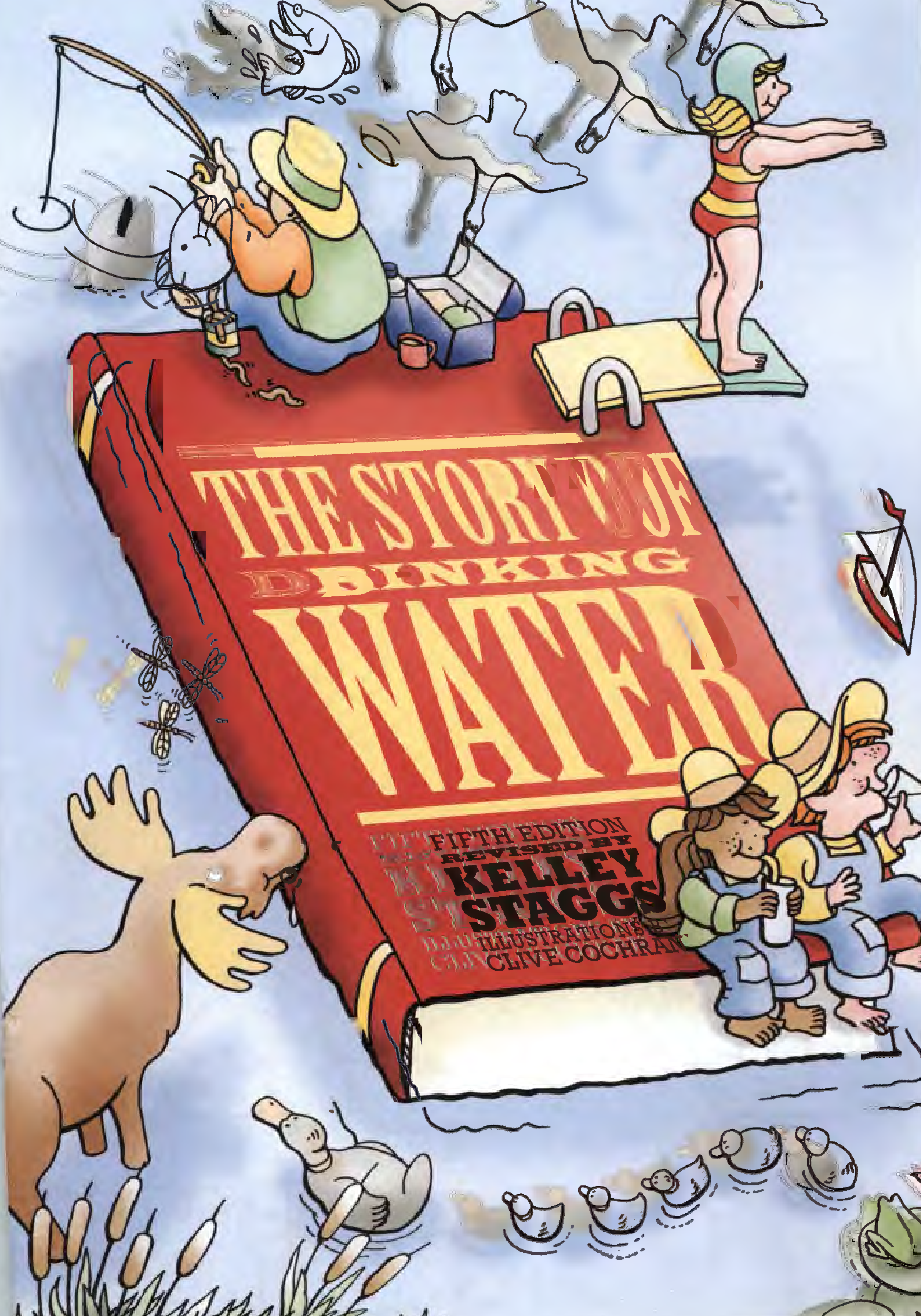
THE STORY OF
DRINKING
WATER
FIFTH EDITION
REVISED BY
KELLEY
STAGGS
ILLUSTRATIONS BY
CLIVE COCHRAN

The Story of Drinking Water: An Activity Book for Grades 4–6

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What is the story of water?

The story of water begins thousands of years ago in prehistoric times. Even then people built their homes on lakeshores or along rivers so they had water to drink and wash in, and so they could travel easily from place to place. These **waterways** contained some **contamination**, but the water was probably cleaner because **pollutants** produced by industrialization and population growth had not yet affected water sources.

The ancient Asians were the first to record methods for **purifying** (cleaning) water. In about 2000 B.C., the Asians kept water in copper vessels, exposing it to sunlight, and **filtering** it through charcoal. Greek physician Hippocrates, who lived from 460–354 B.C., wrote about how to purify water. After boiling rain water, he made a "Hippocrates' sleeve," a cloth bag for straining the rain water. Egyptian records dating to 400 A.D. indicate that the most common ways of cleaning water were boiling it over a fire, heating it in the sun, or dipping a heated piece of iron into it. Filtering boiling water through sand and gravel and allowing it to cool was another common treatment method.

Other ancient people, including the Anasazi in North America, the Mayans in Central America, the Inca of South America, and the Romans in Europe, developed clever ways to capture and transport clean water to their communities. Through **diversion dams** and **aqueducts**, people found ways to ensure that they had adequate supplies of water for washing, drinking, and growing food.

Water treatment and distribution today use some of these same techniques but are more complex. These topics are discussed later in this book. But first, let's see what you know about water.

Solve the Problem: In your science journal, list several ancient cultures, what challenges they had with water and what methods they developed to solve those challenges.

Do you know all beings need water?

Without water, the Earth would look like the moon. There wouldn't be any trees … or animals … or humans. All life depends on water. Next to the air we breathe, water is our most essential element of life.

The human body is about 70% water. Every system in our body uses water.

- Water makes up almost 80% of our brain.
- Water makes up 83% of our blood.
- Water makes up nearly 90% of our lungs.

- Water transports body wastes.
- Water lubricates body joints.
- Water keeps body temperature stable (think sweat!).
- Water aids in digestion (think spit!).

Human beings can live several weeks without food but only four to seven days without water, depending on conditions. We must drink four to eight glasses of water each day, depending on our size, to replace the water we lose from normal activity. Some water loss is visible through sweat and excretion.

Solve the Problem: Calculate how much water you need to replace each day by filling in the following numbers:

- What is your weight in pounds? ________
- Divide by 2 to determine how many ounces you should be drinking: ________
- Add 8 ounces if you are active: ________
- Add another 8 ounces if you live in a dry climate: ________

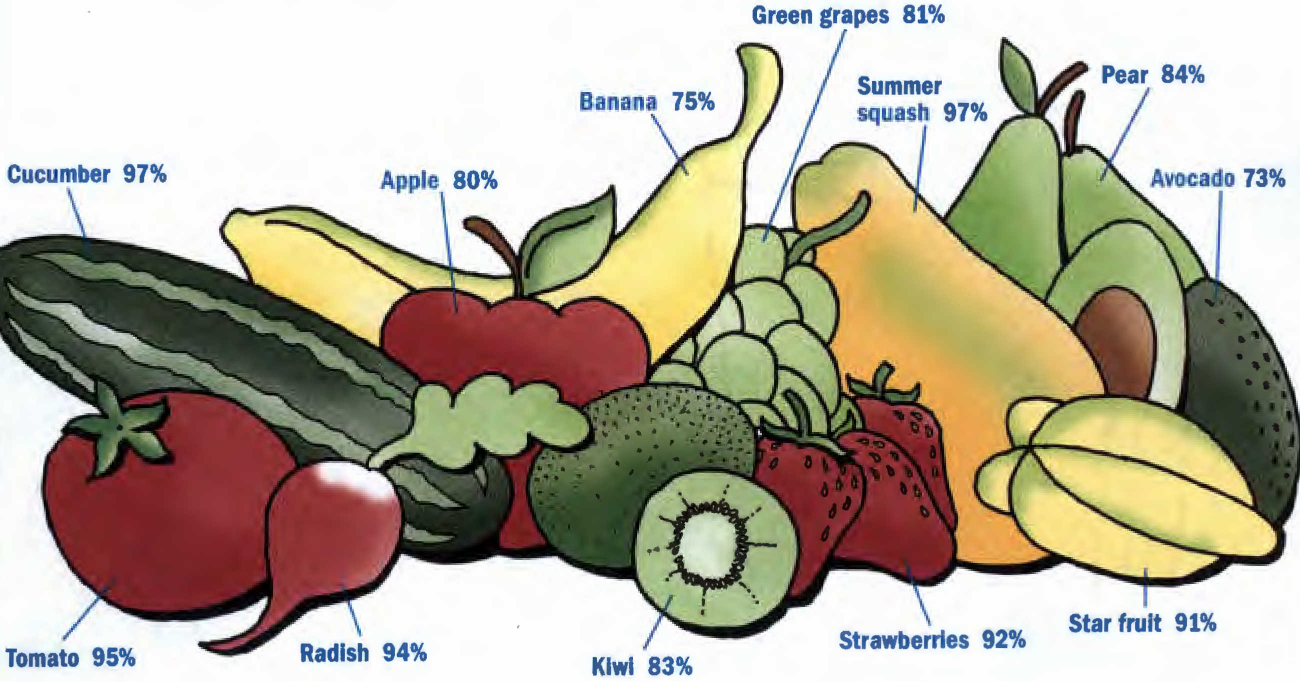
Divide by 8 to determine how many cups you need to drink a day: ________

How else can we get the water we need?

