



Save
Our
Streams



CITY OF
Tulsa
A New Kind of Energy.

A vibrant illustration of a cartoon fish with a yellow body, blue and orange stripes, and a smiling face. The fish is swimming in a blue stream, with green reeds and lily pads in the background. The scene is set against a light blue sky with soft clouds and rolling green hills. The water is depicted with various shades of blue and green, suggesting depth and movement. The overall style is clean and modern, suitable for a children's activity book.

Stormwater Quality Division
Activity Book

Name: _____

Grade: _____

**Hello! We hope you
have fun completing
the activities in this
book while learning
about how you can
help Save Our Streams.**

www.tulsastreams.com



Can you find the names of the different species of fish found in our streams?

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

KEY

MINNOW

DARTER

SUNFISH

CATFISH

BASS

STONEROLLER

CARP

GAR

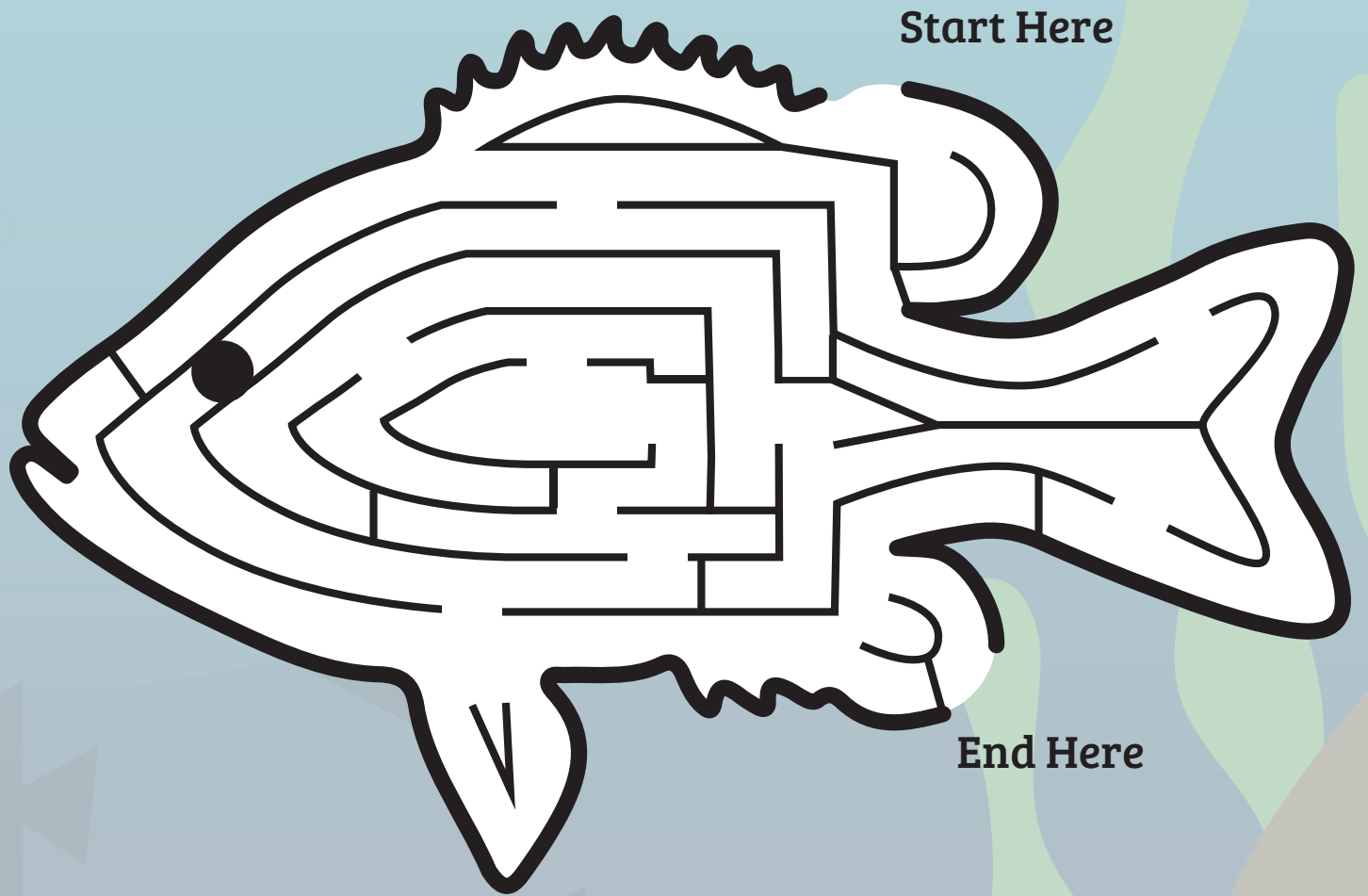
SUCKER

SHAD

CRAPPIE

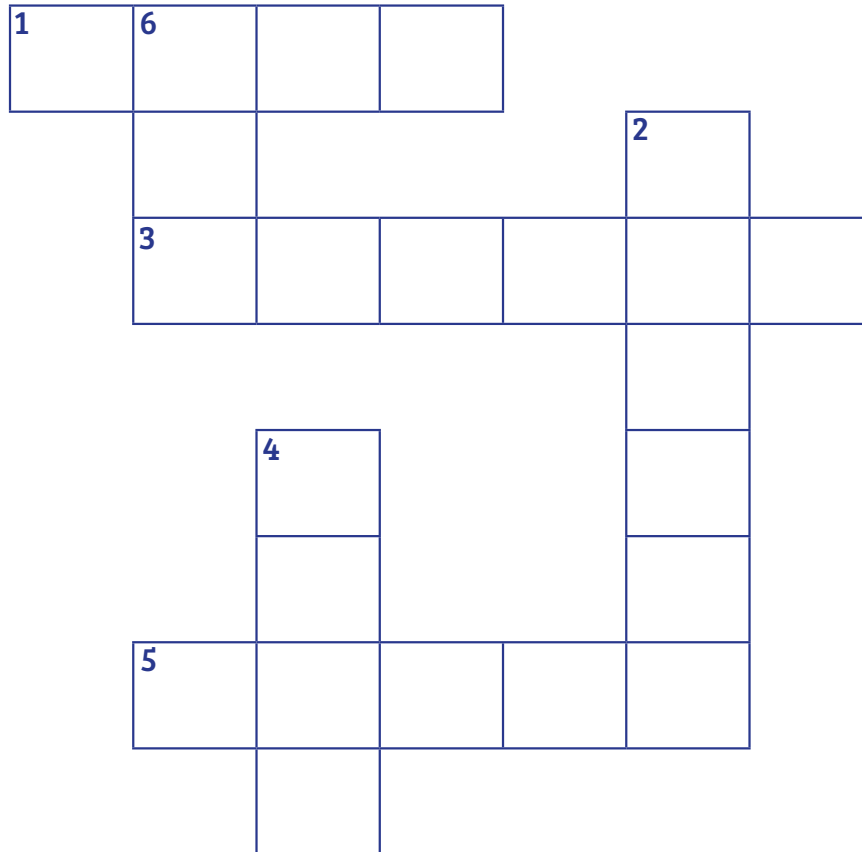


Find your way through the longear sunfish!
Did you know this fish is active during the
day and inactive at night?



