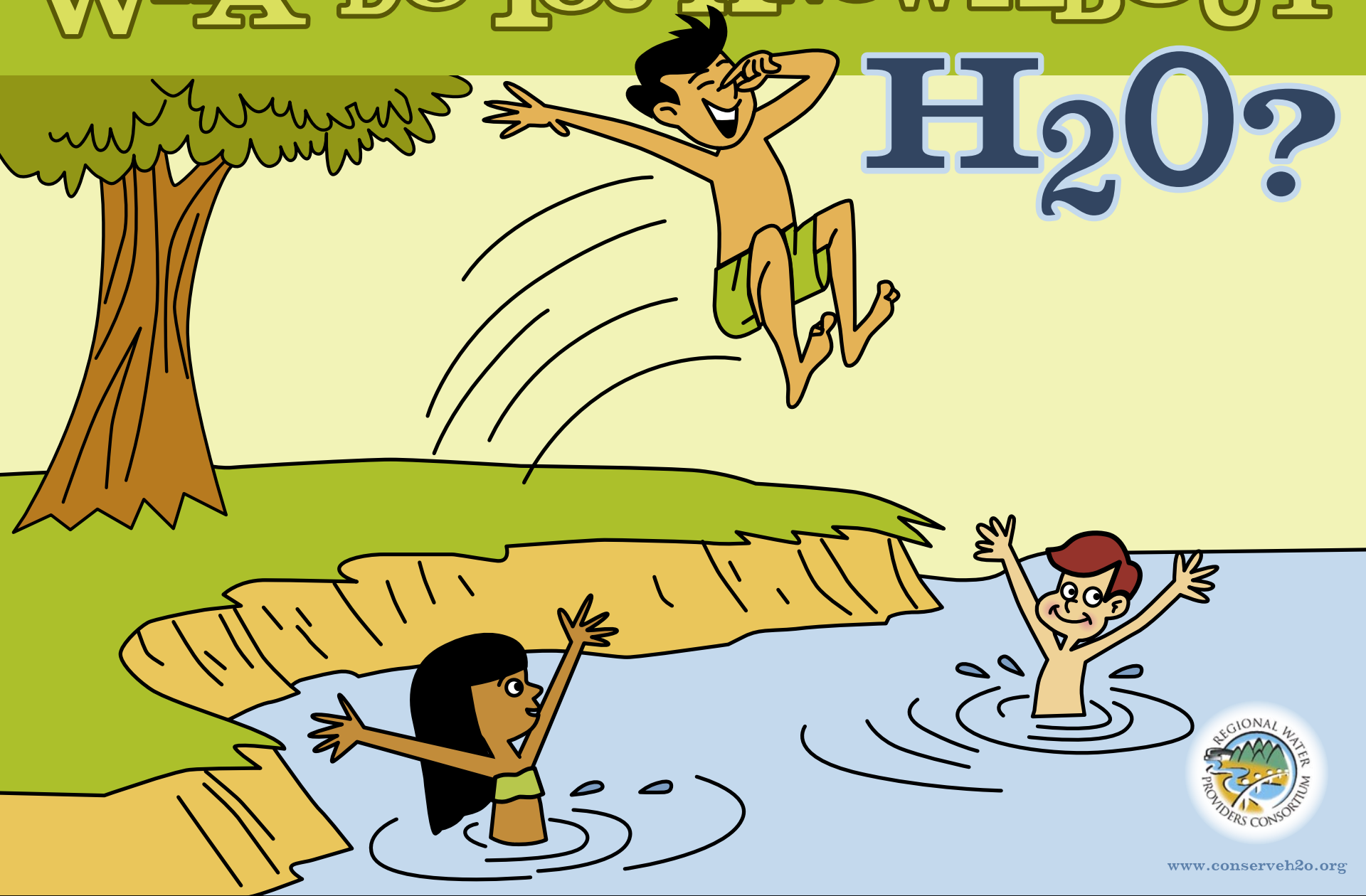


# WHAT DO YOU KNOW ABOUT $H_2O$ ?



[www.conserveh2o.org](http://www.conserveh2o.org)

## ACTIVITY BOOK



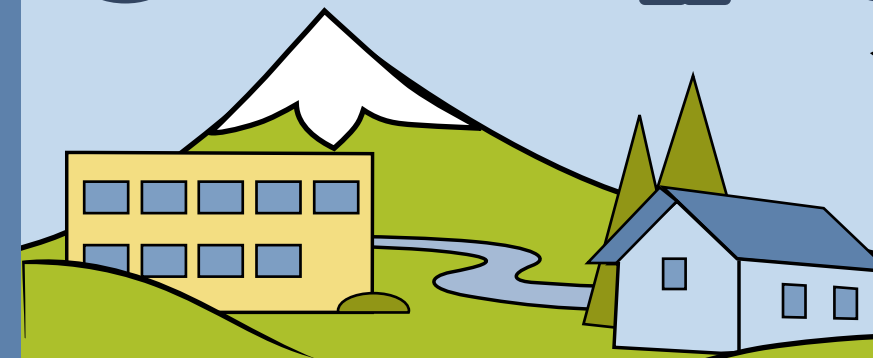
# BE WATER SMART

Water is the most valuable natural resource on earth. We can't live without it. Which means we need to use it wisely and learn as much about it as possible. This Be Water Smart book of puzzles and games will test how much you know about H<sub>2</sub>O. Open your mind and let the info flow. Get water wise!



