

NATURE DISCOVERY BACKPACK
FRESHWATER ACTIVITY BOOK

CONNECTING WITH NATURE

A PROGRAM OF:

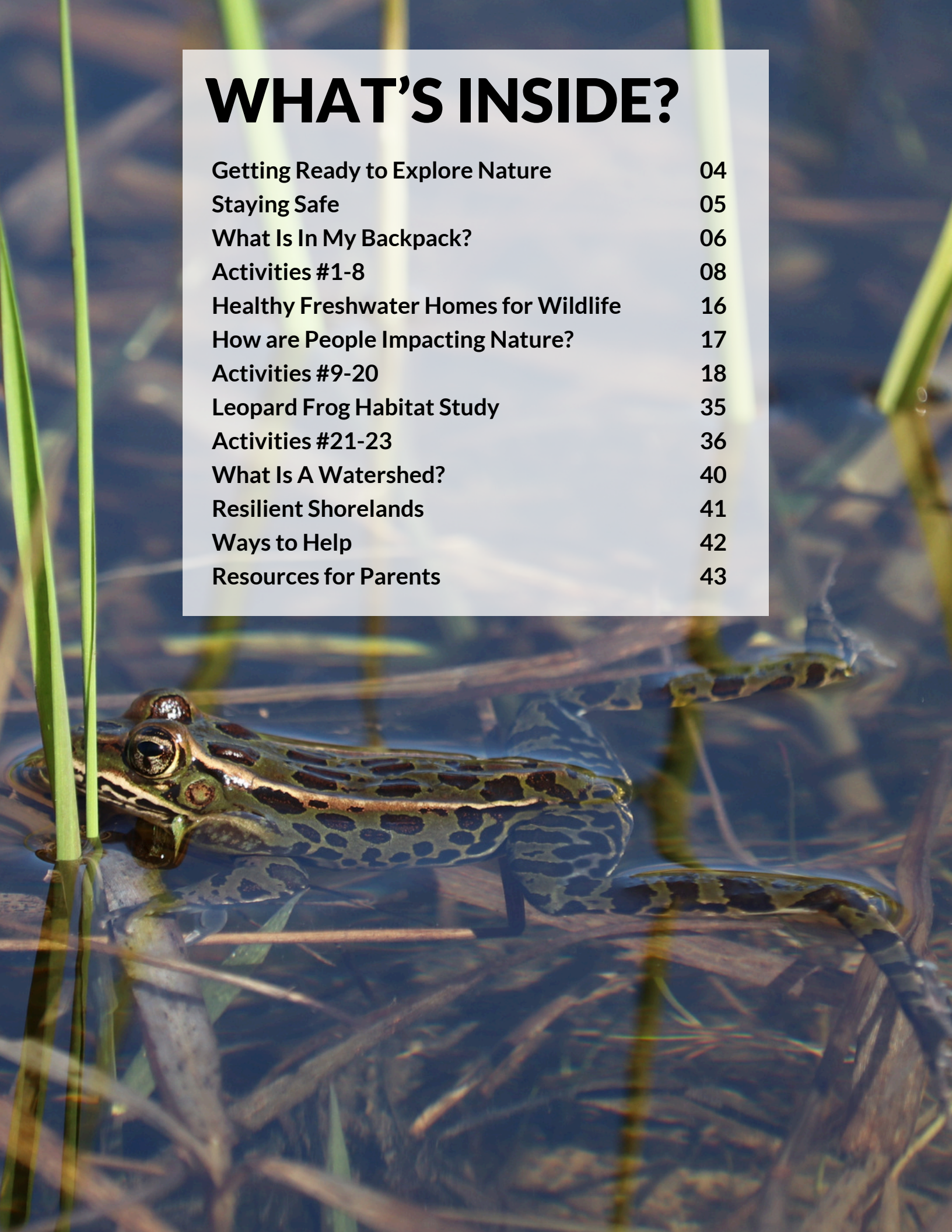


DELIVERED WITH:



WHAT'S INSIDE?

Getting Ready to Explore Nature	04
Staying Safe	05
What Is In My Backpack?	06
Activities #1-8	08
Healthy Freshwater Homes for Wildlife	16
How are People Impacting Nature?	17
Activities #9-20	18
Leopard Frog Habitat Study	35
Activities #21-23	36
What Is A Watershed?	40
Resilient Shorelands	41
Ways to Help	42
Resources for Parents	43



ACKNOWLEDGEMENTS

This activity book was created together by Watersheds Canada and Grey Sauble Conservation with the common goal to educate students and families about the benefits of healthy waterways, lakes, and the surrounding environment for our collective future. This book is linked to the Ontario curriculum for grades K-8. Photography in this book is provided by Watersheds Canada unless otherwise labelled. Cover photo: Getty Images.

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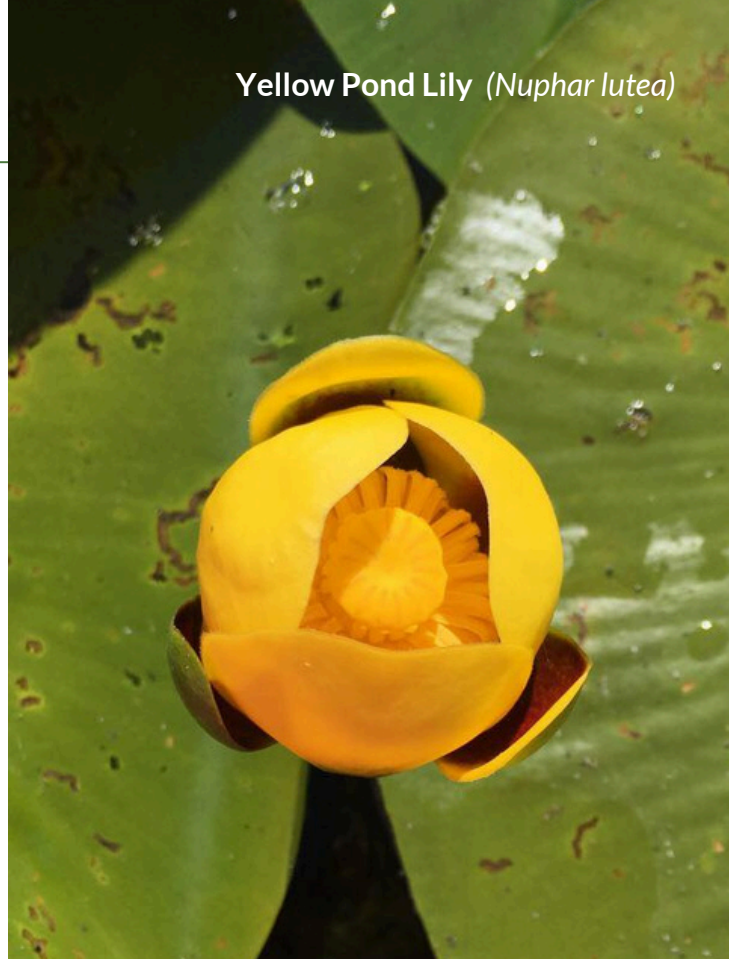
**TD Friends of the
Environment
Foundation**

As one of 36 Conservation Authorities established in the Province of Ontario under the Conservation Authorities Act, Grey Sauble Conservation has made it their mission, in partnership with the stakeholders of the watershed, to champion a healthy and safe watershed through innovative conservation efforts, sound planning, and inspiring education initiatives, now and in the future.

Grey Sauble Conservation acknowledges with respect, the history, spirituality, and culture of the Anishinabek: The People of the Three Fires known as Ojibway, Odawa, and Pottawatomi Nation, who have inhabited this land from time immemorial. And further give thanks to the Chippewas of Saugeen, and the Chippewas of Nawash, now known as the Saugeen Ojibway Nation, as the traditional keepers of this land. Grey Sauble Conservation also recognizes, the Metis whose ancestors shared this land and these waters. May we all, as Treaty People, live with respect on this land, and live in peace and friendship with all its diverse peoples.

Watersheds Canada is a federally incorporated charity (863555223RR0001) and non-profit organization committed to building and delivering education and habitat restoration programs in communities across the country. By working alongside property owners, children and youth, schools, Indigenous communities, businesses, and municipalities, the health of lakes, rivers, wetlands, and shorelines can be enhanced and protected.

GETTING READY TO EXPLORE NATURE



We are so excited for you to explore your local ponds, lakes, and wetlands. You will learn about different local species and how to protect the health of our local natural spaces and beyond!

