

May 1, 2020  
Elementary School Packet



### Celebration of Water 2020!

The Cortland County Soil and Water Conservation District, in conjunction with City, County and other municipal and private participants, usually celebrates the importance of *WATER* with our Water Festival at the Cortland Waterworks on the first Saturday in June. Because of COVID-19, we are not able to hold our annual celebration this year. However, in three separate collections, we have identified or gathered online activities for elementary school, middle school and high school students and their families. These materials educate about water and promote the importance of water and its protection. Hopefully they are fun as well!

Please contact us if you have any questions. Enjoy!

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#### Activity & Game Webpage:

<https://wateruseitwisely.com/kids/games/>

#### Fun Videos:

1) **The Water Cycle** – EPA - interactive

[https://www3.epa.gov/safewater/kids/flash/flash\\_watercycle.html](https://www3.epa.gov/safewater/kids/flash/flash_watercycle.html)

2) **The Water Cycle** – WaterRocks.org, 3 minutes, music video

<https://www.waterrocks.org/newvideo-learning-about-the-water-cycle>

3) **The Water Cycle- How rain is formed-Lesson for kids**, Learning Junction, 3 minutes

<https://www.youtube.com/watch?v=s0bS-SBAgJI>

4) **The Groundwater Story** – King County DNR (WA), 4 minutes

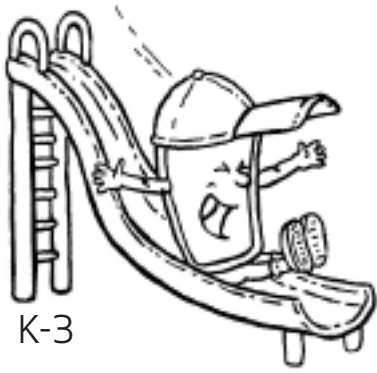
<https://www.youtube.com/watch?v=IC6BR7vYS28&t=163s>

**A Fun Activity: Flat Ronny Raindrop** – Just like the Flat Stanley activity, children can print and color Ronny Raindrop (attached), and have fun carrying him through their neighborhood on their bikes or walking with family members. They can also mail Flat Ronny to others. In each

case, taking a photo of Flat Ronny on his travels and sending the photo to the originating child will introduce children to new places. Ronny particularly likes places with water! Challenge children to think about where water is and how our society uses and appreciates water. For more information about the Flat Stanley Project: <http://www.flatstanleyproject.com/>

### Flat Ronny Raindrop






# Thirstin Builds an Aquifer

## **AQUIFER IN A CUP (AQUIFER ON THE GO)**

### BACKGROUND:

Many communities obtain their drinking water from underground sources called aquifers. Water suppliers or utility officials drill wells through soil and rock into aquifers for the ground water contained therein to supply the public with drinking water. Home owners who cannot obtain their drinking water from a public water supply, will have their own private wells drilled on their property to tap this supply. Unfortunately, the ground water can become contaminated by harmful chemicals such as lawn care products and household cleaners that were used or disposed of improperly after use or any number of other pollutants. These chemicals can enter the soil and rock, polluting the aquifer and eventually the well. Such contamination can pose a significant threat to human health. The measures that must be taken by well owners and water plant operators to either protect or clean up contaminated aquifers are quite costly.

 **NOTE:** This demonstration should follow a class discussion on potential sources of pollution to drinking water supplies.

### OBJECTIVE:

To illustrate how water is stored in an aquifer, how groundwater can become contaminated, and how this contamination ends up in a drinking water source. Ultimately, students should get a clear understanding of how careless use and disposal of harmful contaminants above the ground can potentially end up in the drinking water below the ground. This particular experiment can be done by each student at their work station.

### MATERIALS NEEDED PER STUDENT:

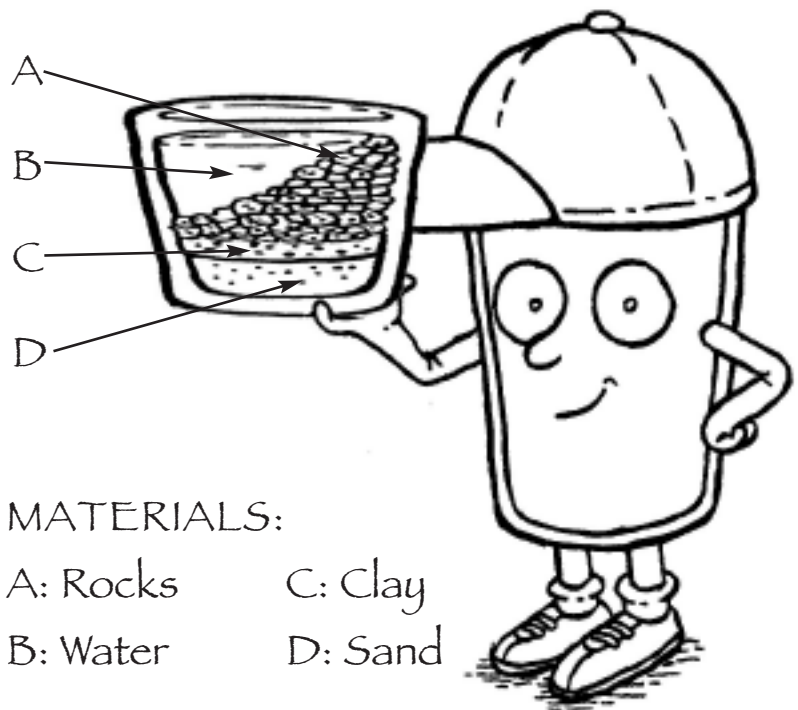
- ✓ **1 clear plastic cup** that is 2 3/4" deep x 3 1/4" wide for each student
- ✓ **1 piece of modeling clay or floral clay** that will allow a 2" flat pancake to be made by each student for their cup
- ✓ **White play sand** that will measure 1/4" in bottom of each student's cup
- ✓ **Aquarium gravel** (natural color if possible) or small pebbles (approximately 1/2 cup per student)  
(*HINT: As many small rocks may have a powdery residue on them, you may wish to rinse them and dry on a clean towel prior to use. It is best if they do not add cloudiness to water.*)
- ✓ **Red food coloring**
- ✓ **1 bucket of clean water** and **small cup** to dip water from bucket

