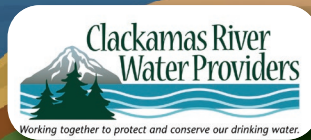
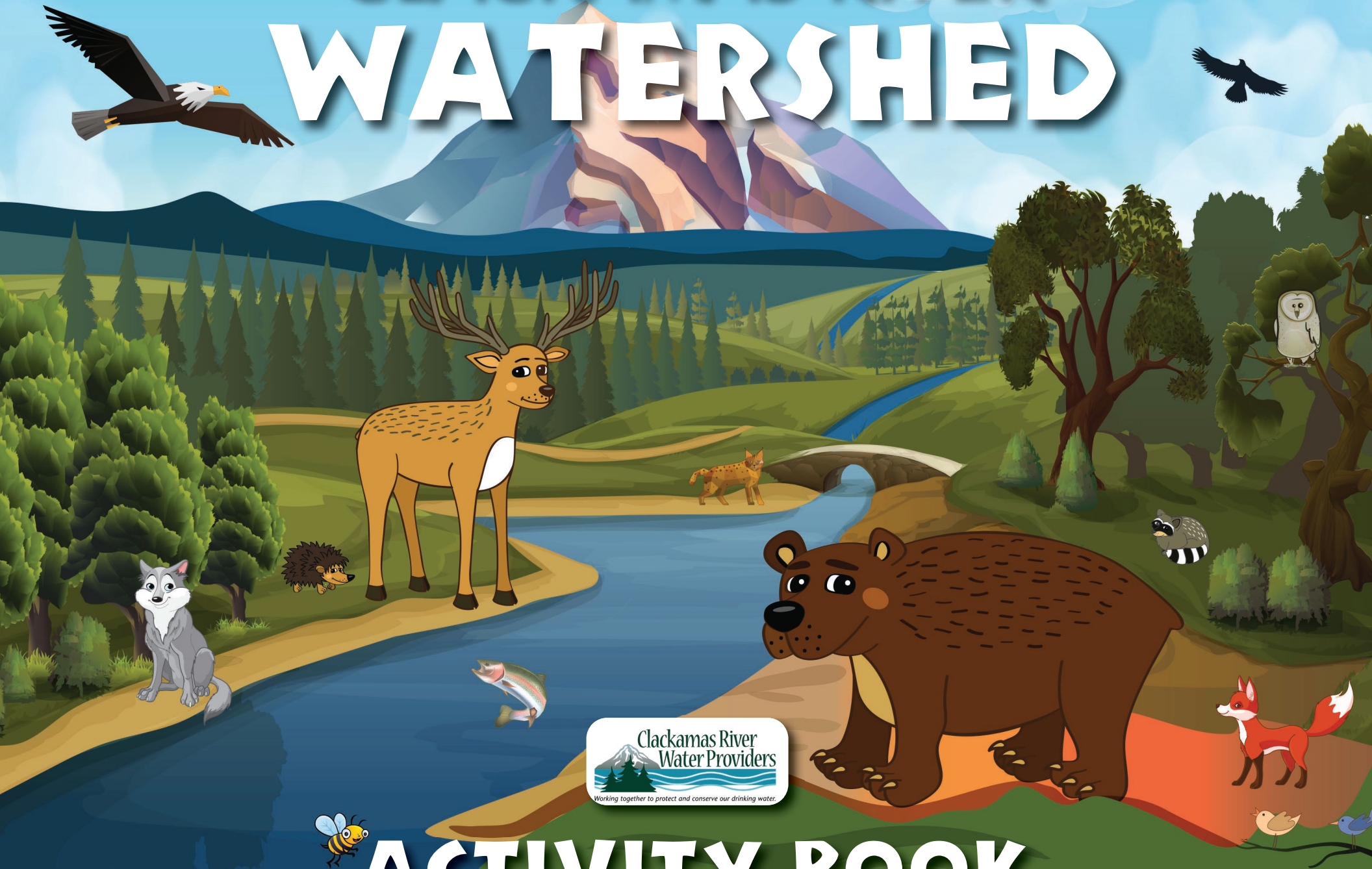


