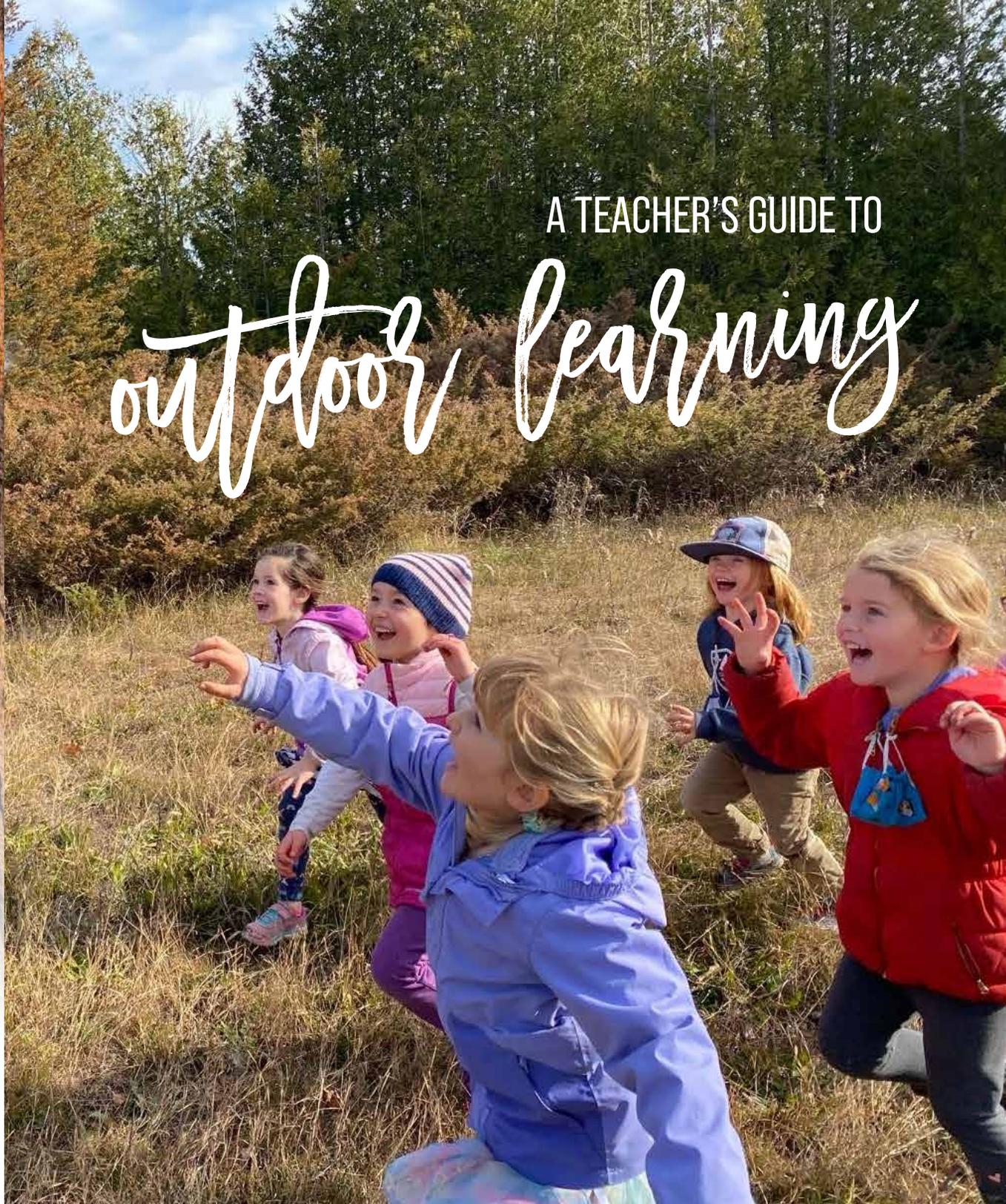


# DISCOVER YOUR SCHOOL'S BETTER NATURE

Presented by Camp Kawartha  
Written by: Jacob Rodenburg

## A TEACHER'S GUIDE TO *outdoor learning*



An agency of the Government of Ontario  
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RESILIENT COMMUNITIES FUND

A photograph of a person hiking on a dirt trail through a forest. The person is wearing a pink jacket and dark pants, and is using trekking poles. The forest is filled with tall, thin trees, and the ground is covered in moss and ferns. The word "welcome" is written in a large, white, cursive font across the middle of the image.

welcome

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"IN NATURE WE NEVER SEE ANYTHING ISOLATED BUT EVERYTHING IN CONNECTION WITH SOMETHING ELSE WHICH IS BEFORE IT, BESIDE IT, UNDER IT AND OVER IT."

GOETHE

THE VALUE OF

# outdoor learning



3

In our school system, we teach about the rest of the world from the confines of four walls. Increasingly, students learn from in front of a glowing, two-dimensional screen. Computers and in-school learning are of course valuable approaches to education, but in a world where the average child spends close to 8 hours a day on the screen, we need to balance these experiences with opportunities to explore, encounter and interact with the natural world; our "neighbourhood." So much research is showing the mental, physical and emotional health benefits of time spent outdoors and in nature. Here are just a few findings:

- *Simply breathing in air from trees has been shown to boost a child's immunity*
- *Being in a natural setting – even a schoolyard, helps increase serotonin levels, the feel-good hormone. Children feel happier being outside.*
- *Time spent outside helps to decrease cortisol (the stress hormone) which helps children to relax and has been shown to significantly reduce anxiety..*
- *Studies have shown children who spend time outdoors focus better, pay attention and are more motivated to learn after returning to the classroom. They are cognitively more flexible, tend to be more creative and have demonstrated improvement in problem-solving abilities and academic performance..*
- *Even moderate physical activity – like walking and exploring - gets the blood pumping and improves mental health. Frequent excursions outside reduce obesity rates and associated health risks.*
- *Children who visit the same outdoor spaces over and over again develop a better sense of community and an enhanced sense of connection to nature.*
- *Time spent outside leads to improved cognitive flexibility, maturation and creativity, including developing the abilities of analysis, synthesis and evaluation.*

Sources: Child and Nature Network, Last Child in the Woods by Richard Louv, ParicipACTION – The biggest risk is keeping kids indoors.





THOSE WHO CONTEMPLATE THE BEAUTY OF  
THE EARTH WILL FIND RESERVES OF STRENGTH  
THAT WILL ENDURE AS LONG AS LIFE LASTS."

**RACHEL CARSON**

## IT IS OUR *Hope* THAT

- Through our workshops, the sharing of resources, and this guidebook, you'll begin to view your school ground and nearby green spaces as an extension of your classroom.
- You as an educator, as well as your students' parents and administrators will feel comfortable taking students outside.
- You'll learn strategies, activities and classroom management techniques to make outdoor learning meaningful and relevant to your students.

## *Where* IS NATURE?

We tend to view nature as "over there," away from our built environment. Many of us think that it resides only in Provincial Parks and Conservation Areas. Remember this - nature and natural processes are close at hand. Nature is in the "weeds" that press their way through cracks in the pavement. Nature is that line of ants crossing the school walkway. Nature is in your school field or in the trees along the fence line. It can be found in the beds of flowers at the entrance to your school. It also can be found in nearby municipal parks, vacant lots and of course, your school yard.

“LOOK DEEP INTO NATURE AND YOU’LL  
UNDERSTAND EVERYTHING BETTER”  
ALBERT EINSTEIN

BEFORE YOU  
*go outside*



1. Make sure you have permission from your administrator. If you are going off school grounds, have parents complete a sample permission form (see appendix A). This one form can provide permission for you to take your students within a defined area for the duration of the school year.
2. Here is a list of recommended equipment. We suggest you keep these items in a designated bin or backpack.

#### **For the Teacher:**

- Cell phone or two-way radio that is fully charged
- A designated gathering signal (whistle recommended)
- Backpack for bringing along extra equipment (see below)
- Bandana (for establishing a boundary). Tying a bandana around a tree and saying that students must be able to see this at all times, is a simple way of keeping students in one area while doing activities)
- First Aid Kit
- Sunscreen
- Water Bottle
- Insect repellent
- Magnifiers and small containers for sharing discoveries (for example, yogurt containers, egg cartons, small jam jars)
- Field Guides (perhaps available at your school library)
- Note: You can borrow a wagon with field guides, nets and other educational material from the Pathway Project: [www.pathwayproject.ca](http://www.pathwayproject.ca)
- Camera (or use your phone)
- Dress for the conditions. Think about dressing in layers: hat, sweater, jacket, boots, gloves (if necessary). You can always peel layers off and place them in your backpack.



### For Students:

- Backpack (for carrying equipment).
- Encourage students to dress for the weather. See the dress for the weather section in this document. Students should wear long pants, socks and closed toed shoes if possible.
- Clipboard (you can simply laminate cardboard and use a bull clip)
- Goose Paper (Good on one side – for taking notes)
- Nature journal (a spiral bound notebook would work well)
- Water bottle
- Rain jacket (or garbage bag as a substitute)
- Whistle (in case of an emergency)
- Laminated set of instructions of what to do in case of an injury or emergency

### Optional Items:

- Sit Upons – For example, small foam seats made from old yoga mats cut up to 16" in length, so that students can sit down in comfort, even when it is damp.
- Tarp and ropes – to set up in case of rain or strong sun
- Insect Nets – perhaps have one set for the school
- Binoculars – one set for the school. These can be borrowed from the Pathway Project [info@pathwayproject.ca](mailto:info@pathwayproject.ca)



## outside

“THE EARTH HAS ITS MUSIC FOR  
THOSE WHO WILL LISTEN.”

ANONYMOUS



**Volunteers:** You can ask if any parent volunteers might be available. The Pathway Project (see page 10) may be able to provide you with the names of potential volunteers from the Peterborough Field Naturalists who are willing to lead an outdoor excursion.

