



BEE BRANCH WATERSHED BEEKEEPERS



Working together to keep the
Bee Branch Watershed healthy and safe!

Dear Teachers and Parents:

Pollution from stormwater can have a major effect on our environment.

In fact, most people don't realize that when it rains, the stormwater that drains out of our alleys, and off our yards, streets, and parking lots, flows directly from the storm drain to our creeks and ultimately to the Mississippi River.

Unlike wastewater, stormwater doesn't get treated and cleaned before it empties into our waterways. So if polluted water goes into the storm drain, it stays that way. With over 6,000 storm drains in Dubuque, you can imagine the impact polluted water can have on the health of our watershed including plants, animals, fish, and even humans!

The goal of this book is to raise awareness about watersheds, stormwater runoff, and how to prevent stormwater pollution. It also addresses flash flooding and the importance of stormwater safety. Please show your students and/or children how they can make a difference by keeping the Bee Branch Watershed clean! Also talk to them about the dangers of flash flooding and the importance of being flood safe.

Thank You!

This book belongs to: _____

(Student Name)

UNDERSTANDING WATERSHEDS

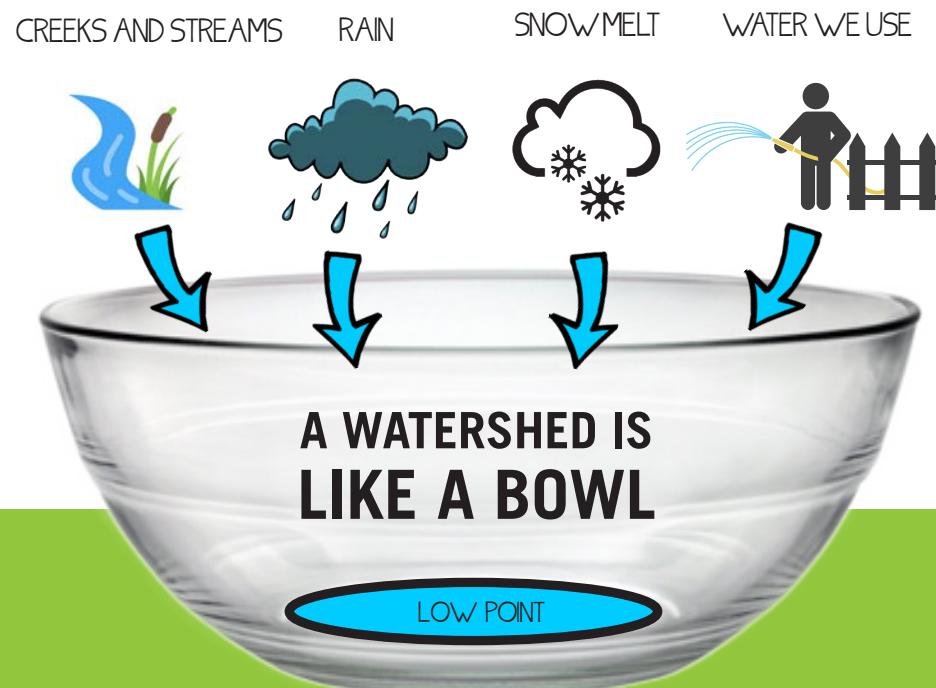
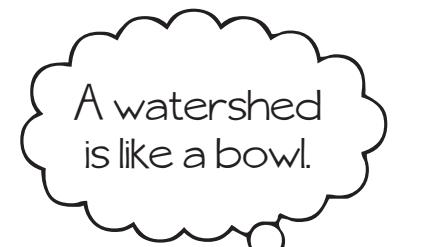
What is a watershed?
How do they work?
Who lives in a watershed?

Everyone lives in a watershed! A **watershed** is an area of land where water flows to the same major body of water, such as a river, lake, or ocean.

Think of a watershed like a bowl, it is surrounded on all sides by higher land. Since watersheds have higher ground all around them, any water that falls anywhere within the watershed flows to the same low point – like the Bee Branch Creek, which is the low point in the Bee Branch Watershed.

A watershed includes the smaller creeks and streams that flow into its big river. It includes the rain that falls, snow that melts on its land, the water we use on our lawns, and the water that pours on our streets. Some of this water soaks into the ground. Some of this water flows over the land and in streets. And, some flows into the storm drains. But all of it eventually flows into one big river and becomes part of it. In Dubuque, all water eventually flows into the Mississippi River!

Watersheds are surrounded on all sides by higher land. Any water that falls anywhere within the watershed flows to the same low point.



BEE BRANCH WATERSHED

The Bee Branch Watershed is approximately 6.5 square miles and is located entirely within the city of Dubuque. It has higher ground in the west and lower ground in the east, which creates the watershed. All of the water that falls anywhere within the Bee Branch Watershed flows to the Bee Branch Creek and then to the Mississippi River.



Over 50% of Dubuque residents either work or live in the Bee Branch Watershed.