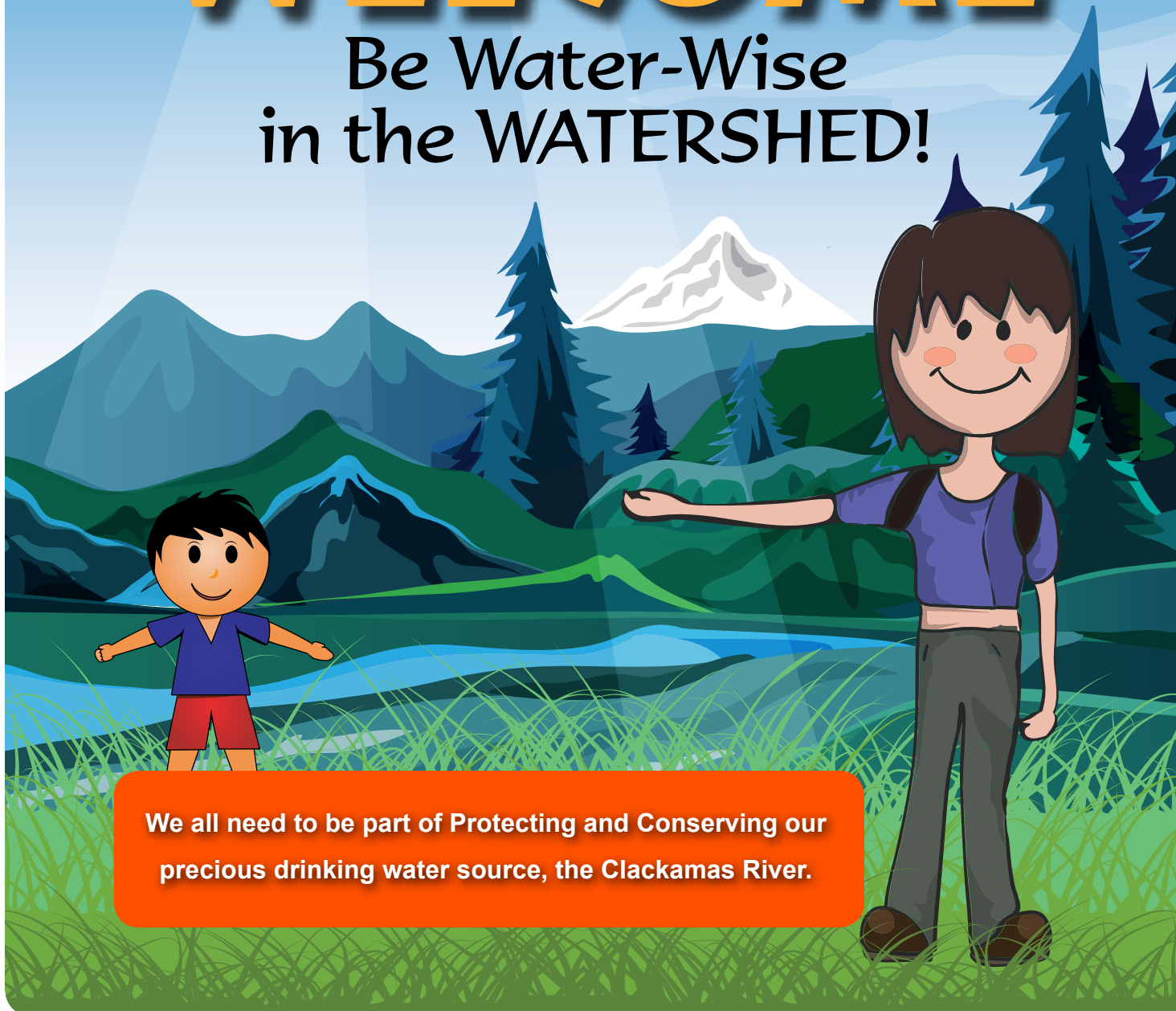
# THE CLACKAMAS RIVER WATERSHED



## ACTIVITY BOOK

# WELCOME

## Be Water-Wise in the WATERSHED!



**We all need to be part of Protecting and Conserving our  
precious drinking water source, the Clackamas River.**

### **Become a Clackamas River Hero!**

Each time you turn on the faucet the water you drink has flowed through the forested hills of the Clackamas River watershed. The Clackamas River Water Providers is a group of water providers that take water out of the river and treat it so it is safe to drink.

Maintaining the high quality of our drinking water takes a lot of work so we hope you will help us out! Through the activities in this book you will learn more about where your drinking water comes from, and what you can do to protect and conserve our drinking water source.

We all play a role in making sure that we protect the Clackamas River from pollution and that there is enough water for all the river users including us. We hope that you will be our next 'Clackamas River Hero'.



