



Pollution, Policy, and the Power of Rain Gardens

What contributes to pollution in Ft. Wayne, and what is being done to clean up pollution in our community? What are the rules for cleaning up the problem? What affects the amount of runoff that accumulates, and how do the surroundings of an area affect the type of pollutants that are in the water?

As rainwater moves across roads, rooftops, and other hard surfaces, it collects pollutants like oil, litter, and fertilizer before flowing into nearby rivers and streams. Students will explore how pollution travels through the landscape, the difference between point and non-point source pollution, and the role local and national policies play in protecting water quality. Through hands-on demonstrations and mapping activities, students will connect what they've learned about water movement to the larger issues of watershed health and community responsibility, setting the stage for meaningful environmental action.

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Science State Standards:

Version 1:

- 3.4, 4.2, 5.4

Version 2:

- 6.3, 6.4, 6.6, 7.4, 7.6, 8.3

Version 3:

- BIO.1, ENV 1&2, PS. 6

Teacher's Guide

Objective:

The goal of this module is to:

- Define and distinguish point vs. non-point source pollution using simple, interactive demonstrations
- Connect local, state, and national regulations, like the Clean Water Act, to real-world impact
- Teach how pollutants enter waterways through runoff and storm drains
- Reinforce how topography and impermeable surfaces exacerbate pollution
- Encourage critical thinking about human choices, local infrastructure, and sustainable solutions

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11 - 17	Activity A - Crosswords + Word Searches	K - 12
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Vocabulary List

Rain Garden - A shallow, planted area that collects and filters stormwater runoff from hard surfaces like roofs and driveways.

Stormwater Runoff - Rain or snowmelt that flows across surfaces and picks up pollution instead of soaking into the ground.

Watershed - A land area where all the water drains into a shared water body, like a stream or river.

Point Source Pollution - Pollution that comes from a single, clear source (like a pipe, drain, or factory outflow).

Nonpoint Source Pollution - Pollution that comes from many scattered sources, often carried by stormwater runoff.

Combined Sewer Overflow (CSO) - A release of untreated water into rivers when too much rainwater and sewage overwhelm a combined sewer system.

Impervious Surface - A surface that does not let water soak into the ground (like pavement, roofs, or sidewalks).

Infiltration - The process of water soaking into the soil.

Turbidity - A measure of how cloudy or dirty water is due to particles like soil, sand.

Sediment - Loose soil, dirt, or sand that washes into waterways and causes pollution.

Nutrients - Chemicals like nitrogen and phosphorus that help plants grow but can pollute water when used in excess.

Algal Bloom - Rapid growth of algae in water caused by excess nutrients, which can use up oxygen and harm fish and plants.

Pathogen - A germ or microorganism that can cause illness in people or animals.

Erosion - The wearing away of soil, often caused by water, wind, or human activity.

Debris - Trash or litter like plastic, wrappers, and cigarette butts that pollute water.

Insecticide - A chemical used to kill insects.

Herbicide - A chemical used to kill unwanted plants or weeds.

Fertilizer - A substance added to soil to help plants grow, but can cause pollution if it runs off into water.

Overflow - Extra water that spills out of a water system when it becomes too full.

Riparian Buffer - A strip of vegetation planted near a water body to catch and filter pollutants before they reach the water.

Low Impact Development (LID) - A design method that works with nature to manage rainwater where it falls (e.g., rain gardens, green roofs).

Clean Water Act (CWA) - A national law passed in 1972 to reduce pollution in U.S. waters and protect water quality.

Downspout - A pipe that carries rainwater from a roof to the ground.

Introduction

Where We Live:

The City of Fort Wayne is divided into three major watersheds: the Maumee, St. Marys, and St. Joseph River Watersheds. A **watershed** is an area of land that collects water from storms, streams, and ditches, and drains into a specific waterbody, like a lake or river.

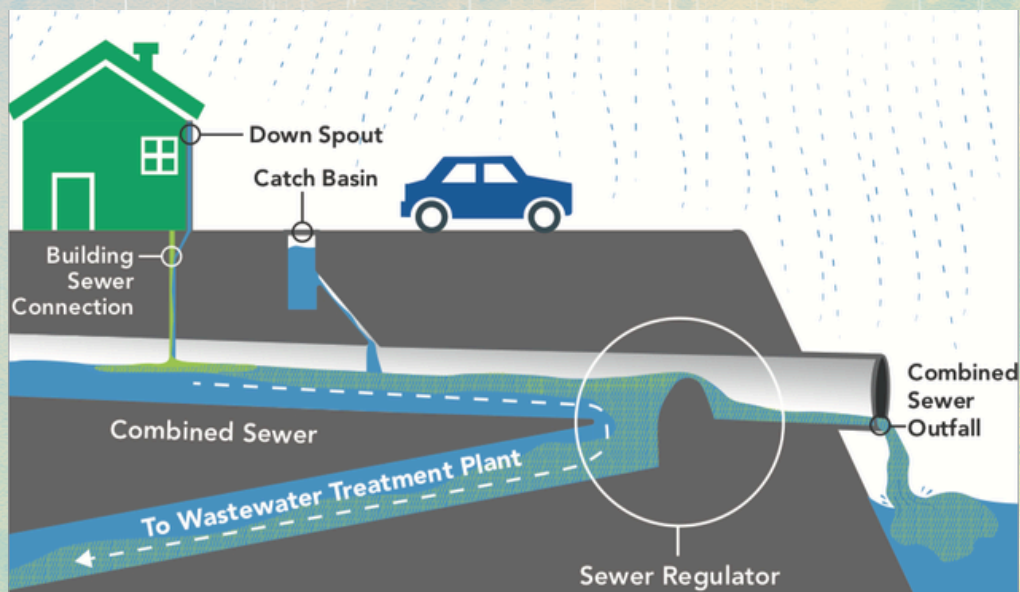


When it rains, water doesn't just fall and disappear. Instead, it flows off rooftops, roads, driveways, sidewalks, and lawns. In Fort Wayne, that runoff water makes its way into storm drains, ditches, and creeks, eventually flowing into the Maumee, St. Marys, or St. Joseph Rivers. Unfortunately, along the way, the water can pick up harmful materials, like pesticides, motor oil, pet waste, trash, and other pollutants.

Pollution Problem:

As Fort Wayne has grown, it has developed many impervious surfaces, places like streets, roofs, and sidewalks, where water can't soak into the ground. This creates more runoff, leading to flooding and pollution problems. Parts of Fort Wayne previously used a **Combined Sewer System**, which is set up to collect rainwater runoff through storm drains and combine it with sewage water. Once combined, this water is typically sent to a treatment plant before being released.

When it rains heavily, these systems can overflow. These Combined Sewer Overflows (CSOs) release untreated mixtures of sewage and stormwater into rivers and streams, causing serious water pollution. Now, portions of the City of Fort Wayne use a single pipe system to carry a combination of sanitary sewage and stormwater. During dry weather, the pipe capacity is adequate to carry sanitary flows to the sewage treatment plant.



This single pipe system, with other key programs, will reduce the number of times combined sewer overflows occur in a typical year from about 71 times to just 4 times on the St. Marys and Maumee Rivers. As our city grows in population, and with it more sewage and wastewater to treat, it is important to find alternative ways to treat and take care of rainwater and storm runoff.

What Is Stormwater Runoff Carrying?

Stormwater runoff is one of the biggest contributors to **non-point source pollution**, a type of pollution that can't be traced to one single source, because it comes from many places. Unlike **point source pollution**, which comes from one specific location (like a leaking pipe or a factory), non-point source pollution is harder to track and control.

Some of the most common pollutants carried by runoff include:

- Sediment: increases turbidity, hinders plant growth, reduces food sources for aquatic life, and makes it difficult to filter pollutants
 - soil
 - dirt
 - sand
- Excess nutrients: from fertilizers (the largest pollutant by volume) or manure, leading to rapidly growing algal blooms that use up oxygen in the water
 - nitrogen
 - phosphorus
- Bacteria: are **pathogenic** (capable of causing disease, especially in humans) and can come from pet waste or sewage
- Debris and trash:
 - plastic bags
 - boxes
 - food packaging
- Hazardous substances:
 - oil
 - paint
 - pesticides
 - herbicides

These pollutants threaten both aquatic ecosystems and public health, causing problems like beach closures, fish kills, and drinking water contamination.

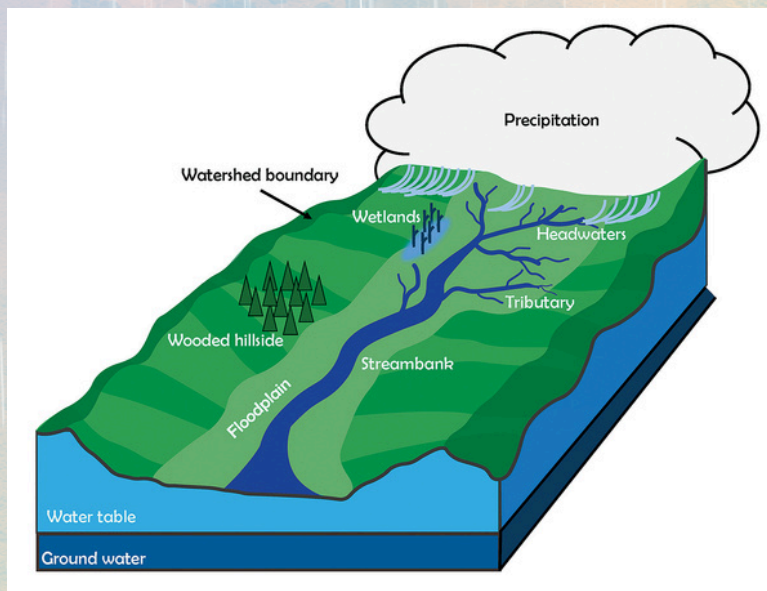


The Pollution Solution

To address pollution, the U.S. passed the Clean Water Act (CWA) in 1972, which created national regulations about what can and cannot be discharged into U.S. waters. This law helped stop pollution from factories and sewage plants by creating limits and requiring treatment before water could be released into rivers and lakes. The CWA has very strict rules laid out that give us guidance on how to keep our streams, rivers, oceans, and other drinking water clean.