DECODING WATERSHEDS

Use the letters of the alphabet that match with the numbers to decode the messages!

1 = A	8 = H	15 = O	22 = V
2 = B	9 = I	16 = P	23 = W
3 = C	10 = J	17 = Q	24 = X
4 = D	11 = K	18 = R	25 = Y
5 = E	12 = L	19 = S	26 = Z
6 = F	13 = M	20 = T	
7 = G	14 = N	21 = U	



Message #1

— 5 — 22 — 5 — 18 — 25 — 15 — 14 — 5 —
— 12 — 9 — 22 — 5 — 19 —
— 9 — 14 — 1 — 23 — 1 — 20 — 5 — 18 — 19 — 8 — 5 — 4 —

Message #2

— 23 — 1 — 20 — 5 — 18 — 9 — 14 — 20 — 8 — 5 — 2 — 5 — 5 —
— 2 — 18 — 1 — 14 — 3 — 8 — 23 — 1 — 20 — 5 — 18 — 19 — 8 — 5 — 4 —
— 6 — 12 — 15 — 23 — 19 — 20 — 15 — 20 — 8 — 5 — 2 — 5 — 5 —
— 2 — 18 — 1 — 14 — 3 — 8 — 3 — 18 — 5 — 5 — 11 —

WHAT IS STORMWATER?

When it rains or when snow melts in Dubuque
-- where do you think the water goes?

Does it soak into the ground?
Does it sit in puddles until it disappears?
Does it run in the street and over the land?

Yes, yes, and yes!

When it rains, water hits the grass, trees, roads, houses, buildings, and sidewalks. When it hits the grass, the rain soaks into the ground. When it hits the roads, houses, buildings, and sidewalks, the rain runs in the street and over the land. This is called **stormwater**.



stormwater in the street

When stormwater runs down the street it goes into a **storm drain**. A storm drain is a big grate in the road where water disappears. But it doesn't really disappear! The storm drain connects to a big pipe underground that carries the stormwater directly to your local creek, stream, or river. This pipe is called a **storm sewer**.

HOW IT WORKS

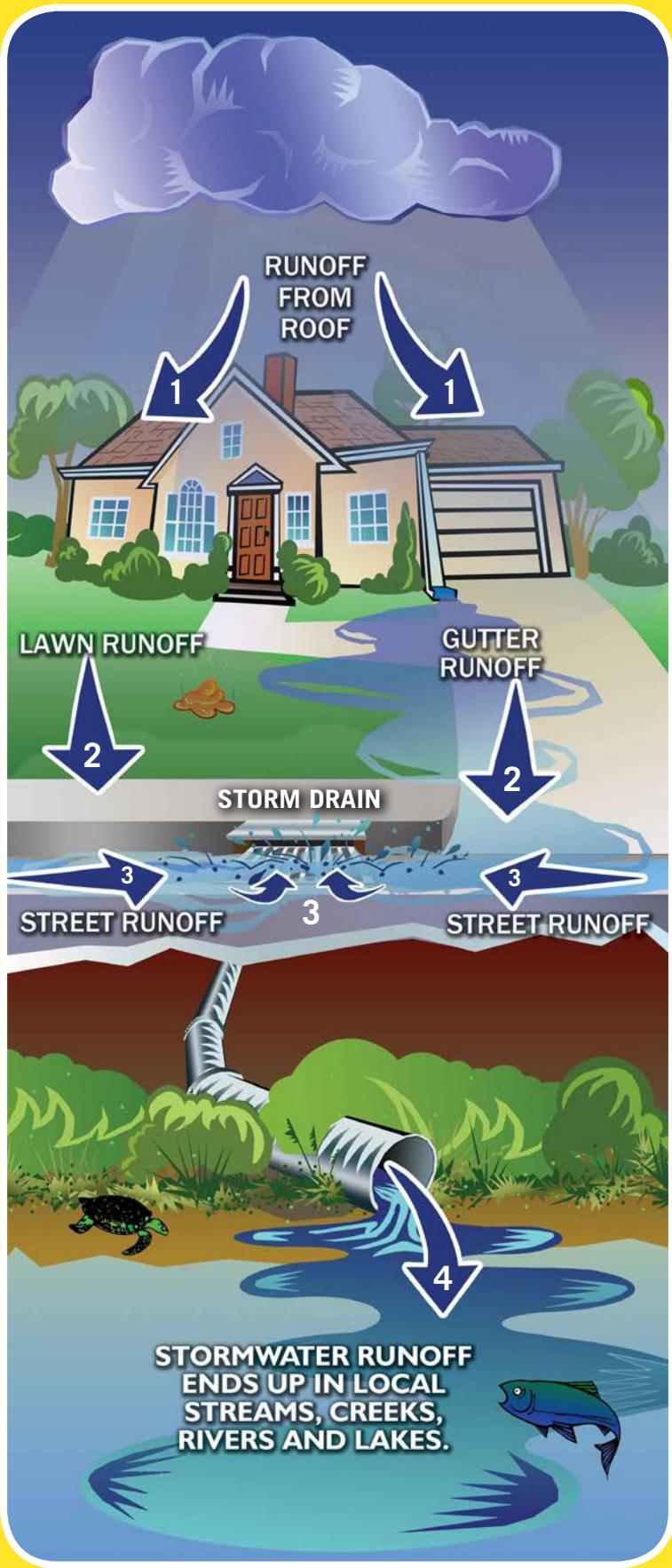
1. First, the rain hits the house. Then it runs down the roof, into the gutter, and onto the driveway, sidewalk, and lawn.
2. It then runs off the driveway, sidewalk, and lawn into the street.
3. Next, the stormwater in the street runs into the storm drain.
4. Lastly, the storm drain is connected to the storm sewer which carries the stormwater to a local stream, creek, river, or lake.