## PROCEDURE:

1. Pour 1/4" of white sand in the bottom of each cup completely covering the bottom of the container. Pour water into the sand, wetting it completely ( there should be no standing water on top of sand). Let students see how the water is absorbed in the sand, but remains around the sand particles as it is stored in the ground and ultimately forming part of the aquifer.
2. Have each student flatten the modeling clay (like a pancake) and cover 1/2 of the sand with the clay (have each student press the clay to one side of the container to seal off that side). The clay represents a "**confining layer**" that keeps water from passing through it. Pour a small amount of water onto the clay. Let the students see how the water remains on top of the clay, only flowing into the sand below in areas not covered by the clay.
3. Use the aquarium rocks to form the next layer of earth. Place the rocks over the sand and clay, covering the entire container. To one side of your cup, have students slope the rocks, forming a high hill and a valley (see illustration below). Explain to students that these layers represent some of the many layers contained in the earth's surface. Now pour water into your aquifer until the water in the valley is even with your hill. Students will see the water stored around the rocks. Explain that these rocks are porous, allowing storage of water within the pours and openings between them. They will also notice a "**surface**" supply of water (a small lake) has formed. This will give them a view of both the ground and surface water supplies which can be used for drinking water purposes.
4. Use the food coloring and put a few drops on top of the rock hill as close to the inside wall of the cup as possible. Explain to students that often old wells are used to dispose of farm chemicals, trash and used motor oils and other activities above their aquifer can end up in their drinking water. They will see that the color spreads not only through the rocks, but also to the surface water and into the white sand at the bottom of their cup. This is one way pollution can spread throughout the aquifer over time.

## FOLLOW-UP:

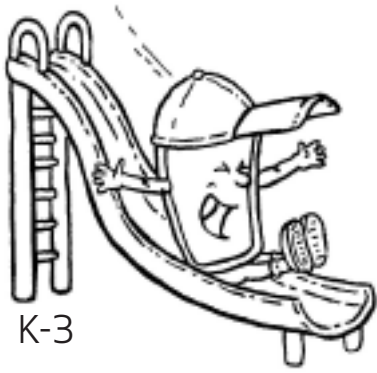
Discuss with students other activities that could pollute their aquifer. Assign students the task of locating activities around the school or their own homes that could pollute their drinking water sources if not properly maintained. Allow students to drain off the water in their cups and carry home their container to refill with water and show their parents surface and ground water and how the food coloring illustrates pollution activity above their aquifer can affect all water. Students should discuss with parents what steps they can take as a household to prevent water pollution.



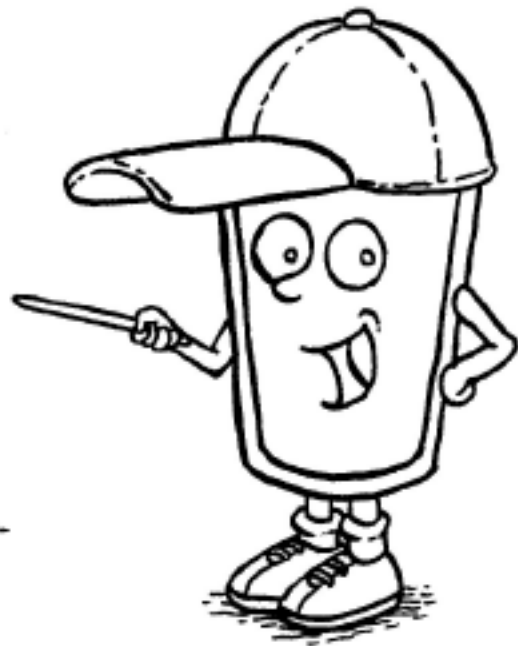
## MATERIALS:

- |          |         |
|----------|---------|
| A: Rocks | C: Clay |
| B: Water | D: Sand |





# Thirstins Water Cycle Activity



## You will need:

1. jar
2. plants
3. bottle cap or shell of water
4. soil
5. sand
6. small rocks

## Directions:

1. Fill jar as in the picture and put the lid on.
2. Put the jar in a sunny place and see how the water cycle works.



# WATER PHASES OF MATTER

GRADES 3-5



## BACKGROUND

People use water in a variety of ways, from recreation to sustaining life. These activities will help you and your students understand and appreciate the water cycle!

The total amount of water on Earth stays the same. It is always cycling through the water cycle. All of the water that is here today was here years ago and in the time of dinosaurs! (And only 0.02% of the water on Earth is freshwater that is readily available for use by people!) The water in rivers, lakes, and oceans rises in a process called evaporation; as the water molecules heat up and move around more, they become a gas (water vapor) and rise into the air. The water molecules then slow down, cool down and become water droplets, and then gather with dust particles to form clouds. This process is called condensation. When the clouds become too heavy, water droplets fall as precipitation. Water either runs across the land as surface runoff or soaks into the ground as infiltration.

In this activity, students will learn about the states of matter to deepen their understanding of the different phases of water in the water cycle.

