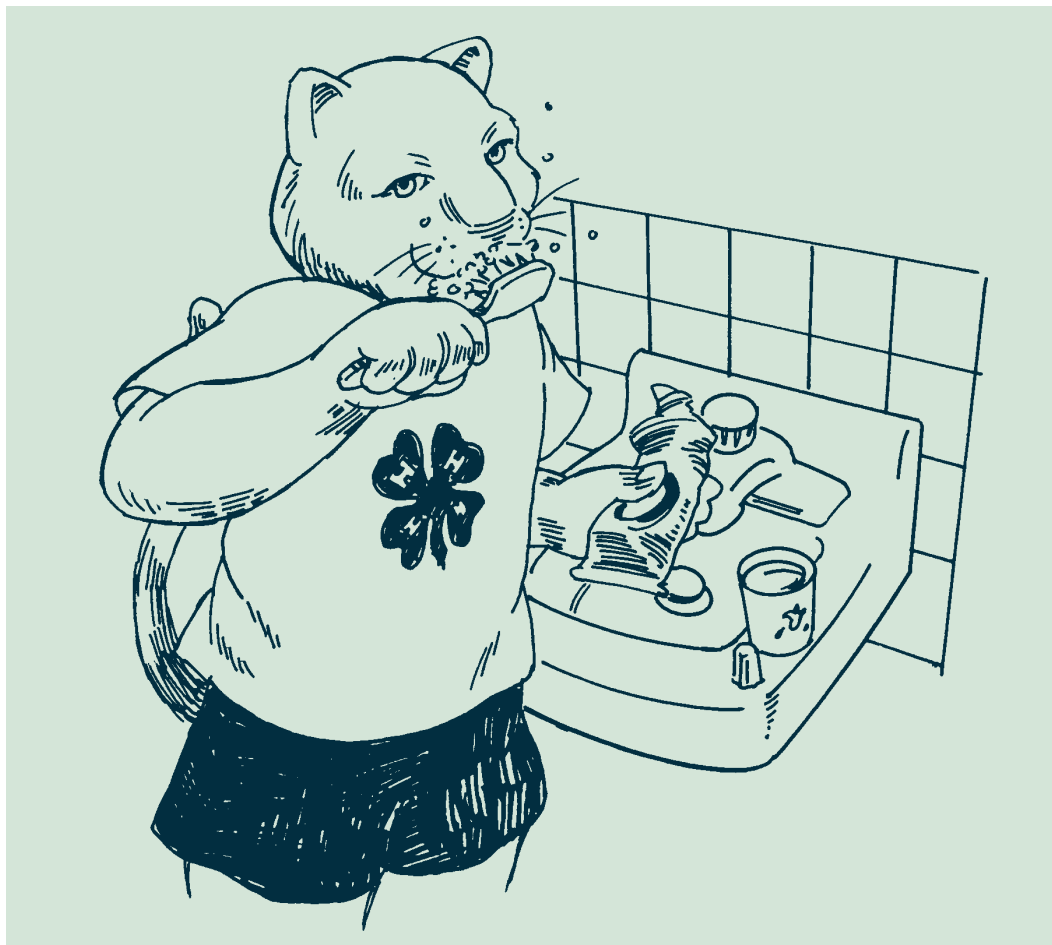


WATER CONSERVATION

with the Water Lion



The 4-H Water Project Unit 1



Contents

Introduction	3
Section 1: Water Use	5
ACTIVITY 1: AVERAGE WATER USE TALLY	9
Section 2: Wasted Water	14
ACTIVITY 2: THE BIG DRIP	16
ACTIVITY 3: LEAK DETECTIVE	17
Section 3: Water-Wise Ways	18
ACTIVITY 4: FAMILY CHECKLIST FOR WATER CONSERVATION IN THE HOME	18

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Introduction

Jennifer turned on the light in her dining room and picked up the newspaper. She sat down to eat her dinner of steak, a baked potato, stewed tomatoes, and an orange. What do all of these things have in common? They all require lots and lots of water. The process of making electricity needs water. Trees need water to grow. Water is used in making newspaper from wood. The cow whose milk was made into the butter on Jennifer's potato drank a lot of water. And water was needed to grow the tomatoes and the orange. Did you realize how important water was in the things you do and the products you use every day? Jennifer's meal probably took about 2,500 gallons of water to grow, process, and prepare. Water has many uses that we don't often think about.

Without water, you would not be alive. Neither would anything else. Water makes up about 60 percent of the human body. Most people can live for many days without food, but a person can live for only four or five days without water. Within our bodies, water allows our joints to move smoothly.