[www.conserveh2o.org](http://www.conserveh2o.org)

## CRACK THE CODE

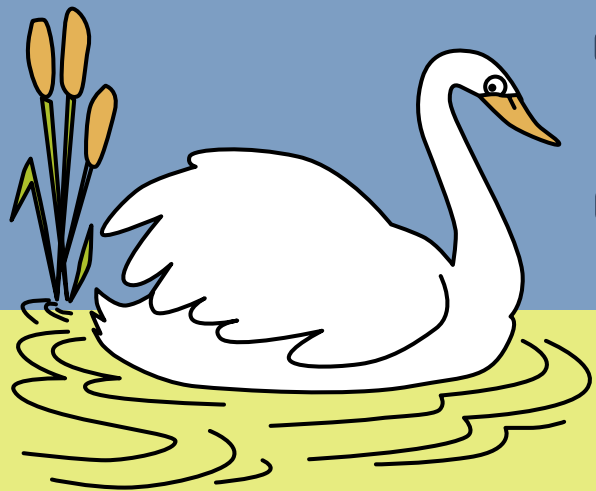


Just turn on the faucet and water flows. But where does it all come from? Decode the secret messages below to find the source.

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

V□ <V□ VJ>□□ CFCJ LJUV J□ □ FFL□FV.  
 ---  
 >□□V □V LJL□□ V<FCJL□ VJ>□□.  
 ---

VEJ□ VJ>□□ L□J□V CFCJ VOLLV <□□□□ >□□  
 ---  
 □FC<□□. >□□V □V LJL□□ □FC<□□VJ>□□.  
 ---



# BELOW THE SURFACE

You can't survive without water. Do you know where to find it? Hope so, because this test could make you thirsty. Draw a line to link each question with the correct answer.

Give an example of standing surface water.

About how many inches of snow make up an inch of water?

What type of soil is most likely to allow groundwater contamination?

What are smaller streams that flow into larger streams called?

Of all the earth's water, how much of it is found in the oceans?

Water that runs off hard surfaces is called?

What is a geographical area called where all the water drains naturally to one place?

What is the scientific name for the study of groundwater?

What is the name of an artificial lake that stores water?

What is the name for an underground layer of sand, gravel, or other rock that is a source of groundwater to a well or spring?

Tributaries

Aquifer

Watershed

97%

Reservoir

10 inches

Surface run-off

Hydrogeology or geohydrology

Sandy

Lake, ponds, swamps, bogs, marshes

## USE WATER WISELY OUTDOORS

Some water-saving ideas are spinning in this "water wheel". For each numbered suggestion, go around the circle clockwise, reading every other word. (Cross them out as you go.) Keep going until you've read all the words. You can write the five tips in the spaces below.

1

\_\_\_\_\_

2

\_\_\_\_\_

3

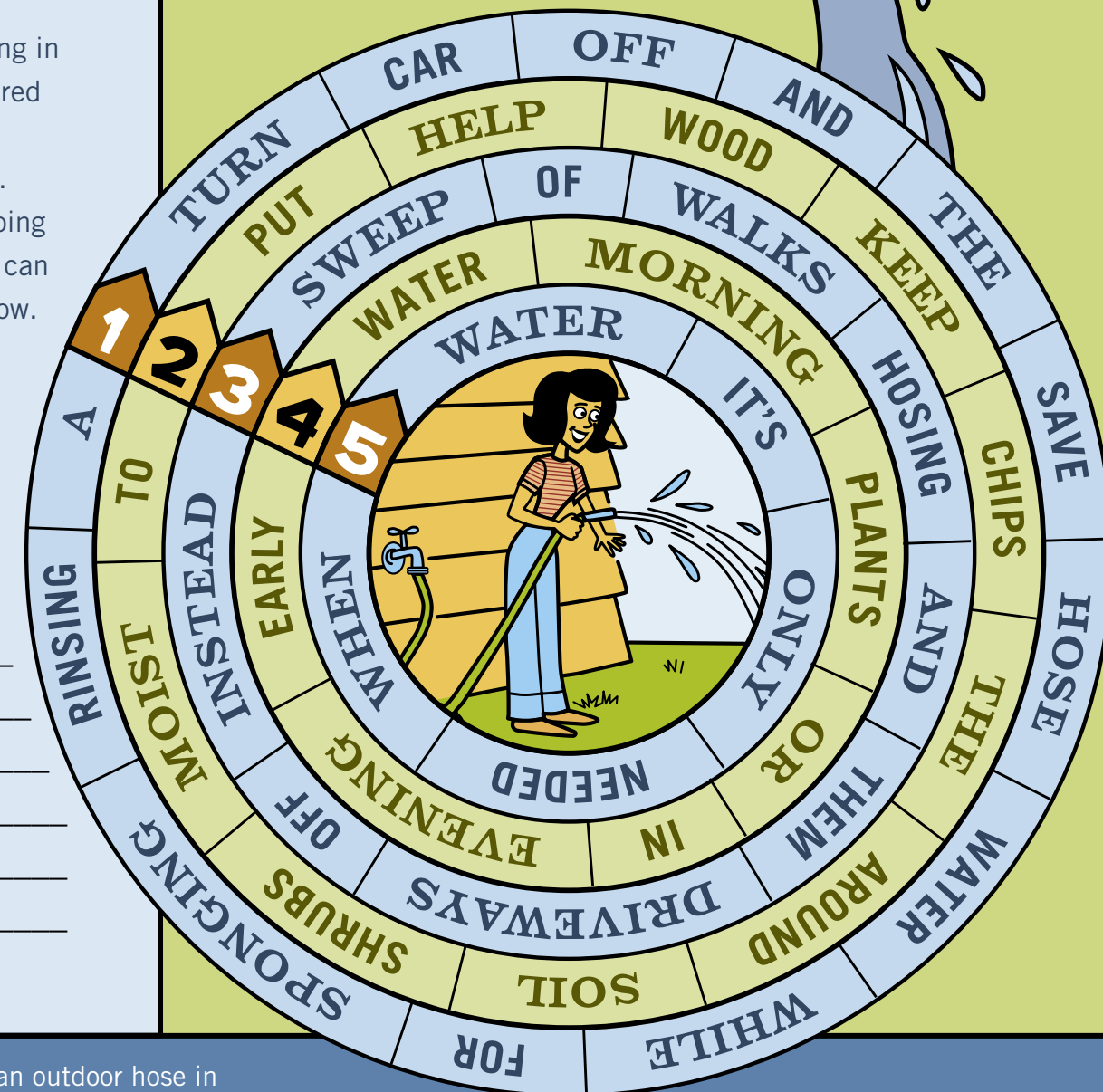
\_\_\_\_\_

4

\_\_\_\_\_

5

\_\_\_\_\_



1000 gallons of H<sub>2</sub>O can run through an outdoor hose in an hour! It's no wonder so much H<sub>2</sub>O is wasted outdoors.