Storm drains in the Bee Branch Watershed carry stormwater to the Bee Branch Creek.

storm drain

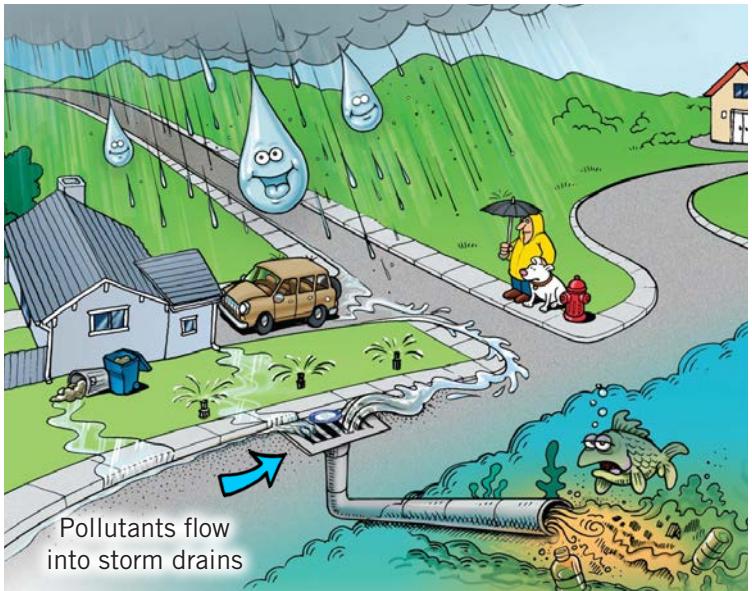


STORMWATER RUNOFF HOW IT WORKS



STORMWATER POLLUTION

Stormwater runs down the street into storm drains which flows untreated into our local creeks, streams, and river. Along the way it picks up pollutants.



What are pollutants?

Pollutants are things that can make people, fish, and animals sick if it is in the water. Soaps, grass clippings, trash, pet waste, pesticides and fertilizers, dirt, and oil are just some of the pollutants that make our water unhealthy.



