

K-3 EXPLORER

toolkit

TEACHER'S GUIDE



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K-3 EXPLORER toolkit



TEACHER'S GUIDE

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**TD Friends of the
Environment
Foundation**



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WHY A K-3 TOOLKIT?

Inside Education and the Global, Environmental and Outdoor Education Council (GEOEC) want to help get students outside and connect to the natural world. Gaining a familiarity and an appreciation for nature sets students up to be thoughtful stewards of the environment and their natural resources, and builds a lifelong relationship to the outdoors.

This kit will give you the tools and activities you'll need to start exploring natural spaces with your students. This kit has the building blocks for outdoor lessons in science, physical education, art, math and language arts for Kindergarten to Grade 3.



WHAT TO PACK?

Along with your toolkit you might also like the following items to enhance your outdoor experience:

- **Tarp**
 - To use as a gathering spot, especially valuable on wet ground or snow!
- **Wagon**
 - Excellent way to transport all your outdoor supplies.
- **Clipboards** and extra **pencils**
- **Small whiteboard** and **markers**
 - To collect observations.
- **First Aid Kit**
- **Extra outdoor gear**
 - Mittens, toques, socks, rain ponchos.



GETTING OUTSIDE: Tips and Tricks

- **Start small**

You don't need to spend your whole day or lesson outside! You can begin with short trips to make observations or measurements, and then work your way up to longer and more involved lessons.

- **Let your students' interests guide your time outside**

Some days you might go out to do a specific activity or lesson, but it is also a lot of fun to just go on a walk to just see what you can find that day and what sparks interests for your students. You can use these sparked interests to inform the next story or art project or research subject in your classroom!

- **Walk with a purpose**

You can always have your students keeping their eyes open for specific things on a walk, from signs of spring to the number of safety signs, this is a great way to keep students focused!

- **Get to know the community**

Is there a community garden, a house with an exceptional yard, historical landmark, forested area or other points of interest within walking distance of the school? Find these points of interest and use them during your outdoor adventures.

- **Reinforce good stewardship practices when you're outside**

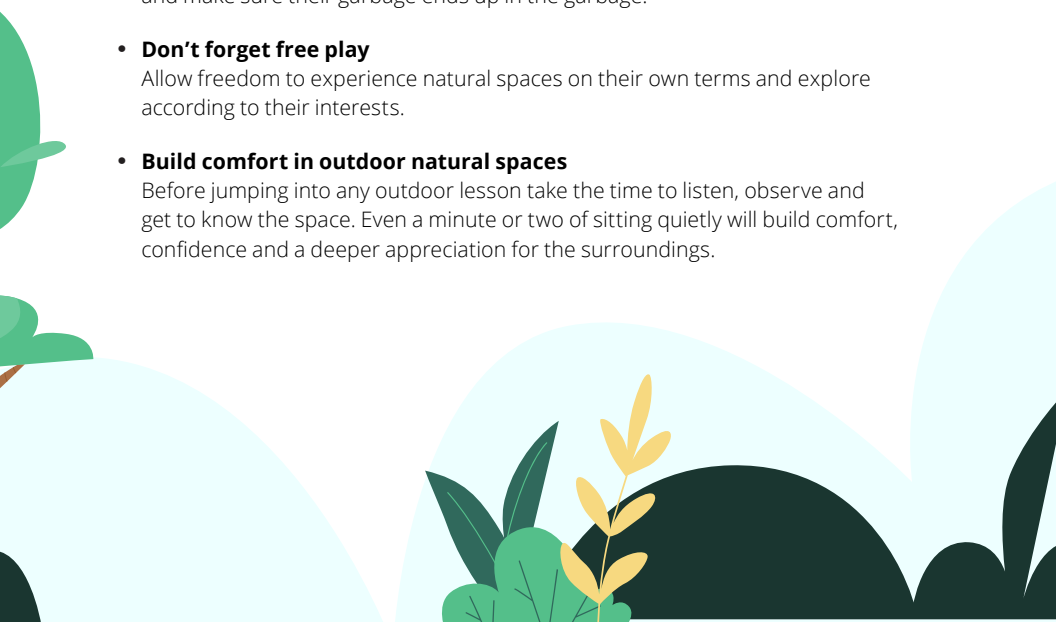
Remind students to stay on the trail, not break branches or pick plants or flowers, and make sure their garbage ends up in the garbage!

- **Don't forget free play**

Allow freedom to experience natural spaces on their own terms and explore according to their interests.

- **Build comfort in outdoor natural spaces**

Before jumping into any outdoor lesson take the time to listen, observe and get to know the space. Even a minute or two of sitting quietly will build comfort, confidence and a deeper appreciation for the surroundings.