You can keep this activity book! This activity book will give you tips to safely explore nature, and information about different local animals and plants. You will learn about freshwater and how you can help protect nature, with fun activities along the way!

Please return all field materials in the backpack.

If you are interested in learning more about Watersheds Canada, please visit [watersheds.ca](https://www.watersheds.ca) or scan this QR code!



STAYING SAFE



Here are some things to keep in mind when exploring outside:

- Bring a hat, snacks, reusable bottle with water, sunscreen, and bug spray.
- Tell someone where you are going and when you will be back.
- Watch wildlife from a safe distance. Do not handle wild things!
- Always swim with an adult nearby who can watch you.
- Please leave nature for everyone to enjoy. Do not pick any plants or bring any wildlife or insects home with you.
- Make sure to bring back your garbage so that you can properly get rid of it at home. With the help of an adult, you can also pick up any garbage you find in nature and bring it home for disposal!
- **There are ticks in the area. Wear long sleeves and long pants if walking in a wooded area. Learn more about tick safety: <https://www.ontarioparks.com/parksblog/how-to-protect-yourself-from-ticks/>**

WHAT IS IN MY BACKPACK?

Meet watery friends!

- Use the magnifier and pocket microscope to closely look at aquatic invertebrates (fun fact: they have no backbone!), plants, and insects.



Identification Guides & Books

Use the scarf to learn more about the water cycle, and the guides and books to learn about the different types of local biodiversity like fish, turtles, frogs, snakes, and aquatic macroinvertebrates.

Each guide has information and photos for each species, like their colour and size.



Note for Adults: Any animals or plants taken from a pond and put into a jar or bucket need to stay in water to stay alive. A fish or aquatic snail, for example, should have water to swim in, just like it has in its pond homes. Animals and plants from the wild cannot be taken home as pets and should always go back to their homes in the wild when you are done looking at them.

Be gentle whenever handling pond critters. Do not handle pond critters if you have lotions, sunscreen, or bug spray on your hands as this can pass through the sensitive skin of the critter and hurt it. Be safe when near water and always keep children within arm's reach.

Binoculars



Use this to help you see things that are far away from you!

Turn the knob on the binoculars to make it easier to see.



What do the numbers of binoculars mean? As an example, if binoculars say they are 8x21, they will help you see things 8 times closer and each lens is 21 millimetres wide.

Water quality testkit

Look inside this blue bag to find:



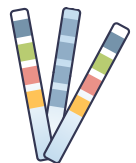
1

A thermometer to measure how hot or cold the water and the air is



2

Small white test strips to measure pH (how acidic or basic the water is)



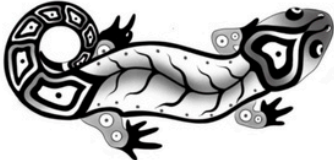







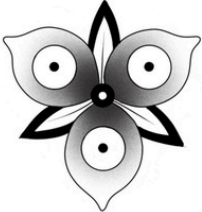
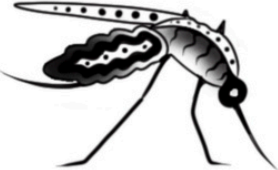

3

An information book



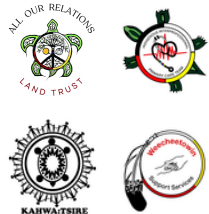
ACTIVITY #1: MAAWNDOOOSHKBIIYAA(N) (MARSH POND) BINGO

Circle the items as you find them in a local watery area!

 <p>Dawagomeg(og) (salamander)</p>	 <p>Apakweyashk (cattail)</p>	 <p>Mskwaadesi (painted turtle)</p>
 <p>Moon'angoonh (trout lily)</p>	<p>An animal or plant of your choice!</p>	 <p>maangodikwam(ag) (water spider)</p>
 <p>Zhiishiib (duck)</p>	 <p>Boojoozhens(ag) (tadpole)</p>	 <p>Biimskodsiinh (snail)</p>
 <p>baashknjibwaan(an) (white trillium)</p>	 <p>Zagime (mosquito)</p>	 <p>Omakakii (frog)</p>

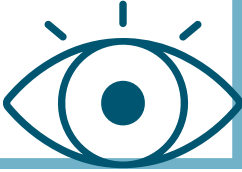



ARTWORK BY:
Ameena Buchanan

TRANSLATIONS
PROVIDED BY:



ACTIVITY #2: SENSES CONNECTION

Find a spot in nature. What do you see? What other senses can you use while in nature? Use your senses and write or draw what you see, hear, smell, and touch.

<p>SEE</p> 	<p>SMELL</p> 
<p>HEAR</p> 	<p>TOUCH</p> 

ACTIVITY #3: WORD SEARCH

Find the hidden words → / ↓

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

LIFE CYCLE

FROG

TURTLE



HATCHLING

EGGS

TADPOLE

ACTIVITY #5: WHICH FISH ARE YOU?

Circle your preferred choice and count up your results!

Spots  or  Stripes



Small  or  Large

Being alone  or  Being in groups

Prey  or  Predator

Vegetated waters  or  Open waters

Picky eater  or  Adventurous eater

Springtime  or  All seasons

How many light blue? ____

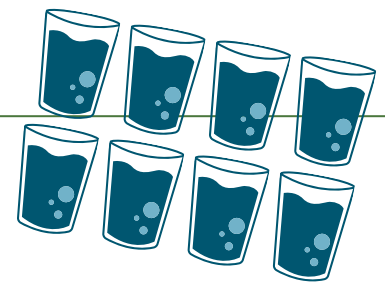
If you chose more **light blue**,
you are a **Northern Pike!**



How many dark blue? ____

If you chose more **dark blue**,
you are a **Yellow Perch!**





ACTIVITY #6: MY FRESHWATER DIARY



Did you know?
Most of your body is made up of water!

You should try to drink 6-8 cups of water a day! But for some, finding clean freshwater is not as easy as turning on a tap.



How much water do I use?



ACTIVITY

TIMES PER DAY

REASON

Shower/Bath	1	To clean myself
Flushing the toilet		
Washing my hands		
Drinking water/juice		
Washing fruits & veggies		



What can I do to use less freshwater? _____

ACTIVITY #7: POETRY

List 6 things that describe what you love about rivers using the first letter of each line. This will make an acrostic poem, where the first letter of each line spells out the word 'rivers' when read vertically. Lines do not have to rhyme.

R _____

I _____

V _____

E _____

R _____

S _____

ACTIVITY #8: SALAMANDER HUNT

You may not see them but that does not mean they are not there!

Get out the
magnifier and
binoculars!



Here are some tips for finding salamanders using your magnifier:

Notes

- Salamanders are delicate so it is best not to touch them. Instead take photos and enjoy them from afar.

Conditions

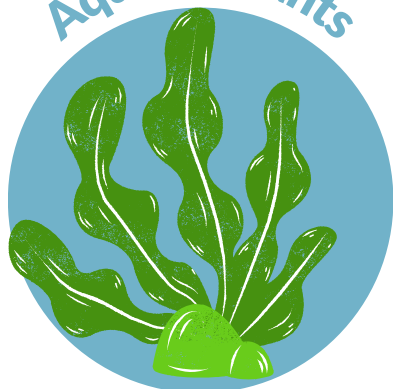
- Amphibians tend to wait for rain to move longer distances.
- Sometimes thousands of frogs or salamanders move in mass migrations on warm, rainy nights.

Habitat

- Salamanders prefer cold, damp places so look under rocks, stumps, logs, and leaves.
- Shorelines and wetlands (such as fens, bogs, swamps, meadows, and marshes) are home to a high diversity of reptiles and amphibians.
- Most frogs and salamanders congregate in wetlands during their breeding season (usually spring and early summer) and can be found easily during these times.
- Forests next to open fields, rock barrens, or meadows are a favourite spot for many reptiles.

HEALTHY FRESHWATER HOMES FOR WILDLIFE

Aquatic plants



As the lungs of the lake, aquatic plants produce oxygen and filter out carbon dioxide.

Shoreline vegetation



Acting like a shield, shoreline vegetation prevents erosion and invading invasive species!

Upland forests



Forests are known to provide a breath of fresh air through oxygen production, and are important habitat.



Did you know?
Even woody debris can play a role in supporting life in the environment!

Woody debris acts as an umbrella and safe house to provide shade and shelter for fish and animals alike!

HOW ARE PEOPLE IMPACTING NATURE?