TRASH



LAWN CHEMICALS



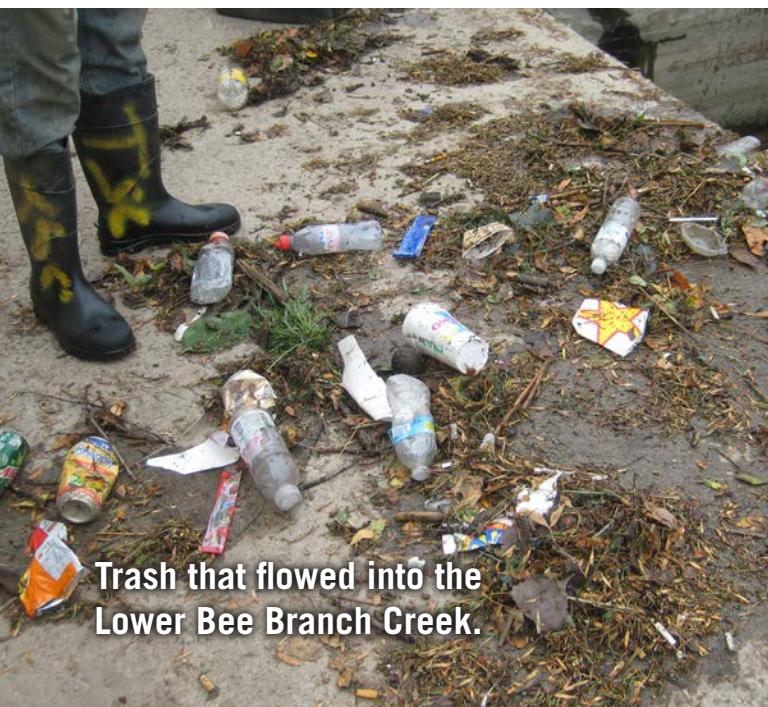
MOTOR OIL & GREASE FROM CARS



PET WASTE



SOAP FOR WASHING CARS



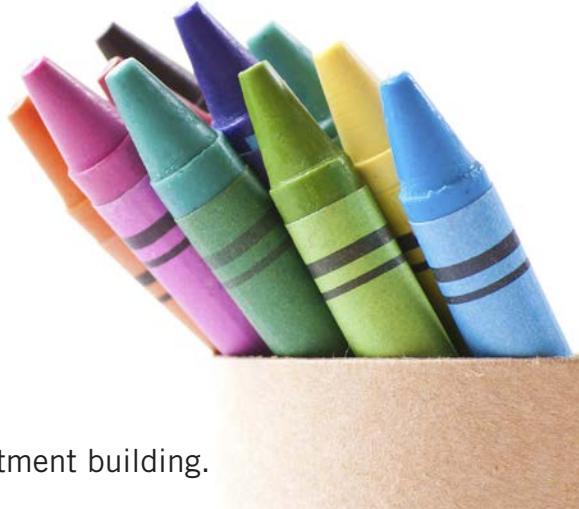
Trash that flowed into the Lower Bee Branch Creek.

Pollutants in the Bee Branch Watershed flow into storm drains and out to the Bee Branch Creek. Yuck!

Can you think of pollutants that float down a storm drain and contaminate our water? List them below.

MAPPING YOUR NEIGHBORHOOD

1. Draw your house or apartment building.
2. Draw your street.
3. Draw your sidewalks.
4. Draw your neighbor's houses.
5. Find and draw the storm drains closest to your house or apartment building.



Keep an eye on the storm drains in your neighborhood. Have your parents call **Dubuque's Stormwater Hotline** at **(563) 690-6200** if your family ever sees somebody putting stormwater pollutants down the storm drain – for example: garbage, grass clippings, pet waste, or motor oil.

WHAT CAN YOU DO?

▶▶▶ Preventing pollution is an everyday activity!

Now that you know how water pollution happens, do you know what you can do to prevent water pollution? There are lots of little things we can do to pollute less. Small changes made by many people make a big difference!



Throw all your trash in a garbage can and not on the street, sidewalk, grass, or in a storm drain.

If you see litter, pick it up and put it in a garbage can.

Keep garbage and recycling containers tightly covered to prevent litter from being blown away or scattered by foraging animals.



Make sure to clean up after your dog or cat. Pet waste contains bacteria that pollutes water. Always put pet waste in the trash.

Use a broom, not a hose, to clean up outside. Do not wash off driveways into the street. Compost or recycle when possible.



Remind your parents and family members to use a commercial car wash or wash vehicles on the lawn to prevent soapy water from entering storm drains.

Only rain in the drain!



Drains are NOT meant for trash!



SOLUTION TO THE POLLUTION MATCHING GAME



Get your pencil out.
It's game time!!

Match the type of pollution to the correct solution by drawing a line from the red dot to the green dot. The first line is already drawn to help you get started!

POLLUTION

Pet Waste



Candy Wrappers



Pop Can



Used Motor Oil



Washing car in the driveway



Litter in your local waterway



Hosing off the sidewalk



Bathing your pet on concrete



SOLUTION

Place them in the trash

Contact the city and ask to volunteer at a cleanup event

Use a broom to sweep up the debris and place in the trash

Recycle them so they can be reused

Do this on the lawn or in the sink or bathtub

Pick it up and dispose of it in the trash. This contains bacteria that pollutes water.

Drop it off at an auto parts store or gas station

Use a commercial car wash where the water is recycled or reused

WHAT IS A FLASH FLOOD?

Floods are strong! Staying away from flood water is the most important thing you can do. Do not walk or play near storm drains, manholes, or rising streams and creeks. Stay inside where it is safe and dry!

Flash floods are when a lot of stormwater fills normally dry areas in a short amount of time with little or no warning. This is the fastest moving type of flood and can surprise people.

Flash flooding happens from very heavy rainfall during short intense storms. They can occur within a few minutes or a few hours of rainfall. Flash floods are the most dangerous kind of flood because they have incredible speed, making them both destructive and unpredictable.



It only takes 6 inches of fast-moving water to knock over an adult.

Most cars will float and be swept away in 18 to 24 inches of moving water.

Turning around and staying away from flood water is the most important thing you can do!