Water helps us digest our food and helps carry nutrients inside our bodies. Water also removes wastes.

As far as we know now, Earth is the only planet that has liquid water on its surface. Seventy percent of the Earth's surface is covered with water, but most of that water is in the oceans, and it is salty. We can't drink it without treating it first to remove the salt, and that's expensive.

We are fortunate to live in Pennsylvania, where there's a lot of water. Pennsylvania has 83,000 miles of streams (more than any other state, except Alaska) and more than 2,400 lakes, reservoirs, and ponds. About 47 trillion (that's 47,000,000,000,000) gallons of water are stored beneath the ground. In an average year, 42 inches of rain, snow, sleet, and hail fall in our state.

This booklet is about *water conservation*. Someone who *conserves* water uses it wisely and uses as little water as possible. By doing the activities in this booklet, you will learn how and why you should use water

wisely in and around your home. You'll discover how water is important in our lives. You'll see how people waste water. You'll also practice some water conservation methods that will help you use water wisely. You'll be urged to share your new knowledge with your family and friends. Throughout this booklet, you'll see the "Water Lion" showing you water-wise ways.

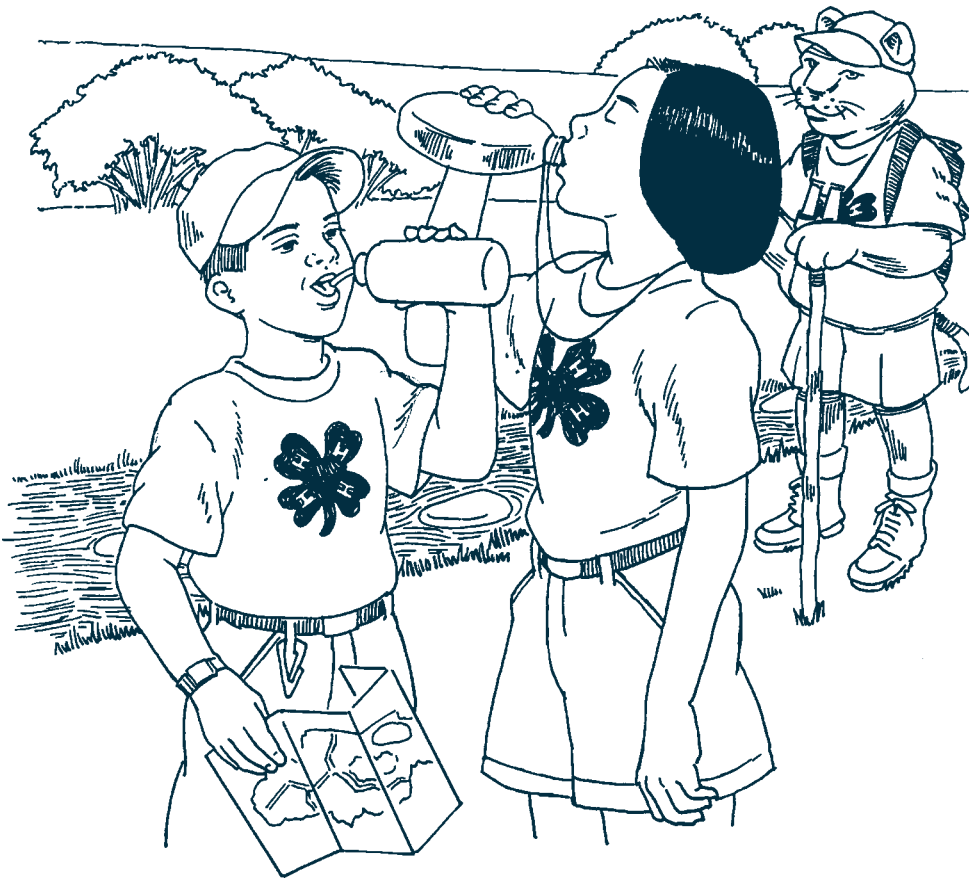
You might wonder why it matters how much water you use. After all, what difference can one person make, right? Wrong! This project is not just about water conser-

vation—it's about seeing that our actions affect the planet. For example, all the water you use has to be cleaned before it can be released back to a river, stream, or pond. It takes energy and chemicals to clean the water. So using the water conservation methods we'll show you here is a first step in caring for our planet!

Conserving water should not be hard. It means making small changes in the way you do things. After you get used to the changes, you might like to make more changes in your life to conserve even more water. Pretty soon, you could be conser-

ving water just for the pleasure of knowing that you're helping the environment. That's when you'll become a good "steward" of the Earth.

The best way to remember new ideas is to learn them through activities. So let's get to it!



