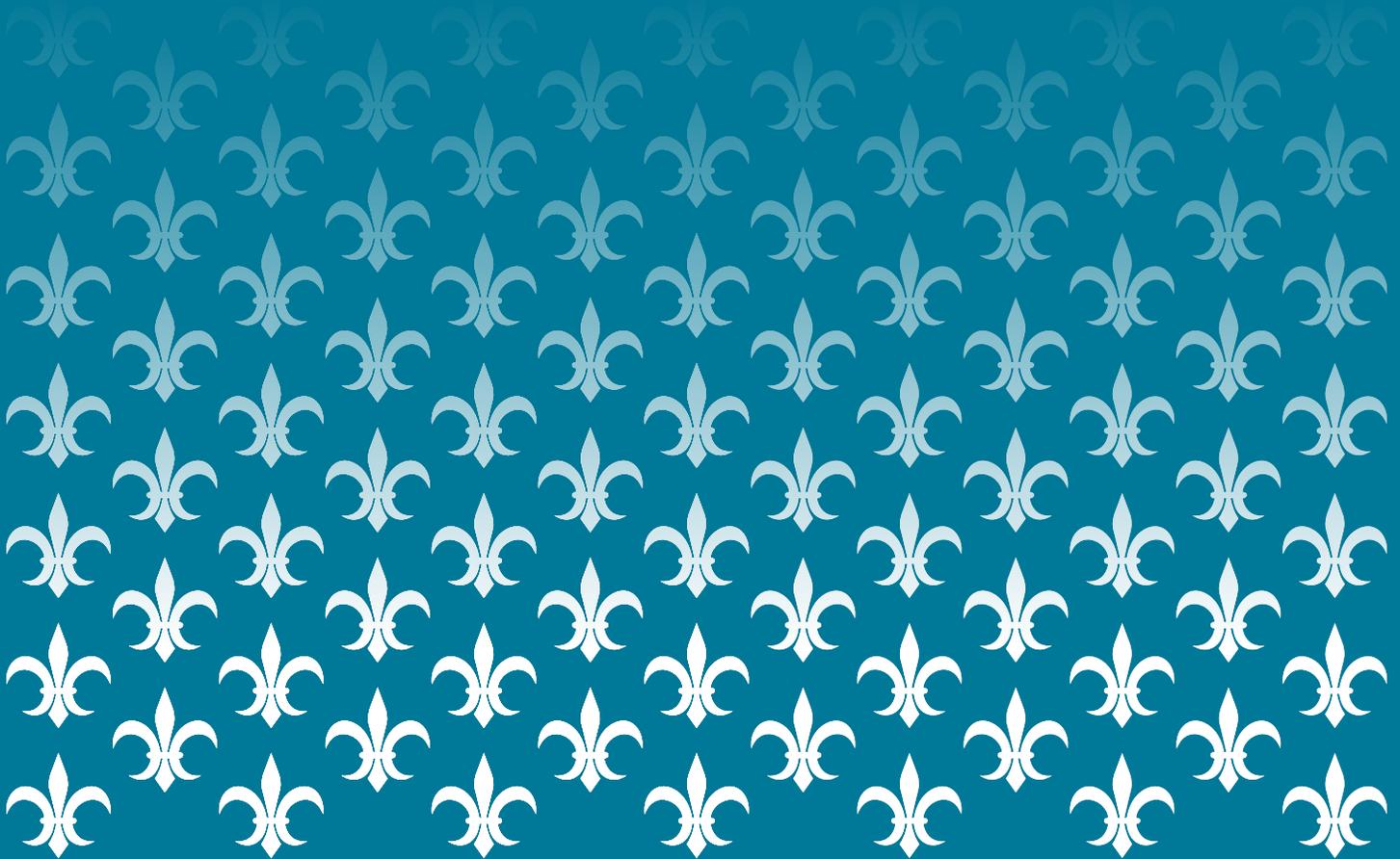


# The Water in Your Home



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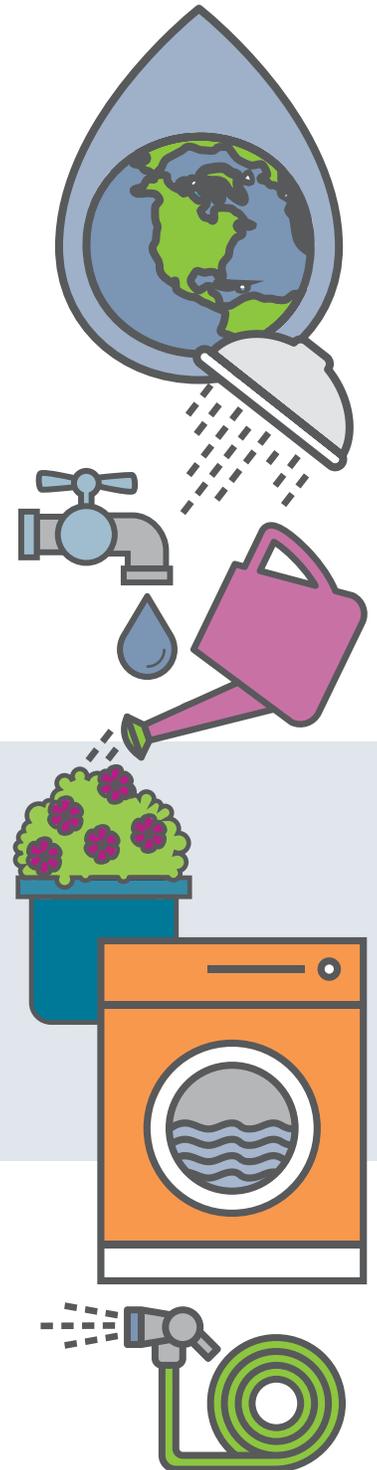
## THE WATER IN YOUR HOME

Water is a precious resource that is necessary for all life, is the center of many natural processes and is used in a variety of ways in our communities and homes. Roughly 71% of the Earth's surface is covered by water. Salt water makes up the majority at 97% while fresh water only comprises 3%. However, less than 1% of the fresh water on Earth is available for use. Water regenerates naturally through the water cycle, making it a renewable resource, but not unlimited.

Water is needed to keep plants alive - whether in your backyard or the entire agricultural industry. We have water heaters in our homes that provide hot water to our household appliances to help us keep clean and hydrated, wash our dishes, laundry, food, cars, and hands. Water heaters not only affect our water bills, but each drop of heated water increases our electricity bill as well.

### In this packet:

Our home energy bills are made up of diverse home appliances usage and household members' behaviors. This packet will help you understand how this vast resource is used in your home and ways to save energy through being water efficient. Being water efficient goes hand in hand with being energy efficient!



**71%**

of the Earth's surface  
is covered by water.



## ACTIVITY 1 • Read the Article

Read the following article from **Water Footprint Network**, and answer the questions.

### What is a water footprint?

Similar to a carbon footprint, a **water footprint** is the amount of water consumed or used. All types of groups can have water footprints: countries, schools, businesses, homes, and even you.

Fresh water is vital to life, but as the world's population grows, so does its use of water. **It takes water - a lot of it - to produce food, to make energy, and to manufacture consumer products.** This is what's known as virtual water. Virtual water is the amount of water used or consumed in the production of a product.

Let's look at how this works for a product we all use: paper. Paper is made from wood pulp, which requires trees, millions of trees. Forests that are used for harvesting require millions of gallons of water to keep these plants alive. Additionally, water is used in the paper manufacturing process - preparing the raw material, cooling machinery, transportation, energy, and more.

Studies show that a single piece of copy paper has a water footprint of 13 liters or approximately 4 gallons of water!

#### Define water footprint:

List three ways water is used from the reading:

1.

2.

3.

### How is a water footprint measured?

A water footprint is measured in terms of the volume of water consumed (used), evaporated, and polluted. The Water Footprint Network splits water footprints into **three corresponding categories**:



#### Blue Water Footprint:

The amount of surface water and groundwater required (evaporated or used directly) to produce an item.

#### Green Water Footprint:

The amount of rainwater required (evaporated or used directly) to make an item.