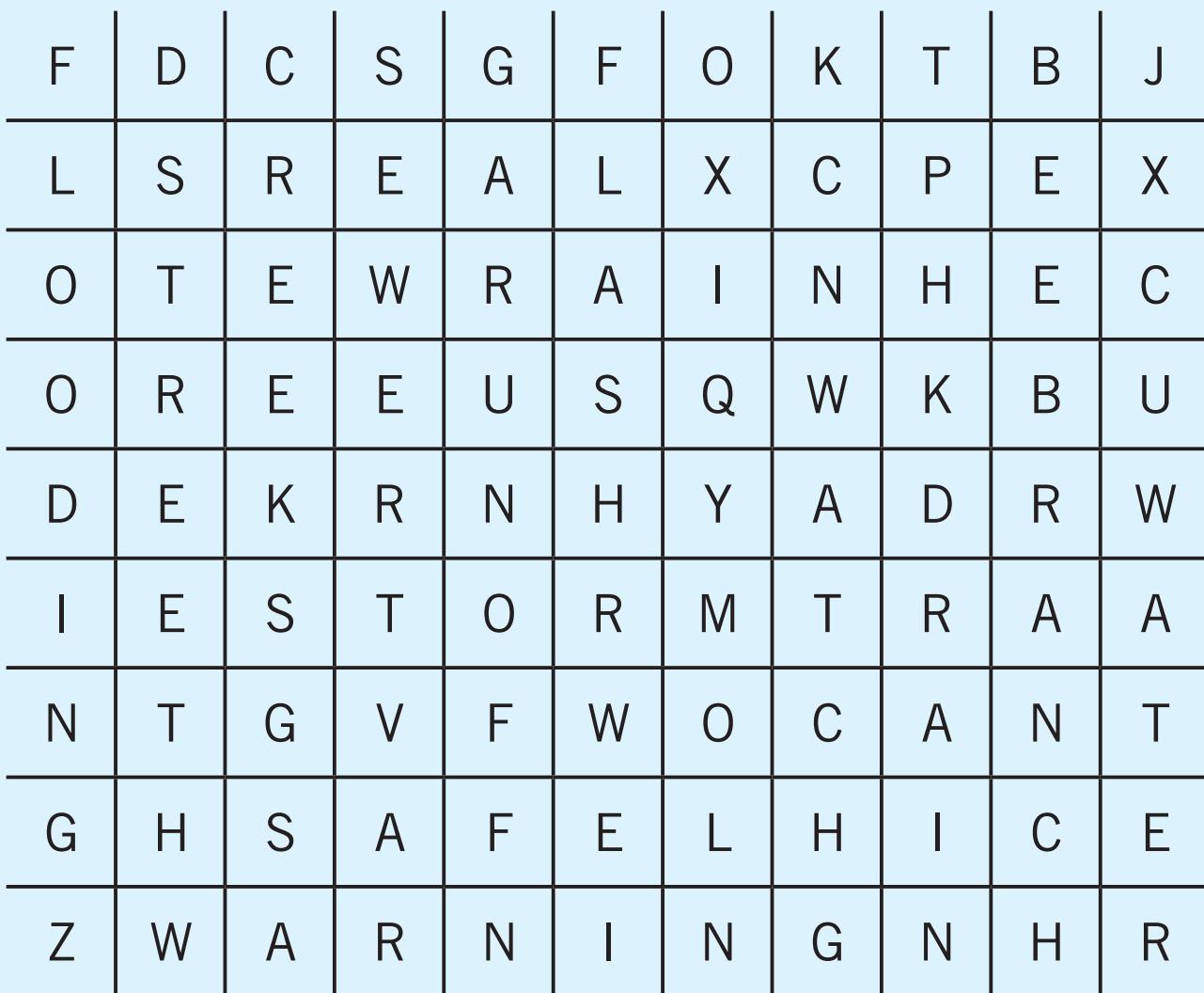
Flash flooding at the corner of E. 22nd St. and White St. in Dubuque.

STORMWATER WORD SEARCH

Find the words listed in the word bank below.

Hint: They can be found horizontally and vertically.

Rain	Creek	Drain
Watch	Flash	Street
Storm	Warning	Flooding
Bee Branch	Water	
Runoff	Sewer	





HOW TO BE FLOOD SAFE!

What does it take to be safe during a rain storm? Follow these flood and stormwater safety rules during severe weather conditions!

To be prepared, you will need to know these
KEY TERMS

Flash Flood Watch

Means that flash flooding is possible in your area

Flash Flood Warning

Means flash flooding is already happening or will start soon in your area

Creek Channel

The ditch where a stream of water runs

Flood Plain

Areas along creeks, streams, and rivers that are covered in water during floods and help lessen the damage caused by flooding

**FILL IN THE →
ANSWERS!**

1

What does a flash flood watch mean?

2

How many inches of fast-moving flood water can knock someone over? _____

STORMWATER SAFETY RULES

Stay Informed and Alert

- Listen to your radio or TV for the latest information on weather conditions that can cause flooding. Be aware if there is a flash flood watch or warning.

If flash flooding is a possibility....

- Do not go near streams, creeks, and other areas known to flood suddenly. Flash floods can occur in these areas quickly without warning.

During a flash flood....

