

DESERT STORMWATER DISCOVERIES

Discover desert
stormwater with me!

**An Elementary School
Activity Book**

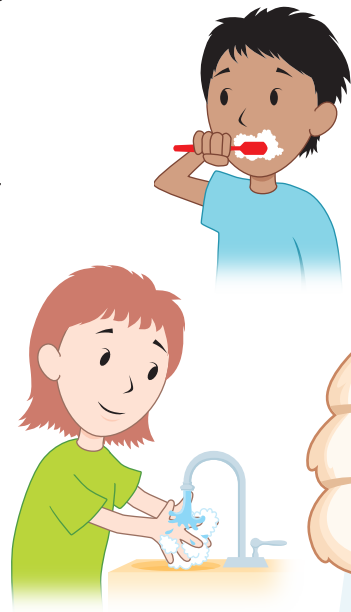


Hi kids! Welcome to **Desert Stormwater Discoveries**. I'm Sparky the Stormwater Safety Pup! I live in the Phoenix Metro area just like you, and I want to help you learn about water.

People, plants, and animals all need water to survive. How do you use water? Place a checkmark on the list for ways that you use water, and write in other ways.

My Water Use

- ☐ Drinking
- ☐ Cooking
- ☐ Bathing/showering
- ☐ Brushing teeth
- ☐ Flushing toilet
- ☐ Washing hands
- ☐ Washing dishes
- ☐ Washing clothes
- ☐ Watering plants
- ☐ For pets
- ☐ For fun (How? _____)
- ☐ Other uses: _____



Now it's time to complete the fun puzzles and games in this activity book to learn about our water sources, the water cycle, watersheds, stormwater pollution and how to prevent it, stormwater safety, and rainwater harvesting! Let's make some discoveries together!

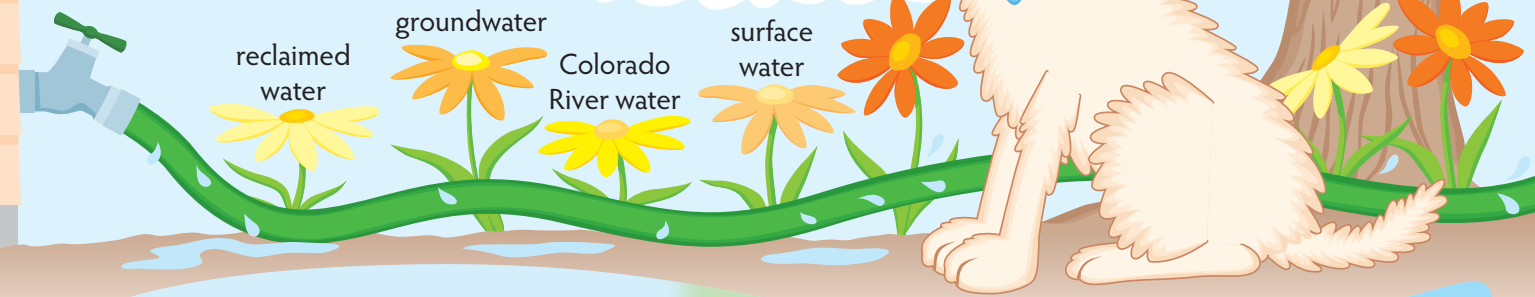


Be on the lookout for this symbol! You can scan the code with a smart device or type in the website link with a trusted adult to discover a creative activity or to watch a special video to learn even more!
e3learn.org/st0

Adults, be sure to look at Family Resources at the end of this book for more information for you and your family!

Our Water Sources

Your local water provider makes sure clean water is delivered to your home! But, where does all that water come from? Use the rhyming clues below to learn about our water sources. Write the correct source beneath each description.

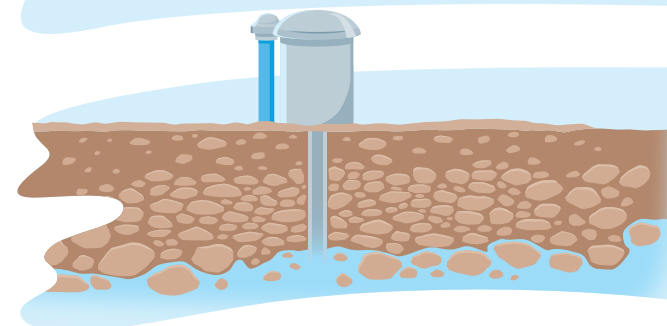
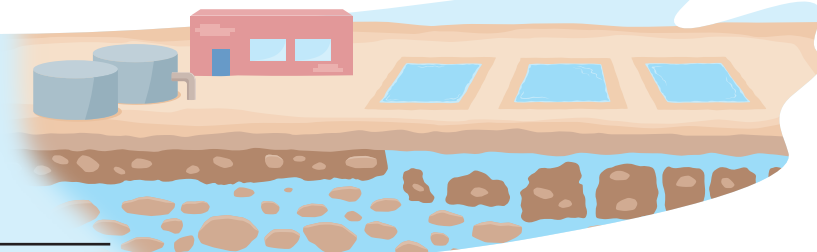


This source of water can flow across the ground. Around the Phoenix Metro area it can be found. In places like the Salt River or a wash after a storm, Even our reservoirs it does form.