## MATERIALS

One matching worksheet per student  
One game worksheet per student

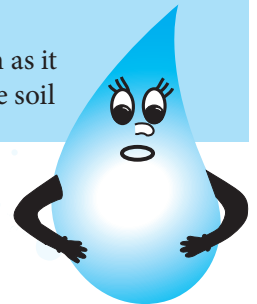
## DEFINITIONS

**Evaporation:** The transformation of water molecules from liquid phase to vapor phase

**Condensation:** The transformation of water molecules from vapor phase to liquid phase

**Precipitation:** Water falling from clouds as rain, snow, sleet, or hail

**Infiltration:** Water in liquid form as it soaks into and moves through the soil



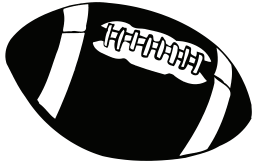
## INSTRUCTIONS

1. Give each student a matching worksheet.
2. Explain the three main states of matter—solid, liquid, and gas—and how they are present in the water cycle. Water is a solid as ice, snow, or hail. Water is a liquid as rain and as flowing water in streams, rivers, lakes and oceans. Water is a gas (vapor) as steam or humidity in the air.
3. To help students understand the states of matter, have them match the pictures to the corresponding states: solid, liquid, or gas.
4. After correctly labeling the objects with their state of matter, give them the next game worksheet. Ask them to write the object names in the corresponding blanks and find the secret message!
5. Review the states of matter and how they appear in the water cycle as well as other common, everyday objects.

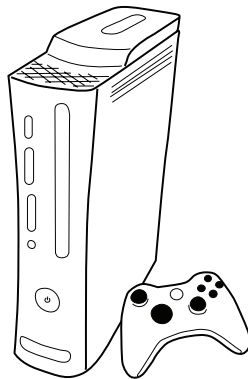


# WATER PHASES OF MATTER MATCHING WORKSHEET

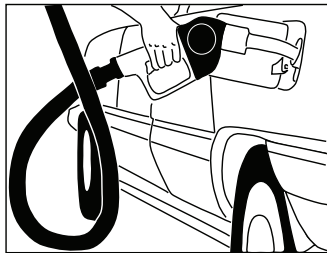
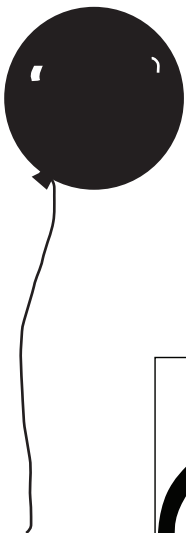
Draw a line from each picture to the correct phase of matter.



**LIQUID**



**SOLID**



**GAS**




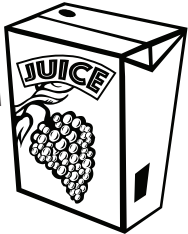


# WATER PHASES OF MATTER GAME WORKSHEET

**LIQUID**

W A T E R

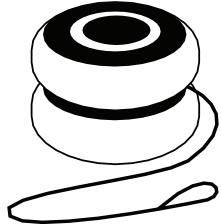

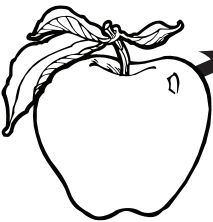

G

**SOLID**

I C E

Y

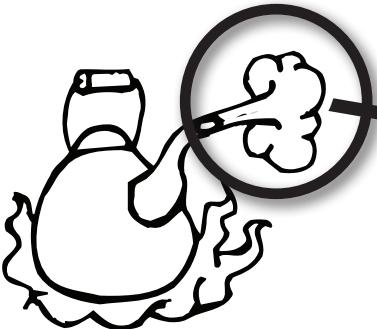
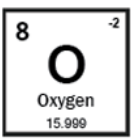
**GAS**

