

# BE A WATER ECOSYSTEM HERO!

Battle Water Pollution in a collaborative game  
and get outside to Find a Pollinator



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[www.wearewater.colorado.edu](http://www.wearewater.colorado.edu)



# Water Pollution!

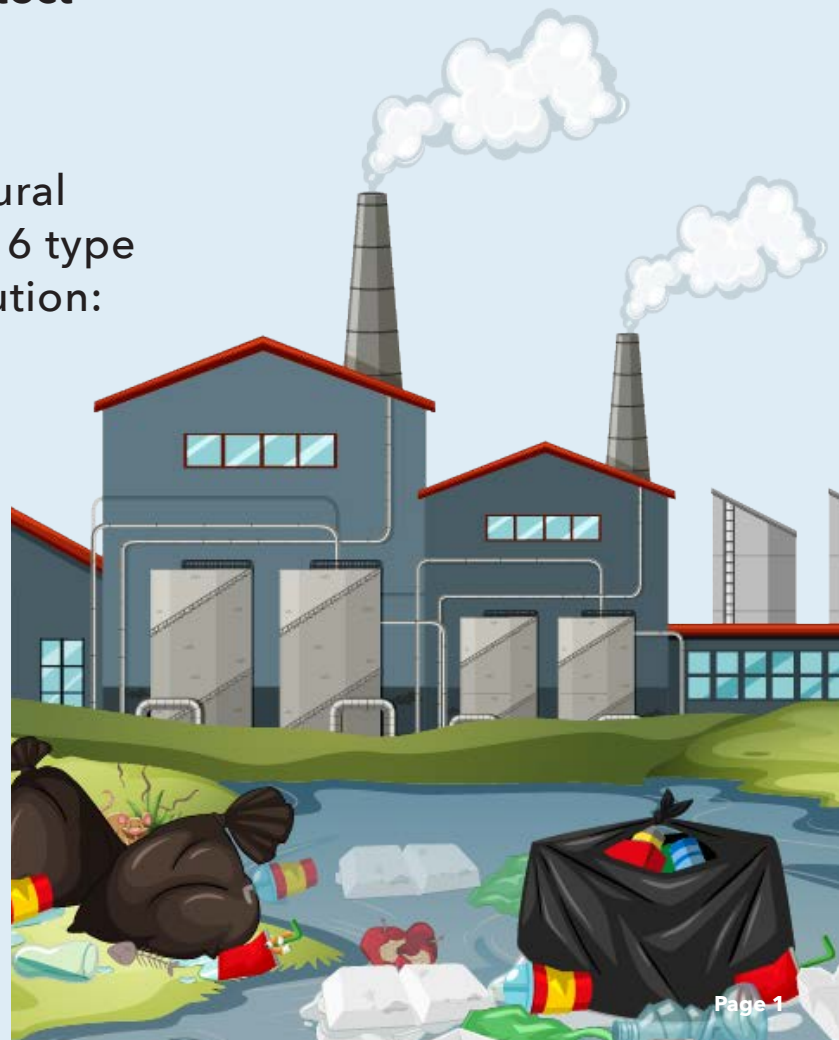
Water is important for all life! But some human activities can pollute water, making it unsafe. Polluted water hurts the people, animals, and plants that depend on that water to thrive and survive.

**Goal: Work with a partner to protect a river from pollution!**

Pollution can be caused by any human activity that changes a natural landscape. In this game, there are 6 type of **SOURCES** that cause river pollution:

1. Neighborhood
2. Roads
3. Shopping Mall
4. Factory
5. Farming
6. Mining

**DISASTER CARDS** describe how each of these sources pollute the river.



# Protecting OUR Rivers

There are many ways to protect a river from pollution such as:

- Removing trash
- Planting natural vegetation

Plants catch trash and other pollutants before they get into the river, and their roots keep the soil from collapsing into the water. They are also great habitats for pollinators which in turn help spread plants and create more spaces with wildflowers and grasses. Players will use **CLEAN CARDS** and **PLANT CARDS** to help protect their shared river.