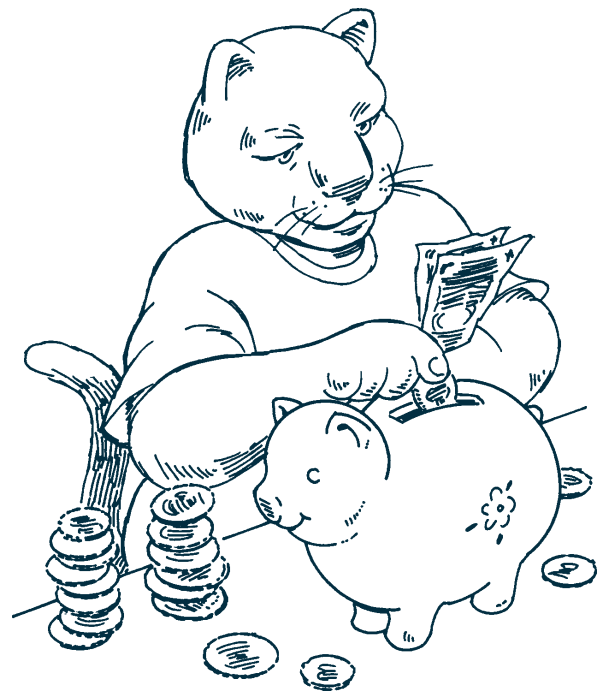


Section 1: Water Use

Many people in the United States don't realize how much water they use. Our modern lifestyle makes it so easy to get water. But where does the water you drink and bathe in come from? The faucet? Yes...but how does it get to the faucet? Most people drink water that is piped to their homes by their city, town, or a private business. But about one in four Pennsylvanians drink water that comes from private sources. These include wells and springs that serve single families or a few families.

Water Is Not Free

Regardless of where your water comes from, water is not free! Most people don't buy it in a grocery store. We don't pay for water by the glass. But we do pay for water, one way or another. We may get water bills from the town, city, or business that supplies water to our homes. Or we may pay to maintain private water sources. Adults are probably always telling you not to waste food because other children don't have enough, and because it costs money. This is also true about water, so you shouldn't waste it either.



Water is very cheap compared to many other things we drink. The average price of water supplied by a city or town works out to about 7 gallons per penny. That's not a lot, is it? In Pennsylvania, a gallon of bottled water at the grocery store costs about 75 cents. A gallon of soda pop costs over three times that much. Water is so cheap that many people see little reason to conserve it. But not people who care about the Earth! You want to leave water for the birds, fish, other animals, and your own kids someday, right?

Water's Many Uses

Water is used for many things besides drinking and bathing. Water helps to make electric power, and it is used in making paper from wood. The fruits and vegetables

we eat need lots of water to grow. We wouldn't even have meat if there were no water. All animals need to drink water or eat plants that depend on water to grow. We fight fires with water and transport goods and people by water using boats and ships. Most people love just to be near water. We swim and boat and fish in water. Many thousands of animals and plants live in or near water.

However, when people take too much water from a river, stream, or pond, the animals living there can be harmed. What's a fish without water?

This booklet will help you see how important water is in our lives. The first step in



becoming “water wise” is to realize when you use water and how much water is used in the tasks you do every day.

Most people in the United States use at least 50 gallons of water per day. This includes only *direct* water uses that you do yourself, such as flushing the toilet, drinking water, showering, bathing, washing dishes, and watering the lawn. This number does not include water needed to make the energy you use or the clothes you wear. It does not account for the water that goes into the food you eat and the paper you write on. These are examples of *indirect* uses of water. These water uses occur without you even knowing about them. But by using products that contain or require water, you are using water indirectly. If we added in all those indirect uses, most people in the United States use about 370 gallons of water per person per day.

Water Made Easy

How might your water use habits change if you had to carry all the water you use into your house or apartment? This is what people in our country had to do until less than 100 years ago. Many people around the world still have to carry their water into their houses every day. In the days before indoor plumbing (toilets and sinks inside with water piped in), the average Pennsylvanian used only about 5 gallons of water per day. That’s as much as one toilet flush today!

Describe five different ways you use water at home.

1. _____

2. _____

3. _____

4. _____

5. _____

What are three ways you use water that you could easily give up if you had to carry in all of your water?

1. _____

2. _____

3. _____

Name three water uses you would *least* like to give up if you had to carry in all of your water.

1. _____

2. _____

3. _____

How do you think people got by with so little water? For one thing, they never dumped out water until it was too dirty to be used for anything else. A person might save their laundry water to clean their floor, for example. Sometimes whole families would take turns using the same bathwater. Be glad we don't still have to do that!