V A P O R

B D

K

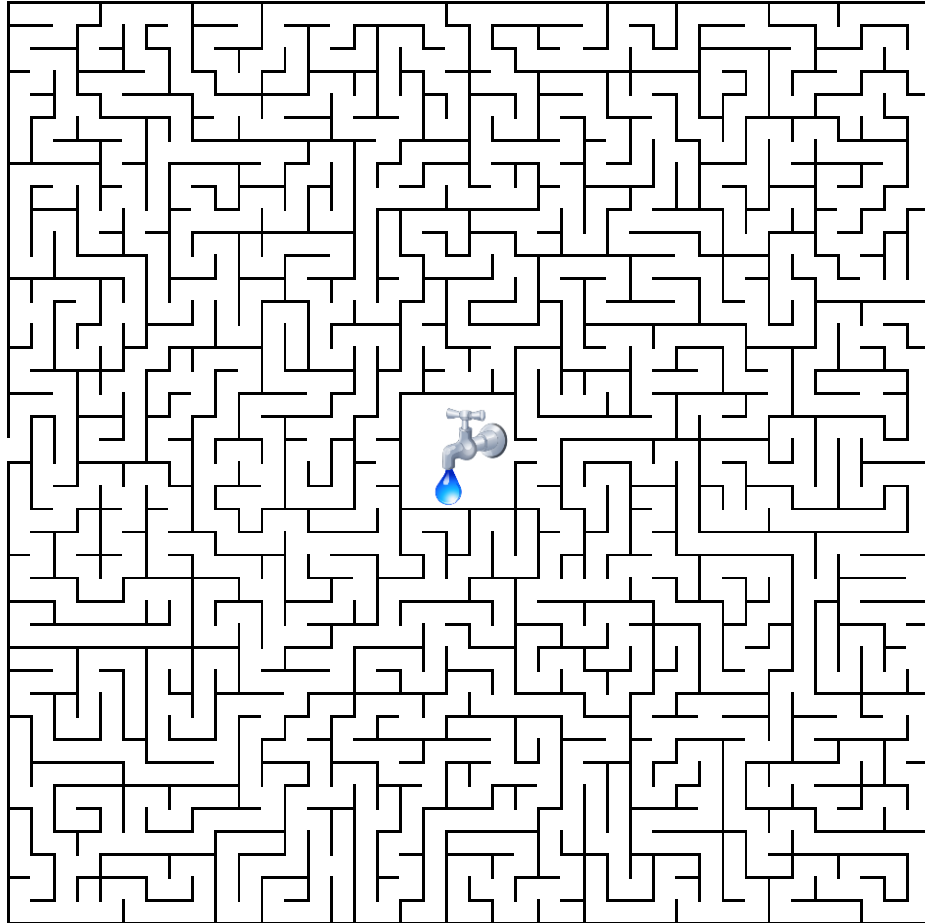
CO<sub>2</sub>



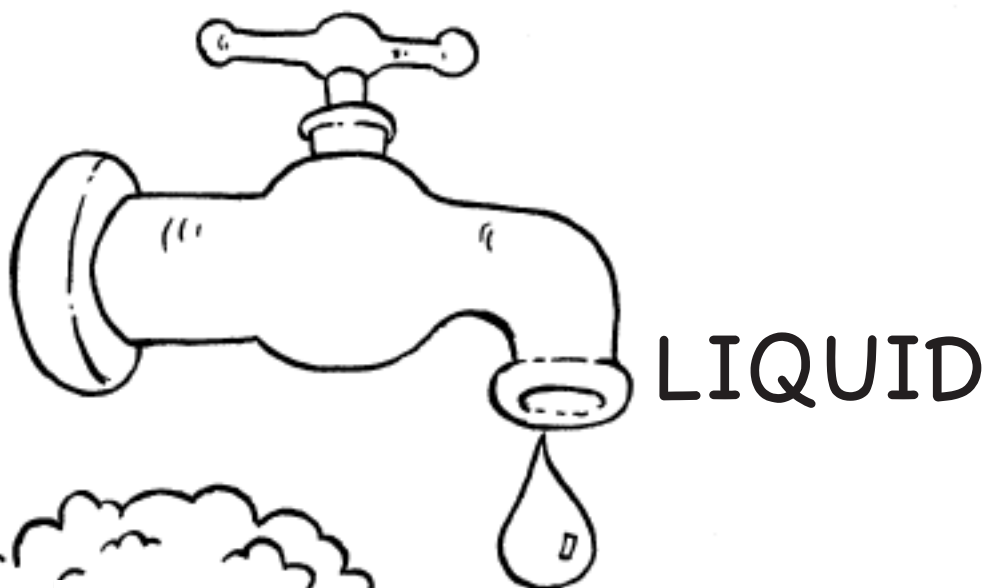
# Clean Water Maze

Help the children get to the clean water!



For more information on how you can help provide clean water to children worldwide, please visit The Water Project at [www.thewaterproject.org](http://www.thewaterproject.org).

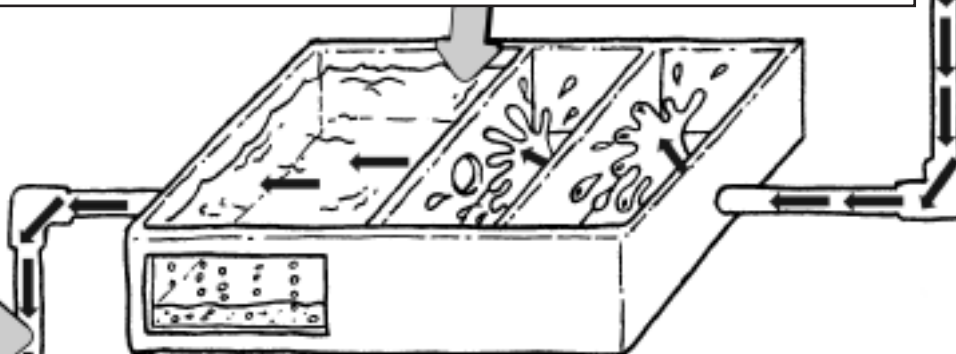
Water comes in three different forms:



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.

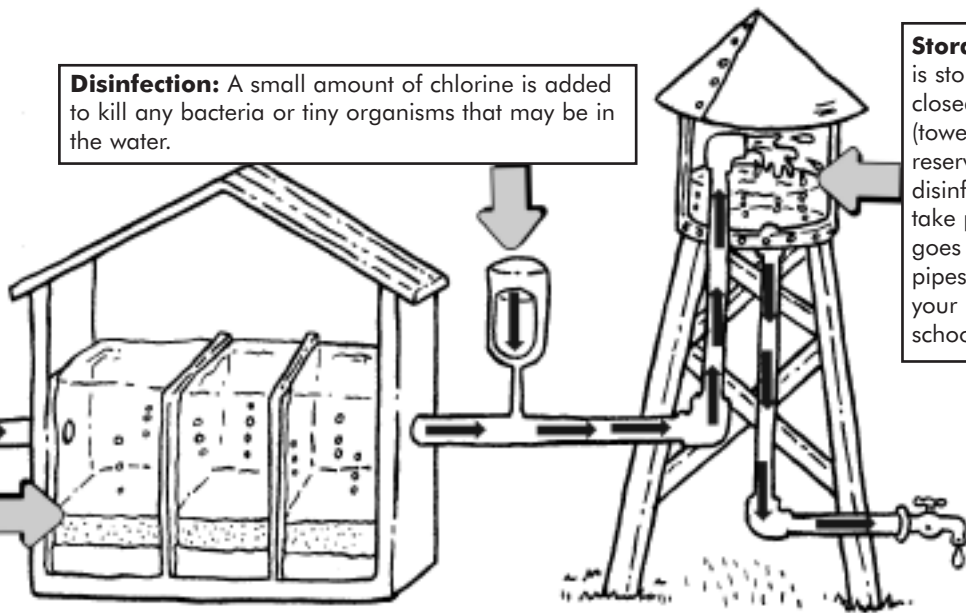


**Coagulation:** Dirty water has many particles floating around in it. Alum and other chemicals are added to the water to form floc that is sticky and attracts the dirt into larger clumps. When they get heavy, they sink to the bottom during sedimentation.