As shorelines become more developed, humans are changing the way shorelines look and the species that can live there.

Some threats to wildlife and water health include: plastic pollution, introducing non-native (invasive) species, road mortality, and habitat removal and fragmentation.

One way to help is to replant a shoreline with native plants along the edge. This buffer helps to filter and stop things like fertilizers and pesticides from entering the water. Plant roots also help keep soil together in heavy rainstorms which prevents erosion.



Photo: Stephany Hildebrand

ACTIVITY #9: WATER QUALITY EXPERIMENT

The guideline for pH (potential hydrogen) is a range of 7.0 to 10.5 in finished drinking water.¹ Generally, a range of 6.5 to 8.2 is preferred for most life in the water. Different things can affect the pH of the water like an algal bloom or increased pollution from things like road salt, car wash soap, or fertilizer runoff.

Some aquatic animals are very sensitive to changes in pH, and are often used as living indicators ("bioindicators") of an ecosystem's health. One example is dragonflies because they have a biphasic lifecycle, meaning they spend part of their life in the water as aquatic nymphs and part of their life in the terrestrial environment as adults.



Photo: Mary Ann Perron

Common Green Darner (*Anax junius*).



A young dragonfly (nymph) lives its life under the water.

¹Health Canada (2015). Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – pH. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. (Catalogue No H144-28/2016E-PDF).

Getting started

Open your Water Rangers test kit. Take out a water test strip. Look at the pH chart. Before you begin testing, guess the pH levels of your water sample (make a hypothesis - an explanation of what you think will happen). Do you think the sample will be preferred by life in the water?

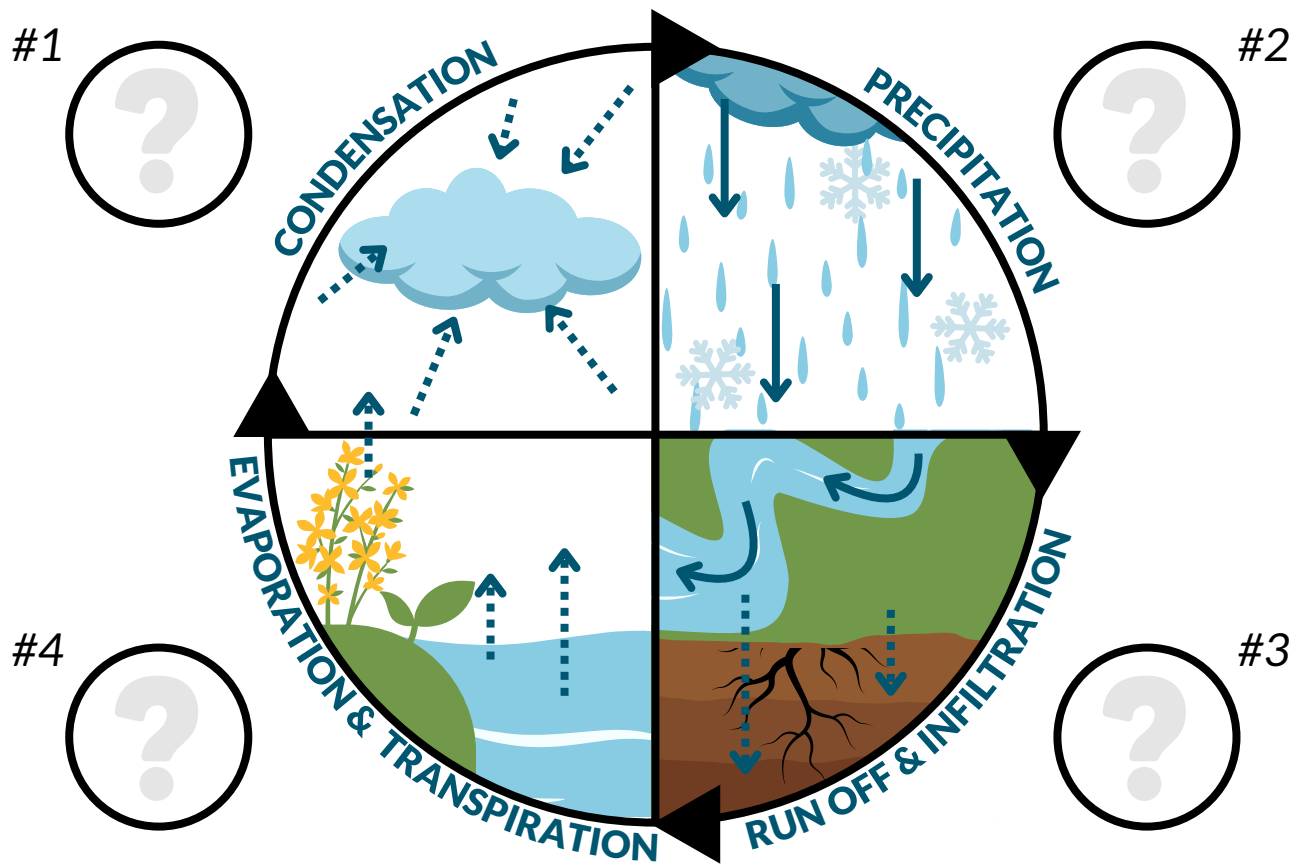
Get out the
Water
Rangers kit!



Where and why do you think you will find different conditions for air temperature, water temperature, and pH?

Record your findings each time on the Water Rangers data sheet in the test kit, or below on this page. What did you find?

ACTIVITY #10: ALL ABOUT THE WATER CYCLE



Match the 4 stages of the water cycle with the answers below.

A. The sun heats the water in lakes, rivers, and on plants, causing the water to become vapour and rise into the air.

C. Water flows and collects in the lakes and rivers. Water also enters the soil. Plant roots help do this!

B. If there is enough water in the clouds, it becomes so heavy it falls to the ground as snow or rain.

D. The water vapour collects to form clouds.

ACTIVITY #11: WRITE A LETTER TO AUTUMN

Read "Autumn Peltier, Water Warrior", then fill in the blanks to write her a letter!



Pick a greeting:
Dear, Greetings,
Hi, Good
morning/
afternoon

Autumn Peltier,
I read your book, "Autumn Peltier, Water Warrior".

Did you like the
book?

Did you read it
on your own or
with others?

You inspired me to learn more about ...

Is there an
action she took
in the book that
you really
liked?

I liked that in the book you ...

Is there something
you want to know
more about?

To protect the water, I am going to ...

How are you
going to join
Autumn to protect
the water?

Pick a closing:
Sincerely, Best
wishes, From,
Thank you

Is there anything
else you want to say
to Autumn?

Add your name here

ACTIVITY #12: CREATE A DICHOTOMOUS KEY

Get out the pond guide!



A dichotomous key consists of a series of statements involving characteristics with two contrasting alternative choices (i.e., yes/no, wings/no wings) in each step to lead you to the correct species.

Choose 5 of the following benthic macroinvertebrates and create a dichotomous key.