Activity 1 Average Water Use Tally

You can learn a lot about your own water use by doing the "Average Water Use Tally" activity. You'll learn where you use the most water at home. You'll find out whether your water use is above or below average. Then, in Section 2, you'll see how water is often wasted. In Section 3, you'll learn some ways you and your family can become water wise. Your leader or other adult can go over the directions for this exercise if you need help.

Directions:

Use the sheets provided to keep track of your own water use for three 24-hour periods. One of the three days should be a *weekend day*. You should include all water use for the three days, even water use at school, at a friend's house, or in a restaurant. You probably won't perform every task on the charts every day, or even once, during the three-day tally. When you're done, answer the reflection questions after the daily charts. Ask an adult for help if you need it.

Follow these steps:

1. Each time you use water in a way listed on the chart, mark a "1" next to the activity in column B.
2. At the end of the day, add up all the 1's for "flush toilet" and write the total in column C.
3. Now multiply the number in column C by the number given in column D. This answer tells you the number of gallons per day you used to flush the toilet. Write this answer in column E.
4. Repeat steps 2 and 3 for the other activities in column A of the chart.
5. Add up all the numbers in column E to get the total number of gallons of water you used on your first tally day.
6. Repeat these steps on days 2 and 3 of your water use tally.
7. After you finish the three-day tally, answer the reflection questions on page 13.





Average Daily Water Use Tally

Day 1: _____ (Day of the Week)

A	B	C	D	E
Water Use Task	Times on Day 1	Total Times on Day 1 (add all your marks in column B)	Gallons Used per Time	Gallons per Day (column C x column D)
Flush toilet			6	
Run faucet for 1 minute (waiting for water to get hot or cold)			4	
Fill a bathtub (about 5 inches of water)			40	
Shower (5 minutes)			35	
Run dishwasher			15	
Wash a load of dishes by hand (in a basin or plugged sink without water running)			4	
Wash a load of dishes by hand (with water running)			30	
Wash a car (water off while soaping)			40	
Wash a car (water on while soaping)			180	
Wash 1 large load of clothing			45	
Wash 1 small load of clothing			30	
Brush teeth with water running			2	
Brush teeth with water off			1	
Wash hands			1	
Drink water			0.25	
Water lawn (20 minutes)			150	

Total Day 1 _____



Average Daily Water Use Tally

Day 2: _____ (Day of the Week)

A	B	C	D	E
Water Use Task	Times on Day 2	Total Times on Day 2 (add all your marks in column B)	Gallons Used per Time	Gallons per Day (column C x column D)
Flush toilet			6	
Run faucet for 1 minute (waiting for water to get hot or cold)			4	
Fill a bathtub (about 5 inches of water)			40	
Shower (5 minutes)			35	
Run dishwasher			15	
Wash a load of dishes by hand (in a basin or plugged sink without water running)			4	
Wash a load of dishes by hand (with water running)			30	
Wash a car (water off while soaping)			40	
Wash a car (water on while soaping)			180	
Wash 1 large load of clothing			45	
Wash 1 small load of clothing			30	
Brush teeth with water running			2	
Brush teeth with water off			1	
Wash hands			1	
Drink water			0.25	
Water lawn (20 minutes)			150	

Total Day 2 _____



Average Daily Water Use Tally

Day 3: _____ (Day of the Week)

A	B	C	D	E
Water Use Task	Times on Day 3	Total Times on Day 3 (add all your marks in column B)	Gallons Used per Time	Gallons per Day (column C x column D)
Flush toilet			6	
Run faucet for 1 minute (waiting for water to get hot or cold)			4	
Fill a bathtub (about 5 inches of water)			40	
Shower (5 minutes)			35	
Run dishwasher			15	
Wash a load of dishes by hand (in a basin or plugged sink without water running)			4	
Wash a load of dishes by hand (with water running)			30	
Wash a car (water off while soaping)			40	
Wash a car (water on while soaping)			180	
Wash 1 large load of clothing			45	
Wash 1 small load of clothing			30	
Brush teeth with water running			2	
Brush teeth with water off			1	
Wash hands			1	
Drink water			0.25	
Water lawn (20 minutes)			150	

Total Day 3 _____

Average Daily Water Use Tally— Reflection Questions

1. Calculate your average daily water use for the three days. (Add the three daily totals together and divide by 3.)

_____ gallons/day

2. Which activity required the most water?

3. In which room of the house was the most water used?

4. What water uses in your house were not included in *your* water use tally?

5. How much does the water you use every day weigh? (A gallon of water weighs 8 pounds, so multiply the answer from question 1 by 8.)