OUTDOOR EXPLORERS TOOL KIT

Material List

1. **Colour chips and Shape Cards**
2. **Bug Collectors**
3. **Bugs and Slugs - A folding pocket guide**
4. **Alberta Nature Guide**
5. **Biodegradable Paint Kit**
6. **Thermometers**
7. **"The Circle of Sharing and Caring" by Theresa "Corky" Larsen-Jonasson**
8. **Mink Tail**
9. **Collection Bags**
10. **Playdough**
11. **Sidewalk Chalk**
12. **Magnifying Glass**
13. **Whistle**
14. **Rulers**
15. **Backpack**
16. **Insect Evidence Booklet**
17. **Cree Language Cards**
18. **Animal Riddle Cards**
19. **Whiteboard & Marker**
20. **Tree cookie**



TOPIC 1

ENVIRONMENTAL AWARENESS

ACTIVITY NAME	LEARNING OBJECTIVE(S)	MATERIALS
Colour Chip Scavenger Hunt	<p>Matching shapes & colours</p> <p>Using the five senses to make observations</p>	<ul style="list-style-type: none"> • Colour chips • Shape cards
Create a Classroom Nature Guide	<p>Developing awareness and personal connection to the environment</p> <p>Identifying wants versus needs</p>	<ul style="list-style-type: none"> • Alberta Nature Guide • Bugs and Slugs Folding Guide • <i>Additional: camera or smartphone</i>
Animal Senses	<p>Developing awareness and personal connection to the environment</p>	<i>None</i>

ACTIVITY 1

Colour Chip Scavenger Hunt

This activity encourages students to notice the different colours and shapes that are found in nature and that many of the colours we create are inspired by nature.

1. Distribute the **colour chips**.
2. Give students 2-5 minutes to find examples of these colours in nature.
3. Repeat until students have done a few different colours each.



EXTENSION

- Ask students which colours were the easiest to find, which were more difficult?
- Go out at different times of year and compare what colours are easiest and hardest to find!
- Brainstorm creative names for the colours found in nature (*berry red, bark brown, leafy yellow, pine tree green etc.*)
- Use the **shape cards** to do the same activity, but looking for shapes in nature.



ACTIVITY 2

Create a Classroom Nature Guide

1. **Discuss the plants and animals that depend on the natural spaces around the school**
— students might come up with things like birds, squirrels, insects, plants, trees, fungus, and people!
2. **Divide your class into working groups and assign each a topic area to focus on** (for example, shrubs, flowers, insects, birds, mammals, etc.).
3. **Go for a walk or spend time in a natural space looking for evidence of what is using nature!**
When something is spotted, take a picture and use the **Alberta Nature Guide**, **Bugs and Slugs Folding Guide**, or identification apps such as *iNaturalist* to help identify species that you have found.
4. **Bring these pictures back to the classroom and compile them in a collage or booklet or PowerPoint to create your own nature guide!**



EXTENSION

- Discuss the needs of living things and how they are using the environment to fulfill them. Compare this with how humans are using the environment — are they fulfilling needs or wants?
- Discuss stewardship — how can we make sure we are respecting the living things in this environment?
- Explore your natural space throughout the year to observe how it changes, or explore various types of environments — field, forest, yard, pond - if possible.

ACTIVITY 3

Animal Senses

Adapted from Bridle Trails Park Foundation's "Expanding Our Senses".

Find a quiet place for your students to sit and observe. You can begin with Owl Eyes and then add on the others, or do each sense separately. Use the scripts below to help your students sense the environment like animals!

1. OWL EYES

Did you know that owls can't move their eyes like we can? Use your peripheral vision. Focus on a single point somewhere straight ahead and imagine your eyes can't move, just like an owl's. Once ready, soften your gaze and see what you can see to your sides without moving your eyes. Stretch your arms out in front of you, begin to wiggle your fingers and see how far to their sides they can reach before you lose sight of them. Bring your arms back in front of you (*repeat, bringing arms up and down*).

**2. DEER EARS**

Put on your deer ears by cupping your hands behind your ears. Do you notice that sounds become louder? Now try cupping hands in front of your ears, pointing backwards (*deer are able to move their ears*), notice how much you can hear behind your now!

**ASK:**

- What sounds do you hear in front of you? Behind? To the sides?
- Are there constant sounds like wind or traffic?
- What is the closest sound? The furthest sound?
- What is something high pitched you can hear? Low pitched?
- Expand this discussion by comparing the hearing range of a deer to a human (*deer can hear up to 800m away, human hearing a comparable sound is ~200m*).

3. RACCOON TOUCH

Raccoons don't have great vision or hearing but use their sense of touch to feel their way through their mostly nocturnal lifestyle. We are going to try feeling with our whole bodies, not just our hands.

- Feel the clothes on your bodies
- Feel how your feet/bodies are connected to the ground
- Do some parts of your body feel warm? Cold?
- Which way is the wind blowing from today?
- Can you feel the sun shining on your face?



4. COYOTE NOSE

Think of how dogs have their nose to the ground as they walk. Take quick sniffs of the air around you, any initial scents? Can you smell better using one long sniff or many short sniffs? Pick up objects such as leaves, a handful of dirt, or a stick and sniff it. What scents are the most strong? Which do you like the best?



5. NATURE STARFISH

We don't have any starfish in Alberta but because of their unique shape they are always connected to their environment through at least 5 points of contact. It's your turn to nature starfish and try to connect with your environment in at least 5 different places - each body part must be touching something different! You can use your hands, feet, fingers, bum, head, elbows, knees. "Nature Starfish" can be called out multiple times to encourage students to move and connect differently each time.