# WHAT'S YOUR H<sub>2</sub>O IQ?

**ARE YOU A WATER SAVER?** We don't mean the lifeguard kind, we're talking about people who use only the water they need and leave the rest for the fish and Mother Nature (she gets thirsty, too). Answer the following questions and see how you "measure up" as a water saver.



## WHEN I BRUSH MY TEETH I...

- a. Only turn the water on to wet my brush and rinse.
- b. Leave the water running the whole time.
- c. I never brush my teeth; I prefer "Pearly Browns."

## I USE THE TOILET FOR...

- a. The stuff you can't do unless you unzip.
- b. Shooting baskets with tissue.
- c. My dog's water dish; he loves the extra flavor.

## FOR ME, THE SHOWER IS...

- a. A quick dip; I have better things to do than wrinkle.
- b. Where I can take time to improve my yodeling skills.
- c. What? Shower and lose my signature scent?

## WHEN MY PARENT ASKS ME TO DO THE LAUNDRY I...

- a. Make sure there's a full load, before starting the washer.
- b. Know the fewer things I wash, the fewer I'll have to fold.
- c. Fold the stuff in the hamper and spray it with Lysol™ – so far they haven't noticed.

## DURING THE DAY I QUENCH MY THIRST WITH...

- a. Water that was chilled in the refrigerator.
- b. Cold water I got by letting the tap run until cool.
- c. A super-big, super-sugary, and super-cafeinated super-sipper!

## WHEN I CAN'T FINISH A GLASS OF WATER I...

- a. Use it to water the plants.
- b. Dump it down the drain.
- c. Put my grandpa's teeth back where I found them; it was the only glass I could find!



## IF YOU ANSWERED...

**MOSTLY "a's":** You're a Water Super Saver! You know water is vital for life, but you don't waste it either.

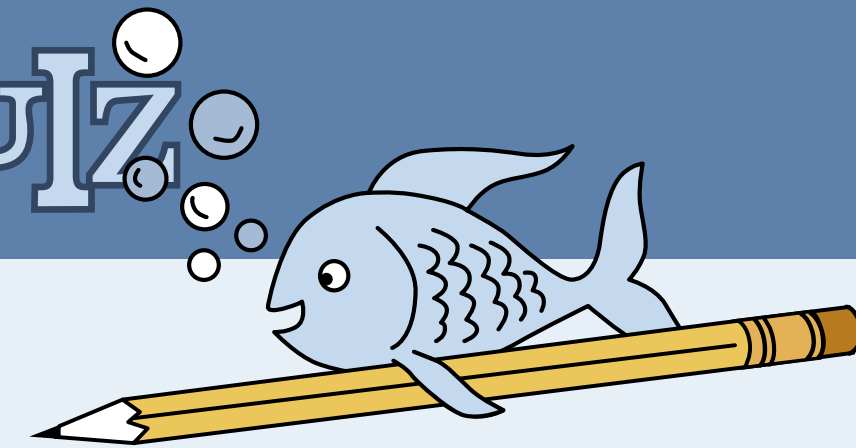
## MOSTLY "b's":

Remember – there's a limited amount of water available for use and you may be using more than your share. See if you can modify a habit or two and turn your "b's into "a's".

## MOSTLY "c's":

You may be saving water, but you're lacking serious personal hygiene. It's okay to USE water, just use it wisely!

# CONSERVA-Quiz



Water is a vital resource and conserving it is smart. Your brain is also a valuable resource. Use it to connect each question with the right answer.

## Conserving water is important because it

- a) saves money
- b) helps salmon
- c) we won't have to build more reservoirs
- d) all of the above

## How can you save water while brushing your teeth?

## Which of the following is the best example of water waste?

- a) washing the driveway
- b) bathing
- c) drinking
- d) fires

## How much water does the average family of four use each day?

- a) 240 gallons
- b) 120 gallons
- c) 500 gallons
- d) 50 gallons

**True or False: A faucet that is dripping 60 drops a minute will waste about 8 gallons a day or 240 gallons in a month.**

**True or False: You can use your water meter to check for leaks.**

True

240 gallons

a) washing the driveway

Turn the water off

True

d) all of the above



## T OR F

## T OR F

## T OR F

## T OR F

## T OR F

## T OR F

## T OR F

## T OR F

T

F

T

F

T

T

T

**F**



**WATER,**  
**WATER,**  
**EVERYWHERE AND NOT**  
**A DROP TO WASTE!**

A cartoon illustration of a smiling water drop character. The character has a large, blue, teardrop-shaped head with a face featuring large, expressive eyes with long eyelashes, a small nose, and a wide, happy smile. It is wearing a white lab coat with a small orange rectangular patch on the left chest and a white pocket on the right. The character's right arm is raised, pointing its index finger upwards, while its left hand is tucked near its chest, also pointing its index finger. The background is a solid light yellow color.