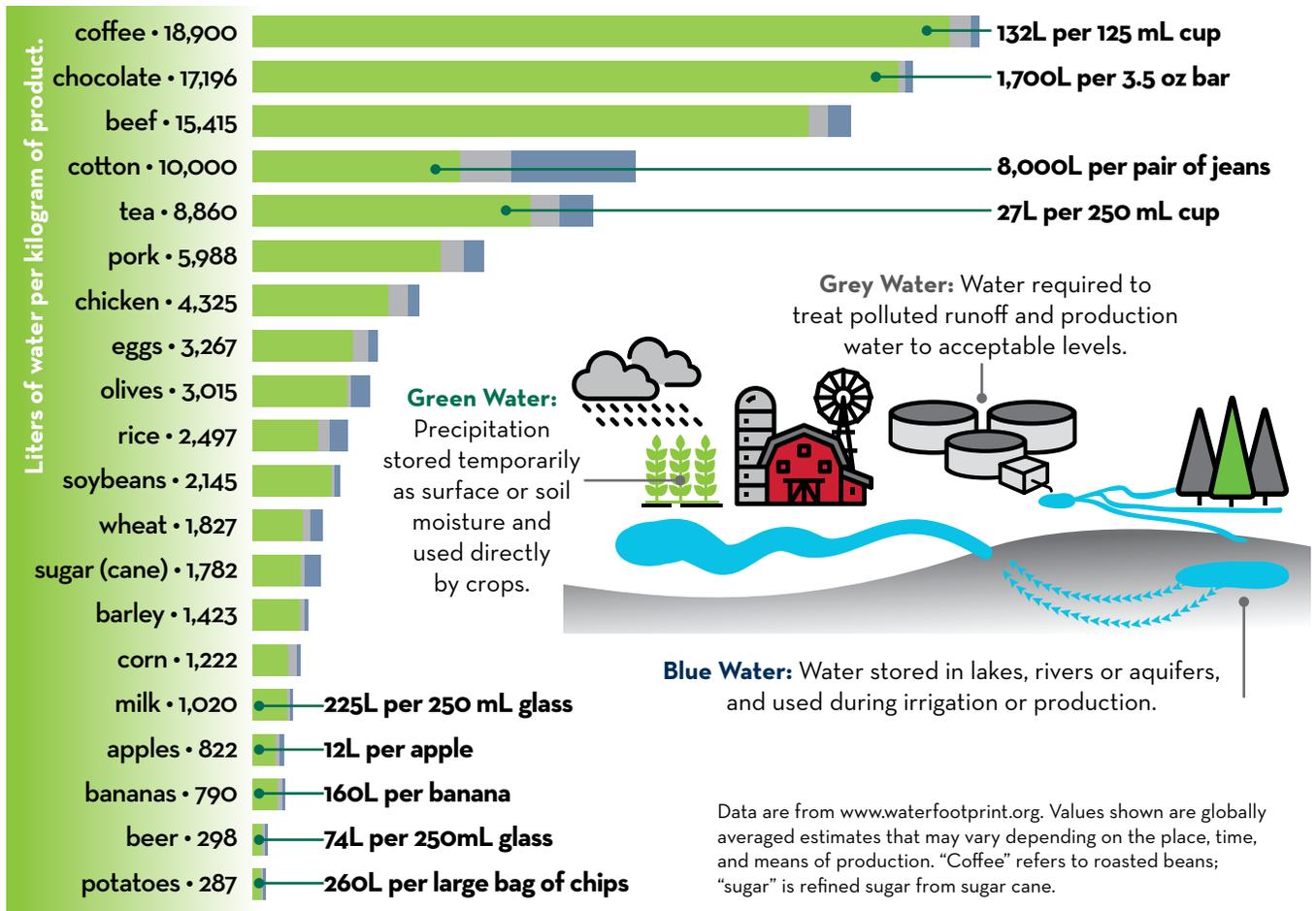
#### Grey Water Footprint:

The amount of fresh water required to dilute the wastewater generated in manufacturing, in order to maintain water quality, as determined by state and local standards



| Define Blue Water | Define Green Water | Define Grey Water |
|-------------------|--------------------|-------------------|
|                   |                    |                   |

### How much water does it take to produce these common goods?



- Green Water needed to produce common goods.
- Grey Water needed to produce common goods.
- Blue Water needed to produce common goods.