**Contact** [info@pathwayproject.ca](mailto:info@pathwayproject.ca)

**Discuss routines before you go outside:** Make sure students are clear about what this experience will look like. Explain a basic code of conduct. Here are some examples:

- a. *While we walk, we stick together*
- b. *When I use the whistle (or another signal), you must gather quickly around me*
- c. *We want to practice respect for each other and for the environment. That means:*
  - You'll listen to me when I'm speaking, and I'll be sure to listen to you when you have something to say. We'll speak one person at a time so that everyone has a voice, and this voice can be heeded.
  - No horseplay, rough housing or hitting with sticks, rocks
  - We won't damage the environment. That means we won't be breaking branches, pulling up wildflowers, stepping on insects or ripping off leaves. We may harvest tiny bits of nature, but if we do so we'll express gratitude and where we can, we'll practice reciprocity by giving back (planting seeds, picking up litter, rewilding a section of the school ground)
  - If a student acts inappropriately, have a process for dealing with this that is clearly understood. Every school is different and each teacher has their own approach to dealing with behavioural issues. The more students are familiar with this process and the more consistently it is followed, the fewer challenges you'll have.

# outside



## Check the Weather before you go outside:

- Download a weather tracking app: Environment Canada and The Weather Network are excellent applications to monitor temperature and weather conditions. You'll also receive severe weather warnings.
- Have a severe weather protocol in place (cancellation of programs, a designated shelter space, emergency meeting areas)
- Some preventative weather tips:
  - Extreme Heat:
    1. Stay hydrated – ensure access to water. Establish a routine of taking in water – sip together often
    2. Wear hats – students, volunteers, teachers
    3. Find shade and talk there
  - Wind and Storms: Monitor wind conditions, watch for severe thunderstorm and tornado warnings. Have a designated emergency spot.
  - Extreme Cold: Dress in layers. Monitor exposed skin. Bring extra gear (socks, mittens, hats). Have a designated shelter area.
  - Wet Weather: Dress in layers – waterproof outer shell (bottom and top). Rubber boots if possible and rain hat. Monitor the weather. Find a sheltered area.



**Scout the Area before you use it:** If this is a green area away from the school, make sure you do a quick review to make sure there aren't any hazardous items (needles, trash, glass).

- a. *Poison Ivy: Get to know what poison ivy looks like and avoid areas where this is growing. Leaves of three with variable edges – some smooth, some slightly pointy. Middle stem longer. Clusters of white or greenish berries. Grows as sprawling plant. Spreads by rhizomes (or roots). Reactions are caused by an oily residue called urushiol. If you suspect you or a student have come into contact with poison ivy – wash the area with soap and water as soon as you can.*
- b. *Ticks: Though ticks (and Lyme Disease) are not very common in this area, there have been a few ticks reported in Peterborough County. Lyme disease can become a serious infection caused by a bacteria spread by the bite of blacklegged ticks (also called deer ticks). Practice doing a quick TICK CHECK if you are exploring in long grass or woods. This helps students to build solid routines around tick awareness and Lyme disease prevention. For more info: <https://www.peterboroughpublichealth.ca/your-health/insects-rodents-other-pests/ticks-and-lyme-disease/>*

**Think about “affordances” before you plan your lesson.** Bert Horwood, an outdoor educator and professor from Queens University in Outdoor and Experiential Education, coined the term “affordance” – meaning the land is always affording opportunities for learning.. A meadow can lend itself to investigating insects, wildflowers and seed dispersal. A forest, or even some trees, lend themselves to exploring trees, habitats, soil types and animals. Just having an idea of what your natural area is like will provide you with clues about what to teach there.

**Bathroom Break:** It may seem obvious, but it is worth mentioning that a bathroom break before you head out may prevent the inevitable “I need to go to the bathroom” comment so urgently made by students once you’ve arrived at your destination.



"NATURE IS NOT JUST A  
PLACE TO VISIT, IT IS HOME."

GARY SYNDER

# PATHWAY TO Stewardship AND Kinship

To help you on your Outdoor Teaching journey, consider integrating the Pathway to Stewardship and Kinship Program into your teaching. The Pathway Program helps to foster healthy children for a healthy planet. Through simple, age-linked **"Landmark" activities** that grow with them, children gain vital tools for physical and mental health, and lifelong relationships with each other and with nature that bring joy and meaning to life.

For more information visit: <https://pathwayproject.ca>

When families, schools and the community work together to give these experiences to every child, the benefits are deep and lasting – for all of us, for future generations, and the world we share.

Pathway Landmarks are linked to the Ontario Curriculum for each grade.

They include opportunities for outdoor learning, for older grades, encourages community involvement and helps to develop leadership skills.

Educators can register as a class or group to showcase what you're doing and share ideas with others. Pick a team name and get started anytime! When you register and report what you're doing, you will see yourselves on our School and Group Leaderboard in the Activity Centre. Collect seasonal points, based on your efforts. Need ideas? See what others are doing. Need help? Check out the dropdown 'Resources' section for each Landmark on the website's 'Landmarks' page, <https://pathwayproject.ca/landmarks> and the many helpful videos in the 'Video Centre' <https://pathwayproject.ca/landmark-videos>.

There are also periodic workshops for educators on many different topics. Make sure you're on our mailing list to hear all about them.

“ONE TOUCH OF NATURE MAKES  
THE WHOLE WORLD KIN.”  
WILLIAM SHAKESPEARE

TIPS FOR  
TEACHING

outdoors



1  
1

**Inquiry Based Learning:** Often teachers are intimidated by taking kids out into nature because they feel they don't know enough about the natural world. Here is the thing. You can explore, discover and learn together. You don't need to be an expert. You just need a healthy sense of curiosity. After all, curiosity is the engine of learning. Using a teaching strategy that emphasizes inquiry-based learning in nature not only engages students, but helps them to cultivate a sense of wonder and awe for the natural world. Being candid by saying "I don't know the answer to that question, but let's find out together" is a perfectly legitimate response and lets students know that you are always learning as well. In this guide we'll provide some useful resources that will help you learn more about how to find the answers to the questions you and your students might have.

**Sense of Place:** We all yearn to belong, to our families, our friends and our communities. But we need to feel a sense of belonging to nature as well. Could it be that our children are feeling a sense of loneliness and alienation because they feel disconnected from the very life systems that nurture and sustain us all? By going to the same places over and over again, we begin to build a relationship between our students and the places we share with our natural neighbours. And like any relationship, it takes intention, mindfulness, compassion and effort. So take the time to visit special places and to foster a positive relationship between your students and nature.

**Indigenous Ways of Knowing:** There is so much to learn from Indigenous perspectives about how to have a positive relationship with the land. Robin Wall Kimmerer's book *Braiding Sweetgrass* is a wonderful place to start. Your Board's Indigenous Education Consultant can also provide you with ideas and resources to help you infuse Indigenous Ways of Knowing into your teaching and learning.



TIPS FOR  
TEACHING

outdoors

**Language:** Be careful about how you speak about nature. Even if a spider makes you uncomfortable – be positive and affirming. Avoid using “yuck” language. Everything in the natural world has a role to play and merits respect. Use the language of wonder, awe and beauty. Try to personalize the landscape. By doing so – we avoid students imagining the land as only a place where we find resources to fulfill human needs. That might be “grandfather rock” because it has been there for millions of years. That tree might be the “heart tree” because it has a hole that is in the shape of a heart. By giving the land character, we begin to animate it – to give it life and to help students recognize that it has been there for eons and hopefully by engaging in acts of stewardship, the land will continue to thrive for countless eons to come.

**Sensory Awareness:** Some people have argued that in today’s modern world, our children are suffering from a measure of sensory anesthesia – a dulling of their senses. When they spend more than 7 hours in front of a glowing screen per day, the only senses activated are those of sight and hearing. Remember this - time spent in nature with all of our senses tuned and primed, helps us to feel more alive and connected to the world around us. By immersing ourselves and our children again and again in natural spaces – we’ll come to cherish them not just as places to go, but as places we belong to. And in belonging, we feel more complete. In this guidebook you’ll find activities that help enhance your student’s sensory awareness of the natural world.

**Exploration:** Kids are born explorers – so let them. You don’t always have to be the purveyor of information. Kids learn best by discovering. You can easily harness their desire to find out more about what is in their environment by providing seasonal scavenger hunts, nets and jars, hula hoops, exploration dice and more. In this guide, we’ll provide hints on how you can encourage and manage your students while exploring the beauty of nearby nature.

THERE IS A WHOLE WORLD OUT THERE, RIGHT OUTSIDE  
YOUR WINDOW. YOU'D BE A FOOL TO MISS IT."

CHARLOTTE ERIKSSON

# outdoor

THEMES



**Integrated teaching:** The good news is that one visit outside can meet a variety of curricular expectations in many subject areas. That way you can get a lot more mileage out of each outdoor excursion. Outdoor learning lends itself to language, history, math, social studies, physical education and more. One of the best places to start is by visiting the Ontario Ministry of Education's document entitled Environmental Education: Scope and Sequence of Expectations (Elementary) [http://www.edu.gov.on.ca/eng/curriculum/elementary/environmental\\_ed\\_kto8\\_eng.pdf](http://www.edu.gov.on.ca/eng/curriculum/elementary/environmental_ed_kto8_eng.pdf)

In here you'll find expectations related to the environment in every subject area for each grade from Kindergarten to grade 8. In most cases any learning experience in the outdoors will have relevant curriculum connections. For example, use trees in your school ground for art - stained glass windows, leaf rubbings; for science - doing leaf chromatography to discover the pigments in leaves that reveal themselves masked by the green chlorophyll; for math - apply the Fibonacci Sequence to discover the branching pattern of leaves; for social studies - explore how First Nations used trees and wood as part of their culture; for language - create nature journals to write about the story of a particular tree; for physical education - use drama and movement to recreate how a tree uptakes carbon, gives out oxygen and releases chemical signals through the mycelium connected to the root systems (yes trees can "talk" to each other).

By organizing your teaching and learning around themes – you'll be able to cover many expectations while providing students with associated mental and physical health benefits of time spent outside.



**Below you'll find tried-and-true outdoor activities used by Camp Kawartha Staff.**

**Action Projects:** In the field of environmental education, well meaning educators want to focus on reducing our harm. And that makes sense. There is a lot to be worried about, from climate change, to pollution, from over population to species depletion. But from a kid's point of view, they just want to know simple and tangible ways that they can create a better, greener world. That is where hope resides. As educators, we need to think about agency, that means empowering our students to work on those problems that they have the motivation, commitment and ability to solve. One simple way to do this is engage in acts of regeneration. We often talk about sustaining – but that term implies a steady state, not making things better. Instead of doing less harm, let's strive to do more good. Let's work together to create nature-rich places where both people and nature can thrive. Here are a few simple ways to help you and your students accomplish this.