How much water does it take to:

Flush the toilet .....	6 gallons
with a water saving device .....	4 gallons
with an ultra-low flush toilet .....	1.6 gallons
Run the faucet without an aerator .....	5 gallons per minute
with a water saving aerator .....	2.5 gallons per minute
Take a shower .....	5 gallons per minute
Run the dishwasher .....	about 17 gallons per load
Run the washing machine .....	41-49 gallons per load
Run a garden hose .....	5 gallons per minute

**6:32 AM** Dr. Drop, in the bathroom, turns on a faucet without an aerator to brush her teeth. How much water would she use if she leaves the water running three minutes? \_\_\_\_\_

How much water would she use if she turns the water on for 15 seconds to wet her toothbrush and again for 45 seconds with an aerator? \_\_\_\_\_

**6:35 AM** Dr. Drop blows her nose. How much water would she use if she puts the tissue in the garbage can? \_\_\_\_\_ How much water would she use if she flushes the tissue down a regular toilet? \_\_\_\_\_

**6:40 AM** Dr. Drop gets in the shower. How much water would she use if she showers until 7:00am? \_\_\_\_\_ How much water would she use if she takes a short, five minute shower?

**7:05 AM** Dr. Drop, in the kitchen, gets a glass of cold water. Not counting the water in her glass, how much water would she use if the water came from a pitcher of icy water in the refrigerator? \_\_\_\_\_

How much water would she use if she lets the water run for one minute without an aerator?

# TIPS FOR TAPS

brushing  
faucets  
leaks  
shut-off  
broom  
five  
mulch  
sprinklers  
drip  
food coloring  
refrigerator  
teeth  
driveway  
full  
shorter  
toilet  
evaporation  
hose  
sidewalk  
trash can

Fill in the blanks below with the words on the left and discover what you can do to save water:

1. Water during the cool part of the day to avoid \_\_\_\_\_.
2. Instead of using a \_\_\_\_\_ to clean off your sidewalk or driveway, use a \_\_\_\_\_.
3. Take a \_\_\_\_\_ shower in \_\_\_\_\_ minutes or less.
4. Run the dishwasher and washing machine with \_\_\_\_\_ loads only.
5. When washing your car, use a hose with a \_\_\_\_\_ nozzle.
6. Put a layer of \_\_\_\_\_ around trees and plants to slow evaporation of moisture and discourage weed growth.
7. Position your \_\_\_\_\_ so water lands on the lawn or garden, not on your \_\_\_\_\_ or \_\_\_\_\_.
8. Check \_\_\_\_\_ and pipes for \_\_\_\_\_. Even the smallest \_\_\_\_\_ from a worn washer can waste 20 or more gallons a day.
9. Check your \_\_\_\_\_ for leaks by putting a little \_\_\_\_\_ in your toilet tank. If, without flushing, the color begins to appear in the bowl, you have a leak that should be repaired immediately.
10. Turn off the water while \_\_\_\_\_ your \_\_\_\_\_. Just wet your brush and fill a glass for mouth rinsing.
11. Don't use your toilet as a \_\_\_\_\_. Dead bugs and used facial tissue should go in the wastebasket.
12. Keep a bottle of cold water in the \_\_\_\_\_ for drinking, instead of letting the tap run until cold.



## It's A MATCH

Draw a line from each word to its definition.

**Transmission System**

A device used for recording the amount of water passing through a pipe

**Distribution System**

Water that is fit for consumption

**Groundwater**

A facility for cleaning and treating fresh water for drinking

**Water Conservation**

Using up goods and services

**Precipitation**

Large water pipes over 18" in diameter and pumps used to distribute drinking water from the source to the community

**Consumption**

Water underground, such as in wells and aquifers

**Potable Water**

The act of of destroying harmful microorganisms

**Treatment Plant**

Pipes; valves to control water flow; and fire hydrants, tanks and reservoirs used in drinking water systems, which deliver water to homes

**Water Meter**

Saving, not wasting, water

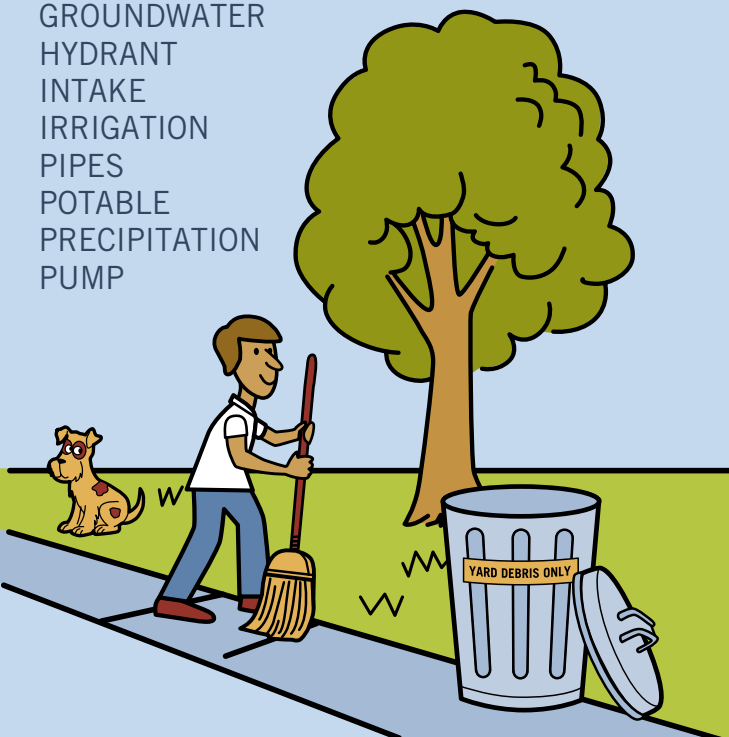
**Disinfection**

Water vapor falling from the atmosphere as rain, hail, sleet or snow

# WORD SEARCH

AQUIFER  
CONDENSATION  
CONDUIT  
CONSERVATION  
CONSUMPTION  
CONTAMINATION  
DAM  
DISINFECTION  
DISTRIBUTION  
DROUGHT  
EVAPORATION  
GROUNDWATER  
HYDRANT  
INTAKE  
IRRIGATION  
PIPES  
POTABLE  
PRECIPITATION  
PUMP

RESERVOIR  
SOURCE  
SURFACE WATER  
TRANSMISSION  
TREATMENT PLANT  
VALVE  
WATER CYCLE  
WATER METER  
WATER SYSTEM  
WATERSHED