TOPIC 2

THE FOREST FLOOR

ACTIVITY NAME	LEARNING OBJECTIVE(S)	MATERIALS
We're Going on a Bug Hunt	<p>Searching for evidence</p> <p>Investigating how small creatures fulfill their needs</p> <p>Appreciate diversity in the environment</p>	<ul style="list-style-type: none"> • Magnifying Glass • Bug Collectors • Bugs and Slugs Folding Guide • Alberta Nature Guide • Insect Evidence Booklet • Notebooks and writing utensils
Tally Sticks - Representing Numbers	<p>Exploring ways numbers can be represented</p> <p>Counting using tally markers</p>	<i>None</i>
Nature Art	<p>Observing patterns in nature</p> <p>Using natural materials for art</p>	<ul style="list-style-type: none"> • Biodegradable Paints • Sidewalk Chalk • Other art supplies you might have – <i>hole punches, construction paper, glue, paintbrushes</i>

ACTIVITY 1

We're Going on a Bug Hunt

1. Brainstorm places insects like to hide (*on leaves, under tree bark, under rocks, etc.*)
2. Show students the **Insect Evidence Booklet** and explain that we don't have to see insects to know they are there! We can also look for evidence of insects.
3. Distribute **magnifying glasses** and **bug collectors**
4. Invite students to bring you the things that they find so you can help identify them using the **Bugs and Slugs Folding Guide** and **Alberta Nature Guide**, and have them share what they found with one another!
5. Create a tally chart to track what types of insects you find. Have your students sketch or draw what they find - they may be able to label parts like wings, legs, abdomen, etc.
6. Once you are done all insects need to be returned to their homes!



Remind students that insects are living things and that we need to be gentle with them and treat them respectfully

EXTENSION

- **Take photos of the insects your students find to help you catalogue and identify!**
You can use apps like *ABMI NatureLynx* and *iNaturalist* to help identify species.
- **Research what role the insects might have in the ecosystem.**
Are they a decomposer? A pollinator? A predator? A pest? You may also be able to find details on the insect's life cycle!
- **Ask your students questions about their insects habitat.**
Where was it found? What was it doing when they found it?
- **Change the words to going on a 'bear hunt' to going on a bug hunt** and use some of the insects you found to create your own lyrics.
- **Have students create a graph using the insect tally.**
- **Complete this activity multiple times comparing different seasons and/or locations.**
- Use **playdough** to make a model an insect they have found.

ACTIVITY 2

Tally Sticks - Representing numbers

Adapted from The Educator's Spin On It, "Teach Tally Marks, an Outdoor Math Lesson with Sticks".

1. COLLECT STICKS

Have each student collect 20 small sticks that are approximately the same size (*15-20 cm works best*). Use your sticks as tally markers and call out numbers between 1-20 and ask students to demonstrate the number using the sticks.

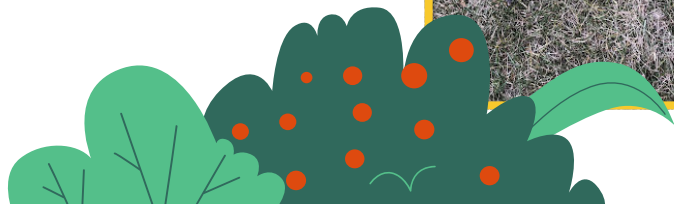
2. PLAY A GAME

One student chooses something in the area for the other student to count (*number of houses, lamp posts, benches, evergreen trees, etc*). The second student counts the number of that item they can see aloud, while the first student keeps track of the number using the tallies. Once they have successfully represented the number, they can switch roles.

Remind students to only collect branches that are already dead and on the forest floor!

EXTENSION**Use as base 10 blocks:**

A similar activity can be done using sticks as your ten markers, and small rocks as your one markers. If you are planning on counting into the hundreds, use elastic bands or string to group sticks together as hundreds.



ACTIVITY 3

Nature Art

NATURE PRINTS

Have students collect items from the forest floor that have interesting textures or patterns on them (*leaves, branches, berries, stones, pieces of bark, etc.*). Use the **paintbrushes** to coat the items in paint, and then use the items as stamps to create nature works of art.

ROCK ART / PATTERN MAKING

Students can begin by collecting rocks that are smooth and look like they would be easy to paint. Then you can decide what you want to make:

- **Students can make “pet rocks.”** Paint faces or characters on the rocks, and then find a special home to leave their rock in the forest
- **Make a class “rock snake” or “rock millipede.”** By decorating different body segments and leave them in the forested area as an art piece; you can return throughout the year to add more segments, or invite students from other classes to add to the piece!
- **Make a larger rock art project.** Use both painted and unpainted rocks or natural items to create an art piece on the forest floor. Consider arranging them into animals, nature scenes or geometric shapes.

MAKE A NATURE PORTRAIT

Give each student a blank piece of construction paper. Spend some time as a class searching the forest floor for materials that they could use to create a self-portrait. Students can make “permanent” portraits, where they glue the materials to the paper, or they can make “temporary” portraits, where they lay out their portrait, take a picture of the finished piece, and then return the supplies back to nature.