TRIED AND TRUE

*activities*



"WHEN WE TUG AT A SINGLE THING IN NATURE, WE  
FIND IT IS ATTACHED TO THE REST OF THE WORLD."

ADAPTED FROM JOHN MUIR

# BIRD feeder



**Set up a Bird Feeder:** If you are on the ground floor and have windows facing some green space, purchase a simple stick-on bird feeder (for about \$25). Fill this with black oil sunflower seeds (the kind of seeds most birds like, especially chickadees, blue jays and cardinals). You can obtain a simple bird poster from Project Feeder Watch <https://feederwatch.org/learn/identifying-birds/download-feederwatch-posters> In a short while, birds will begin to come. And if you stock the feeders regularly the birds will feed even when students are right next to the window. Use the poster to identify what birds you see. Here are some inquiry-based questions:

- Ask students to begin observing bird behaviour.
  - Is there a difference in feeding habits (for example chickadees taking a single seed and flying into the trees to peck it open versus a blue jay who stuff seeds into its crop and hides them for later)?
  - Can you tell the difference between a male and female? For example, male and female chickadees look the same while cardinals have distinct colour differences (sexual dimorphism)
  - How do they fly? Some birds flap continuously, others flap, glide, flap.
  - What does the shape of the bird, its beak and its wings suggest about where it might live? With their broad wings, red tailed hawks tend to soar over fields, while the sharp shinned hawks hunt in forests with their shorter more rounded wings.

# naturalize



Work with your administration, parent council, custodial staff and your students to create a plan to naturalize a section of your school yard. Start very small (perhaps a patch that is the size of a small room) and build on your successes. Edmison Heights has a well-established naturalized area started by Drew Monkman. There are plenty of resources to help you with this including funding: **To start go to: <https://eccdc.org/naturalizing-play-spaces/funding-sources/>**

## In your naturalized area think about including:

- Native species that are food sources of birds, butterflies and mammals
- Bird, toad and butterfly houses
- Boards for salamanders
- Places for students to sit and observe
- As a project for students, creating simple field guides
- A sheltered area

**Rewild:** A typical schoolyard has a massive expanse of mown lawn. That is great for students to run and play but not so great for wildlife. By simply allowing a corner of the yard to grow back, you'll be inviting pollinators, birds and wildflowers back into this space. You don't have to do anything except convince the custodial staff that this area should be left alone. To show just how much life there can be in this small space, have students throw a hula hoop on the mown lawn and record all the different kinds of life you observe. Now have them throw the same hula hoop in the area that has been rewilded. You'll notice an incredible difference!

“GRATITUDE IS A STATE OF BEING IN WHICH WE FEEL CONNECTED TO EVERYTHING IN THE UNIVERSE. IT IS A FULLNESS OF THE HEAR THAT RECOGNIZES THE BLESSINGS OF NATURE WITHIN AND WITHOUT”

DEEPAK CHOPRA

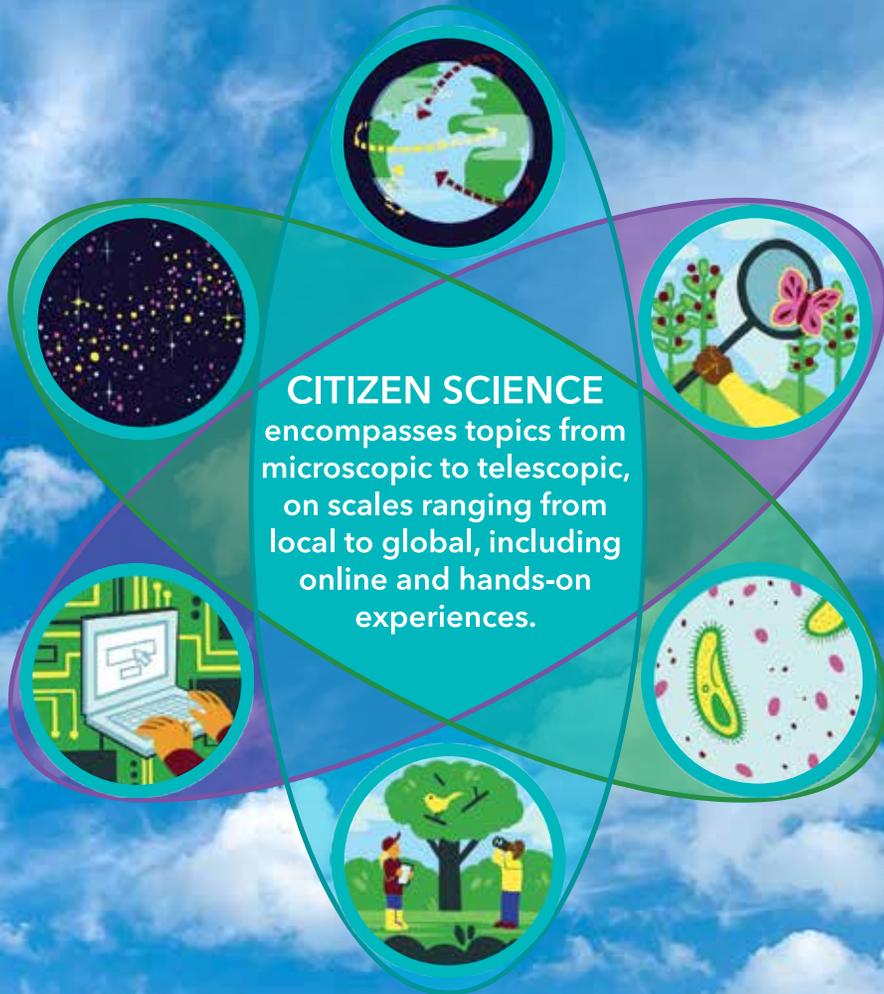
# growing PLANTS



**Growing Plants:** Even if your classroom is located in a heavily urbanized area, you can grow plants and watch how they change over time in your windowsill. Even a small box garden in the school grounds can offer wonderful learning opportunities. Here are a few suggestions:

- To create a living wall - Take 2 litre pop bottles. Lay them on their side. Using scissors cut away the top third. Fill with potting soil and plant with seeds such as lettuce and herbs. Hang them by some twine. Water once per week. <https://theverybesttop10.com/transform-empty-plastic-pop-bottles/>
- Indoor Planter box – Make a small wooden box that fits in front of your windows. Or purchase them from your local hardware store. Again, fill with potting soil and sprinkle in seeds. You might conduct an experiment to find out which window provides the best yields.
- Outdoor Planter Box – Have the students design and build a simple planter box for your school’s garden. A good size to start with is 4 feet x 6 feet. In spring, plant fast growing herbs and lettuce. <https://www.weedemandreap.com/best-material-for-raised-garden-boxes>. Make sure there is something to harvest before the students leave for summer break. You might start off your seedlings in April inside the classroom. This is also a wonderful opportunity to create a pollinator garden. Many local pollinators are struggling (solitary bees, butterflies). By planting a few nectar rich native species, you and your students can help to increase biodiversity. Think about planting: purple coneflower, common milkweed, bee balm, wild bergamot, butterfly milkweed, joe pye weed, coreopsis, new jersey tea, black eyed susan, potentilla, chokecherry, nannyberry, service berry and dogwood.

# CITIZEN science



**Citizen Science:** You and your students can become scientists. How? By becoming involved in the rapidly expanding field of “Citizen Science.” This is scientific research conducted in whole or in part by volunteers, usually with no formal background or experience in the area. A wide variety of projects provide the opportunity for your students to participate in important research and, in the process, to learn more about nature, science, and conservation. Citizen science projects encourage you and your students to look more closely and really pay attention to all that surrounds you.

A great way to start is by visiting [www.scistarter.com](http://www.scistarter.com) where you can search for projects based on different criteria, including suitability for children. Hundreds of projects are catalogued. You’ll find everything from monitoring fireflies to reporting on butterflies. Some of the most popular projects include:

- iNaturalist: A great app that helps students keep track of their observations and with the help of experts, helps them identify what they’ve found <https://www.inaturalist.org/>
- eBird: Helps track bird sightings <https://ebird.org/home>
- Project Squirrel: All about squirrels and reporting on them <https://projectsquirrel.org/index.shtml>
- Journey North – Track the migration of Monarch Butterflies and other migrants. <https://journeynorth.org/>
- Canadian Citizen Science portal: [https://www.ic.gc.ca/eic/site/063.nsf/eng/h\\_97169.html](https://www.ic.gc.ca/eic/site/063.nsf/eng/h_97169.html)
- Ontario Community Science Program: <https://ontarionature.org/programs/community-science/>
- Water Rangers. All about water: [www.waterangers.ca](http://www.waterangers.ca)
- Colony b. Focused on microscopic life: [www.csb.cs.mcgill.ca/colonyb](http://www.csb.cs.mcgill.ca/colonyb)
- Great Backyard Bird Count. All about native birds: [www.gbcb.birdcount.org](http://www.gbcb.birdcount.org)
- Nature Watch. Nature in general: [www.naturewatch.ca](http://www.naturewatch.ca)
- Bat watch. All about Bats: [www.batwatch.ca](http://www.batwatch.ca)
- Bumble Bee Watch. All about bumble bees: [www.bumblebeewatch.org](http://www.bumblebeewatch.org)

# nature APPS



Here are a few tried and true nature apps. Be cautious not to be overly dependent on screens. They are a tool and shouldn't replace the actual experience of observing nature. There is a tendency in the modern world to default our memory to our devices. After all, we can look things up in seconds. And yet, we know things differently, more deeply and intimately when we commit them to our own memory. Have students memorize a few common native mammals, plants, insects, birds and a story about them – just as they would remember the names and character of their own friends.

At the same time, there are some great nature apps that will help your students to learn more about the natural world. Just search for them on your apps store. Some are free while others you can purchase for a modest sum. Just type the name of the App cited below into your App search icon.