## ACTIVITY • Breakfast, Lunch, and Dinner

For this activity, you will pick items from the chart on page 3 that you would typically eat for breakfast, lunch, and dinner. Then calculate the water footprint or gallons of water used to produce your meal. Look at the example below.

|   | Item           | Virtual water per item   | Total water footprint in liters | Total water footprint in gallons  |
|---|----------------|--------------------------|---------------------------------|---|
| EXAMPLE                                     | Coffee<br>Milk | 132 Liters<br>225 Liters | $135L + 225L = 350L$            | Multiply Liters by 0.26 to convert to gallons.<br>$350L \times 0.26 = 91$ gallons |
| BREAKFAST                                   |                |                          |                                 |   |
| LUNCH                                       |                |                          |                                 |   |
| DINNER                                      |                |                          |                                 |   |
| TOTAL WATER FOOTPRINT FOR ALL MEALS PER DAY |                |                          |                                 |   |



### For Chocolate Lovers

It takes over 1,700 liters or \_\_\_\_\_ gallons of water to make 1 bar of chocolate! The standard bathtub holds 60 gallons of liquid. How many bathtubs of water does it take to produce a single bar of chocolate?

Draw and write your answer in the space below; round to the nearest tenth.

Answer the following questions to review the information from the article.

**How is a water footprint measured?**

**What is virtual water?**

**Explain the differences between blue, green, and grey water in your own words.**

**Brainstorm a list of everyday items that contribute to your water footprint.**



## ACTIVITY • Household Water Usage Activity

Directions: Use the Water-Use Worksheet on the next page to measure the amount of water used in your household.

**Before starting this activity, answer the following questions.**

1. Choose a timeframe to conduct this experiment:

1 day            3 days            1 week

2. How many people live in your household? \_\_\_\_\_

Remember to count each time every action is performed by everyone in the household.

| Activity             | Number of times activity is performed each day | Quantity of water needed each time | Number of days | Total amount of water used per activity over time |
|----------------------|--|------------------------------------|----------------|---|
| BATHROOM             |  |                                    |                |   |
| Flushing toilet      |  | _____ x 1.5 gals                   | _____ x days   | = _____ gals                                      |
| Showering            |  | _____ x 1.5 gals                   | _____ x days   | = _____ gals                                      |
| Bathing              |  | _____ x 1.5 gals                   | _____ x days   | = _____ gals                                      |
| Brushing teeth       |  | _____ x 1.5 gals                   | _____ x days   | = _____ gals                                      |
| KITCHEN/LAUNDRY      |  |                                    |                |   |
| Washing dishes       |  | _____ x 1.5 gals                   | _____ x days   | = _____ gals                                      |
| Dishwater            |  | _____ x 1.5 gals                   | _____ x days   | = _____ gals                                      |
| Washing machine      |  | _____ x 1.5 gals                   | _____ x days   | = _____ gals                                      |
| OUTDOOR              |  |                                    |                |   |
| Washing car          |  | _____ x 1.5 gals                   | _____ x days   | = _____ gals                                      |
| Watering lawn/garden |  | _____ x 1.5 gals                   | _____ x days   | = _____ gals                                      |
| Other                |  | _____ x 1.5 gals                   | _____ x days   | = _____ gals                                      |
| GRAND TOTAL          |  |                                    |                | gals  |

How many total gallons of water did your household use during your observation period?

# 300

Approximate number of gallons of water that the average American household uses per day, according to the EPA.

Fill in the sentence below.

My household uses an average of \_\_\_\_\_ gallons of water per day. That is \_\_\_\_\_ gallons (above/below) the national average.

Calculate the amount of water your household consumes in a month. Depending on the timeframe you chose, your multiplier will change.

How many of those times did you or your family use heated water? List them below.

Using the information from your Water-Use Worksheet. Estimate the number of gallons of heated water your family used during the observation period.



## ACTIVITY • Read the Article

Read the following article from [HomeWaterWorks.org](http://HomeWaterWorks.org).