Dragonfly nymph



Water scorpion



Mayfly



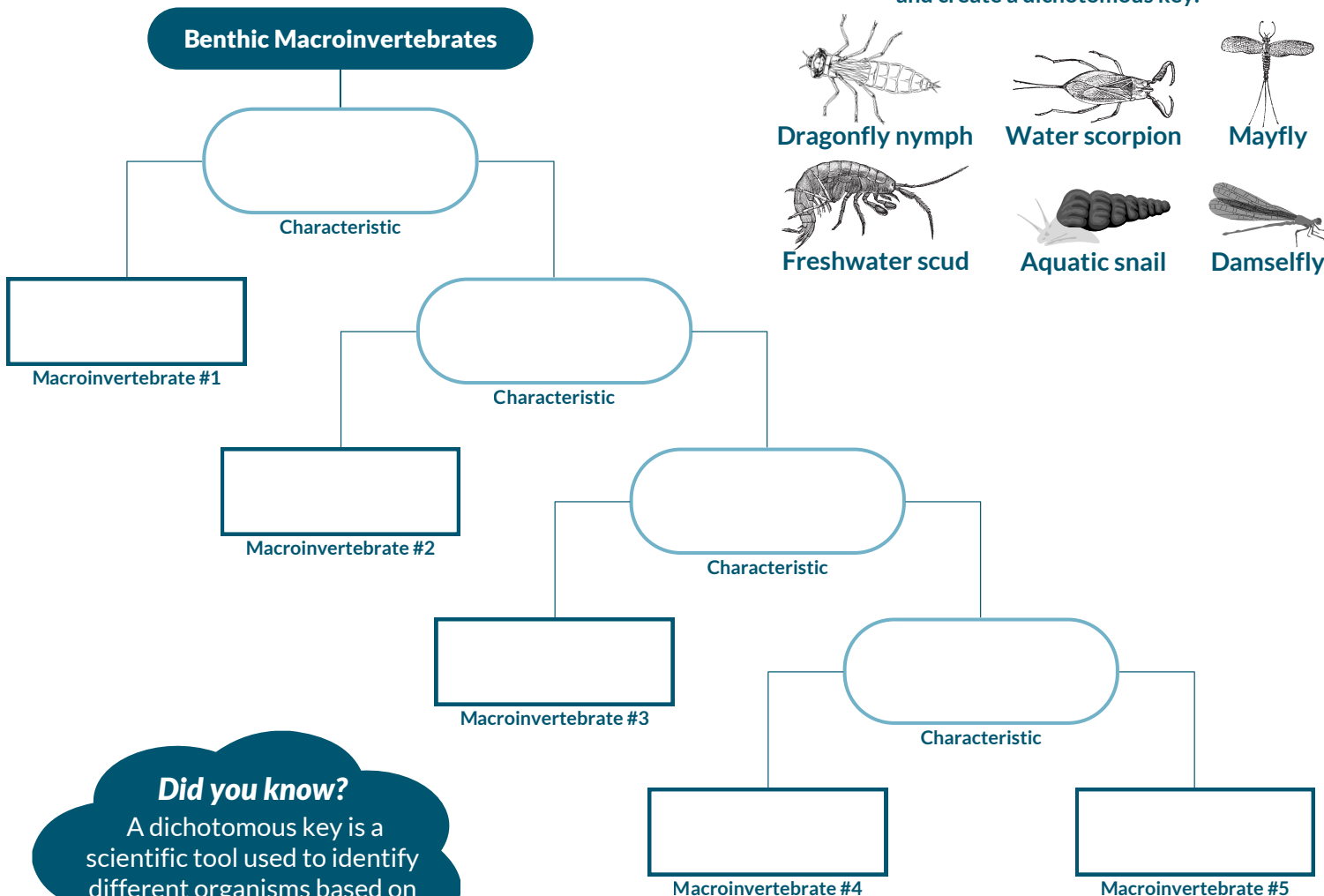
Freshwater scud



Aquatic snail



Damselfly



Did you know?

A dichotomous key is a scientific tool used to identify different organisms based on observable traits!

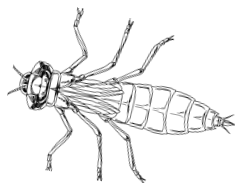
ACTIVITY #13: MAKE THE MATCH

Get out
the
pond
guide!



Benthic macroinvertebrates have no backbone (spine) and we can see them with our eyes. They live in or around a waterbody their whole life, so they are living indicators that show us how healthy a waterbody is. Draw a line from the species to their name!

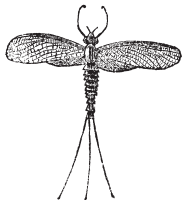
1)



2)



3)



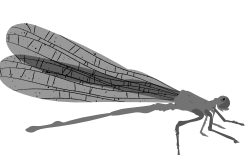
4)



5)



6)



A) Aquatic snail

Fun fact: they usually have a coiled shell but sometimes it can be a short, broad cone shape.

B) Freshwater scud

Fun fact: they have seven pairs of hard jointed legs and the first two pairs have small claws.

C) Dragonfly nymph

Fun fact: they have 3 pairs of hard jointed legs with 2 claws on each leg.

D) Mayfly

Fun fact: they are the only type of insect that has a winged immature stage.

E) Damselfly

Fun fact: there are over 50 different damselfly species found in Ontario.

F) Water scorpion

Fun fact: their "tail" is two half-tube structures that can be locked together and used like a snorkel.



ACTIVITY #14: DRAGONFLIES AND DAMSELFLIES

Create your own dragonfly or damselfly and write four things it needs in its habitat (home).



1 _____

2 _____

3 _____

4 _____

INSECT WITH TRANSLUCENT WINGS

WINGS OPEN AND OUT AT REST

THICK BODY

EYES CLOSE TOGETHER

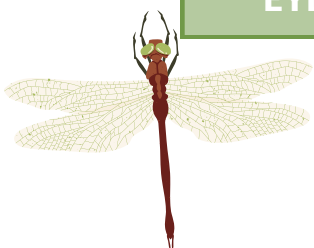
DRAGONFLY

WINGS TOGETHER AT REST

THIN BODY

GAP BETWEEN EYES

DAMSELFLY



ACTIVITY #15: I SPY

How many different colours can you spot outside? Write what you see next to the pencil crayon matching its colour.

I spy with my little eye something that is...

Get out the magnifier and binoculars!



LIGHT GREY		-----
GREY		-----
BROWN		-----
TAN		-----
PINK		-----
PURPLE		-----
NAVY BLUE		-----
BLUE		-----
LIGHT BLUE		-----
DARK GREEN		-----
GREEN		-----
LIGHT GREEN		-----
ORANGE		-----
RED		-----

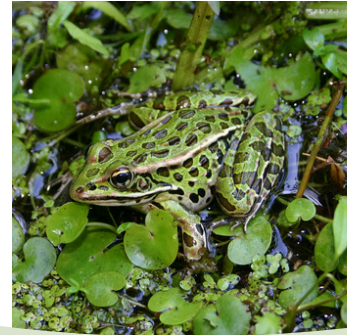
CHALLENGE! What is the farthest away living thing you can see?

ACTIVITY #16: WHO AM I?

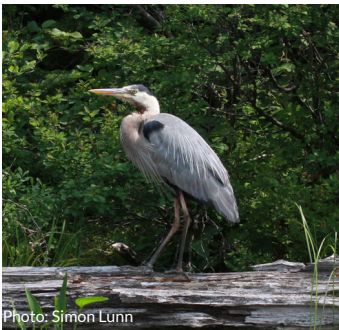
Meet some new wetland friends! Look at the photos and clues and then write the name of the species living in Ontario.



This medium-sized fish has a green back and sides. Its upper jaw goes past its eye and it has a deep notch between its dorsal fins.



My favourite foods are bugs and spiders. I am often green in colour with dark round spots that have a light edge.



This large bird has a big yellow-orange bill and is found in small ponds, marshes, and bays.



I like to live in ponds, marshes, and lakes that have lots of logs to stretch out on and aquatic vegetation to hide in.

ACTIVITY #17: DESIGN A NATURAL SHORELINE

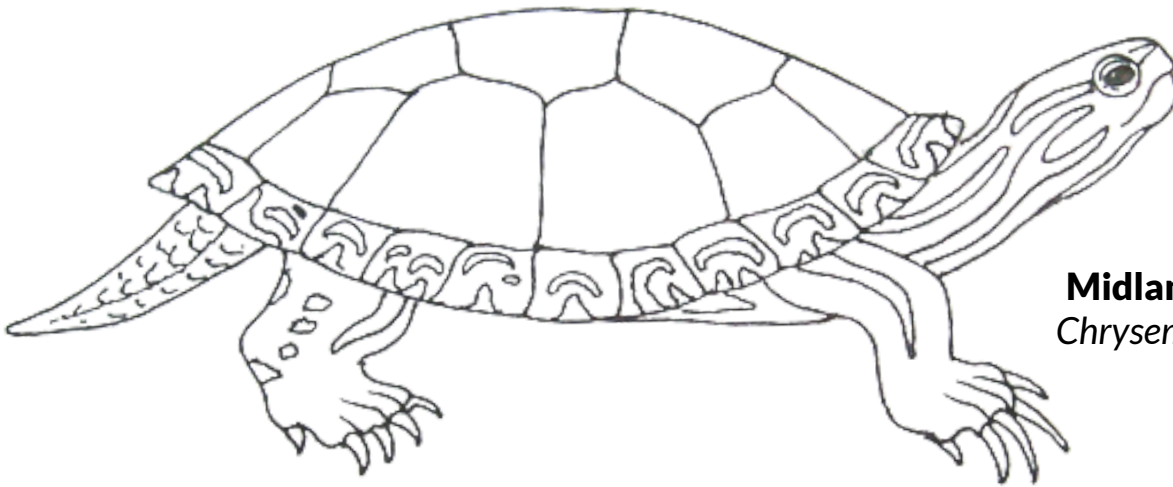
Can you help Tisna and her family plant their shoreline? Draw different plants in the riparian zone that will help hold the soil together!