- **BIRDS** - Merlin Bird ID (walks you through ID process and its free), Audubon Birds, iBird Pro, National Geographic Birds, Peterson Birds and Sibley eGuide for Birds, BirdsEye Bird Finding Guide
- **MAMMALS** - MyNature Animal Tracks, Audubon Mammals
- **AMPHIBIANS & REPTILES** - Audubon Reptiles & Amphibians
- **TREES & PLANTS** - Audubon Trees, MyNature Tree Guide, Leaf Snap, TreeBook (beginner), FloraFolio, Audubon Wildflowers, Arbor Day Tree Identification Guide, Botany Buddy, Beesmart (native plants for pollinators)
- **INVERTEBRATES** - Audubon Insects & Spiders, Audubon Butterflies
- **FISH** - Audubon Fish, Find-a-Fish
- **FUNGI** - Audubon Mushrooms
- **ASTRONOMY** - Star Walk, Skyview, Google Sky Map
- **GEOLOGY** - Rockhound
- **RECORDING SIGHTINGS** - iNaturalist, Project Noah Journey North, Sci.Spy, WildObs Observer
- **WHERE TO GO?** - Parkfinder, EveryTrail, Trailhead
- **EVOLUTION** - NHM Evolution
- **FOR KIDS** - Nature Tap, Hippo Season, Parts of Plants, Parts of Animals, Backyard Scat and Tracks

EXPLORING

nature

**Exploring Nature:** Plan time to explore the environment around your school. You'll find students have a keen eye and an enthusiasm to share discoveries.

Here are a few simple exploration strategies:

**Scavenger Hunts** – There are plenty of nature scavenger hunts available online. Under images simply search "nature scavenger hunt." We've provided a few examples for you along with a Nature BINGO card. See Appendix .

**Exploration Dice** – Here is a wonderful activity that bounces you around the landscape in unexpected ways. Find two large blocks (wood or cardboard) (6 inch / 15 cm by 6 inch /15 cm cubes). On one, place a direction on each face — N, S, E, W, NW, SE. On the other place 6 numbers: 4, 8, 12, 16, 20, 24. While walking, roll the dice. Using the compass (or your own sense of direction), walk with students in the direction and number of paces indicated, for example, NW for 12 paces. Then say: "hunker down." Ask the students to find something interesting near where they are crouching. These dice will take you to places you might never have discovered. And there is always something interesting to discover: a beetle, browse marks, a hole, a flower, an animal track.

"LET'S TRY TO LEAVE THE EARTH A BETTER  
PLACE THAN WHEN WE ARRIVED"

SIDNEY SHELDON

# micro TRAILS



**Micro Trails:** "Einstein once said "Imagination is more important than knowledge. Imagination is the language of the soul. Pay attention to your imagination and you will discover all you need to be fulfilled." Encourage your students to use their imagination and shrink yourselves down to the size of an ant. What would the forest look like if you were only a fraction of an inch tall? What points of interest might capture your attention? Perhaps a funny coloured mushroom, a chewed leaf or an interesting groove on a fallen log?

- For each group of 3 or 4, hand out 10 to 20 Popsicle sticks and about 30 feet (10 meters) of colourful yarn or string. Using these simple materials, have your students create a micro trail. Encourage them to find at least eight points of interest no more than a few steps from each other. They might find an interesting hole in the ground, a spider's web or an animal track.
- Beside each point of interest, press a Popsicle stick into the ground (a nature stop). Connect all the points with the yarn by wrapping it a couple of times around each stick and extending the string to your next Popsicle stick until all points are joined in one long line. This becomes your micro-trail.
- When students are finished, have them sit down and quietly watch the trail for a few minutes. If you have them, use magnifying glasses or hand lenses and really study things up close. Have students take another group along their micro-trail and give them a guided tour of their discoveries!





## CLOTHES *pin view*

### Clothes Pin View:

We often forget how nature can change so rapidly. When we go for a walk, we tend not to notice what is right in front of us. To truly appreciate how quickly the natural world changes over time, try this with your students:

- During the spring or fall, give students a clothes pin and have them write their name on it. Clip your clothes pin to a tree bud during spring or clip it to a green leaf during late summer, just as the forests are about to change colour. Visit your clothes pin each day and notice how your bud or leaf transforms. If you can, take a photograph of your bud or leaf every day. By focusing on one particular spot in the natural world, we begin to appreciate the beauty yet ephemeral nature, of seasonal change.

"IN EVERY WALK IN NATURE, WE  
RECEIVE FAR MORE THAN WE SEEK."

ADAPTED FROM JOHN MUIR

SIMPLE NATURE

# games



2  
3

## Simple Nature Games:

Key Concepts:

- i. Adaptation – What living things have (physical attributes) and what they do (behavioural attributes), to help them survive
- ii. Stalking – a silent mode of hunting
- iii. Predator and Prey relationships

**The Fox Hunt:** This is one of our favourite games. A wonderful and engaging way to illustrate adaptations in action. Explain some of the remarkable adaptations of a red fox (*vulpes vulpes*). With their sensitive nose, a fox can smell 10,000 times better than a human. Foxes often hunt in the evening and one of their favourite hunting grounds are meadows. They are looking for mice, rabbits, voles, chipmunks – anything that isn't too big. Foxes are slender bodied, have semi-retractable claws, light bones and soft pads on the bottom of their feet. They hunt by placing one foot directly in front of the other so that their tracks look like they walked on the edge of a 2 x 4. They are the quintessential quiet stalker. Their ears, like satellite dishes, are perked and able to pick up the faintest of sounds. Foxes hunt upwind. Whenever they think they might be seen, they slink down in the long grass and hide.

This game is a modification of red light and green light.

- a. Select a student to be a cottontail rabbit. Have them walk about 30 meters away from the other students. Place a small stone in front of the rabbit. Explain that this cottontail needs to eat but it also needs to look out for danger. The cottontail places its head down to eat and whips its head up to look for danger.





SIMPLE NATURE

# games

- b. Have the rest of the students line up shoulder to shoulder (paw to paw) in a line 30 meters away, facing the cottontail. Have each fox hunker down on all fours. Each time the cottontail lifts its head, the foxes sink down into the grass and they freeze. Instinctively, animals (both predator and prey) will freeze in place when they think they've been spotted.
- c. Each time the cottontail lifts its head and sees a fox move, even just a bit, that fox must retreat back to the beginning line. The successful fox will have made their way to the stone and pounced on it to simulate a successful hunt. Switch places so the fox becomes the cottontail.

**Bat - Moth:** Here is a tried-and-true game based on that childhood staple "Marco - Polo."

Remind students how bats hunt – They send out a stream of high-pitched sonar waves that help the bat "echo-locate" their food. This game does a wonderful job of replicating how sonar helps bats to pinpoint the exact location of their food, when they are flying at night.

- Select one volunteer to be a bat and another to be a moth. Have everyone else make a large circle facing inward. Their arms should be stretched out so that their hands, when extended, are about half a meter from the person to next to them. These folks will serve as your "cave walls."
- Blindfold both the bat and the moth. Explain that it is now dark outside and neither of the bat nor the moth can see very well. In this game, the bat's job is to "catch" the moth.
- In real life, a bat would send out a series of high-pitched sounds and listen for the sound's return – zeroing in on the moth. When located, they would then scoop out the moth with either their tail just like a catcher's mitt and transfer it to their mouth, or they would smack the moth with their wing into transfer it to their tail and subsequently into their mouth. Interestingly, a single bat can eat up to 1,200 mosquitoes in one hour and up to 8,000 of them in one night!

SIMPLE NATURE

# games



2  
5

- To show how echolocation works – have the bat say distinctly “bat” loudly and clearly. Every time the moth hears the bat say “bat”, it must say equally loudly and clearly “moth” (to show how the sonar pulse is being reflected back to the bat). If either the bat or the moth venture too closely to the cave walls, have the walls gently say “wall,” so there aren’t any collisions.
- Now ask the bat to try to tag the moth. After a short while, ask the bat to experiment by increasing the frequency of their call. Does this help them track the moth more effectively?
- If you like, add another moth to the game. Some moths have evolved to start evasive manoeuvres if they hear a bat’s sonar. They’ll begin dive-rolling and zig zagging, trying to move in an abrupt and unpredictable fashion. Can the moth try some evasive moves to confuse the bat? Some species of Tiger Moths have evolved to “jam” the bats sonar by making a series of disruptive clicks using a special organ in their thorax called a tymbal.
- Biologists have called the bat/moth predator/prey relationship a kind of arms race as each evolve ever more complex methods to catch prey and to avoid being eaten.



## QUICK FROZEN

## critters



**Quick Frozen Critters:** Adapted From Project Wild Theme: habitat loss

This is a wonderful game, which illustrates habitat loss in both a graphic and memorable way. A complete description of this activity can be found in Project Wild. This is a wonderful course you can take with an accompanying resource book full of nature activities, games and ideas. For more information visit: <https://cwf-fcf.org/en/explore/wild-education/?src=EL>

**Equipment:**

- approximately 8 hula hoops
- 4 pylons
- food tokens (e.g. - Popsicle sticks – at least 4 for each student)

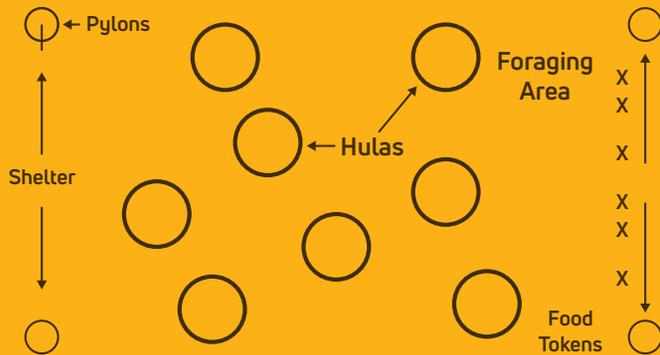
**Set up the playing field as follows** (see diagram, right):

Explain that all living things require the following: food, water, shelter, space. All of these can be found in this game. Food is the food tokens (popsicle sticks) which represent berries, roots, leaves, mushrooms etc. Sprinkle a generous amount of popsicle sticks between the two foraging pylons (see diagram above). A sheltered area is the space between the two pylons – this might be a hole in the ground, a hole in a tree, a thick bush etc. These are also represented by the hula hoops (trees, bushes, thick grass). Scatter the hula hoops between the four pylons. Water can be found in the food that is eaten, in small puddles after a rainfall and in lakes and streams.

In this game students are taking on the role of herbivores such as rabbits, voles, chipmunks, deer etc. They begin in their “SHELTER” area between the first two pylons. They need to be able to move to their “FORAGING” area (between the last two pylons) where their food (popsicle sticks) is located. The object of the game is for students to grab one Popsicle stick (food) and to return to their “SHELTER.” In the natural world, an animal’s shelter is usually separate from the area in which they feed (foraging area).