This source of water comes from Lake Havasu 190 miles across the desert it's pumped to get to you! The Central Arizona Project, known as the CAP, Brings this distant water source all around the Valley!

Some Valley towns have water treatment plants nearby To clean up our wastewater, do you wonder why? Wastewater is recycled, then slowly sinks down To help recharge the aquifers beneath our towns.



Into the ground a deep well needs to be drilled So that your bath or water bottle can easily be filled. When you turn on the faucet, the water it does flow. It's pumped up from the aquifer in the ground deep below.

Our Water Cycle

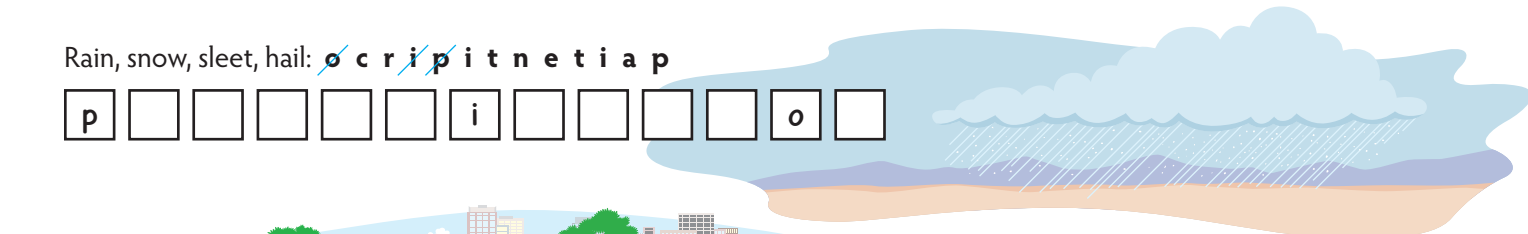
Water Cycle Words

All the Earth's water is part of **nature's water cycle**. Unscramble the Water Cycle Words below to discover how water moves through the water cycle as solid, liquid, or gas.



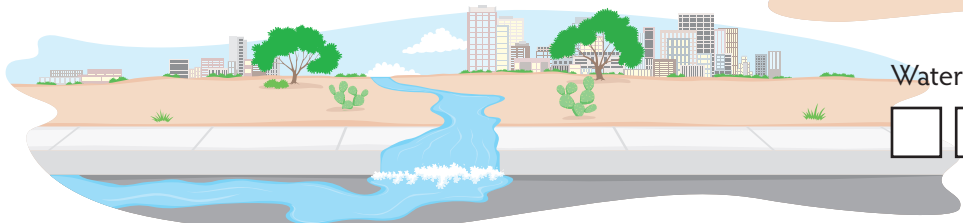
Rain, snow, sleet, hail: **o c r i p i t n e t i a p**

p [] [] [] [] [] [] i [] [] [] [] o []



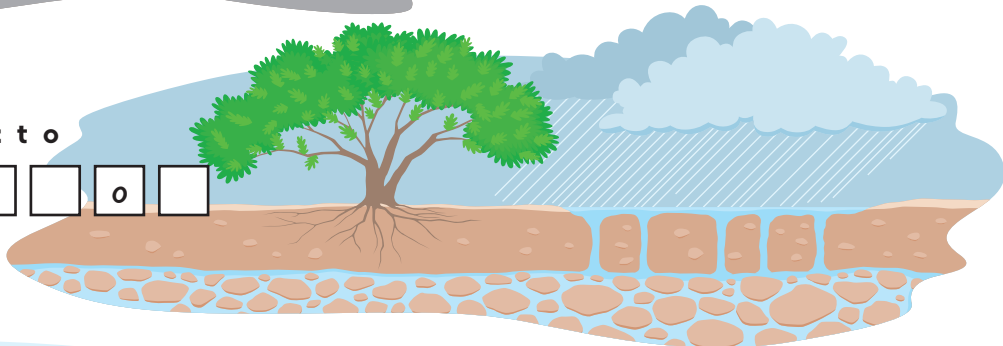
Water that flows on Earth's surface: **f o u n r f**

[] u [] [] [] f



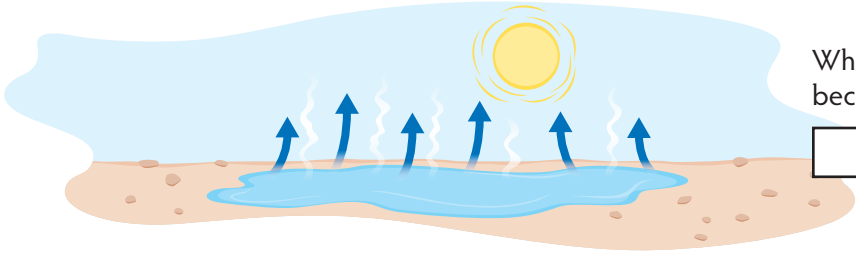
When water slowly sinks underground to reach the aquifer: **l p r e i n o a c t o**