_____ pounds/day

How would you like to have to carry that much water into the house every day?

6. Was your average water use more or less than the national average of 50 gallons per person per day?

More Less

If it was lower, congratulations! You already practice some water-wise ways. If it was higher, you'll learn some simple ways to start conserving water in the third section of this booklet. But first we're going to learn more about some ways that people waste water.

Adapted from "Water Wise: Lessons in Water Resources," by E. C. Moran and M. E. Krasny, published by Cornell Cooperative Extension, 1989.



Section 2

Wasted Water

Earth's Water Resources

In Pennsylvania, we are blessed with a lot of water. We just turn on the faucet and get water. This can make it hard to remember that water is valuable.

Earth is known as the “Water Planet.” Three-quarters of its surface is covered with water. But most (97 percent) of the planet’s water is stored in the oceans. This water is too salty for most uses. Less than 3 percent of Earth’s water is fresh (not salty), and most of the planet’s fresh water is stored in icebergs and glaciers. Glaciers are huge masses of ice that never completely melt. Glaciers occur only in very cold areas, often on mountaintops. The chart on the opposite page shows how one gallon of water would be broken up to represent where we find water on Earth.

Now you have an idea of how little of the Earth’s water is fresh. Can you see how precious that water is? Section 3 will show you some ways to save water, but first let’s talk about two common problems that may occur right in your own home.

Wasted Water

Are there any leaking faucets in your house? Have you ever checked? If not, it’s time that you do! Leaks waste water and money. We learned in Section 1 that water is not free. It costs money to clean water so that it is safe for drinking. Wasted water goes down the drain without being used, but it still has to be cleaned again before it can be returned to nature.

Leaks start when pipes or faucets become old and worn. Many people think that the water lost from a leaky faucet doesn’t matter. But if it’s a big leak, it can really add up. Later in this section, you’ll see how much water can be wasted from a leaky faucet.

Another common problem is leaking toilets. Older toilets often leak water from the tank behind the toilet into the bowl. Toilet leaks can amount to a lot of wasted water. A leaky toilet will sometimes sound like the tank is always filling. If this is the case, it’s a big leak.

The Division of Earth's Water

Water source	% of total	Of 1 gallon of water
Oceans	97	15 $\frac{1}{3}$ cups + 1 Tbsp
Icebergs and glaciers	2	5 Tbsp + $\frac{1}{3}$ tsp
Groundwater	0.68	1 Tbsp + 2 tsp
Lakes	0.01	About 8 drops
Atmosphere	0.001	About 1 drop
Rivers	0.0001	About $\frac{1}{10}$ drop

Tbsp = tablespoon, tsp = teaspoon



Activity 2 The Big Drip

You will need:

- A 2-cup container or a measuring cup that will measure 2 cups
- A faucet

Directions

Set a faucet to a steady drip. Guess how long it might take the leaky faucet to fill a 2-cup container. Write your guess on line 1 of "The Big Drip" worksheet. Next, find a stopwatch or other clock and time how long it takes to drip 2 cups of water into your container. Finally, complete "The Big Drip" worksheet on your own or with an adult's help. See for yourself how much water is wasted by a little dripping!

The Big Drip Worksheet

1. How long might it take the leaky faucet to fill a 2-cup container?

_____ minutes

2. How long did it actually take for the leaky faucet to fill the 2-cup container?

_____ minutes

3. How long would it take this leak to fill a 1-gallon jug? (There are 16 cups in 1 gallon, so multiply the answer on line 2 by 8.)

_____ minutes

4. How many 1-gallon jugs could be filled in



1 hour? (There are 60 minutes in an hour, so divide 60 by the answer on line 3.)

_____ gallon jugs/hour

5. How many gallons would this faucet leak in 1 day (24 hours)? (Multiply the answer on line 4 by 24.)

_____ gallons/day

6. How many gallons would this faucet leak in 1 month (30 days)? (Multiply the answer on line 5 by 30.)

_____ gallons/month

7. How many gallons would this faucet leak in 1 year (365 days)? (Multiply the answer on line 5 by 365.)

_____ gallons/year

As you can see, even a little drip can add up to a large amount of wasted water! All it takes is time.

This worksheet is based on information in the "Instructor's Guide to Water Education Activities" published by the Pennsylvania Department of Environmental Protection (DEP). Additional materials are available through the DEP Web site (<http://www.dep.state.pa.us>).

Activity 3 Leak Detective

This activity will help you stop water waste in your own home. You will learn how to check faucets and toilets for leaks. Ask for an adult's help if you need it.