# GAME PIECES

## On the Board

### River



### Numbers

Player 1

2

Player 2

5

### Sources



## Action Cards

### Disaster Cards

Chemicals and heavy metals from a **mine** make it into the river

### Plant Cards

Plant Wildflowers

2



### Clean Cards

Clean River

3

## Tokens

### Pollution Tokens (-1)

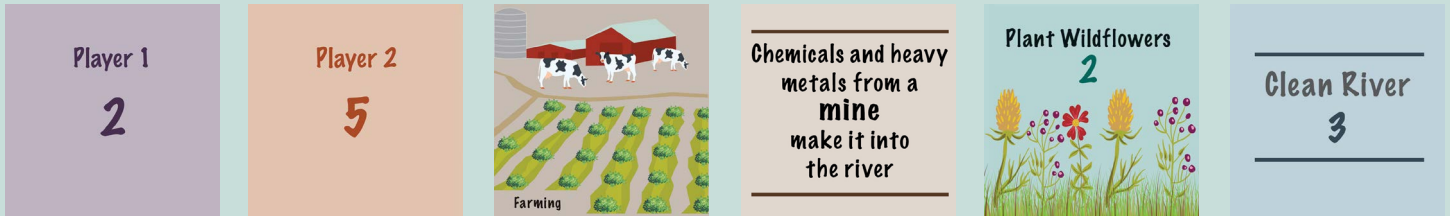


### Pollinator Tokens (+1)



# GAME SETUP

- 1 Organize the game pieces by type. Shuffle the **DISASTER CARDS**, **PLANT CARDS**, and **CLEAN CARDS**.



- 2 Decide who will be Player 1 and Player 2. Player 1 will randomly place the **Player 1 NUMBERS** on the left side of the river. Player 2 will randomly place the **Player 2 NUMBERS** on the right side of the river.



Numbers	River	Numbers
Player 1 2		Player 2 3
Player 1 3		Player 2 1
Player 1 6		Player 2 6
Player 1 1		Player 2 5
Player 1 5		Player 2 2
Player 1 4		Player 2 4

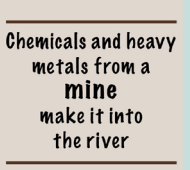
3



Add the **SOURCES** to the board. Player 1 will randomly place one of each type of Source to the left of their Numbers. Player 2 will randomly place one of each type of Source to the right of their Numbers.

Sources	Numbers	River	Numbers	Sources
Factory	Player 1 2		Player 2 3	Mining
Mining	Player 1 3		Player 2 1	Roads
Neighborhood	Player 1 6		Player 2 6	Shopping Mall
Roads	Player 1 1		Player 2 5	Factory
Farming	Player 1 5		Player 2 2	Farming
Shopping Mall	Player 1 4		Player 2 4	Neighborhood

4

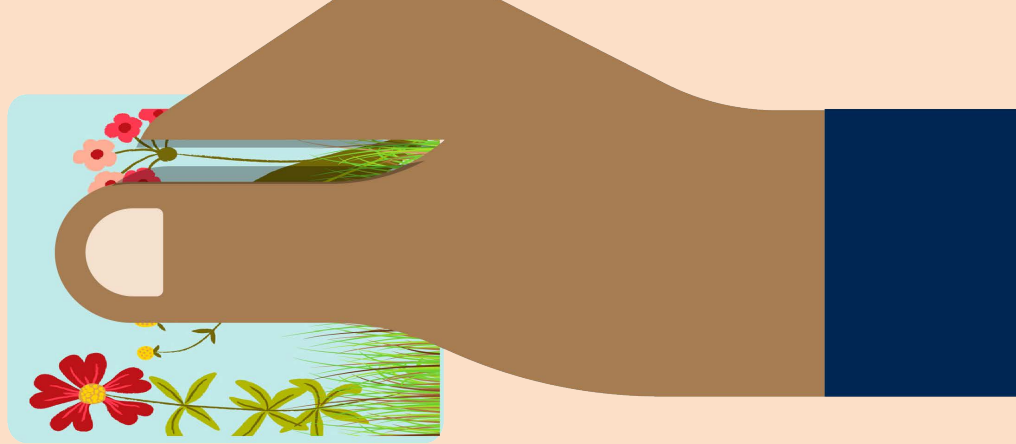


Place the shuffled **DISASTER CARDS**, **CLEAN CARDS**, and **PLANT CARDS** face-down at the bottom of the board. Place the **POLLUTION TOKENS** next to the Disaster Cards. Place the **POLLINATOR TOKENS** next to the Plant Cards.