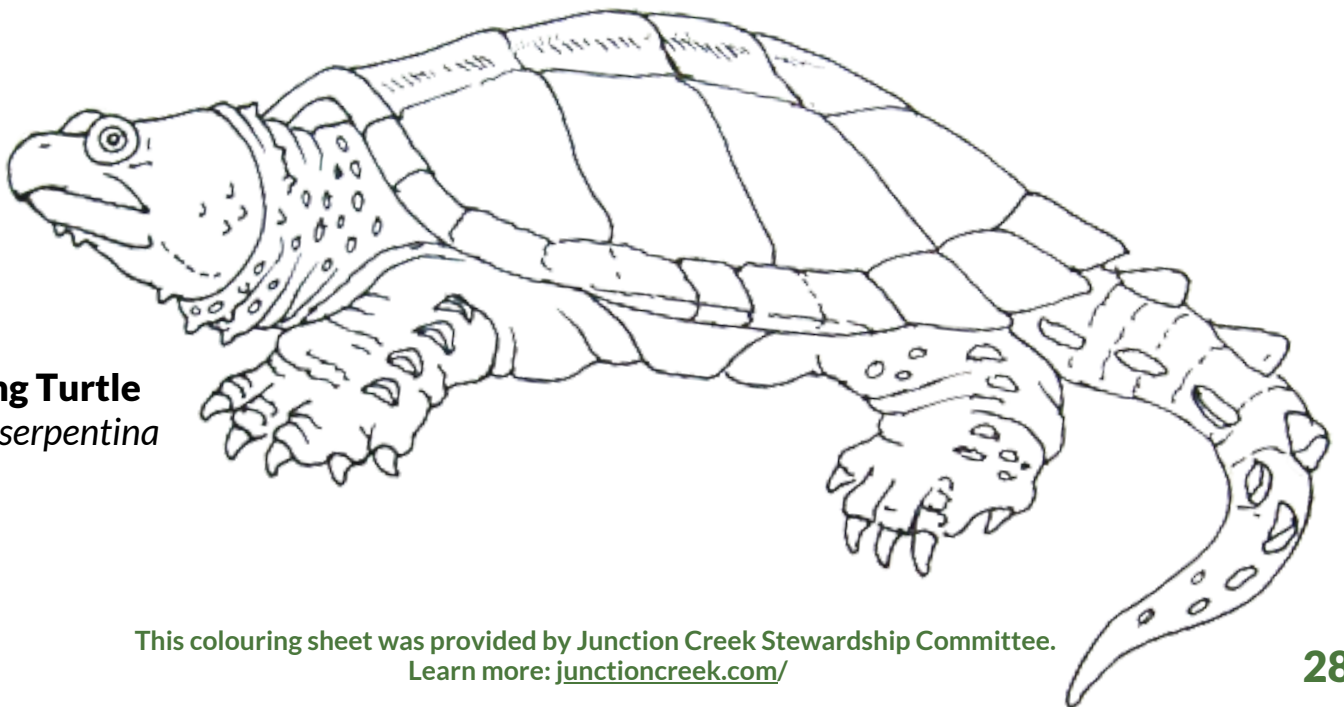
The place where the water meets the land is called the shoreline, or riparian zone. The shoreline area is the first 30 metres of land around a lake or river. This area helps almost all plants and animals grow during their life.

ACTIVITY #18: COLOURING TIME!

Ontario is home to 8 native turtle species. Turtles need healthy lakes and wetlands so they can find food, grow, and lay their eggs.

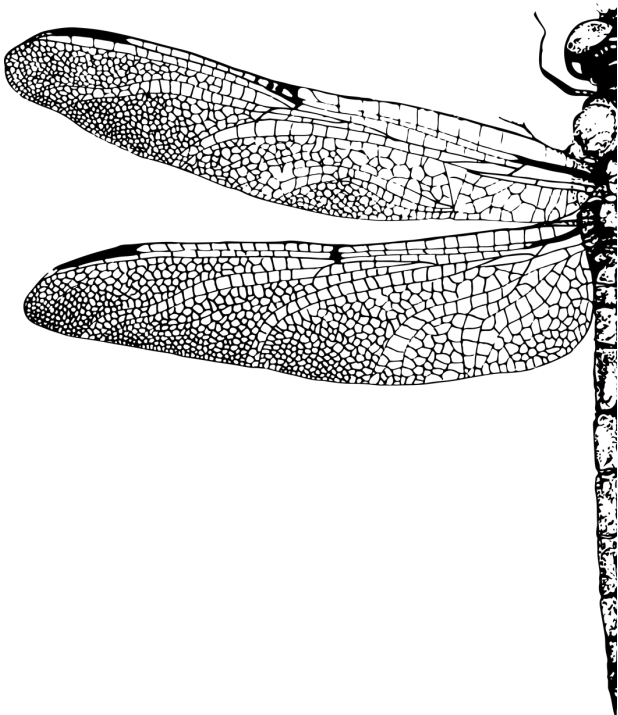
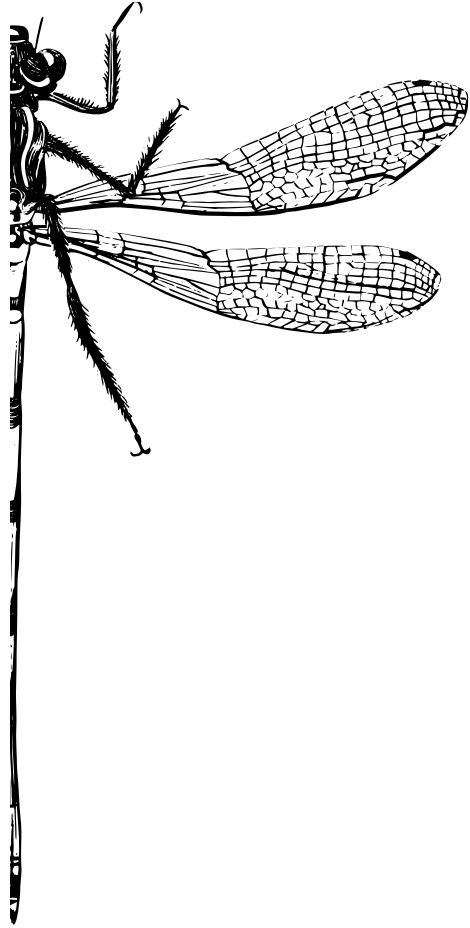


