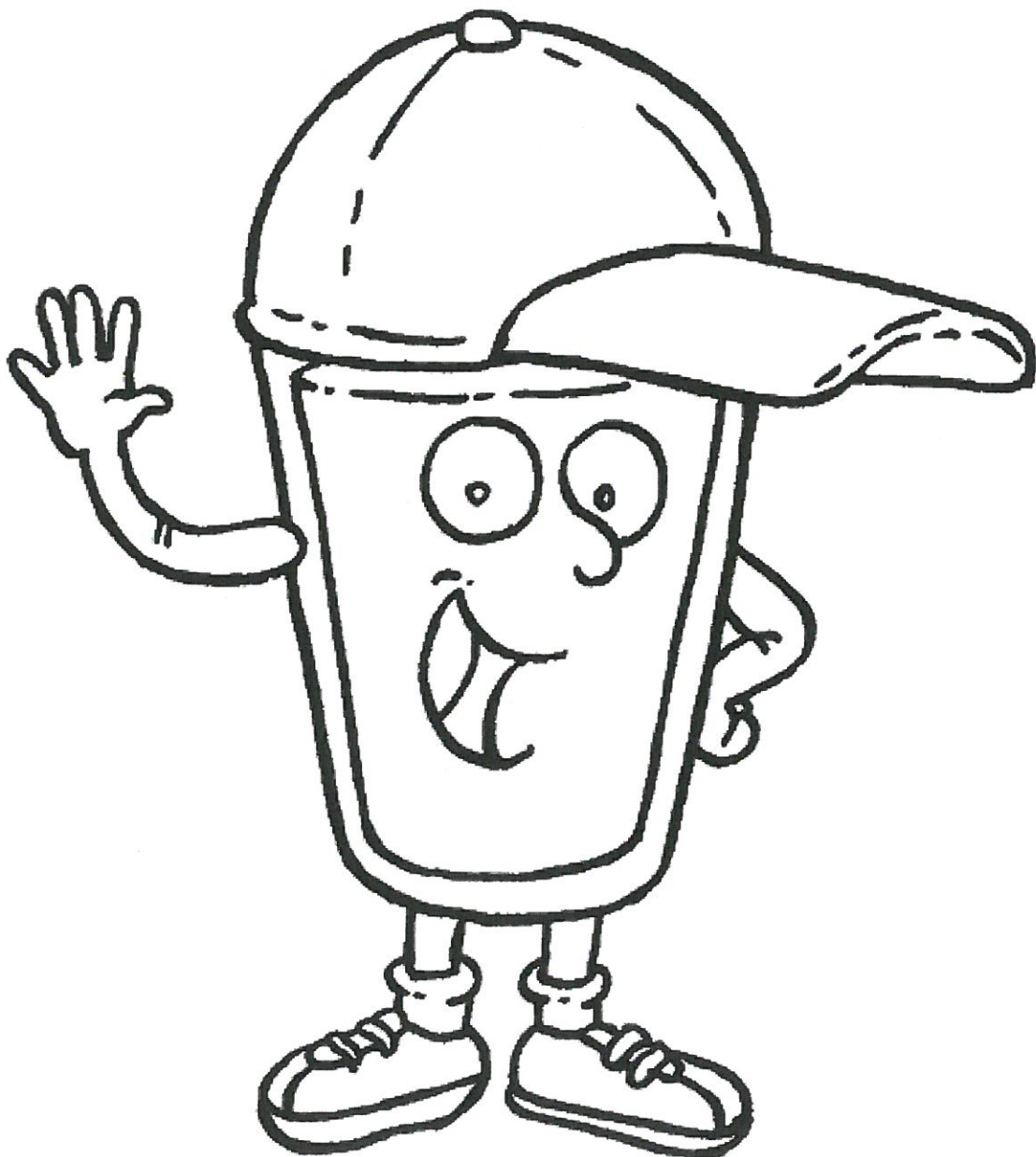
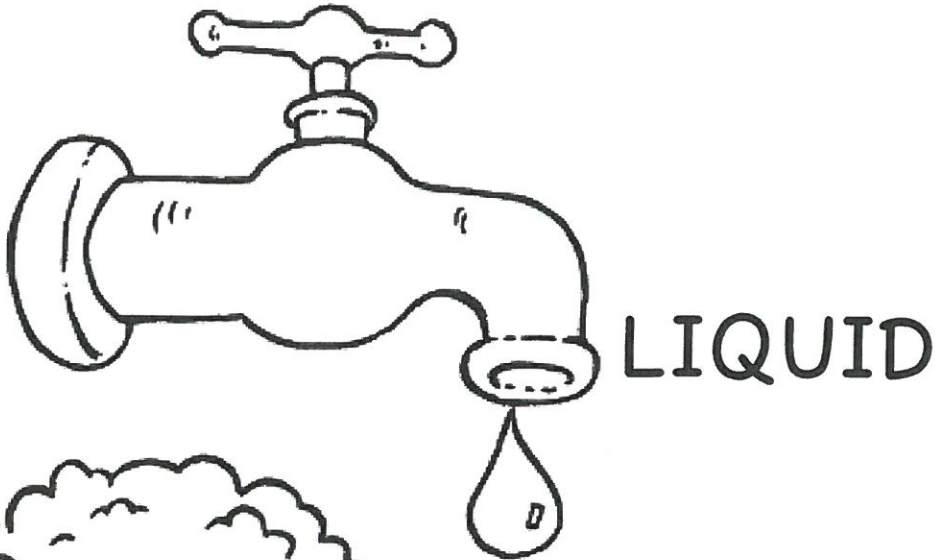


Hello, my name is Thirstin. I am here
to talk about protecting and conserving
DRINKING WATER.

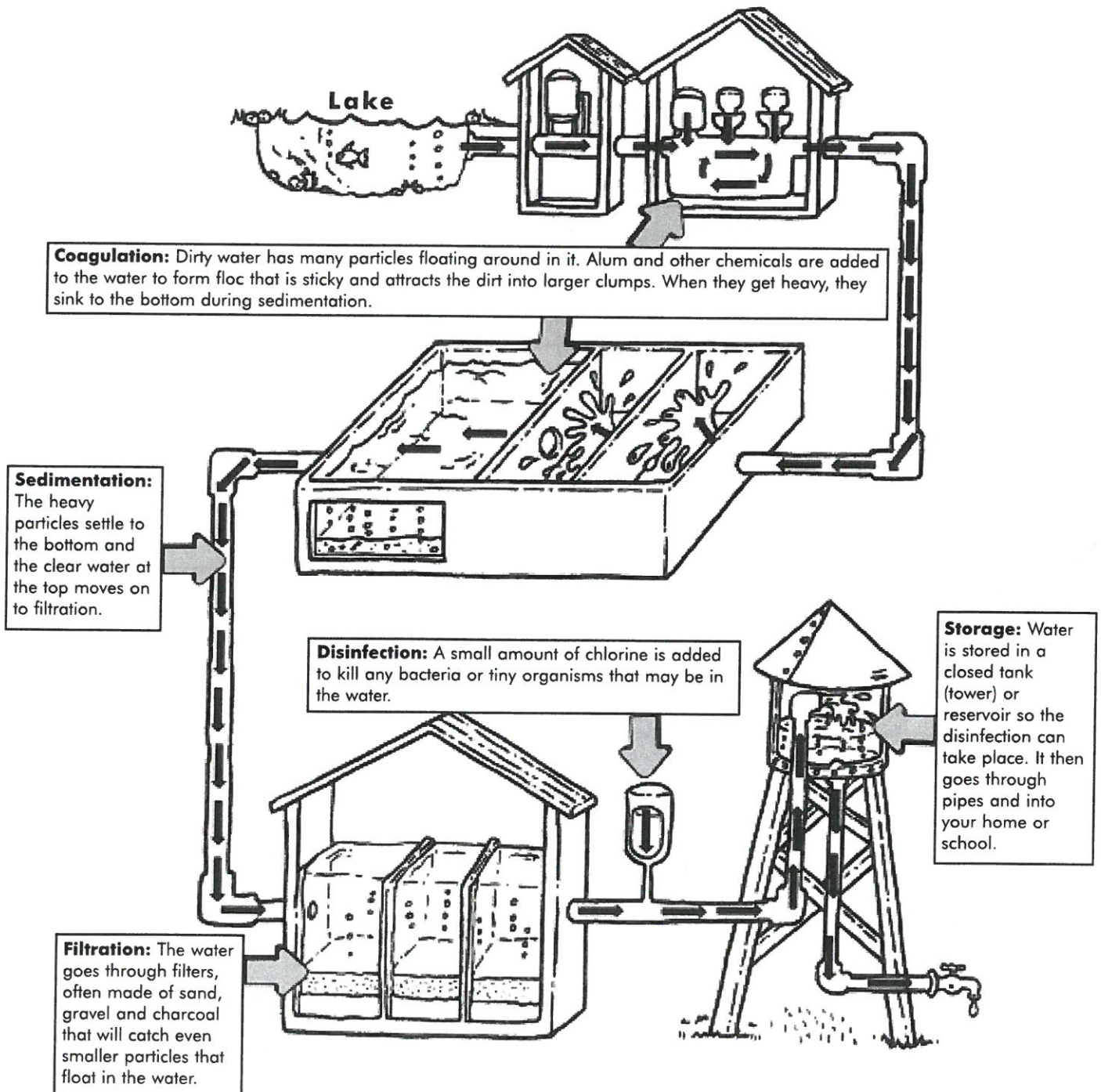
Follow me and I'll show you some fun facts
and activities about water.