TOPIC 3

OUR CHANGING WORLD:

Climate and The Seasons

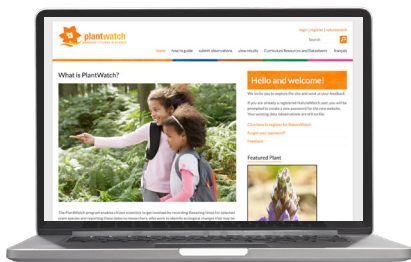
ACTIVITY NAME	LEARNING OBJECTIVE(S)	MATERIALS
PlantWatch	<p>Searching for evidence</p> <p>Investigating how small creatures fulfill their needs</p> <p>Appreciate diversity in the environment</p>	<ul style="list-style-type: none"> • Alberta Nature Guide • Whiteboard & Marker
Signs of the Season	<p>Observing seasonal changes</p> <p>Exploring properties of heat and temperature</p>	<ul style="list-style-type: none"> • Thermometer • Whiteboard & Marker
Animal Riddles	<p>Recognize the ways that living things adapt to the seasons</p>	<ul style="list-style-type: none"> • Animal Riddle Cards

ACTIVITY 1

PlantWatch

PlantWatch is a citizen science program operated by *NatureWatch* that collects observations of when certain plants bloom each spring, and uses it to help track the effects of climate change in Canada!

Whether you decide to report your results or not, going out over the course of the springtime to track when plants in the neighbourhood leaf out and flower is a great way to keep track of the seasons.



www.naturewatch.ca/plantwatch

The PlantWatch website suggests tracking common neighbourhood plants such as:



Aspen poplar



Larch



Paper birch



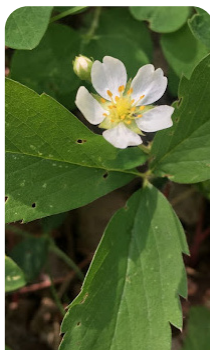
Lodgepole pine



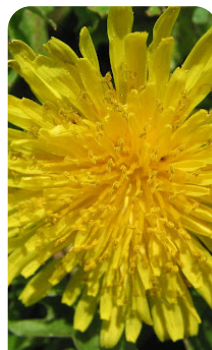
Chokecherry



Common purple lilac



Wild strawberry



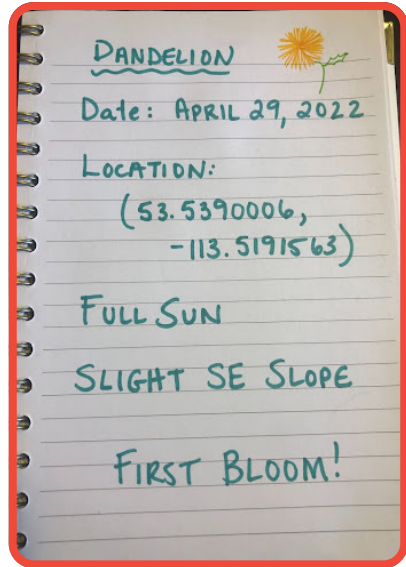
Dandelion

1. Plan to begin around April 15th, and plan to go outside once a week until your plants reach mid-bloom
2. In the first week, identify and tag the plants you are planning on visiting so that you remember which plants you are tracking. Use the **Alberta Nature Guide** and pictures in this book to help identify your plants
3. On the subsequent weeks, return to your plants and record the data about them as follows:

Date:

Location (latitude and longitude):

Amount of sun:



Record “first bloom” - when the flowers first bloom, and “mid bloom” — when half the flowers are open on a patch or shrub.

Check out the *PlantWatch* website, which provides tips on how to identify these different plants, as well as how to tell if a plant is in first bloom and mid bloom. www.naturewatch.ca/plantwatch

EXTENSION

- As a winter activity, *Icewatch/Rinkwatch* is another citizen science program operated by *NatureWatch* which tracks the freezing and melting of water bodies in temperate northern zones. Go out weekly in the fall and spring and record what you observe on a nearby river, pond, or ice rink!

— For more information on the project, visit www.naturewatch.ca/icewatch/

ACTIVITY 2

Signs of the Season

Helping students understand how to dress appropriately for the weather and the season is an important learning objective, so before heading out take time to discuss how humans change our clothes, behaviours and activities with the seasons.

PART A

- Choose a natural area close to your school and plan to visit it at least three times throughout the school year.
- Start by discussing what season it is and what you would expect to see.
- Each time you visit, have students list and/or draw the signs of the season that they observe. Keep the drawings to compare them over time.

Head outside to look for signs of the season! Start with a discussion and some brainstorming about what season it is outside, and what are some signs that we might be able to see when we go outside?

LISTEN - for bohemian waxwings trilling as they move around in large flocks! Mountain ash berries are a common winter food for these birds!



SPRING

- Plants budding leaves
- Geese migrating north
- Snow and ice melting
- Insect activity - laying eggs, becoming pupae
- Birds collecting materials for nests

SUMMER

- Plants with leaves and flowers
- Sun high in the sky
- Rabbits have turned brown
- Active insects — bees, butterflies, ladybugs

FALL

- Leaves turning gold, red, yellow, and falling off
- Cooler temperatures
- Ducks and geese migrating south
- Frost on grass in the mornings
- Sun is lower in the sky

WINTER

- Snow on the ground, water bodies are frozen
- Deciduous leaves have completely lost their leaves
- Rabbits have turned white
- You can see your breath when you breathe out
- Winter birds are active — chickadees, woodpeckers, common redpoll, bohemian waxwing
- Days are short and the sun is very low in the sky

OUR CHANGING WORLD

PART B

TRACK THE TEMPERATURE

Go out over many consecutive days and use your **thermometer** to measure the temperature!