[] [] r [] [] [] a [] [] o []



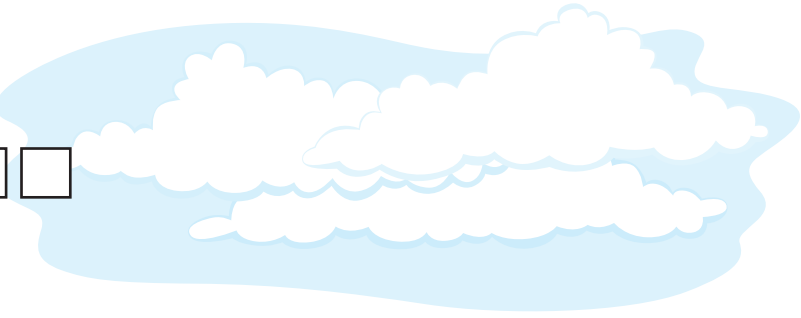
When liquid water is warmed up by the sun to become a gas (water vapor): **p a e t y n a o r o i**

[] v [] p [] [] [] t [] [] []



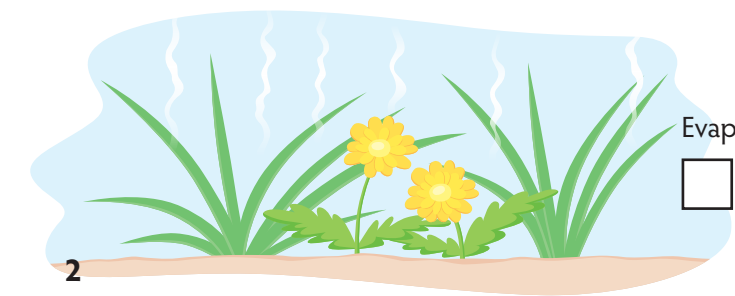
When water vapor in the air is changed into tiny drops of water that forms clouds: **s c t d o n o e n a i n**

[] [] [] d [] [] s [] [] i [] []



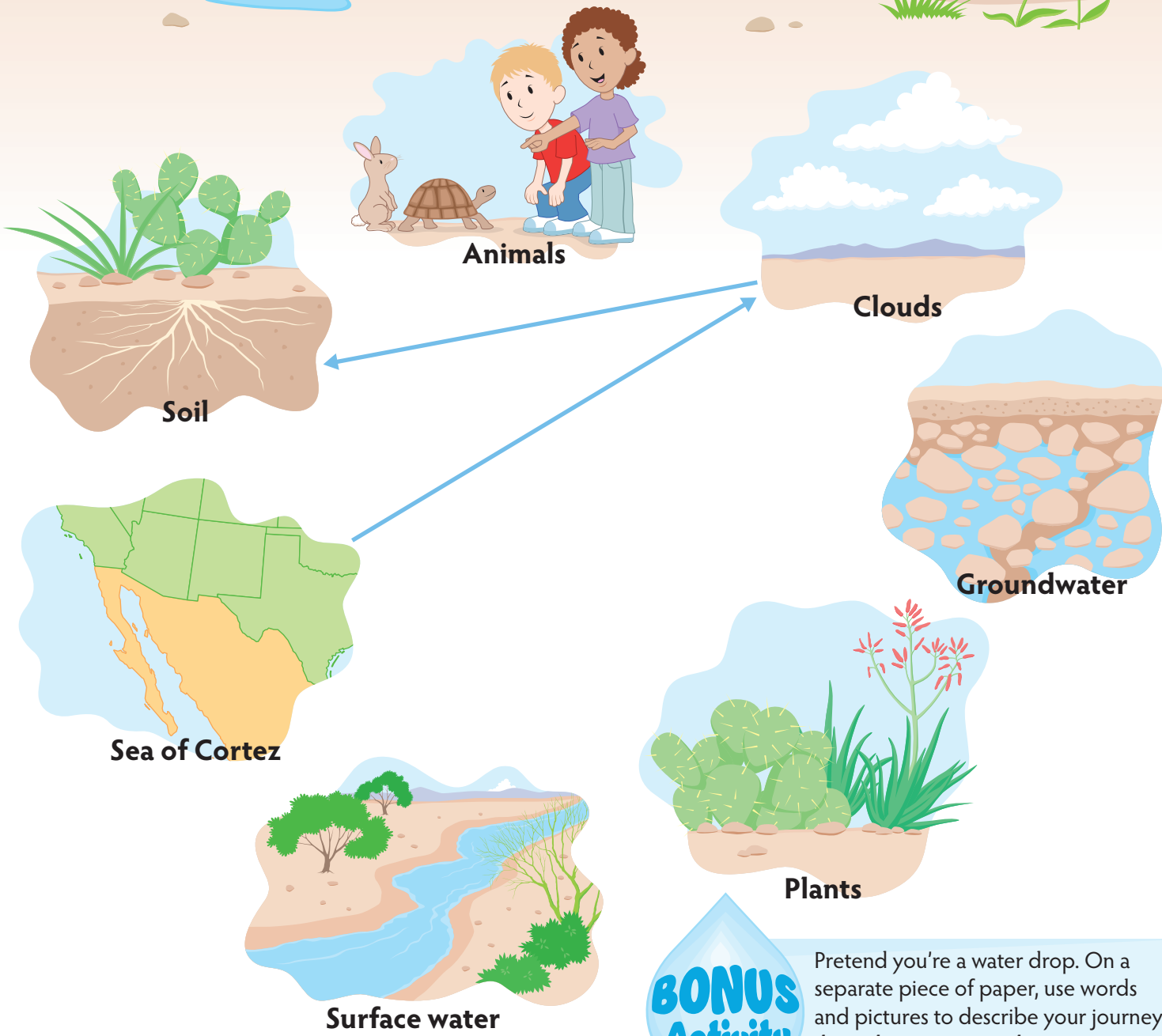
Evaporation of water from plants: **r s p t i r a n i a t o n**