Point source pollution is no longer the biggest threat to our waterways. Today, non-point pollution sources are the biggest contributors of pollution to our rivers and streams.

That's why cities like Fort Wayne are working to improve water quality with a **watershed** approach, focusing not just on rivers themselves but on the land area that drains into them. Local governments enforce environmental guidelines, promote sustainable development, and support water conservation by using practices and technologies that limit water use in the bathroom, kitchen, laundry room, lawn, driveway, and garden. Conserving water reduces the demand on existing water supplies and limits the amount of water that runs off the land.



Another way to address non-point pollution is by using a variety of water quality practices, which include Rain Gardens themselves and sewer systems. Detention basins are large depressions that hold stormwater temporarily and release it slowly, reducing flooding and allowing pollutants to settle out. Two-stage ditches mimic natural streams by adding a floodplain within the ditch, helping slow water flow and reduce erosion.

Runoff can also be minimized by using low-impact development (LID) techniques and Best Management Practice (BMPs) techniques. LID Techniques work with the native landscape to soak up more rainwater by improving infiltration, controlling polluted runoff through erosion control, and creating riparian (vegetated) zones next to waterbodies to filter out pollutants and preserve the soil.

Rain Gardens and Local Solutions

An effective tool we have to reduce stormwater pollution is the rain garden. These shallow, vegetated depressed gardens collect rainwater, allowing it to soak into the ground instead of rushing into storm drains. Native plants in rain gardens help absorb and filter water, trap sediment, and remove pollutants like fertilizer, oil, and bacteria before they reach waterways.

The City of Fort Wayne has launched a Rain Garden Program to promote the use of rain gardens in homes, schools, and parks across the city.



Rain gardens, and other green infrastructure tools like green roofs, rain barrels, riparian buffers (vegetated zones near water), silt fencing for erosion control, and native landscaping, are all part of a broader effort to reduce runoff and protect our shared water.

What You Can Do to Help

Preventing water pollution starts with small actions that make a big impact. Here are ways you can help:



- Never dump anything down a storm drain
- Recycle, and never litter
- Pick up pet waste
- Sweep driveways, sidewalks instead of hosing them down
- Properly dispose of household chemicals
- Fix oil leaks from cars and recycle motor oil
- Use a car wash instead of washing in the driveway
- Plant over bare soil spots to prevent erosion
- Collect water using a rain barrel for lawn use
- Use appropriate fertilizer, pesticide, and herbicide application rates
- Educate your friends and neighbors
- ...or build or plant a rain garden!

Activity A - Crosswords + Word Searches

These Crosswords and Word Searches are designed to familiarize students with waterways, pollution, and environmental factors that intertwine with each other. It can be completed individually or in small groups. There are three crosswords designated for different grade levels, which are:

Crossword 1: K - 3

Crossword 2: 4 - 8

Crossword 3: 9 - 12

Activity Time: **Grade Level**

15 Minutes K - 12

Objectives:

To reinforce key vocabulary related to stormwater, pollution, regulation, and rain gardens through a fun and challenging word puzzle format.

Materials Needed:

- Printed crossword puzzles or word searches (different difficulty levels for grade bands)
- Pencils or markers

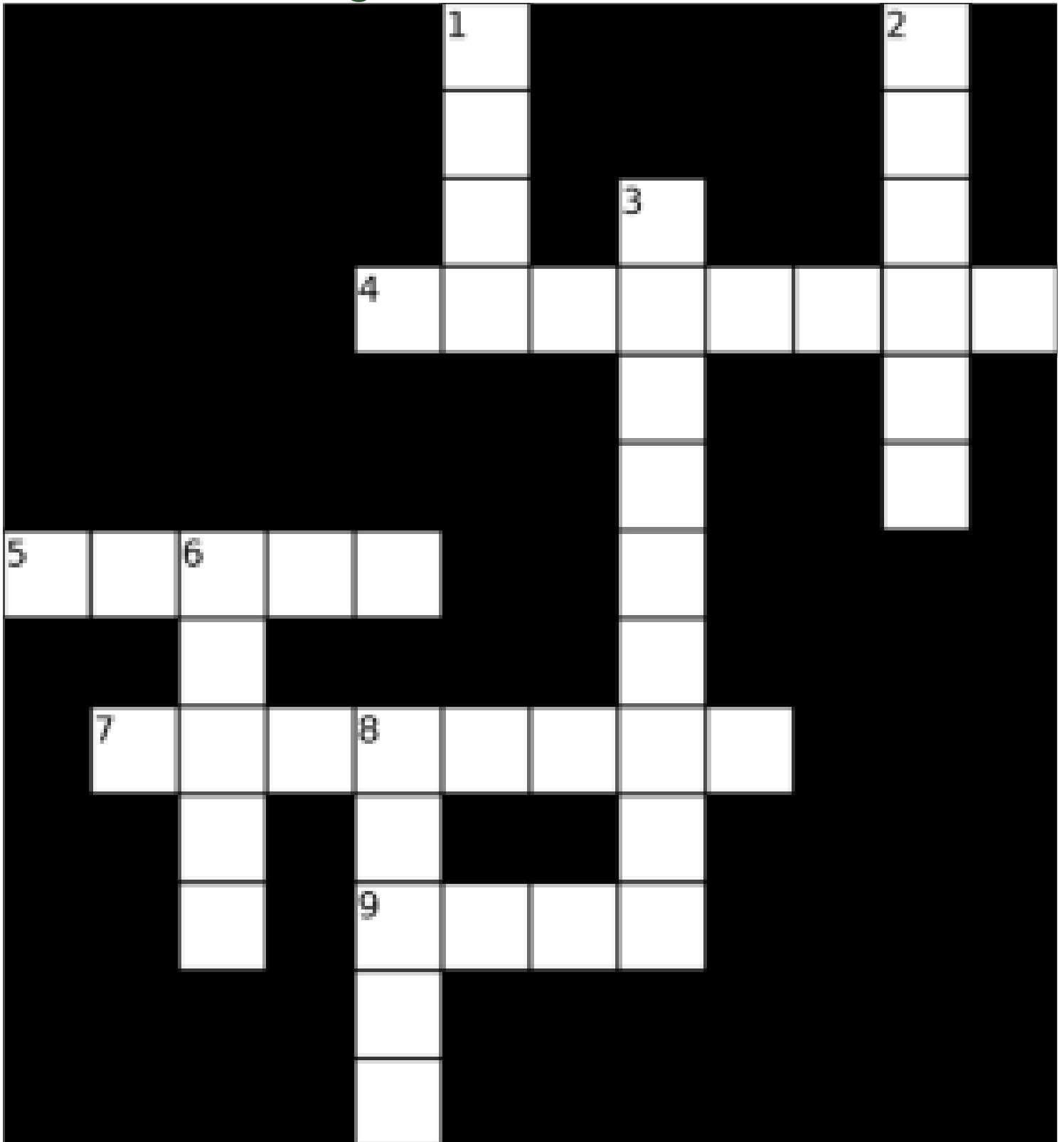
Setup & Prep:

- Print puzzles ahead of time
- Optionally review key terms in a quick warm-up discussion

Instructions:

1. Hand out crossword or word search worksheets.
2. Give students 10–20 minutes to complete independently or in pairs.
3. Go over the answers as a class or let students self-check with a key.
4. Ask a few students to define or illustrate words from the puzzle for added reinforcement.