### Every drop of water we use takes energy to move, treat, or heat.

Water and energy are closely linked. A clean, reliable water source consumes energy. Water conservation leads to energy conservation. The clean water that flows out of a faucet needs energy in many stages of processing and transport before it gets to the tap.

**Extraction** Depending on the location and quality of source water, be it a stream, lake, or aquifer, preliminary water treatment measures are often required to meet water-quality standards. The transportation of water is one of the most significant uses of energy in freshwater production. Pumping groundwater to the surface and over land through high elevations is an energy-intensive process.

**Treating** Public water systems treat, clean, and purify water to make it safe to drink and use inside homes, businesses, and schools.

**Heating** In an average home, heating water accounts for 15%-20% of the total household energy use. Nearly 30% of all indoor water use is hot water. Hot water is used for dishwashing, clothes washing, showers, baths, faucets, hot tubs, and cleaning. Running hot water out of a faucet for five minutes is equal to the amount of energy it takes to burn a 60W incandescent bulb for 14 hours.

**Wastewater** After the water goes down the drain, it flows into the sewer to be treated at a wastewater treatment plant. Energy is used in pumping water to the wastewater treatment plant and in treating it with aeration and filtration.



Directions: In the boxes below, show the four stages of how water is processed for home use. Draw a picture and label each stage.

What percentage of all household water is heated? \_\_\_\_\_

Why does heating water contribute to your water and energy bill?

Describe the ways in which water and energy are connected.

An electric water heater uses 380-500 kWh a month. The average resident in New Orleans pay 10.5 cents a kWh.

Find the highest and lowest amount of money that heating water can add to your family's electric bill.

Lowest \$ \_\_\_\_\_ Highest \$ \_\_\_\_\_



## ACTIVITY • Read the Article

Read the following article from [WaterCalculator.org](http://WaterCalculator.org).

### What is Water Conservation and Efficiency?

Many factors affect how much water people use in a day, including where they live, whether they live in a house or an apartment, and how they live their day-to-day lives. While water might seem plentiful to meet people's individual needs, there are many others who share in that water use. In addition, droughts and water shortages can happen anywhere in the country.

Water conservation and efficiency can help people curb their water use, and while the two terms might seem like the same thing - as both achieve the same goal of using less water - they approach water savings differently.

## Water Conservation

**Water conservation** can be defined as: “Beneficial reduction in water loss, waste, or use.” Water conservation includes all of the policies, programs, and practices designed to help people change their behaviors and use less water. The goal is to use only the water needed; for example, turning off the water when shaving or brushing teeth, or only running the dishwasher when it’s full.

**Define water conservation.**

**List five ways you can conserve water at home.**

## Water Efficiency

**Water efficiency** can be defined as: “Minimization (limitation) of the amount of water used to accomplish a function, task, or result.” Water efficiency means doing more with less water; for example, washing dishes or flushing the toilet with the least amount of water necessary to get the job done. Water efficiency normally relies on well-engineered products and fixtures like reduced water-use dishwashers, or low-flow toilets and showerheads.

**Water efficiency can lead to significant savings in money and energy.**

Here is a short list of ways families can be energy efficient by being **water efficient**:

- Install faucet aerators on all bathroom and kitchen sinks.
- Install low-flow showerheads in each bathroom.
- Checking and stopping leaky faucets or pipes.
- Upgrade home appliances to models that are efficient in saving water and energy.
- Use cold water whenever possible.

