The Jane Goodall Institute of Canada's Youth Advisory Council (2022-2023) presents

A Guide to Nature Walks

Jane Goodall Institute
Canada

Cover photo credit: Edrianne-Alexa Tumaneng

Photo credit: Mei-Ling Patterson

Table of Contents

Introduction - A Letter from the 2022-2023 JGIC Youth Advisory Council 4

Spring 6

Community Science - Properties of Water 7

Art and Nature - A Poetic Activity 9

Wellness - Mindfullness Walk to Welcome Spring 10

Reflection - Planting Seeds in Your Life 11

Summer 12

Community Science - Summer's Energy 13

Art and Nature - Drawing Nature 15

Wellness - How to Stay Cool 16

Reflection - Reflecting on Summer Adventures 17

Fall 18

Community Science - The Science Behind Fall Colours 19

Art and Nature - Leaves Art 21

Wellness - Autumn Mindful Nature Walk 22

Reflection - What Brings Colour to Your Life? 23

Winter 24

Community Science - Adaptations to the Cold 25

Art and Nature - Celebrating Winter 27

Wellness - Rest and Hibernation 28

Reflection - Avoiding the Frost 29

Concluding Thoughts and Additional Resources 30

To Anyone Looking to Enjoy and Connect with Nature...

Welcome to the Youth Advisory Council's

GUIDE TO NATURE WALKS

More than 60 years ago, conservation icon Dr. Jane Goodall began her research on chimpanzees. It was the beginning of a lifelong commitment to addressing the three crises – climate change, biodiversity loss, and environmental inequity. Over many years Jane has inspired hundreds of thousands of people all over the world and has always believed in the optimism and energy of youth.

Today, the Jane Goodall Institute of Canada (JGIC) supports youth-led projects and initiatives across Canada. One of their programs is the Youth Advisory Council (YAC), which selects 12 youths to join as members from across Canada being part of various JGIC committees, driving their own initiatives, and providing feedback on programming, and outreach.

This nature guide resource was mindfully created by the 2022-2023 JGIC YAC cohort. As youth growing up during the rise of the three crises, we understand that for people to protect something, they first have to care about it.

Photo credit: Mei-Ling Patterson

We hope this resource will help you, your friends, your students, or your classmates fall in love with the natural world a little bit more, and that it inspires you to protect what we have before it's too late.

Within the guide you will find sections on science, art, mindfulness, and more. It is designed to be used at any time of year, or in any region of Canada.

Before you get started, there are a few things to remember.

- We recommend you check the weather or tidal conditions before going on any nature walk.
- Take note of any dangerous wildlife and ensure you know what to do if you encounter these animals.
- Be sure to bring appropriate supplies with you like water, trail mix/snack, and first aid materials.
- No matter where you're going, always tell someone where you will be and for how long, as a safety precaution.
- In the spirit of Jane's vision for a world that supports animals, people, and the environment, respect the place you're in by taking any litter with you, letting plants grow instead of picking them, and keeping your distance from animals that call this place home.

We hope you enjoy this seasonal guide as much as we enjoyed creating it. We encourage you to share your nature walk with us on socials at **@janegoodallcan** or using **#JaneGoodallCAN**.

Happy Trails,

The JGIC Youth Advisory Council 2022-2023

YAC Photo credit: Michael Lecchino
Photo credit: Mei-Ling Patterson

Photo credit: Edrianne-Alexa Tumaneng

Snow melt
Rain falling
Hibernation coming to an end

Buds blooming
Birds singing
And the cycle starts again

Growth and new life
Renewed and rejuvenated
The season transcends

SPRING

Spring is a time of renewal. The days are getting longer, the air is getting warmer, birds are singing, and plants are starting to grow again. It's a great time of year to learn about nature around you and watch how plants change as the season shifts to becoming warmer and sunnier. Take time to listen to the birds as they teach their offspring how to fly. Look for the bunnies, coming out of their winter dens to eat the fresh grass and clovers. Or stop and feel the warmth of the sun on your skin.

Take advantage of spring season as a time to connect with the changing environment. Allow yourself to take inspiration from the resilience of nature, by reflecting and giving yourself space to grow, change and adapt during this time of year.

Ecological Implications from Physical Properties of Water

For a lot of Canada, spring feels like the wettest season of the year with tons of rain, puddles, and mud. Have you ever noticed a nice smell after a rainstorm? That smell is called “petrichor,” and it comes from the soil because of the microbes and plant oils in there (Halton, 2018). When water is added to soil and they mix the water helps the smell of the plant oils and bacterial chemicals to fly out into the air.