Activity A - Crossword 1



Activity A - Word Search 1

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

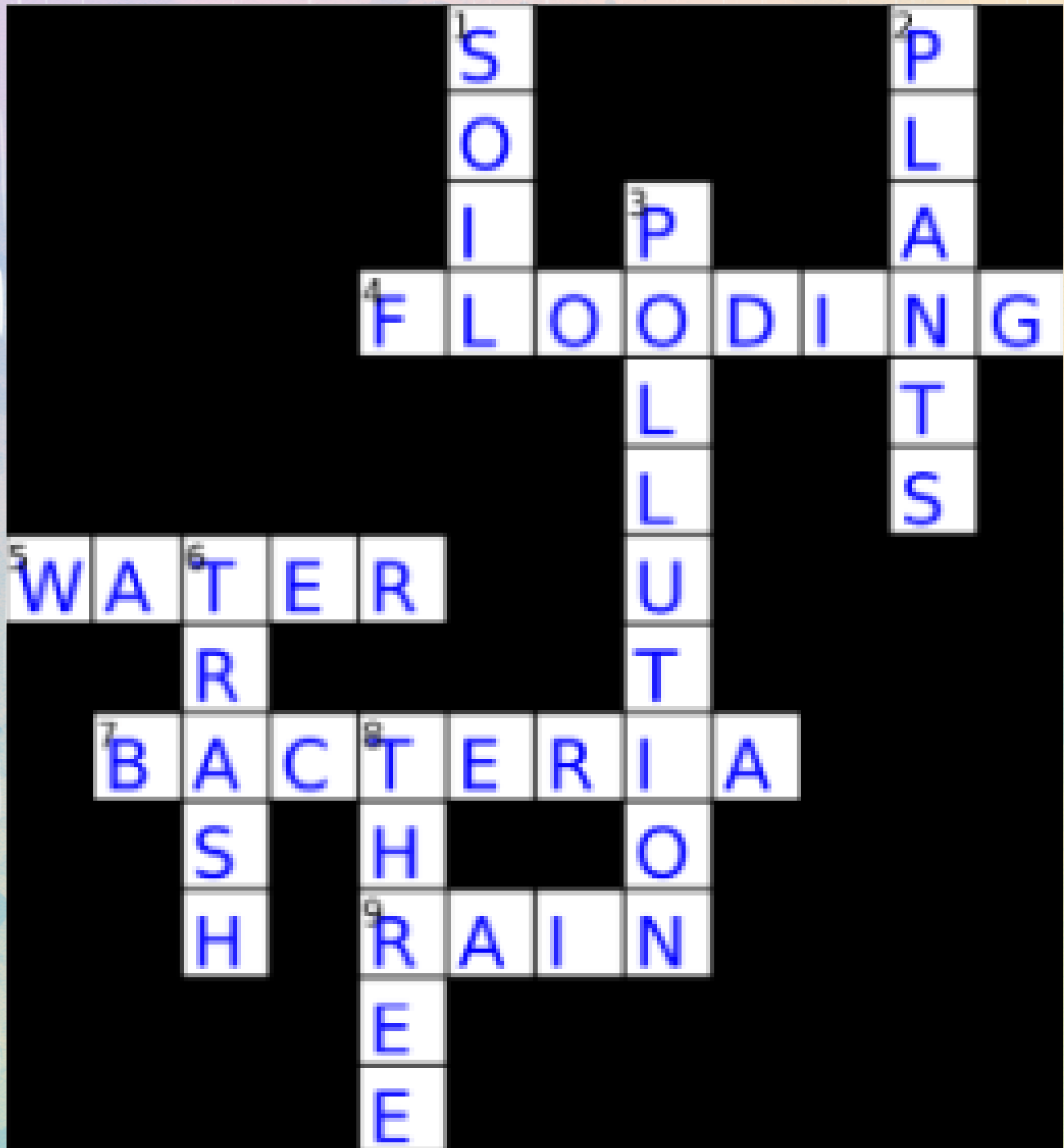
Crossword + Word Search 1

Across	Down
<p>4. This is when there is too much rainwater</p> <p>5. A watershed is a land where _____ runoff drains into rivers, streams, or oceans</p> <p>7. This can cause a human to get sick</p> <p>9. A _____ garden is designed to collect and filter water</p>	<p>1. Erosion is the washing away of _____</p> <p>2. Animals use these for food</p> <p>3. A name for litter, grease, oil, and other bad items that end up in our water</p> <p>6. Recycling is the best way to get rid of your _____</p> <p>8. The number of major watersheds in Ft. Wayne is _____</p>

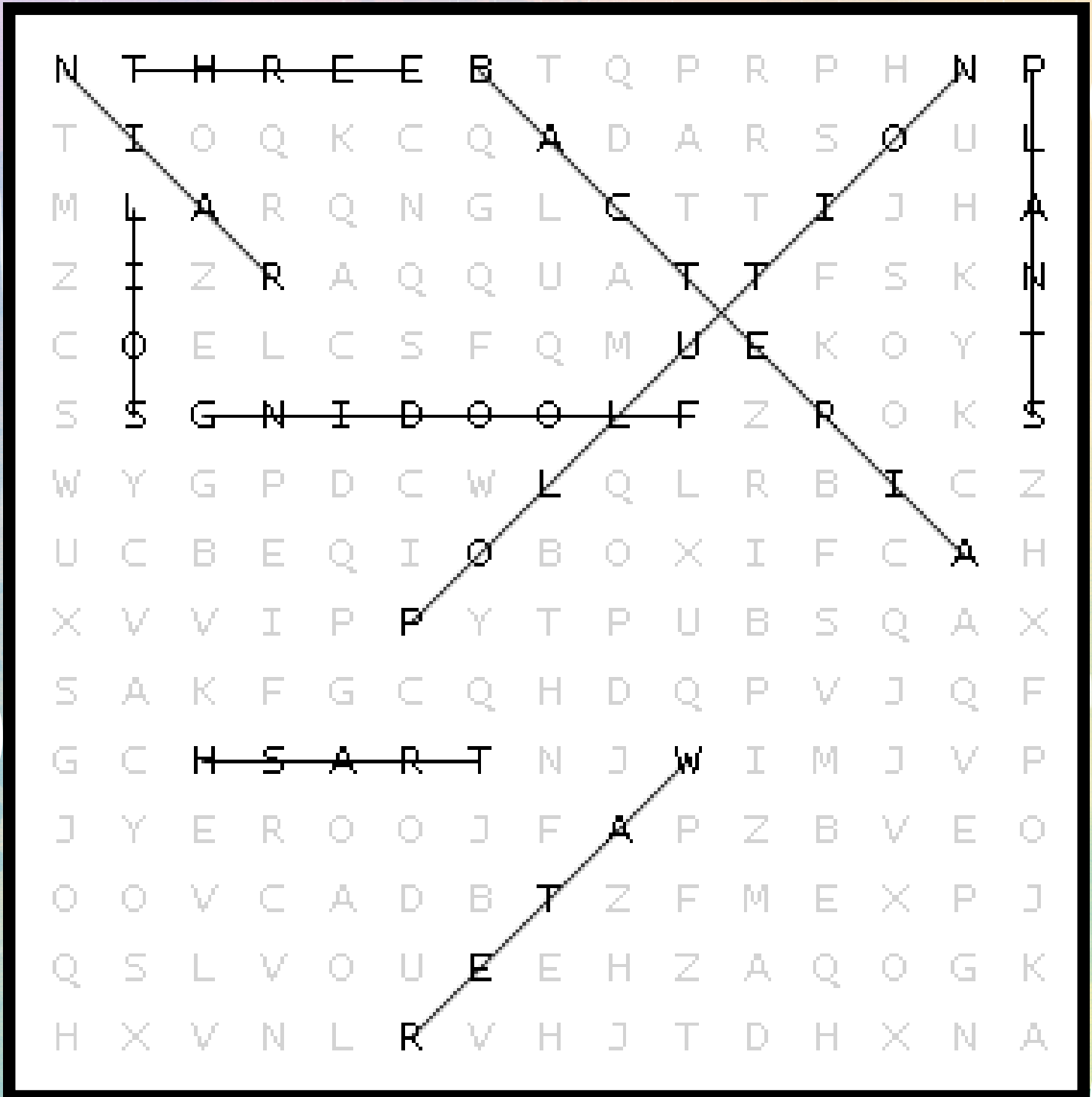
Word Bank: (All words will be used only once)

**TRASH, RAIN, SOIL,
POLLUTION, THREE, BACTERIA
PLANTS, WATER, FLOODING**

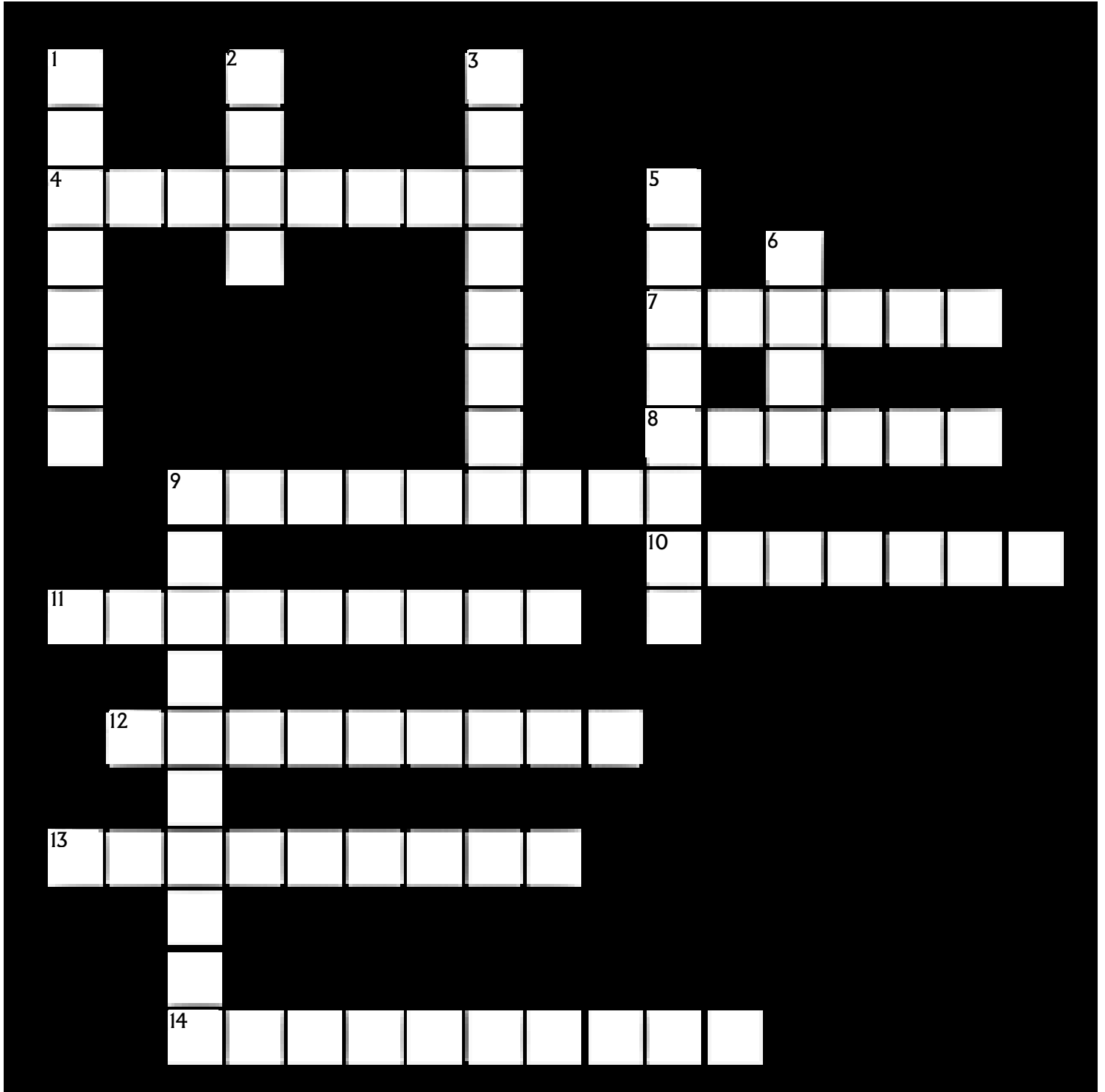
Answer Key - Crossword 2



Answer Key - Word Search 1



Activity A - Crossword 2



Activity A - Word Search 2

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

Crossword + Word Search 2

Across	Down
<p>4. This is made up of dirt, soil, and sand and ends up in area streams and rivers</p> <p>7. The 3 major watersheds in Ft. Wayne are St. Mary, St. Joseph, and _____</p> <p>8. Rain gardens and green roofs are a type of low-_____ development techniques</p> <p>9. There are two major types of _____: Point and Non-point Sources</p> <p>10. When soil is washed away by rain water</p> <p>11. A _____ is land area whose water runoff drains into nearby bodies of water</p> <p>12. Water flows off of a roof, into a _____ and can be directed to a rain garden</p> <p>13. Insecticides and herbicides are types of _____ harmful to our waterways</p> <p>14. Turbidity is a measure of water _____</p>	<p>1. It is important to properly _____ of pet waste</p> <p>2. Type of garden used to collect water runoff and filter pollutants</p> <p>3. This is the name for items such as nitrogen and phosphorus</p> <p>5. This type of sewer system carries stormwater and sewer water together</p> <p>6. Never _____ anything down storm drains</p> <p>9. This term means able to cause disease, especially in humans</p>