**Sedimentation:** The heavy particles settle to the bottom and the clear water at the top moves on to filtration.

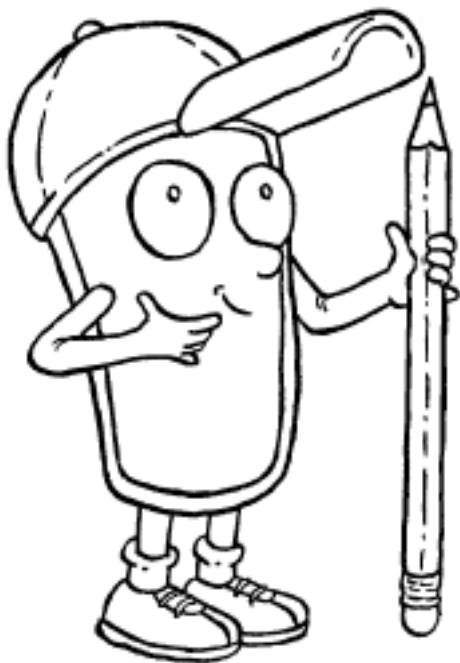
**Disinfection:** A small amount of chlorine is added to kill any bacteria or tiny organisms that may be in the water.



**Storage:** Water is stored in a closed tank (tower) or reservoir so the disinfection can take place. It then goes through pipes and into your home or school.

**Filtration:** The water goes through filters, often made of sand, gravel and charcoal that will catch even smaller particles that float in the water.