You'll need:

- A pencil or pen and paper
- Small bottle of food coloring (blue, red, or green)

Directions:

Be a leak detective in your home.

1. Check each faucet in your home for leaks. Don't forget to also check outside and basement faucets (if you have any). Write down any leaks you find.
2. Check your toilet(s) for leaks. Does it make a trickling or gurgling sound for a long time after a flush? If you hear this, there's probably a leak.
3. Do this step only with an adult present. Choose a quiet time of day (not early morning or late evening). Ask everyone in your home not to use the toilet for 45 minutes. Remove the lid on the tank behind the toilet. Add food coloring by drops to the tank. Blue is a good color to use. Stir gently with a stick or ruler that you don't need anymore. Be careful not to damage the equipment in the tank or spill any of the coloring on your clothing or hands. Add

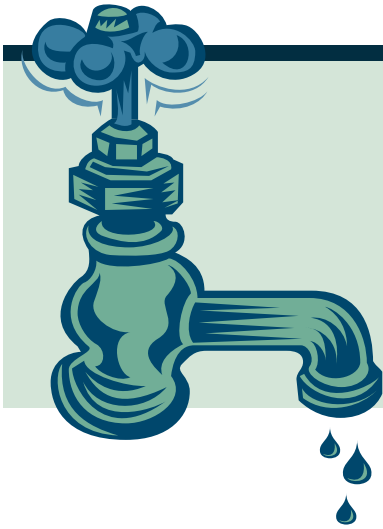
enough food coloring so that the water in the tank turns color. (This will probably take 10 to 15 drops.) Replace the tank cover. Hang a sign on the toilet saying that it is off-limits. Wait 30 minutes.

When time is up, lift the lid of the bowl. What color is the water in the bowl? If it's the color of the food coloring, water is leaking from the tank into the bowl. If the water is still clear, there's no leak. If any colored water appears outside the toilet or on the floor, you may have discovered a serious leak. These types of leaks can damage your home. When the floor stays wet all the time, the flooring, carpeting, or tiles can be ruined. Wet floors are dangerous, too. They can be very slippery.

Repeat the test for each toilet in your house or apartment.

4. Write down any leaks you've found. Tell an adult about the leaks. Tell them what you've learned about how precious water is. Encourage them to have any leaks repaired. If you live in an apartment, an adult should report the leak to the building manager.

Adapted from "The ABC's of Water Conservation," Channing L. Bete Co., Inc., South Deerfield, MA, 1981.



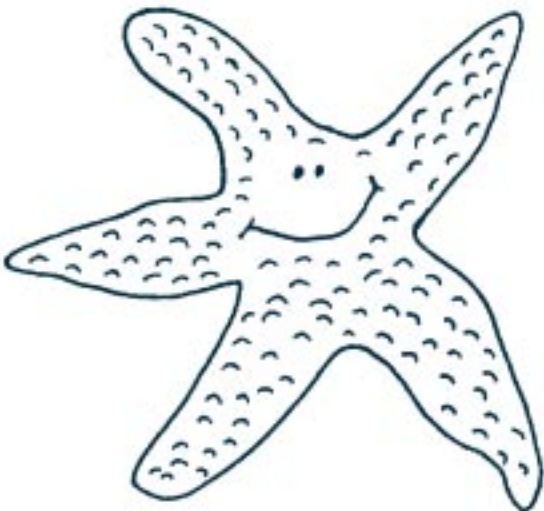
Section 3

Water-Wise Ways

Simple Savings

Conserving water should not be difficult. In fact, you may already save water without knowing it. The checklist below will help you spot water-wise things you already do. You'll also learn a bunch of other ways to save water. You might start by making one of the water-wise ways part of your daily routine. Then you can slowly use more water-saving ways.

It should make you feel good to know that you are helping the planet. Remember that the birds, fish, and other animals depend on us to take care of their water. Do your part to conserve water and teach others what you have learned.



Activity 4

Family Checklist for Water Conservation in the Home

Directions:

1. On the checklist, pages 19–22, check the things that you already do to conserve water.
2. Mark an “X” by 3 to 5 methods you think you could do. Over the next few weeks, try to save water every day using these new methods.
3. Keep this checklist handy and mark your progress.
4. Ask another family member to complete this activity (using a different color ink). Talk with your family about why water conservation is important.