Drinking water or other liquids provides only part of the water we need. The other part comes from the foods we eat. Fresh fruit and vegetables contain much more water than cooked or processed food.

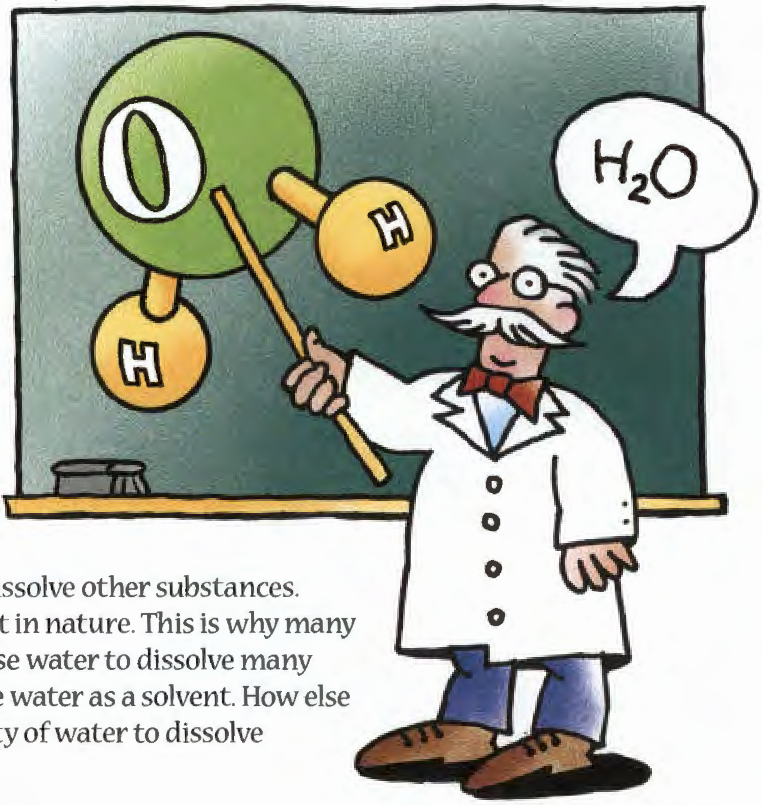
For example:

- A cucumber is about 97% water.
- A tomato is about 95% water.
- An apple is about 80% water.
- A banana is about 75% water.
- A slice of cheese pizza is about 47% water.
- Chicken nuggets contain about 47% water.
- A slice of bread is about 37% water.
- French fries are about 35% water.
- Buttered popcorn is about 5% water
- Pretzels are about 3% water.
- Potato chips contain less than 1% water.



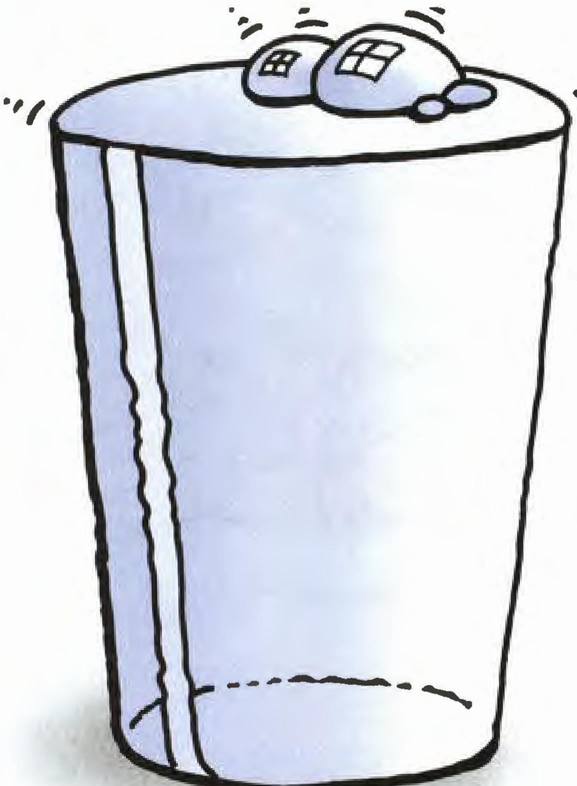
What do you know about the water molecule?

Everything is made of **atoms**. An atom is the smallest particle of an element, such as oxygen or hydrogen. Atoms join together to form **molecules**. A water molecule has three atoms: two hydrogen (H) atoms and one oxygen (O) atom. That's why water is sometimes referred to as H_2O. A single drop of water contains billions of water molecules.



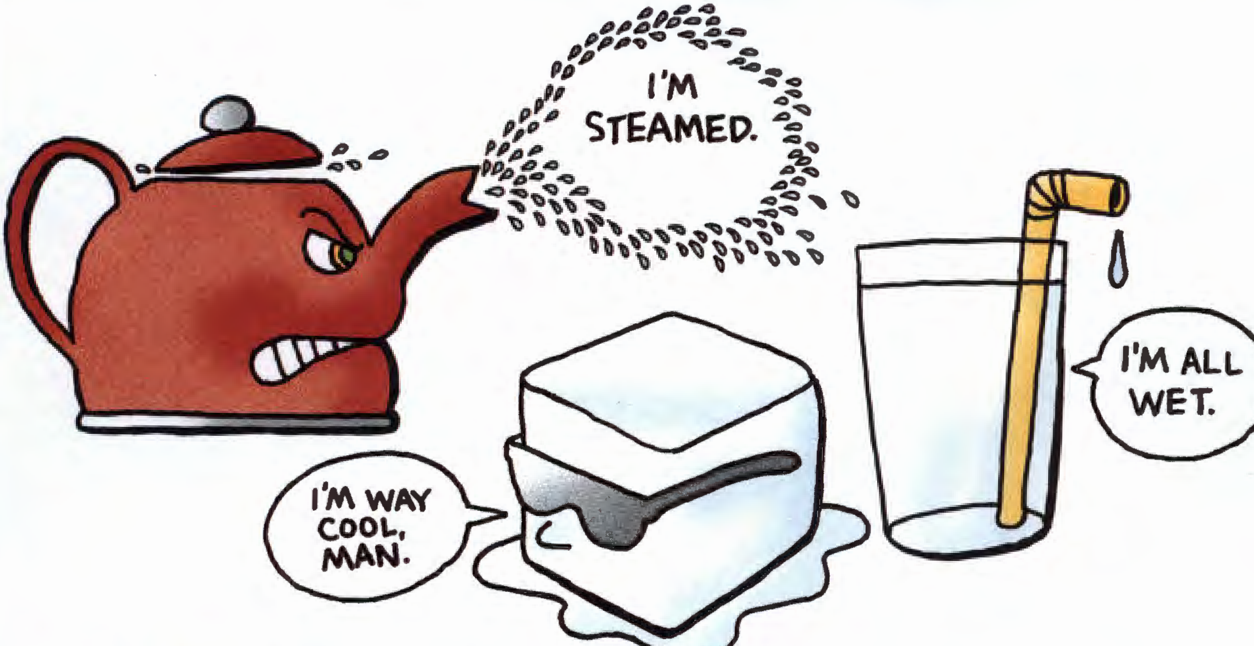
What is a solvent?

A **solvent** is a liquid that can dissolve other substances. Water is the most common solvent in nature. This is why many minerals are found in water. We use water to dissolve many things. Even when we cook, we use water as a solvent. How else do we take advantage of this ability of water to dissolve almost anything?



What are some other properties of water?

- Water can **absorb** heat. This makes it useful in industries as a coolant for machinery.
- Water has very high **surface tension**. Water molecules naturally attract to each other, bunching together tightly at the surface, so you can fill a water glass above the rim. Surface tension also helps things float.
- Pure water has a neutral **pH** of 7. Pure water is not an acid or base, which allows plants and animals to live and thrive in it.
- Water weighs 8.34 pounds per gallon, and 1 liter of water weighs 1 kilogram.



What do you know about water's three forms?

Pure water is tasteless, odorless and colorless. Water can occur in three states: liquid, solid (ice), or gas (vapor).

Liquid water. Most people think of water in its liquid state: wet and fluid. We use liquid water in many ways, including washing and drinking.

Solid water. Water becomes a solid when it freezes. As water freezes, its molecules move farther apart, making ice less dense than liquid water. This means that ice is lighter than the same volume of water, so ice floats in water. Water freezes at 0° Celsius, 32° Fahrenheit.

Water as a gas. When water boils, it loses its surface tension and changes from a liquid to a gas or water vapor. When water vapor cools, it produces a small cloud called steam, which is a mini version of the clouds we see in the sky. At sea level, water boils at 100° Celsius, 212° Fahrenheit.

When water vapor attaches to small bits of dust in the air, it forms clouds or fog. When the air temperature is warm, the gas condenses, and raindrops may fall from the clouds. In cold temperatures, the water drops in the clouds freeze and come down as snow or sleet.

Solve the Problem: What do you think would happen if ice did not float? What would happen to the fish and plants in the water? How does the ice on top of a lake help the fish and plants that live underneath?*

**If ice did not float, lakes would freeze from the bottom up. The plants and fish would also freeze, and most of them would die. But the ice on top keeps the water underneath protected from the cold. It is like a blanket that keeps the water at a safe temperature for the living things in the lake.*

What do you know about water on Earth?

About 70% of Earth's surface is covered with water.