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

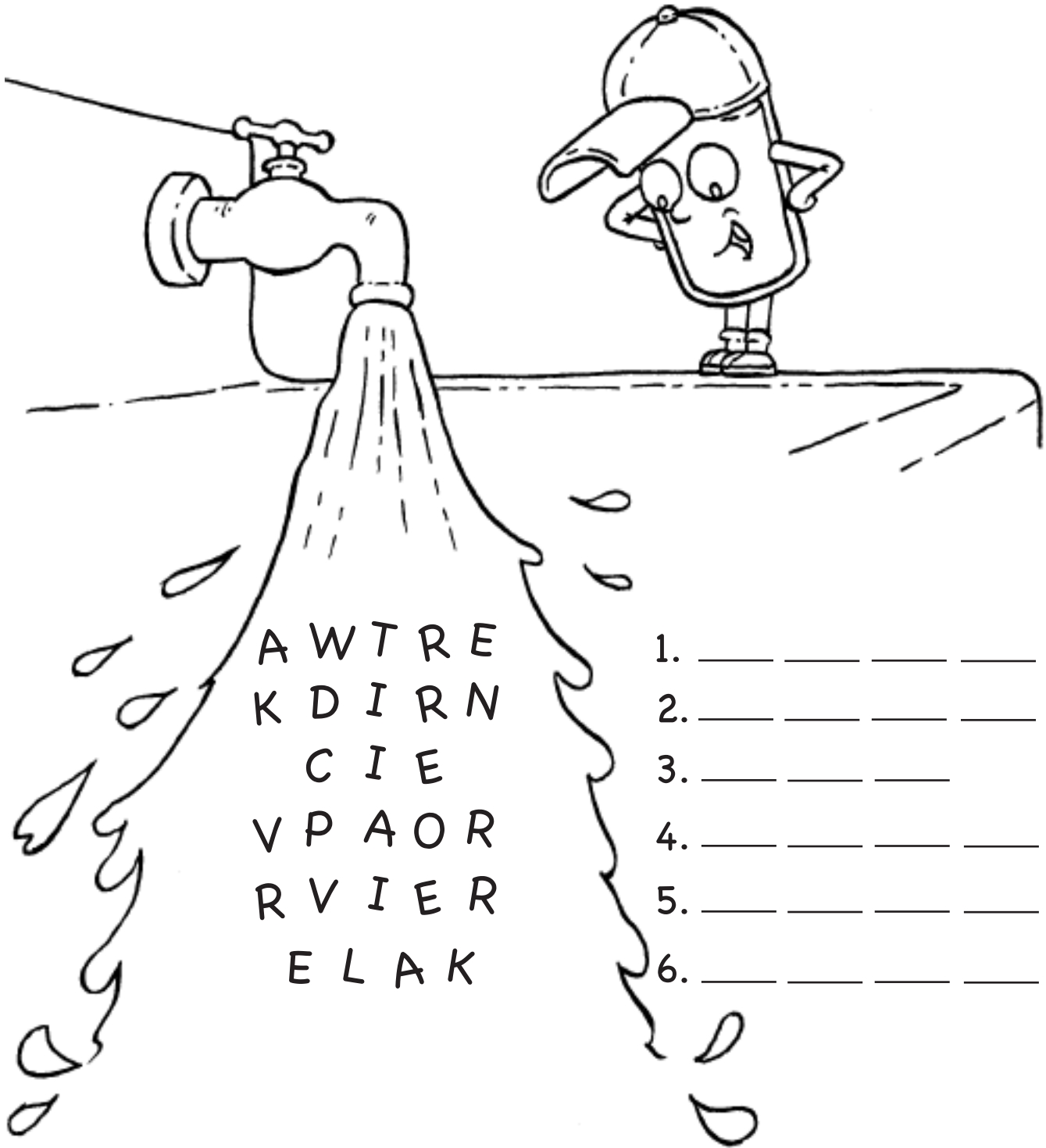
SAFE

POLLUTION

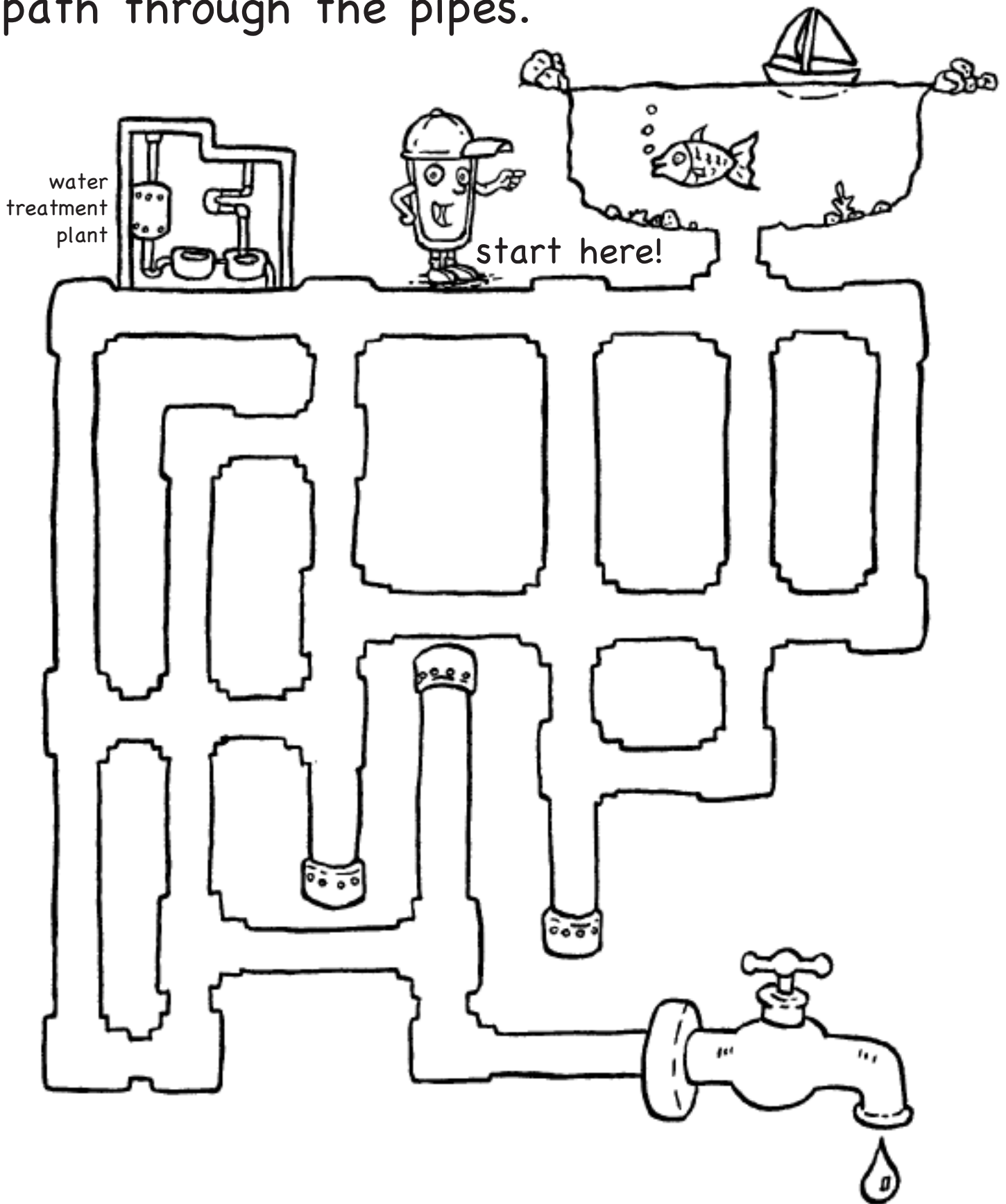
WATER

LAKE

Unscramble the letters:

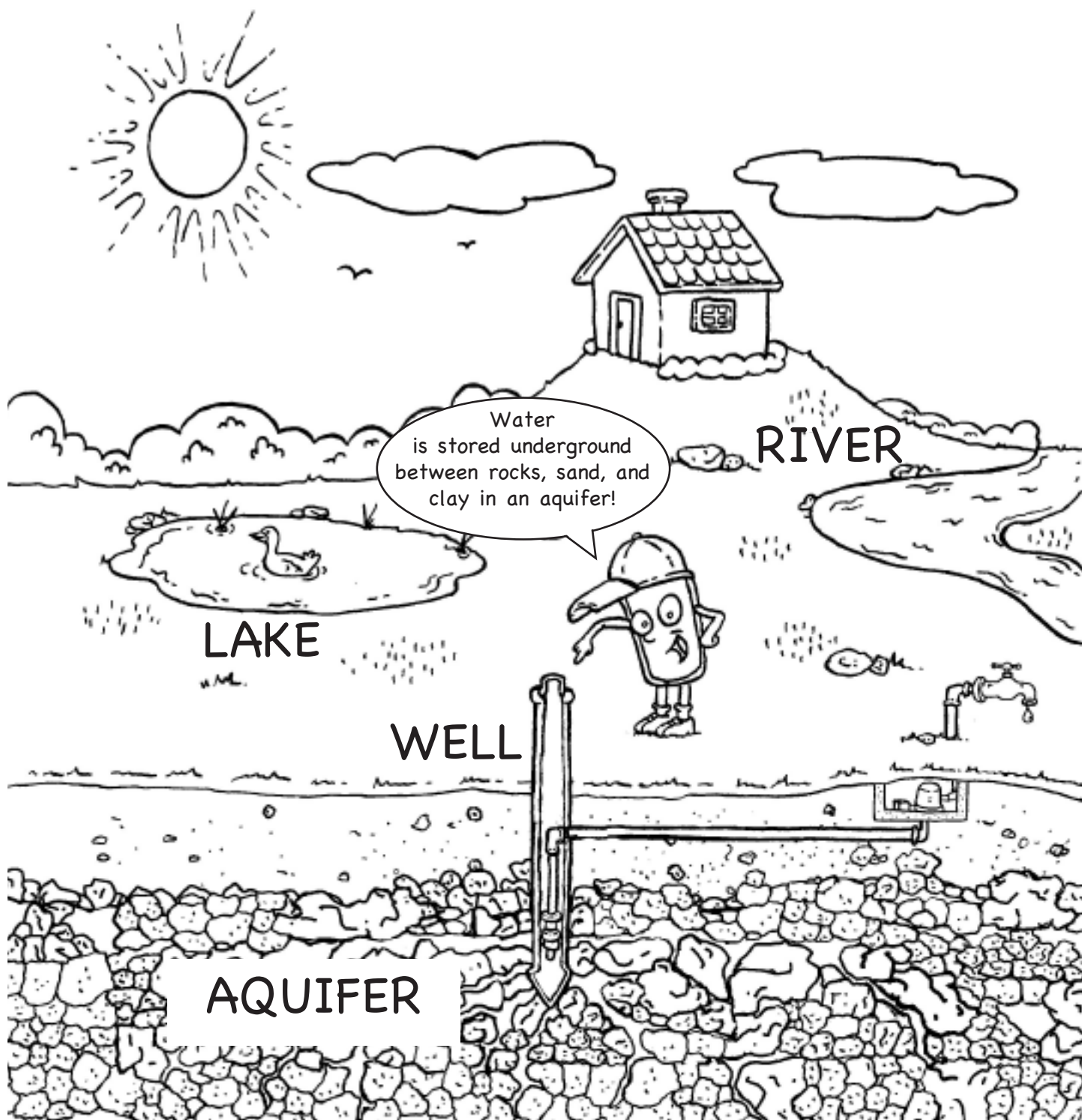


Help the water find its way from the lake to your faucet by following the correct path through the pipes.