Sources	Numbers	River	Numbers	Sources
Factory	Player 1 2		Player 2 3	Mining
Mining	Player 1 3		Player 2 1	Roads
Neighborhood	Player 1 6		Player 2 6	Shopping Mall
Roads	Player 1 1		Player 2 5	Factory
Farming	Player 1 5		Player 2 2	Farming
Shopping Mall	Player 1 4		Player 2 4	Neighborhood

Pollution tokens  
 Pollinator tokens

# GAME RULES



1

Chemicals and heavy metals from a mine make it into the river

To start each round, each player draws a **DISASTER CARD** and plays it on their side of the river. Each Disaster Card describes a **SOURCE** that is causing pollution. Players will use a **POLLUTION TOKEN** to mark the location(s) where pollution has made it into the river.



For example, if Player 1 draws a card that says 'trash from a nearby neighborhood makes it into the river' then that player will place a Pollution Token on the section of the river that is in the same row as the neighborhood.

Sources	Numbers	River	Numbers	Sources
Factory	Player 1 2		Player 2 3	Mining
Mining	Player 1 3		Player 2 1	Roads
Neighborhood	Player 1 6		Player 2 6	Shopping Mall
Roads	Player 1 1		Player 2 5	Factory
Farming	Player 1 5		Player 2 2	Farming
Shopping Mall	Player 1 4		Player 2 4	Neighborhood

Trash from a neighborhood makes it into the river

Oil from vehicles traveling on a road makes it into the river



2



Next, each player will complete an action by drawing either a **CLEAN CARD** or a **PLANT CARD**. Choose your action wisely! Both actions can improve your chances of winning, but each action helps in different ways:

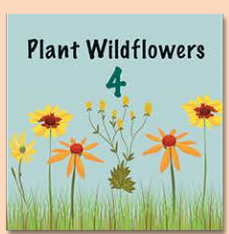


**PLANT CARDS** prevent pollution by allowing a player to plant Wildflowers on one of their Numbers Pieces. Each Plant Card describes where a player can plant. Players gain points by placing a Pollinator Token on top of the Wildflowers.



For example, if Player 1 draws a Clean Card with the number 4, then that player will place their **PLANT CARD** and a **POLLINATOR TOKEN** on top of their Number 4.

Once planted, wildflowers keep pollution from entering the river. However, planting does not remove existing pollution from the river.









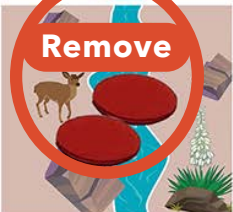


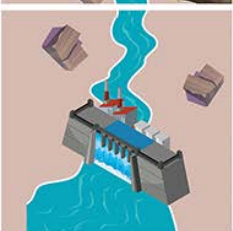

Clean River  
3

**CLEAN CARDS** allow players to remove the Pollution Tokens from one section of the river.

Each Clean Card describes where a player can clean the river.

For example, if a player draws a Clean Card with the number 2, then that player removes all of the Pollution Tokens from the river section that is next to their Number 2.



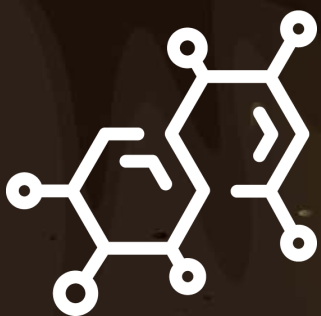
Sources	Numbers	River	Numbers	Sources
 Roads	Player 1 1		Player 2 5	 Factory
 Farming	Player 1 5		Player 2 2	 Farming
 Shopping Mall	Player 1 4		Player 2 4	 Neighborhood

Clean River  
2

**3** Once both players have completed their actions, the next round begins. After the first round, if a player draws a Disaster Card that describes a Source that is next to wildflowers, then pollution is blocked from getting into the river.

**4** There are enough **DISASTER CARDS** for 10 rounds of play. After all of the cards have been used, the game is over, and players tally the points on the board using the Pollution Tokens and Pollinator Tokens.

Chemicals and heavy metals from a mine make it into the river



Plants and their roots help filter out chemicals



# GAME SCORING



In this game, you count points as a team! The tokens that are on the board at the end of the game determine what your final score is. To beat pollution, players must have a score above zero.



Each **Pollinator Token** = +1 point

Each **Pollution Token** = -1 point

**Automatic loss:** Regardless of the final point tally, if there is a Pollution Token in every section of river at the end of the game, pollution wins.

# Help clean up the river!

Collect the bottles as you move through the maze. When you get to the end count how many bottles will be added to the recycle bin.