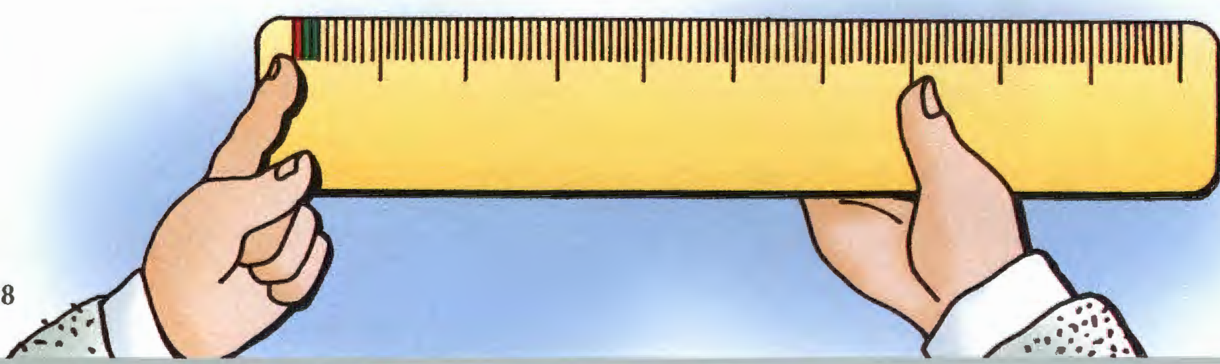
Ninety-seven percent of the water on Earth is **salt water**, mostly in the oceans. Salt water contains salt and other minerals, which humans cannot drink. New technology, however, can remove salt from ocean water to make it safe to drink, or **potable**. This technology, called **desalination**, is used increasingly around the world, particularly in the Middle East and in coastal cities, where the nearest water supply is an ocean.

Two percent of the water on Earth is **glacier ice** at the North and South Poles. This ice is fresh water and could be melted; however, it is too far away from where people live to be usable. Because of the Earth's changing temperatures, some glaciers are melting into the oceans. Perhaps someday there will be a way to capture this fresh water before it mixes with the salty ocean water.

Less than 1% of all the water on earth is **fresh water**. We use this small amount of water for drinking and cleaning but also for agriculture, industry, and commercial purposes. Most of this water must be treated to remove any pollutants before it is used by humans. Because fresh water is limited, many communities are finding ways to conserve this resource by using less water, reusing it, and installing water-saving devices.

This ruler has 100 spaces representing 100% of the water on Earth.

- One space of **Red** is 1% of the spaces on the ruler. This shows the fresh water we can use.
- Two spaces of **Green** are 2% of the spaces on the ruler. This shows the water frozen in glaciers.
- Ninety-seven spaces of **Yellow** are 97% of the spaces on the ruler. They show the amount of salt water on Earth.

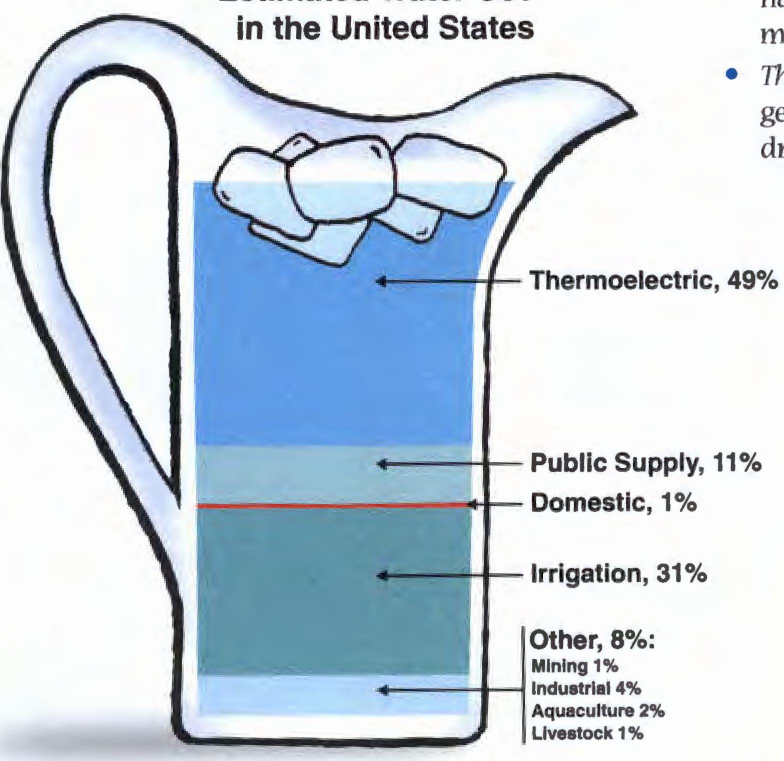


How do we use our fresh water?

In addition to home use, fresh water is used for transportation, agriculture, heating and cooling, industry, livestock, and many other purposes. That one percent of water is primarily used in eight different ways, or categories:

- *Domestic.* Residential home indoor and outdoor use, such as drinking, cleaning, and watering lawns
- *Public supply.* Public and commercial buildings, such as schools and restaurants
- *Irrigation.* Watering systems for farms that grow food
- *Livestock.* Watering systems for animals on ranches and farms
- *Aquaculture.* Watering systems for fish farms and hatcheries
- *Industrial.* Water used for manufacturing products, including food, paper, and petroleum products
- *Mining.* Water used for extracting natural resources such as metals, minerals, natural gas, and oil
- *Thermoelectric.* Water used for generating electricity using steam-driven generators

Estimated Water Use in the United States



Solve the problem: According to the graph, what category uses the most fresh water? How can we reduce this amount of water use? What alternative energies can be developed? Make a bar graph of this chart.

Does fresh water get dirty?

Everything we do with water adds something to it, and sometimes that causes pollution. The most worrisome pollutants are animal and chemical wastes. Livestock operations, industry, and mining operations must be extra sure that the water they use is clean before it is returned to the ecosystem. A law in the United States called the **Clean Water Act** puts limits on how much of any given substance can be discharged to open waterways.

After water is used, it goes down the drain into sewer pipes that carry the used water to a wastewater treatment plant where it is treated (cleaned) before it is sent back to a natural water source such as a river. This protects everyone and everything that use the water downstream. Some water is sent back to a water treatment plant to be recycled and reused again for **nonpotable** (non-drinking) purposes such as irrigating parks and car washes.

In the United States, the **Safe Drinking Water Act** protects our drinking water. In Canada, safe drinking water is required by the **Guidelines for Canadian Drinking Water Quality**. These laws help make our drinking water safe by setting standards of how clean our water must be before we can drink it from our taps. The rules establish how much of a substance, be it a contaminant like bacteria or gasoline or an additive like fluoride, can be in our water and still be safe to drink. Your local water utility follows these standards when cleaning our water.

Everyone must do his or her part to keep our water sources clean. Fresh water in lakes and rivers are part of the drinking water supply, so it is important not to pollute these sources. Even deep underground aquifers can be polluted from the surface. For example, oil thrown on the ground can seep into the groundwater.

Is water important for ecosystems?

Nature distributes its fresh water through a variety of land features, creating **ecosystems** that depend upon this water. For example, some ecosystems start in the Rocky Mountains, where winter snow melts into streams and rivers that nourish forests of spruce, willow, and aspen trees that are home to cougar, elk, moose, mountain goats, big horn sheep, beaver, marmots, and many other animals.

As the rivers flow down from the mountains and rush toward the oceans, they break down rock, soil, and minerals. This is called **weathering**. Smaller bits of rock and minerals are carried downstream. This is called **erosion**. Some sediment is deposited along the river banks, helping to create **riparian** ecosystems that are the habitat of fish, frogs, waterfowl, and other migrating birds and wildlife. The runoff from snow-packed peaks provides shelter, food, and travel corridors for wildlife.

Many cities and towns along the way also rely on these fresh water rivers for their community drinking water.

As the rivers flow into the bays and straits that line the coast, they deposit eroded sand, mud, and silt, which create new land and habitat called **deltas.** Deltas create ecosystems such as mudflats, marshes and peat bogs. Millions of migrating birds, including sandpipers, yellowlegs, and black-bellied plovers, rely on this water ecosystem being clean and healthy. People also depend on clean water in the deltas for sail boarding, boating, fishing, and other activities.