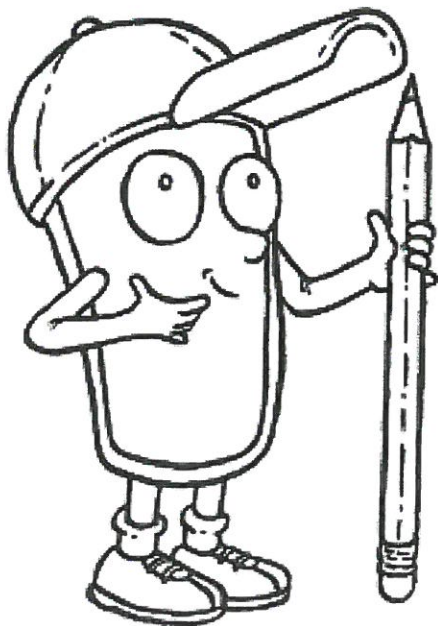
Water comes in three different forms:



Water can get dirty, so before we can drink it, it must be clean. Water is cleaned at a Treatment Plant and then sent to our homes through pipes.



P M A E R T S B G T
X O B F L A K E H R
W T L I D J O Q T E
P A X L L L E W L A
I N T T U G V P U T
P F O E Y T D W C M
E V S R R A I M K E
S T R Z B N P O Y N
N E F A S K W A N T



Find and circle these words:

STREAM

WELL

FILTER

TREATMENT

PIPES

TANK

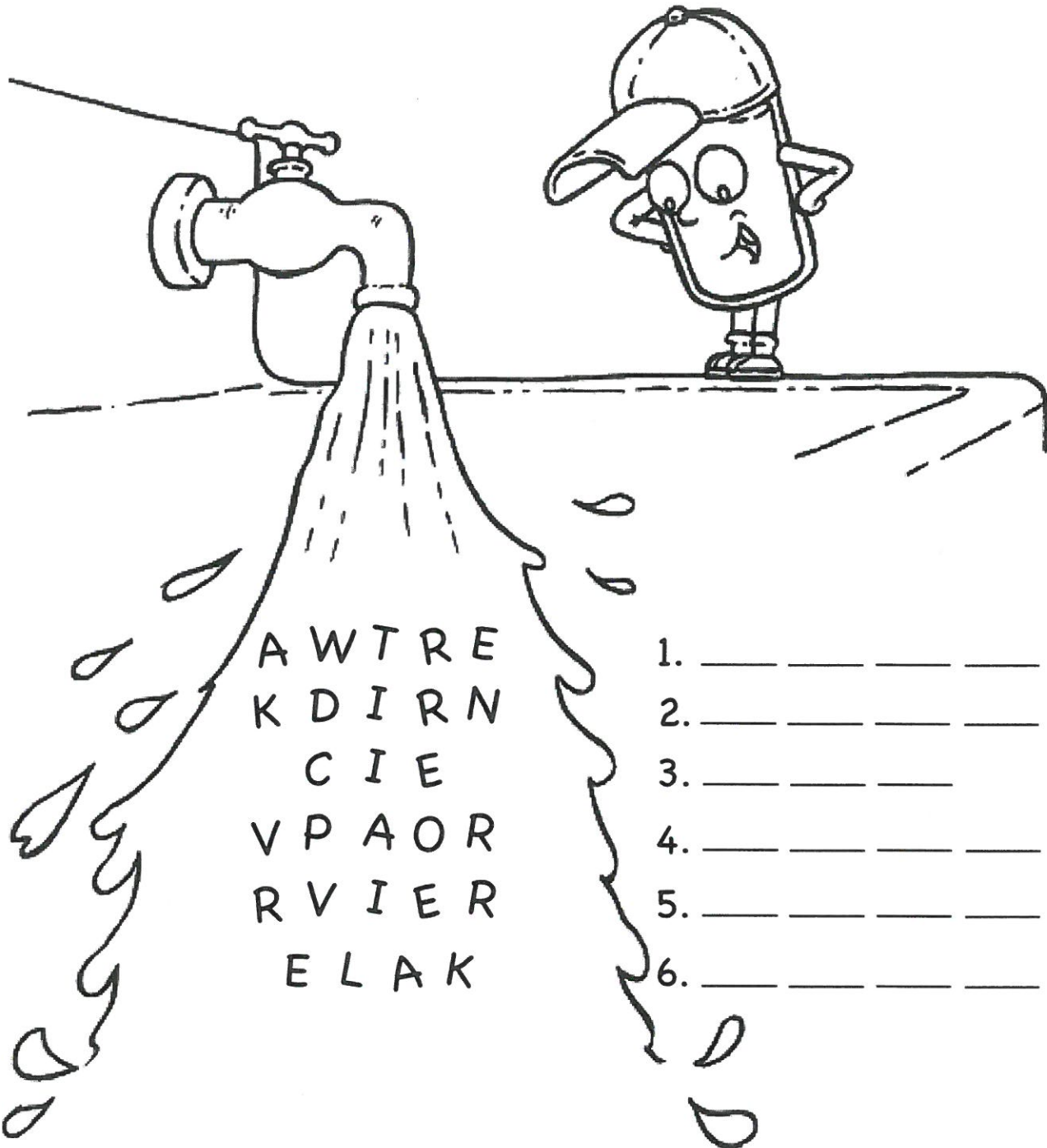
SAFE

POLLUTION

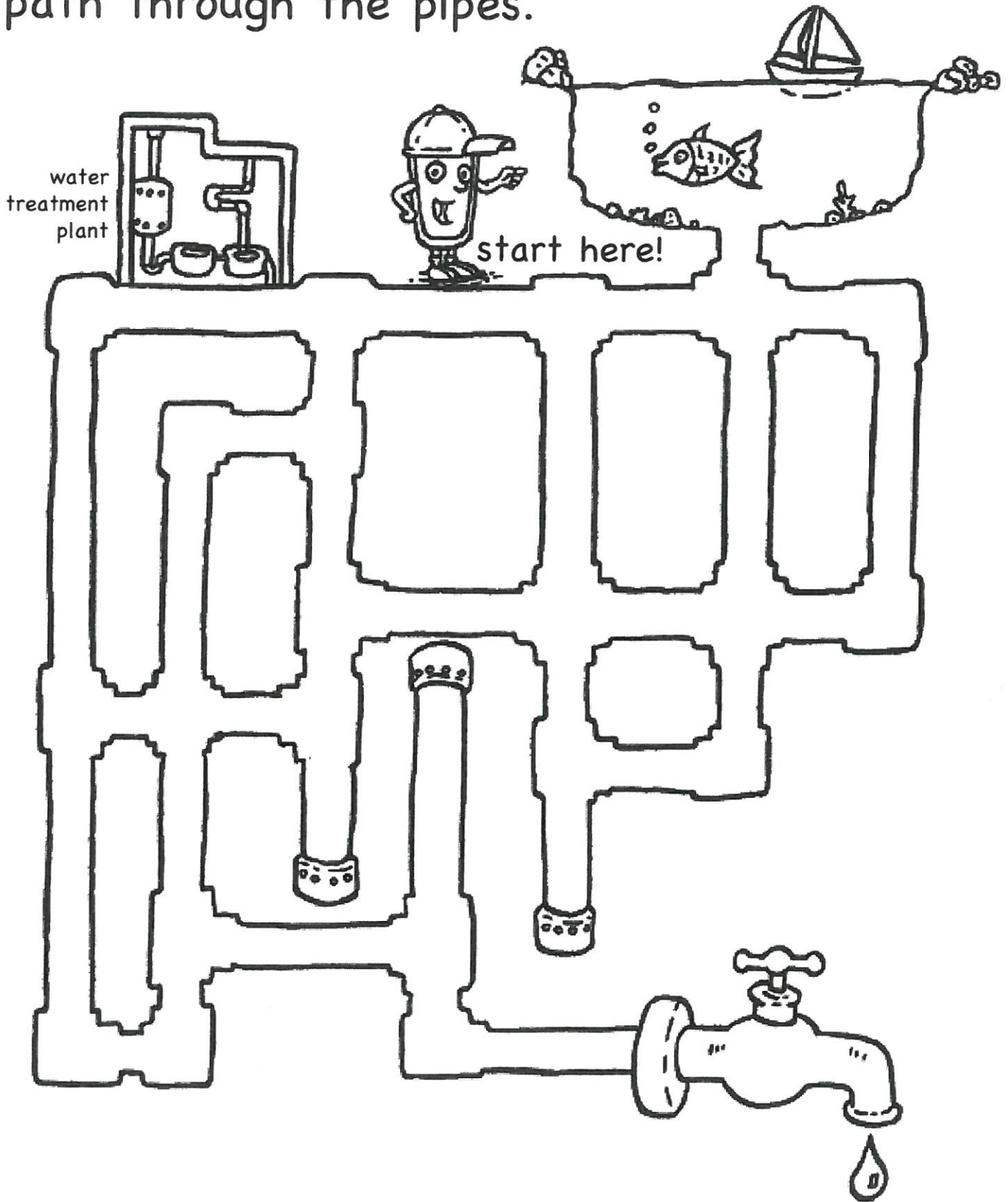
WATER

LAKE

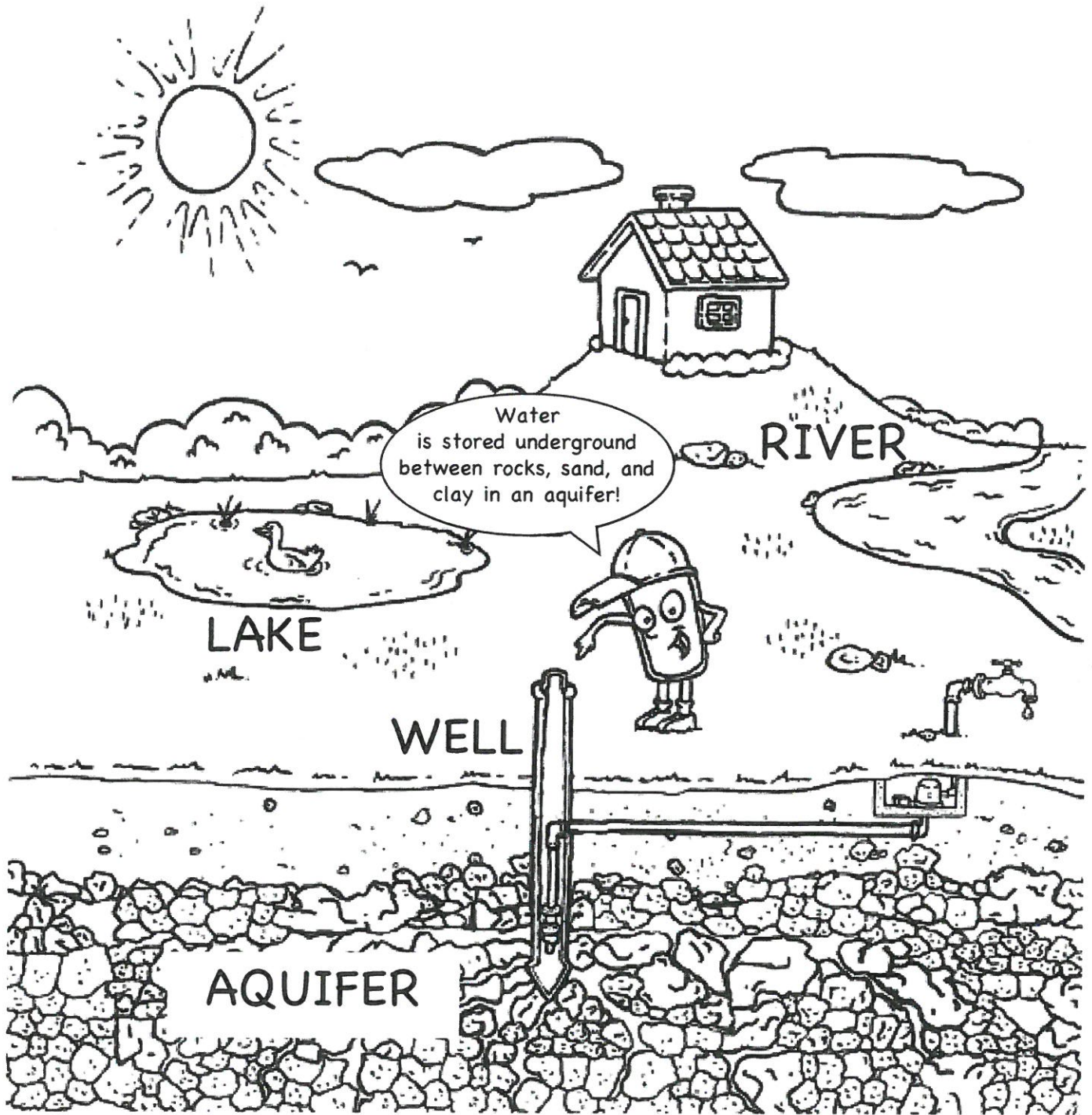
Unscramble the letters:



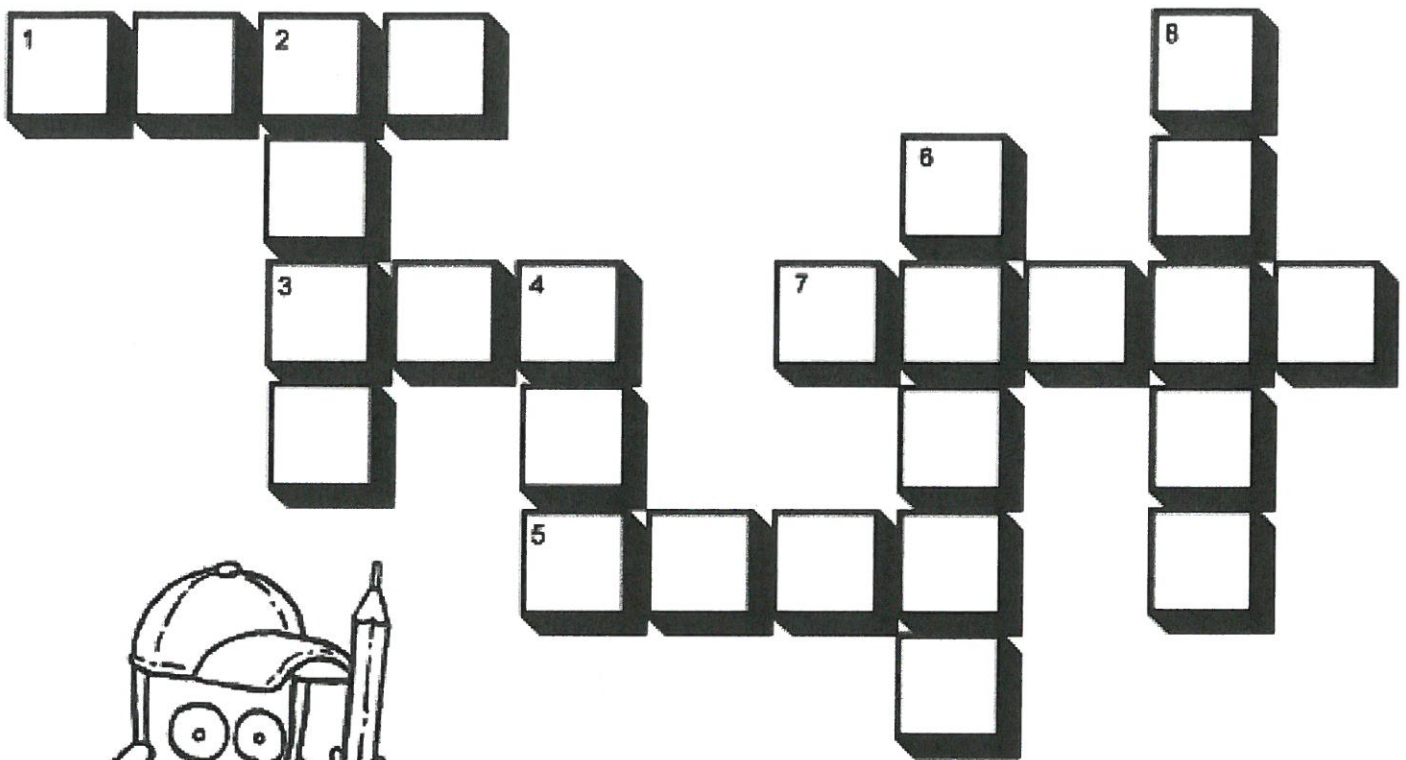
Help the water find its way from the lake to your faucet by following the correct path through the pipes.



Drinking water comes from lakes, rivers, streams, or under the ground (ground water).



Complete the crossword puzzle to test your knowledge of water.



ACROSS

1. Always _____ your hands before dinner.
3. Add this to water to make it cold.
5. Big body of water.
7. If you have a leaky faucet, get it _____.

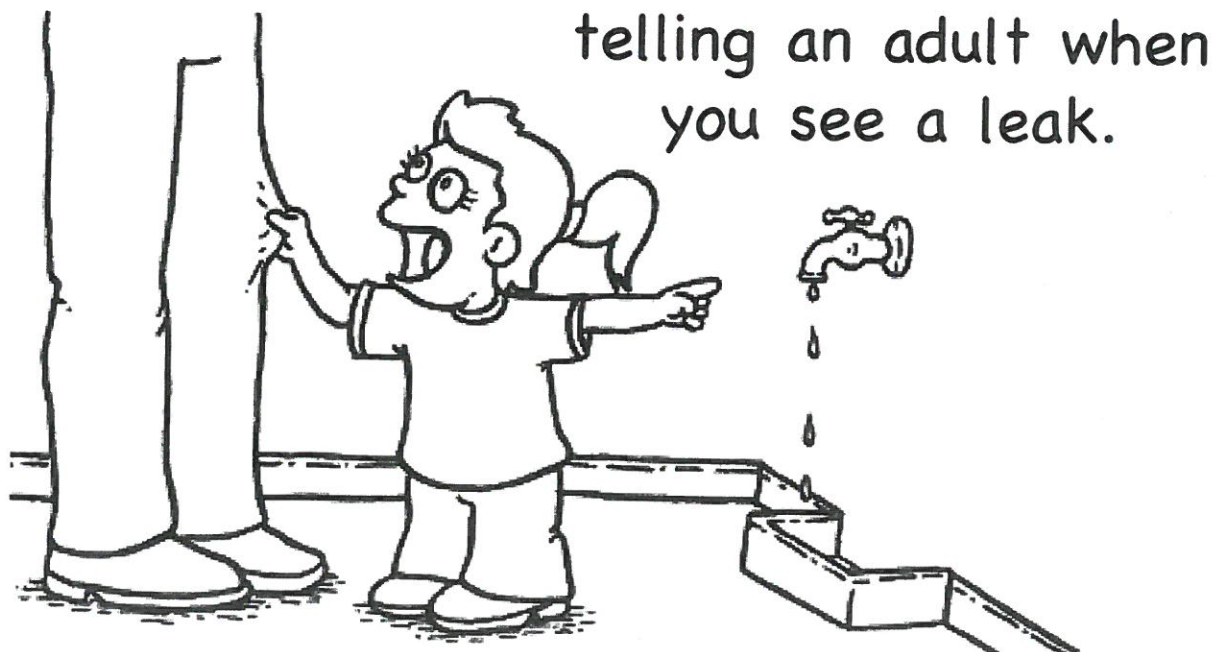
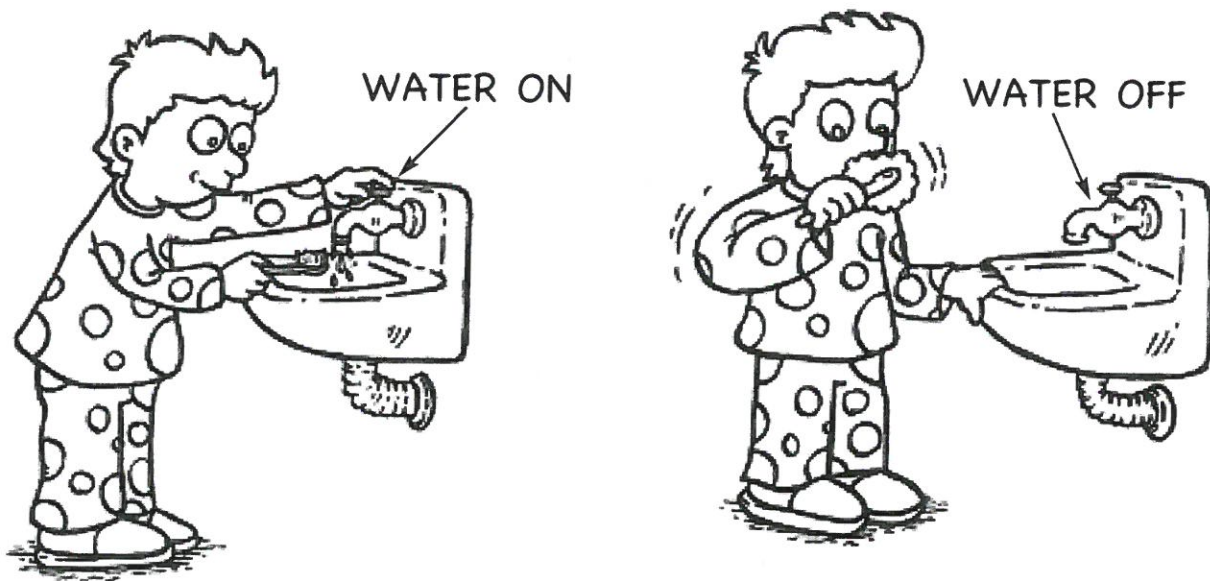
DOWN