Crossword

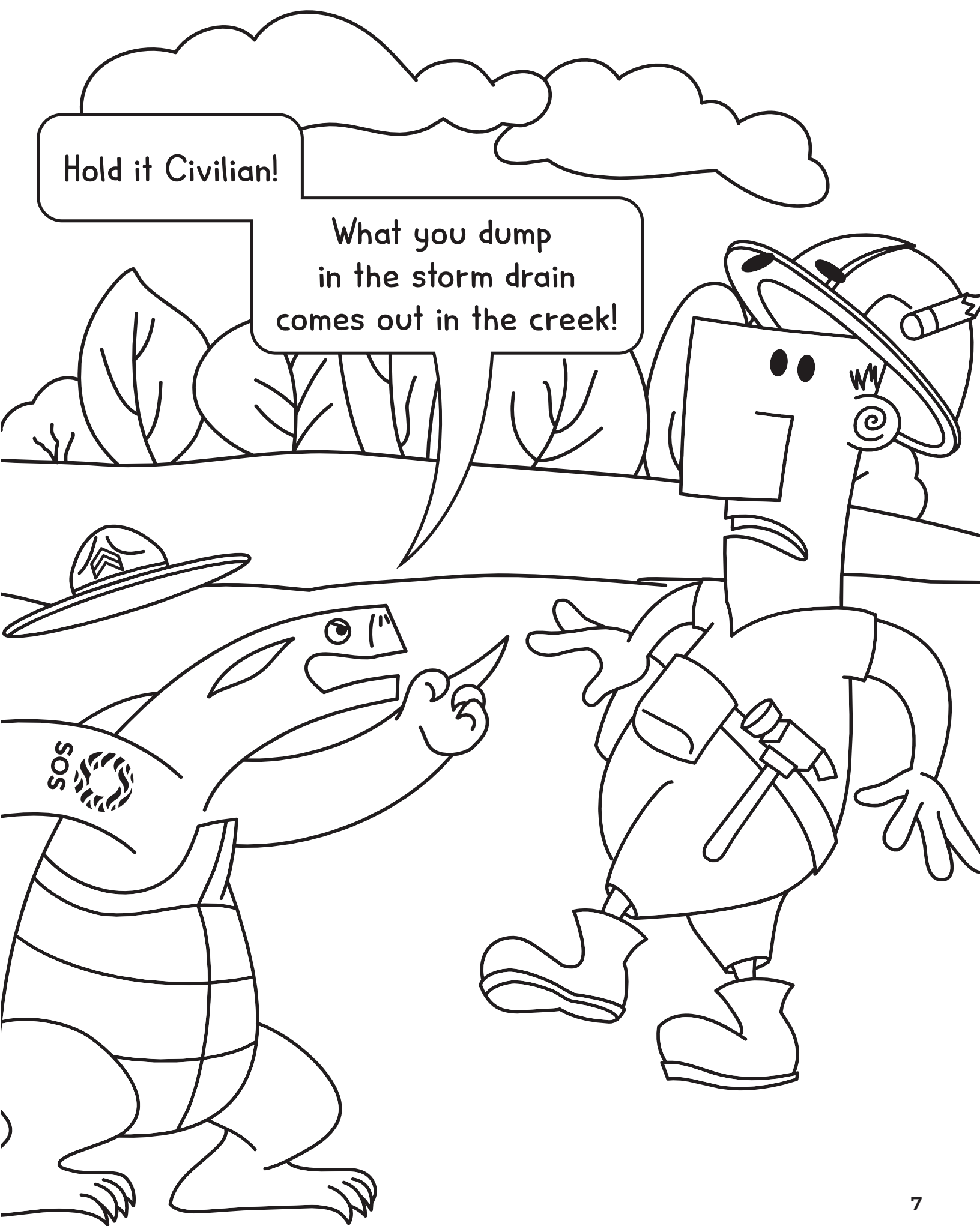
Use the clues to discover some of the things that can contaminate our streams.



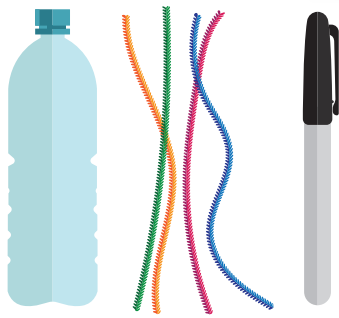
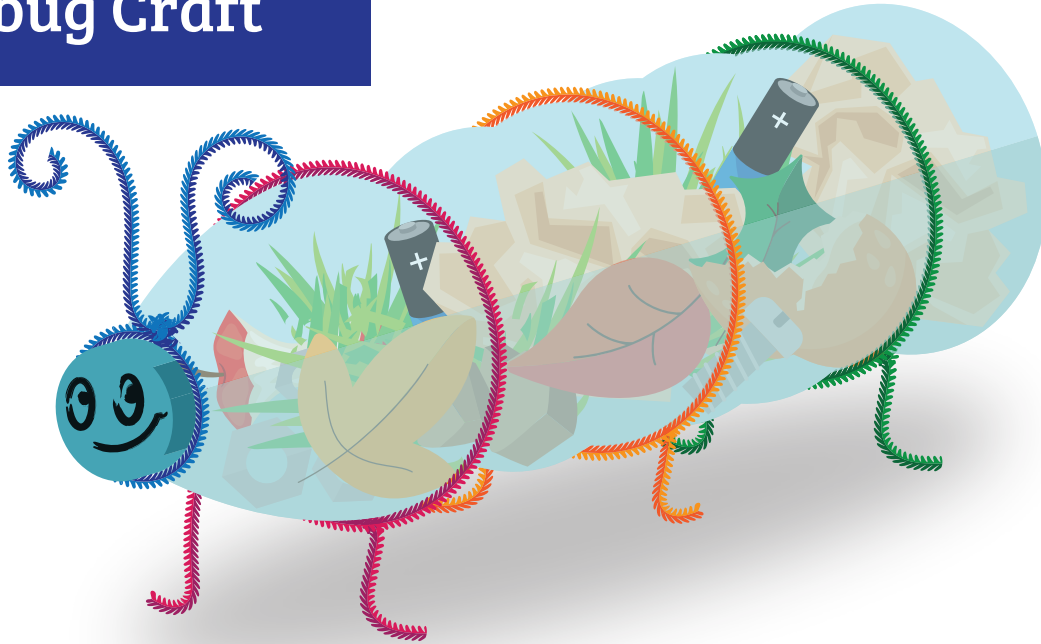
1. Pets leave this in the grass, and if we don't bag it and throw it away, rain washes it into the storm drains.
2. These fall from trees, and if we don't rake them up, they can clog up storm drains and cause flooding.
3. This word is another word for the garbage that gets left on the ground and washes into our streams through storm rains. Think _____ bug—like on page eight!
4. Grass and other plants grow in this, but if left bare and loose, it can wash into a stream and cover the river bed.
5. We cut this part of our yards in the spring and summer. If not bagged and thrown away, it will wash down the storm drain and create algae in the water.
6. Cars sometimes leak this fluid onto driveways, and rain washes it into the storm drains.

Hold it Civilian!

What you dump
in the storm drain
comes out in the creek!

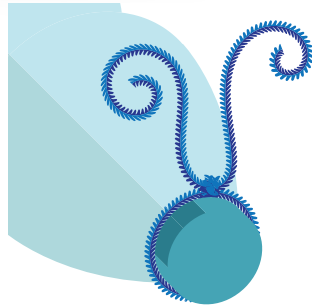


Litterbug Craft



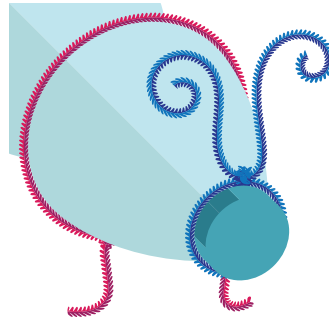
Supplies

- Empty Water Bottle with Cap
- Pipe Cleaners
- Permanent Marker



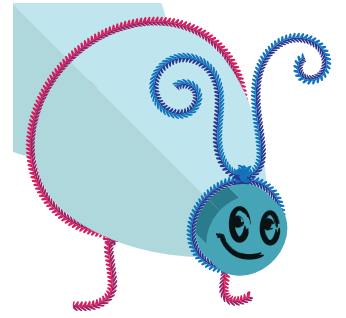
Step 1

Use a blue or black pipe cleaner to create your bug's antennae.



Step 2

Use a different color of pipe cleaner to create legs. Remember, most bugs have six legs!



Step 3

Use the permanent marker to make the face. It can have whatever expression you want!

Step 4

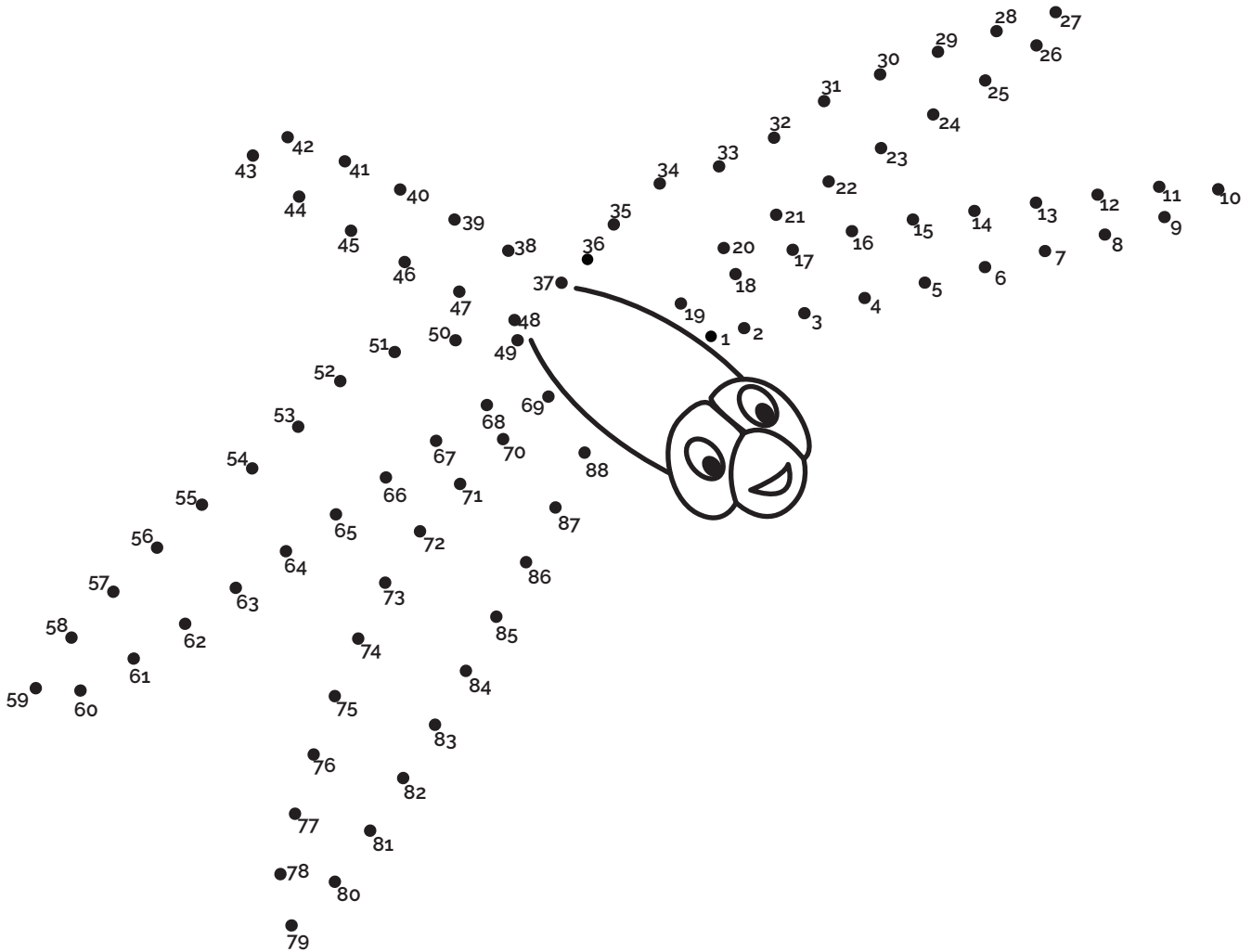
Explore your yard and find items we don't want to end up in our storm drains and streams. This can include trash, grass clippings, leaves and dirt. Put those items in your litter bug, so they don't end up in the storm drains!