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



# CLACKAMAS WATERSHED FACTS

## What Do You Know?

Find the correct answers from this box:



Chinook Salmon	Sand Castles	Plants	Starfish
Fishing	Easter Bunny	A Football Field	Aquatic Species
Surfing	Makes Electricity	Steelhead Trout	Coho Salmon
Grows food and plants	Pot of Gold at End of Rainbow	Grows Trees to Build Houses	Provides Drinking Water
Sharks	2 Square Blocks	Elves and Fairies	Camping
Wildlife	Rafting	Hiking	940 Square Miles

**The Clackamas River** begins on the slopes of Olallie Butte. The watershed can be roughly divided in half, with the upper watershed consisting of forests, mountains, and rugged terrain. While the lower watershed, is mainly farms and cities. In addition to supplying high-quality drinking water to over 300,000 people, the Clackamas River Watershed:

- Drains more than 940 square miles, and has 16 sub watersheds
- Is used for agriculture, recreation, and farming
- Includes federal, state, and private land



Place your answers here:

- 1. The Clackamas River provides important habitat for:**  
1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_
- 2. Name 4 ways people play in the watershed.**  
1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_  
4. \_\_\_\_\_
- 3. Name at least 3 fish that live in the River.**  
1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_
- 4. Name 4 things that the watershed does:**  
1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_  
4. \_\_\_\_\_
- 5. How many square miles is the Watershed?**  
1. \_\_\_\_\_

# CLACKAMAS WATERSHED FACTS

## What is a Watershed?

Can you figure out which of the statements below are **TRUE** or **FALSE**?

- \_\_\_\_ 1. A watershed is a shed or building that stores water.
- \_\_\_\_ 2. People have no affect on watersheds, and watersheds have no affect on the health of our rivers and streams.
- \_\_\_\_ 3. A watershed is any area of land from which water drains to a common point, be it a river, pond, stream or lake.
- \_\_\_\_ 4. Watersheds are contained within county, state, and national boundaries.
- \_\_\_\_ 5. A watershed can be as large as all the land draining into the Columbia River, or as small as 20 acres draining into a pond.



### **DID YOU KNOW?**

From food and beverages to toothpastes and jeans, water is the primary ingredient in thousands of things we use everyday.



# BUILD YOUR OWN WATERSHED

## Where does the water go when it rains?

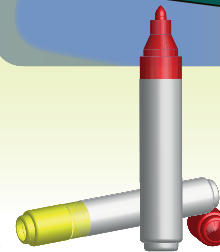
**Find out by making it rain!** In this activity, build a simple model of a watershed to see how water droplets flow and how the shape of the land helps collect water. Using water-based colored makers helps show how water carries pollutants.

### Materials:

- A sheet of white paper
- A shallow pan
- Water-based colored markers
- Spray bottle with water

### Procedure:

1. Crumple the sheet of paper and then partially smooth it out being careful to leave lots of ridges.
2. Using water-based markers, color along the creases using a blue marker. The blue ink will represent water.
3. Using the other color markers, to represent pollutants such as fertilizers (green), pesticides (red), pet/animal waste (brown), etc.
3. Lay the sheet of paper in the pan and shape it so it looks like a mountainous watershed.
4. Gently spray the paper with water and watch colors begin to flow.



# WATERSHED PROTECTION

## Sources of Pollution

Each time it rains or snows, pollutants wash off our roofs, lawns, streets, and parking lots and flow untreated into creeks and rivers. This is called **stormwater runoff** or **non-point source pollution**, and is one of the biggest sources of pollution in our watershed. These pollutants include nutrients from garden fertilizers, bacteria from pet waste and litter, soil erosion, pesticides, and runoff from parking lots.

Can you figure out which are **non-point source pollution** sources? Place the correct letters in the white box.

<b>A</b> Washing your car on the lawn	<b>G</b> Runoff from a parking lot
<b>B</b> Soil and silt erosion	<b>H</b> Using too much pesticide
<b>C</b> Putting candy wrappers in the garbage	<b>I</b> Not picking up pet waste
<b>D</b> A beaver making a dam	<b>J</b> A fairy building a sandcastle
<b>E</b> Creating a rain garden	<b>K</b> A car leaking oil
<b>F</b> Dumping antifreeze or paint down a stormdrain	<b>L</b> A frog swimming in the river

## Stormwater Runoff



### Sources of Non-Point Source Pollution:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_





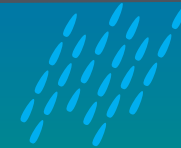
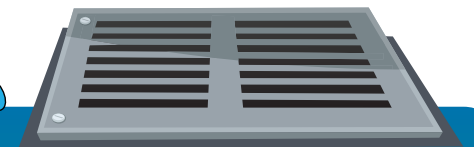
# STORMWATER POLLUTION

**Unscramble the words** to complete the tips on how you can prevent stormwater pollution and protect our watershed.

1. **EPWSE** the driveway instead of hosing it off to keep debris out of the storm drain. \_\_\_\_\_
2. Never **PUDM** motor oil, antifreeze, pesticides, or any toxic materials down storm drains or onto the ground. \_\_\_\_\_
3. Ask your parents to **EYECRCL** used motor oil.  
\_\_\_\_\_
4. Water the lawn for **TROSRHE** periods to prevent runoff.  
\_\_\_\_\_
5. Pick up **ETP TAWES** and put it in the garbage.  
\_\_\_\_\_
6. **SWHA** the car on the lawn or at the car wash, so dirt, oil and soap don't end up in the storm drain. \_\_\_\_\_
7. Make sure your car is not leaking **LIO** or **DIFSUL**.  
\_\_\_\_\_
8. **NLATP** trees along streams to keep the **AKBSN** from eroding. \_\_\_\_\_



**ONLY RAIN  
DOWN THE  
STORM DRAIN**



## **DID YOU KNOW?**

All storm drains lead directly to a local river, creek, or stream.