2. People go to the beach to _____.
4. Snake-like fish.
6. Water travels through these.
8. When you boil water, _____ rises out of the pan.

Because we need water to live, it is important to conserve as much water as we can.

You can help by:

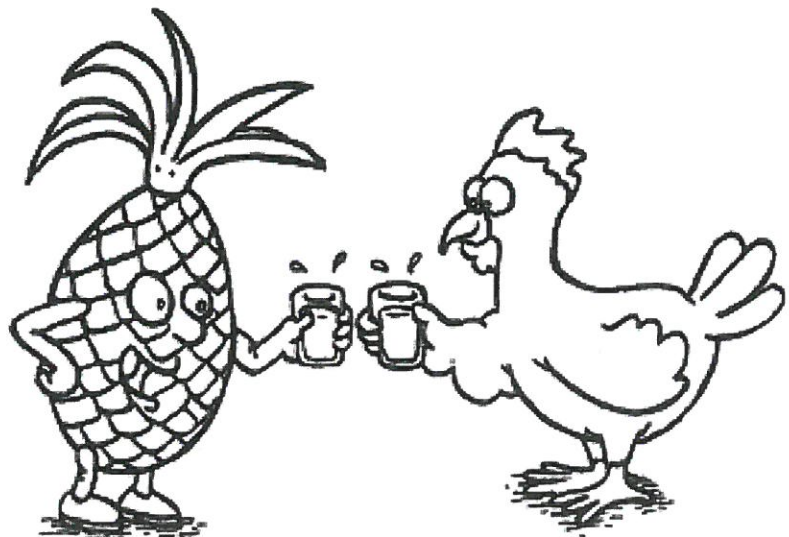
turning off the water when you're not using it, and . . .



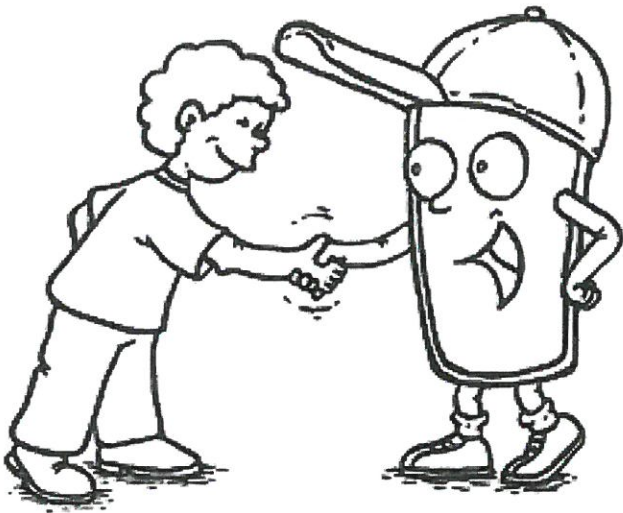
WATER TRIVIA!

Fun Facts About Water . . .

1. How much water does it take to cook a Hamburger?
Approximately one gallon.
2. How long can a person live without food?
More than a month.
3. How long can a person live without water?
Approximately one week, depending upon conditions.
4. How much water is used to flush a toilet?
2-7 gallons.
5. How much water is used to brush your teeth?
2 gallons.
6. How much water does an individual use daily?
50 gallons.
7. How much of a chicken is water?
75%
8. How much of a pineapple is water?
80%
9. How much of an elephant is water?
70%
10. How much of an ear of corn is water?
80%



REMEMBER!



Your help is needed to keep drinking water clean!

Keep rivers, lakes and streams free of trash!

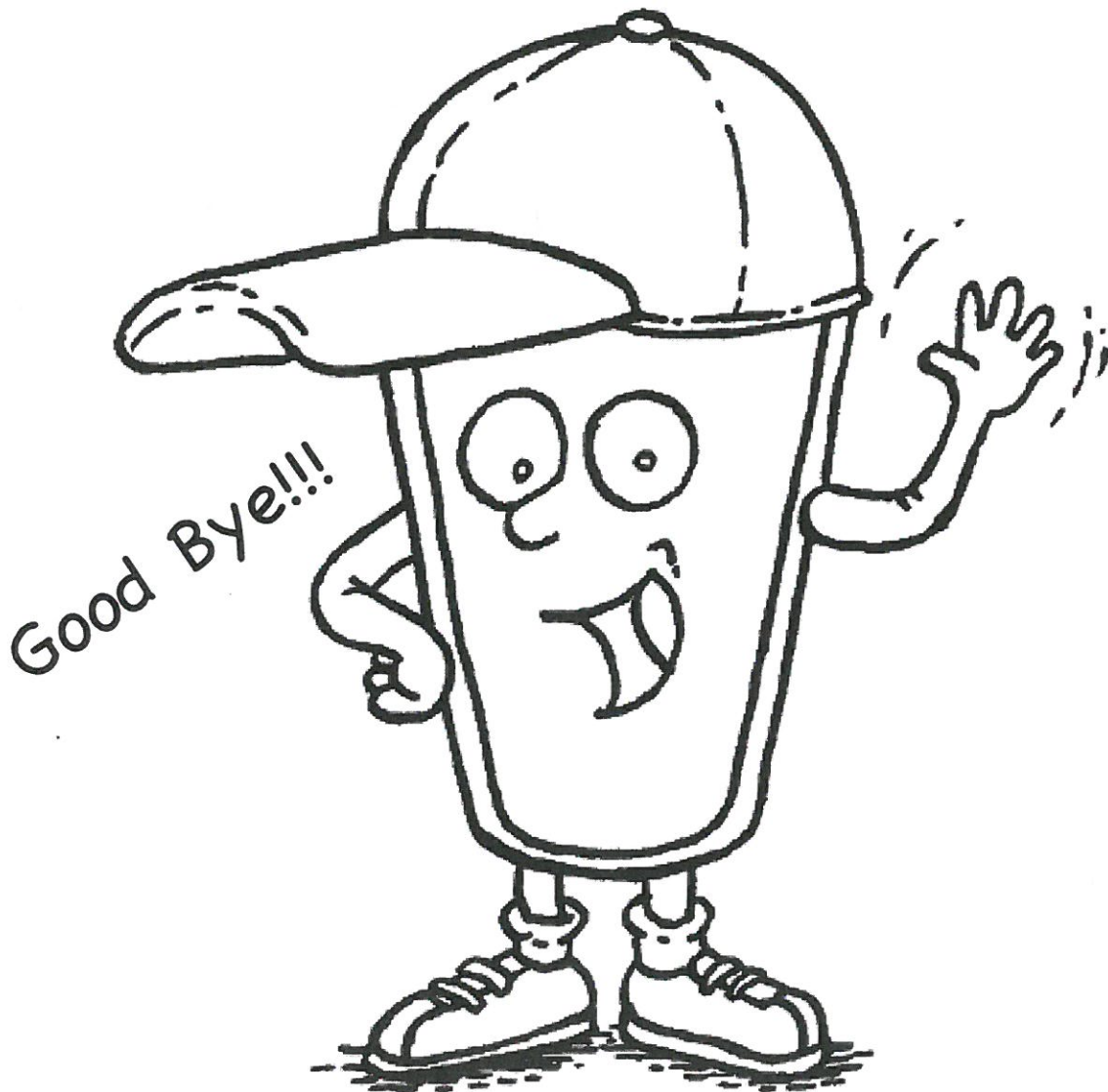
Never allow oil or gasoline to be poured on the ground!

Make a list below of other things you can do to help:

FOR MORE INFORMATION AND
ACTIVITIES, VISIT OUR WEBSITE AT:

www.epa.gov/safewater

Click on Kid's Stuff and submit
an art project!