- Stay away from rising creeks, manholes, and storm drains.
- Beware of rising, fast-moving water.
- Avoid flood waters; water may be contaminated by oil, gasoline, or bacteria. Water may also be dangerous due to underground or downed power lines.
- Stay away from downed power lines and report them to the power company.
- Do not walk through moving water; 6 inches of fast-moving water can make you fall. If you have to walk in water, walk where the water is not moving. Use a stick to check the firmness of the ground in front of you.

Stay away from the Bee Branch Creek

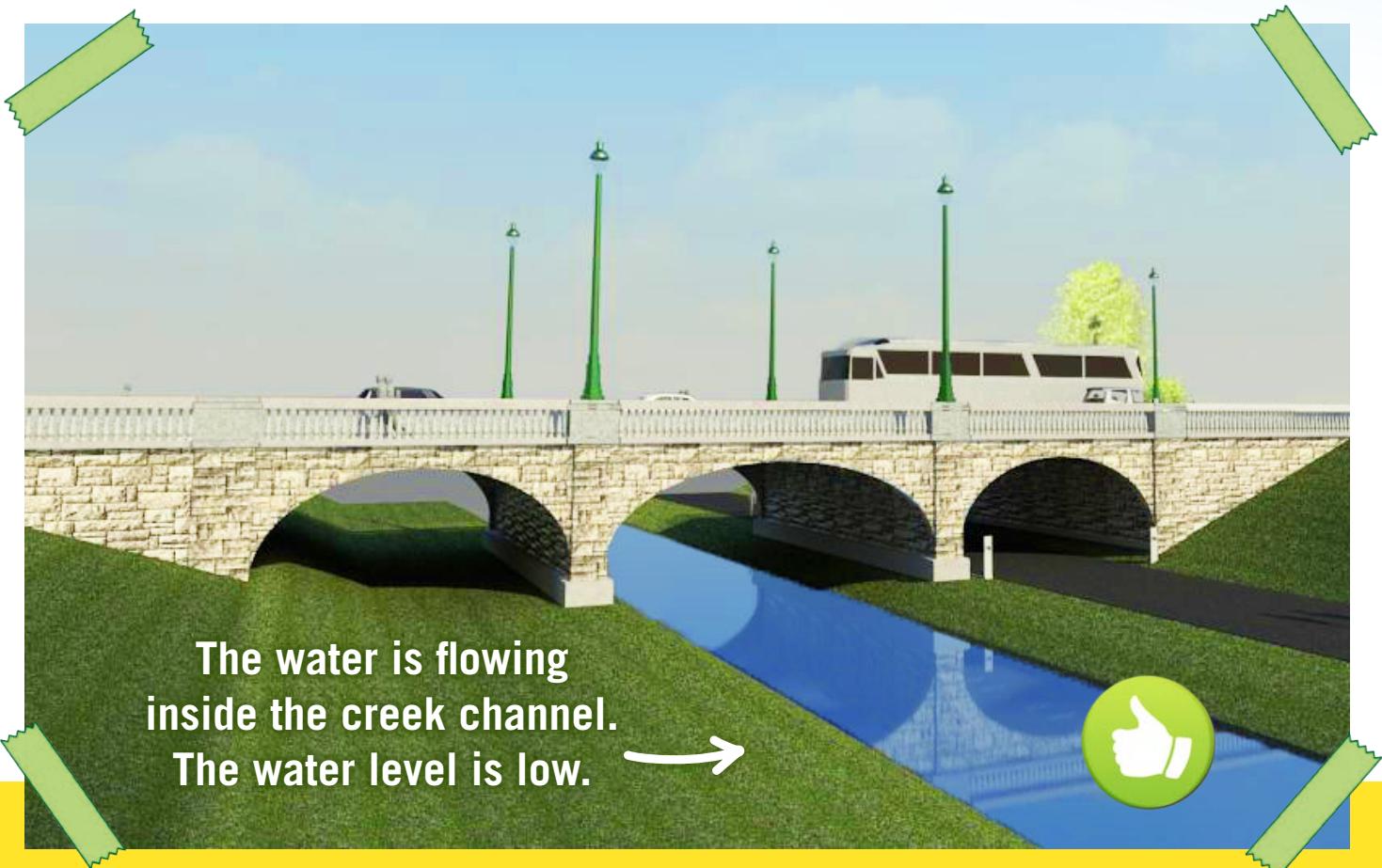
- Flooding can change familiar places, like the trails and play areas near the Bee Branch Creek or other roads and walkways in your neighborhood. Avoid walking through any water. It might be deeper than you think!
- The Bee Branch Creek can rise quickly during heavy rain events and things such as storm drains, fences, and culverts can trap and drown even the strongest swimmer.

UNDERSTANDING THE BEE BRANCH CREEK

The Bee Branch Creek was built to carry stormwater. When it rains, the water in the Bee Branch Creek will get higher and flow faster. The creek is one part of a larger project to help prevent flooding in the Bee Branch Watershed.



SAFE TO BE NEAR THE CREEK!