Water is needed by all living things, so smell is important and is used by animals and humans to detect water (Fox, 2020).

Water is really special and is the reason why life exists on Earth. Let us take your through some scientific properties of water that highlight why it so important for all living things.

1. Water is sticky.

Don’t think glue or honey sticky, instead, it sticks well to itself and the surfaces it touches. That sticking to itself is called “cohesion,” meaning that water wants to be connected. For example, when droplets of water touch each other, they quickly merge into a bigger bubble. This cohesion property is how insects can walk on water because the surface doesn’t want to break, and the insect is light enough to rest on the surface. When water sticks to other things, it is called “adhesion.” Plants moving water from their roots up to their leaves is based on both cohesion and adhesion. Adhesion, because the water is sticking to the pipe walls in the plant, allowing water particles to climb up the walls. Cohesion, because the water is sticking to itself, dragging along the rest of the water particles so they stay together.

Photo credit: Mei-Ling Patterson

Ecological Implications from Physical Properties of Water

2. Water can take a lot of heat.

Have you ever noticed that it takes a long time for water to boil? Most liquids don't take as long as it takes water to boil, but this fact is helpful for life on Earth. Overall, water is slow to change temperature, either warmer or cooler. This property allows aquatic organisms to stay in conditions that don't change too suddenly. This characteristic is also seen when animals or humans sweat. When the body sweats, the surface of the skin is heating the sweat until it evaporates. Water on the body takes a lot of heat before it evaporates, meaning water can sit on the body a long time too.

3. Ice floats.

When you have water and ice together, the ice floats. That means the solid (ice) is less dense than the liquid (water), where density means how close together the particles making up an object are. In most substances, a solid is denser than a liquid, but water is different. Water particles form crystal-like structures that join together. When ice freezes at the top of a water mass, it creates a "roof" over the top of the lake or pond, keeping the water underneath it warm and protected. If water froze from the bottom up there wouldn't be a protective layer, and organisms that live on the bottom of the pond would also freeze.

Water matters to every living thing on the planet and we need to remember not to take it for granted. You can help support our water by providing data about water quality through a program called Water Rangers in Canada. By using a custom test kit, volunteers can regularly test local water and send it to a database for research. There are even test kits available to purchase for classroom use. Use the following link to browse their available programs: waterrangers.ca.

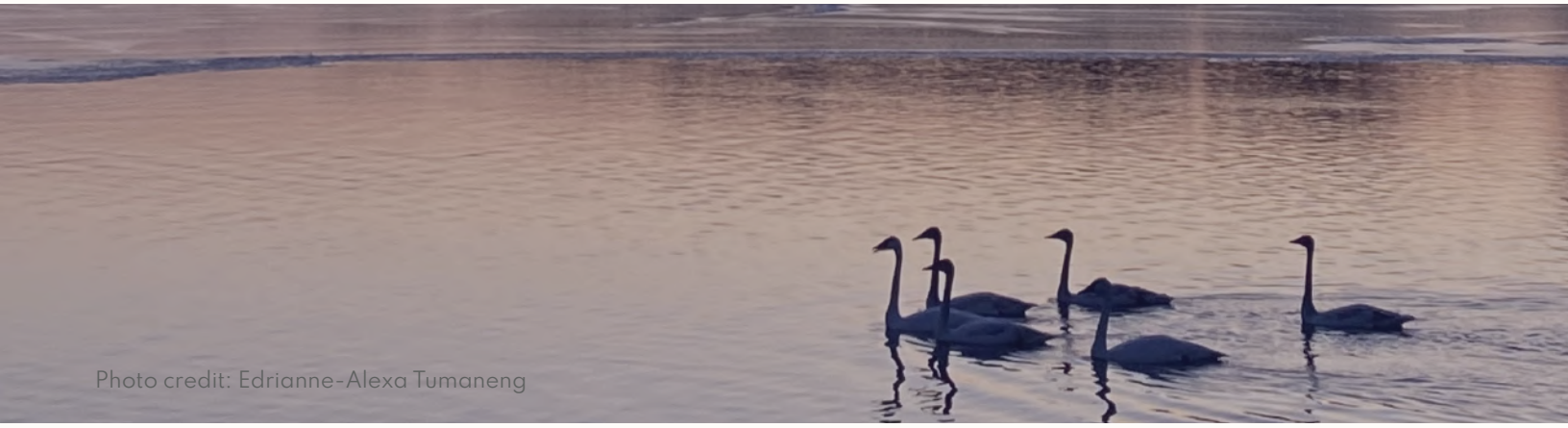

Photo credit: Edrianne-Alexa Tumaneng

Spring - Art and Nature

A Poetic Activity

Spring is a season of change. In this activity, let us compare two very different kinds of days using poetry. Poetry is about writing what you feel. Spring will help us think about what we feel about the changes that happen at this time of year.