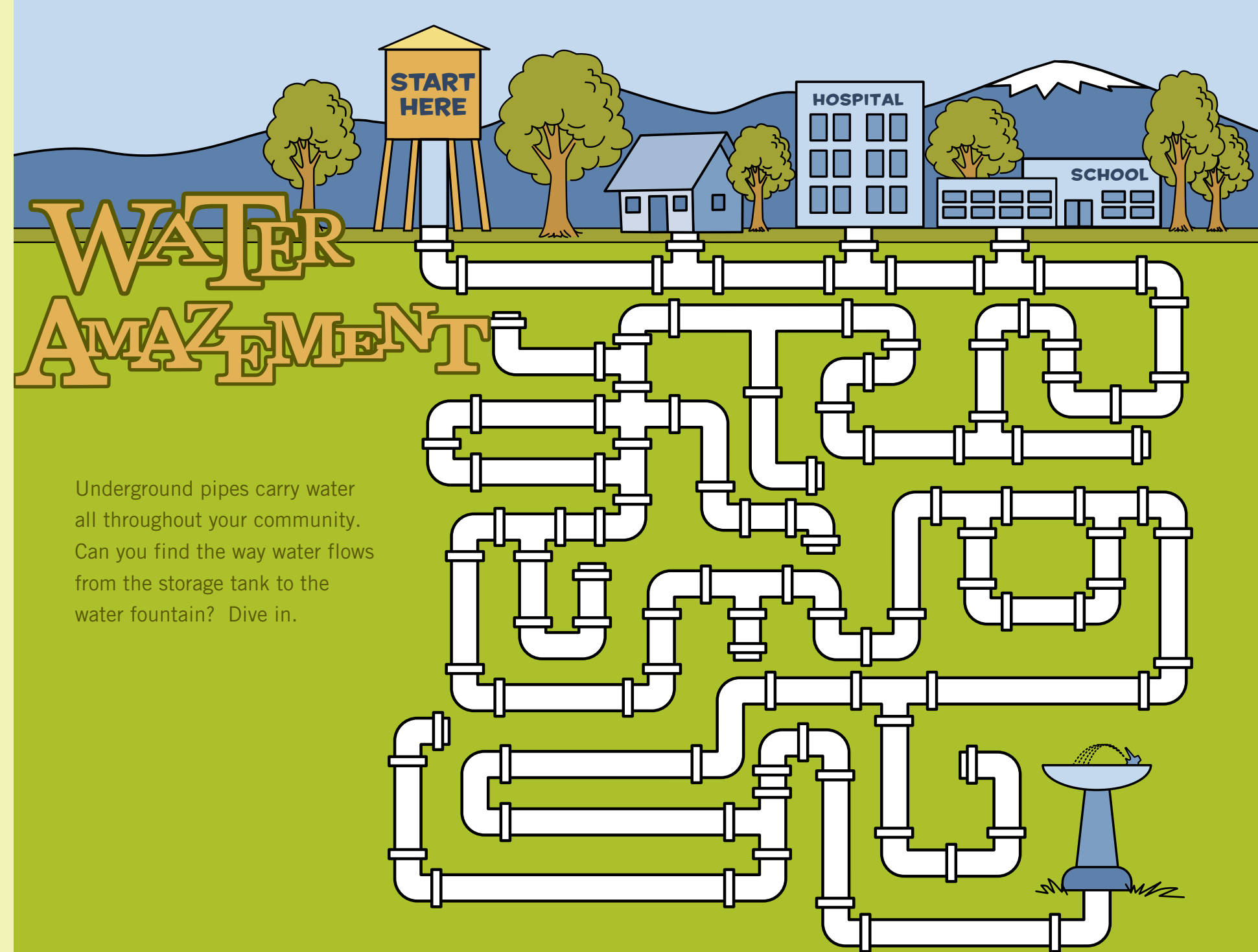


Circle, in the puzzle below, the water words listed on the left.

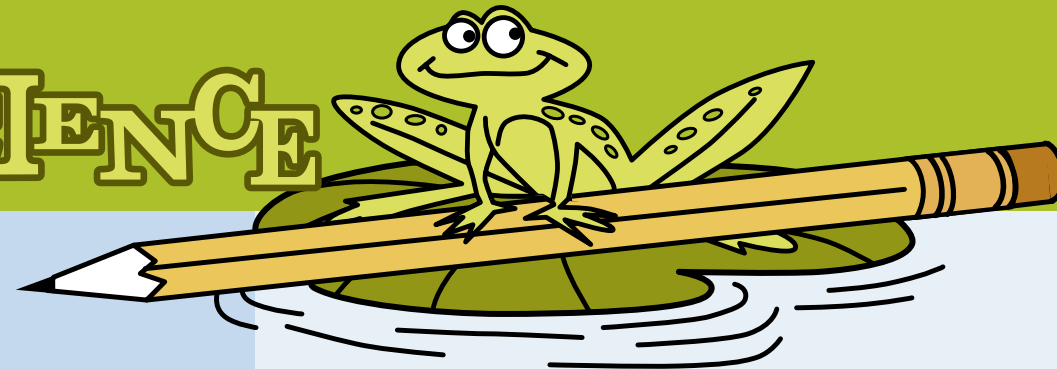
D	T	R	E	A	T	M	E	N	T	P	L	A	N	T
O	N	T	P	W	A	C	E	W	A	T	E	R	T	H
E	S	U	R	F	A	C	E	W	A	T	E	R	T	H
I	O	E	E	W	T	O	C	O	I	L	T	E	T	
R	R	T	I	T	E	D	N	B	A	T	S	A	K	D
I	C	E	P	E	T	E	S	A	N	A	D	N	D	I
G	E	B	I	R	E	N	U	G	S	K	W	S	D	S
A	U	R	T	M	E	S	M	R	T	E	A	M	R	I
T	D	O	A	E	V	A	P	O	R	A	T	I	O	N
I	I	T	T	T	U	T	U	E	Q	E	S	U	F	
O	S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

Moving across the rows from left to right, use the remaining uncircled letters to fill in the blanks below and reveal the water conservation message.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# STREAMS OF SCIENCE



Show what ya’ know about H<sub>2</sub>O. Draw a line that connects each question with the correct answer. Put your thinking cap on. It might rain.