Did you know?

Dragonflies, mayflies, damselflies and many other flying insects are actually born in the water. The eggs attach to the rocks in stream beds, and the infants spend the first few weeks of their lives in the water.

Connect the dots to complete the dragonfly!



Explore Outdoors

Do you see anything that shouldn't wash into storm drains like trash, grass clippings, leaves or dirt? If so, collect them and place them in the trash. Then, make a family plan to try and prevent them from ending up in the storm drains in the future.



What did you find?

Draw them here.

A large, empty rectangular box with a black border, intended for drawing the items found during the outdoor exploration.



Garbage juice is liquid from all of the yucky things we throw away. And no one wants to find garbage juice in our streams!

HHP Word Scramble

Unscramble the words to see what items can be safely disposed of at the Tulsa Household Pollutant Collection Facility.

LOI NAD XALET INSPAT

WANL MECACHLIS

OUTA LUFIDS

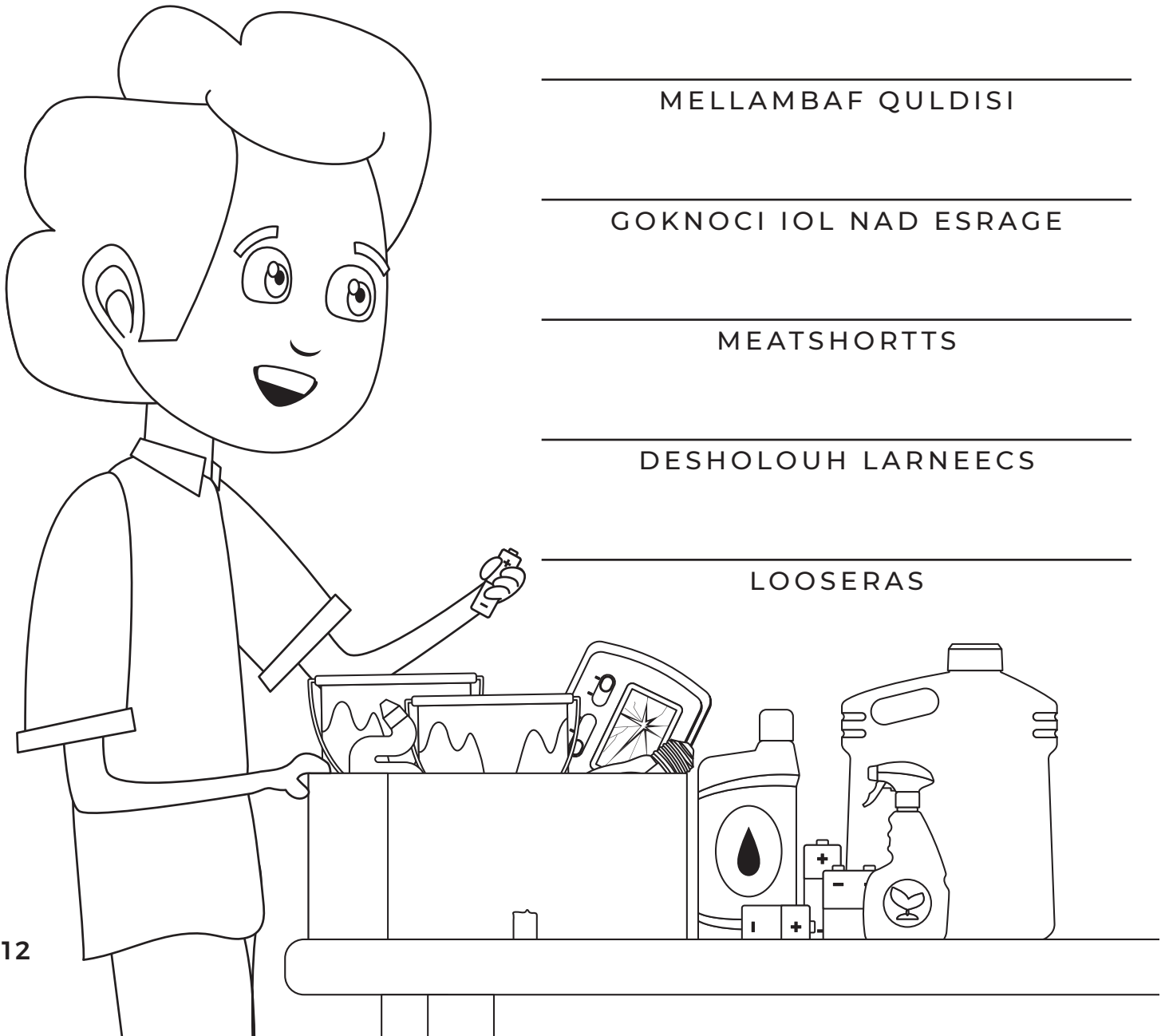
MELLAMBAF QULDISI

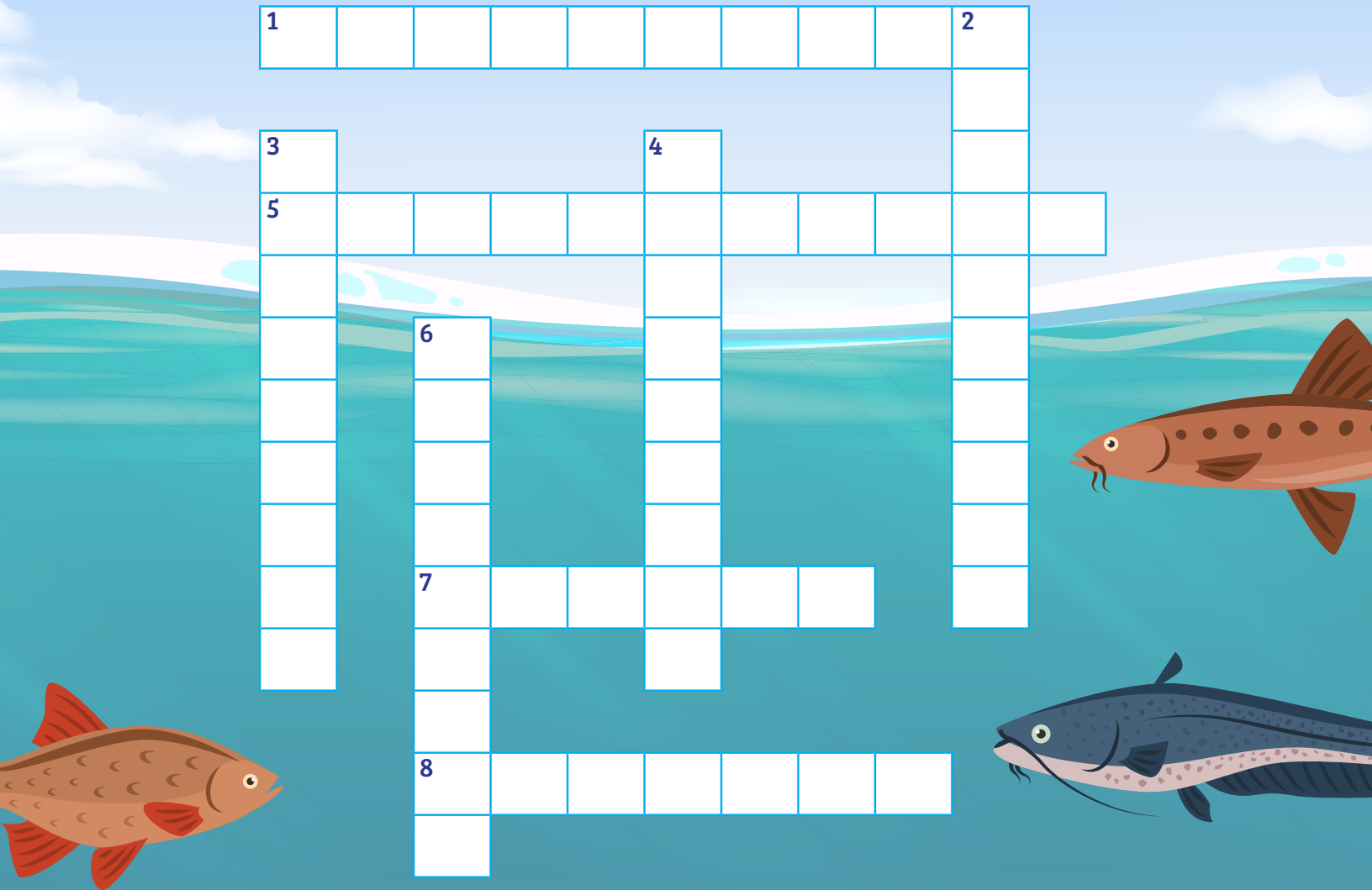
GOKNOCI IOL NAD ESRAGE

MEATSHORTTS

DESHOLOUH LARNEECS

LOOSERAS





1. A chemical or natural substance added to the soil to replace nutrients and increase fertility.
2. A garden of native shrubs, perennials and flowers planted to absorb and filter rainwater runoff that flows from roofs, driveways or lawns.
3. A substance used to destroy insects and other organisms harmful to plants and animals.
4. The introduction of harmful waste or substances into our environment that create harm or damage.