Unfortunately, there are two predators lurking in the playing areas (yourself and a volunteer). Your job is to hunt herbivores. The predators do so by tagging them. If a herbivore is tagged, they must stand to the side. Herbivores can escape predators in two ways:

## PLAYING FIELD EXAMPLE



# THE game

- They can “freeze.” Many prey animals escape detection in this way. Freezing only works, however, when there is sufficient cover (in this case – long grass). If an animal stays stock still for at least 5 seconds the predator will move on to another prey.
- They can hide in a thicket (hula hoops or tires). Only two animals to a hoop.

Blow a whistle and have the herbivores begin to move towards their prey. Stop the game when all the animals have returned to their shelter. The “dead” animals can re-enter the game (these are the young from last year). Ask how many herbivores used the thickets.

**Second Round:** Because this is such a beautiful area, announce that “your name” Incorporated (or whomever) has decided to build a housing subdivision in this natural community. Bulldozers removed thickets to make way for the development. They had to remove topsoil to place water and sewage pipes, they needed to make roads, lighting, houses and driveways. It is important to emphasize that development isn’t necessarily bad – people need places to live too. But perhaps we can be thinking about wildlife when we develop urban areas. Take away 3 hula hoops to illustrate that there isn’t the cover (shelter spots) there once was. Play another round. What happened?

**Third Round:** The subdivision was very successful so “your name” Incorporated decided to construct a small strip mall. More thickets were removed to make way for the mall and a parking lot. Take away the remaining hula hoops and play the third round. What happened?

Because there are no longer enough thickets, students are not allowed to freeze (there is no long grass left to hide behind). What happens to habitats when humans build their communities? What can we do to provide habitat for animals? Answer: leave habitats and create new ones.

**Last Round:** Have an ecological restoration team rewild backyards, create a few parks, and make green connecting spaces. Explain that healthy places to live must also be healthy for wildlife. In Canada, more than 200 hectares are lost each day due to urban sprawl and agriculture. Over 50% of the Earth’s biodiversity has been lost since the 1970’s. We can help regenerate and restore the natural world in the places where we live. By planting native species, re-wilding and establishing natural corridors – we begin to create healthier habitats for people and the planet. To illustrate this, place more hula hoops back again. Play a final round with the restored space. What else can we do to make the places we live more nature rich? After the game, make a plan to rewild a small space in your schoolyard.



## SENSORY AWARENESS

# activities

### **Sensory Awareness Activities:**

Seasonal Colour Wheels: Each season has its unique colour palette. During spring, there are so many shades of green. Summer is the time of crimson, blues and whites, as flowers bloom. Hues of gold, yellow and orange draws thousands of people in autumn, to the forests of Algonquin Park to bear witness to the dramatic colour change in leaves. Winter is characterized by shades of white, grey, tan and brown.

It is tempting to want to blend everything together in one colour. That forest may just look like a smear of green. But hold a leaf or a blade of grass next to a colour chip and you really become aware of how many shades there are. Here is an activity to help you appreciate the tremendous variety of colour in the natural world. You'll need copies of the colour wheel as well as plenty of clothes pins.

- Colour photocopy the seasonal colour wheel provided in this guide (see Appendix C).
- Can students find something in nature that precisely matches the colours on each of the seasonal wheels? How close can you get to a match? If you find a match, clip a clothes pin to the right segment to show that you found it.
- Try this activity throughout each season of the year.
- You can also obtain paint chips from your nearby paint store. How many of these shades are found in nature? What seasonal colours are you finding?

"THE EARTH IS WHAT WE ALL  
HAVE IN COMMON."  
WENDELL BERRY

## NATURE sculpting



There is art in nature everywhere. Andy Goldsworthy knows this. He is a remarkable artist who uses natural materials to create inspiring art. See <https://www.livingyourwildcreativity.com/art-gallery-1-mitchell-1>. He might pin up coloured leaves in the fall using thorns and allow the light to shine through. Or he might create beautiful spherical objects using intertwining branches. He even breathes icicles together to create a frozen star. Goldsworthy uses material he finds in nature, and he makes art with his hands only – he doesn't use tools of any kind. He then takes a picture and allows the natural world to reclaim his creation.

### **You too can make a beautiful nature sculpture. Here is how:**

- Find a natural area that is not too heavily impacted by humans
- If you can, take a look at Andy Goldsworthy's art for some ideas. You'll find plenty of examples on the internet. Some of Goldsworthy creations are quite large so think small scale.
- Talk to your students about responsible harvesting. If you are going to pick something – say a wildflower or small section of an evergreen bough, only take a little bit from one area and then move along. Never pick a whole plant. Or you can simply say – only make your nature sculpture out of dead material.
- Practice reciprocity. We often take seeds with us and plant them as a way of giving back to the environment.
- In groups of two or three, create a nature sculpture – think about pattern, colour, form, texture, shape. It can lay flat on the ground, free standing or hanging from something.
- Have students name their creation.
- Take a photo of each piece
- It is time for an art exhibit. Go for a tour of the various sculptures. Bring a small glass of grape juice as if you were at an art exhibition and savour the natural forms.
- Allow the natural world to reconstitute the art into something natural once again.





## NATURAL INK AND

# paint brushes

You can make some wonderful paintings with your students, simply by making use of natural materials. Here is how to make simple berry ink:

- 1 cup ripe berries (such as raspberries, strawberries, blackberries)
  - 1 teaspoon vinegar or lemon juice
  - 1 teaspoon salt
  - Strainer
  - Small bowl
  - Small jar with lid
  - Spoon
1. Pour berries into strainer that sits on a bowl
  2. Press the berries using the back of a spoon so that the ink squeezes into the bowl.
  3. Add one teaspoon of vinegar or lemon juice (each will produce a slightly different colour). Add salt and stir. The salt and vinegar act as a mordant fixing the colour of the ink.
  4. Place in a small jar. You are ready to use this. Apply to regular paper or watercolour paper using regular brushes or your own homemade nature paint brushes.
  5. Nature Paint brushes: Make your own nature paint brushes by collecting some small twigs. Attach anything feathery to the ends using an elastic. Some suggestions: cedar and pine needles, feathers, flowers, grass and narrow leaves.

"THERE IS NO PLANET B."  
ANONYMOUS

STAINED GLASS

# windows



During the fall, encourage your students to collect a variety of coloured leaves. Have them create a leaf rainbow - arranging the lightest colours to the left and darker colours to the right. Carefully layer these between two pieces of wax paper. After the students have left for the day, flatten these using an iron. The wax will help to preserve your leaves. Tape these to a window and marvel at how the light makes your student's creations glow.

**Leaf Skeletons:** Here's a way to make some "friendly" Halloween skeletons. Collect a series of leaves (maple, oak and basswood work well). Leave them in a container of water for several weeks. Then take the leaves out and use a small paintbrush or a toothbrush to gently remove the soft tissue surrounding the veins. Brush from the inside towards the outside of the leaf. Rinse frequently. Soon the delicate and lacy pattern of veining in a leaf is revealed. Allow to dry for several days by placing your skeletons inside several layers of newspaper. Glue your dried skeletons onto a white sheet of paper.

**Leaf Rubbings:** Collect a variety of fall leaves. Place them under a white sheet of paper. Secure a leaf under the paper with your fingers. Make sure the veins face up. Use the sides of crayons to rub layers of colour on the paper. Focus on the edges and the veins. Slowly build up the colours. You'll be amazed at how lovely your creations will become.



## FRAMING

## nature



Sometimes, just by isolating a small piece of the natural world, you see it in an entirely different way. Try an old photographer's trick.

- Ask your students to do the following: Take one hand and extend it outward. Turn your hand inward with your thumb pointing down and your fingers pressed together. Extend your other hand and flip your hand with your thumb pointing upward. Joint your two hands together and you should have a frame that you can see through.
- Close one eye and scan the natural world for an image that really captivates you.
- Visit an area that has the potential for some eye-catching views. It could be where the edge of a lawn meets the woods, or perhaps a curving hill or a meandering pathway.
- Take with you some rope, twine or string, some empty frames and some clothes pins. To make an empty frame, you could simply take a cardboard box and using a utility knife and a ruler cut out the fame with a 1-inch border (a 12" x 12" frame seems to work nicely). Or go to your local paint store and ask for wooden paint stirrers. Or you could simply glue these or tongue depressors together. Now you have reusable frames. It is time to hang them!
- Tie a rope, string or twine about eye level across various points that look intriguing.
- Ask your participants to hang their frames using two clothes pins, anywhere along the rope that looks appealing them. When they've selected their perfect spot, ask them to provide a name for their piece.
- You can also simply pin your frame on a tree branch, or lay your frame on the ground. Or hold your frame skyward so you can frame clouds.
- Have an art exhibit where you all have an opportunity to see each other's creations.

"NATURE DOES NOT HURRY,  
YET EVERYTHING IS ACCOMPLISHED."

LAO TZU

## SCIENCE

# activities



**Leaf Chromatography:** Make Your Own Fall Colours. For this activity, you'll need a variety of green leaves from a nearby tree (maple and oak work well), a coffee filter, scissors, a pencil, rubbing alcohol, aluminum foil and paper.

**Step 1:** Take the coffee filter and cut one strip about 2 cm wide. Cut a point at one end of the strip.

**Step 2:** Tear up the green leaves into small pieces. Place in a blender with enough rubbing alcohol to cover the leaves. Grind up the leaves into a green slurry. Let stand for 24 hours. Cover the top with the blender top or aluminum foil to avoid evaporation.

**Step 3:** Tape your coffee filter strip to a pencil and hang it so that the very tip of the strip touches the alcohol. Leave for about an hour or so. Various pigments in the leaf should move up the filter. What colours did you notice? Those colours were in the leaf all along, masked by the green chlorophyll. Pigments such as carotene yield an orange colour while xanthophyll gives a yellow colour and anthocyanins give leaves their red or purplish hue. Leave it overnight to dry. Use your chromatograph as an autumn bookmark.



## FIBONACCI *sequence*

There is something beautiful and harmonious about the regular patterning found in nature – from a snail’s shell to the colourful arrangements of petals on a flower; from the position of scales on a pinecone to the way that leaves clasp onto a stem. And what is wonderful is that these patterns and so many others in the natural world follow a particular mathematical rule called the Fibonacci sequence. First made popular by an Italian merchant named Leonardo Pisano (also known as Fibonacci) over 800 years ago, the sequence is both elegant and powerful. The sequence is: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89... each number is the sum of the previous two. So  $1 + 0 = 1$ ,  $1 + 2 = 3$ ,  $3 + 5 = 8$ ,  $8 + 5 = 13$  and so on... If you express this in terms of area, you begin to generate a spiral.