GAME ANSWERS

Word Search Game



Word Scramble Game

1. WATER
2. DRINK
3. ICE
4. VAPOR
5. RIVER
6. LAKE

Crosswords Game

- | ACROSS | DOWN |
|----------|----------|
| 1. WASH | 2. SWIM |
| 3. ICE | 4. EEL |
| 5. LAKE | 6. PIPES |
| 7. FIXED | 8. STEAM |

Take the Stormwater Runoff Challenge

Across:

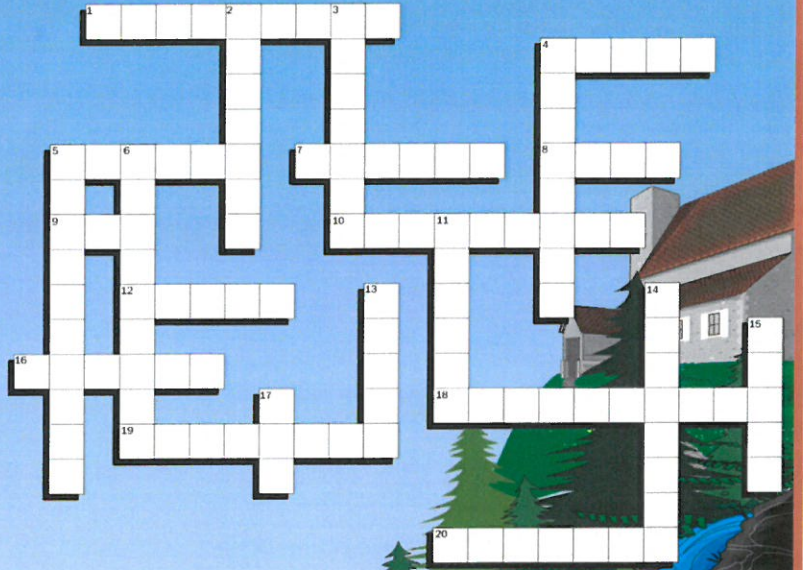
- 1) The area of land that drains into an estuary, lake, stream, or groundwater is known as a _____.
- 4) The _____ of speeding boats can erode shorelines.
- 5) Maintaining your _____ tank will help to prevent bacteria and nutrients from leaking into groundwater and surface waters.
- 7) Wetland plants act like a natural water _____, removing harmful pollutants from stormwater runoff.
- 8) Leave your grass clippings on your _____ to reduce the need for commercial fertilizers.
- 9) A single quart of motor _____, if disposed of improperly, can pollute 2 million gallons of water.
- 10) Fertilizers and animal wastes contain _____ that "feed" algae and other aquatic plants harmful to water quality.
- 12) Polluted runoff from both rural and _____ sources has a significant impact on water quality.
- 16) Storm _____ don't always connect to sewage treatment plants, so runoff can flow directly to rivers, lakes, and coastal waters.
- 18) Follow directions carefully when applying _____ on your lawn—more isn't always better.
- 19) Polluted runoff (also called _____ source pollution) comes from so many places that it's hard to "pinpoint" a source.
- 20) Yard and vegetable food waste are suitable additions to a _____ pile.

Down:

- 2) Don't dump used motor oil into storm drains. _____ it!
- 3) _____ of soil from barren land can cloud nearby streams.
- 4) _____ prevent flooding, improve water quality, and provide habitat for waterfowl, fish, and wildlife.
- 5) Marking "Do Not Dump, Drains to Bay" on a _____ is one way to educate people about polluted runoff.
- 6) Excess sediment, nutrients, toxics, and pathogens are all types of runoff _____.
- 11) Polluted _____ is the nation's #1 water quality problem.
- 13) The cattail is one wetland _____ that helps purify polluted runoff.
- 14) Too much _____ in water can harm aquatic life.
- 15) Proper crop and animal management on _____ helps to control water pollution.
- 17) _____ impact development helps control stormwater pollution through conservation approaches and techniques.

Choices:

compost	nonpoint	sediment
drains	nutrients	septic
erosion	oil	storm drain
farms	plant	urban
fertilizer	pollution	wakes
filter	recycle	watershed
lawn	runoff	wetlands
Low		



For more information, please visit EPA's
Polluted Runoff web site at www.epa.gov/nps

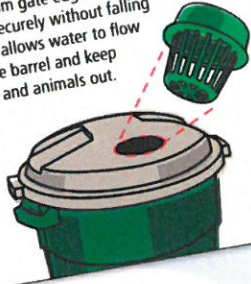
Printed with soy based inks on recycled paper.

What Do I Need to Get Started?

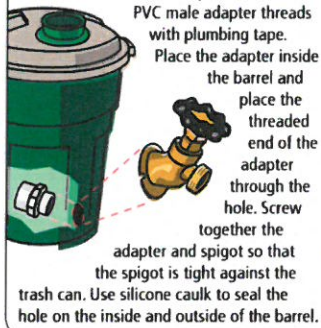
All of the following items can be purchased at your local hardware store for a total cost of around \$30 depending on the type of trash can and brand of fittings you purchase.

- Outdoor trash can with lid (any size will work – the larger, the more water you will collect)
- Downspout flex-elbow
- 6 inch atrium grate
- Sump pump drain hose kit (kit includes: one 1/4 inch, 24 ft. hose, and one 1 1/4 inch insert male adapter)
- 1 1/4 inch PVC female adapter
- 3/4 inch spigot with sillcock
- 3/4 inch PVC male adapter (do not get CPVC male adapter)
- Electric drill
- 1 inch drill hole saw (type of drill bit)
- 1 1/2 inch drill hole saw (type of drill bit)
- File
- Silicon caulk
- Plumbing tape (also known as Teflon tape)
- Felt tip pen
- Utility scissors or utility knife
- Hacksaw (for cutting downspout if desired)
- 2-4 Concrete blocks

STEP 1: Trace the outline of the top of the atrium grate (largest circle) on the top of the barrel with a felt tip pen. Next, with utility scissors or a utility knife, cut a hole out of the lid by following the traced line. The hole should be snug enough to allow the atrium gate edge to sit on top of the barrel securely without falling in. This allows water to flow into the barrel and keep debris and animals out.



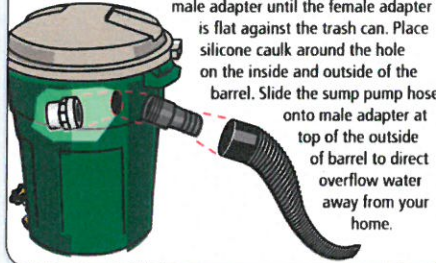
STEP 2: Drill a 1 inch hole about 1 1/2 to 2 inches from the bottom of the barrel. Leave enough distance between the hole and the barrel's bottom to allow the barrel to sit flat on the ground without the spigot hitting the ground. Insert spigot on outside of barrel. Wrap the 3/4 inch PVC male adapter threads with plumbing tape.



5 Easy Steps to Make a Rain Barrel

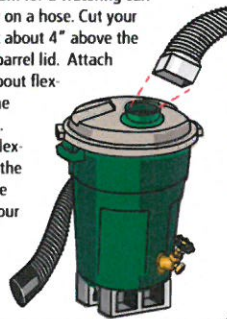
These steps serve as a guideline for the construction of your own rain barrel. Changes can be made based on your personal preferences.

STEP 3: Choose the side of the barrel that you want to place your overflow valve, and drill a 1 1/2 inch hole about one to two inches below the top of the barrel. Use your file to enlarge the hole enough to insert the 1 1/4 inch male adapter from the outside of the hole. Screw together the 1 1/4 inch female adapter on the inside to the male adapter until the female adapter is flat against the trash can. Place silicone caulk around the hole on the inside and outside of the barrel. Slide the sump pump hose onto male adapter at top of the outside of barrel to direct overflow water away from your home.



STEP 5: Congratulate yourself on your hard work and for making a difference in reducing stormwater pollution. Make sure to let all the caulk dry thoroughly before using. Enjoy your rain barrel!

STEP 4: Place 2 concrete blocks under your selected downspout as a raised base to allow room for a watering can or to screw on a hose. Cut your downspout about 4" above the top of the barrel lid. Attach the downspout flex-elbow to the downspout. Direct the flex-elbow into the atrium grate on top of your trash can.



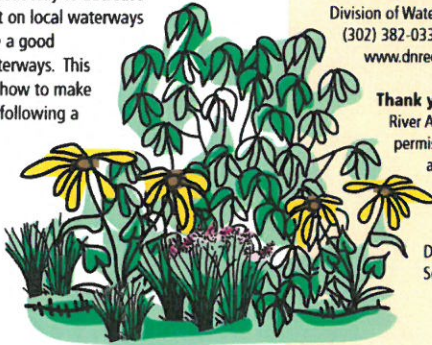
What Are Rain Barrels and Why Should I Use One?

A rain barrel is a container that collects and stores the water from roofs and downspouts for future uses such as watering lawns, gardens, and house plants; cleaning off gardening tools; and washing your car.

Rain barrels help to **lower your water bills**, particularly in the summer months by collecting thousands of gallons of free water a year that you don't have to buy!

Rain barrels are also important for our environment because they help reduce water pollution by decreasing the amount of stormwater runoff reaching our streams and rivers. **Think about it.** The average rainfall of one inch within a 24 hour period can produce more than 700 gallons of water that run off a typical house! While it's running from our homes and lawns, this stormwater picks up anything on the ground such as litter, excess fertilizer, pet waste, and motor oil and transports it to storm drains that **DO NOT** treat the water before dumping it directly into our waterways. So, rain barrels play an important role in protecting our water resources by collecting the stormwater runoff from our homes before it reaches our local streams and rivers.

Using rain barrels is a great way to decrease your household's impact on local waterways and to help you become a good steward of our local waterways. This brochure will show you how to make your own rain barrel by following a few simple steps!