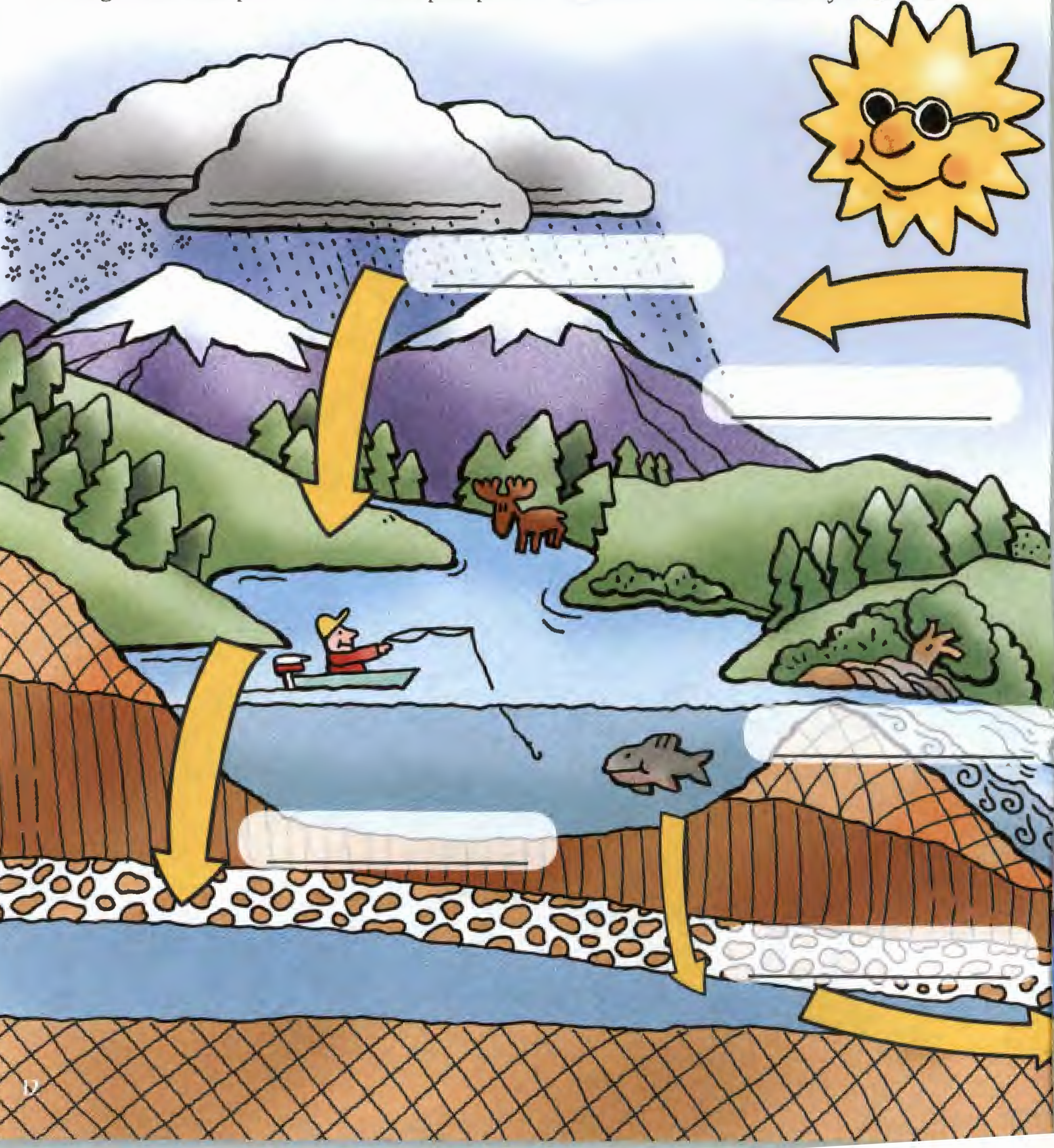
Finally the rivers empty into the ocean, forming a nutrient-rich ocean ecosystem. Kelp forests are nurseries for smaller marine life which become food for schools of larger fish, sea birds, and marine animals, such as harbor seals, killer whales, octopus, and sea stars.

What do you know about the water cycle?

Would you believe that a dinosaur could have once used your last drink of water? Water on Earth today has been here for millions of years. Because of the **hydrologic cycle** (water cycle), water moves from Earth to the air to Earth again. It changes from solid to liquid to gas, over and over again.

Water evaporates. It travels into the air and becomes part of a cloud. It falls to Earth as precipitation. Then it evaporates again. This repeats in a never-ending cycle.

Precipitation creates runoff that travels over Earth's surface and helps to fill lakes and rivers. It also percolates or moves downward through openings in the soil to replenish aquifers under the ground. Some places receive more precipitation than others. These areas may be close to



large bodies of water that allow more water to evaporate and form clouds. Other areas receive less precipitation. As clouds move up and over mountains, the water vapor condenses to form precipitation and freezes. Snow falls on the peaks. When the snow melts, it flows into the rivers and lakes or seeps into the ground.

Hydrologic cycle (water cycle) vocabulary

Aquifer—An underground water source

Condensation—Water vapor cooling and becoming a liquid

Evaporation—Liquid water heating and becoming a gas

Groundwater—Water under the ground that supplies springs and wells

Hydrologic—Relating to water

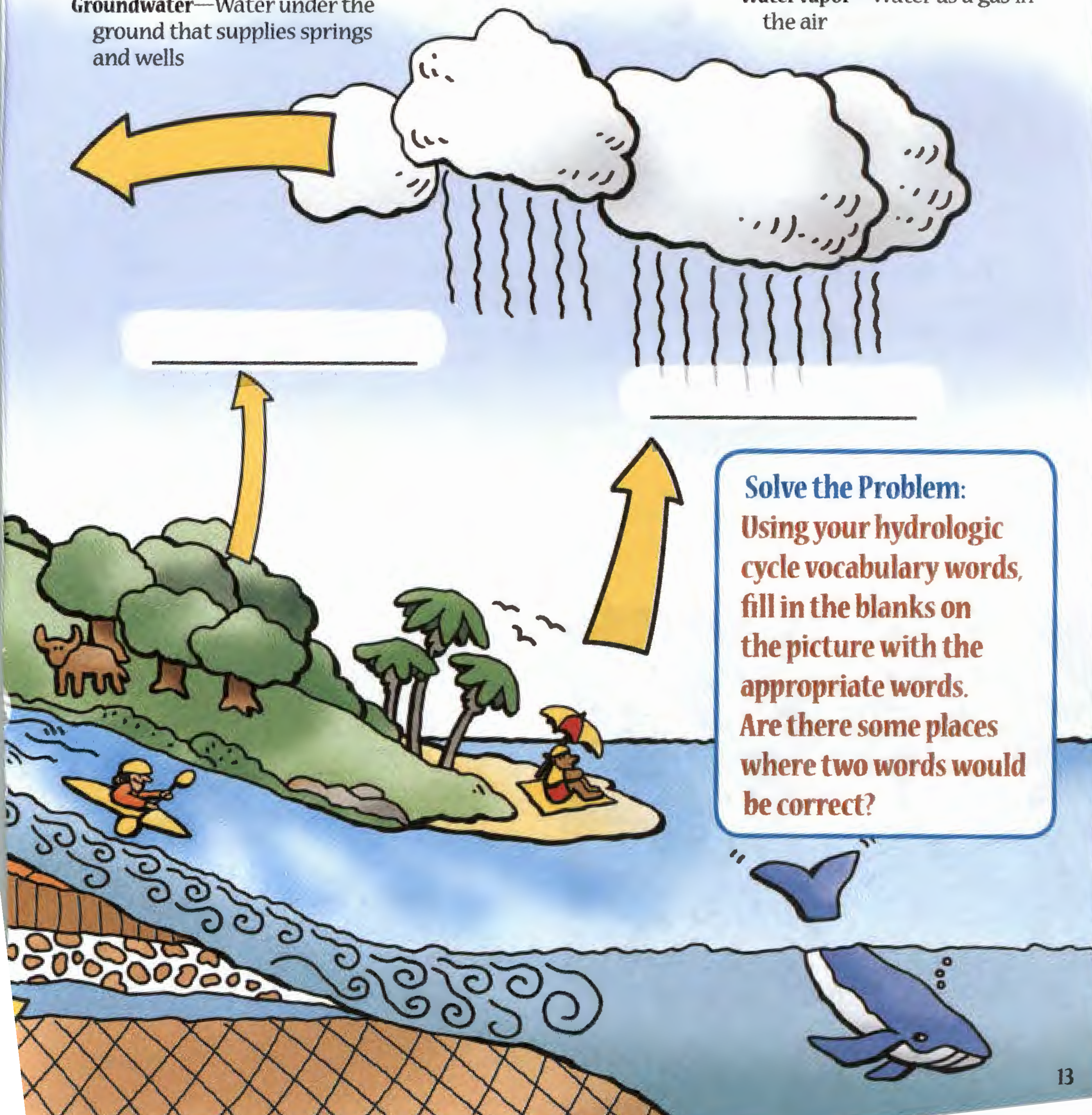
Percolation—Water moving downward through openings in the soil

Precipitation—Rain, snow, sleet, or hail

Transpiration—Process of water vapor transferring from living plants to the atmosphere

Surface runoff—Storm water that runs along Earth's surface into lakes and rivers

Water vapor—Water as a gas in the air



Solve the Problem:
Using your hydrologic cycle vocabulary words, fill in the blanks on the picture with the appropriate words. Are there some places where two words would be correct?

How does water affect weather?

The hydrologic cycle plays a major role in weather patterns around the world. Extreme weather conditions almost always involve water. Consider thunderstorms, hurricanes, and floods.

Thunderstorms produce a large amount of rainfall over a particular area, replenishing water sources and nourishing ecosystems. **Supercell thunderstorms** are extremely large thunderstorms that rotate in a circular pattern because of **wind shear** and **updraft**. These storms can reach 3 to 7.5 miles (5 to 12 kilometers) in vertical height and produce severe winds, hail, heavy rain, and tornadoes. The National Weather Service keeps a close eye on supercell thunderstorms and possible tornadoes using radar and storm chasers. The Emergency Alert System announces storm watches or warnings to local areas.