Word Bank: (All words will be used only once)

DOWNSPOUT, IMPACT, SEDIMENT, PATHOGENIC, COMBINED, MAUMEE, CHEMICALS, WATERSHED, CLOUDINESS, RAIN, NUTRIENT, POLLUTION, DISPOSE, DUMP

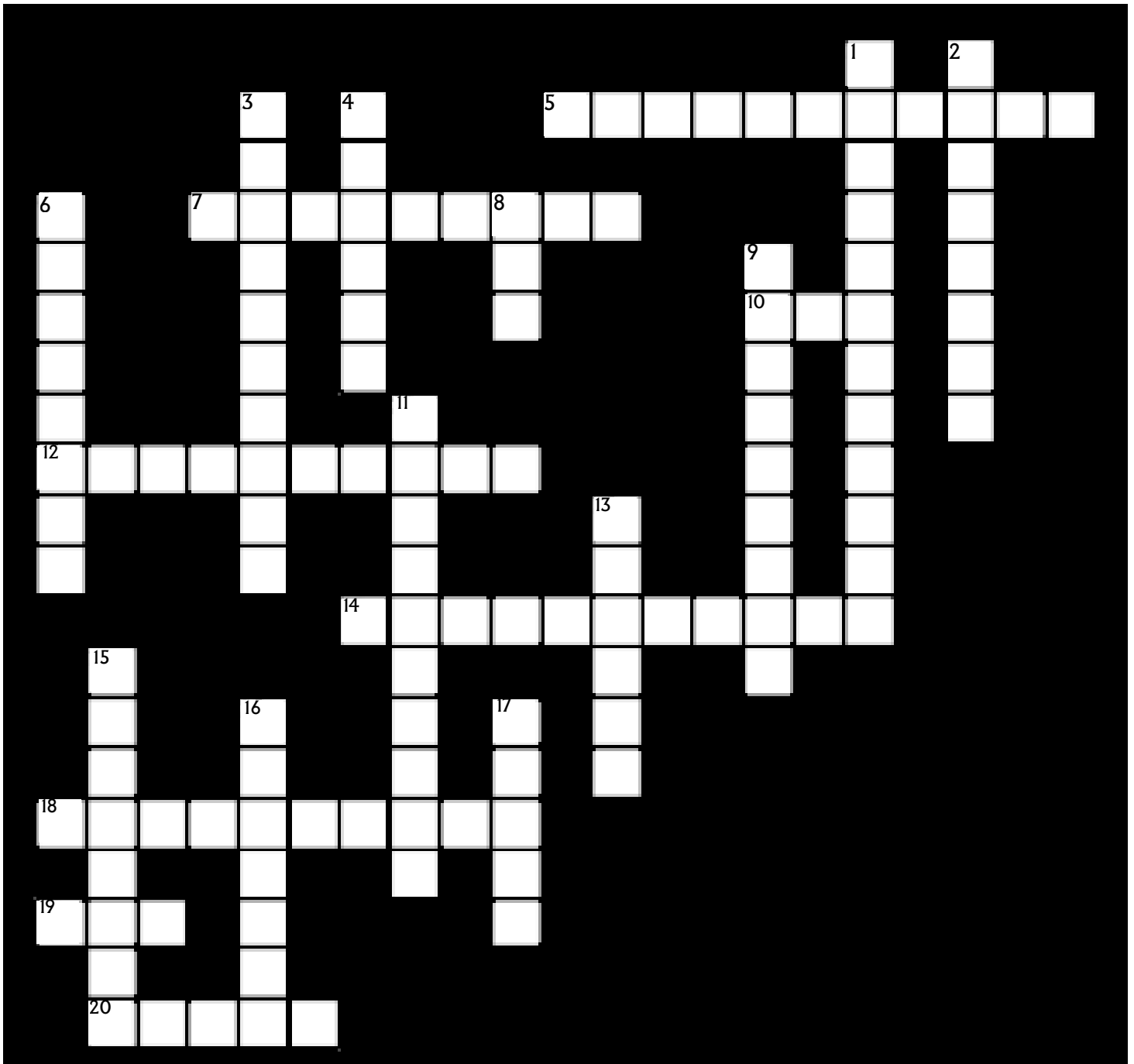
Answer Key - Crossword 2

D R N
I A U
S E D I M E N T C
P N R O D
O I M A U M E E
S E B M
E N I M P A C T
P O L L U T I O N
A E R O S I O N
W A T E R S H E D D
H
D O W N S P O U T
G
C H E M I C A L S
N
I
C L O U D I N E S S

Answer Key - Word Search 2

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

Activity A - Crossword 3



Activity A - Word Search 3

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

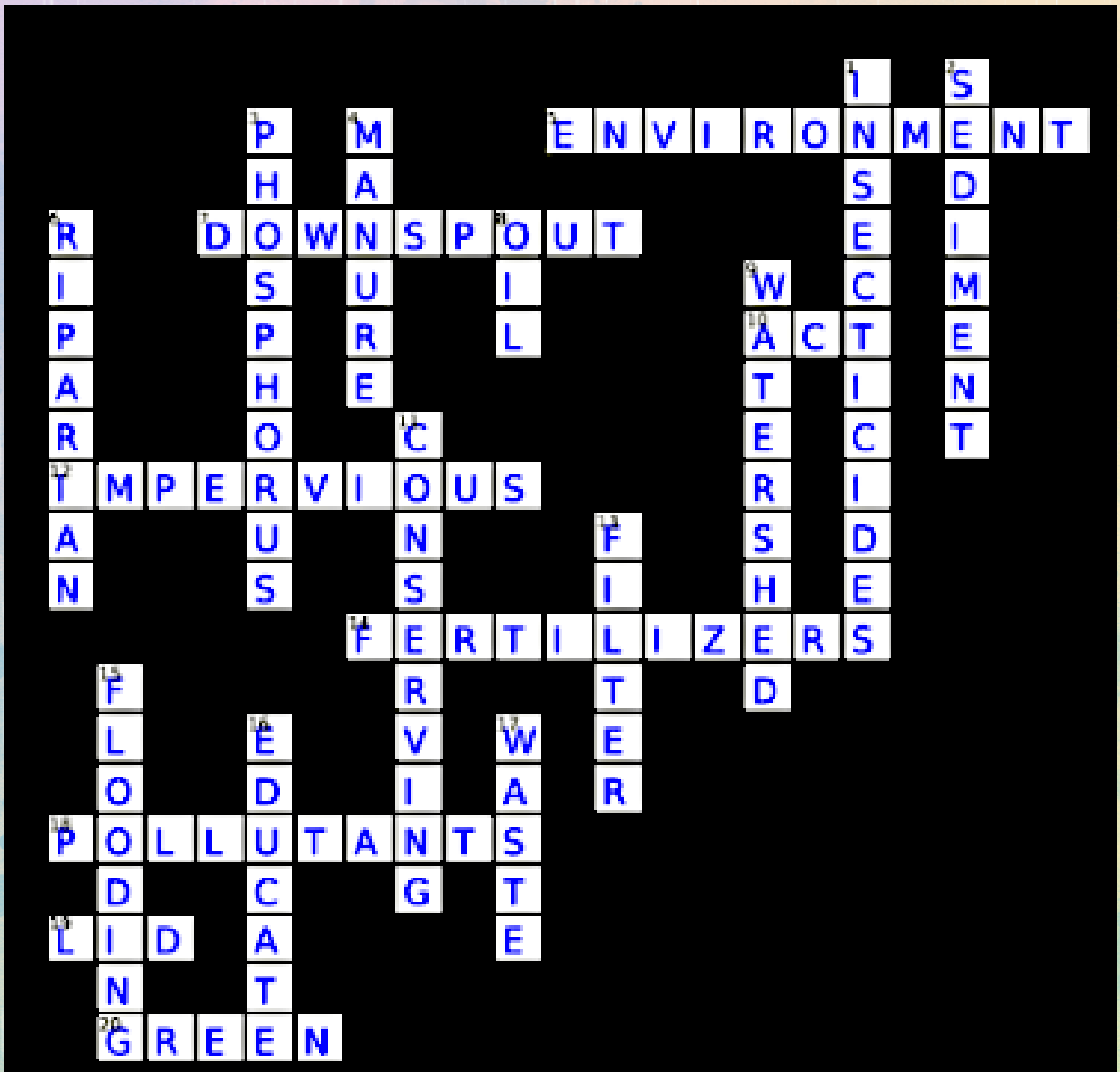
Crossword + Word Search 3

Across	Down
<p>5. Non-point source pollution comes from various places in the _____</p> <p>7. A _____ directs water from a roof to a rain garden</p> <p>8. The Clean Water _____ was established in 1972</p> <p>10. Type of surface where water is unable to reach the ground to soak in</p> <p>14. Homeowners should use _____ sparingly.</p> <p>18. Water picks up _____ such as pesticides from lawns when it rains.</p> <p>19. These techniques work with natural landscapes to soak up rainwater</p> <p>20. _____ roofs are a type of LID technique</p>	<p>1. Chemicals used to control or kill insects</p> <p>2. _____ can cause an increase in turbidity</p> <p>3. High levels of this nutrient can cause algal blooms</p> <p>4. This is a natural source of nitrogen and phosphorus</p> <p>6. This is a zone of vegetation next to bodies of water used to filter out pollutants</p> <p>8. Leaking _____ can cause pollution when picked up off road surfaces</p> <p>9. Land area whose water runoff drains into a body of water</p> <p>11. _____ water reduces the demand on existing water supplies</p> <p>13. Rain gardens help to _____ pollutants</p> <p>15. Increased development and large rain events can cause _____</p> <p>16. It is important to _____ friends, family, and neighbors on ways to keep our water clean</p> <p>17. Properly dispose of pet _____</p>