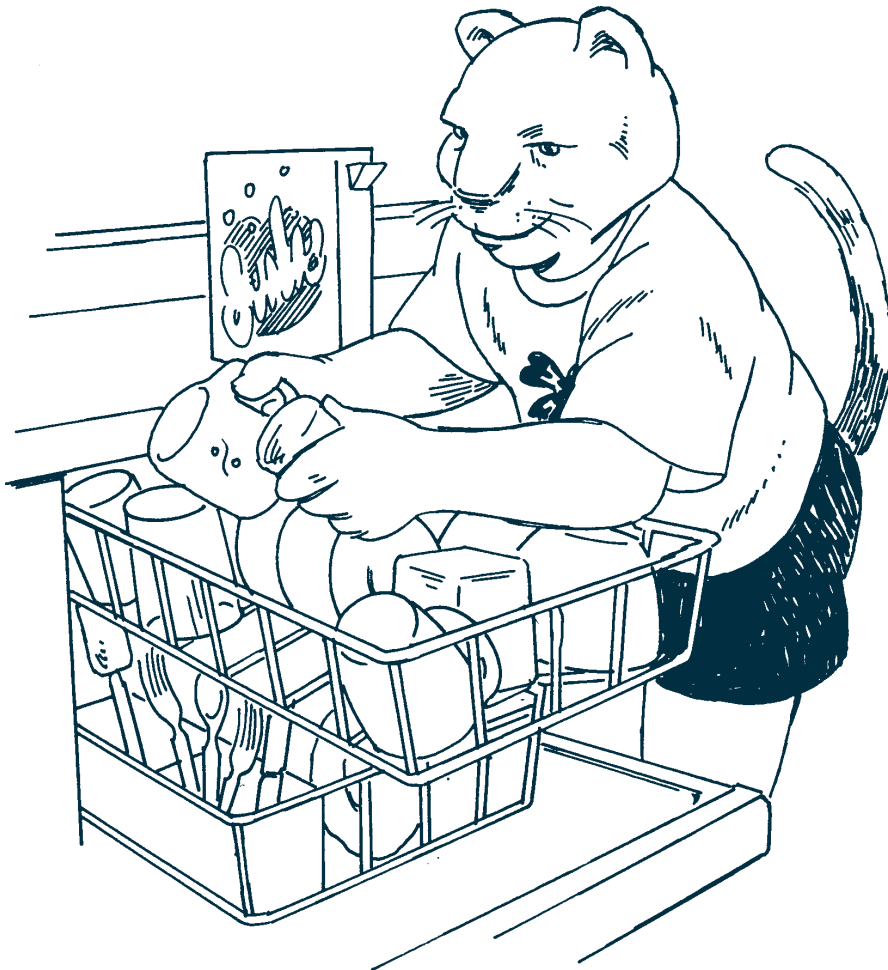
Bathroom

- Put the stopper in the tub before you turn on the water for a bath. The cold water that comes out first will mix with the hot water later.
- Don't overfill the tub for a bath. Use only about 5 inches of water or less.
- Turn off the water while you brush your teeth. Use a cup of water to rinse your mouth.
- When washing your hands or face, turn off the faucet while you lather up.
- Don't use the toilet as a wastebasket. Throw tissues, bugs, and paper towels in the trash rather than in the toilet.
- See how quickly you can shower and still come out clean. Keep the shower at a lower water pressure than you usually do.



Kitchen

- ❑ Wash the dishes in a basin rather than with the water running to reduce water and energy use.
- ❑ Use two basins when you wash dishes by hand: one basin with soapy water to wash in and one with clear water to rinse.
- ❑ Save water by soaking dishes with baked-on food before you wash them. Explain to an adult why you're waiting to wash the dishes so they don't get upset.
- ❑ By using the garbage disposal less often, you'll save water. Instead, start a compost pile for vegetable food waste.
- ❑ Keep a bottle of water in the refrigerator for cold drinking water. That way you won't waste water while you wait for it to get cold.
- ❑ Operate the dishwasher only with a full load. This saves water and electricity costs.
- ❑ Use the correct size pan for cooking foods. When boiling, add water so that it just covers the food.