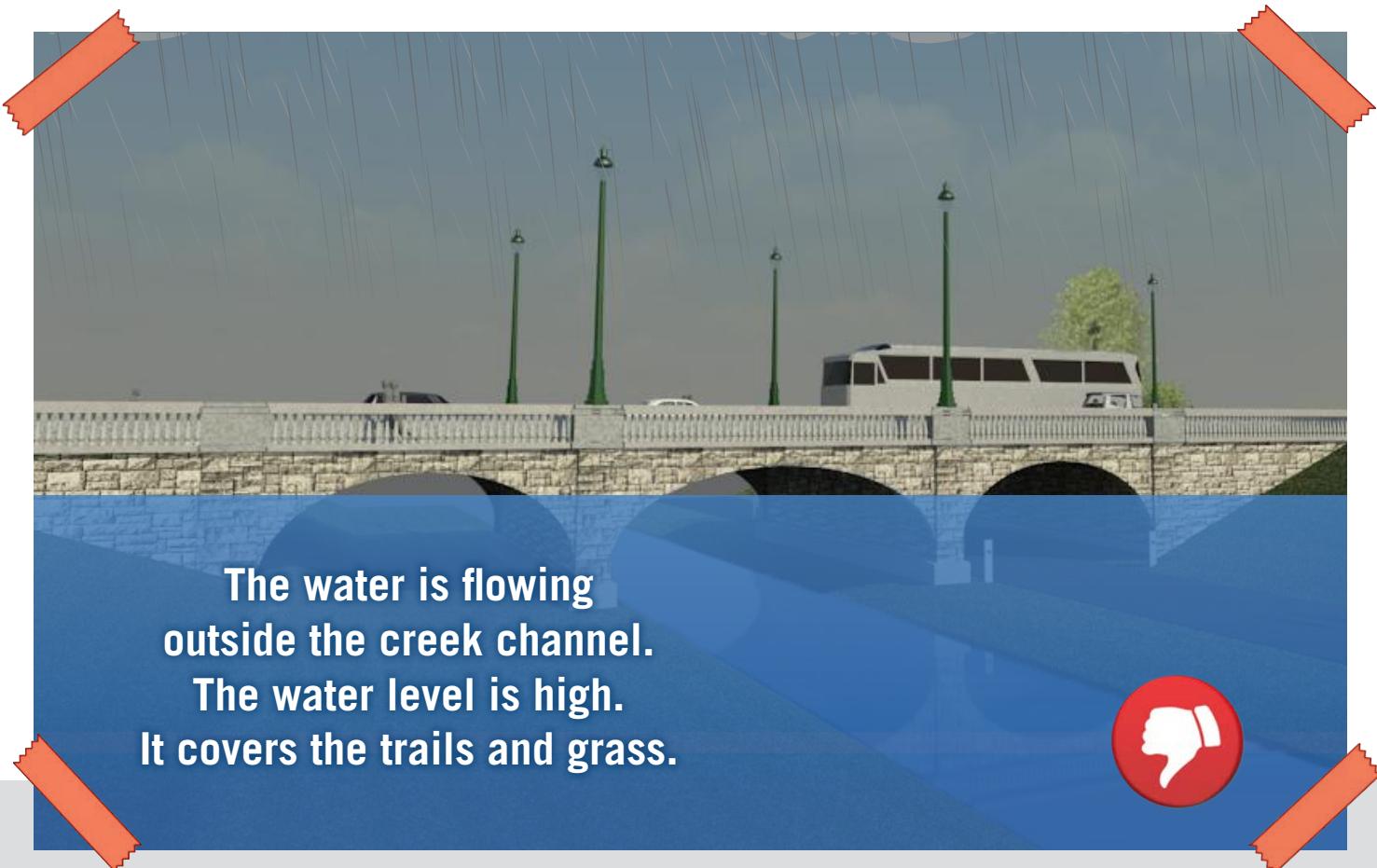
The water is flowing inside the creek channel.
The water level is low.

When it's not raining, the creek will be about 1 ½ to 3 feet deep. This is when it is safe to be near the Bee Branch Creek. The amphitheater, play area with slides, and the community orchard are all great places to hangout. There are trails for walking or riding your bike, benches for sitting, and grassy areas to play!



When it rains, you've learned that stormwater runs down streets into storm drains. It then flows through storm sewers to the Bee Branch Creek. Putting stormwater from the streets into the creek makes the creek higher. It is NOT safe to be near the creek when it's raining and the water is high.

STAY AWAY FROM THE CREEK WHEN IT'S RAINING!