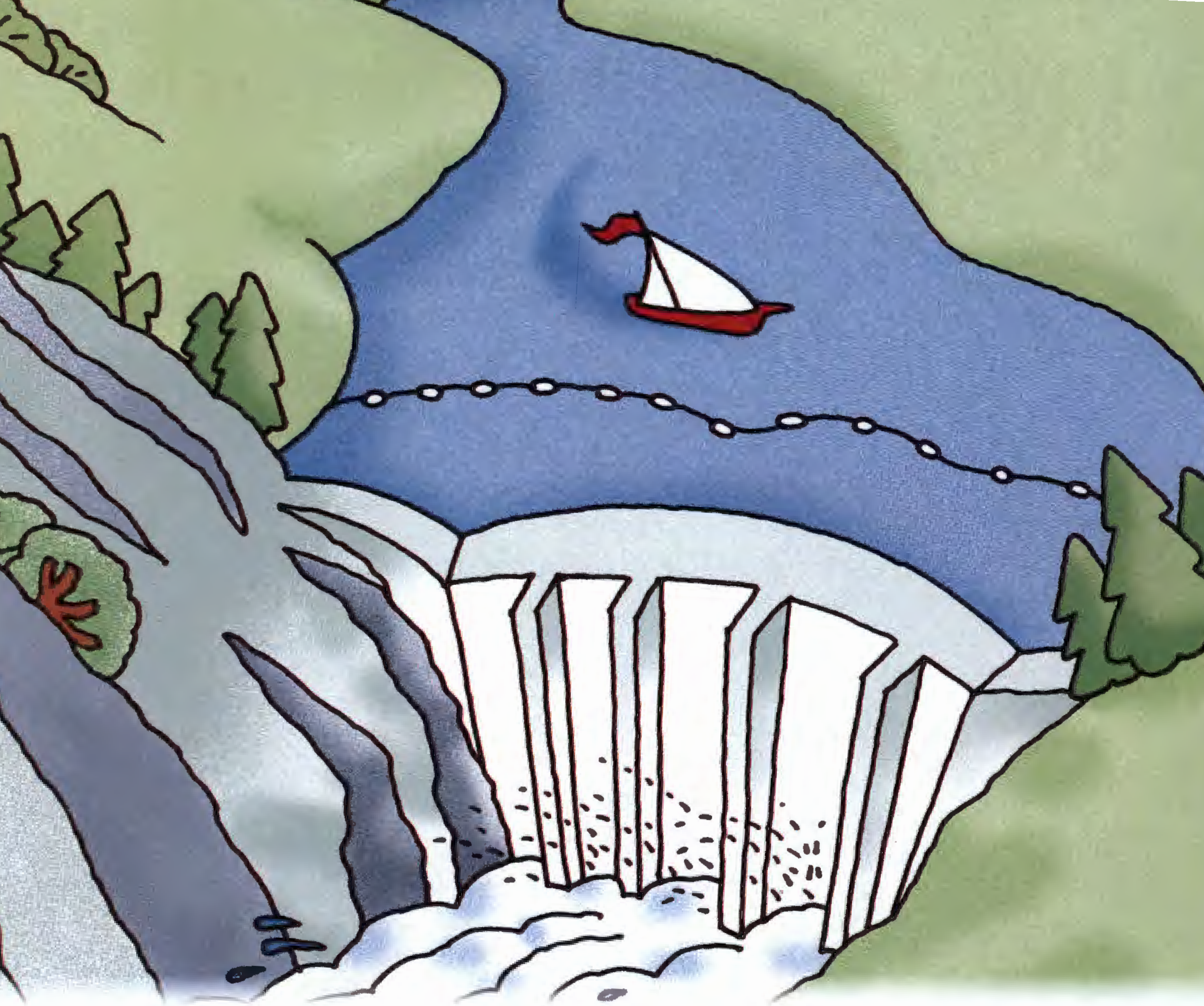
Hurricanes start near the equator where the ocean is the warmest. When massive amounts of warm, moist ocean air evaporate into the **troposphere**, the part of the upper atmosphere where weather is created, a low-pressure system is created nearer the ocean's surface. This low pressure is fed by more high-pressure air that tries to displace and equalize it, creating a rotating wind that spirals air inward. The air in the upper atmosphere continues to twist and gather energy, producing higher and higher winds. When the winds reach 74 miles per hour (119 kilometers per hour), the storm is classified as a hurricane. Hurricanes occur in the Atlantic Ocean and eastern Pacific Ocean, but they are called **typhoons** in Asia and Australia and **cyclones** when they occur in the Indian Ocean.

What happens if there is too much or too little water?

Floods occur when excess water overflows banks of a river, stream, reservoir, or drainage area and spreads across nearby land. Extreme rainfall or snowmelt, **storm surges** from hurricanes, or breaks in human-made retaining walls such as dams or levies can cause flooding. The Mississippi River has flooded many times. In 1993, intense rainfall and snowmelt during the spring and summer drained into the Mississippi from **tributaries** flowing from 13 states and Canada. This surge of water lasted for 144 days and left the Missouri and Mississippi Rivers at record high levels. Many drinking water sources were contaminated and some water treatment plants were flooded. Many people had to boil their water before drinking it to kill the germs until the flood waters receded.

Dry weather over a long period of time causes **drought**, when the lack of water depletes water supplies and prevents ecosystems from thriving. When surface water sources are depleted, the sun's heat can no longer create enough evaporation for clouds to form and the land dries out instead. Water utilities may ask everyone to **conserve** water and require homeowners to minimize lawn watering. Agricultural crops are damaged because farmers can't irrigate their fields. Lightning can spark wildfires in **arid** areas. The National Oceanic and Atmospheric Administration (NOAA) monitors areas that may experience extreme droughts by measuring precipitation, soil moisture, stream flows, and reservoir levels.

Solve the Problem: If your area were experiencing a drought, what measures could you take to conserve water?



What is our drinking water supply?

Water supplies in North America, particularly in towns and cities, are usually managed by **utilities**. Utilities are companies or government agencies that supply electricity, gas, or water to the public. The water utility often manages three aspects of the water supply: **source**, **treatment**, and **distribution**.

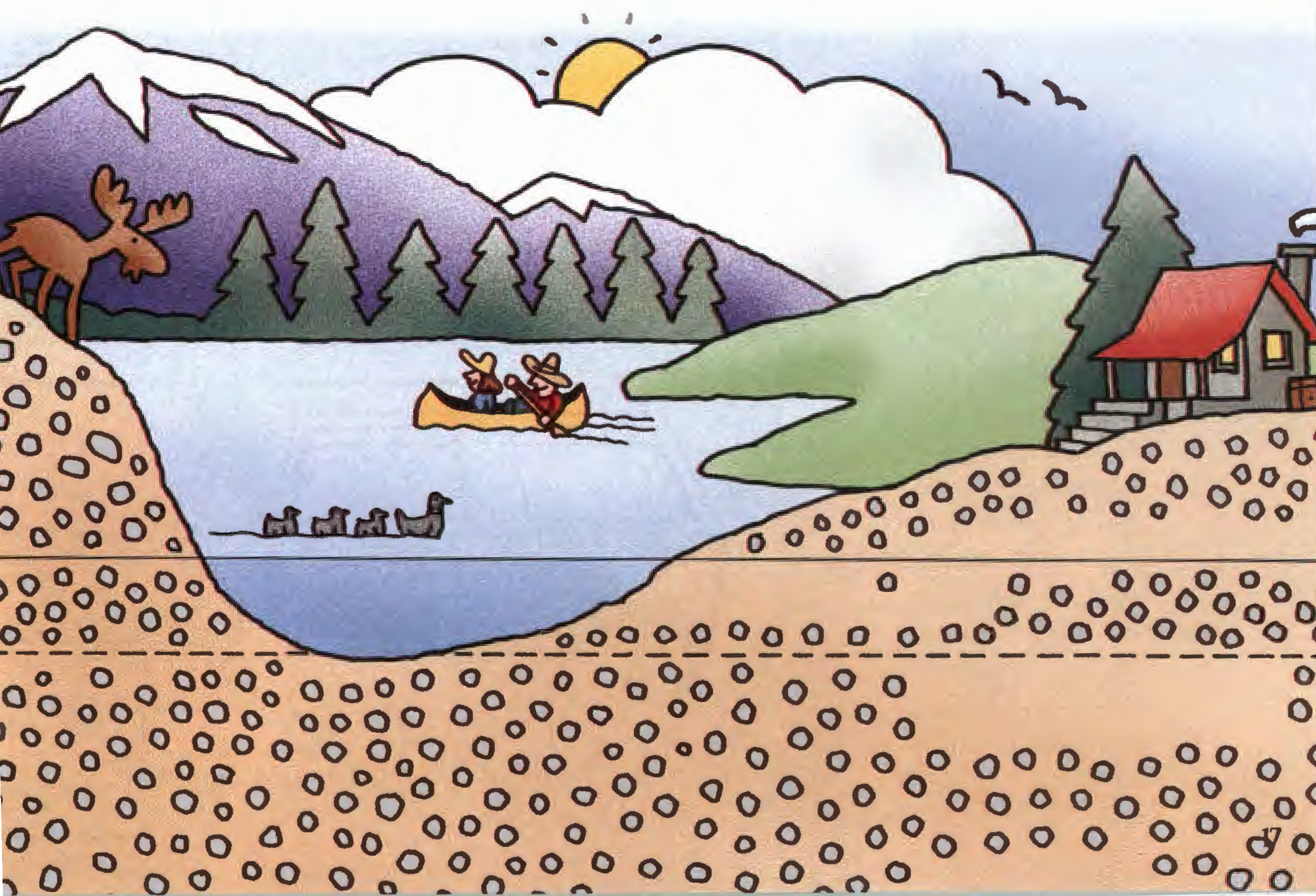
The source can either be **surface water**, such as lakes and rivers, or **groundwater**, which is water below the Earth's surface. The majority of people served by public water systems in the United States and in Canada's major cities are served by surface water. Some surface water sources are created by dams that are built to hold rivers back or capture the flow of natural springs. The water collected behind the dam is called a **reservoir**. This water is then piped to a water treatment plant through **transmission** pipes. Dams are also used to protect areas from flooding and, if they are built with turbines, dams can create electricity. These are called **hydroelectric** dams.