## DID YOU KNOW?

The water we use today is the same water that was used by the dinosaurs!

Condensation = \_\_\_\_\_

Percolation = \_\_\_\_\_

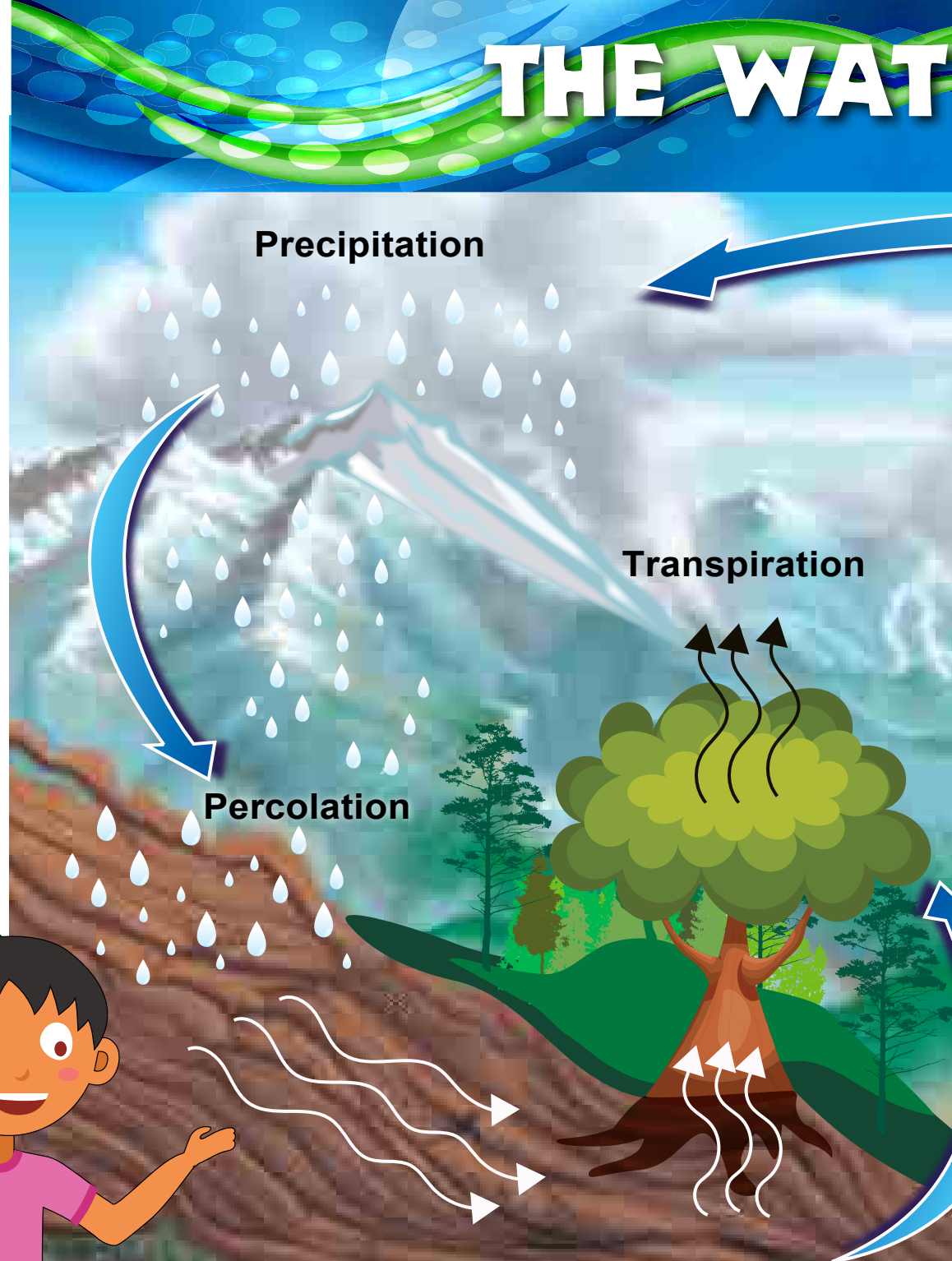
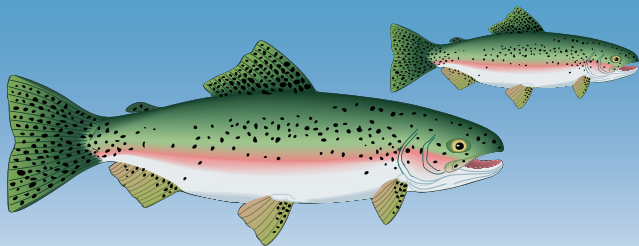
Precipitation = \_\_\_\_\_