5. The place where a person, animal or plant lives. It can also mean the natural world as a whole.
6. An area of land that keeps the water from one river from flowing into another river or stream.
7. The draining away of water from the surface of the land or structure.
8. The process that happens when wind, water or other natural substances slowly wear down the surfaces of the Earth.

Can you find these words or phrases?

Conservation
Environment
Erosion
Fertilizer
Low Impact

Nonpoint Source
Pesticide
Pollution
Rain Gardens
Xeriscape

Riparian
Runoff
Sediment
Watershed

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

Create a Watershed



Supplies

- Markers
- Paper
- Spray Bottle Filled with Water



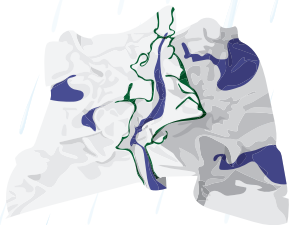
Step 1

Crumple up a piece of paper into a tight ball. Open it back up, but don't completely flatten it out. The highest points on the paper represent mountains, and the lowest wrinkles represent valleys.



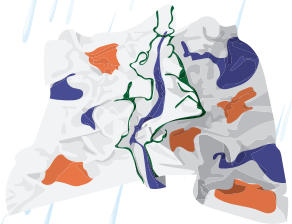
Step 2

Choose one color of marker and use it to mark the highest points on the map. These points are the mountain ridge lines.



Step 3

Choose a second color and mark the low points, which is where different bodies of water might be. Use your imagination to decide where creeks, lakes and rivers might be.



Step 4

With a third color, choose four to five places to represent human settlements, like houses, factories, shopping centers and schools.

Step 5

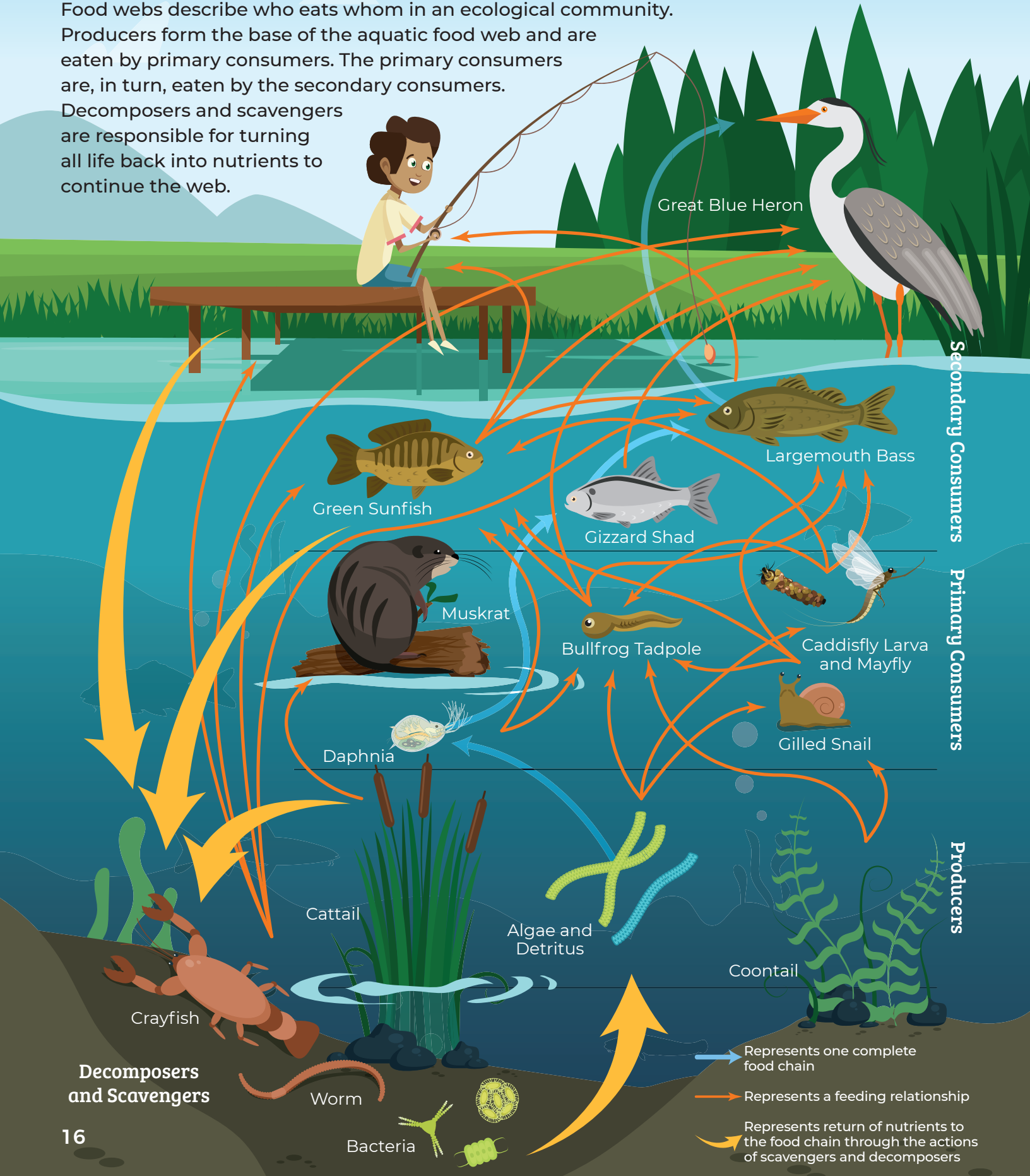
Make rain fall into your watershed by spraying it with the water in your spray bottle. Watch how the water travels through the system.

What did you learn?