Use your **whiteboard & marker** to record the changing findings in the field and then track the changing temperatures on a chart or graph in the classroom. You can also compare different microclimates, such as:

- Under a tree vs. in the sun
- Next to the school vs. in the middle of a field
- Under the snow vs. on top of the snow
- On the grass vs. on pavement



PART C

SHADOW DRAWING

Track how the sun changes position throughout the year by going out at roughly the same time of day throughout the year and having students draw the shadow of a buddy or of a toy or object they bring out. Why is the shadow long and skinny in January and barely there in June?



Flickr: Alan Levine

ACTIVITY 3

Animal Riddles

- Read out the **Animal Riddle Cards** to students one at a time, and have them try to guess the animal.
- If your students are readers, they can take turns giving the clues, or even turn it into a game of charades, where they act out the animal doing the action, and others have to guess.



Flickr: U.S. Fish and Wildlife Service, Northeast Region

TOPIC 4

NATURE STORIES



ACTIVITY NAME	LEARNING OBJECTIVE(S)	MATERIALS
Talking Stick & Talking Circle	Exploring Indigenous traditions	<ul style="list-style-type: none"> • Storybook - The Circle of Sharing and Caring • Collection bags
Story Starters	Using different modes to tell a story	<i>None</i>
Cree Animals Vocabulary	Language appreciation - Cree vocabulary	<ul style="list-style-type: none"> • Cree language cards
Cree Storytelling	Identifying similarities and differences Using different modes to tell a story	<ul style="list-style-type: none"> • Mink tail artifact

ACTIVITY 1

Talking Stick & Talking Circle

Read the story **The Circle of Caring and Sharing**.

Create a classroom talking stick, like the one used in *The Circle of Caring and Sharing*.

1. Head outside to find your classroom talking stick. You will need a stick 15-45 cm in length — encourage students to help find one that is already broken off and on the ground.
2. Prepare the talking stick by peeling off bark and sanding the stick until it is smooth.
3. Invite each student to choose an object to add to the stick that has meaning to them; you can go on a hunt for these objects or have students bring them from home. You can discuss why each student chose their item or what it represents — it is common to choose items that represent characteristics you would want your talking sticks to represent, for example honesty or empathy. If taking items from nature, it is customary to take a moment to offer thanks to Mother Earth for providing the item.
4. Use leather cord, ribbon, or glue to attach the items to the stick, leaving room for a handle
5. Use the talking stick during class discussions as a way to manage whose turn it is to speak and be listened to.

EXTENSION

Have students reflect on some of their favourite places to spend time outside and how the outdoors could help them in times when they are upset. Discuss if they have ever used the environment to help them handle conflict by taking a walk or spending quiet time in a favourite spot.

CHECK OUT THESE RESOURCES FOR MORE INFORMATION:



Learn Alberta -
Talking Circle:
Fact Sheet



How to Make A
Talking Stick -
RavenSpeaks

ACTIVITY 2

Story Starters



How does the land itself tell a story?

The land is a knowledge keeper and holds memory.

Take the students outside to consider what the land might have looked like in the past:

- What did the environment look like 12,000 years ago, before humans arrived in North America?
- What did it look like 500 years ago, before European people arrived in Alberta?
- Think about what would have been the same and different to the present.

Invite students to write or draw a short story about the past, present, and future of the land using the following story starters:

- A long time ago, this land...
- Today, this spot where I'm standing...
- If my grandchildren visit this place, I hope that...

ACTIVITY 3

Cree Animals Vocabulary

This book is written by an author who is a part of the Plains Cree community, and she includes many Cree words for the animals in the story at the back of the book.

Use the book and the website below to practice saying these words aloud as a group, and then have students use the **Cree Language Cards** to practice — they can be used as flashcards to practice, as prompts for charades, or even as matching cards to play Memory.



Prince Albert Grand Council -
Speak Cree



ACTIVITY 4

Cree Storytelling

Storytelling has been used by many Indigenous peoples for thousands of years to pass on culture and traditions. These stories would explain environmental trends or theories, or offer a lesson for the listeners. Storytelling occurred most in the winter and storytellers would tell the same stories more than once so that listeners can think about the story and gain new lessons as time goes on.

Show students the **weasel tail artifact**. The Cree word for weasel is “sikhos” — Sikhos is featured in Cree stories; including stories of why weasels turn white in the winter and why they are nervous and vigilant animals.

1. Share the **weasel tail artifact** with the class
 - **Look at the weasel's tail** — do they think this weasel was trapped in the summertime, wintertime, or somewhere in between?
 - **Guess what you think the weasel's fur will feel like** - will it be coarse and stiff, or soft and fluffy?
 - **Touch the weasel's tail** — it is very soft and fluffy! Weasels need to hunt for food in the snow, so they have a soft coat to keep them warm.
 - **Weasels also need to be careful because they are small animals!** What might eat a weasel? Coyotes, foxes, owls, etc.
2. Head outside and choose a plant or animal to observe.
3. Brainstorm words that describe the characteristics of their chosen plant or animal.
4. Have students choose one of the characteristics and think about WHY? Why do crows hop instead of walk? Why is a prickly rose prickly? Have them use their imaginations, and think of fable-like reasoning for their observation.
5. Once they have had time to think about their question and an answer, have students get into pairs or groups and explain to the other students the answer to their question. They can then switch pairs or groups to explain to new students, as a way to practice their story and iterate on their idea.