Important Tips for Using Your Rain Barrel

- Do not use collected water for drinking, cooking or bathing.
- Keep lid secure so children and pets cannot fall in and make sure that all other openings are secured to help prevent mosquitoes from entering the barrel.
- The atrium gate should prevent most mosquitoes but eggs could still fall through so for added mosquito prevention add a tablespoon of vegetable oil to the water every season or try a mosquito dunk that kills mosquito eggs but is non toxic to plants and animals.
- When using the overflow valve, make sure water drains away from structures and does not flow onto pavement, sidewalks, or neighboring properties.
- Disconnect the barrel from the downspout during winter months to avoid the formation of damaging ice in the barrel.
- Paint or decorate your rain barrel to make it a distinct part of your yard or garden!

For more information contact:

Delaware Department of Natural Resources
and Environmental Control

Division of Watershed Stewardship
(302) 382-0335 or (302) 739-9922

www.dnrec.delaware.gov/swc/wa/Pages/EducationalTips.aspx



Thank you to the Appoquinimink
River Association for their
permission to use their artwork
and reprint this brochure.



Funding for this brochure was supplied by
the EPA Clean Water Act 319 funding through the
DNREC Division of Watershed Stewardship Nonpoint
Source Program.

Rain Barrels



STORMWORKS

innovative rainwater management



PRODUCTS

Rain Barrels

Rain Garden

Rain Barrel Maintenance

RAIN BARRELS

Oh, Contain Yourself!



RAIN GARDENS

StormWorks rain gardens are designed to capture rainwater runoff and keep it from entering your

[Read More ...](#)



Rain barrels and cisterns are becoming very popular among conservation-minded property owners, and for good reason. They are loved by gardeners, residents trying to reduce flooding in their yard or basement, and anyone who is committed to doing their part to make their community better.

A rain barrel is a system that collects and stores rainwater from your roof that would otherwise be lost to runoff into storm drains and streams. With the right rain barrel properly sited, sized, and installed, the water can slowly soak through the ground and into the water table, being cleansed by soils and plants along the way. StormWorks offers high-quality, state-of-the-art rain barrels designed for this region, to seriously get the job done.

StormWorks currently features four different rain barrels.

[For orders outside of Allegheny County, please email us at info@stormworkspgh.com.](mailto:info@stormworkspgh.com)



TREE PLANTINGS

Trees are nature's most efficient runoff managers. Their root systems capture water that would

[Read More ...](#)



RAIN BARRELS

Water usage increases in the summer by 30%. Cut back on costs and waste by installing a rain

[Read More ...](#)



StormWorks rain barrel has a slim, modern design that can fit in narrow spaces between houses or shared walkways, behind shrubs, or neatly up against or in a tight area of your house to blend in with your landscape.

The Hydra has a capacity of 116 gallons to handle any size roof. It has multiple spigot and overflow openings, a removable mosquito-proof filter basket, making it one of the most user-friendly and aesthetically-appealing rain harvesting containers on the market.

The Hydra is now available in 3 colors.



Price: 100% Recycled Resin (Black): \$325.00

Purposes of Rain Barrels

Next time it rains, think about how much water you could be collecting in a rain barrel. For every inch of rain that falls on a 1,000-square-foot roof, you can gather about 600 gallons of water. (See References 1, page 10). The U.S. Environmental Protection Agency (EPA) reports that at least 36 states are anticipating water shortages by 2013; by utilizing rain barrels for non-potable water needs like landscaping you can help reduce the strain on municipal water supplies while lowering your water bill. (See References 2) Keep in mind that local regulations may prohibit using rain barrels or catchers (see References 6).

Sponsored link

Visual Analysis Guide

New: Visual Analysis Best Practices - Download the Free Guidebook Now!

www.tableau.com

Lower Your Water Bill

Water treatment facilities use a considerable amount of energy delivering clean water to your tap and treating your waste water, and they pass on the costs to you. Every year the average household spends up to \$500 on water and sewer bills, according to the EPA (see References 3). Using rainwater rather than city water for plant irrigation can save you money. Watering plants during the peak months of summer with collected rainwater will allow most homeowners to conserve about 1,300 gallons of water (see References 4).

Help Your Garden Thrive

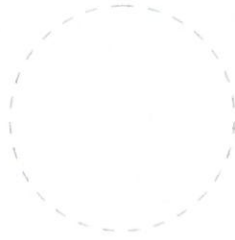
Most of the water we use to irrigate our plants is drinking water. In fact, the EPA estimates that 40 percent of a household's total water use is dedicated to watering plants and lawns. Rainwater is nature's free source of the high-quality water that contains no chlorine, calcium or lime. In this way, rainwater is actually better for most plants than chemically-treated water --- it's softer and lower in acidity. (See References 4) It can also be used to top off the swimming pool or wash the car. Note, however, that roofing materials may contain hazardous chemicals; therefore, the National Resources Defense Council recommends you avoid using rain barrel water on edible plants (see References 5).

Reduce Stress on the Water Supply

Meeting the demand for water involves dams, reservoirs, surface-water withdrawals from natural water bodies and wastewater treatment facilities. Irrigating with collected rainwater reduces the stress on these facilities, as well as the need for new construction. Take a look at the city of Bellingham, Washington: If each of the roughly 35,000 occupied households used rain barrels for watering its lawns and gardens during peak summer months, the EPA estimates that the city would save more than 45 million gallons of water per year (see References 4 and 5).

Preserve Water Quality

Urban runoff is a major cause of water and beach pollution. In urban areas, much of the rainfall hits roads, sidewalks and rooftops, where it picks up contaminants like oil, animal feces and trash and carries it into storm sewers. Rain barrels can help preserve water quality by catching some of the runoff from rooftops before it runs into the storm sewers, and storing it for later usage to water lawns, trees and shrubs.



Stormwater runoff is precipitation from rain or snowmelt that flows over the ground. As it flows, it can pick up debris, chemicals, dirt, and other pollutants and deposit them into a storm sewer system or waterbody.

Anything that enters a storm sewer system is discharged *untreated* into the waterbodies we use for swimming, fishing, and providing drinking water.

Remember:
Only Rain Down the Drain

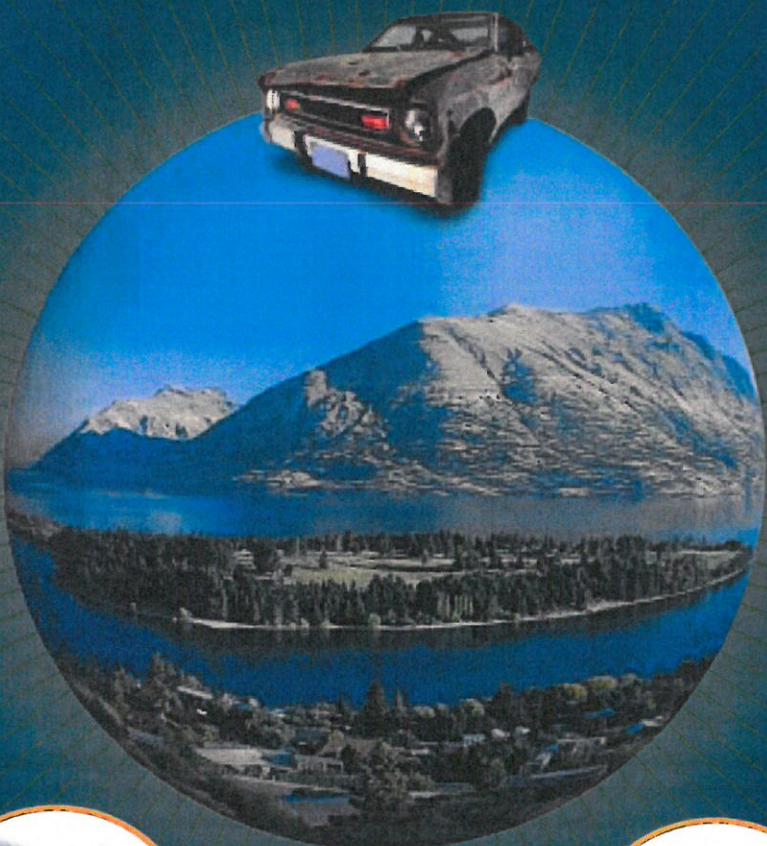
To keep the stormwater leaving your home or workplace clean, follow these simple guidelines:

- ◆ Use pesticides and fertilizers sparingly.
- ◆ Repair auto leaks.
- ◆ Dispose of household hazardous waste, used auto fluids (antifreeze, oil, etc.), and batteries at designated collection or recycling locations.
- ◆ Clean up after your pet.
- ◆ Use a commercial car wash or wash your car on a lawn or other unpaved surface.
- ◆ Sweep up yard debris rather than hosing down areas. Compost or recycle yard waste when possible.
- ◆ Clean paint brushes in a sink, not outdoors. Properly dispose of excess paints through a household hazardous waste collection program.
- ◆ Sweep up and properly dispose of construction debris like concrete and mortar.



Only Rain in the Drain

Stormwater protection starts with YOU!



Remove fluids from incoming vehicles

Drain fluids from incoming vehicles to reduce the possibility of spills when parts are removed later, and time and cost to your business from cleaning up leaks and spills.

Drain vehicle fluids before dismantling fluid-containing parts, placing vehicles in the yard for long-term storage, or crushing.



Handle drained fluids properly

Store fluids properly to reduce the amount of contaminants that end up in stormwater. Confine fluid storage to designated areas that are covered and have adequate secondary containment.

Keep all storage containers away from storm drains, and don't leave open drain pans around the shop.



Drain, cover and contain all oily parts

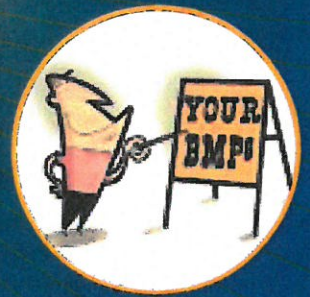
Store engines, transmissions, and other oily parts to avoid exposure to rain or snowfall.