[] [] a [] [] [] r [] t [] [] []



Water Cycle Connections

How are all the parts of the water cycle in the Phoenix Metro area related? For example, an arrow has been drawn from the Sea of Cortez to Clouds because water evaporates from the ocean in Mexico and then condenses to form clouds over Arizona. Precipitation falls from the clouds and lands on the soil, so an arrow has been drawn from Clouds to Soil. Multiple lines can be drawn to and from each of the parts of the water cycle. Can you discover at least 10 connections? Draw them in!



Pretend you're a water drop. On a separate piece of paper, use words and pictures to describe your journey through our water cycle.

Rainy Day Poetry

It may not rain a lot here in the Sonoran Desert, but when it does, we know how important it is and how it makes us feel. Learn about our two different rainy seasons in the Phoenix Metro area, then use the river of words below to help you write poems to describe each of these seasons.



Winter

- December-February
- Any time of day
- Gentle rains
- Widespread

Summer

- June 15 to September 30 (monsoon season)
- Clouds build up in the afternoon
- Short, heavy thunderstorms
- Can be local

BONUS Activity

On a separate piece of paper, draw pictures to go along with your poems.

monsoon, drizzle, flash flood, puddles, pouring, sprinkle, thunder, cloudy, showers, rainfall, storm, lightning, windy, long, gentle, hail, hot, cold, short, sudden

What is Stormwater?

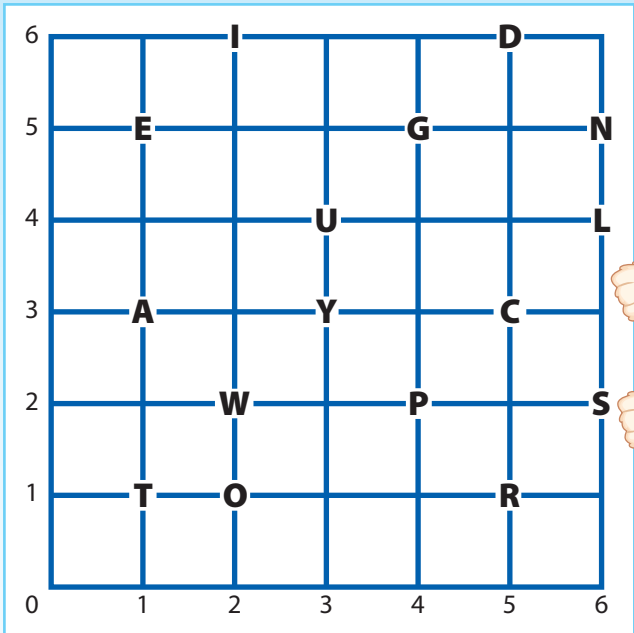
Don't let those words float away! Use them to fill in the blanks to complete these rhymes about stormwater!

When snow melts or n falls
Where does that water go?
Some of it sinks into the ground,
But sr starts to fw.

Stormwater flows wherever it can
Dl when it rains
Flowing through an urban system
Of ds and ss.

Sometimes the water can't sink in
Because the ground is already too wet.
And rs, ps, sidewalks, and rs
Result in lots of stormwater, you can bet!