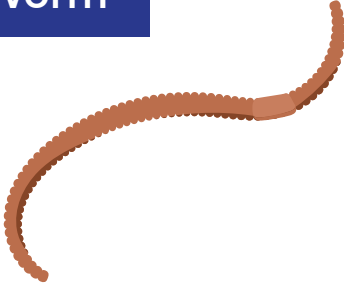
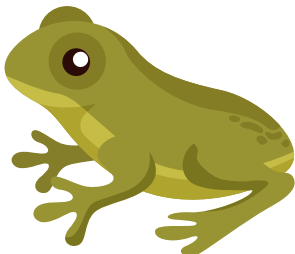
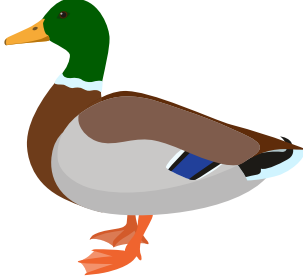
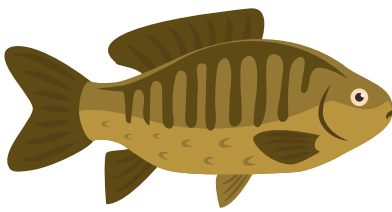


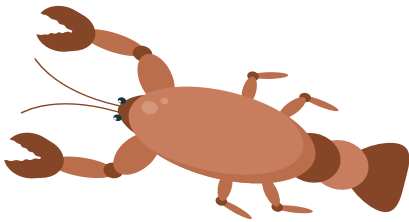
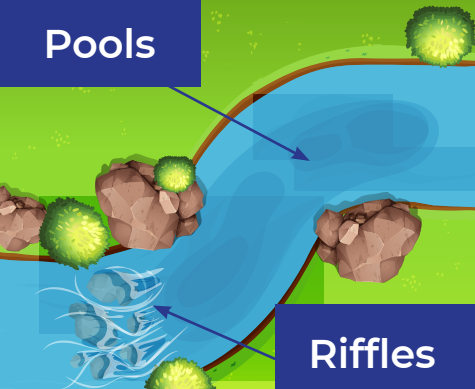
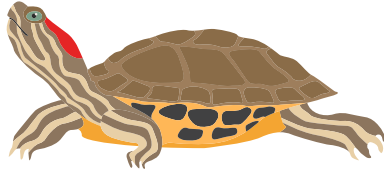
- What changes did you observe in the watershed?
- Where does most of the rain fall?
- What path does the water take?

Aquatic Food Web

Food webs describe who eats whom in an ecological community. Producers form the base of the aquatic food web and are eaten by primary consumers. The primary consumers are, in turn, eaten by the secondary consumers. Decomposers and scavengers are responsible for turning all life back into nutrients to continue the web.



Stream Bingo

Worm 	Frog 	Duck 
Fish 	Free Space 	Insect Larvae 
Crawfish 	Pools  Riffles	Turtle 

Each time you visit a Tulsa stream, see if you can find these.

Hidden objects

Can you find all of the hidden objects in the photo below? They're all things we don't want in our rivers and streams:



Automotive Fluid



Dirt and Debris



Garbage



Lawn Clippings



Leaves



Litter



Trash



Pet Waste

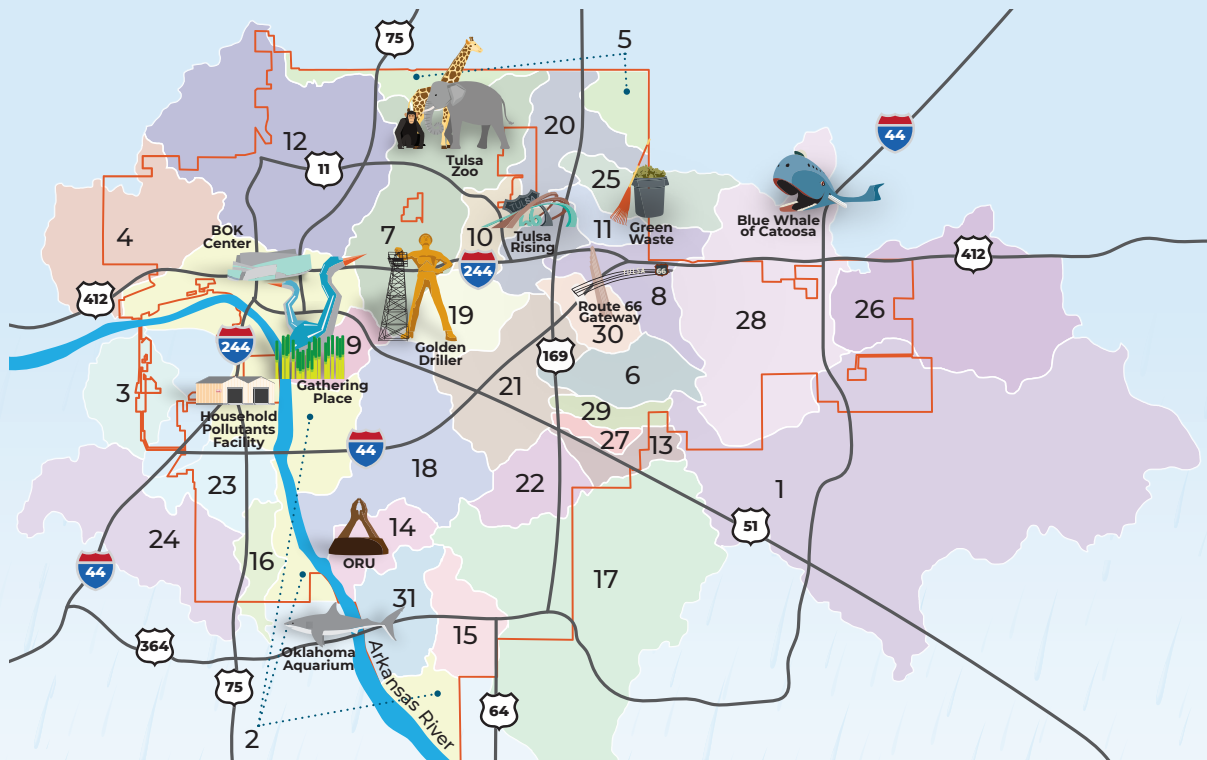


Plastic Bag



What watershed do you live in?

When most people think of a river or stream in Tulsa, they only think of the Arkansas River. Did you know there are actually more than 29 streams in Tulsa's city limits? Each of these streams make up 31 watersheds. A watershed is an area of land where all of the moisture that falls on it, flows into the same waterway. Can you find your watershed on the map below? Be sure and do the watershed activity on page 15 to see how a watershed works.



- | | | |
|----------------------------------|---------------------------------|--------------------------------|
| 1. Adams Creek | 12. Flat Rock Creek | 21. Mingo Creek Drainage—Upper |
| 2. Arkansas River Local Drainage | 13. Ford Creek | 22. Mill Creek |
| 3. Berryhill Creek | 14. Fred Creek | 23. Mooser Creek |
| 4. Bigheart Creek | 15. Fry Ditch | 24. Nickel Creek |
| 5. Bird Creek | 16. Hager Creek | 25. Quarry Creek |
| 6. Brookhollow Creek | 17. Haikey Creek | 26. Salt Creek |
| 7. Coal Creek | 18. Joe Creek | 27. South Park Creek |
| 8. Cooley Creek | 19. Mingo Creek Drainage—Lower | 28. Spunky Creek |
| 9. Crow Creek | 20. Mingo Creek Drainage—Middle | 29. Sugar Creek |
| 10. Douglas Creek | | 30. Tupelo Creek |
| 11. Eagle Creek | | 31. Vensel Creek |

Locate your watershed by visiting <https://maps.cityoftulsa.org/mywatershed/>

Storm Drain Maze

Help the rainwater get through the storm drain to the river without coming across any of the pollutants.



STORMWATER RUNOFF ENDS UP IN LOCAL STREAMS, CREEKS AND RIVERS.

This is what could happen to any of the items below that are left in your yard, driveway or street. They might end up in our streams!



THINGS THAT HAPPEN WHEN THESE ITEMS ENTER THE STORM DRAIN:

- Can cause blockages and lead to flooding
- Increased levels of bacteria
- Excessive nutrients decrease oxygen levels
- Dangerous to recreation

TULSASTREAMS.COM



Causes & Effects of Pollution in Our Local Creeks & Streams

OIL & GREASE

COAT SURFACES WITH OIL AND DECREASE DISSOLVED OXYGEN

Use absorbent material such as sawdust or kitty litter to absorb, then throw away in the gray trash cart.

FERTILIZER & PESTICIDE

POISONOUS TO FISH, MACROINVERTEBRATES AND PLANTS

Use only as directed; do not over-water or apply before a rain storm.

PET WASTE

BACTERIA IS SPREAD WHEN EXPOSED TO RAIN

Bag waste and throw away in the gray trash cart.

GRASS & LEAVES

CAN CLOG STORM DRAIN, INCREASE FLOODING AND DECREASE DISSOLVED OXYGEN

Use a mulching mower for grass and bag leaves.

LITTER

CAUSES FLOODING PROBLEMS AND IS DETRIMENTAL TO WATER QUALITY

Secure trash cans; make sure trash can't blow away. Walk your property and pick up loose trash along fences and storm drains.

IF YOU SEE A BLOCKED DRAIN OR SUSPECT ILLEGAL DUMPING OF PRODUCTS INTO THE DRAINAGE SYSTEM, CALL (918) 591-4325, AND AN INSPECTOR WILL INVESTIGATE.

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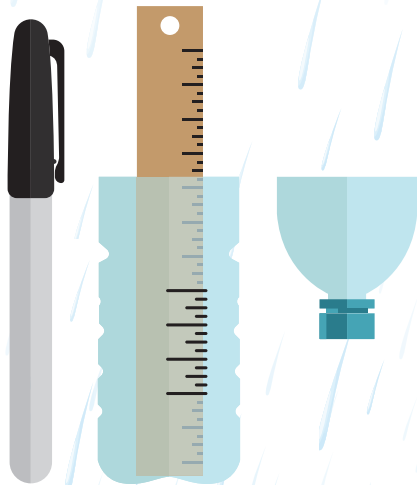
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Build a Rain Gauge

A rain gauge is a tool for measuring how much rain fell during a storm.