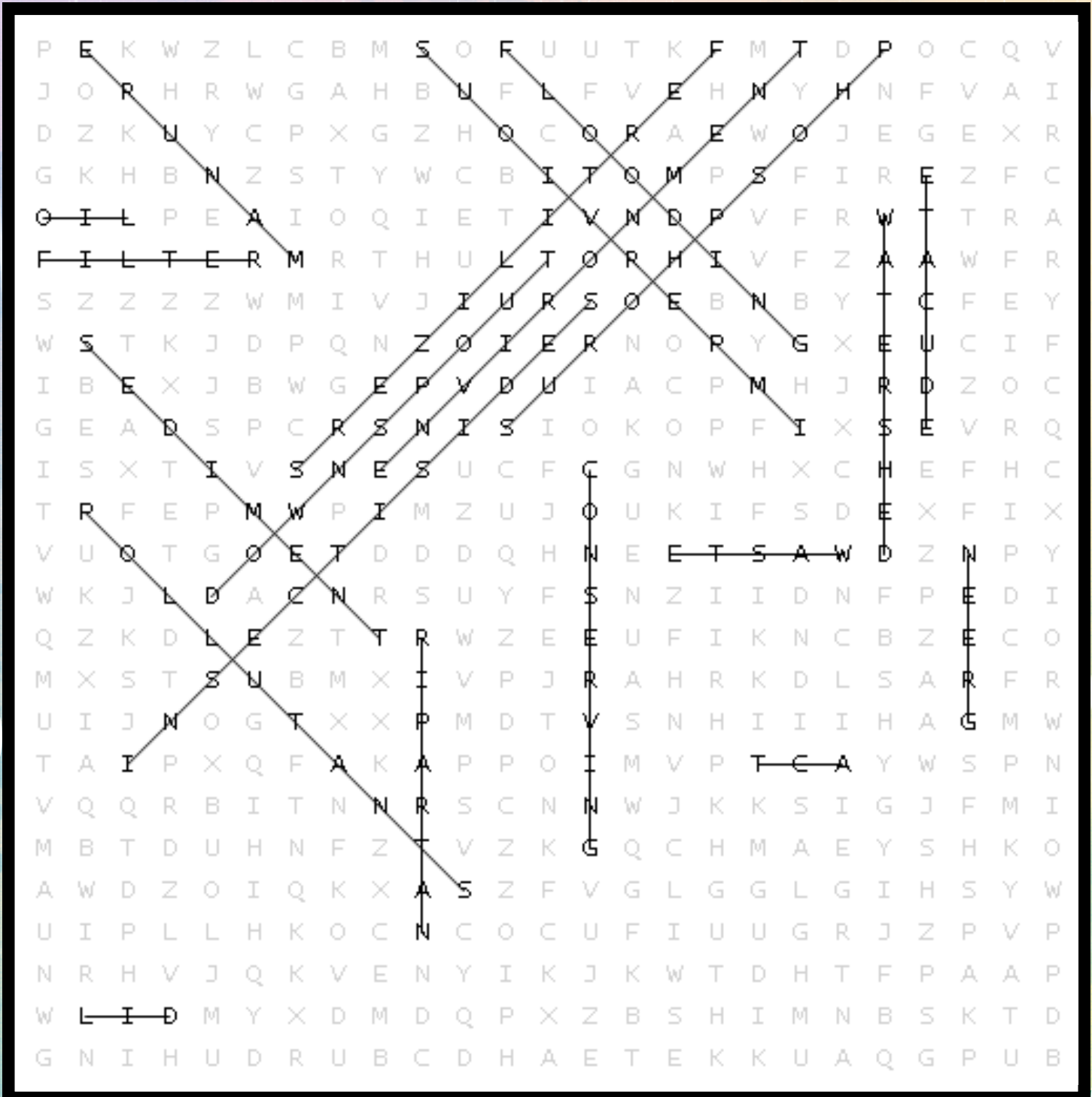
Word Bank: (All words will be used only once)

DOWNSPOUT, FILTER, SEDIMENT, CONSERVING, FERTILIZERS, WASTE, IMPERVIOUS, GREEN, ENVIRONMENT, LID, FLOODING, RIPARTAN, PHOSPHORUS, ACT, MANURE, EDUCATE, INSECTISIDES, OIL, POLLUTANTS, WATERSHED

Answer Key - Crossword 3



Answer Key - Word Search 3



Activity B - Pollution in Motion

The Pollution in Motion demonstration is recommended to be done as a classroom, but can be done at separate stations with each runoff surface. This activity highlights point source vs. non-point source pollution and how rainwater leaches different pollutants from different surfaces into out land. After demonstrating, students will complete a worksheet where they match the types of surfaces to the pollutants that come from them.

Activity Time: **Grade Level**

45 Minutes K - 12

Objectives:

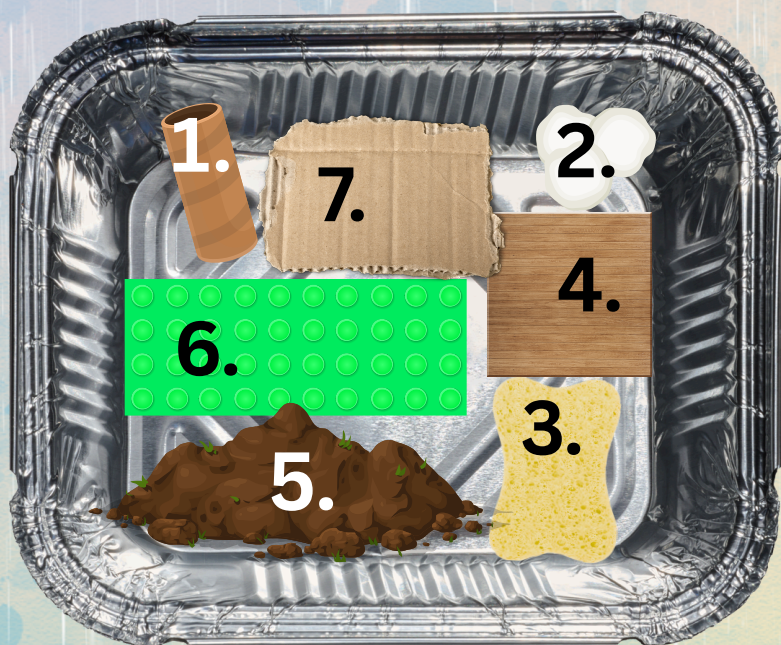
To help students see how pollution moves through water and the environment, and to distinguish between pollution that comes from a direct, identifiable source (point source) and pollution that is spread out and harder to track (nonpoint source).

Materials Needed:

- 1 large tray or shallow bins
 - If doing as separate stations, 6 trays
- Surfaces: (substitute as needed)
 - Cardboard tube (factory source)
 - Cotton balls (source point leak)
 - Sponge or felt square (grass/lawn)
 - Wood (sidewalk/pavement)
 - Soil/sand (agriculture field)
 - Lego (roof/downspout/gutter)
 - Cardboard (parking lot/asphalt/streets/highways)
- 6 Cups/containers for pollutants
 - If doing as separate stations, 12 cups
- 2 droppers/pipettes
- Water and spray bottle or a watering apparatus
- Paper towels
- Pollutants: (substitute as needed)
 - 3 colors of food coloring (point source pollution)
 - Cocoa powder or instant coffee (soil erosion)
 - Cooking oil (car leaks)
 - Glitter (fertilizer runoff)
 - Sprinkles/confetti (pet waste/trash)
 - Salt (road salt)
- Worksheets

Setup & Prep:

- Assemble tray/s with a gentle slope (book under one end)
- Lay down the “landscapes” in the tray, which include:
 1. Cardboard tube (factory pipe/source point leak)
 2. Cotton balls (sewage/source point leak)
 3. Sponge or felt square (grass/lawn/field)
 4. Wood (sidewalk/pavement)
 5. Soil/sand (agriculture field)
 6. Lego surface (roof/downspout/gutter)
 7. Cardboard (parking lot/asphalt/streets/highways)
- Your setup may look different depending on materials available. The picture below is a general idea of what your layout could be.