Evaporation = \_\_\_\_\_

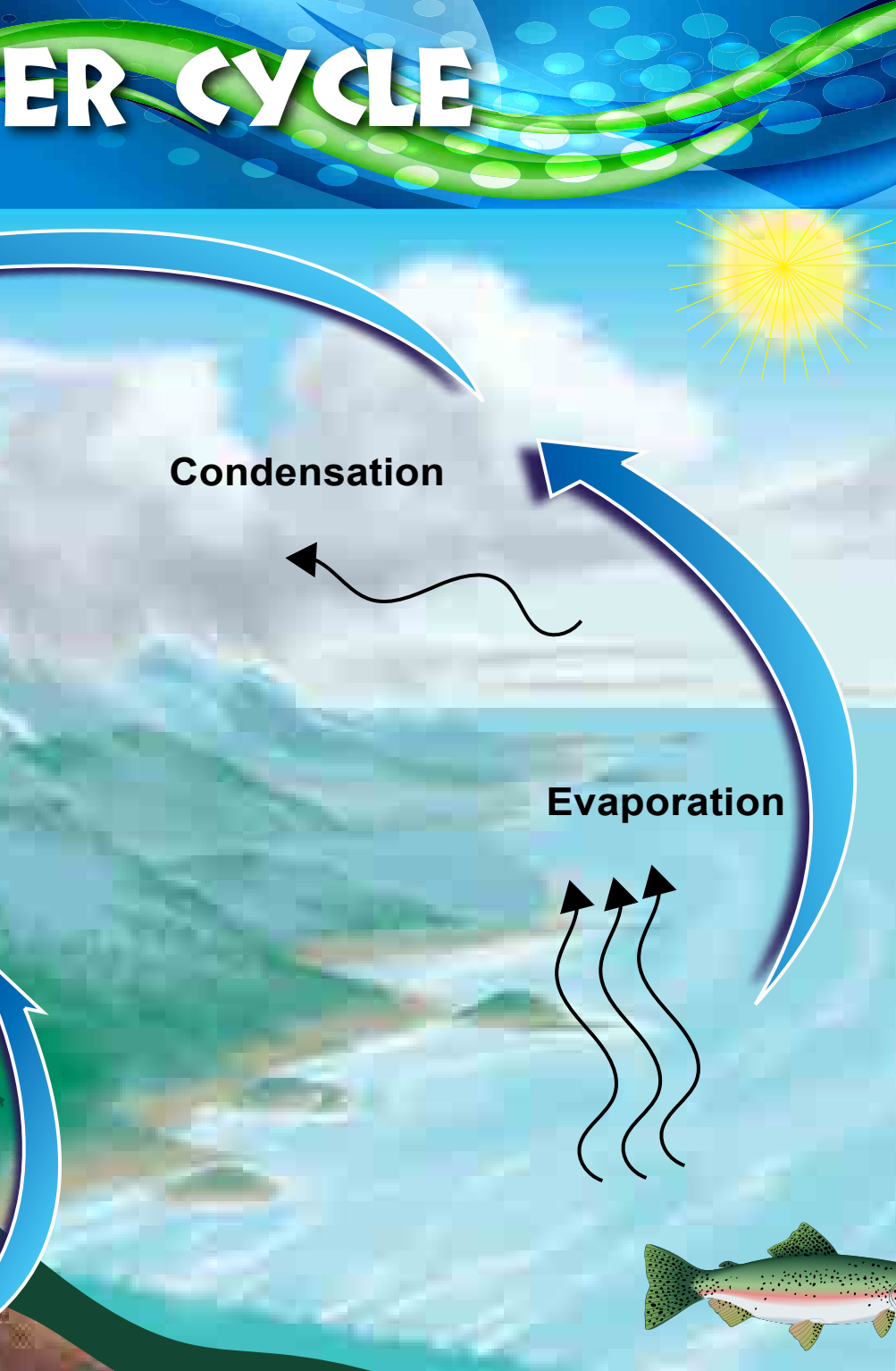
Transpiration = \_\_\_\_\_

*Can you match  
the correct  
Water Cycle  
word with  
the correct  
definition?*

- A** **Vapor created** when the sun heats water in lakes, streams, rivers, oceans, puddles, etc.
- B** **The formation of clouds** when water vapor rises into the air and cools.
- C** **Moisture released** from clouds in the form of rain, snow, hail, etc.
- D** **Vapor created** when plants and trees take water from the soil.
- E** **The downward movement** of water through the ground.