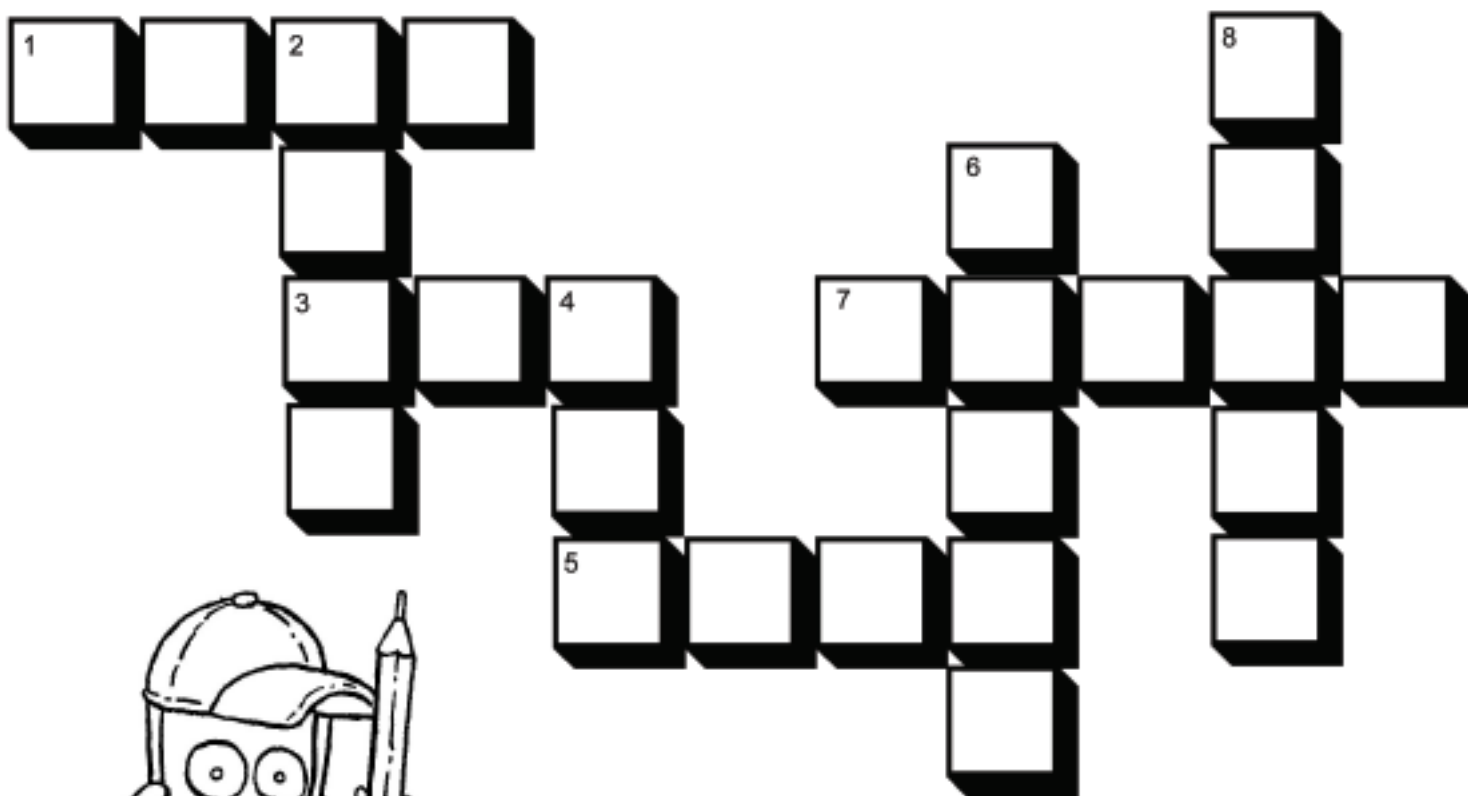




Drinking water comes from lakes, rivers, streams, or under the ground (ground water).



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 \_\_\_\_\_.

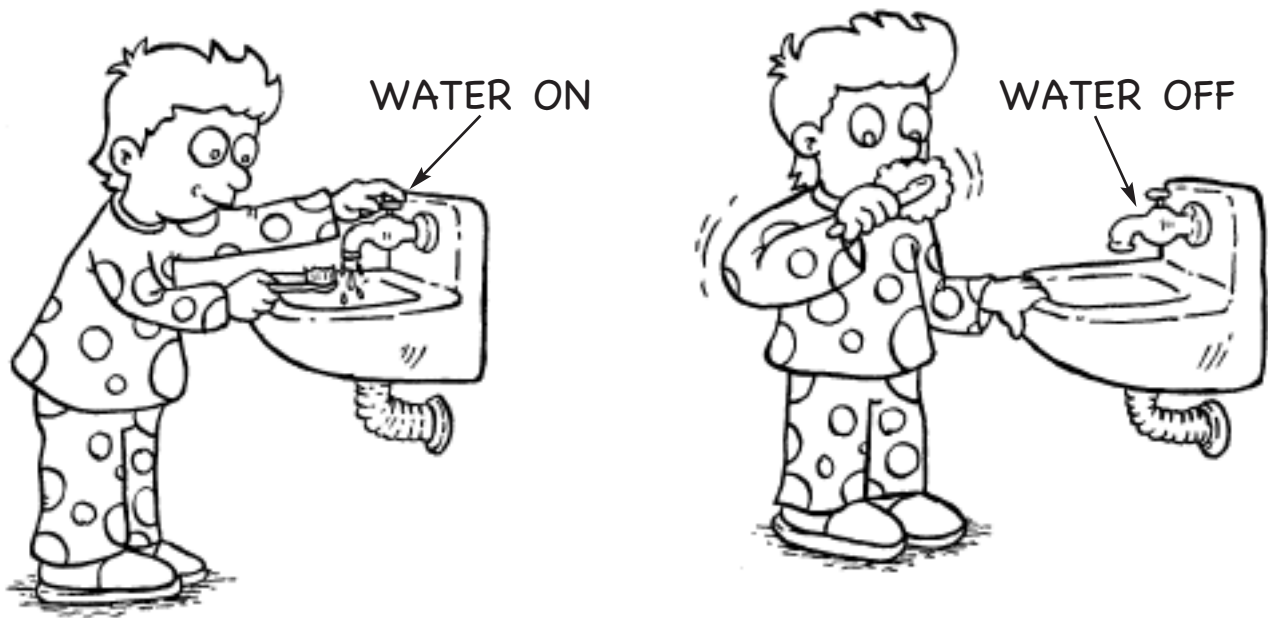
DOWN

- 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 . . .



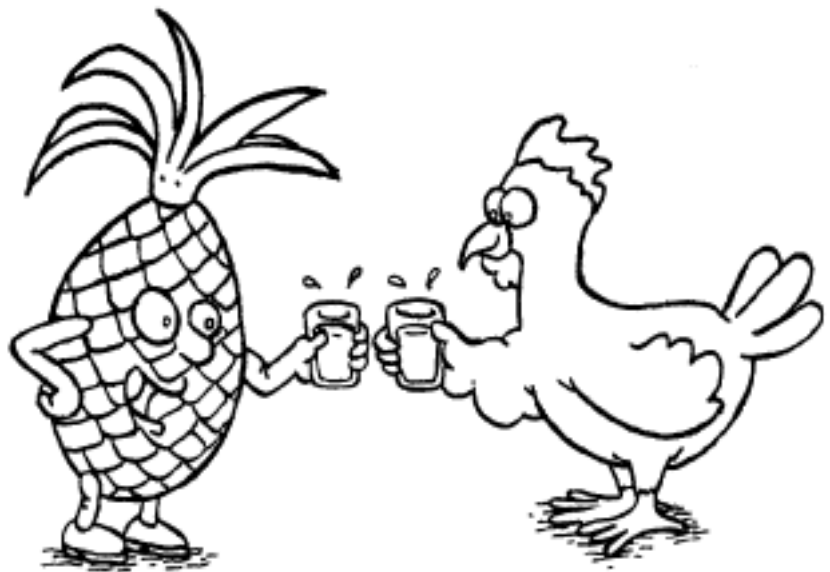
telling an adult when you see a leak.



# 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%*



# GAME ANSWERS

## Word Search Game



## Word Scramble Game

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

## Crosswords Game

ACROSS

1. WASH
3. ICE
5. LAKE
7. FIXED

DOWN

2. SWIM
4. EEL
6. PIPES
8. STEAM