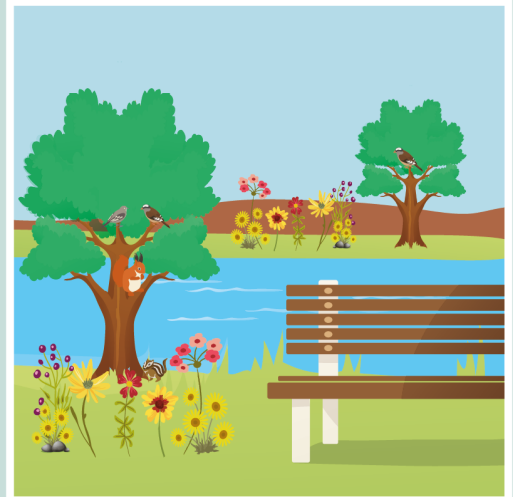
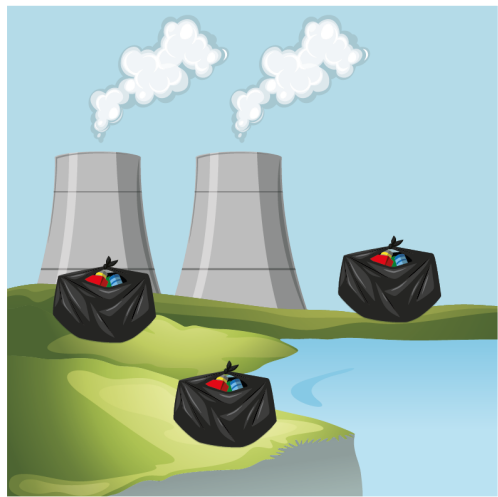
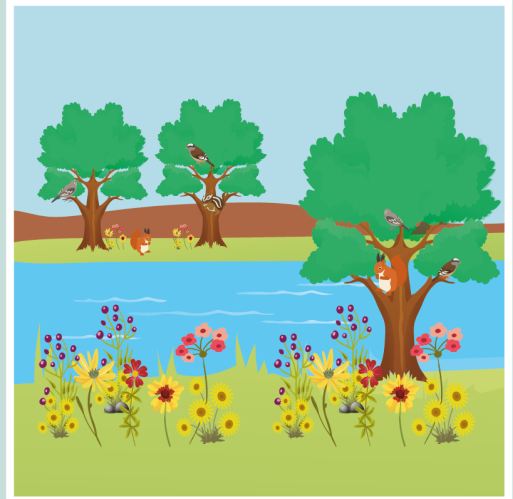
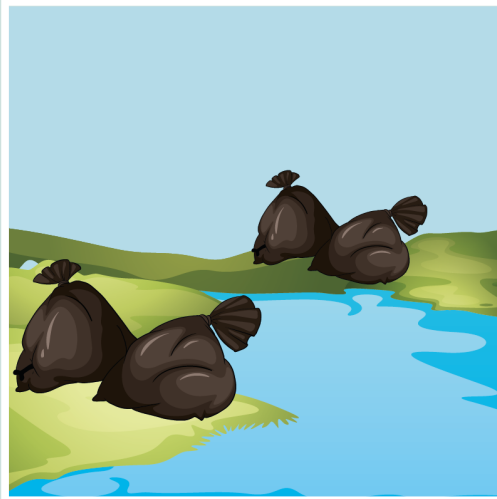


Start

Finish

# Where would you be most likely to find a pollinator?

Circle all of the pollinator friendly environments below!





# I SPY

How many of each item pictured on the right can you find?




# WORD SEARCH

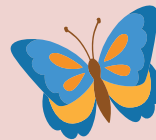
B R U R I K K D Y L S F C Z G  
 E C E L E X O T M L B P Z C L  
 E E B T C V I O C Q H Z X T P  
 S S D Z A N I K I C S G V Z L  
 N N Z P U W Q R H E L D I W A  
 W K L M R M A R I X E E W B N  
 Y T M Z S A K L Y R F M A V T  
 W O Y A V J F S G O W T L N I  
 C N U C B R B I R D S A C C N  
 N S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

Bats  
Clean  
Protect

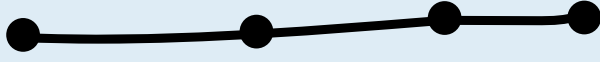
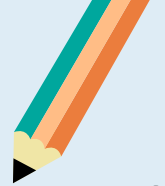
Bees  
Community  
River