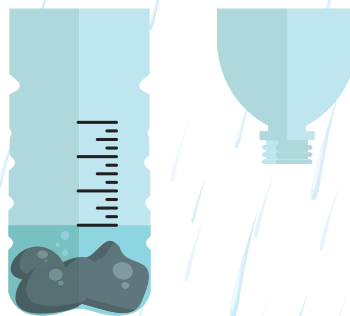
Supplies

- Empty Bottle
- Permanent Markers
- Scissors
- Ruler
- Rocks
- Tape



Step 1

Have an adult help you cut the top section off of a clear bottle as shown. Use a ruler to mark measuring increments starting about 2" from the bottom.



Step 2

Place several small rocks in the bottom (for weight), then fill the bottle with water to the 0" mark. This will calibrate your gauge.

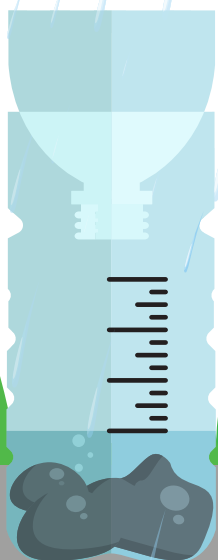


Step 3

Invert the top of the bottle into to rain gauge to act as a funnel. Tape around the edge to seal. Place gauge on a flat surface outside.

Step 4

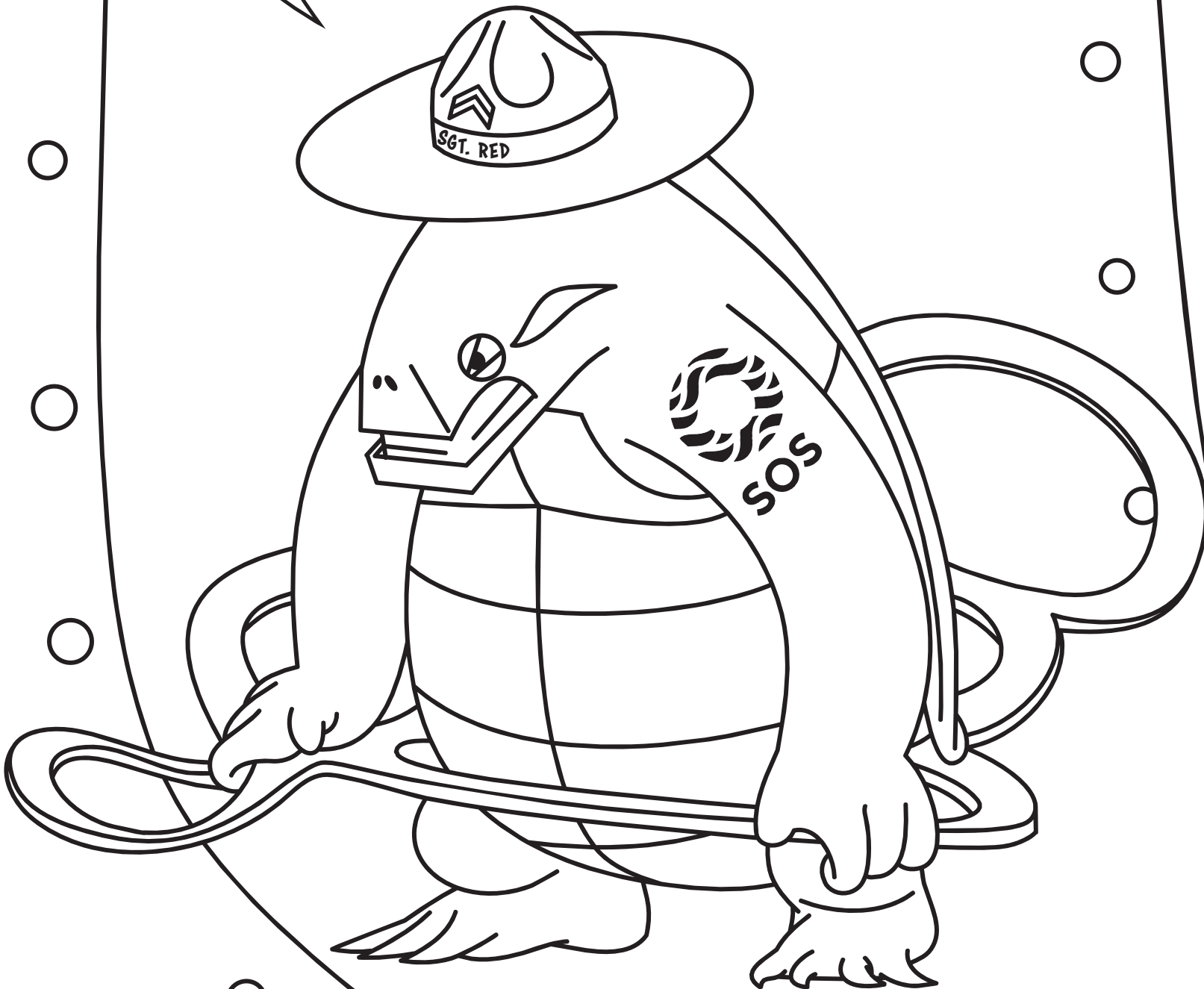
Wait for the next rain storm and observe and record the rainfall amounts.





Think of it!
Litter on the ground
ends up here!

Litter left on the ground washes down the storm drain and into my home! Litter hurts my friends and me. Help us keep litter off the ground and out of our streams.





Polluted Habitat

Does the water in this cup look like a good place to live? Definitely not! This is the environment that fish and other stream wildlife have to live in when we let the items listed above go down our storm drains and into our streams!

The Stormwater Mystery

Each number represents the color shown below. Can you color all of the numbers with the correct colors to see what the mystery image is?

1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	6	2	2	6	1	1	1	1	1	1	1	1	1
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1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1



Rain Garden Benefits

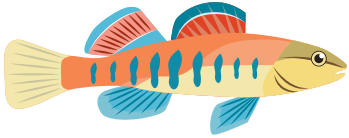
A rain garden is a garden of shrubs and flowers planted in a small pit or natural slope. It can temporarily hold and soak in rainwater runoff that flows from roofs, driveways or lawns. Rain gardens

can remove up to 90% of nutrients and chemicals and up to 80% of sediments from the rainwater runoff. Compared to a conventional lawn, rain gardens allow 30% more water to soak into the ground.

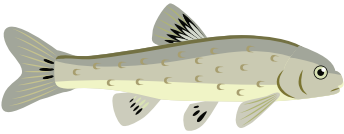


Matching

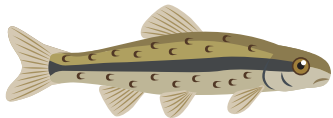
Connect each fish with its name.



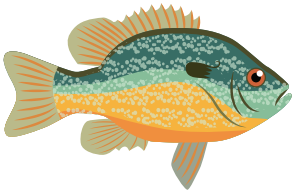
Small mouth bass



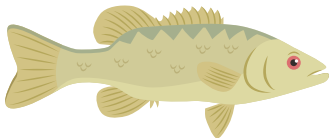
Blunt nose minnow



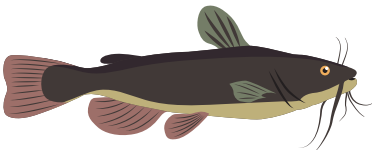
Mosquito fish



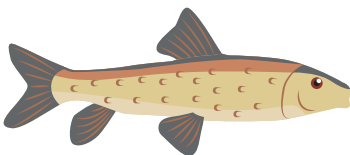
Black bullhead catfish



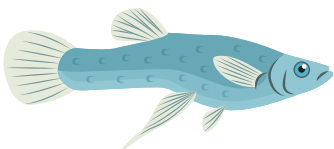
Spotted sucker



Central stoneroller



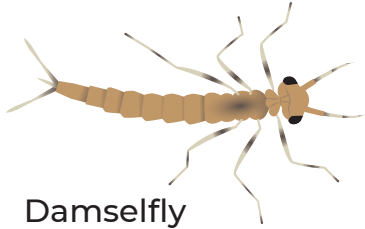
Orangethroat darter



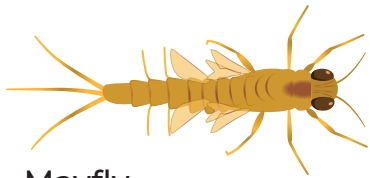
Longear sunfish

Matching Macros

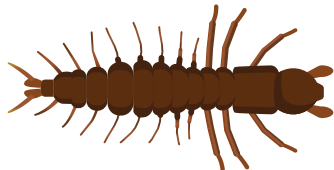
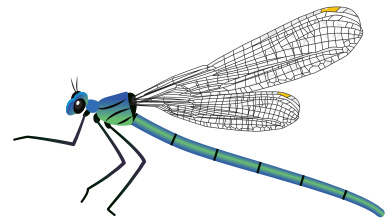
Match each macroinvertebrate larva with its adult form.