Midland Painted Turtle
Chrysemys picta marginata

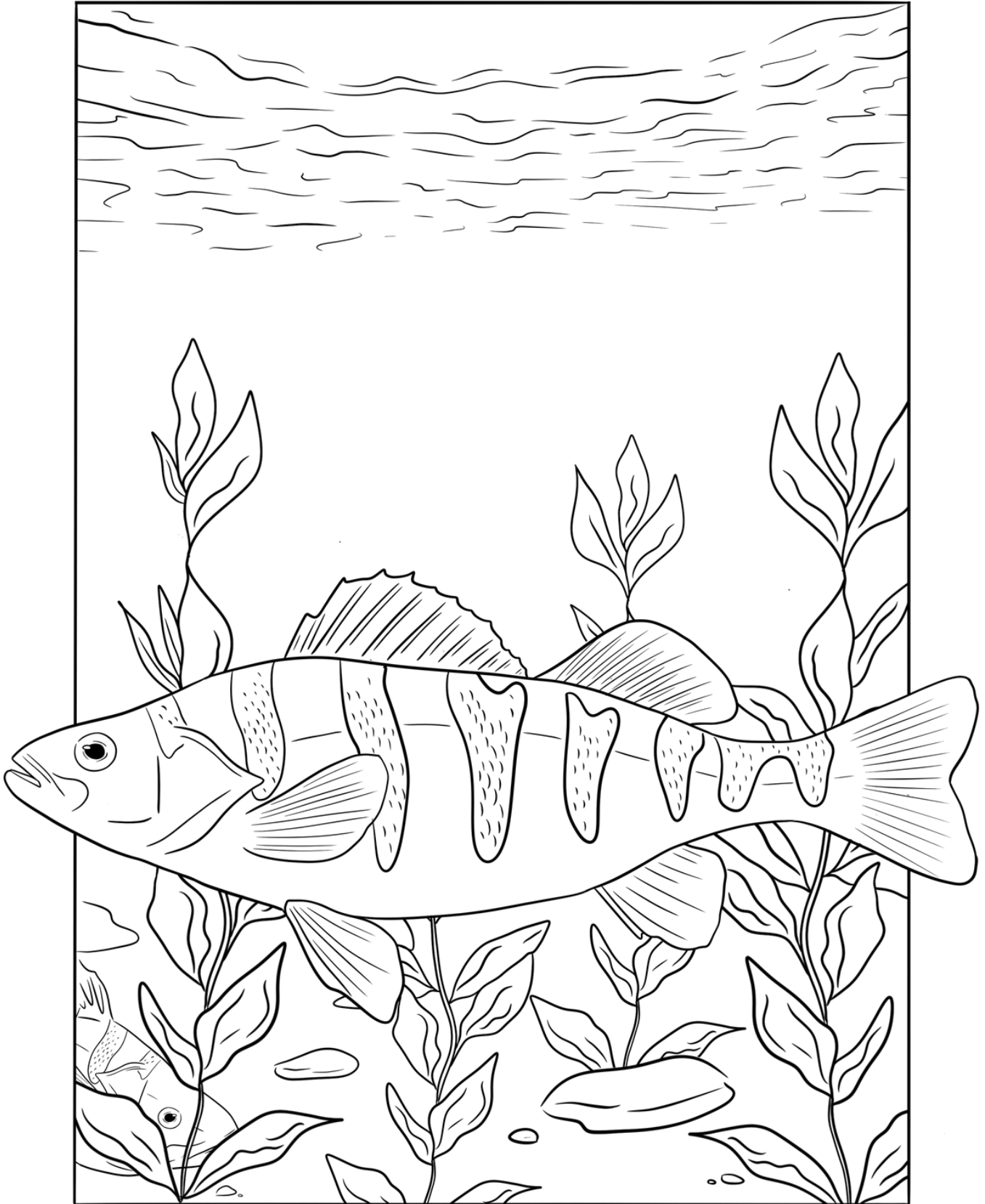


Snapping Turtle
Chelydra serpentina

Draw the other half of this damselfly and dragonfly!



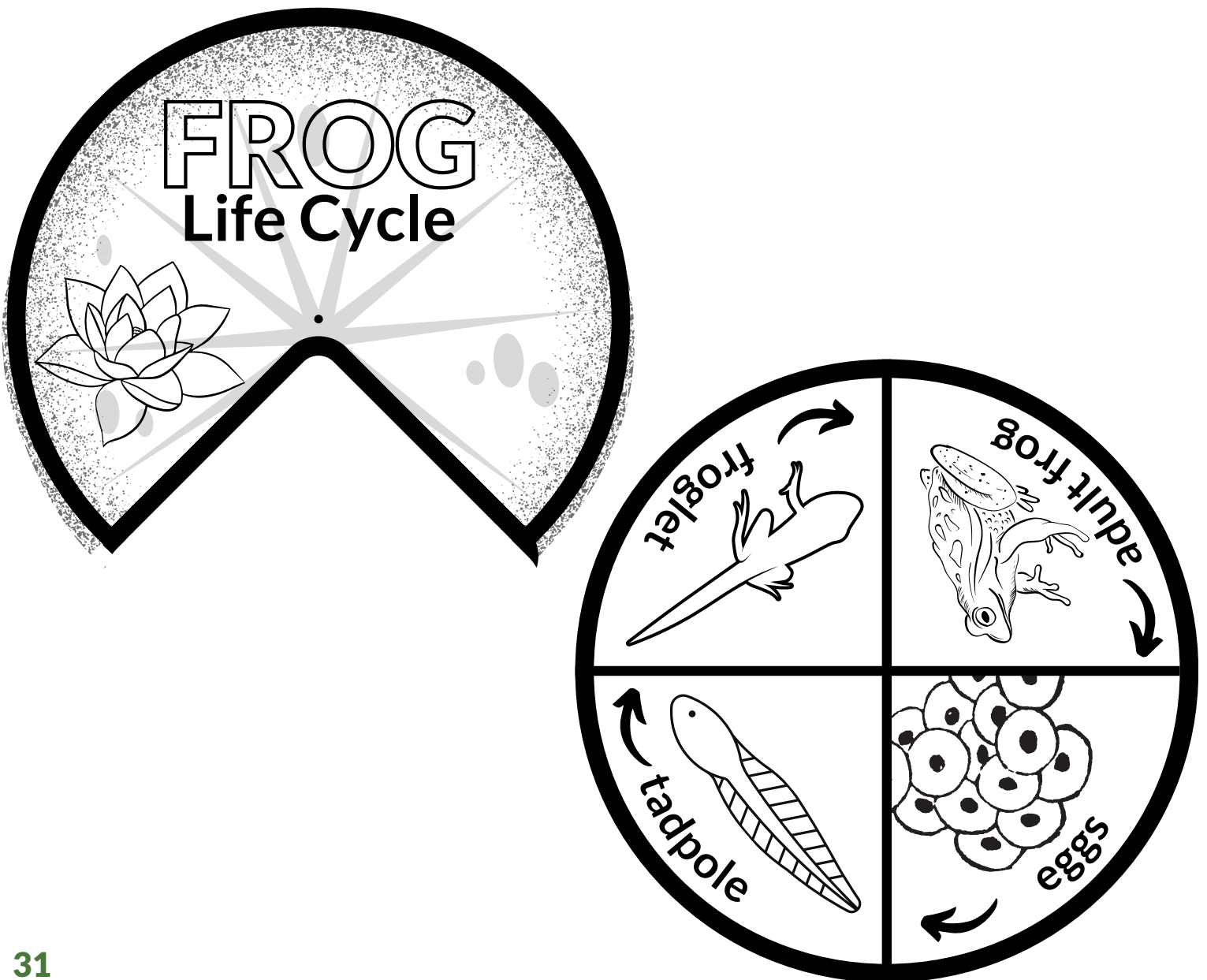
Yellow Perch

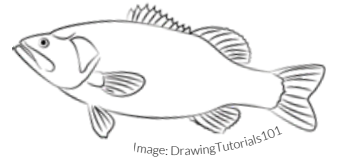
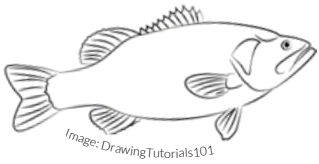