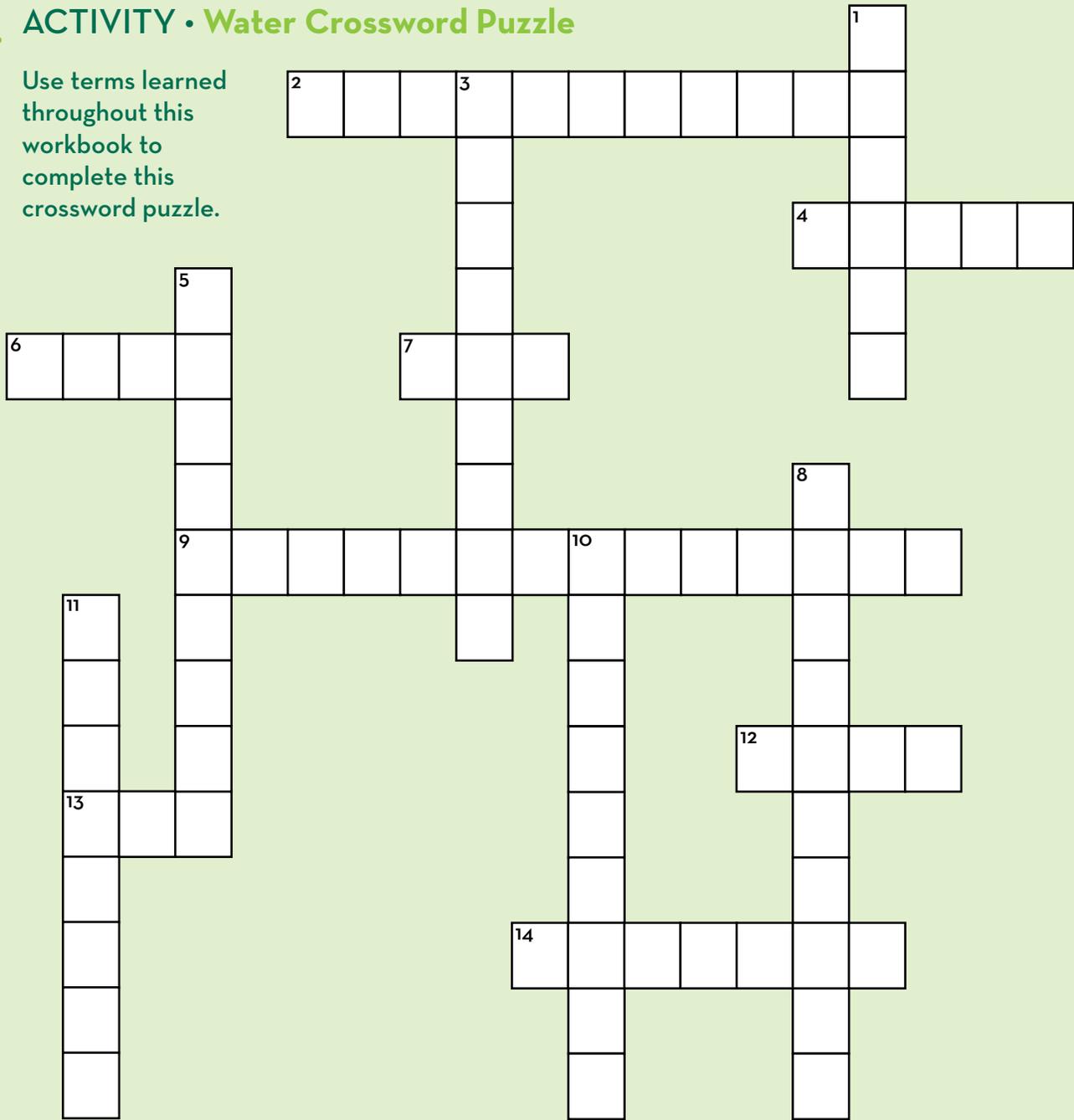
**Define water efficiency.**

**List five ways you can be water efficient at home.**



## ACTIVITY • Water Crossword Puzzle

Use terms learned throughout this workbook to complete this crossword puzzle.



### ACROSS

2. The use of a good, resource, or service.
4. Rainwater.
6. Surface water and groundwater.
7. A measured use for the number of kilowatts used for 1 hour
9. Using water wisely.
12. Freshwater used to dilute wastewater.
13. \_\_\_\_\_ percent of the Earth's water is fresh water.
14. The amount of blue, green, and grey water used to produce a product.

### DOWN

1. It takes \_\_\_\_\_ to extract, treat, heat, and transport water.
3. About 97% of the Earth's water is \_\_\_\_\_.
5. Water is a \_\_\_\_\_ resource.
8. The Mississippi River is one major source of water for this city.
10. The amount of water used.
11. The unit of measurement used to express 1,000 watts of power.



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