Store these parts indoors or under a roof on an impervious surface, if you store oily parts outside, use weather- and leak-proof covered containers, or place them in vehicle bodies.



Routine housekeeping is important

Clean up spills promptly and thoroughly. Use shop rags and oil dry to clean up smaller spills, and keep spill kits available in the areas where you conduct dismantling, fluid removal, and fluid storage. Sweep paved surfaces and clean absorbent material daily to reduce sediment and contaminant buildup.



Train all relevant employees in your BMPs

Employee training is critical! Train employees on stormwater management procedures, especially during the wet season and before it rains or snows. All employees must be trained upon their initial hire and at least once per year thereafter.

What is Storm Water?

Storm water is water from precipitation that flows across the ground and pavement when it rains or when snow and ice melt. The water seeps into the ground or drains into what we call storm sewers. These are the drains you see at street corners or at low points on the sides of streets. Collectively, the draining water is called storm water runoff.

Why is Storm Water "Good Rain Gone Wrong?"

Storm water becomes a problem when it picks up debris, chemicals, dirt, and other pollutants as it flows or when it causes flooding and erosion of stream banks. Storm water travels through a system of pipes and roadside ditches that make up storm sewer systems. It eventually flows directly to a lake, river, stream, wetland, or coastal water. All of the pollutants storm water carries along the way empty into our waters, too, because storm water does not get treated!



Pet wastes left on the ground get carried away by storm water, contributing harmful bacteria, parasites and viruses to our water.



Vehicles drip fluids (oil, grease, gasoline, antifreeze, brake fluids, etc.) onto paved areas where storm water runoff carries them through our storm drains and into our water.



Chemicals used to grow and maintain beautiful lawns and gardens, if not used properly, can run off into the storm drains when it rains or when we water our lawns and gardens.

Waste from chemicals and materials used in construction can wash into the storm sewer system when it rains. Soil that erodes from construction sites causes environmental degradation, including harming fish and shellfish populations that are important for recreation and our economy.



Where To Go To Continue the Information Flow

Your community is preventing storm water pollution through a storm water management program. This program addresses storm water pollution from construction, new development, illegal dumping to the storm sewer system, and pollution prevention and good housekeeping practices in municipal operations. It will also continue to educate the community and get everyone involved in making sure the only thing that storm water contributes to our water is ... water! Contact your community's storm water management program coordinator or the Pennsylvania Department of Environmental Protection for more information about storm water management.



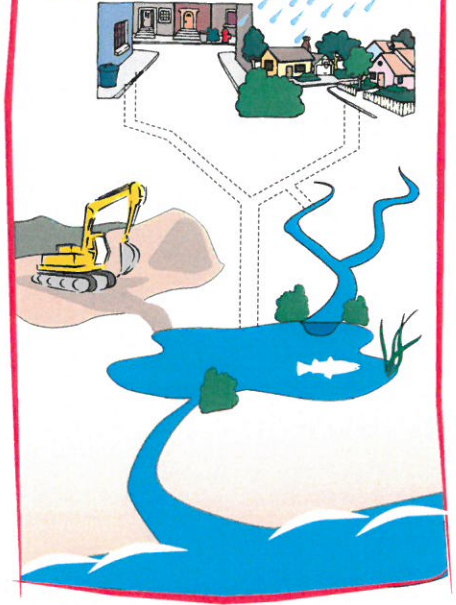
Pennsylvania Department of Environmental Protection
www.dep.state.pa.us

1. Ditch - Part of the storm sewer system. Most people think that the system is just a series of underground pipes. It can also include ditches used to convey storm water from the land to a receiving lake, river, or stream.
2. Fire Hydrant - Not part of the storm sewer system. Water sprayed from fire hydrants is not storm water, but is allowed by law to enter the storm sewer system.
3. Curb with Storm Drain Inlet - Part of the storm sewer system. Many people do not realize that this is an opening leading to the storm sewer system. Anything going into the hole (e.g. trash, leaves, impurity) is disposed of hazardous material) travel directly to a receiving lake, river, or stream without being treated first. Many communities send storm drains with "Do Not Dump" messages to let people know.
4. Storm Sewer Outfall - Part of the storm sewer system. An outfall is where storm water drains from the storm sewer system into a receiving lake, stream, or river. If there is flow from an outfall when it rains, that means there could be a problem with the system or someone has used a storm drain for illegally disposing of materials.
5. Trench - Not part of the storm sewer system. Wastewater from sinks and toilets in houses and businesses travel through a sewer system designed to carry sanitary wastes in some instances, other communities may have a combined sewer system designed to carry both storm water and sanitary waste.
6. Septic System - Not part of the storm sewer system. Homeowners use septic tanks to manage sanitary wastes on-site. Improperly maintained septic systems can leak and contribute pollutants to the storm sewer system, as well as directly to lakes, rivers, and streams.
7. Roads and Other Paved Areas - Not part of the storm sewer system. Roads and other hardened surfaces such as parking lots and sidewalks can accumulate pollutants (e.g., grease, dirt, leaves, trash, pet wastes) that storm water eventually washes into the storm sewer system.
8. Storm Drain Inlet - Part of the storm sewer system. This is another example of what a storm drain may look like. Like the storm drain inlet shown in picture 2, anything that enters the drain will go directly to streams, rivers, and lakes without being treated first. It is important to recognize this as a storm drain to prevent litter and debris from being used as a trash can.

Answers to Test Your Storm Sewer System Savvy:

When It Rains, It Drains

Understanding Storm Water and How It Can Affect Your Money, Safety, Health, and the Environment



What Happens When It Rains?

Rain is an important part of nature's water cycle, but there are times it can do more damage than good. Problems related to storm water runoff can include:



Flooding caused by too much storm water flowing over hardened surfaces such as roads and parking lots, instead of soaking into the ground.

Increases in spending on maintaining storm drains and the storm sewer system that become clogged with excessive amounts of dirt and debris.



Decreases in sportfish populations because storm water carries sediment and pollutants that degrade important fish habitat.

More expensive treatment technologies to remove harmful pollutants carried by storm water into our drinking water supplies.



Closed beaches due to high levels of bacteria carried by storm water that make swimming unsafe.

We can help rain restore its good reputation while protecting our health and environment while saving money for ourselves and our community. Keep reading to find out how...

Test Your Storm Sewer System Savvy!



What does the storm sewer system look like in your community? See if you can identify which pictures are part of the storm sewer system. (Answers are on the back.)



Restoring Rain's Reputation: What Everyone Can Do To Help

Rain by nature is important for replenishing drinking water supplies, recreation, and healthy wildlife habitats. It only becomes a problem when pollutants from our activities like car maintenance, lawn care, and dog walking are left on the ground for rain to wash away. Here are some of the most important ways to prevent storm water pollution:

- ◆ Properly dispose of hazardous substances such as used oil, cleaning supplies and paint—never pour them down any part of the storm sewer system and report anyone who does.
- ◆ Use pesticides, fertilizers, and herbicides properly and efficiently to prevent excess runoff.
- ◆ Look for signs of soil and other pollutants, such as debris and chemicals, leaving construction sites in storm water runoff or tracked into roads by construction vehicles. Report poorly managed construction sites that could impact storm water runoff to your community. (See the back of this brochure for contact information.)
- ◆ Install innovative storm water practices on residential property, such as rain barrels or rain gardens, that capture storm water and keep it on site instead of letting it drain away into the storm sewer system.
- ◆ Report any discharges from storm water outfalls during times of dry weather—a sign that there could be a problem with the storm sewer system.
- ◆ Pick up after pets and dispose of their waste properly. No matter where pets make a mess—in a backyard or at the park—storm water runoff can carry pet waste from the land to the storm sewer system to a stream.
- ◆ Store materials that could pollute storm water indoors and use containers for outdoor storage that do not rust or leak to eliminate exposure of materials to storm water.



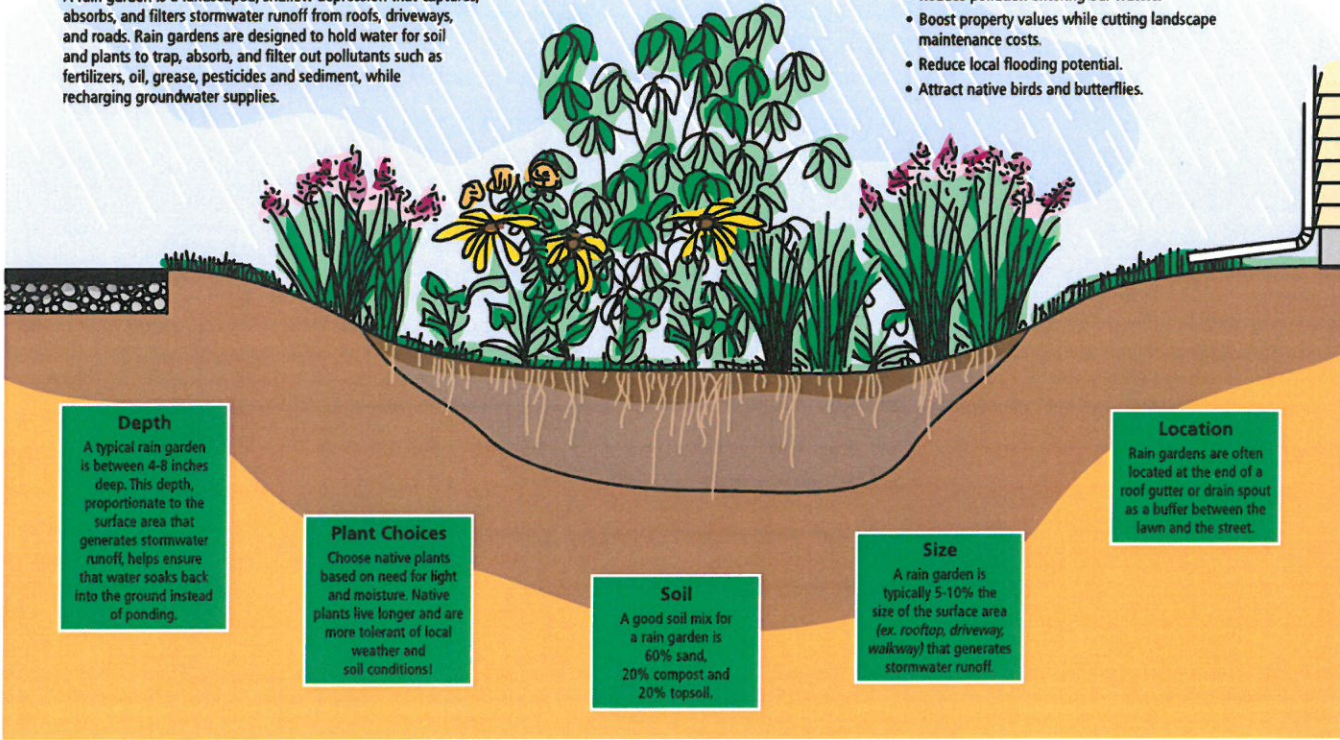
Rain Gardens Have Many Benefits

What is a Rain Garden?