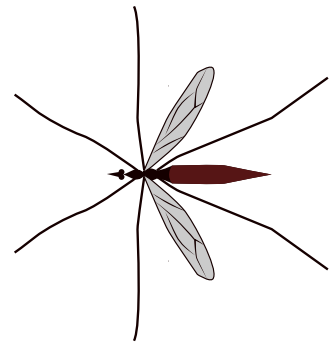
Damselfly



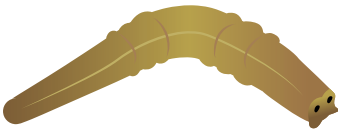
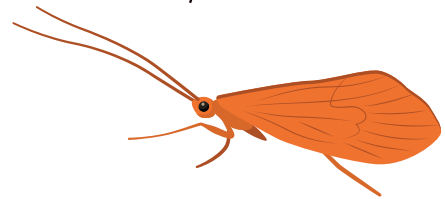
Mayfly



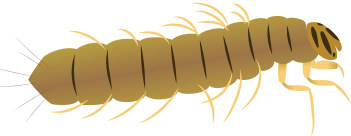
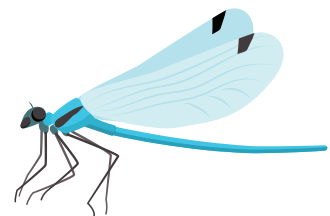
Hellgrammite



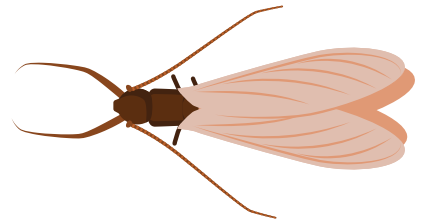
Dragonfly



Crane fly



Caddisfly





Where's Mingo?



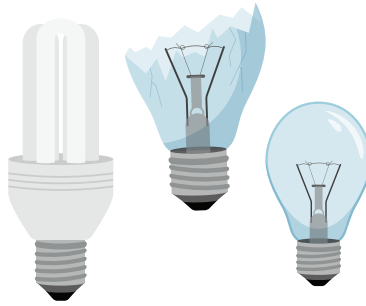


Do you have any of these unused items around your house?

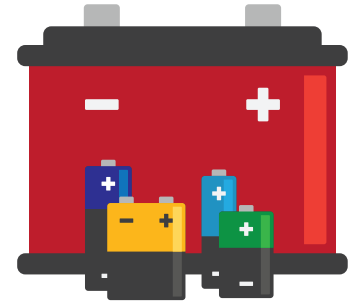
Help us keep these items out of our streams by bringing them to the Household Pollutant Collection Facility, where our team will properly dispose of them.



Oil and Latex Paints



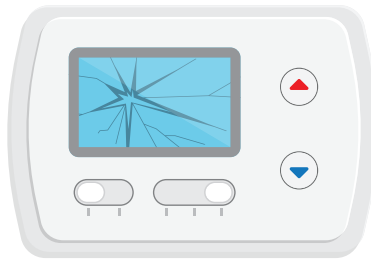
Fluorescent and CFL Lightbulbs



Household and Car Batteries



Cooking Oil and Grease



Thermostats



Household Cleaners



Flammable Liquids



Lawn Chemicals

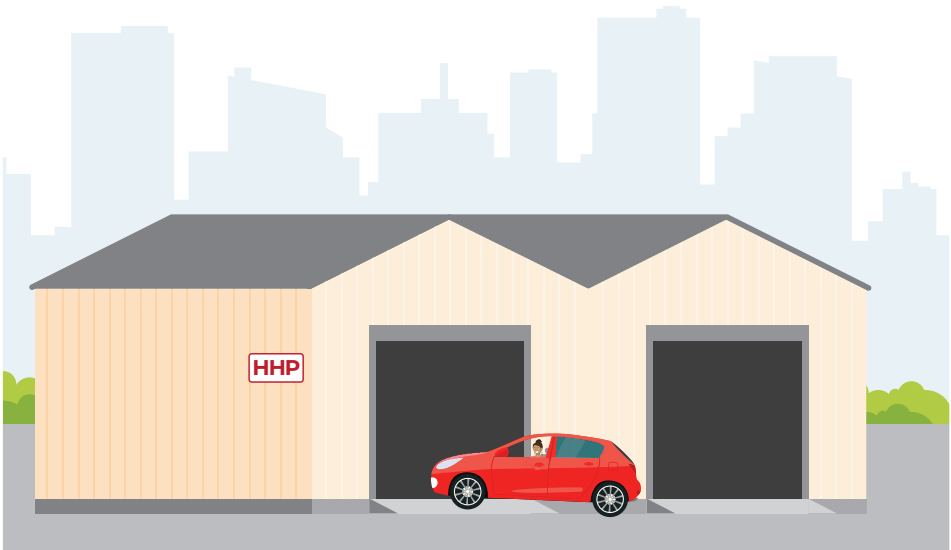
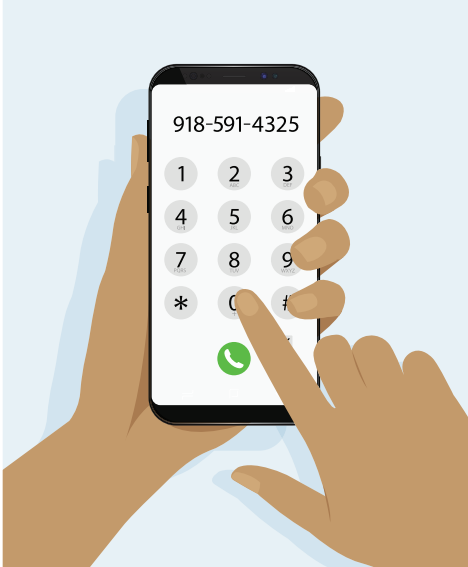


Pool Chemicals



Automotive Fluids

The Household Pollutant Collection Facility



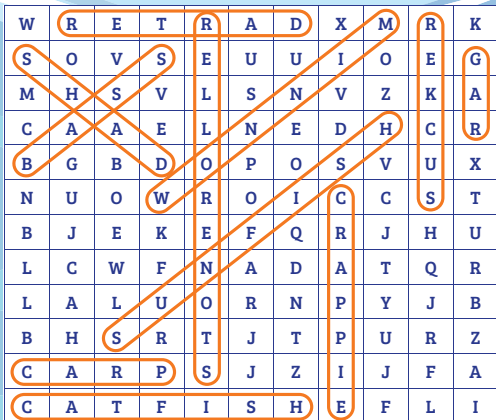
My Action Plan

Write a list of things you can do to help take care of Tulsa's streams.

Answer Key

Page 4

Can you find the names of the different species of fish found in our streams?



KEY

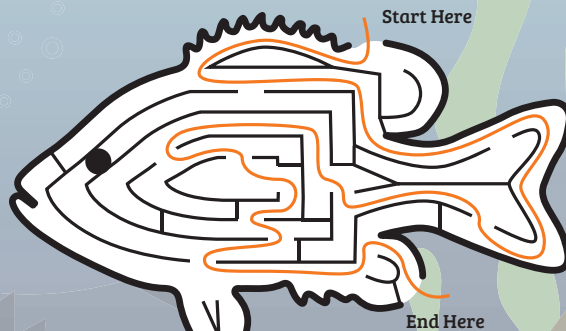
- | | |
|-------------|---------|
| MINNOW | CARP |
| DARTER | GAR |
| SUNFISH | SUCKER |
| CATFISH | SHAD |
| BASS | CRAPPIE |
| STONEROLLER | |



4

Page 5

Find your way through the longear sunfish! Did you know this fish is active during the day and inactive at night?

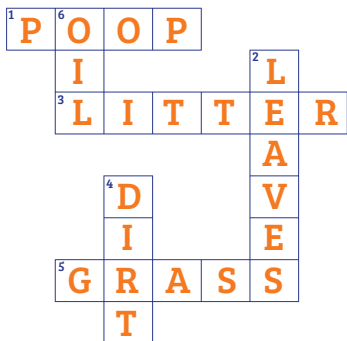


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Page 6

Crossword

Use the clues to discover some of the things that can contaminate our streams.



- 1.) Pets leave this in the grass, and if we don't bag it and throw it away, rain washes its _____ into storm drains.
- 2.) These fall from trees, and if we don't rake them up, they can clog up storm drains and cause flooding.
- 3.) This word is another word for the garbage that gets left on the ground and washes into our streams through storm rains. Think _____ bug.
- 4.) Grass and other plants grow in this, but if left bare and loose, it can wash into a stream and cover the river bed.
- 5.) We cut this part of your yards in the spring and summer. If not bagged and thrown away, it will wash down the storm drain and create algae in the water.
- 6.) Cars sometimes leak this fluid onto driveways, and rain washes it into the storm drains.