Groundwater can be found in the **porous** areas of underground rock, clay, sand, and gravel. Precipitation evaporates, runs into streams and rivers, and soaks into the soil. Roots of trees and plants may absorb this water, or it can continue to percolate through various layers of sediment and rock formations. Water fills in all of the pores (or spaces) between the grains of rock. Some rock layers are more porous than others and able to trap large amounts of water in what's called an **aquifer**. The top of an aquifer is called the **water table**.

Groundwater is pumped out of the rock layers through drilled wells. Aquifers can be **recharged**, or refilled, by more precipitation soaking through the soil and rock layers. If an aquifer is completely full, a swamp, lake, or spring may form on the surface. If too much water is pumped out for irrigation or a drought occurs, an aquifer can be depleted. As water is pumped out, the surface area of the land drops, and the land becomes more susceptible to flooding. This is called **subsidence**.

Because most pollutants are filtered out as the water percolates through soil, groundwater is generally cleaner than surface water. Recent regulations, however, require most groundwater to undergo a certain level of treatment to ensure that it is clean before it reaches our faucets.

Solve the Problem: In this diagram of a groundwater aquifer, draw where you think wells should be placed. You want to be close to the house for access and want to have water even during dry seasons.

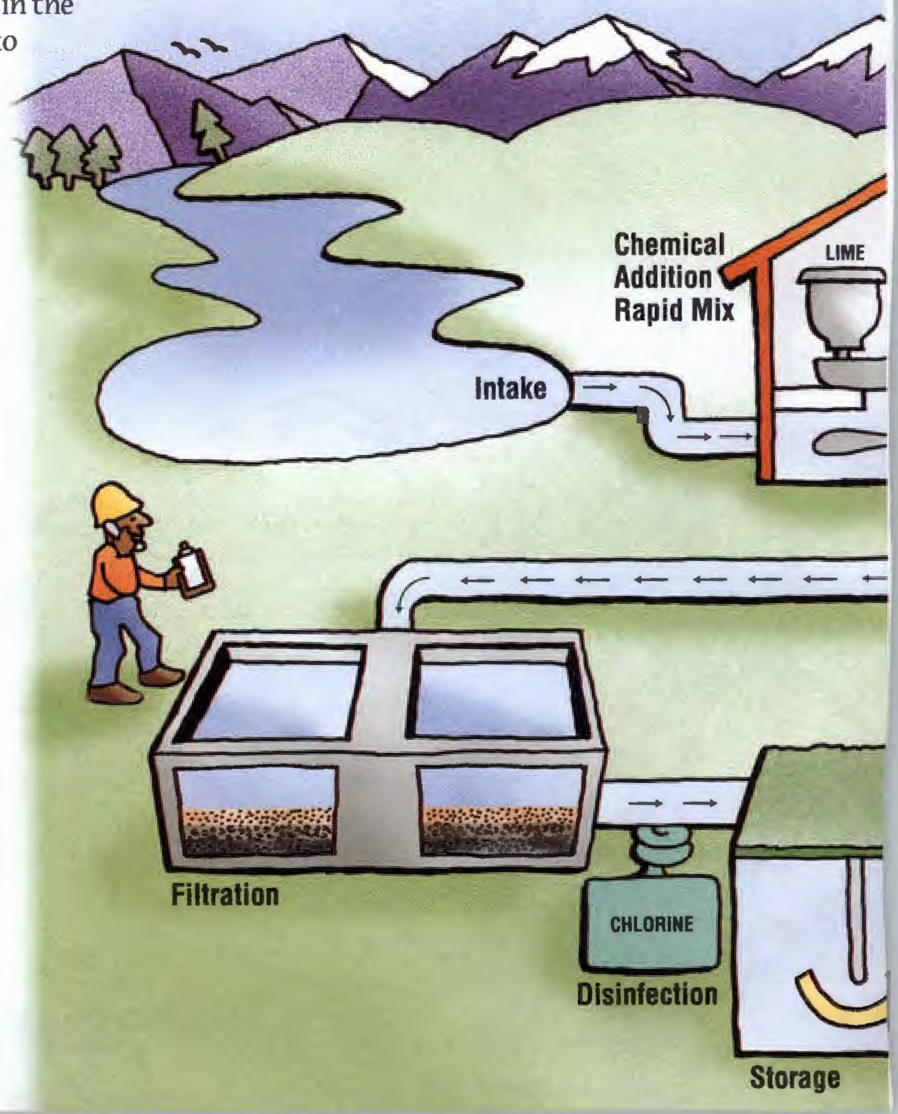


What is water treatment?

Water treatment is the process of cleaning water. Treatment makes the water safe for people to drink. Because water is a good solvent, it picks up all sorts of natural substances. In addition, industry, transportation, agriculture, and other human activities can add pollution to waterways that must be removed before the water can be consumed.

When the **microscope** was invented in the 1850s, germs could be seen in water for the first time. In 1902, Belgium was the first country to use chlorine to clean or treat water in a public water supply. Today, almost every city in the industrialized world treats its drinking water. Treatment includes **disinfection** with **chlorine** or other chemicals to kill germs. Conventional water treatment plants—the most common—follow the same basic process.

1. *Intake.* Water is taken from surface water, and logs, fish, plants, and other large contaminants are screened out before the water is drawn into the treatment plant.
2. *Chemical addition.* Chemicals such as chlorine, aluminum sulfate (alum), and lime-soda ash are added to the water to kill germs, improve taste, remove odor and minerals that may cause staining, and help settle out particles in the water. The water and chemicals are rapidly mixed together to create a reaction that helps the chemicals work.
3. *Coagulation and flocculation.* During this step, the added chemicals continue to react with natural particles in the water, allowing them to cling together during a process called coagulation. The particles are gently stirred during flocculation to form particles called **floc** that are large enough to be removed.
4. *Sedimentation.* The water and the floc particles flow into a sedimentation basin where the floc settles to the bottom and is removed.
5. *Filtration.* After sedimentation, the water flows through filters made of layers of sand, gravel, and sometimes charcoal. Filtration removes any remaining particles left in the water.

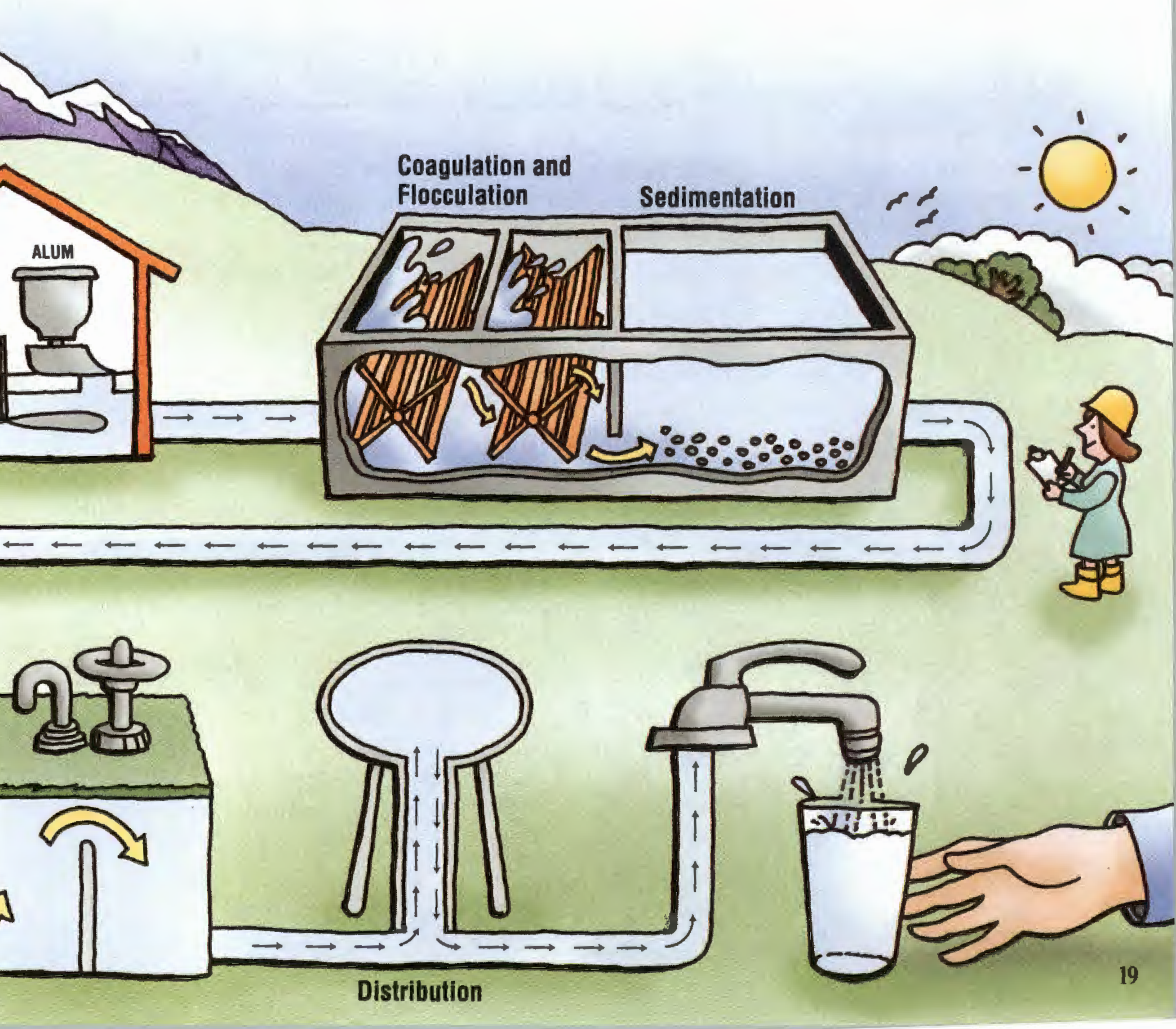


6. *Disinfection.* A small amount of chlorine or other germ-killing chemical is added to the water, which is then held in a closed tank or reservoir called a **clearwell**. Here, the chlorine mixes throughout the water to keep the water safe as it travels to the public through the **distribution system**. In some water systems, especially those with groundwater sources, disinfection is the only treatment necessary.