A rain garden is a landscaped, shallow depression that captures, absorbs, and filters stormwater runoff from roofs, driveways, and roads. Rain gardens are designed to hold water for soil and plants to trap, absorb, and filter out pollutants such as fertilizers, oil, grease, pesticides and sediment, while recharging groundwater supplies.

Rain Gardens Help:

- Reduce pollution entering our waters.
- Boost property values while cutting landscape maintenance costs.
- Reduce local flooding potential.
- Attract native birds and butterflies.



Depth
A typical rain garden is between 4-8 inches deep. This depth, proportionate to the surface area that generates stormwater runoff, helps ensure that water soaks back into the ground instead of ponding.

Plant Choices
Choose native plants based on need for light and moisture. Native plants live longer and are more tolerant of local weather and soil conditions!

Soil
A good soil mix for a rain garden is 60% sand, 20% compost and 20% topsoil.

Size
A rain garden is typically 5-10% the size of the surface area (ex. rooftop, driveway, walkway) that generates stormwater runoff.

Location
Rain gardens are often located at the end of a roof gutter or drain spout as a buffer between the lawn and the street.

Here are some great NATIVE PLANT OPTIONS to check out when you are planning your rain garden!

FLOWERING PLANTS



Blueflag Iris (*Iris versicolor*)



Great Blue Lobelia (*Lobelia siphilitica*)



Cardinal Flower (*Lobelia cardinalis*)



Swamp Milkweed (*Asclepias incarnata*)

Check out our website for places to go buy these plants!

www.raingardensforthebays.org

Here are some great
NATIVE PLANT OPTIONS
to check out when you are
planning your rain garden!

GRASSES

Switchgrass
(*Panicum virgatum*)



Big Bluestem
(*Andropogon gerardii*)

Broomsedge
(*Andropogon virginicus*)

Tussock Sedge (*Carex stricta*)



Soft Rush
(*Juncus effusus*)

SHRUBS

Buttonbush
(*Cephalanthus occidentalis*)

Silky Dogwood
(*Cornus amomum*)



Winterberry (*Ilex verticillata*)

Spicebush
(*Lindera benzoin*)

Arrowwood Viburnum
(*Viburnum dentatum*)

Our Polluted Waters

Our waterways are not as clean as they once were due to water pollution such as stormwater runoff. Stormwater is water from rain or melting snow that does not quickly soak into the ground. Stormwater runs from rooftops, over driveways, sidewalks and lawns collecting and carrying pollutants such as dirt, pet waste, oil and grease, pesticides, fertilizers, leaves, and litter into our waterways.

Houses and neighborhoods that are not next to a stream or lake can still contribute to the problem. Storm drains found in most local neighborhoods are designed to move runoff from your neighborhood to the nearest body of water. While many people believe otherwise, stormwater is not filtered in wastewater treatment plants before entering streams and rivers. Storm drains carry UNFILTERED and UNTREATED water directly into our local rivers and streams. Lots of pollution from stormwater runoff can make our waterways very unhealthy for people, plants and animals.



Help us green our neighborhoods and protect our streams by joining the Rain Gardens for the Bays Campaign to create thousands of rain gardens in local watersheds! Participate in a community rain garden planting or install a rain garden in your own yard! Your support will help to keep our waters healthy and protect our communities from flooding and polluted runoff during storms.

The Rain Gardens for the Bays Campaign is supported by the Mid-Atlantic National Estuary Program, state, and local partners. The Partnership for the Delaware Estuary, the Center for the Inland Bays and the Maryland Coastal Bays are collaborating to encourage healthier bays by creating thousands of rain gardens in our backyards, school campuses, town halls, libraries, local businesses and on our corporate lands.

TO FIND OUT MORE:
Call 302-739-9939

Visit www.raingardensforthebays.org

Brochure illustrations provided by the
Appoquinimink River Association.



Funding provided by the Environmental Protection Agency.



Rain Gardens



KEEPING YOUR STREAMS AND LAKE HEALTHY...

1. GET YOUR LAWN AND GARDEN OFF DRUGS!

- Limit the use of chemical pesticides, herbicides, and fertilizers — and avoid using chemicals entirely in wet weather.
- Pesticides, herbicides, and fertilizers run off into creeks and streams — and eventually into Lake Erie. Fertilizers add excessive nutrients to natural waters that lead to algae bloom, bad odors from lack of oxygen, and fish kills. Pesticides and herbicides kill fish and their food sources.
- Consider using compost instead of fertilizer and natural means to control pests and plant disease.

2. FEED YOUR STREAM RIGHT

- Never pour oil, grease, detergent from car washing, gasoline, antifreeze, paint products, carpet-cleaning chemicals, pesticides, herbicides, or other toxic substances down street storm drains. Storm drains flow directly into creeks, which flow directly into Lake Erie. All of these substances are toxic to fish and other stream-dwelling organisms. Grease and oil coat fish gills, deplete the oxygen supply, and smother bottom-dwelling organisms.

3. DON'T PLUG YOUR ARTERIES

- Dispose of garbage at your curbside pickup or landfill — not in creeks or streams. Some people think of creeks as garbage dumps. Look in our streams, and you'll find shopping carts, mattresses, car parts, plastic, cans, Styrofoam, yard debris, and paper litter. Debris creates dams that cause flooding and erosion. Litter is mistaken by wildlife for food and can be toxic or cause starvation. Backed-up water is a breeding place for rodents and mosquitoes. If you need help removing or disposing of debris, contact your Borough, Township, or Chamber of Commerce, who can direct you to local volunteer organizations.

This guide has been funded by the League of Women Voters of the Pennsylvania Citizen Education Fund through a Section 319 Federal Clean Water Act grant from the U.S. Environmental Protection Agency administered by the Pennsylvania Department of Environmental Protection.

For more information on stream health:
• <http://pa.lww.org/wvnet/>
• <http://www.epa.gov/>
• <http://dep.state.pa.us/>

Printed on recycled paper.





4. GIVE YOUR CREEK ENOUGH OXYGEN TO LIVE

- Many forms of pollution deplete oxygen in the streams and Lake Erie. Oxygen depletion creates "dead zones" in the lake where nothing can live.
- Compost lawn clippings, leaves, and soil instead of putting them in streams. *These materials are biodegradable, but they use oxygen in the water to break down and thus deplete the oxygen available for aquatic life.*
- Limit your use of lawn fertilizer and control its runoff. *Runoff from excessive lawn fertilizing causes algae blooms, which deplete oxygen in streams.*
- Drain pools and hot tubs into grassy areas, not into the street or stream. *This allows the chlorine to dissipate into the air before it enters the stream where it is toxic to fish.*



6. KEEP THE STRESS TO YOUR STREAM LOW

- Check downspouts and other pipes to see where they drain. *Direct pipes to grassy areas so that runoff water can filter and lessen in volume before entering the stream. Runoff causes stream surges during storms that cause bank erosion and wash pollution into streams.*
- Control drainage in paved areas, such as driveways, parking lots, and patios. *Consider surrounding paved areas with grassy sunken strips, shrubs, or trees, which can make the area more attractive as well as filter runoff pollutants. Don't shovel excess snow into the streams and lakes. Road salt contains chlorides, which are toxic to aquatic life.*
- Don't rake leaves or lawn clippings into the storm drain or creek. *Instead, mulch leaves when you mow and leave them on the lawn or add them to your compost pile. Leaf mulch is good for your lawn. Borough residents can rake leaves to the curb for pick-up.*



7. GO NATURAL

5. PROVIDE A STABLE ENVIRONMENT

- Maintain or improve stream-side vegetation. *Trees stabilize banks, provide habitat for birds and small mammals, and keep water temperature cool for fish. Removing natural vegetation leads to eroded stream banks and property loss. Modify steep banks to form shallow slopes or create terraces, and replant with native plants.*
- Check for erosion regularly and correct problems promptly. *Soil, sand, and fine gravel can fill in the creek bed and reduce its ability to carry flood waters. Erosion debris destroys pools, eliminates shelter and fish spawning habitat, and diminishes food supplies for fish and aquatic insects. A vegetated slope is the best defense.*



- Landscape with native plant species. *Native plants provide erosion protection during high flows and are adapted to recover quickly when flood waters subside. Native species require less water and fewer chemicals than other plants.*
- Consider using compost instead of chemical fertilizers.
- In winter, use sand, gravel, or other natural substances on your walkways and driveways instead of salt.
- Pave only where necessary. *Paving increases runoff during storms, adding to flooding and erosion problems. Paving contributes to lower creek flows during the dry summer months and depletes the overall water table.*



Brought to you by the Baker Creek Watershed Association. © 2005