Wondering About Watersheds



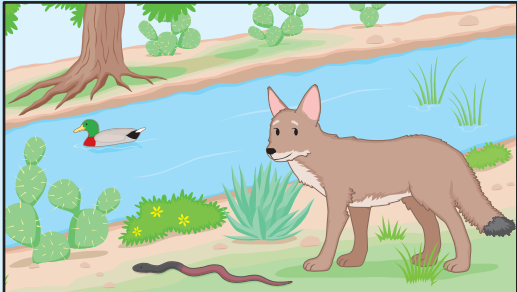
A **watershed** is an area of land that drains water to a central location. Surface water flows downhill across the land to small streams into larger ones until it reaches a river, lake, or the ocean.

How is water in our watershed important? Find out by using the grid to fill in the blanks. To find each letter, count across the grid and then count up. Example: For the first letter in the clue to the right (5,1), go across 5 and up 1 to find the letter R.



It's fun to go swimming, fishing, boating, rafting, and tubing!

R					A		O		
(5,1)	(1,5)	(5,3)	(5,1)	(1,5)	(1,3)	(1,1)	(2,6)	(2,1)	(6,5)



Plants and animals living in our watershed need water to survive.

E
(6,5) (1,3) (1,1) (3,4) (5,1) (1,5)

Farmers and ranchers use water to grow crops and raise animals.

		R				L		U		
(1,3)	(4,5)	(5,1)	(2,6)	(5,3)	(3,4)	(6,4)	(1,1)	(3,4)	(5,1)	(1,5)

Factories need water to make products like clothing and electronics. And, our power plants need water to generate electricity.

N				T			
(2,6)	(6,5)	(5,6)	(3,4)	(6,2)	(1,1)	(5,1)	(3,3)



We need water for drinking, cooking, cleaning, bathing, flushing toilets, and more!

P
(4,2) (1,5) (2,1) (4,2) (6,4) (1,5)

Make your own mini-watershed!
e3learn.org/st1

Some of our surface water sinks underground to the aquifer, and then we pump it up to use it.

			U				A			
(4,5)	(5,1)	(2,1)	(3,4)	(6,5)	(5,6)	(2,2)	(1,3)	(1,1)	(1,5)	(5,1)

Stormwater Pollution Contribution

As stormwater flows over land and man-made surfaces in a watershed, it picks up dirt, trash, and other materials along the way. Some materials, called **pollutants**, can flow into storm drains and eventually flow into nearby rivers, lakes, or retention basins and washes. Pollutants can be harmful to the water and the environment throughout a watershed.



Find and circle at least 10 things in this neighborhood scene that could become stormwater pollutants if they are not cleaned up properly.

Then, **scan the four QR Codes** on this page (or type in the URLs) with a trusted adult to discover more about preventing stormwater pollution.