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HHP Word Scramble

Unscramble the words to see what items can be safely disposed of at the Tulsa Household Pollutant Collection Facility.

OIL AND LATEX PAINTS
LOI NAD XALET INSPAT

LAWN CHEMICALS
WANL MECACHLIS

AUTO FLUIDS
OUTA LUFIDS

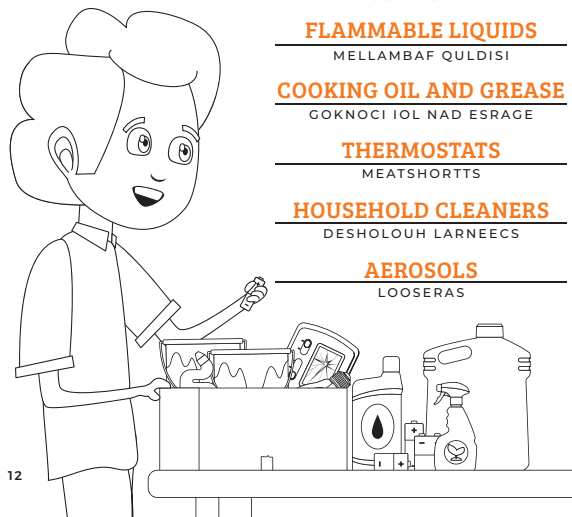
FLAMMABLE LIQUIDS
MELLAMBAF QULDISI

COOKING OIL AND GREASE
GOKNOCI IOL NAD ESRAGE

THERMOSTATS
MEATSHORTTS

HOUSEHOLD CLEANERS
DESHOLOUH LARNEECS

AEROSOLS
LOOSERAS



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Answer Key

Page 13

1 FERTILIZER **2** RAIN GARDEN
3 ENVIRONMENT **4** POLLUTION
5 WATER
6 RAIN GARDEN
7 RUNOFF
8 EROSION

1. A chemical or natural substance added to the soil to replace nutrients and increase fertility.
2. A garden of native shrubs, perennials and flowers planted absorb and filter rainwater runoff that flows from roofs, driveways or lawns.
3. A substance used to destroy insects and other organisms harmful to plants and animals.
4. The introduction of harmful waste or substances into our environment that create harm or damage.
5. The place where a person, animal or plant lives but can also mean the natural world as a whole.
6. An area of land that separates waters from flowing into other rivers or streams.
7. The draining away of water from the surface of the land or structure.
8. The process that happens when wind, water or other natural substances slowly wear down the surfaces of the Earth.

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Can you find these words or phrases?

Conservation Environment	Nonpoint Source Pesticide Pollution Rain Gardens Xeriscape	Riparian Runoff Sediment Watershed
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Page 18

Hidden objects

Can you find all of the hidden objects in the photo below? They're all things we don't want in our rivers and streams:

Automotive fluids	Dirt and debris	Garbage	Lawn Clippings	Leaves
Litter	Trash	Pet Waste	Plastic bags	

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Page 20

Storm Drain Maze

Help the rainwater get through the storm drain to the river without coming across any of the pollutants.

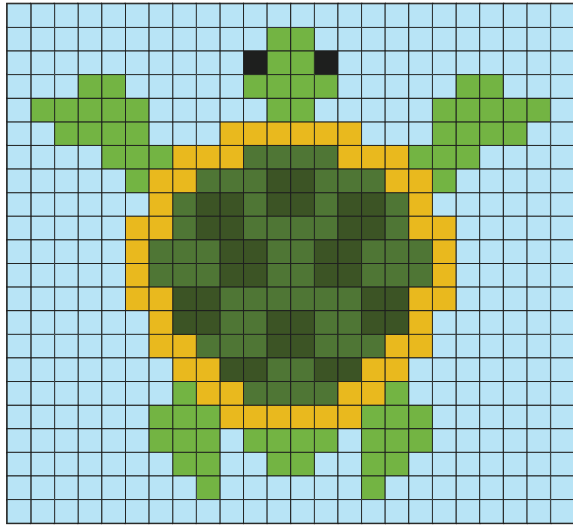
20

Answer Key

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The Stormwater Mystery

Each number represents the color shown below. Can you color all of the numbers with the correct colors to see what the mystery image is?

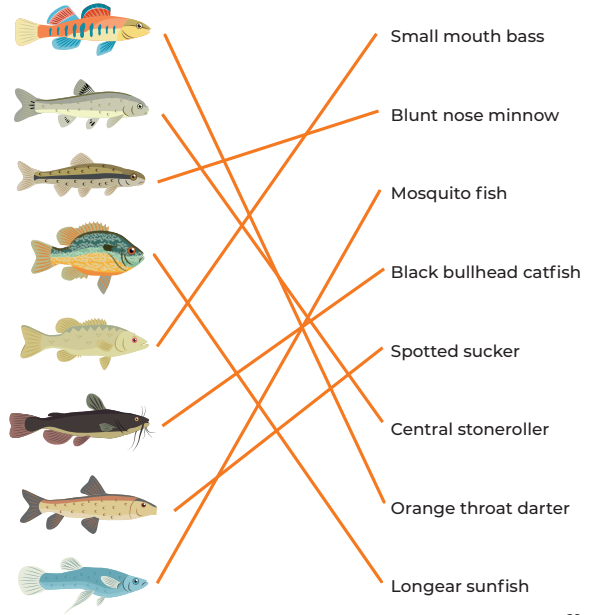


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Matching

Connect each fish with its name.

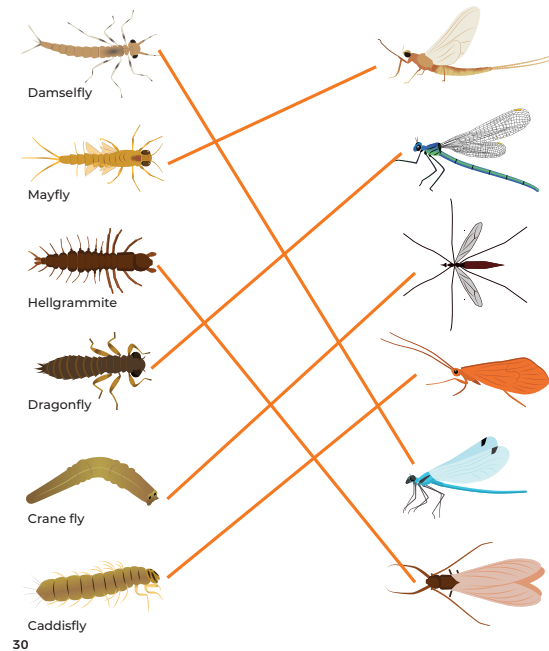


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Matching Macros

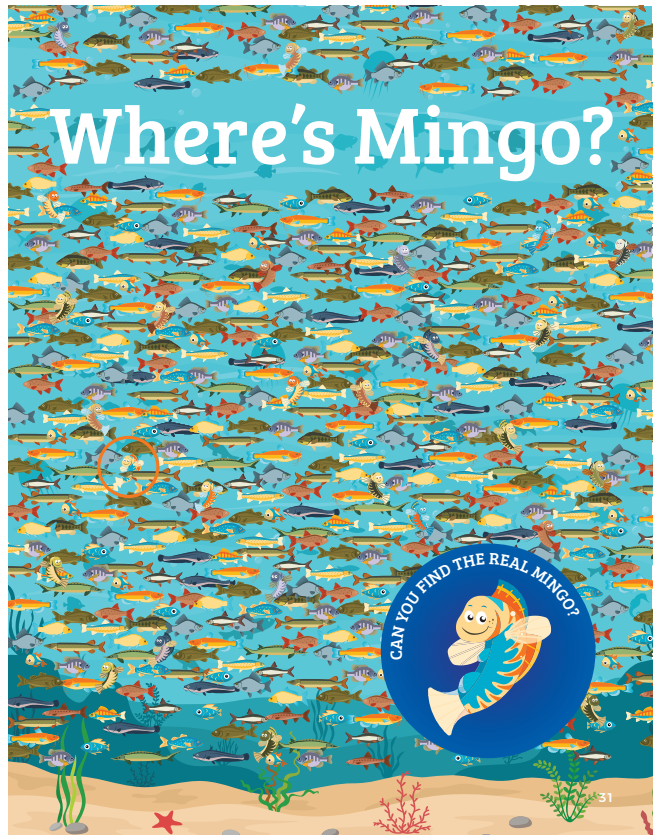
Match each macroinvertebrate larva with its adult form.



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Where's Mingo?



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Mingo Cut-Out

Instructions

- Have your parents help you cut along the dotted lines around Mingo and his fin. Don't forget the slot in the middle!
- Slip Mingo's fin through the slot in his middle. All done!



Save
Our
Streams



CITY OF
Tulsa
A New Kind of Energy.™