Story - Why the Weasel is Nervous
(Swampy Cree)



Story - The Story of wesakecāk and sikhos
(Video)

TOPIC 5

NATURE IN YOUR COMMUNITY



ACTIVITY NAME	LEARNING OBJECTIVE(S)	MATERIALS
Neighbourhood Plot Study	<p>Developing awareness and personal connection to the environment</p> <p>Categorizing observations</p>	<ul style="list-style-type: none"> • Whiteboard & Marker
Building Animal Homes	<p>Building structures out of a variety of materials</p> <p>Investigating how small creatures fulfill their needs</p>	<ul style="list-style-type: none"> • Collection Bags
Life Cycles of Neighbourhood Animals	<p>Investigating the growth & development of living things</p>	<ul style="list-style-type: none"> • Bug Collector

ACTIVITY 1

Neighbourhood Plot Study

A plot study is a method that scientists use to inventory all of the living things in an area. Plot studies are useful tools for looking at biodiversity and human impacts on an ecosystem. Turn a community walk into a plot study by collecting data about all of the living and nonliving things your students find!

SUGGESTIONS FOR COLLECTING DATA:

- Use the **whiteboard & marker** to make a group list and tally (ex. *Squirrel - III, Trees - IIII, Lawns - II*)
- Collect photos, either as a class or individually
- Draw a map & have students label where they find different things
- Draw pictures of different things you find in a visual journal, keep a tally of how many times you found those things

In the classroom, work with your students to sort your data into different categories. Some examples of categories you may wish to sort your data into include:

- Living and Nonliving things
- Plants, Animals, Fungi, etc.
- Trees, Grasses, and Shrubs
- Birds, Mammals, Reptiles, and Amphibians

Finally, explore with your students which things they found may have been put there by humans, and which things may naturally be a part of the ecosystem. For example, nonliving components of the constructed environment are easy to identify as human-made, but what about lawns, gardens, and boulevard trees? If your students made a map, can they colour code the map in natural and constructed areas?



ACTIVITY 2

Building Homes

Just like humans, wild animals also need shelter to survive. Animals often use materials found in nature, such as sticks, mud, or grasses, to build their shelters. Shelters come in all shapes and sizes and can be used to protect from weather, store food, raise young, and hide from predators. Use a collection bag to collect materials from nature to build a nest for a bird, a shelter for a slug, or if you're up for an extra challenge, you can build a bat box.

INSTRUCTIONS:

1. **BUILD A BIRD NEST** — birds use materials such as twigs, grasses, mosses and mud to build their nests. Collect your materials and build a bird nest - make sure to include a 'cavity', which is the hole where the bird sits. Some birds nest in trees, while others nest on the ground or even on the sides of structures such as bridges and houses! After you've built your bird nest, place it somewhere you think a bird might live.
2. **BUILD A SLUG HOME** — slugs need shelter to stay away from predators and stay hidden from the drying effects of the sun. Slugs like to live under leaf litter, dirt and moss, or really anywhere that stays dark and damp. Build a slugs home on the ground where a slug could find it.
3. **BUILD A BAT BOX** — bats prefer a big space with lots of smaller chambers, that gets a lot of sunlight during the day but stays very dark at night. They should be dark in colour and placed 3-6 metres off the ground, within 300 m of a water source.



Scan this QR code for detailed instructions! or visit insideeducation.ca/bat-box-design

ACTIVITY 3

Life Cycles of Neighbourhood Animals

A life cycle is the stages an organism goes through throughout its life. Even humans go through a life cycle — from baby, to child, to adult, to senior (*and the other stages in between!*). Insects provide a great opportunity to study life cycles.

INSTRUCTIONS:**→ Find a butterfly!**

Butterflies go through complete metamorphosis, which means that their life cycle has 4 stages — egg, larva (*caterpillar*), pupa (*chrysalis*), and adult. Find a butterfly in any stage of its life cycle. Remember to look on leaves for larva, and in the sky for adults.

Moths also go through complete metamorphosis, but instead of their pupa stage being a chrysalis, it's a cocoon!

→ Find a dragonfly!

Dragonflies go through incomplete metamorphosis, which means that their life cycle has 3 stages — egg, nymph, and adult. Find a dragonfly in any stage of its life cycle.

The best place to find dragonflies is near a lake or wetland! To find a dragonfly nymph, you'll need a dip net - they live underwater.

→ Find a mosquito!

Mosquitoes go through complete metamorphosis, transforming from egg, to larva, to pupa, to adult. They live underwater until they're adults.

→ Find evidence of leaf miners!

Some insects, such as leaf miners, live inside leaves during their larval stage. Find a leaf with tracks or tunnels on it.

→ Find another invertebrate and research what stage of its life cycle it's in.