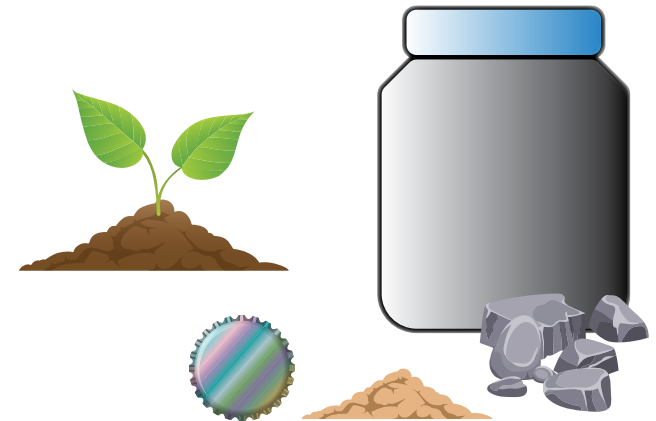


## Make a Mini Water Cycle Activity

We know that water can be a liquid, a gas, or a solid. Through this process, water is recycled over and over. Build your own water cycle and see, first hand, how the water cycle works.

### Materials;

1. Glass jar with a lid
2. Bottle cap
3. Small stones
4. Sand
5. Soil
6. Few small plants



### Procedure:

1. Using a large jar with a wide top (example: pickle jar) layer small stones in the bottom and then cover with sand.
2. Fill jar with soil until half full. Place a few small plants in the soil.
3. Fill the small cap (example: soda bottle cap) with water and place next to the plants.
4. Tighten the lid on the jar. Place jar in the sun for a few days.



# PUBLIC WATER SYSTEMS

## Word Search

Find the words listed on the right, and circle them in the box below:

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

Clackamas  
public  
water  
systems  
provide  
water at  
all hours,  
365 days  
a year!



## Words:

CLACKAMAS RIVER  
CLACKAMAS RIVER WATER  
DAMASCUS  
DISTRIBUTION SYSTEMS  
DRINKING WATER  
ESTACADA  
FIRE HYDRANTS  
GLADSTONE  
HAPPY VALLEY  
LAKE OSWEGO  
LEAK DETECTION  
OAK LODGE  
OREGON CITY  
PIPES  
PRESSURE ZONES  
PUMP STATIONS  
RESERVOIRS  
TIGARD  
TREATMENT PLANT  
UTILITY BILL  
WATER CONSERVATION  
WATER METERS  
WATER QUALITY TESTING  
WEST LINN



# WATER CONSERVATION

Water conservation is something that we all should practice.

*The more water we save, the more water we can leave in the Clackamas River for fish!*

Name five ways you use water:

- 1)
- 2)
- 3)
- 4)
- 5)

Name five ways you can save water:

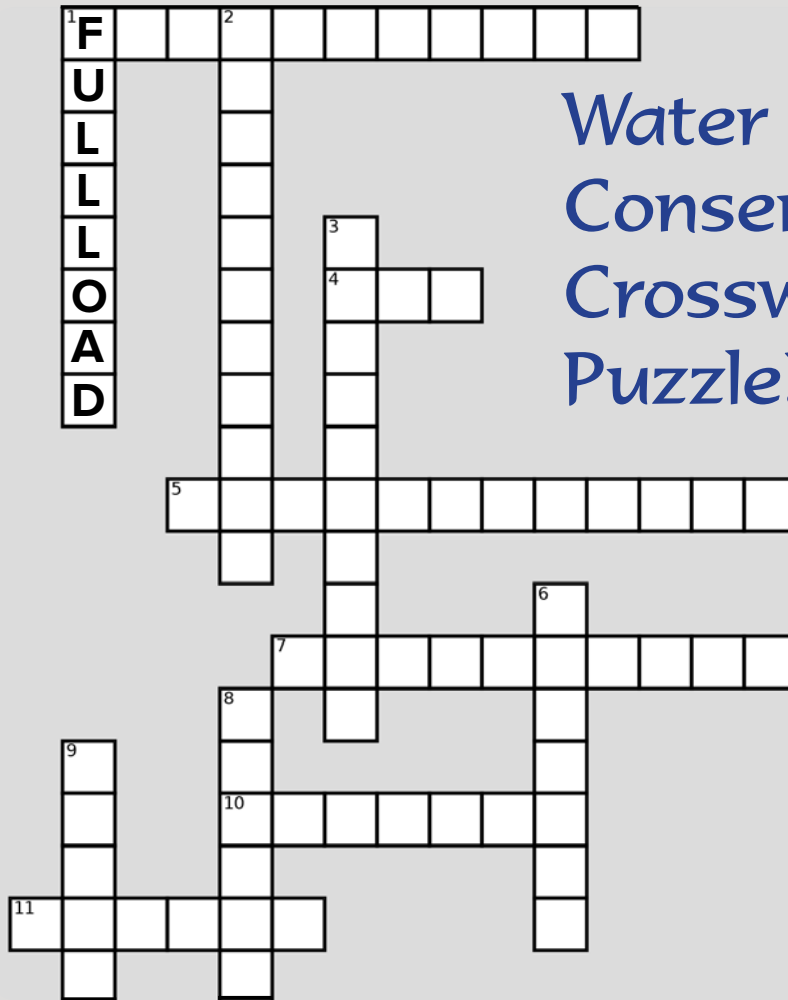
- 1)
- 2)
- 3)
- 4)
- 5)