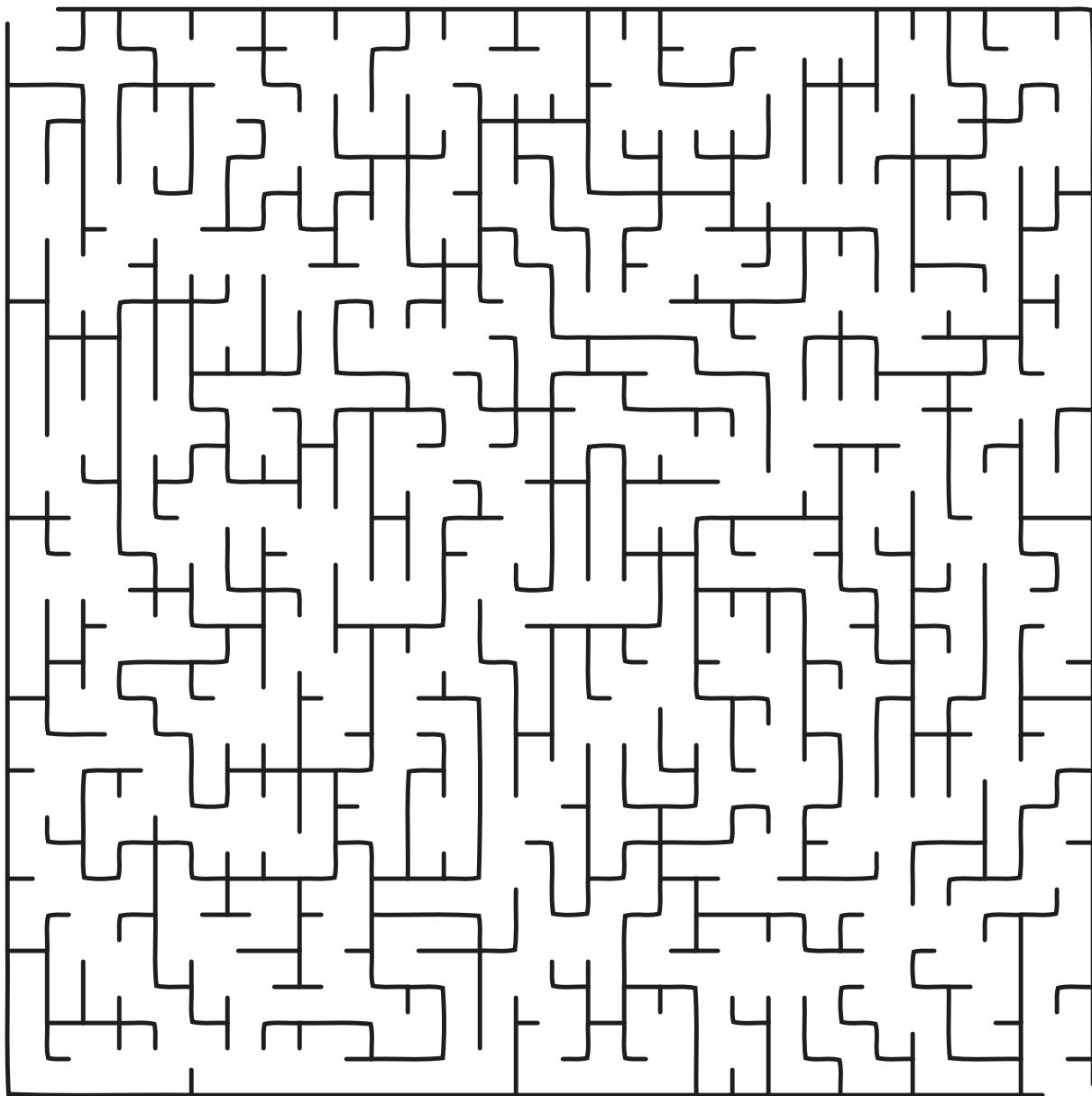
When it rains, the Bee Branch Creek fills up with water similar to how a bath tub fills up with water. Similar to how a bath tub drains, the creek also drains. It drains underneath Garfield Ave. to the Lower Bee Branch and into the Mississippi River. When it stops raining, the water will return to its normal level and go back to flowing inside the creek channel.

FLASH FLOOD MAZE

You just heard a flash flood warning has been issued for Dubuque. Hurry home and stay inside until the storm passes. Remember to avoid streams, creeks, and other areas known to flood suddenly!



Start Here



You made it home safely!



WATERSHED AND STORMWATER FILL IN THE BLANK



Time to see
what you've
learned!

1. A _____ is an area of land where water flows to the same major body of water, such as a river, lake, or ocean.
2. Water that falls anywhere within the Bee Branch Watershed flows to the _____ and then to the Mississippi River.
3. When stormwater runs down the street it flows into a _____.
4. _____ are things that can make people, fish, and animals sick if it is in the water. Examples include soaps, grass clippings, trash, and pet waste.
5. Floods are _____! Staying away from flood water is the most important thing you can do.
6. Do not _____ or _____ near storm drains, manholes, or rising streams and creeks.
7. The Bee Branch Creek was built to carry _____.
8. It is NOT safe to be near the Bee Branch Creek when it's _____ and the water is _____.

Bee Keepers work together to keep the Bee Branch Watershed healthy and safe!





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