Birds  
Plant  
Southwest

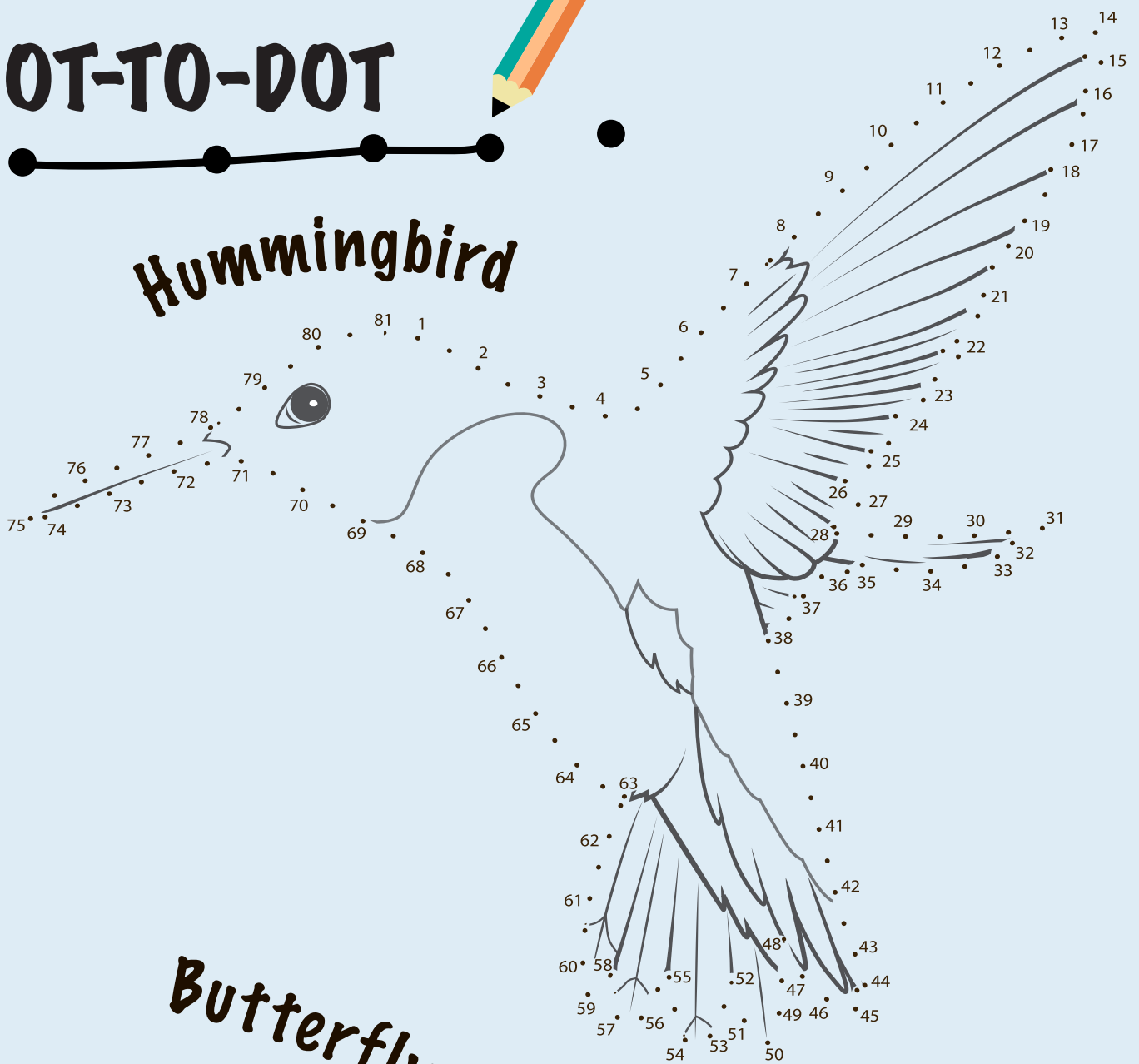
Butterflies  
Pollution  
Water



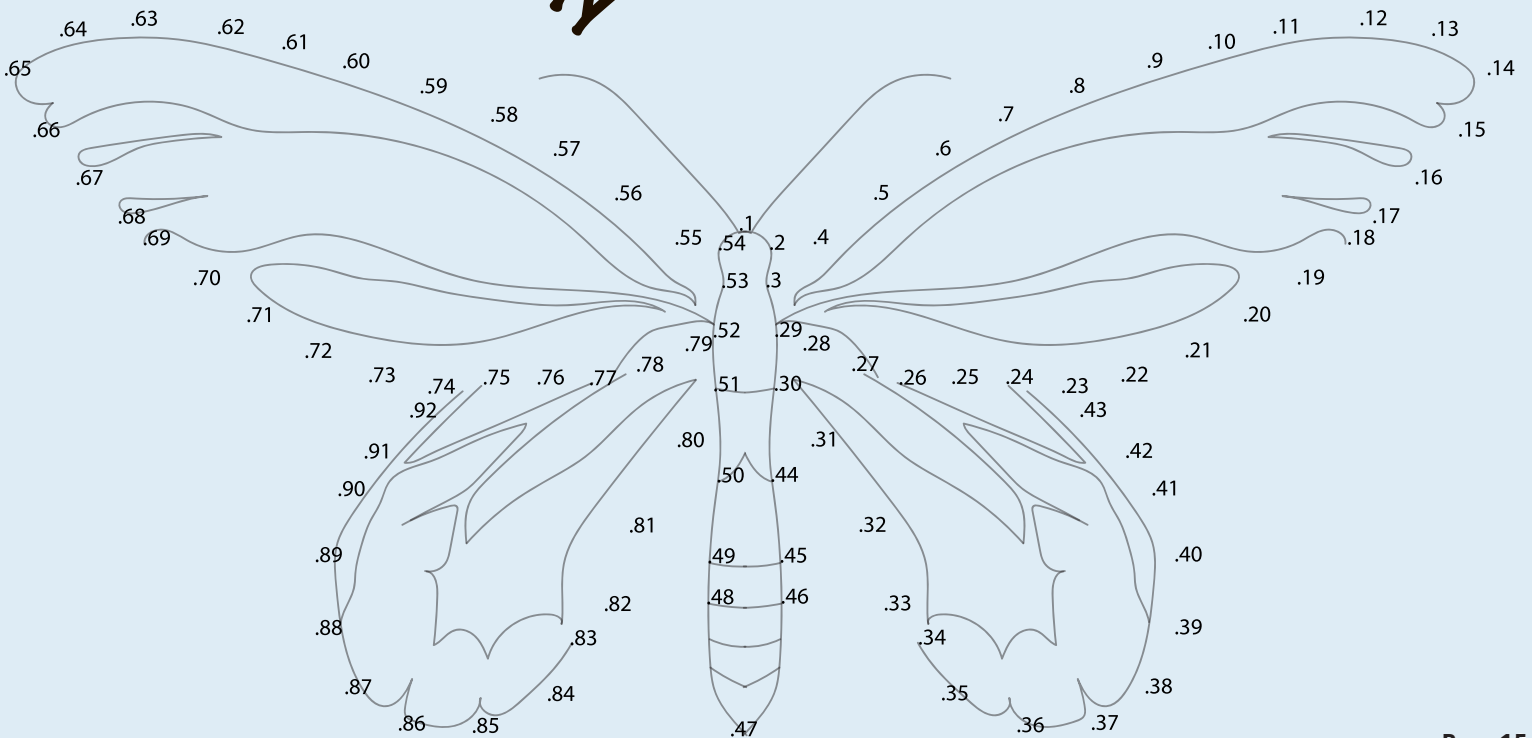
# DOT-TO-DOT



## Hummingbird

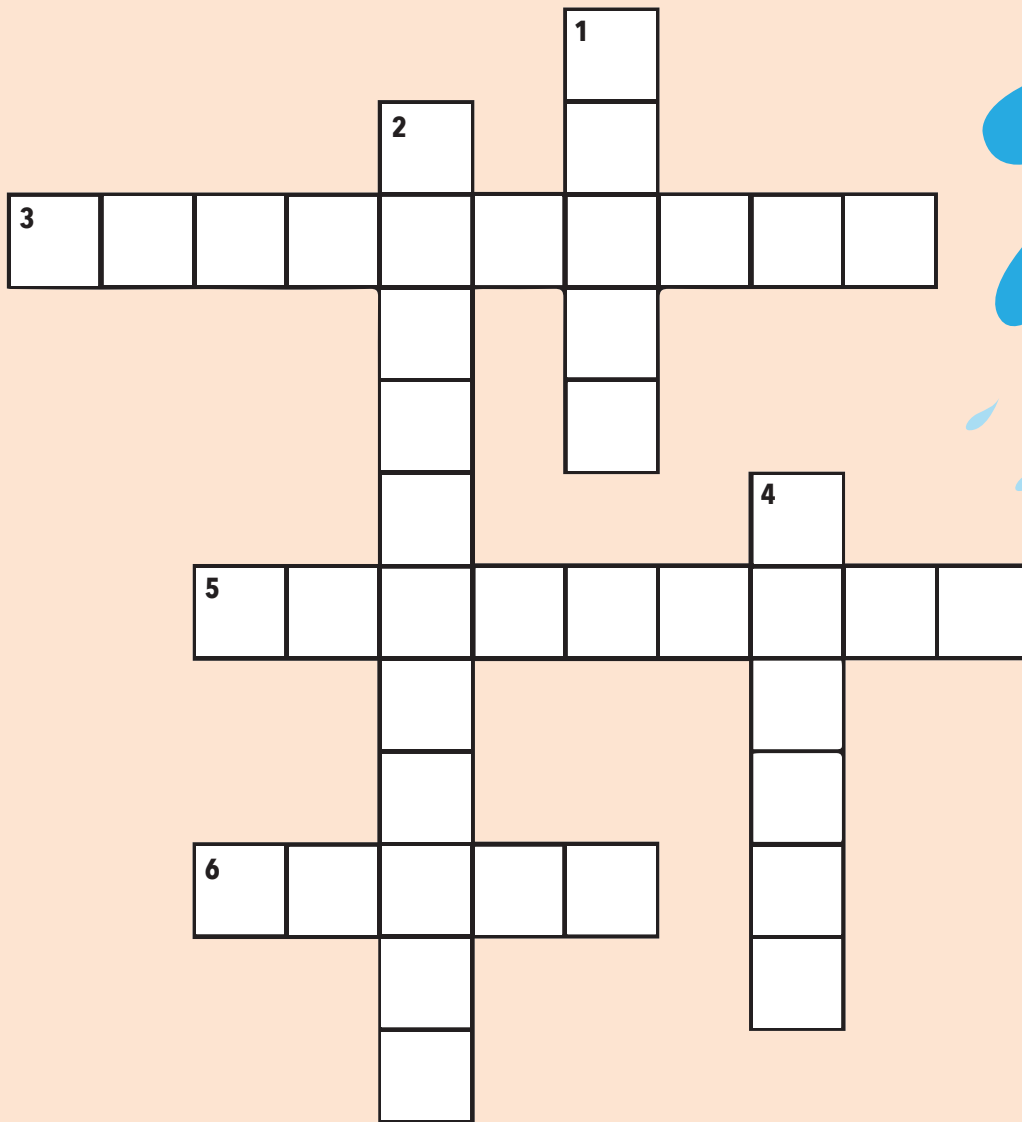


## Butterfly





# CROSSWORD PUZZLE



## Down:

1. An action to grow something from the ground
2. A type of plant that can help keep trash from entering the water
4. \_\_\_\_\_ move water from mountains to land at lower elevation

## Across:

3. A type of animal or insect that moves pollen from one place to another
5. Trash or chemicals that harm the environment
6. An action to remove trash from area

Down: 1. Plant, 2. Wildflowers, 4. Rivers, Across: 3. Pollinator, 5. Pollution, 6. Clean

# FIND A POLLINATOR



## The Five Minute Challenge

In the **Battle Water Pollution** game, you learned that the plants which help protect water from pollution also serve as a habitat for many different pollinators. These pollinators are important for plant reproduction and growth because they move pollen from one location to another. Your next challenge is to watch an area outside for five minutes and search for signs of pollinators.

### TYPES OF POLLINATORS

- Bees
- Butterflies
- Birds
- Bats
- Moths
- Flies
- Wasps



Choose a location where you can sit comfortably for five minutes (bring a watch or timer!). This can be a spot in your backyard, a nearby park, or outside your local library where you can observe plants that produce pollen like weeds, flowers, or trees. Use the table on the next page to record what you see.

## Do you see or hear any birds? What about insects?

Count any potential pollinators you see or hear and add them to your table.

Find a different location and a different plant to observe—maybe at a different time of day.