(Take a look at the words on this page, and you will see some clues. Pick the ones you think are the most important.)



# WATER WORDS

## Water Conservation Crossword Puzzle!



### Down

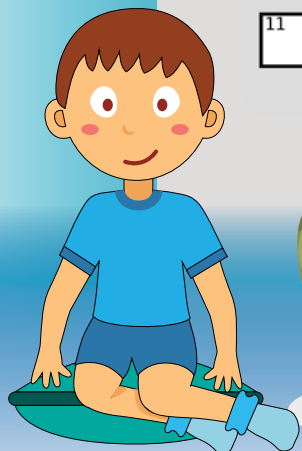
1. Make sure you have a \_\_\_\_\_ when you are doing laundry.
2. What is it called when water turns from a liquid to a vapor?
3. You can save water by \_\_\_\_\_ your food instead of using a garbage disposal.
6. When it hasn't rained for a long time it is called a \_\_\_\_\_.
8. What time of year do we use the most water?
9. Use a \_\_\_\_\_ instead of a hose to clean off your driveway.

### Across

1. How long should your shower be?
4. Turn \_\_\_\_\_ the faucet while you brush your teeth.
5. Another word for saving water:
7. What amount of earth's fresh water is available to use for drinking water?
10. What time of day is the best time to water your lawn and garden?
11. Don't use your \_\_\_\_\_ as a waste basket, each flush uses 3 –5 gallons of water.

### HINTS:

Full load	Broom
Evaporation	Summer
Off	Morning
Composting	Drought
Conserve	One percent
Five minutes	Summer
	Towel



# DID YOU KNOW?

- South Fork Water Board, drinking water treatment plant owned by West Linn and Oregon City started getting their drinking water from the Clackamas River in 1915.
- The average white cloud weighs about 216,000 pounds. That's roughly 2/3 the weight of a blue whale.
- A garden hose or sprinkler can use almost as much water in an hour as a family of four uses in one day.
- It takes about 35 gallons of water to produce a bicycle.
- The average person uses 100 gallons of water a day.
- It takes about 70 gallons of water to produce one gallon of gas.
- It takes about 120,000 gallons of water to produce a small car.
- The Clackamas River flows 83 miles from its headwaters to the confluence with the Willamette River.
- A dairy cow must drink four gallons of water to produce one gallon of milk.
- A faucet that leaks 1 drip per second results in wasting 3,000 gallons of water in a year.
- Bottled water cost 2000 times more than tap water.
- It is not possible to tell if water is safe to drink by visual examination.
- Tap water undergoes far more testing than bottled water.
- You can refill an 8-oz glass of water approximately 15,000 times for the same cost as a six-pack of soda.
- The City of Tigard started getting all of their drinking water from the Clackamas River in 2016.



## FUN FACTS!



# ANSWERS

## PAGE 3. WATERSHED FACTS:

1. Plants, Aquatic Species, and Wildlife
2. Fishing, Rafting, Hiking and Camping
3. Coho Salmon, Steelhead Trout, Chinook Salmon
4. Grows Trees to Build Houses, Makes Electricity, Grows Food and Plants, Provides Drinking Water
5. 940 Square Miles

## PAGE 4. TRUE OR FALSE?

- 1.-False, 2.-False, 3.-True, 4.-False, 5.-True



## PAGE 6. NON-POINT SOURCE POLLUTION SOURCES.

Correct letters are:

**B, F, G, H, I, and K**



## PAGE 7. WORD SCRAMBLE:

1. SWEEP
2. DUMP
3. RECYCLE
4. SHORTER
5. PET WASTE
6. WASH
7. OIL, FLUIDS
8. PLANTS, BANKS

## PAGE 8. WATER CYCLE: B, E, C, A, D

**Evaporation** — Vapor created when the sun heats water in lakes, streams, rivers, oceans, puddles, etc.

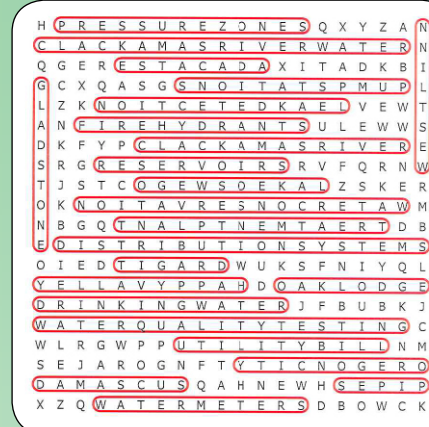
**Condensation** — The formation of clouds when water vapor rises into the air and cools.

**Precipitation** — Moisture released from clouds in the form of rain, snow, hail, etc.

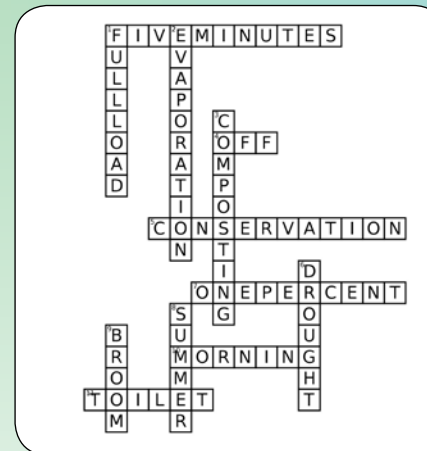
**Transpiration** — Vapor created when plants and trees take water from the soil.

**Percolation** — The downward movement of water through the ground.

## PAGE 10. WORD SEARCH:



## PAGE 12. CROSSWORD PUZZLE:



### Down

1. FULL LOAD
2. EVAPORATION
3. COMPOSTING
6. DROUGHT
8. SUMMER
9. BROOM

### Across

1. FIVE MINUTES
4. OFF
5. CONSERVATION
7. ONE PERCENT
10. MORNING.
11. TOILET.

## PAGE 11. WATER CONSERVATION

### Use Water:

- Drink
- Bath
- Gardening
- Clean
- Cook
- Washing dishes
- Swimming pool
- Water balloons



### Save Water:

- Limit shower time
- Turn off water
- Brush teeth water off
- Water garden in the AM
- Rain barrel
- Run dishwasher full
- Use water efficient fixtures
- Shrink lawn
- Use professional car wash
- Fix leaks
- Time sprinklers

**THANK YOU!**  
FOR PLAYING WITH US!





# CERTIFICATE OF PROTECTION & CONSERVATION



*This Certificate recognizes my efforts  
to protect and conserve the Clackamas River Water.*



Name \_\_\_\_\_

Date \_\_\_\_\_

Kimberly Swan, *Water Resource Manager*

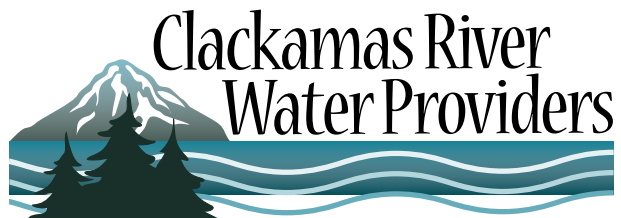
Christine Hollenbeck, *Public Outreach & Education Coordinator*

Please fill in your name, and date, and place where others can see to ask questions about your achievements!

## As a 'Clackamas River Hero', I pledge to:

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Shut off the water while brushing my teeth. | <input type="checkbox"/> Pick-up pet waste.     | <input type="checkbox"/> Remember only rain goes down the drain.       |
| <input type="checkbox"/> Put all litter in the garbage can.          | <input type="checkbox"/> Take 5-minute showers. | <input type="checkbox"/> Turn off the sprinkler when finished playing. |

***Your school, teachers, and your community thank you for being a Clackamas River Hero!***



*Working together to protect and conserve our drinking water.*

14275 S Clackamas River Drive  
Oregon City, OR 97045  
[www.clackamasproviders.org](http://www.clackamasproviders.org)  
[christine@clackamasproviders.org](mailto:christine@clackamasproviders.org)  
503.723.3511



[www.crwater.com](http://www.crwater.com)



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



[www.ci.gladstone.or.us](http://www.ci.gladstone.or.us)



[www.ci.oswego.or.us](http://www.ci.oswego.or.us)



[www.tigard-or.gov](http://www.tigard-or.gov)



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



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



[www.sunrisewater.com](http://www.sunrisewater.com)