Artwork: Nicole Dubé

ACTIVITY #19: FROG LIFE CYCLES

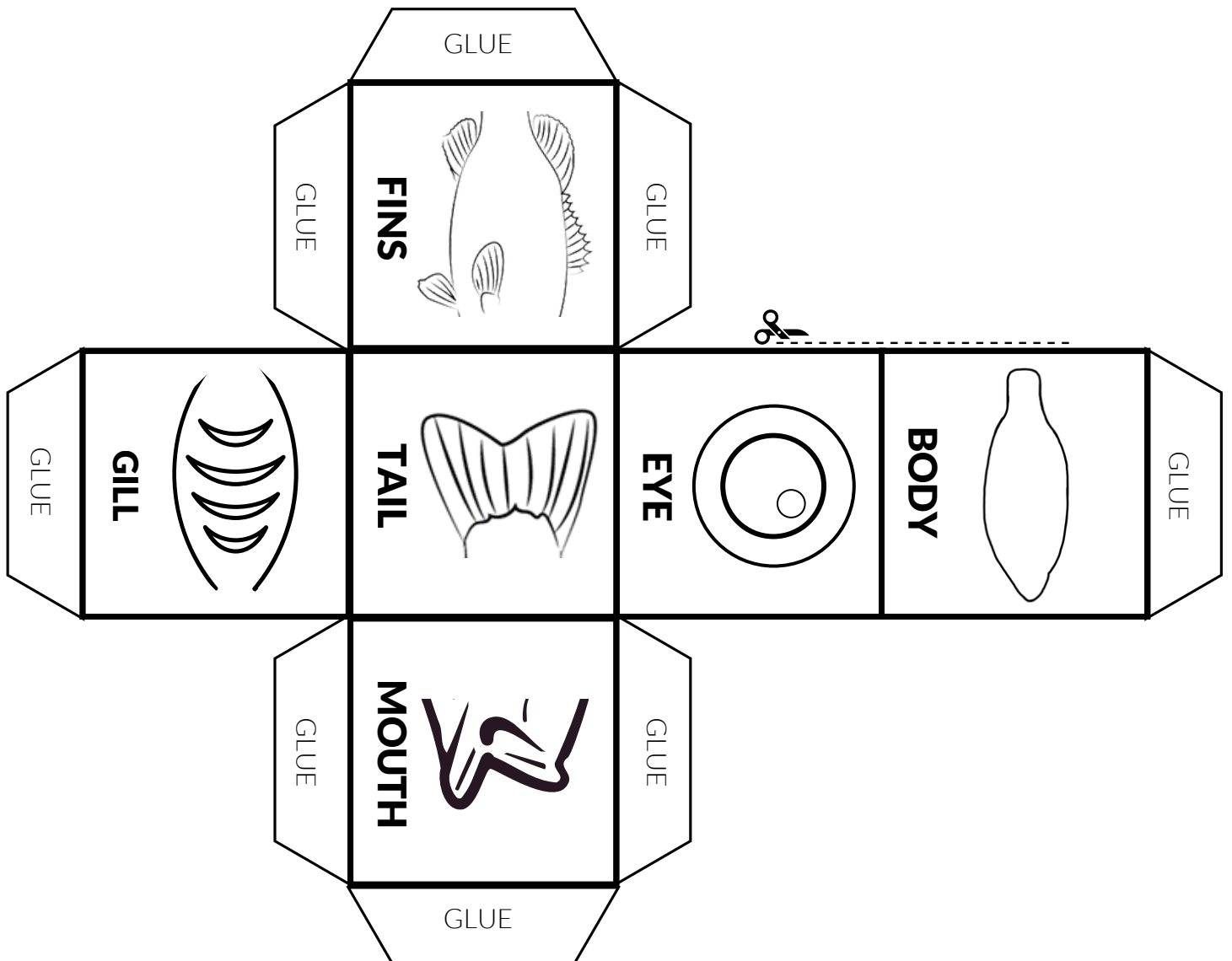
Colour and cut out both pieces. Then attach the pieces together with a brad (metal fastener) through the center dot. Spin and see the life cycle of a frog!





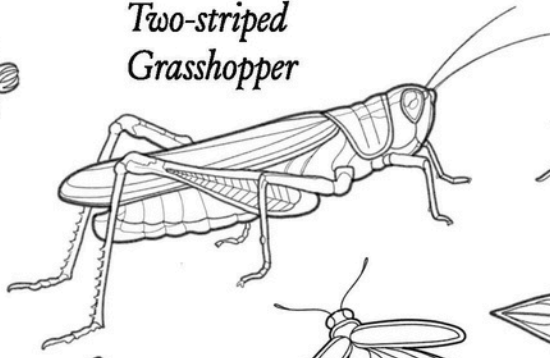
ACTIVITY #20: ROLL TO BUILD A FISH!

Colour the fish body parts and cut the outer shape below. Then fold and glue your fish cube. Roll the cube and draw a part of a fish. Keep rolling the cube until you have built an entire Largemouth Bass!

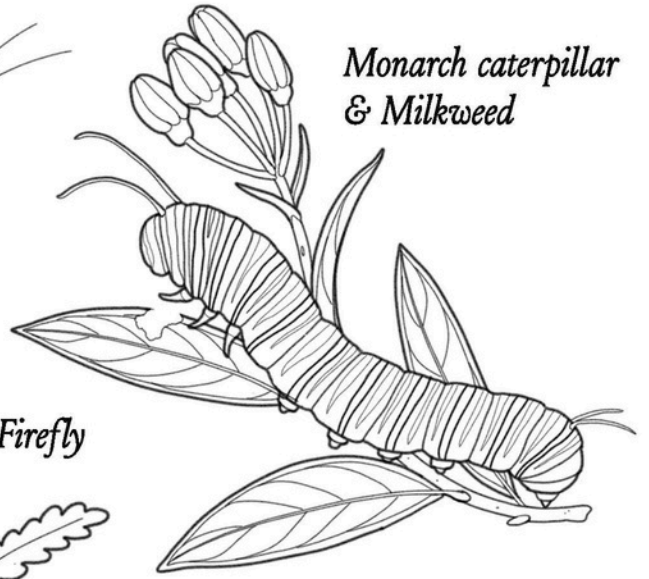




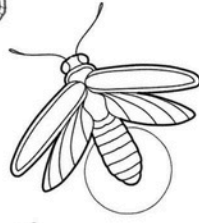
Two-striped Grasshopper



Monarch caterpillar & Milkweed

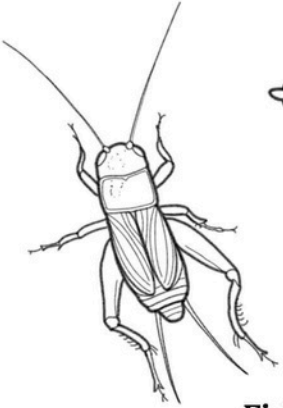
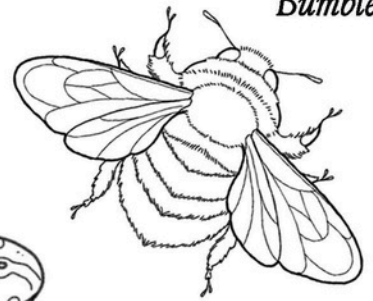


Antler & Chicory

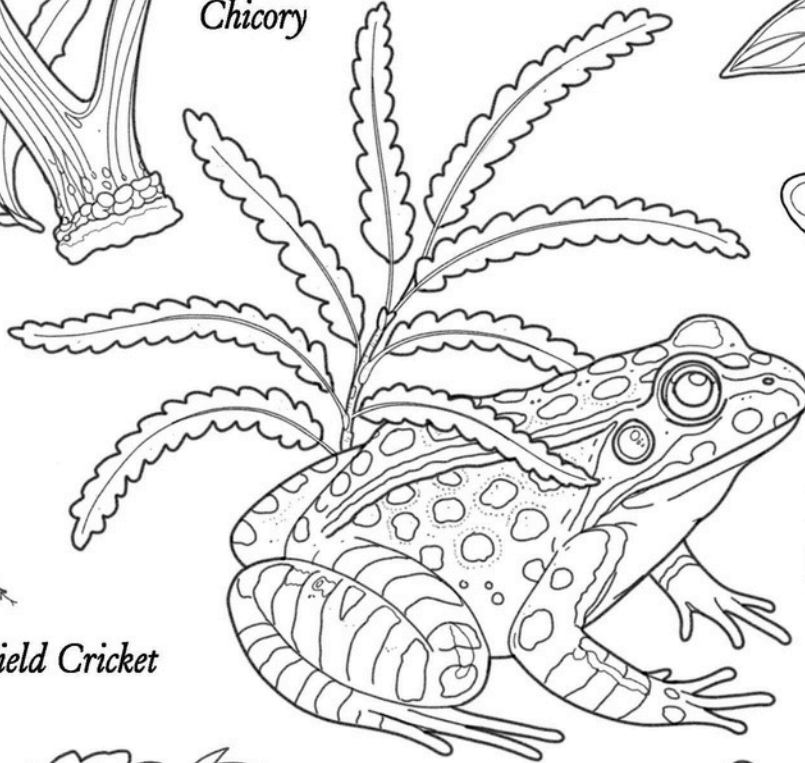


Firefly

Bumblebee

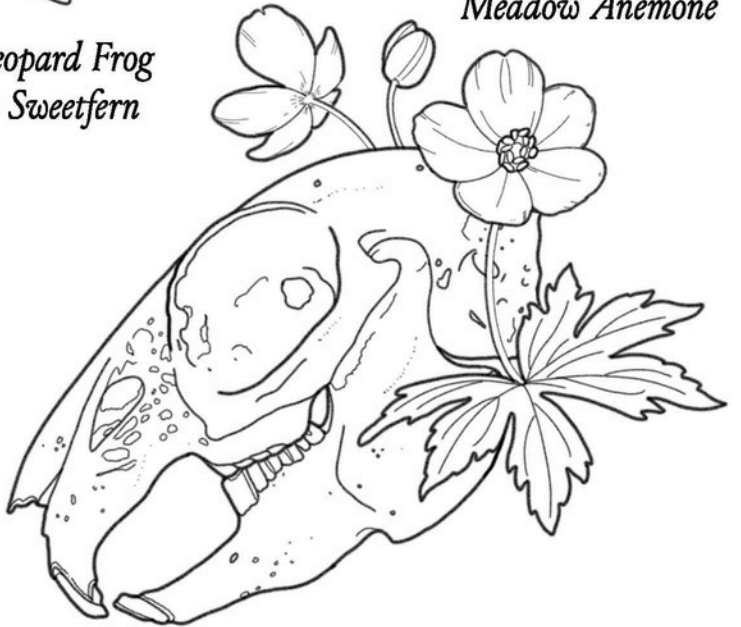


Field Cricket



Leopard Frog Habitat Study

Rabbit Skull & Meadow Anemone



Leopard Frog & Sweetfern



Wild Strawberries

ACTIVITY #21: DO A BIO-BLITZ

A BioBlitz is a volunteer-led count of the biological species found in an area. Using your identification guides, you can get a "snapshot" of the species and biodiversity found in your area.