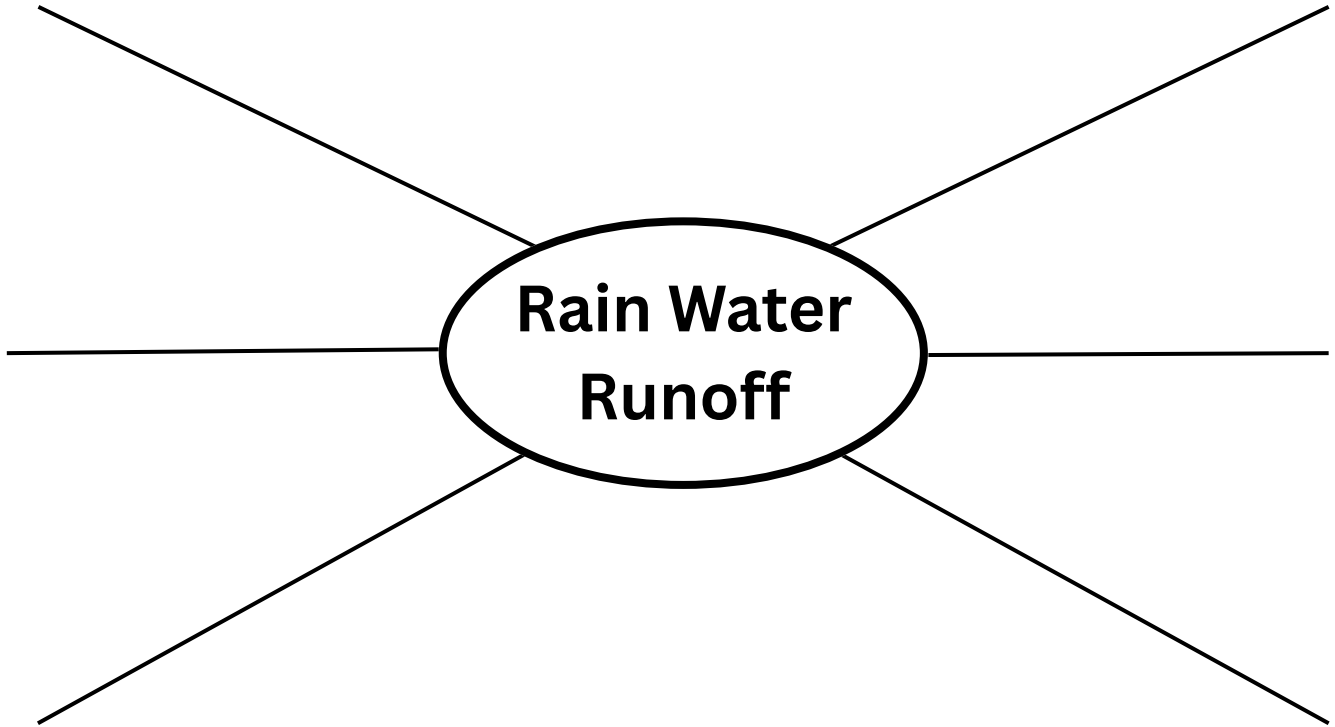
- Set pollutants in labeled cups or small piles, which include:
 - A. Food coloring + water
 - Use with 1, 2, 6
 - B. Cocoa powder (soil erosion)
 - Use with 3, 5
 - C. Cooking oil (car fluids)
 - Use with 7
 - D. Glitter (fertilizer runoff)
 - Use with 3, 5
 - E. Salt (road salt)
 - Use with 4, 7
 - F. Confetti (trash or pet waste)
 - Use with 3, 4, 5, 7

Instructions:

1. Briefly explain point vs. nonpoint source pollution.
 - a. Point source comes from a single, identifiable location, like a pipe or factory discharge
 - b. Non-point source comes from a wider, less defined area, and originates from multiple sources.
2. Start by sprinkling the non-source point pollutants around and explain what each material represents:
 - a. With the cocoa powder (soil erosion) and glitter (fertilizer runoff), sprinkle this over your sponge (grass/lawn) and dirt (agriculture field)
 - b. With the salt (road salt), sprinkle this over the LEGO surface (streets/highway)
 - c. With the confetti (pet waste and trash), sprinkle this over your sponge (grass/lawn), wood (sidewalk/pavement), dirt (agriculture field), LEGO surface (streets/highway), and cardboard (parking lot/asphalt)
 - d. With the cooking oil (car leaks), drop some using the pipette over the cardboard (parking lot/asphalt)
 - e. With the food coloring, drop some using the pipette over the LEGO surface (roof/downspout/gutter)
3. Next, spread out the point source leaks
 - a. Soak the cotton balls (sewage overflow/leak) in the food coloring and water
 - b. Dump some of the food coloring and water down the cardboard tube (factory pipe/source)
4. Spray water over each surface and observe what happens. Then move on to raining over the entire tray.
5. Ask students: What moved fastest? What spread the most?
6. Transition to Fort Wayne Waterways Map Worksheet:
7. Have students identify the nearest local waterway
8. Draw where stormwater might flow in their neighborhood
9. Label features like downspouts, storm drains, rivers, and the Maumee watershed

Activity B - Pollution in Motion Worksheet

1. In the diagram below, write on the lines 6 types of surfaces that water falls onto when it rains.



2. Of the surfaces you identified, which do you think results in the most stormwater run off when it rains?

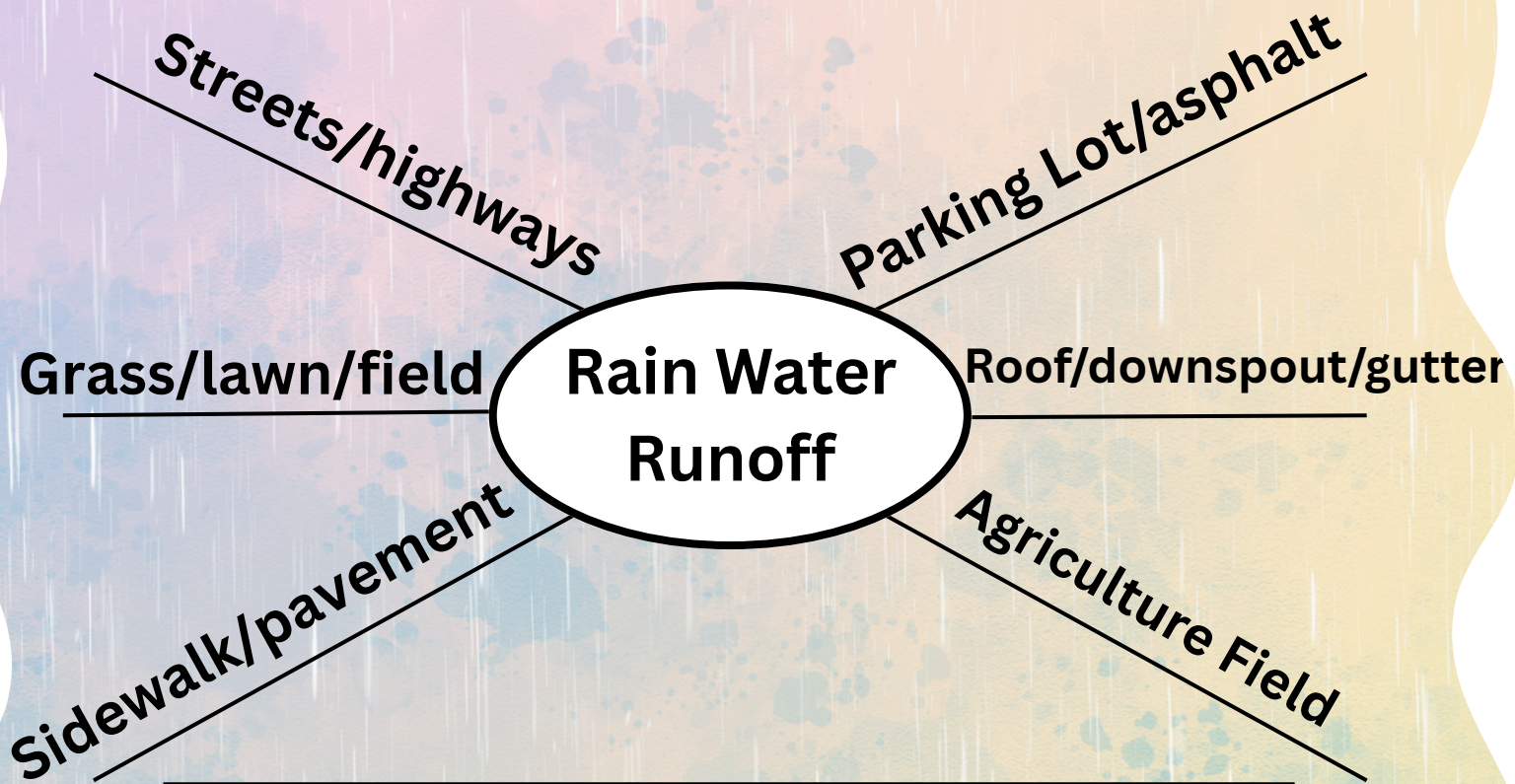
Activity B - Pollution in Motion Worksheet

3. List the surfaces you provided in question 1. Next to them, name 2 pollutants that could be picked up when water runs over them.

Surface	Pollutant 1	Pollutant 2

4. Do you think the slope of a surface has an effect on the amount of pollutants that are picked up from it?

Answer Key - Pollution in Motion



Surface	Possible Pollutants
Streets, Highways	oil, car dirt, salt from ice treatment, litter
Grass, Lawn, Field	Pet waste, fertilizers, pesticides, home chemicals, sediment, yard debris
Sidewalk, Pavement	Gum, litter, paint from markings, soil
Agriculture Field	Sediment, rocks, sticks, leaves
Roof, Downspout, Gutter	Petroleum products from roof, leaves
Parking Lot, Asphalt	Litter, oil, car fluids, asphalt aggregate, car dirt

Activity C - Regulation Game

In this hands-on game, students take on the role of rain garden inspectors, reviewing different garden proposals to decide if they meet local regulations. Using a reference sheet of rain garden rules, teams evaluate illustrated scenarios and stamp them “APPROVED” or “DENIED” with reasons why. The activity builds real-world problem-solving skills and helps students understand why city guidelines exist to protect water quality and public safety.

Activity Time: **Grade Level**

15 Minutes K - 12

Objectives:

To introduce students to basic local rain garden regulations and let them practice applying those rules by “approving” or “fixing” different proposed rain garden scenarios.

Materials Needed:

- Scenario Cards (with diagrams or short paragraphs describing garden proposals)
- Stamp or sticker for "APPROVED" or "DENIED"
- Rain Garden Regulation Reference Sheet (with Fort Wayne rules summarized)
- Clipboards or group bins (if rotating stations)

Setup & Prep:

- Print 4–6 sample rain garden scenarios (some following rules, some not)
- Print or post a visual guide to Fort Wayne’s rain garden placement rules

Instructions:

1. Split students into teams or run this as a rotation station.
2. Each team gets a scenario card and a checklist of rules.
3. They decide if the plan should be approved or denied and give a reason.
4. Use a stamp or sticker to mark each card, then rotate to the next scenario.
5. Wrap up with class discussion:
6. Which rules were the hardest to follow?
7. Why do cities create these regulations?