Stop Illegal Dumping!
e3learn.org/st3



Keep It on the Green!
e3learn.org/st4



Don't "Pool"-ute!
e3learn.org/st5

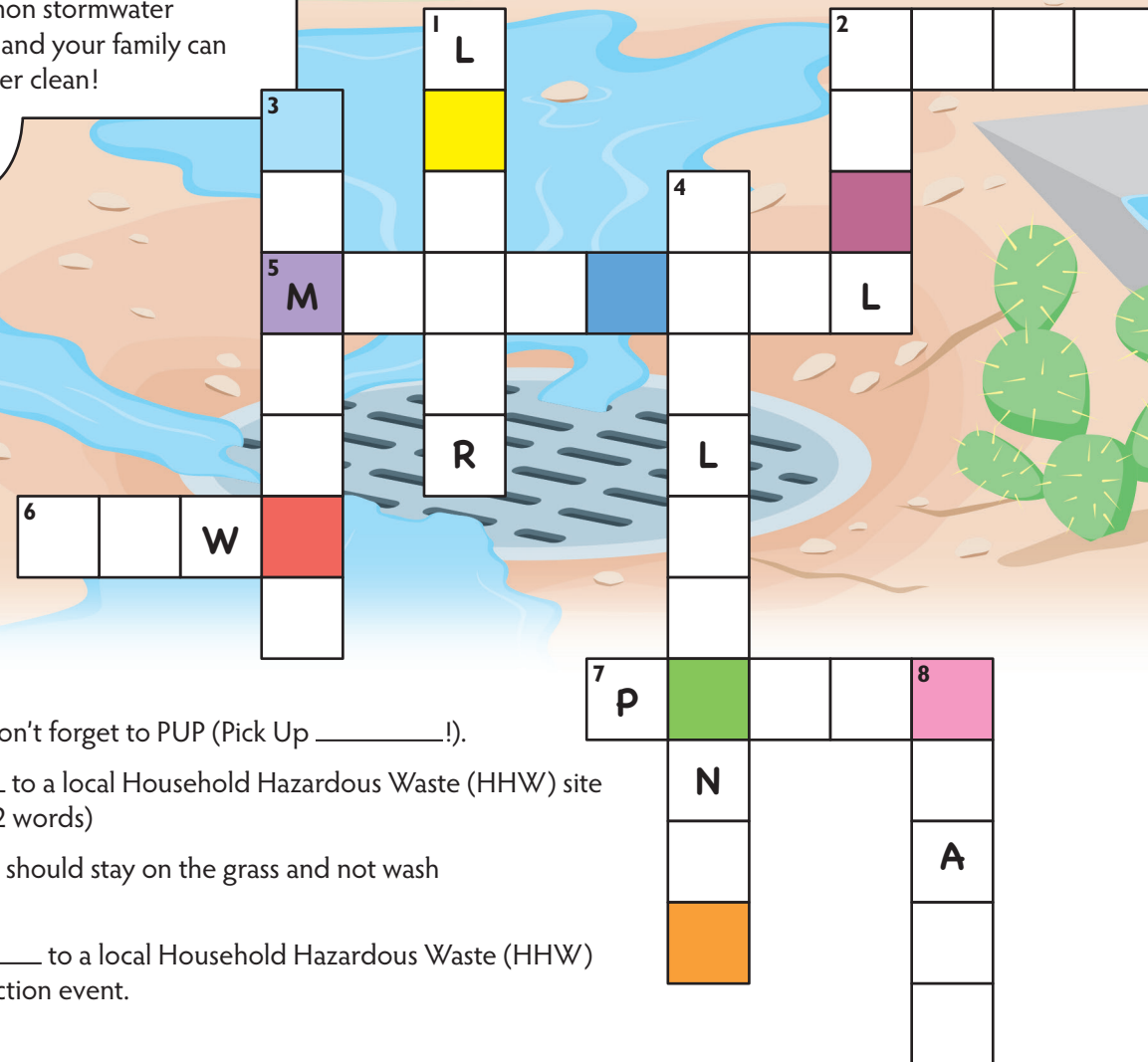


Carpet Wastewater Cleanup!
e3learn.org/st2

Stormwater Pollution Solutions

Stormwater Pollution Puzzle

Complete the crossword puzzle to discover more about some common stormwater pollutants and how you and your family can help keep our stormwater clean!



ACROSS

2. Dogs can't flush, so don't forget to PUP (Pick Up _____!).
5. Take used _____ to a local Household Hazardous Waste (HHW) site or auto parts store. (2 words)
6. _____ chemicals should stay on the grass and not wash into the street.
7. Bring unused _____ to a local Household Hazardous Waste (HHW) site or a special collection event.

DOWN

1. When you're picnicking at a park, don't leave your _____ on the ground.
If there's no trash or recycling bin, remember: pack it in, pack it out, and dispose of properly at home.
2. Help your parents dispose of _____ chemicals correctly. Stay cool by the pool without polluting!
3. No _____ of waste into our storm drains or washes! Dispose of waste properly!
4. _____ are things that are harmful to people, pets, wildlife, and our water supply. Dispose of them safely!
8. Help your parents bag and tie your _____, but no plastic bags in your recycling bin! And, don't overfill your bins!

Place the letters in the colored boxes in the puzzle in the matching colored boxes below.

Only     in the           !

Keep our stormwater clean!

Sort the Solutions

Don't let pollutants get tangled up in our stormwater! For each pollutant, **trace the path** to the correct disposal method using a different colored pencil or marker.

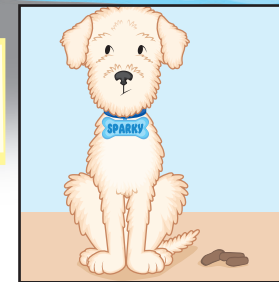
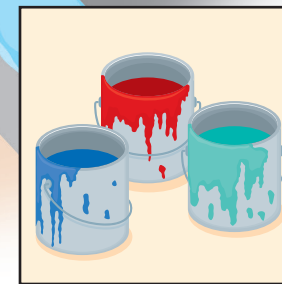
Then, **scan the five QR Codes** on this page (or type in the URLs) with a trusted adult to discover more about keeping only rain in the storm drain.



Pick Up Poop!
e3learn.org/st7



Dispose of
Paint Properly!
e3learn.org/st6



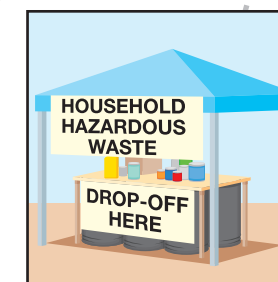
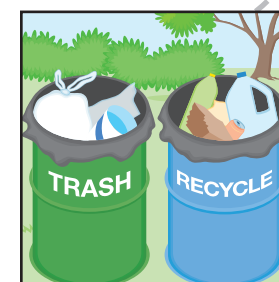
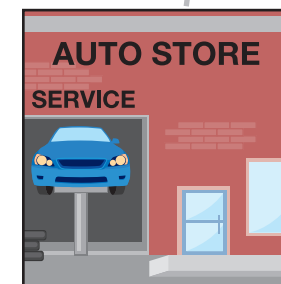
Clean Car Care!
e3learn.org/st8



Litter-Free
Community!
e3learn.org/st9



Prevent Litter
at Home!
e3learn.org/st10



Stormwater Safety

Use the secret code to discover how to stay safe in or near washes and drainage areas. They can be very dangerous!