Flickr: Ksblack99



Flickr: Scot Nelson

EXTENSION

LIFE CYCLE - ROCK, PAPER, SCISSORS GAME

Review the rules of rock, paper, scissors. Students move through the life cycle of different animals by playing rock, paper scissors with others at the same life cycle stage.

The winner of each round moves on to the next life cycle stage. All students begin the game by crouching down to represent an egg, the larval stage is represented by students standing up straight and the adult stage represented by flapping arms to mimic flying.

Play a few rounds and then debrief by asking the following questions:

- **Why might some larvae not make it to adulthood?**
(lack of food, predators, disease, habitat loss, weather)
- **How can humans help?**
(bee boxes, pollinator gardens, avoid herbicides/pesticides)

THE BUG CATCHER'S COMING GAME

A variation of 'Captain's Coming'.

Define the play area including the habitat that the students must stay within and the net area where they go if they are captured.

The teacher becomes the bug catcher and the students are the bugs. Students act out the insect of their choice. The bug catcher calls out actions and any bug not completing the action goes to sit in the net.

Ideas for actions include:

- **Egg** — students crouch down
- **Larva** — students stand and squirm
- **Cocoon** — spin in a circle
- **Dead Bug** — lie on the ground
- **Spider Web** — Stretch out with arms and legs apart
- **Bug Catchers Coming** — tag where the bug catcher and/or captured bugs try to tag the ones not yet captured

Add other action to personalize the game for your class!





TOPIC 6

PLANTING THE SEED



ACTIVITY NAME	LEARNING OBJECTIVE(S)	MATERIALS
Meet a Tree	Developing awareness and personal connection to the environment	<i>None</i>
Tree Characteristics	Identifying similarities and differences	<ul style="list-style-type: none"> • Paper and writing utensils
Tree Cookie Show & Tell	Investigating the growth & development of living things	<ul style="list-style-type: none"> • Tree Cookie
Leaf Rubbings	Using natural materials for art	<ul style="list-style-type: none"> • Paper and crayons



ACTIVITY 1

Meet a Tree

This activity allows students to explore nature through their senses other than sight.

1. Have students get into partners and decide who will be “it” and who will be the guide.
2. Demonstrate having whoever’s “it” close their eyes, while the guide carefully leads them towards a tree that they will get to meet.
3. Students should feel the texture of the bark, feel where there might be branches or scars on the tree, make note of the feeling of the ground beneath their feet - they can even hug or smell the tree.
4. Once they are done meeting the tree, the guide will carefully lead them away, and turn them around a few times to mix them up.
5. The student who is “it” try to guess which tree was theirs.
6. The students switch roles and repeat the activity.

Debrief with students to find out who was able to guess which was their tree, and ask how they knew, and what senses they used to determine their tree.



ACTIVITY 2

Tree characteristics

1. Begin by discussing how trees might be different from each other:
 - Colour and texture of the bark and leaves
 - Needle leaves or broad leaves
 - Long or short needles
 - Number of branches and where they are located on the tree
 - Leaves with smooth or toothed edges
 - Shape of the full grown tree
2. Have students work in small groups or pairs and select 2 trees to compare.
3. Challenge students to come up with 5 things the two trees have in common, and 5 ways that they are different - encourage students to use senses other than sight, they might want to feel the texture of the bark or smell a crushed up tree needle.
4. For added challenge, have students choose two trees of the same species and have them try to find 5 differences — they may need to look for things like holes or scars in the trunk, nests in the tree, broken branches, etc.



ACTIVITY 3

Tree Cookie Show & Tell

Choose a tree and invite students to make guesses about how old it might be. Explain that trees grow more slowly than humans, and that we can figure out how old a tree is by looking at its rings!

Show students the **tree cookie**, and explain that the first year of growth is the very middle ring (*the pith*), and the most recent growth is the outermost ring. Trees develop rings each year because they grow quickly in the summer months (*the wide, light coloured ring*), when they have access to sunshine and water, but go dormant in the winter (*the narrow, dark coloured ring*).

Have students help you count the number of rings on your cookie — remember to only count the dark coloured rings, not both the light and dark! How old is your tree?

We can learn even more about a tree's life by looking at a tree cookie! Years that had poor growing conditions — for example, years with drought might have narrow rings, but years when trees have access to all the resources they require might have wider rings. We can also look for damage caused by branches or fires or insects in a tree's rings.

Can your students learn anything about the life of your tree by looking at the cookie?

In Alberta, trees usually aren't harvested until they are at least 80 years old!





EXTENSION

HAVE STUDENTS CREATE A TREE COOKIE AUTOBIOGRAPHY

Adapted from Fun Family Crafts, “My Years, In Tree Rings”.

1. Begin by having students think about big events in their lives that made them grow or change — maybe moving houses, or getting a new sibling or pet, losing a tooth or breaking a bone. Try to come up with 5-10 different life events.
2. Help students put the events into chronological order
3. Have students draw the tree cookie, starting with the day they were born as the “pith”, and then adding rings for each event they came up with — if students think it was a little change, they can add a narrow ring. If they think it was a huge event, they can add a big ring. Have students label each ring with the event.
4. The final, outer layer should be where they are today, in your classroom!