Fort Wayne Rain Garden Rules

1. Put your rain garden where it can **catch the most rain** from a roof, driveway, or sidewalk.
2. **Look for low spots** where water already flows—but place your garden a little uphill to stop it from flooding.
3. **Don't put your garden where water already stands** or puddles for a long time.
4. Keep your rain garden **at least 10 feet away from buildings** to protect basements and foundations.
5. Be **careful not to block sidewalks**.
6. **Don't build your rain garden near a septic system**, ditch, or drain.
7. **Avoid putting rain gardens near big trees**—digging could hurt their roots.
8. If the water doesn't flow there naturally, **you can use a pipe or swale to help guide it** to your garden.
9. Put your garden **downhill from your driveway** so it can catch rainwater that runs off.
10. **Check with your neighborhood** to see if they have rules or an HOA before you start.
11. **Don't put your garden where utility lines are** or public property might be; get permission first.
12. Plan where extra water will go if your garden fills up, **make sure it won't flood your house** or your neighbor's yard.
13. **Must use native plants!**
14. **A distinct border that separates your garden from the rest of your lawn is necessary**, and ensures that your garden is compliant with Fort Wayne's neighborhood codes.
14. **Call 811 before you dig** to make sure you don't hit any underground cables or pipes.

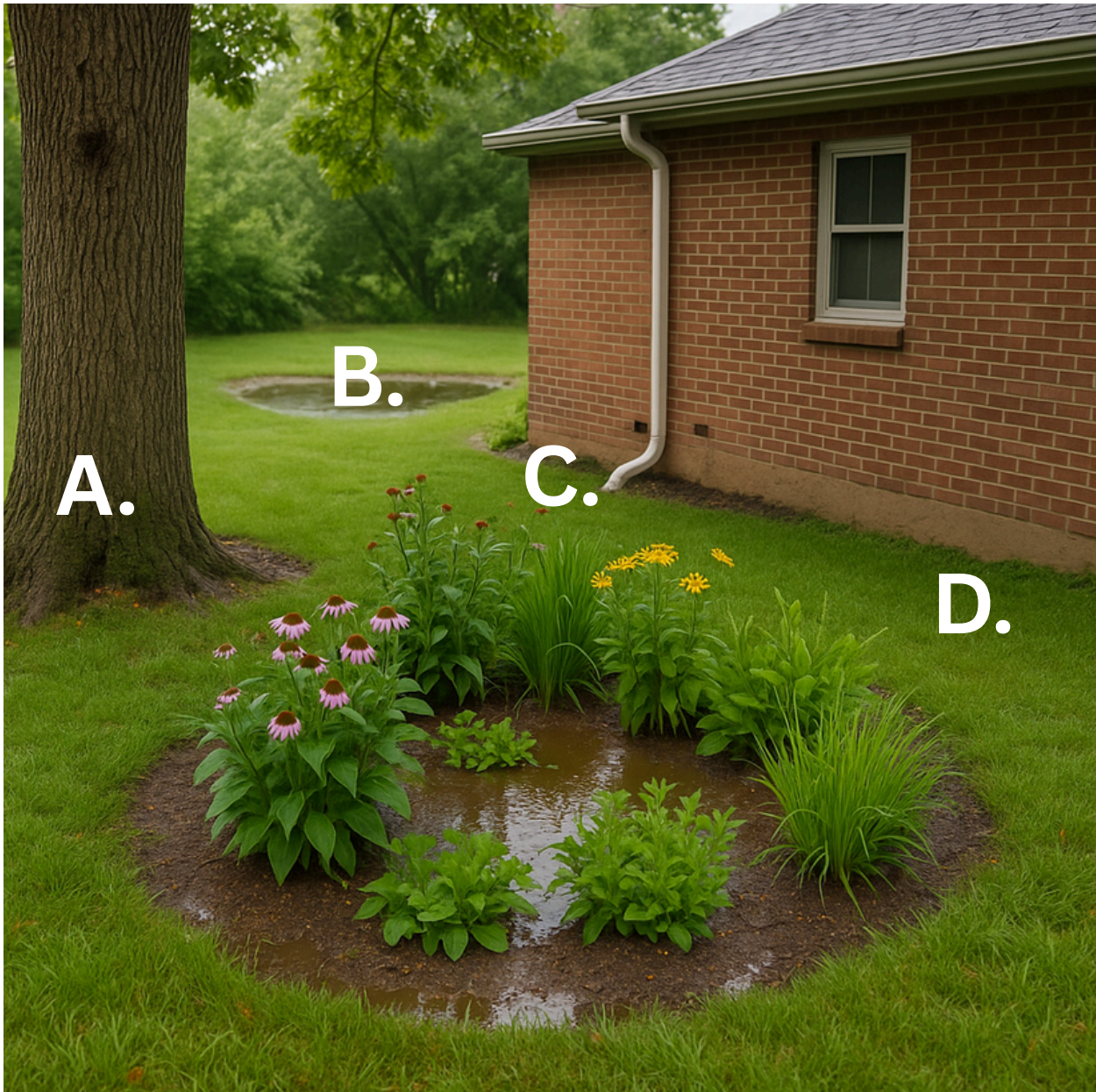
Rain Garden Regulations - Practice Example

A. Built under a large tree!

- directly beneath a mature tree
- digging here would damage the roots
- extra moisture could harm the tree.

B. In an existing puddle zone!

- visible standing water area nearby
- spot with poor drainage, might make it worse



C. Not aligned with the downspout!

- isn't positioned downhill from the downspout
- Runoff likely won't reach it naturally, won't serve its purpose

D. Too close to the building!

- planted just a few feet from the house
- risks water pooling near the foundation and seeping into the basement.

Rain Garden Regulations - Example 1



For this rain garden, they did not call 811 or talk to their neighborhood.

Rain Garden Regulations - Example 2



Rain Garden Regulations - Example 3



Rain Garden Regulations - Example 4



Activity C - Rain Garden Regulation Worksheet

In the examples below, circle if you think the rain gardens are correct or incorrect, and the 4 reasons why.

Example 1: **Correct** **OR** **Incorrect?**

Example 2: **Correct** **OR** **Incorrect?**

Example 3: **Correct** **OR** **Incorrect?**

Example 4: **Correct** **OR** **Incorrect?**

Answer Key - Rain Garden Regulations

In the examples below, circle if you think the rain gardens are correct or incorrect, and the 4 reasons why.

Example 1: **Correct** OR **Incorrect?**

Too close to house

No overflow

No natural water flow

No permission

Example 2: **Correct** OR **Incorrect?**

Too close to house

No overflow

Poor drainage

Too close to sidewalk

Example 3: **Correct** OR **Incorrect?**

Good distance from house

No standing water

No barrier

Good plants

Proper downspout

Example 4: **Correct** OR **Incorrect?**

Too close to house

No overflow

Poor drainage

Border around garden

Answer Key - Rain Garden Regulations

Example 1: Incorrect

- **Too close to public infrastructure (sidewalk & utilities)**
 - Located directly under overhead power lines and next to a utility box
- **Planted in a location without natural water flow**
 - Nearby parking lot drains toward the garden, but it's also uphill from the source, and no swale or pipe connects them
- **No overflow plan in place**
 - If water overtops the edge of the garden, it will run over the parking lot and pick up pollutants.
- **No permission obtained for use of right-of-way space**
 - Only two feet from the sidewalk, partially obstructing access

Example 2: Incorrect

- **Too close to the house.**
 - Building directly against the home's siding could cause moisture damage or flooding near the foundation, especially during heavy rain.
- **Poor drainage and visible water pooling**
 - This could mean the soil isn't draining properly, or the garden is built in a spot that already floods (breaking the "no standing water" rule).
- **No overflow plan**
 - There's no clear way for excess water to drain away safely, which means it could back up or cause erosion.
- **No setback from paved surfaces**
 - The garden is tight against a sidewalk without any protective buffer, increasing the risk of overflow onto public space or nearby properties.

Answer Key - Rain Garden Regulations

Example 3: Correct!