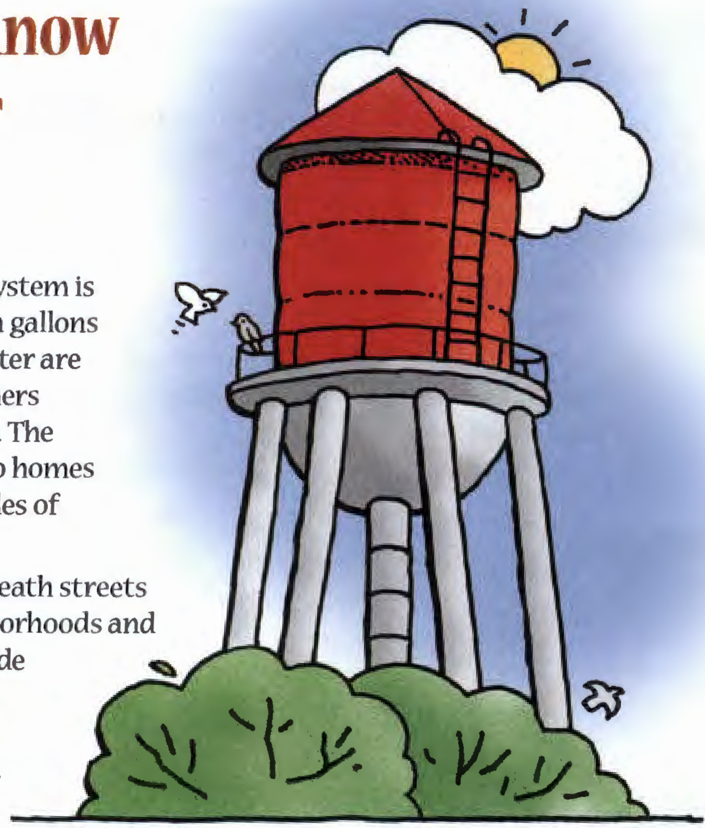
Several other water treatment processes are also effective in cleaning water. These processes are often combined with different steps in the conventional treatment process and include

- *Ultraviolet (UV) disinfection*, which uses a UV (black) light shined into the water, in a manner similar to the solar exposure used by ancient civilizations;
- *Membrane filtration*, which uses filters with extremely tiny holes to screen out contamination;
- *Ozonation*, a chemical that "blasts" germs to death; and
- *Aeration*, which mixes water with air, releasing gaseous contaminants.

Utilities test the water throughout the treatment process to measure the amounts of chemicals and pollutants and ensure the water is safe. When water leaves a treatment plant, it is as clean as or cleaner than required by the standards established by the Safe Drinking Water Act.



What do you know about water distribution?



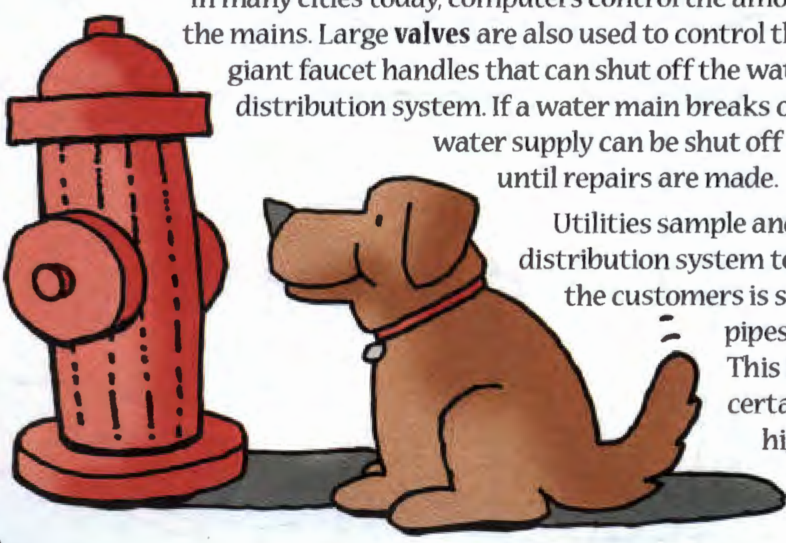
The third part of a water supply system is distribution. Each day, about 40 billion gallons (227 billion liters) of clean drinking water are produced to be distributed to consumers by water systems in the United States. The water treatment plant is connected to homes and businesses through miles and miles of underground pipes.

Large pipes, called **mains**, run beneath streets to carry the water to different neighborhoods and business districts. These pipes are made of iron, concrete, steel, or hard plastic. Buildings are connected to the mains by **service lines**, often made of copper. These service lines are linked to a building's indoor **plumbing**.

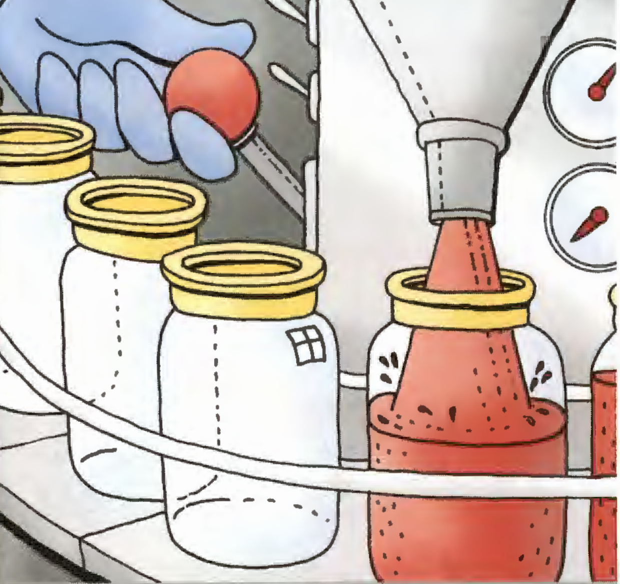
In addition to service lines, **storage tanks** and **fire hydrants** are also connected to the mains. The storage tanks are usually built on high ground so gravity can move the water through the pipes to the customers. This saves energy.

Storage tanks hold water in reserve so there is enough water for everyone to use water at the same time, like in the morning when people are getting ready for school and work. More importantly, tanks store water so there is enough to fight fires. Firefighters connect hoses to hydrants that pull water out of the distribution system when they need to fight a fire. Back in the 1800s, before water treatment plants existed, water distribution systems were built in cities just to provide quick access to water to put out fires.

In many cities today, computers control the amount of water that goes through the mains. Large **valves** are also used to control the water. The valves act just like giant faucet handles that can shut off the water at important points in the distribution system. If a water main breaks or other problems occur, the water supply can be shut off to the broken section of pipe until repairs are made.



Utilities sample and test water throughout the distribution system to make sure the water reaching the customers is safe. They also **flush** the water pipes regularly to keep them clean. This is done by turning off valves at certain points and forcing water at high pressure through a section of pipe and out fire hydrants.



Where is treated water used?

Water is a necessity in all aspects of life. Water distribution systems connect to buildings and irrigation systems throughout a community, providing clean water for many uses. These are some of the different ways that water is used.

RESIDENTIAL (in homes)

- Watering
- Bathing
- Cooking
- Washing
- Recreation (e.g., swimming pools)

COMMERCIAL (stores and service businesses)