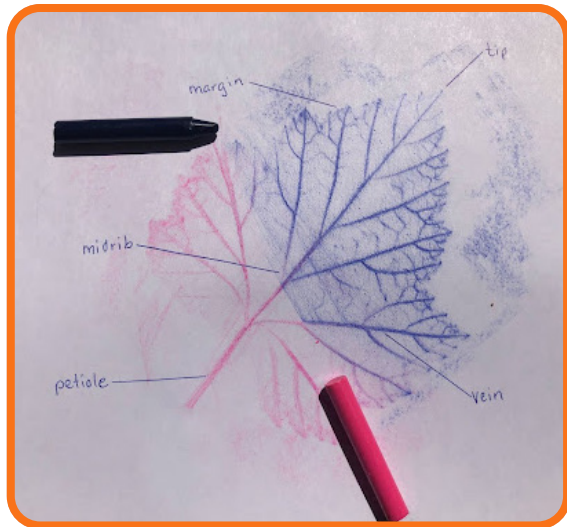


ACTIVITY 4

Leaf Rubbings

1. Take some time to collect some interesting leaves from the ground — make sure they aren't too wet or too dirty.
2. Place the leaf underneath a piece of looseleaf or journal paper, with the bottom side up — this is the side where the veins stand out better.
3. Use the side of an unwrapped crayon to colour on the paper over the place where you've put the leaf; colour just firmly enough so that you can see the outline of the leaf under the paper.
4. Try different leaves with different shapes, or even a compound leaf with many leaflets, like a mountain ash tree or prickly rose.
5. Label the different parts of the leaf:

- **Petiole**
- **Vein**
- **Tip**
- **Margin**
- **Midrib**



APPENDIX: *OUTDOOR FUN WITH SIMPLE MATERIALS*

THINGS YOU CAN DO WITH PLAYDOUGH

1. Playdough Nature Printing — students gather various natural materials such as leaves, twigs, flowers, berries, etc. and gently press the items into the play dough to create nature prints and designs.
2. Make faces that represent how students feel outside using playdough and other materials such as rocks and sticks.
3. Learn insect body parts — challenge students to make different animals out of playdough that include the different body parts of an insect or spider or other animal.
4. Sculpting observations — use playdough to sculpt the plants or animals discovered during outdoor exploration.
5. Have students create an animal track in a “pancake” of playdough (*provide references for AB animals such as wolf/cougar/bear/bird/deer/bison*).
6. Students can create the complete metamorphosis life cycle of insects such as butterflies and beetles using playdough shapes.



THINGS YOU CAN DO WITH STICKS, LEAVES AND “FOUND” MATERIALS

1. Leaf Matching Scavenger Hunt- show students different types of leaves, and have them search for ‘matching’ leaves that are the same as the ones they were shown. Discuss how leaves are the same and different (*eg. shape, colour, size*). Alternatively, students can search for leaves with certain characteristics like certain shape or colour (*eg. Can you find a yellow leaf? Oval? One with teeth?*). This activity could also be turned into a timed game!
2. Rock stacking — have students gather rocks and attempt to build the tallest tower by stacking them.
3. Using the playdough and sticks/leaves to create a mythical forest creature? How many arms/legs does it have? What animal does it look like.
4. Build a playground for an ant using natural items.

THINGS YOU CAN DO WITH RULERS

1. Have a longest/shortest competition — have students try to find the biggest leaf/rock/insect/etc. and then the smallest; have them measure to confirm.
2. Give the students a height range, and have them find and measure as many different things as they can within that range (*eg. find items that are 5-10cm tall*). Depending on the age group, include a description of the object.
3. Frog jumping game - the start line is marked out with tape or chalk. The student crouches down like a frog and jumps as far as they can. Their partner measures how far they jumped using a ruler or measuring tape. The students switch roles. To extend this activity you could also do how far they can get with 3 or 5 jumps, marking each landing point in chalk.
4. Seed dispersal — many seeds are dispersed by wind. Collect different seeds and berries to measure how far they go when blown (*use the wind, fan or even a big breath*).
5. Plant a seed and measure the growth of the seedling over time.

THINGS YOU CAN DO WITH SIDEWALK CHALK

1. Create a stewardship message or game on the sidewalk in front of the school, assign a sidewalk stone for a group of students to colour and write a way they care for the environment or an action for others to do: pick up litter, walk to school, turn off the lights in the classroom, recycle their paper products.
2. Play Pictionary outside — have one student draw a nature-themed prompt, and have the other students guess what it is!
3. Shadow drawing — in partners, have one students stand still while the other draws their shadow — this could be done as a part of the discussion about changing seasons, and done on one the cement or on the wall *or* over the course of the day. Have students trace the shadows of an object to show how the sun changes direction and length of shadows. Record the time when shadows were traced.
4. Trace natural objects such as leaves. Students can colour in their tracings to match the object, or decorate it in a fun way.
5. Draw tracks that match an animal's gait to talk about different patterns (*four-beat walk, diagonal stride, bounding, galloping*). Have students practice moving like those animals.



Edmonton Office

11428 - 100 Avenue
Edmonton, AB T5K 0J4

780-421-1497

Calgary Office

Suite 701, 615 Macleod Trail SE
Calgary, AB T2G 4T8

403-263-7720

www.InsideEducation.ca

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