All around the Phoenix Metro area, there are many dry streams and rivers called S.

◆ ⚙️ ⚙️ ⚙️ ✈️ ⚙️

Many neighborhoods also have A areas.

💧 ⚙️ ⚙️ ⚙️ ⚙️ ⚙️ ✈️

Heavy rains can quickly fill washes and drainage areas with rapidly flowing water, causing a FO.

⚙️ ⚙️ ⚙️ ⚙️ ⚙️ ⚙️ ⚙️ ⚙️

This can occur many miles away from a storm as the water moves quickly downhill.

BONUS Activity

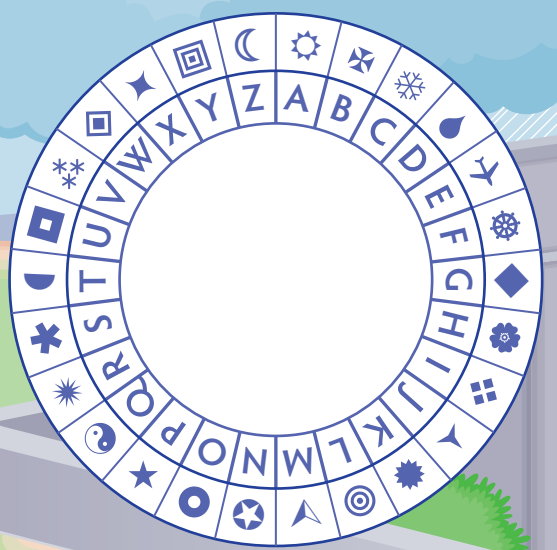
Use the decoder to reveal this important stormwater safety message!

Don't get WA, find a E.

⚙️ ⚙️ ✈️ ⚙️ ⚙️ ⚙️ ⚙️ ⚙️ ⚙️ ⚙️

place to D and L.

💧 ⚙️ ⚙️ ⚙️ ✈️ ⚙️ ⚙️ ⚙️



If you are in a car with your family, never drive around a AL.

⚙️ ⚙️ ⚙️ ⚙️ ⚙️ ⚙️ ⚙️ ⚙️

It's there to protect you from flooding across the road.

It's unsafe to dig a fort in the banks of a wash. The sand could suddenly collapse on you!

It's also not safe to play in washes because of wildlife who don't want to be disturbed in their homes. Can you **find and circle** eight desert critters among the rocks and plants?

Stay E and don't P.

⚙️ ⚙️ ⚙️ ✈️ ⚙️ ⚙️ ⚙️

in or near washes and drainage areas!

BONUS Activity



Watch Out For Flash Floods!
e3learn.org/st11

Water Walk

Take a walk with your family - around your neighborhood, on a hiking trail, or in a local park! Finding water in the desert might seem like a challenge, but it's all around us! Can you find water or things that use water while you're on your walk? Can you find evidence of stormwater runoff? Color the items that you find and draw in any others you discover on your outdoor adventure. Don't forget to bring along a reusable water bottle!



Observation Sensation!

Use your senses to better observe your surroundings.



Adjust the way you look at things - an animal might be hiding in the vegetation along the water's edge or in a patch of shade by a tree.



Listen carefully. Do you hear the chirp of a bird, the buzz of a fly, or flapping bird wings? How many different sounds can you hear?

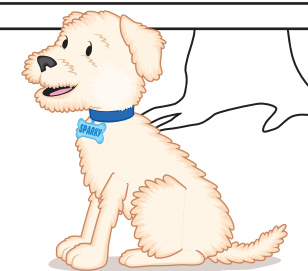


Sniff the air! Some animals have distinct smells even if you can't see them.

As you explore your surroundings, walk and talk quietly to see more wildlife and interesting wildlife behavior.



Which of your senses helped you be more observant? How? (Can you guess my favorite? Sniff, sniff!)



Rainwater Harvesting

Rainwater can be harvested! We can capture and save rainwater that falls on our roofs and yards and use it to water our plants! Can you find and circle the **RAINWATER HARVESTING WORDS** from the illustrations in the word search below? Be sure to look forwards, backwards, up, and down! (Look for my name, too!)