**Name the force that causes water to flow down hill.**

**When tiny drops of water gather together what do they make?**

**Which of the following is not part of the natural water cycle?**

a) evaporation  
b) condensation  
c) devaluation  
d) precipitation

**As molecules of water freeze do they?**

a) expand  
b) contract  
c) neither a or b

**What is water called that is located below the earth’s surface in rock crevices?**

**Find the scientific name for the natural water cycle.**

**Water evaporating from the leaves of plants and trees is called?**

**What is the temperature at which water boils in Fahrenheit?**

212 degrees

Transpiration

Gravity

Groundwater

A cloud

c) devaluation

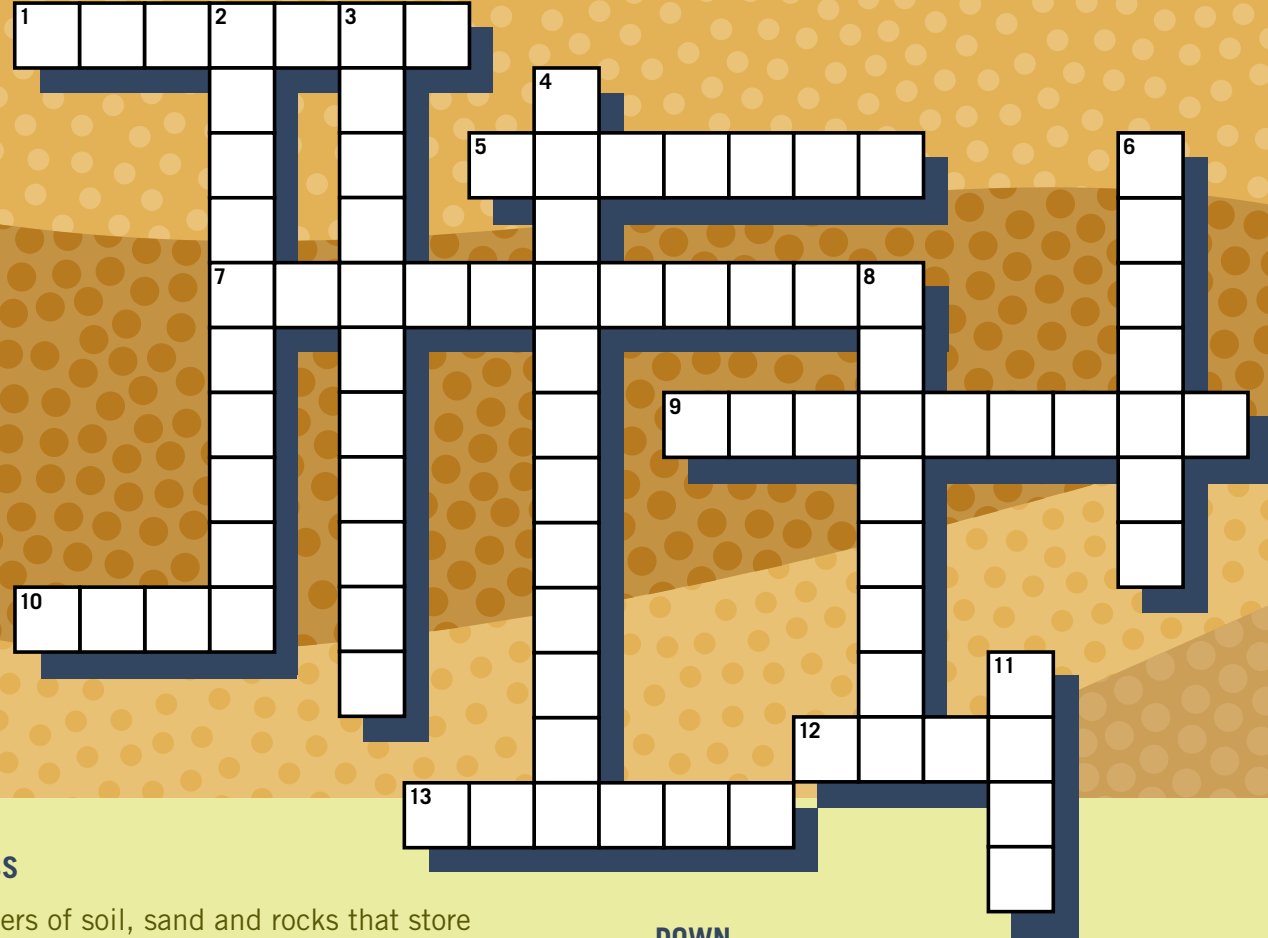
a) expand or pull away from each other

Hydrologic cycle

## CROSSWORD

**H<sub>2</sub>O**

Crossword puzzle courtesy of The Groundwater Foundation.