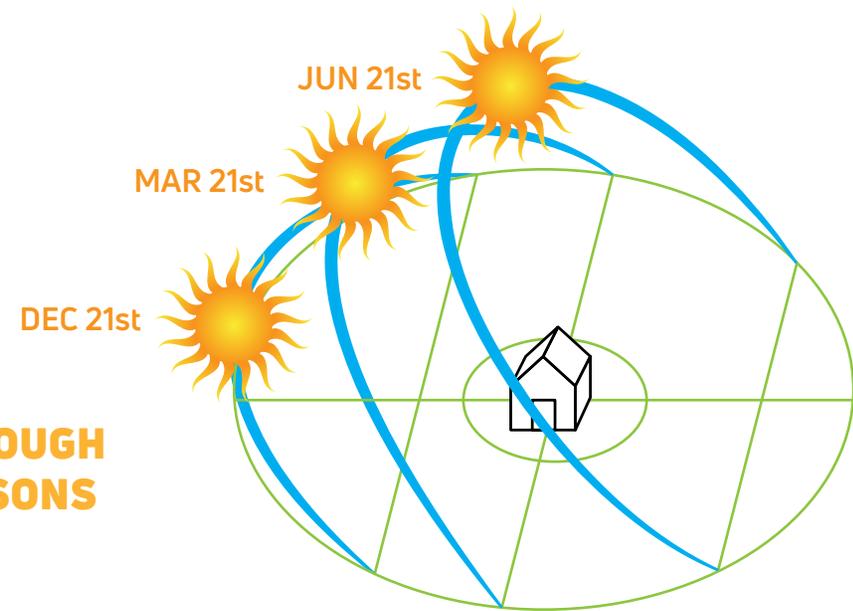
There are so many things in nature that follow this rule. Here are just a few:

- Spiral of a snail’s shell
- The arrangement of seeds in a sunflower
- A curling fern
- Petals on a flower
- The arrangement of branches on a tree
- Scales on a pinecone
- Our spiral galaxy
- The folds of our ear
- The shape of an egg
- The ridges of our thumbprint
- The patterns of clouds in a hurricane

Take your students to your schoolyard. How many examples can of the Fibonacci Sequence can they find...?

# MEASURE YOUR shadow

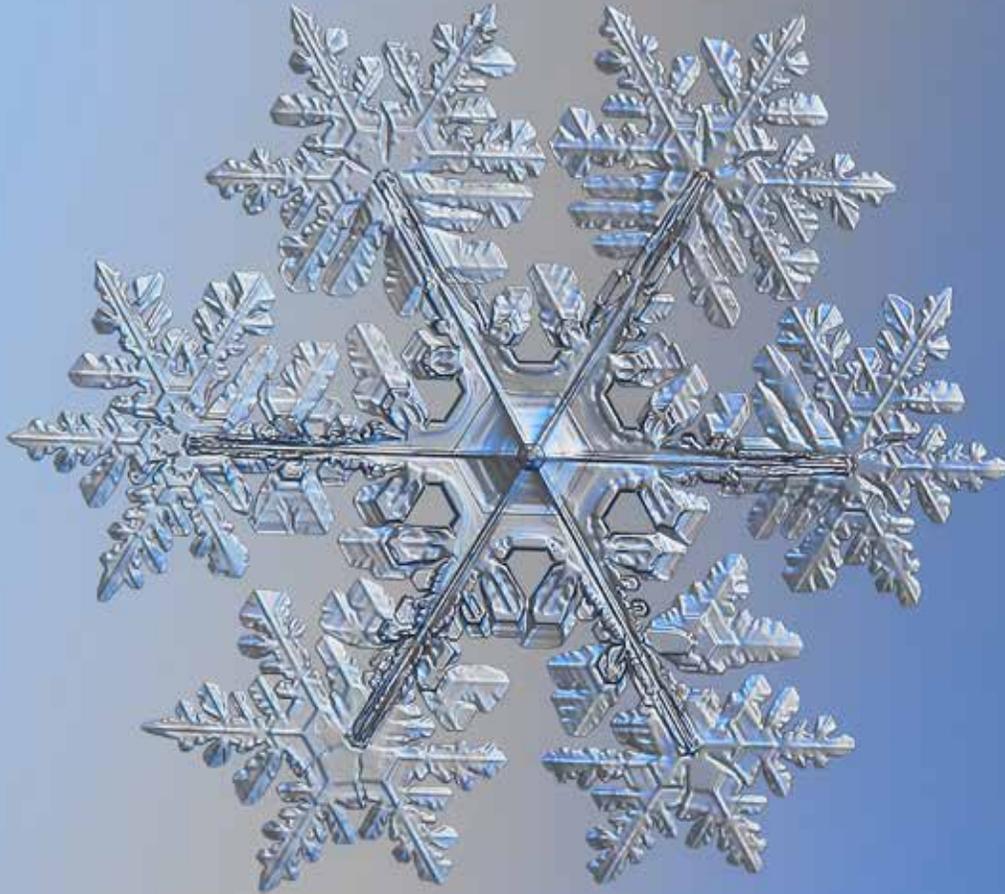
## SUN THROUGH THE SEASONS



Here is a wonderful way for students to understand seasonal change. They'll learn that depending on the time of year, the Northern hemisphere of the Earth is tipped toward or away from the Sun.

By measuring shadows from September through June, children will discover that the length of their shadow changes quite dramatically. This is because the relative height of the Sun in the sky changes with the seasons due to the Earth's tilt. At the summer solstice, the noonday sun is almost directly overhead (short shadows), while at the winter solstice, the noonday sun is much lower on the horizon (long shadows). At the fall and spring equinoxes, shadow length is intermediate between the two. This will help children to grasp the idea that shadow length depends on whether our hemisphere is tipped toward or away from the Sun. It also lays the groundwork for understanding why we have seasons.

**Here is how:** On a sunny day close to the fall equinox, and then again at the winter solstice, spring equinox and summer solstice, go outside at noon with a measuring tape or ruler – one for each pair of students. Have one student stand up straight on a flat surface (e.g., lawn, asphalt) with your back to the Sun. Have the other student measure the length of shadow of the student who is standing. Record this and track the length of shadows during each season of the year (or more often if you can). Each time you measure your shadow, try to do this at the same time of day, for consistency. Graph your results. You can also make a simple sundial to mark the time. Visit: <https://www.wikihow.com/Make-a-Sundial> to learn more.



## THE MAGIC OF snowflakes

With so much white around us on a snowy day, we don't often think about just how magical a single snowflake can be. And yet it is true, every snowflake is different - each flake is a beautifully wrought snow crystal - a diamond of frozen water, and we should take the time to admire its delicate and exquisite beauty.

A snowflake will form on the tiniest particle of dust. As the snowflake tumbles through the air, it forms a complex and beautiful snow crystal. When first formed, a snowflake is likely to be a hexagonal prism looking like a honeycomb. As it grows larger, arms of crystal form at the corners of the crystal (always six sided) and they begin to take on ever more complex and stunning shapes, often star like. However, they can also form as needles, plates, sheathes and columns (see below). A fully formed snowflake crystal is nothing short of magic!

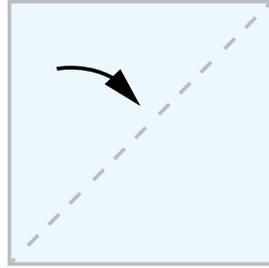
How to catch a snowflake: Find some black Bristol board and several magnifying glasses. You can get these both of these at the dollar store. Cut the Bristol board into squares about 10 inches by 10 inches. If you can, laminate these. On a day in which the temperature is about 5 degrees Celsius or about 23 degrees Fahrenheit and it is gently snowing with little wind, go outside. Make sure you've allowed your Bristol board (snowflake catcher) time to cool so the snowflakes won't melt. Catch snowflakes on your board as they fall. Study these through your magnifying glass. Can you find stellar crystals, hexagonal plates, needles or columns?

**SNOWFLAKE CHART:** available from [www.snowcrystals.com](http://www.snowcrystals.com)

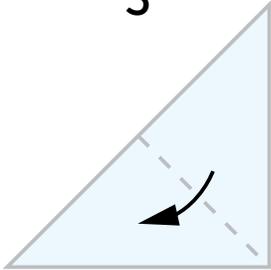
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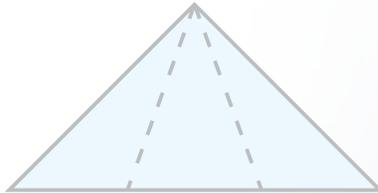
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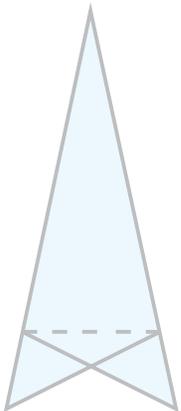
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4



5



6



You can make your own anatomically correct paper snowflake (six sided).

Here is how: Fold a square piece of paper diagonally. Fold this piece in half again (see diagram). Now fold this section carefully into thirds. You should have three equal sections (see diagram). Fold this section in half and begin cutting. Your snowflake should have six sides. The more snowflakes you make, the more delicate and beautiful your designs become. You need to be brave in your cutting. As long as one part of your spine stays together, you'll have a whole snowflake. If you like, iron these between two layers of wax paper.

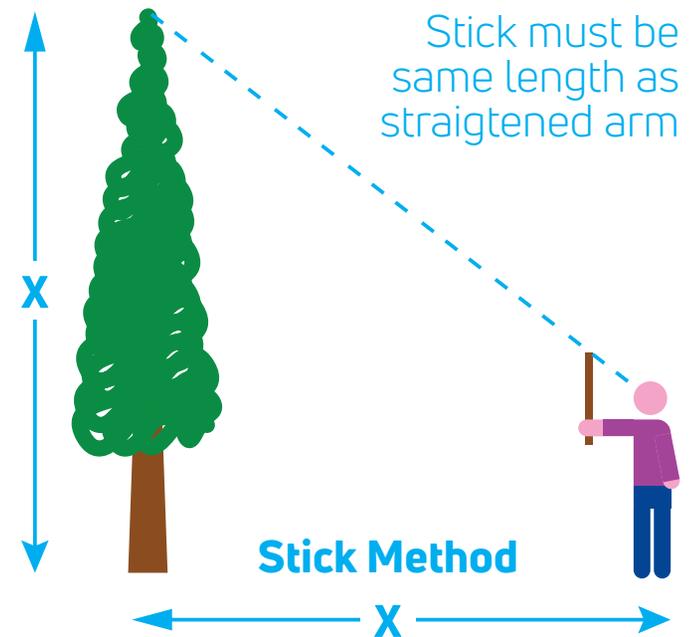


# AGE OF A pine Tree

**Estimate the Age of a Pine Tree:** You can quite accurately estimate how old a pine tree is without counting the growth rings.