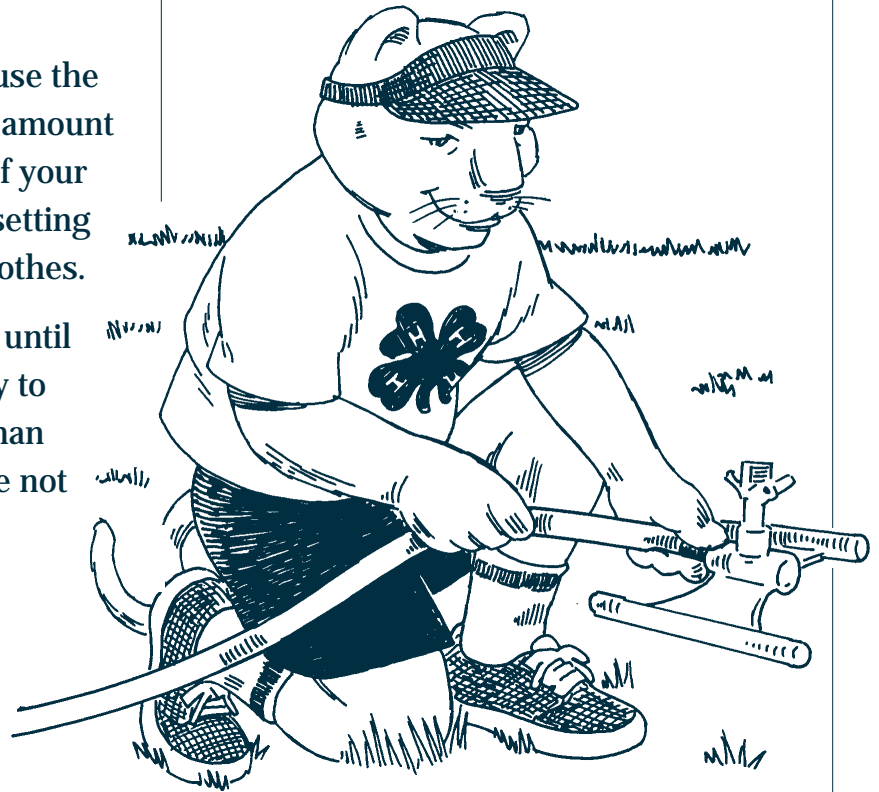


Laundry room

- ❑ If you help with the laundry, use the load setting that matches the amount of clothes you have to wash. If your washer does not have a load setting dial, wash only full loads of clothes.
- ❑ Don't put clothes in the wash until they're actually dirty. It's okay to wear pants and shirts more than once before washing if they're not dirty.

Throughout the house

- ❑ Twice a year, repeat the Leak Detective exercise (Activity 3). Check all the faucets inside and outside your house for leaks. Also check the toilet for leaks. Ask an adult to have any leaks fixed.
- ❑ When you help out around the house (doing dishes, laundry, or other cleaning), use the least possible amount of soap that will get the job done. This saves on rinse water.
- ❑ Pour water from fish tanks and extra drinking water on houseplants or the garden.



In the yard

- ❑ Water the lawn long enough for water to seep down to the grass roots. This way the lawn won't need to be watered as often. A light sprinkling will not reach the roots, and the water will just dry up.
- ❑ Water the lawn early in the morning to reduce evaporation.
- ❑ Ask an adult to help you place mulch around the bases of trees and shrubs and in flower and vegetable gardens. Mulch holds water in the soil and helps control weeds.

- Avoid splashing lots of water out of swimming pools.
 - If you help wash the car, ask an adult to park it on the grass. This allows water to enter the ground rather than the storm sewers.
- Use a broom rather than the hose to remove debris from the driveway or sidewalk.



4-H Activities Report

This report will help you keep a better record of your club activities. Fill it in as you complete each activity or assignment. Refer to this record when you are entering county, state, and national programs. Ask your local leader to explain these programs to you.

My 4-H Activities Report for the 20_____ Club Year

Projects taken _____

Offices held _____

Club _____

County _____

“Show-and-tells” given to

Family _____

Friends _____

Local club _____

County _____

Regional _____

State _____

News articles _____

Radio _____

TV _____

Things done to improve my health _____

Community service or citizenship work done

By myself _____

With club _____

Number of meetings my club(s) held this year _____

Number I attended _____

Number of new members I encouraged to join 4-H _____

Number of boys and girls I helped with projects _____

In what way? _____

Check those attended and tell how you helped

_____ 3- or 4-day camp

_____ 1-day camp

_____ Club or county tours

_____ Club picnic

_____ Countywide picnic

_____ 4-H Sunday

_____ County fair

_____ Achievement programs

_____ Roundup

_____ Teen Leader Retreat

_____ State 4-H Capital Days

_____ Camp Leadership Training

_____ Penn State 4-H Achievement Days

_____ Pennsylvania Farm Show

_____ National 4-H Week

_____ State Ambassador Conference

_____ Judging training

Others:



Name _____

Address _____

Name of club or group _____

Leader's or teacher's name _____

4-H Club Motto
"To make the best better"

4-H Club Pledge
I pledge
my head to clearer thinking,
my heart to greater loyalty,
my hands to larger service, and
my health to better living, for
my club,
my community,
my country, and
my world.

4-H Club Colors
Green and White