**ACROSS**

1. Layers of soil, sand and rocks that store groundwater.

5. To contaminate, to become unclean.

7. Water that is found underground in the cracks and spaces in the soil, sand and rocks.

9. Groundwater leaves the ground and enters a lake or stream in a \_\_\_\_\_ area.

10. An example of precipitation.

12. A pipe in the ground that is used to remove water from an aquifer.

13. Water on the earth’s surface which moves into a lake or stream without absorbing into the soil.

**DOWN**

2. The largest use for groundwater is \_\_\_\_\_.

3. The stage of the water cycle when water changes from liquid to a vapor.

4. Clouds are an example of this.

6. A long period of dry weather could cause a \_\_\_\_\_.

8. Part of the water cycle when water soaks into the soil.

11. The movement of water underground is called groundwater \_\_\_\_\_.



# WATER VOCABULARY

**Aquifer** - an underground layer of rock, soil and sediment that is filled or saturated with water

**Condensation** – water changing from a gas to a liquid

**Conduit** – a pipe for transporting fluids, such as water

**Conservation** – saving, not wasting

**Consumption** – using up goods or services

**Contamination** – unfit for use; pollution

**Dam** – a structure built to hold back a flow of water

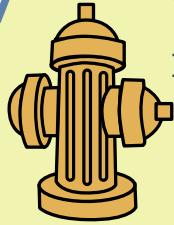
**Disinfection** – the act of destroying harmful microorganisms

**Distribution System** – pipes, valves to control water flow; and fire hydrants, tanks and reservoirs used in drinking water systems

**Drought** – a long period of dry weather without rain

**Evaporation** – the changing of water from a liquid to a vapor and rising into the air

**Groundwater** – water underground, such as in wells and aquifers



**Hydrant** – an upright pipe with a spout or nozzle for drawing water from a water main, installed for fire suppression

**Intake** – an opening which allows water into a conduit

**Irrigation** – supply water to dry land by way of ditches, pipes or streams

**Pipes** – tubes that convey fluid such as water. Water pipe material can be plastic, copper, ductile or cast iron, or concrete cylinder

**Potable Water** – water that is fit for drinking

**Precipitation** – water vapor falling from the atmosphere as rain, hail, sleet or snow

**Pump** – a machine that assists the flow of water in pipes; used to boost water to a higher elevation

**Reservoir** – a tank, pond or lake where water is collected and stored until needed

**Source** – a body of water such as a spring or lake that creates a primary water supply

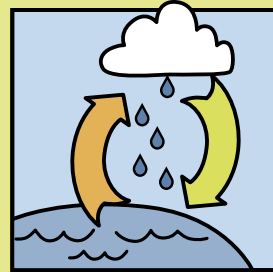
**Surface water** – precipitation that does not soak into the ground or return quickly to the atmosphere. Surface water can be a stream, lake, river, pond, wetland, ocean or reservoir

**Transmission System** – large water pipes over 18" in diameter and pumps used to distribute drinking water from the source to the community

**Treatment Plant** – a facility for cleaning and treating fresh water for drinking

**Valve** – a device that controls the flow of water through a pipe by opening, closing or obstructing the passageway

**Water Cycle** – often called the hydrologic cycle; the circulation of water from the sky to the earth and back which includes precipitation, transpiration and evaporation



**Water Meter** – a device used for recording the amount of water passing through a pipe

**Water System** – a river and all its branches; or a series of pipes, storage tanks, pumps, fire hydrants connected together to deliver water

**Watershed** – an area of land from which water drains to a single water body like a river

# WANT MORE RESOURCES?

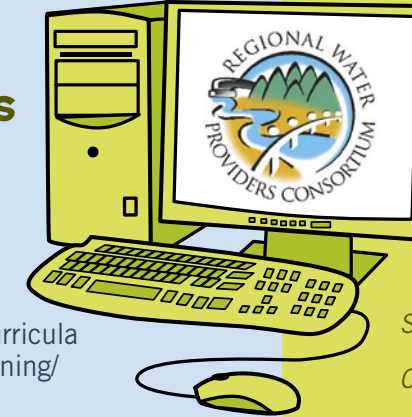
## Waterful Web Sites

### YOUTH WEB RESOURCES

[www.conserveh2o.org](http://www.conserveh2o.org)  
[www.waterdata.com/student.htm](http://www.waterdata.com/student.htm)  
[www.waterwiser.org](http://www.waterwiser.org)  
[www.awwa.org](http://www.awwa.org)  
[www.getwise.org](http://www.getwise.org)  
[www.ecokidsonline.com](http://www.ecokidsonline.com)  
[http://wri.wisc.edu/library/WaterCurricula](http://http://wri.wisc.edu/library/WaterCurricula)  
[www.bellmuseum.org/distancelearning/watershed/watershed2.html](http://www.bellmuseum.org/distancelearning/watershed/watershed2.html)  
[www.epa.gov/safewater/kids/index.html](http://www.epa.gov/safewater/kids/index.html)  
[www.epa.gov/watrhme](http://www.epa.gov/watrhme)  
[http://ga.water.usgs.gov/edu](http://http://ga.water.usgs.gov/edu)  
[www.groundwater.org](http://www.groundwater.org)  
[www.epa.gov/safewater/kids/kids\\_4-8](http://www.epa.gov/safewater/kids/kids_4-8)  
[www.h2ouse.org](http://www.h2ouse.org)  
[www.groundwater.org/kc/kc.html](http://www.groundwater.org/kc/kc.html)  
[www.uwex.edu/erc/gwah/](http://www.uwex.edu/erc/gwah/)

### TEACHER WEB RESOURCES

[www.oceansonline.com/water\\_props.htm](http://www.oceansonline.com/water_props.htm)  
[www.biologylessons.sdsu.edu/classes/lab1/lab1.html](http://www.biologylessons.sdsu.edu/classes/lab1/lab1.html)  
[http://ga.water.usgs.gov/edu/waterproperties.html](http://http://ga.water.usgs.gov/edu/waterproperties.html)  
[http://ga.water.usgs.gov/edu/followdrip.html](http://http://ga.water.usgs.gov/edu/followdrip.html)  
[www.und.nodak.edu/instruct/eng/fkarner/pages/cycle.htm](http://www.und.nodak.edu/instruct/eng/fkarner/pages/cycle.htm)  
[www.epa.gov/surf](http://www.epa.gov/surf) to locate your watershed  
[www.adopt-a-watershed.org](http://www.adopt-a-watershed.org)  
[www.oregonwri.org/watershedinfo.html](http://www.oregonwri.org/watershedinfo.html)  
[www.epa.gov/owow/wetlands](http://www.epa.gov/owow/wetlands)  
[www.nwrc.gov/fringe/about\\_ff.html](http://www.nwrc.gov/fringe/about_ff.html)  
[http://edtech.kennesaw.edu/web/wetlands.html](http://http://edtech.kennesaw.edu/web/wetlands.html)  
[www.epa.gov/seahome/groundwater/src/ground.htm](http://www.epa.gov/seahome/groundwater/src/ground.htm)  
[www.ngwa.org/educator/educator.html#top](http://www.ngwa.org/educator/educator.html#top)  
[www.epa.gov/OWOW/monitoring/vol.html](http://www.epa.gov/OWOW/monitoring/vol.html)  
[www.waterqualityreports.org/](http://www.waterqualityreports.org/)  
[www.earthforce.org/section/programs/green/](http://www.earthforce.org/section/programs/green/)