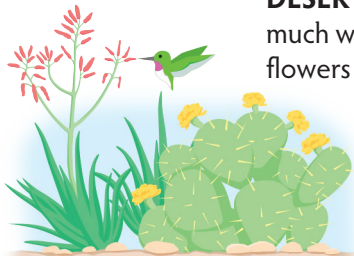
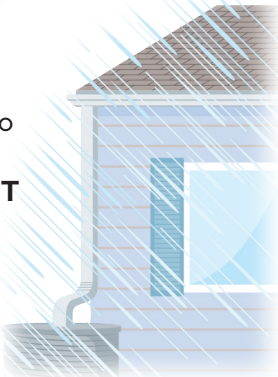


D	X	S	E	C	R	U	O	S	R	E	T	A	W
F	D	E	S	E	R	T	P	L	A	N	T	S	G
C	O	N	S	E	R	V	A	T	I	O	N	H	L
M	R	S	V	T	U	O	P	S	N	W	O	D	T
S	E	I	N	I	M	O	O	M	G	P	X	E	S
P	Q	N	A	B	F	F	O	N	U	R	T	G	E
A	S	K	D	K	I	W	I	Q	T	C	O	A	V
R	A	I	N	W	A	T	E	R	T	Z	P	R	R
K	V	I	H	C	N	I	H	C	E	U	S	O	A
Y	E	B	F	C	I	S	T	E	R	N	A	T	H
L	E	X	I	P	O	C	A	P	E	R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



We're installing a **CISTERN** to **HARVEST** and store **RAINWATER**!

Cool! The **RAIN GUTTER** is used to carry rainwater to the **DOWNSPOUT** and cistern for **STORAGE**!



DESERT PLANTS don't use much water and many have sweet flowers for birds and insects!

A **LANDSCAPE BASIN** keeps rainwater **RUNOFF** in the yard where it can **SINK** into the ground and be used by plants.



Using harvested rainwater helps **SAVE** our four **WATER SOURCES**! That's water **CONSERVATION** in action!



Are there any cisterns or landscape basins in your neighborhood or at your school?

BONUS Activity



Harvest That Rainwater!
e3learn.org/st12

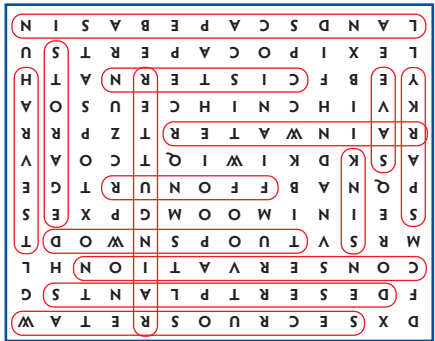
Family Resources



Attention adults! Learn more about how you and your family can use water wisely, prevent stormwater pollution, be safe around stormwater, and harvest rainwater. Discover additional educational resources for teachers and students!
e3learn.org/st13

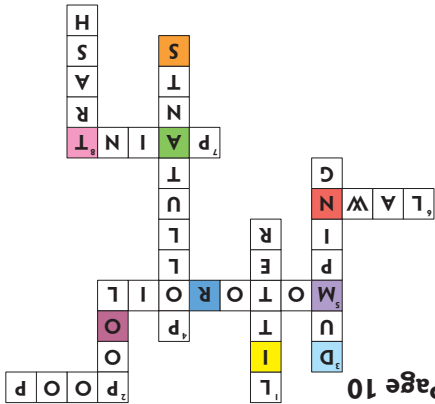


Answer Key



Page 16

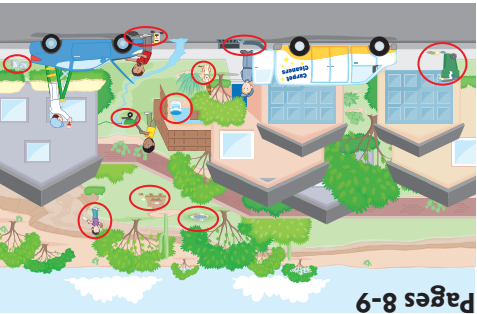
Only RAIN in the STORM DRAIN!



Page 10

rain
stormwater
flow
Downhill
drainage areas
storm drains
rooftops
parking lots
roads

Page 5

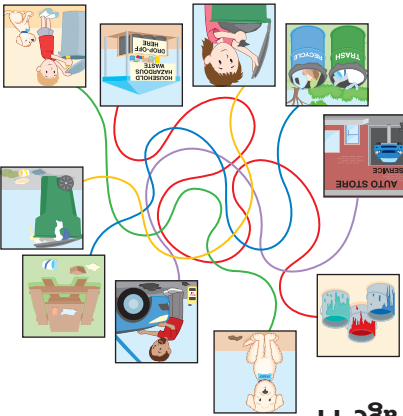


Pages 8-9

Don't get **SWEEP AWAY**, find a **SAFER** place to **DRIVE** and **PLAY**!

WASHES
DRAINAGE
FLASH FLOOD
ROADBLOCK
SAFE
PLAY

Pages 12-13



Page 11

AGRICULTURE
PEOPLE
RECREATION
NATURE
INDUSTRY
GROUNDWATER

Pages 6-7

precipitation
runoff
percolation
evaporation
condensation
transpiration

Page 2

surface water
Colorado River water
reclaimed water
groundwater

Page 1

STORM

Only rain in the stormdrain

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ADOT