## Here is how:

1. Branches on an evergreen tree branch such as a white pine, grow just like the spokes of a wheel. These are called "whorls." Each year an evergreen grows, it puts out a new set of branches or a whorls.
2. Count the whorls starting at the bottom of the tree and moving upward. Start at 3 because for most evergreens, whorls aren't produced until the 4th year of growth. Look for signs that there were branches (a scar or nub). Evergreens tend to lose lower branches due to a lack of sunlight. When you've counted them all, you have a fair idea of the age of this tree.
3. If you find one small branch in between whorls, likely it does not represent a year of growth.
4. You might encounter an unusually short increase in length between whorls that may signify a "lammas" year. This means that the tree developed branches twice, perhaps because of exceptional growing conditions. You can ignore these, unless you find evidence of an injury that could have been responsible for the very short internode.



**Tree measuring:** Your students can determine the height of a tree without cutting it down. Here is how:

1. Find a long, straight stick
2. Make sure it is the same length as from the top of your shoulder to your outstretched fingers (hold your arm straight out at shoulder height to measure).
3. Hold the stick vertically at the bottom so that you are creating a right angle and do not let go.
4. Close one eye - walk backwards until the stick seems as if it is the same height as the tree.
5. Place the stick in the ground at exactly that point.
6. Now count the number of paces from your stick to the tree.
7. Multiply this by .75 (the average length of a standard stride) and you'll get the rough height of the tree in meters.
8. Go to: [https://www.youtube.com/watch?v=\\_kKsp9R9Xb0](https://www.youtube.com/watch?v=_kKsp9R9Xb0)

"I ONLY WENT OUT FOR A WALK AND  
FINALLY CONCLUDED THAT BY GOING OUT,  
I FOUND, WAS REALLY GOING IN."

ADAPTED FROM JOHN MUIR

## SUGGESTED

# Resources

### BOOKS:

- Project Wild, Focus on Forests - An excellent source of hands-on environmental games. You'll need to take the course to obtain the guide. Trent's School of Education conducts courses several times a year. To find out more visit: <https://cwf-fcf.org/en/explore/wild-education/?src=EL>
- The Big Book of Nature Activities – By Jacob Rodenburg and Drew Monkman, published by New Society Press, 2017. A compendium of activities, games and natural history notes anchored in each season of the year.
- The Book of Nature Connection – By Jacob Rodenburg – coming in the spring of 2022.
- A selection of sensory awareness activities that help children connect to nature.
- Braiding Sweetgrass – By Robin Wall Kimmerer. Just a wonderful book that help us rethink our connection to land from an Indigenous
- Keepers of the Earth: Native American Stories and Environmental Activities for Children by Joseph Bruchac and Michael Caduto. 1997.
- Science Is – By Susan Bosak - A source book of fascinating facts, projects and activities to do with science

### ORGANIZATIONS:

- Council of Ontario Outdoor Educators [www.coeo.org](http://www.coeo.org). A group of educators that promote outdoor education and share their expertise.
- Ontario Society for Environmental Educators [www.osee.ca](http://www.osee.ca)
- Evergreen Foundation - [www.evergreen.ca](http://www.evergreen.ca) Is a national non-profit environmental organization with a mandate to bring nature to our cities through naturalization projects. Evergreen motivates people to create and sustain healthy, natural outdoor spaces.
- Journey North – <https://journeynorth.org/>
  - Journey North tracks the journeys of a dozen migratory species each spring. Students share their own field observations with classrooms across the Hemisphere. In addition, students are linked with scientists who provide their expertise directly to the classroom. Several migrations are tracked by satellite telemetry, providing live coverage of individual animals as they migrate. As the spring season sweeps across the Hemisphere, students note changes in daylight, temperatures, & all living things as the food chain comes back to life.
- Federation of Ontario Naturalists – [www.ontarionature.org](http://www.ontarionature.org)
  - The Federation of Ontario Naturalists (FON) protects Ontario's nature through research, education, and conservation action. FON champions woodlands, wetlands and wildlife, and preserves essential habitat through its own system of nature reserves. FON is a charitable organization representing 25,000 members and supporters and 119 member groups across Ontario.
- Canadian Wildlife Federation – [www.cwf-fcf.org](http://www.cwf-fcf.org)
  - Dedicated to helping Canadians connect to and protect wildlife. They often have nature posters and other information available to educators.

# Resources

## LOCAL GROUPS:

- Peterborough Field Naturalists
- Pathway to Stewardship and Kinship
- Peterborough GreenUP
- Camp Kawartha
- Kawartha World Issues Centre
- Ganaraska Forest Centre

## JOURNALS:

- Canadian Journal of Environmental Education - <https://cjee.lakeheadu.ca/> CJEE explores a variety of environmental topics relevant to educators.
- Green Teacher – [www.greenteacher.com](http://www.greenteacher.com). Green Teacher is a magazine by and for educators to enhance environmental and global education across the curriculum at all grade levels.
- Play Outdoors Magazine - [www.playoutdoorsmagazine.ca](http://www.playoutdoorsmagazine.ca). A wonderful quarterly magazine consisting of tips, ideas and resources for younger primary teachers on how to connect children to nature

## WEBSITES:

- Vermiculture – Worm composters - Cathy's Composter [www.cathyscomposters.com](http://www.cathyscomposters.com). All about how to compost with worms. Has curriculum connections, activities and worm related equipment to set up your own vermi-composter.
- Phenology – [www.drewmonkman.com](http://www.drewmonkman.com) a website showcasing what is going in nature at any given time of year. Drew Monkman, well known naturalist and educator, has a wonderful website full of detailed information about what species are active during each month of the year.
- Step Outside: [www.resources4rethinking.ca/en/step-outside](http://www.resources4rethinking.ca/en/step-outside). A wonderful selection of activities and information about what is happening in nature during each season of the year. This information will arrive in your email box once per month, telling you what is happening in the natural world during this time of year.
- To help student's calculate their carbon footprint visit: <https://www.footprintnetwork.org/resources/footprint-calculator>
- To track litter in and around your school community: <https://litterati.org>
- To link the Ontario Curriculum to Outdoor and Environmental Activities: [http://www.edu.gov.on.ca/eng/curriculum/elementary/environmental\\_ed\\_kto8\\_eng.pdf](http://www.edu.gov.on.ca/eng/curriculum/elementary/environmental_ed_kto8_eng.pdf)

## EQUIPMENT:

- For a wide variety of nature-based equipment including replica, skulls, tracks, owl pellets try: [www.acornnaturalists.com](http://www.acornnaturalists.com)
- For Canadian based equipment try: [www.outdoorlearningstore.ca](http://www.outdoorlearningstore.ca)
- For nature and science equipment try: [www.boreal.com/store](http://www.boreal.com/store)

## APPENDIX A

Sample letter to Administrators (adapted from "Into Nature – A Guide to Teaching in Nearby Nature")

<https://www.back2nature.ca/teachers-guide-into-nature-english/>

Dear Administrator,

I have planned an exciting new learning routine for my class this year, and I hope to receive your support and invite your participation. To develop new learning experiences that help students understand and connect personally with the Ontario Curriculum, I plan to use the outdoors as a regular learning space. This means I will be teaching in and around the schoolyard and/or in local natural areas delivering the same content that is normally taught indoors.

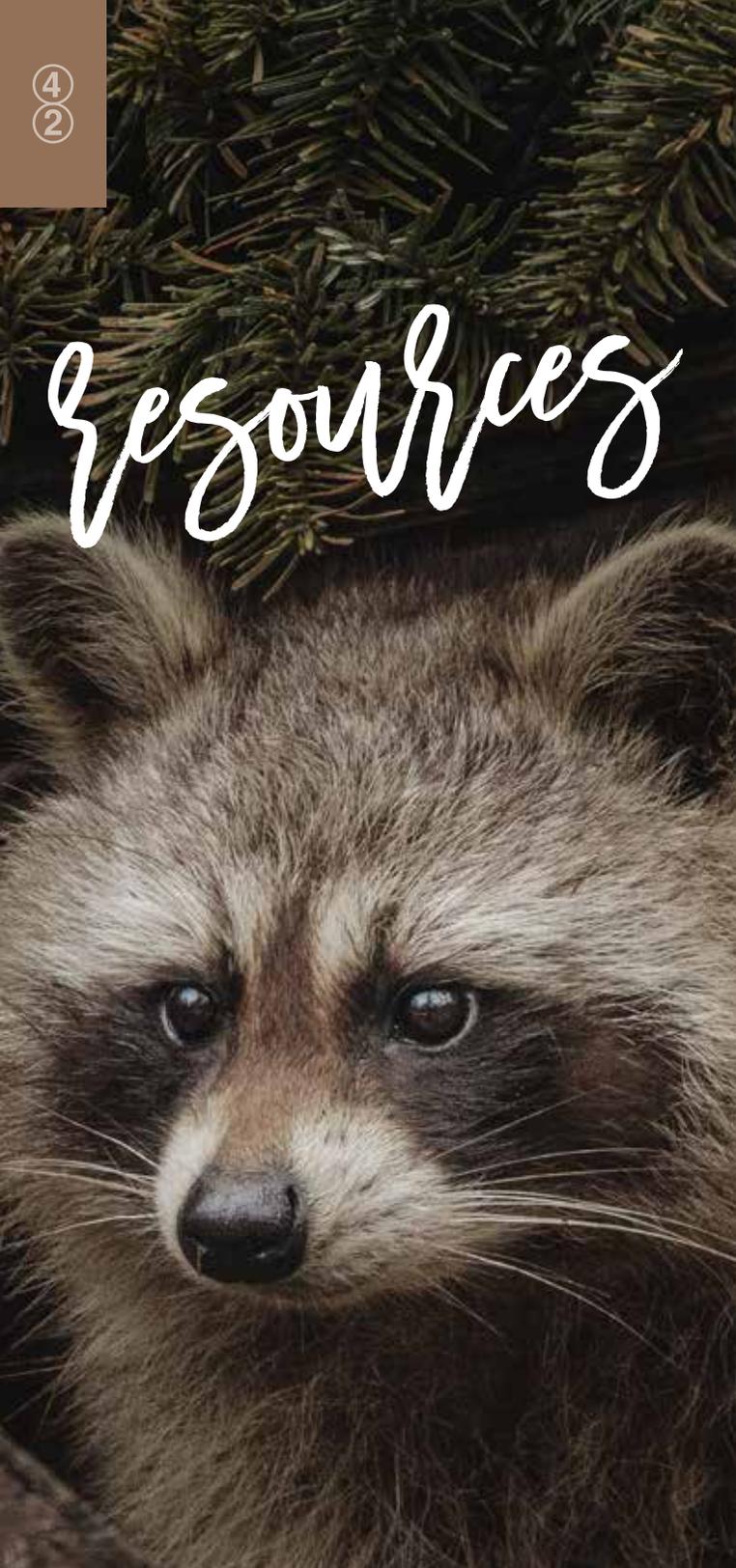
This teaching initiative is based on solid pedagogical principles. There is growing scientific evidence that children who experience regular time outdoors in nature are healthier physically, emotionally and intellectually; as students, they are better learners and achieve higher intellectual standards. Richard Louv, a writer and leading proponent of connecting children to nature, calls time spent in nature Vitamin "N" (Nature).