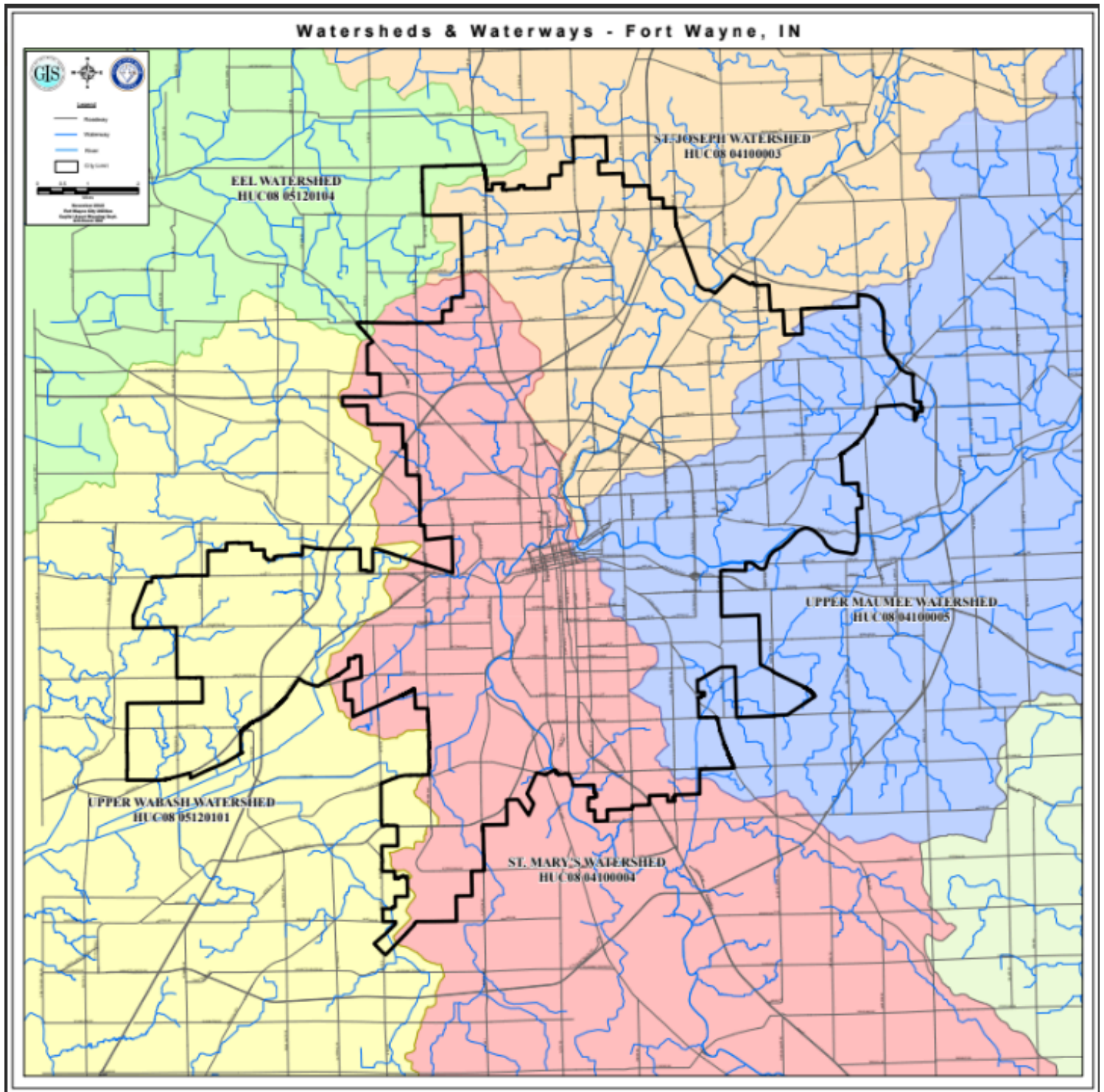
- **Proper distance from the house**
 - Set back from the brick wall and foundation, more than 10 feet from the building.
- **Downspout connection with extension**
 - Downspout extends away from the house, sloping directly toward the garden, guiding water to the center.
- **No standing water or pooling**
 - Soil appears well-drained, with no puddling, suggesting good placement and infiltration.
- **Native plants with staggered heights**
 - Plants are well-spaced, with taller species in the center (wet zone) and smaller ones at the edges.
- **No hard barriers around the edge**
 - The garden uses soft natural borders (no bricks or blocking edges), which allow water to enter and overflow safely.

Example 4: Incorrect

- **Too close to the house**
 - Right against the siding risks water damage or basement flooding.
- **Built in a spot with poor drainage**
 - Standing water in the center indicates poor infiltration and violates the rule against building where water already pools.
- **No clear overflow route**
 - No sign of an overflow channel to direct excess water safely away from the house or yard, increasing the risk of water damage.
- **Bordered on all sides**
 - Fully ringed with bricks, which could prevent water from flowing efficiently, depending on the slope.

Activity C - Map it Out

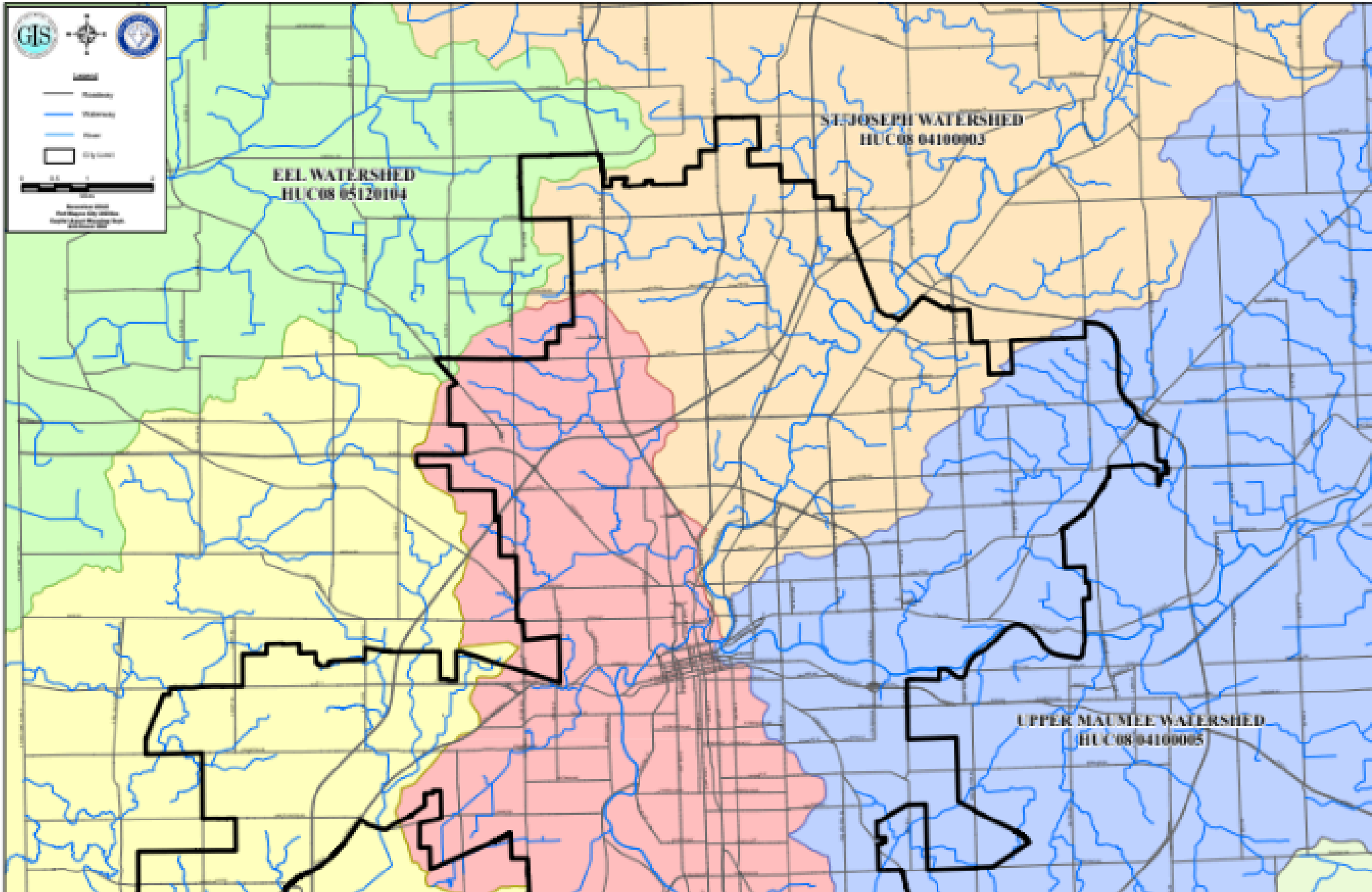
Ft. Wayne Watershed Map

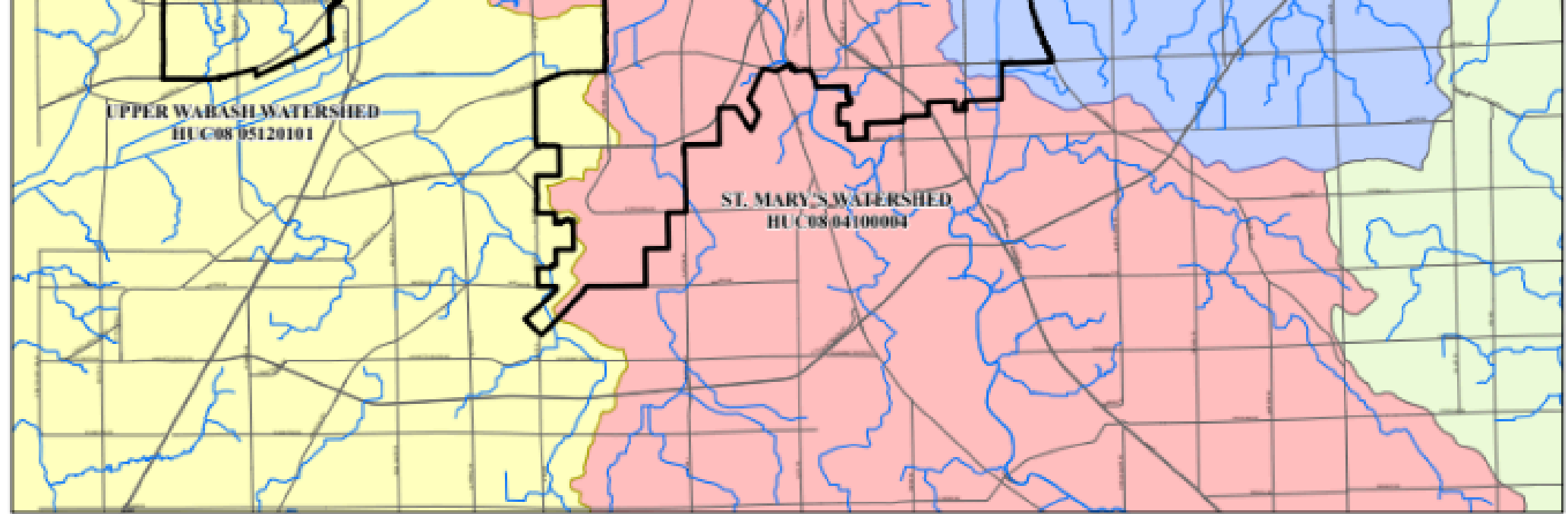


Activity C- Map it Out

Ft. Wayne Watershed Map

Watersheds & Waterways - Fort Wayne, IN





Activity C - Map it Out Reflection

Look at the map provided. Mark with a circle or dot which watershed your home is located in.

1. What watershed do you live in? _____

2. What watershed do you go to school in? _____

3. Indicated on the map marked by the class, which watershed do most people in your class live in? _____

4. Which of the 3 rivers do you think you and your family personally effect the most with pollution every day? Why? Consider where you spend the most time going to school, activities, at home, etc. _____
