What seems to be the problem?” asked one of the water detectives.

“Well,” said Mrs. Jackson, “as you know, I rent out several apartments to college students. I never allow more than four students to stay in one apartment. But, in Apartment 319, I know there are more than four people, I just can’t prove it.”

One of the water detectives interrupted her with a question, “Have you ever tried making surprise visits?”

“Yes,” she answered, “but every time I go there, four people or less are at home. Those college students come and go at all hours of the day and night. There is no way for me to keep track of how many students actually share the apartment.”

“Very interesting,” said one of the detectives. “I think we can help you, but first we’ll need to see last month’s water bill for the apartment.”

“How will that help?” asked Mrs. Jackson.

“We’ll be able to see how many gallons of water were used last month,” said another water detective.

Mrs. Jackson found the bill. It revealed that last month the occupants used 15,000 gallons.

“Let’s see,” said one of the detectives. “Last month was September, which has 30 days. If we divide 15,000 gallons by 30 days, we know that they used 500 gallons a day.”

“Yes,” said Mrs. Jackson, “but is that a little or a lot?”

“We’ll have to investigate and get back to you. We’ll do a survey to find out how much the average person uses,” said the detective.

With that, the water detectives left Mrs. Jackson with a promise to return soon with an estimate of how many people are sharing the apartment. The water detectives decided that they needed to do some research to determine how much water people use in one day. In order to come up with an estimate, they decided to find out how much water their own families use in one day. Here’s how:

**ACTIVITY: THE CASE OF THE MYSTERIOUS RENTERS**

**Step 1:** Record the facts of the case.

- The people in the apartment used \_\_\_\_\_ gallons of water in September.
- September has \_\_\_\_\_ days.
- The average number of gallons of water used per day was \_\_\_\_\_ gallons.

**Step 2:** Form a hypothesis.

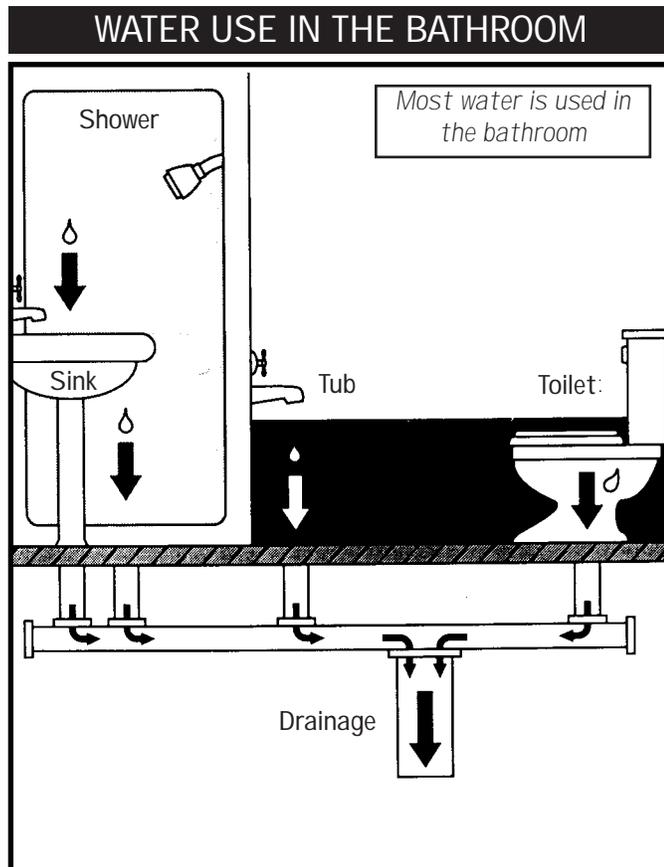
How many gallons of water a day do you think a person uses?

\_\_\_\_\_ gallons

**Step 3:** Fill out the water survey.

**Step 4:** Record your conclusions.

1. How many total gallons of water did your family use in one day?  
\_\_\_\_\_ gallons
2. How many gallons of water per person per day did your family use?  
\_\_\_\_\_ gallons
3. Based on your results, how many people do you think are living in Mrs. Jackson's apartment? \_\_\_\_\_
4. Compare your answer with the answers of others in your class.