What can you find in 30 minutes? An hour?

ANIMALS

PLANTS

ACTIVITY #22: BECOME A COMMUNITY SCIENTIST

When you enter your animal or plant observations online, it can help scientists and nature groups keep track of the health of different populations over time.

Here are some community science programs you can join and be a part of:



Merlin Bird ID



The Canadian Lakes Loon Survey is a program of Birds Canada, delivered in partnership with QuébecOiseaux.

ACTIVITY #23: FRESHWATER HELPER

Cross out the 5 human actions that can harm freshwater animals and plants and their watery home with a big ✕!



Save the Bay!



The bay needs a hero like YOU!

What can you do to help protect Georgian Bay from pollution and storm water runoff?

Write down your action plan here!



WHAT IS A WATERSHED?

- A **watershed** is an area of land that water flows through or across on its way to a particular water body, like a stream, river, wetland, lake, or coastline.
- A watershed is the land where precipitation – like rain – falls and flows to a common, watery place!
- Depending on where you live in Owen Sound, you may be in the Sydenham River Watershed, Bothwell's Creek Watershed, or Pottawatomi River Watershed.

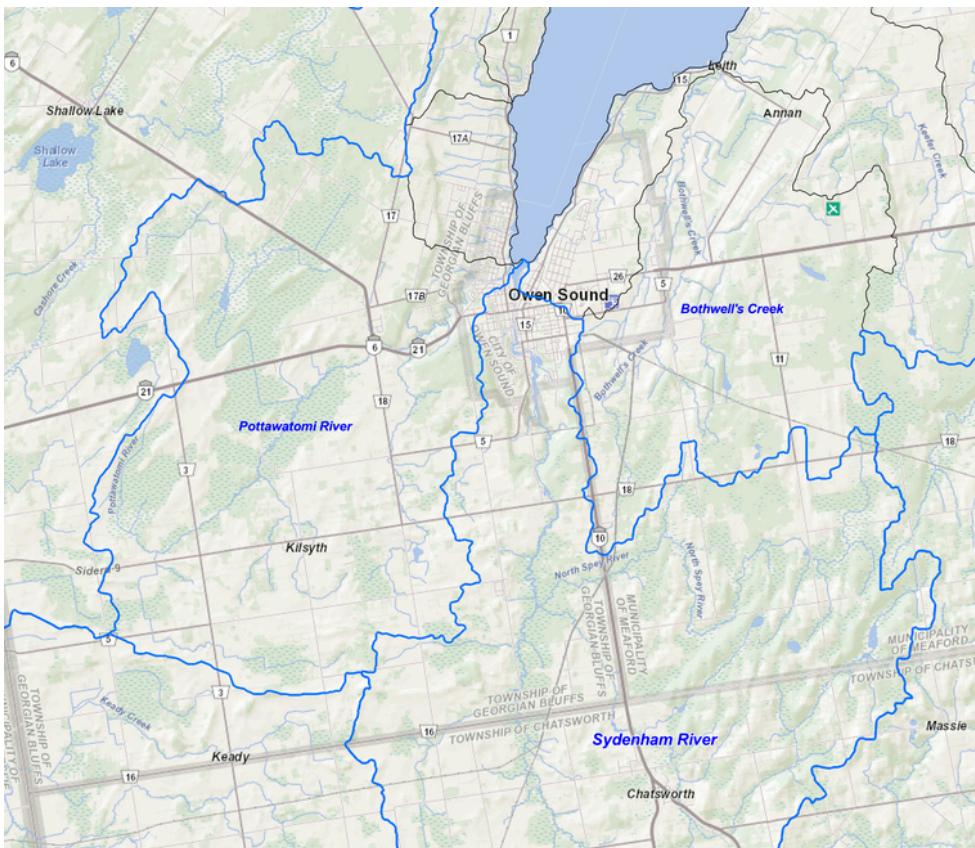


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RESILIENT SHORELANDS

The **Littoral Zone** extends from the water's edge to where sunlight no longer penetrates to the bottom of the water. This is where docks are built and people swim. However, we share this area with an incredible array of biodiversity as up to 90% of lake species (e.g., pike, ducks, otters and turtles) are born, raised, fed, or live in the littoral zone.

The **Shoreline** is the edge where the land and water meet. The mix of plants, shrubs, and trees form an intricate web of roots, foliage, and fallen limbs that hold the waterfront together and fend off erosion from wind, rain, boat wakes and ice.

The **Riparian Zone**, also known as the Ribbon of Life, extends inland from the shoreline for at least 15 metres and may be flooded during high water periods. It is a natural buffer protecting the shoreline, water quality, and natural habitat both on land and in the water. It is made up of trees, shrubs and grasses that absorb excess nutrients (e.g., fertilizers) and pollutants (e.g., seepage from septic systems, oil, gas and pesticides) before they can contaminate the water.

The **Upland Zone** is a drier forested area with better drainage compared to the riparian zone. The deep roots of trees stabilize the slope, the foliage buffers the effects of wind, the canopy cools its surroundings, and plants provide habitat for deer, birds, porcupines, grouse, rabbits, and many other creatures.

Upland

Riparian

Shoreline

Littoral



Watersheds
CANADA

WAYS TO HELP

- Gather data.** Take photos and observations of different animals and plants you see in nature and submit them to an online database like [iNaturalist](#), [eBird](#), [MonarchWatch](#), or [Water Rangers](#).
- Be natural.** Consider adding native plants to provide stabilization, habitat, and food to your property. Learn what native species to plant on your property: naturaledge.watersheds.ca/plant-database/
- Grow Me Instead!** Learn about native plants you can grow in your garden by checking out the “Grow Me Instead” chart: <https://ontarioinvasiveplants.ca/wp-content/uploads/2020/04/Southern-Grow-Me-Instead-1.pdf>
- Keep it clean.** Prevent the spread of invasive species by staying on trails while hiking and by cleaning equipment after boating. Learn more: <https://ontario.ca/page/invasive-species-fact-sheets>
- Be respectful.** Take only photos and leave only footprints when exploring in the forest. This lets other people, animals, and plants use the space too.
- Support local.** Buy local native plants at the Inglis Falls Arboretum Alliance: <https://greysauble.on.ca/arboretum-alliance/>
- Help local turtles!** Get involved with the turtle stewardship program at Grey Sauble Conservation: <https://greysauble.on.ca/turtle-stewardship-program/>
- Protect baby turtles.** Turtle nest predation rates are very high in our area. Help protect turtle eggs and ensure they have a chance to hatch. As a family, consider if it may be appropriate for you to make your own turtle nest protector: <https://ontarioturtle.ca/get-involved/turtle-nests-and-nest-protection/>

RESOURCES FOR PARENTS

Rewilding Lawns and Public Spaces

We can all make a positive difference for wildlife and pollinators in Owen Sound! Some ways we can help on our public and private properties include:

- Creating pocket meadows and forests by planting native species of wildflowers, shrubs, and trees that are beneficial to local wildlife and pollinators throughout the year.
- Promoting a “no-mow” area of your lawn.
- Making properties bird and pollinator friendly by adding native plants (food and shelter), bird houses, natural water areas, and applying bird friendly anti-collision tape to your windows.



Fireworks

Although fireworks create a spectacular show enjoyed by many, there are risks to this activity.

Noise and light from fireworks can have a negative impact on wildlife, including nest desertion. The particulate left in the sky after a firework explodes contains heavy metals which can land directly on the lake or be washed into the lake following a rain storm. This has harmful effects on the aquatic food chain.





Watersheds
C A N A D A

115-40 Sunset Blvd, Perth, ON, K7H 2Y4

watersheds.ca



Painted Turtles