I'll be using the Environmental Education: Scope of Sequence of Expectations 2017 addition (Ontario Ministry of Education) <http://www.edu.gov.on.ca/eng/curriculum/elementary/environment.html>

[html](http://www.edu.gov.on.ca/eng/curriculum/elementary/environment.html) which provides curriculum links in all grades and subject areas for outdoor and environmental education. Delivering Environmental Education is something that is required by the Ontario Ministry of Education. "Today's students will shape the world of tomorrow. More than ever, it is vitally important that our education system not only prepare students academically but also provide them with the skills, perspectives, and practices they will need to meet the social and environmental challenges of the future." Ontario Ministry of Education, Acting Today, Shaping Tomorrow Environmental Education Policy Framework. (2009), p. 8.

Other evidence suggests that those who find it hardest to function in the indoor classroom, benefit tremendously from spending regular time learning outdoors, including those students who are living with ADHD. In such cases, classmates who experience less disruption during lessons also benefit. The preponderance of evidence indicates that regular connection with nature and the outdoors is essential for full development of our children. Children, however, spend far less time outside today than in the past. Using natural areas in and around the schoolyard as part of our learning space will help deliver on this key need and demonstrate leadership in applying the most current and powerful teaching tools to engage our students more fully. Besides learning experiences, the plan I have prepared for learning outside includes the crucial considerations of safety, parent involvement and student preparedness. I would like to share these plans with you at your convenience in order to solicit your feedback and approval. I look forward to presenting my plans to you in person and sharing my excitement for improving the learning of our students by using our outdoor learning space!

Thank you!  
Best regards,  
(Your Name)



# Resources

## APPENDIX B: Sample Letter to Parents

(adapted from "Into Nature – A Guide to Teaching in Nearby Nature")

Dear Parent,

I have planned an exciting new learning routine for our class this year. I want to share it with you to let you know what it means for you and your child. Our class will be using the outdoors as a regular learning space to develop new learning experiences that help students understand and connect personally with all curriculum subjects. This means I will be designing lessons based on The Ontario Curriculum to teach in and around the schoolyard and/or in local natural areas. There is a growing amount of scientific evidence that when we provide children with the chance to spend regular time in nature, they are happier, are more motivated to learn and focus better when returning to the classroom.

Unfortunately, most children spend far less time outside today than in the past, even though we are now finding out that a connection with nature and the outdoors is very important for healthy childhood development. Using natural areas of the schoolyard as part of our learning space helps to realize this important need at our school. To help your child in feeling comfortable and ready to learn in the outdoors please help him or her to choose clothes and footwear that are appropriate for the weather each day. I'll provide a list of items that will help in outfitting your child and will be discussing these needs in class. In addition, we will work as a class on quick and inexpensive solutions for the weather, for example rain jackets made of new garbage bags for a light rain. If you have any questions about our outdoor learning or about your child's individual needs, please don't hesitate to contact me.

Thank you!

Best regards,  
(Your name and School's name)

APPENDIX B: Scavenger and Bingo Card hunt

*Nature Sign Bingo Card (check all the clues you find)*

	B	I	N	G	O
B	 <input type="checkbox"/> BROWSE RABBIT	 <input type="checkbox"/> DEER BROWSE	 <input type="checkbox"/> BIRD NEST	 <input type="checkbox"/> ANIMAL HOLE	 <input type="checkbox"/> CHEWED LEAF
I	 <input type="checkbox"/> CHEWED CONES	 <input type="checkbox"/> RED SQUIRREL	 <input type="checkbox"/> BARK BEETLE GALLERY	 <input type="checkbox"/> BLACK CAPPED CHICKADEE	 <input type="checkbox"/> WOODPECKER HOLES
N	 <input type="checkbox"/> COYOTE SCAT	 <input type="checkbox"/> DEER TRACK	 <input type="checkbox"/> SAPSUCKER HOLE	 <input type="checkbox"/> SQUIRREL DREY	 <input type="checkbox"/> A PRETTY BIRD SONG OR CALL...
G	 <input type="checkbox"/> PROCUPINE SCAT	 <input type="checkbox"/> GOLDENROD GALL	 <input type="checkbox"/> INSECT EGG MASS	 <input type="checkbox"/> BUTTERFLY	 <input type="checkbox"/> FOX TRACK
O	 <input type="checkbox"/> WILDFLOWER	 <input type="checkbox"/> SPIDER WEB	 <input type="checkbox"/> ACORN	 <input type="checkbox"/> WHITE PINE NEEDLES	 <input type="checkbox"/> YOUR OWN DISCOVERY

# Resources

## Micro Scavenger Hunt:

You'll need small yogurt containers or film canisters.

Ask students to find something that will fit into the container that:



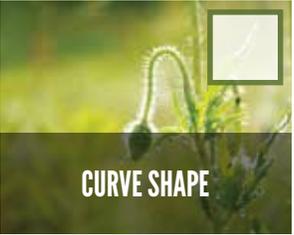
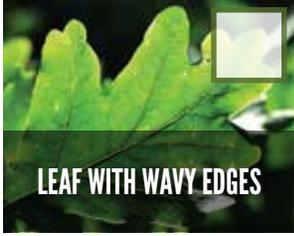
Is older than you	Is brand new
Is changing	Is an energy producer
Reminds you of the season	Is useless
Is out of place	Is edible
Is recycled	Has unusual texture
Is warm/cold	Reminds you of someone
Is beautiful	Contains water
Is red, blue or yellow	Is of value to you personally
Is recyclable	Is unique to this area
Is related to another item (find two items)	Your choice...

# Spring Walk

# BINGO

<p>Perching bird</p>  <p>Plant growing in the water</p> 	 <p>Fiddleheads</p>	 <p>Walking bird</p>	<p>Moss on a log</p> 	
<p>Soaring bird</p> 	<p>Signs of a woodpecker</p> 	 <p>Fish</p>	<p>The sound of wind</p> 	<p>Flowering tree</p> 
 <p>Spider web</p>	<p>Chipmunk</p> 	<p>Free Space</p> 	 <p>Mud</p>	<p>Animal tunnel or holes</p> 
<p>Calling Frog</p> 	<p>Trail marker</p> 	 <p>butterfly</p>	<p>Tree Sapling</p> 	<p>Hiding bird</p> 
<p>The smell of flowers</p> 	<p>Swimming bird</p> 	<p>Active nest</p> 	<p>Brand new leaves</p> 	<p>Squirrel food</p> 

# NATURE SHAPE BINGO CARD (CAN YOU FIND...) FILL IN A ROW, COLUMN OR DIAGONAL FOR A BINGO

	B	I	N	G	O
B	 <p>HEART SHAPE</p>	 <p>TRIANGLE SHAPE</p>	 <p>ROUND SHAPE</p>	 <p>OVAL SHAPE</p>	 <p>STAR SHAPE</p>
I	 <p>RECTANGLE SHAPE</p>	 <p>CURVE SHAPE</p>	 <p>BILATERAL SYMMETRY (ONE SIDE IS A REFLECTION OF THE OTHER SIDE)</p>	 <p>RADIAL SYMMETRY (ROTATE THE SHAPE AND IT LOOKS THE SAME)</p>	 <p>A SPIRAL SHAPE</p>
N	 <p>LEAF WITH WAVY EDGES</p>	 <p>LEAF WITH POINTED EDGES</p>	 <p>ELLIPTIC LEAF (LONG, NARROW AND POINTED)</p>	 <p>SERRATED LEAF (TOOTHED EDGE)</p>	 <p>RENIFORM LEAF (KIDNEY SHAPED)</p>
G	 <p>LEAF WITH PALMATE VEINING (VEINS SPREAD FROM CENTRAL POINT)</p>	 <p>LEAF WITH PINNATE VEINING (VEINS RUN NEXT TO EACH OTHER)</p>	 <p>LEAF WITH ARCULATE VEINING (VEINS BEND TO A POINT)</p>	 <p>AN ACICULAR LEAF (NEEDLE SHAPED)</p>	 <p>RACTAL (BRANCHING PATTERN)</p>
O	 <p>HEXAGON SHAPE</p>	 <p>SOMETHING IN NATURE WITH A STRAIGHT EDGE</p>	 <p>SOMETHING CYLINDRICAL</p>	 <p>MOUNDED SHAPE</p>	 <p>YOUR OWN SHAPE DISCOVERY</p>

**APPENDIX C: Seasonal Colour Wheels:** Here is an activity to help you appreciate the tremendous variety of colour in the natural world. Colour photocopy the seasonal colour wheels below. Provide each participant with a small bag of clothes pins. Can participants find something in nature that precisely matches the colours on this wheel? There are photos of actual objects in nature along with their corresponding colour. How close does your natural object match the corresponding inner colour? If you find a match, clip a small piece of the object with the cloths pin, onto this. Larger versions of the colour wheels for printing can be found at this link: <https://newsociety.com/pages/book-of-nature-connection-worksheets>



SEASONAL

# colour wheels