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# HOW MUCH WATER DO YOU USE?

### Directions:

We are doing a water survey to find how much water we use in one day. Place a tally mark in the Times/Day column every time someone in your family does the activity.

		Times/Day		Total
Toilet Flushing	5 gallons	x _____	=	_____
Short Shower	25 gallons	x _____	=	_____
Tub Bath	35 gallons	x _____	=	_____
Teeth Brushing	2 gallons	x _____	=	_____
Washing Dishes with running water	30 gallons	x _____	=	_____
Washing Dishes by filling a basin	10 gallons	x _____	=	_____
Using Dishwasher	20 gallons	x _____	=	_____
<b>Grand Total</b>				= _____

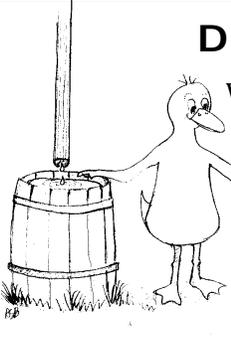
*NOTE: Washing clothes in a washing machine is not included in these calculations—a typical wash cycle uses 40 gallons of water. Another significant seasonal water use is lawn and garden watering. This survey deals with daily water use in the home, but most of us use additional amounts of water at school, at work, and other places throughout the day.*

To find average use per person in your family, divide the grand total by the number of people in your family. The answer is: \_\_\_\_\_

### Follow-up Questions:

1. In your home, which activity happened most often? \_\_\_\_\_  
\_\_\_\_\_
2. Which activities use the most water each time they occur? \_\_\_\_\_  
\_\_\_\_\_
3. What other activities at home consume large amounts of water? \_\_\_\_\_  
\_\_\_\_\_

## DID YOU KNOW THAT ALL WATER IS RECYCLED?



We drink the same water that the dinosaurs did, and future generations will drink that same water. That's why it's our job to use water wisely and protect water supplies whenever and wherever possible. If we each save a small amount of water each day, our combined savings will add up to millions of gallons each year.

**Water saved is money saved!** Water conservation can save on water and sewer fees. Also, when you use less water, your fuel bills are lower. Even if you use well water, saving water reduces both electric costs and the waste load going into your septic system.

## WATER CONSERVATION TIPS

### Bathroom

Two thirds of the water used in the average home is used in the bathroom, mostly for flushing toilets, showers, and baths.

- ✓ Turn off the water when you are not using it—don't let it run while you brush your teeth or shave.
- ✓ Flush the toilet less often—put used tissues, trash, hair, paper towels, etc. in the wastebasket instead of flushing them.
- ✓ Fix leaks and drips—this is often simply a matter of changing a washer.
- ✓ Retrofit older plumbing fixtures with flow-reducing devices.
- ✓ Take shorter showers—less than 5 minutes is adequate, any longer is recreation.
- ✓ Take baths—a partially filled tub uses less water than a shower.

### Kitchen and Laundry

- ✓ Use appliances efficiently—run full loads in the dish or clothes washer or, if your appliance has one, use a load selector.
- ✓ Buy a water saver—select new appliances that are designed to minimize water use.
- ✓ Clean vegetables and fruit efficiently—use a vegetable brush to expedite cleaning.
- ✓ Use garbage grinders as little as possible—start a compost pile or give leftovers to a dog, cat, chicken, horse, etc.
- ✓ Keep a bottle of drinking water in the refrigerator—avoid running the tap just to cool water for drinking.

### Lawn and Garden

- ✓ Water the lawn and garden only when necessary—early morning or evening are the best times. Let grass grow higher in dry weather. Mulch your trees and plants. Avoid watering driveways and sidewalks.
- ✓ Deep-soak your lawn—allow the moisture to soak down to the roots where it does the most good. A light sprinkling evaporates quickly.
- ✓ Plant drought resistant trees and plants—many beautiful trees and plants thrive with less watering, particularly native species.
- ✓ Wash your car sensibly—Clean the car with a pail of soapy water and use the hose only for a quick rinse.

**CAN YOU THINK OF OTHER WAYS TO CONSERVE WATER AND PROTECT YOUR WATER SUPPLY?**