## What do you see?



Location	How long did you watch?	Types of pollinators	Number of pollinators



Location	How long did you watch?	Types of pollinators	Number of pollinators



# Draw, paint, or take a photo of **YOUR** **SURROUNDINGS**



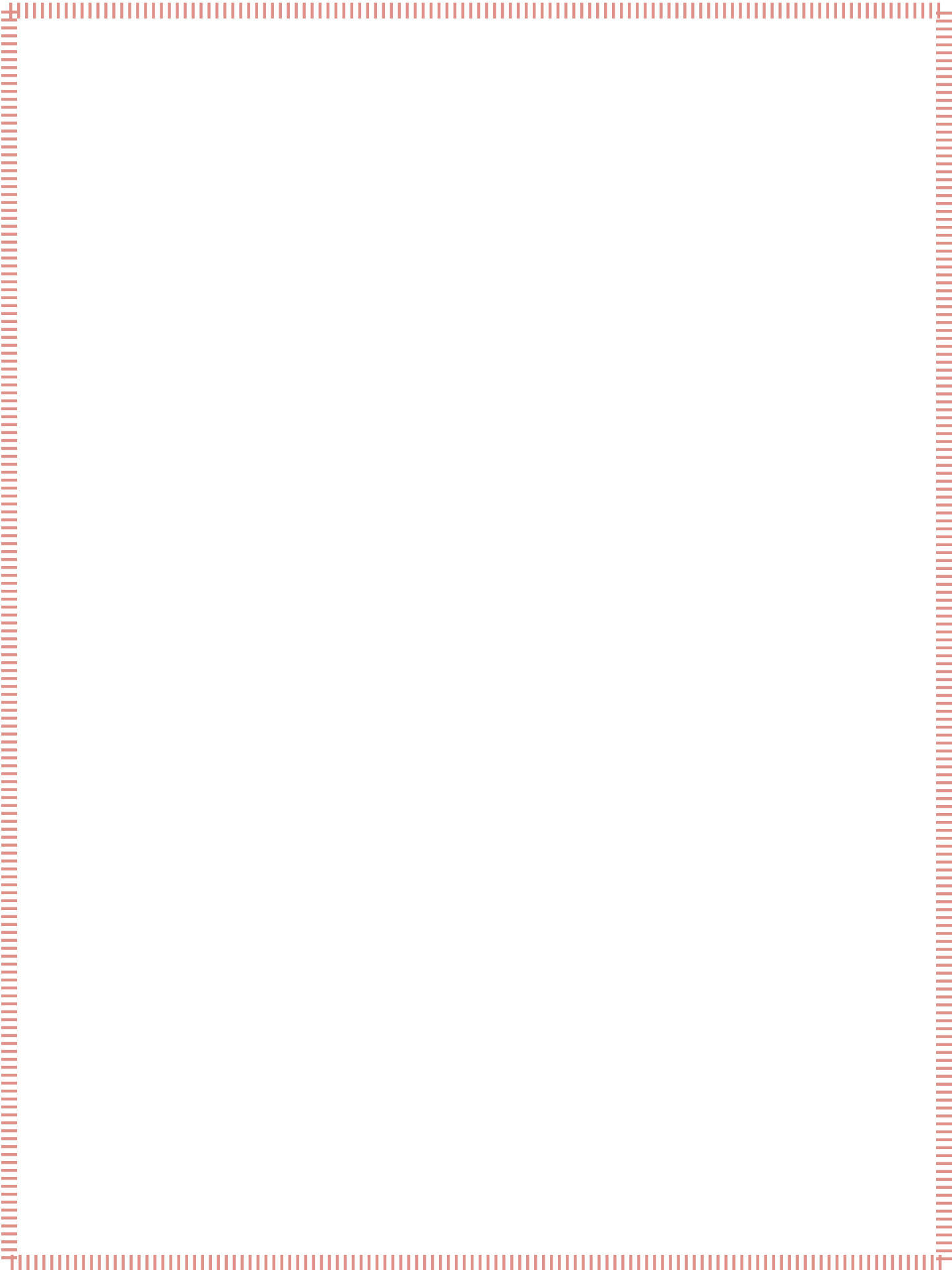
Observation isn't just about recording data. Art is an important part of sharing stories and information. Draw, paint or take a photo of the area around you. You can include any animals, insects or natural features you see as well as anything human-made (buildings, homes, bridges, cars, etc.). You can use the space on the next page.

## Share your art or photo with your community!



Do you want members of your community to see your art? Submit your artwork to the We Are Water Virtual Museum using the QR code or bit.ly link below. Be sure to select the **'Water and Natural Habitats'** theme when you submit.

[http:// bit.ly/WeAreWaterArt](http://bit.ly/WeAreWaterArt)



# Tell us what you think!



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