- Hospitals
- Restaurants
- Sports arenas
- Schools and universities

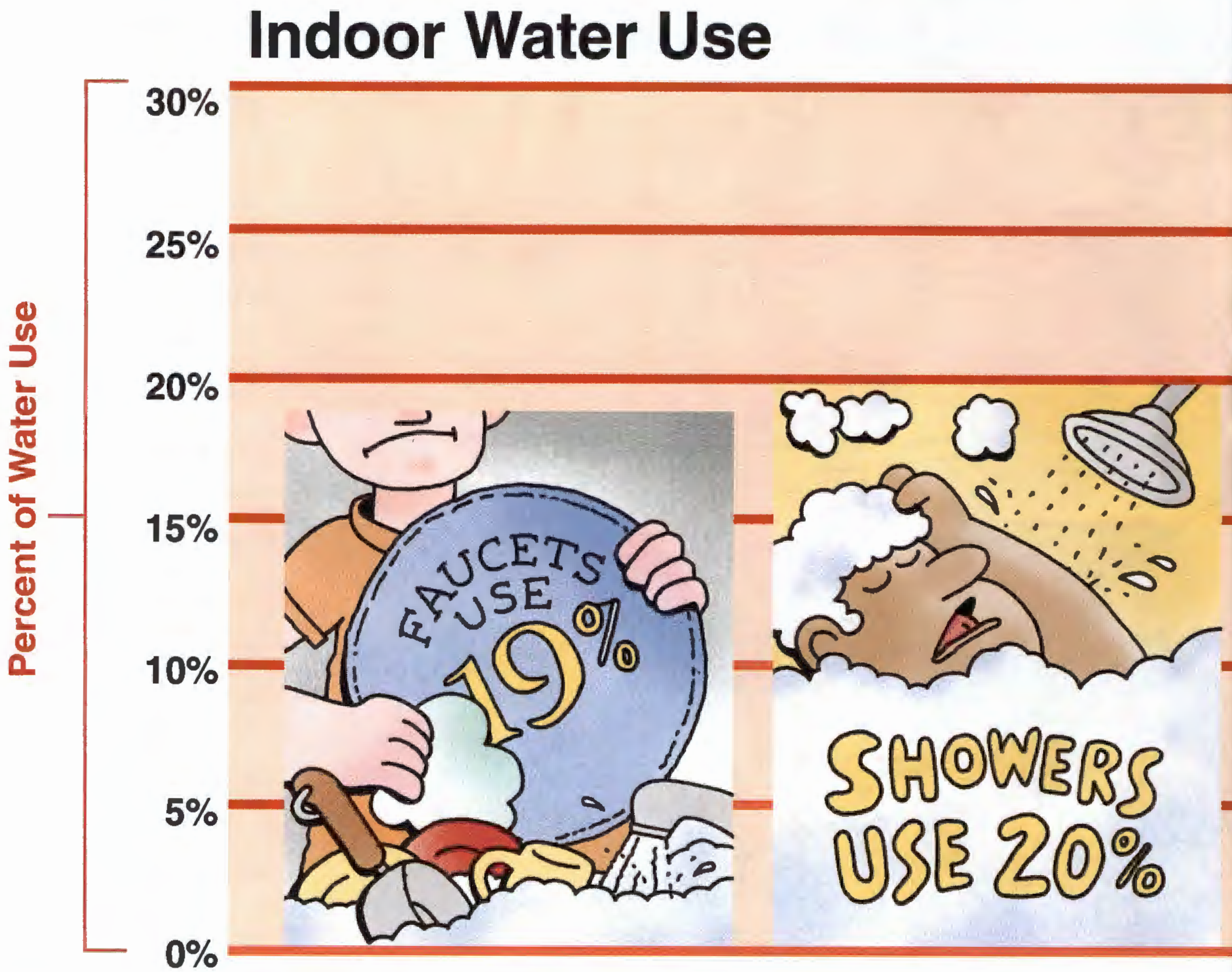
PUBLIC USE

- Parks
- Public pools
- Highway medians

INDUSTRIAL (factories and manufacturing plants)

- Processing microchips for computers
- Ore smelting
- Meat butchering and packing
- Food processing
- Producing electricity

Solve the Problem: Which of the listed activities would be appropriate for reused water—clean water that doesn't need to meet drinking water standards?

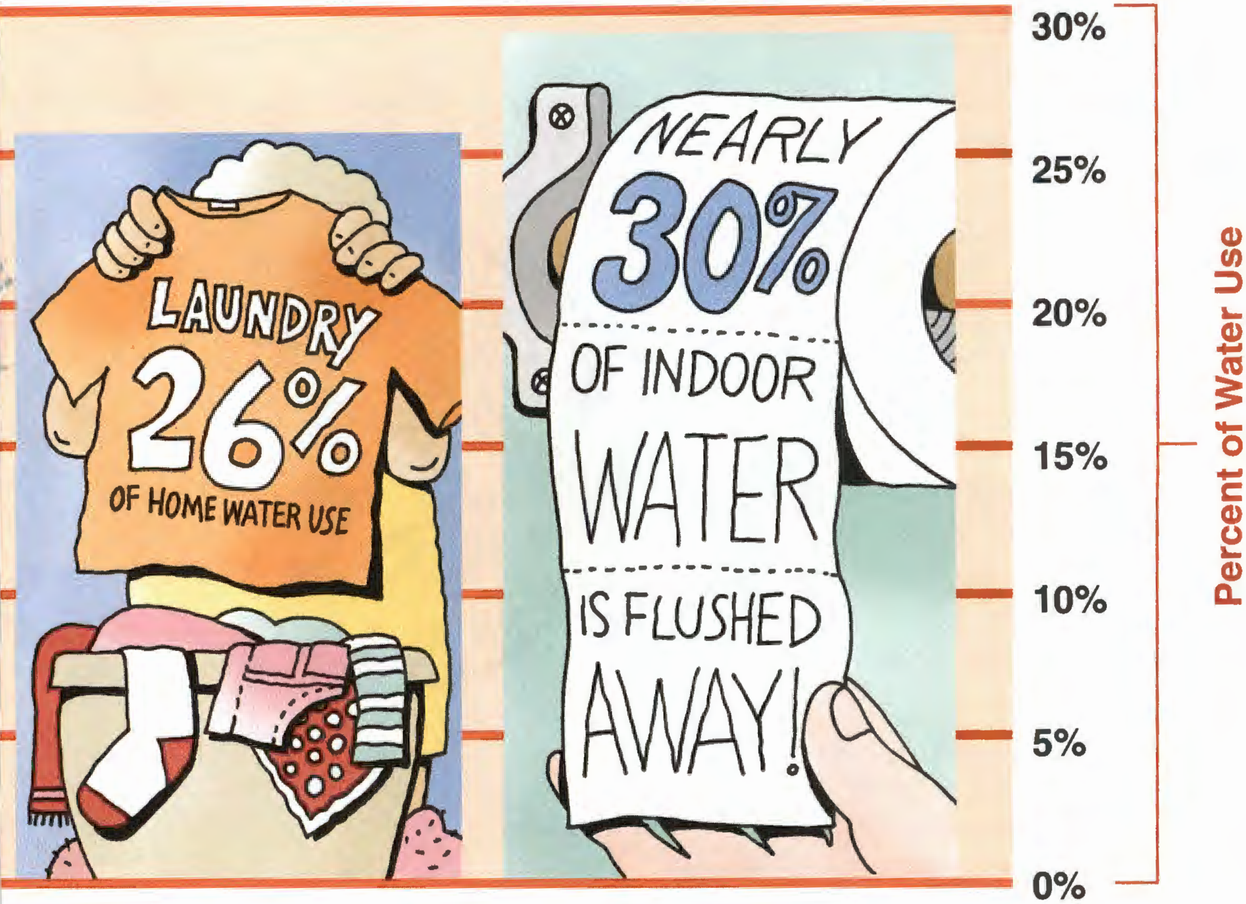


What can you do to save water?

A person needs only five gallons of clean water a day to meet basic needs, but most North Americans use much more than that. A typical U.S. household of four people uses 400 gallons (1,514 liters) of water per day. Much of that water goes to watering the lawn. Indoors, nearly 30 percent is flushed down the toilet. Clothes washing accounts for 26 percent of that use, followed by showers at 20 percent and faucets (dishes, washing hands, brushing teeth, etc.) at 19 percent.

Water-saving toilets and other fixtures can save more than 11,000 gallons (41,600 liters) per year in an average home. For example, low-water-use toilets require less than 1.3 gallons (4.9 liters) per flush, compared to 3.5 gallons (13.2 liters) per flush for older, less-efficient models. Conserving water also conserves energy, because it takes energy to treat and deliver the water that you use every day.

A lot of water is wasted because of leaky fixtures. A dripping faucet that fills an 8-ounce (237-milliliter) container in less than 30 minutes can waste as much as 1,225 gallons (4,637 liters) of water each year. To detect hidden leaks, look at your family's water bill. It will tell you how much water is used per month, or per billing period. If four people live in your house and the bill shows more than 12,000 gallons (45,400 liters) used per month during a winter month, such as January or February, your house probably has some serious leaks.



What are some ways you can save water?

1. Take a shower instead of a bath. A full bathtub uses about 70 gallons (265 liters) of water, while a five-minute shower uses just 10 to 25 gallons (38 to 95 liters).
2. Be a drip detective. Check all faucets, toilets, and appliances for leaks. A leaky faucet can waste as much as 1,225 gallons (4,630 liters) of water a year.
3. Clean vegetables in a pan of water rather than under running tap water, then give your plants a drink with the used water.
4. Run the dishwasher and clothes washer only when full.
5. Cool your drinking water in the refrigerator instead of running the tap.
6. Run water at less than full flow, and turn the faucet off when you floss and brush.
7. Adjust the height of your lawn mower to cut your grass higher. A lawn height of 2½ to 3 inches (6.3 to 7.6 centimeters) helps protect the roots from heat stress and reduces the loss of moisture to evaporation.
8. Use a broom or rake, not the hose, to remove debris from driveways and walkways.
9. Keep swimming pools covered when not in use to slow evaporation.
10. Water lawns and plants early in the morning or in the evening, when the sun's rays aren't working to evaporate your water.

Water—A great value

Water from the tap is a bargain. The average price of water in the United States is about $1.50 for 1,000 gallons. At that price, a gallon of water costs less than a fraction of a penny.

One gallon of tap water = less than ½ of 1 cent

One gallon of bottled water = $1.43 – $8.00

One gallon of soda pop = $2.80 – $4.60

One gallon of milk = $3.79 – $4.24

One gallon of gasoline = $2.49 – $3.75

One gallon of table wine = $5.45 – $37.95

One gallon of coffee-shop lattés (individually served) = $35.00 – $52.00

One gallon of imported olive oil = $135.00 – $525.00

One gallon of French perfume = $60,160

Based on 2010 U.S. prices.

An 8-ounce (237-milliliter) glass can be refilled with tap water approximately 15,000 times for the same price as a six-pack of soda. Bottled water costs about 1900% more than water straight from the tap. What do you think is the better bargain?

As you have learned in this story of drinking water, the water that your local utility delivers to your tap is monitored for more than 100 contaminants and meets close to 90 regulations for water safety and quality. The bill your family receives for tap water pays for much more than simply water. You get sophisticated water treatment, frequent testing and monitoring, and a vast network of pipes, pumps, valves, tanks, hydrants, and meters that delivers the water to your home every day.

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