## Books to Wet Your Whistle

*A Drop of Water: A Book of Science and Wonder*, Walter Wick, Scholastic Inc, 1997

*The Everything Kids' Science Experiments Book*, Adams Media Corp., 2001

*The Stream Team of Patrol*, John Shepard, ABD Publishing, 1993

*Water: The Drop of Life*, Peter Swanson, Creative Publishing International, 2001

*Science in the Water*, World Book, Inc., 1999

*Common Ground: The Water, Earth and Air We Share*, Molly Bang, Scholastic, Inc., 1997

*The Rainstick, A Fable*, Sandra C. Robinson, Falsomn Press Publishing Co., 1994

*Water for the World*, Frankly M. Branley, Harper Collins Books, 1992

*Water: A Thematic Unit*, David Jeffris, Teacher Created Materials, Inc., 1999

*Where the River Begins*, Thomas Locker, Penguin Putnam Books, 1993

*Water Up, Water Down: The Hydrologic Cycle*, Sally M. Walker, Lerner Publishing, 1992

*A Drop Around the World*, Barbara S. McKinney, Dawn Publications, 1998

*Water Squeeze*, Mary O'Neal, Troll Communication, 1991

*The Magic School Bus at the Waterworks*, Joanna Cole, Scholastic, Inc, 1990

*365 Nature Crafts and Activities*, Karen Bledsoe & Candyce Norvell, Publications International

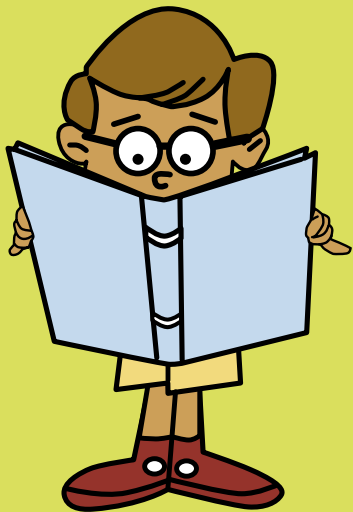
*The Water Hole*, Graeme Base, Harry N. Abrams

*The Everything Kids' Science Experiments Book*, Tom Robinson, Adams Media Coporation

*Water Dance*, Thomas Locker, Voyager Books

*Raven Returns the Water*, Anne Cameron, Habour Publishing

*Down to the Sea*, Nicholas, Jay W., Bookpartners



# HOW MUCH IS ENOUGH?

To measure the collected water, place this strip in each tuna can as pictured.



Cut on dotted line for tuna can test.



The number to the right tells how much time it will take to get 1 inch of water to the lawn during the summer months.

ADJUST YOUR FLOW - THE "INCH" CHART	
NUMBER OF MINUTES YOU NEED TO WATER TO GET 1" OF WATER PER WEEK	
AVERAGE WATER DEPTH IN TUNA CAN (IN INCHES) AFTER 15 MINUTES	TOTAL WATERING TIME YOU'LL NEED TO GET ONE INCH OF WATER
1/8	120
1/4	60
1/2	30
3/4	20
1	15

# TIPS FOR TAPS

Fill in the blanks below with the words on the left and discover what you can do to save water.

brushing faucets leaks shut-off broom shorter shower in five minutes or less Run the dishwasher and washing machine with full loads only. When washing your car, use a hose with a shut-off nozzle. Put a layer of mulch around trees and plants to slow evaporation of moisture and discourage weed growth. Position your sprinklers so water lands on the lawn or garden, not on your sidewalk or driveway Check and faucets for leaks Even the smallest drop from a worn washer can waste 20 or more gallons a day. Check your toilet for leaks by putting a little food coloring in the toilet tank. If, without flushing, the color begins to appear in the bowl, you have a leak that should be repaired immediately. Turn off the water while brushing your teeth Just wet your brush and fill a glass for mouth rinsing. Don't use your toilet as a trash can Dead bugs and used facial tissue should go in the wastebasket. Keep a bottle of cold water in the refrigerator for drinking, instead of letting the tap run until cold.	
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# STREAMS OF SCIENCE

Show what ya' know about  $H_2O$ . Draw a line that connects each question with the correct answer. Put your thinking cap on. It might rain.

Name the force that causes water to flow down hill.

When tiny drops of water gather together what do they make?

Which of the following is not part of the natural water cycle?

- a) evaporation
- b) condensation
- c) desicculation
- d) precipitation

As molecules of water freeze do they?

- a) expand
- b) contract
- c) neither a or b

What is water called that is located below the earth's surface in rock crevices?

Find the scientific name for the natural water cycle.

Water evaporating from the leaves of plants and trees is called...

What is the temperature at which water boils in Fahrenheit?

212 degrees

Transpiration

Gravity

Groundwater

A cloud

c) evaluation

a) expand or pull away from each other

Hydrologic cycle

# BE WATER SMART

To learn more about the Regional Water Providers Consortium, or for information on conservation resources and tips, contact your local water provider or visit our Web site at:

[www.conserveh2o.org](http://www.conserveh2o.org)



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