Step 1: Take yourself outside on a day in early spring.

What do you notice? It is likely still a cool, wintry feeling outdoors. Ask yourself the following questions:

- What do I see?
- Does the air have a specific feeling?
- What living things can I see?
- How do I feel?

Write down short answers to these questions. Then, use your answers to make a poem. Save this poem for later.

Step 2. Go outside on a day in late spring.

Do you notice if it is much warmer and different than the first observation day? Ask yourself some questions again:

- What do I see?
- Does the air have a specific feeling?
- What living things can I see?
- How do I feel?

Step 3. Read the two poems you wrote for spring.

- Can you tell if you felt different when writing your two poems?
- What are the similarities in the two poems?
- What does each poem tell you about the changes you observed in the season of spring?

Spring is a season of celebrating transitions and change is a part of life. Getting outside and engaging in art as a way to connect with the changing season can help bring personal awareness to how we ourselves embrace the season.

Photo credit: Mei-Ling Patterson

Spring - Wellness

Mindfulness Walk to Welcome Spring

After months of hibernation, conserving energy, and a long pause, the natural world is beginning to bloom, renew, and blossom. Wildlife is returning and bringing life again to spaces that were bare in wintertime, wildflowers are budding, and the sights, smells, and sounds of seasonal change are everywhere around us – we just need to pay close attention to notice and appreciate these signs of spring.

Activities

- Venture outside! Perhaps it's just to sit in the sun, or to walk on school grounds in your local community.
- See if you can start to notice signs of spring appearing in your community.
- Can you spot buds on trees, hear robins chirping, or see flowers blooming around you?
- Pay attention to your senses. What do the flowers in bloom smell like? What does a flower feel like?
- Now what can you hear? Is there a symphony of bird songs?
- Take a few moments to take some deep inhale and exhale breaths and soak up these exciting signs of spring.

Our lives are often fast-paced and rushed, and it can be easy to feel disconnected from the natural world. Practicing self-care can be as simple as reconnecting to nature close to you. Often when we are observant of the ebbs and flows of nature and the cycles of seasons, it reminds us of important lessons such as to slow down, to pause, to regenerate.

Mindful walks are a way to tap into the natural world and practice gratitude for the beauty in our communities. When we connect to the places around us we often feel more inspired to protect and care for the lands and waters close to home and afar.

Photo credit: Meghan Patterson

Photo credit: Alison Cuffley

Spring - Reflection

Planting Seeds in Your Life

Gardens in the winter are quiet, often covered in snow, and preparing their soils for a healthy growing season to come. With spring's arrival, snow begins melting and gardens are uncovered ready for a new season of growth and abundance. Like a gardener who chooses wisely which seeds they will plant in their garden, you too can plant some seeds in your life for what you wish to grow and flourish for the months ahead.

Journaling Activity:

1. Find yourself a comfortable place to take some time to journal. Reflect and write down your thoughts and ideas to the following prompts below. Spring is a time for growth, and new beginnings. What would you like to "plant" in your garden? Maybe you would like to start a new hobby, learn about a new topic, or perhaps you would like to connect with nature more. Write down a "seed" or maybe a few "seeds" that you are excited to watch grow throughout this season.
2. Write out how you will "nurture" and water those "seeds" that you've planted? Maybe that looks like making sure you get outside 20 minutes every day, or maybe you will join a club to inspire that new knowledge, or maybe you'll ask a friend if they'd like to join you in going outside more often.

As we too are a part of nature, we experience our own shifts and changes in the seasons within our own lives. Spring is an invitation to practice self-care and nurture the parts of ourselves. Like we water our vegetable gardens or flowers in our backyards, this season reminds us to fill our own cups too, so we can continue to blossom for ourselves, our communities, and the Earth.

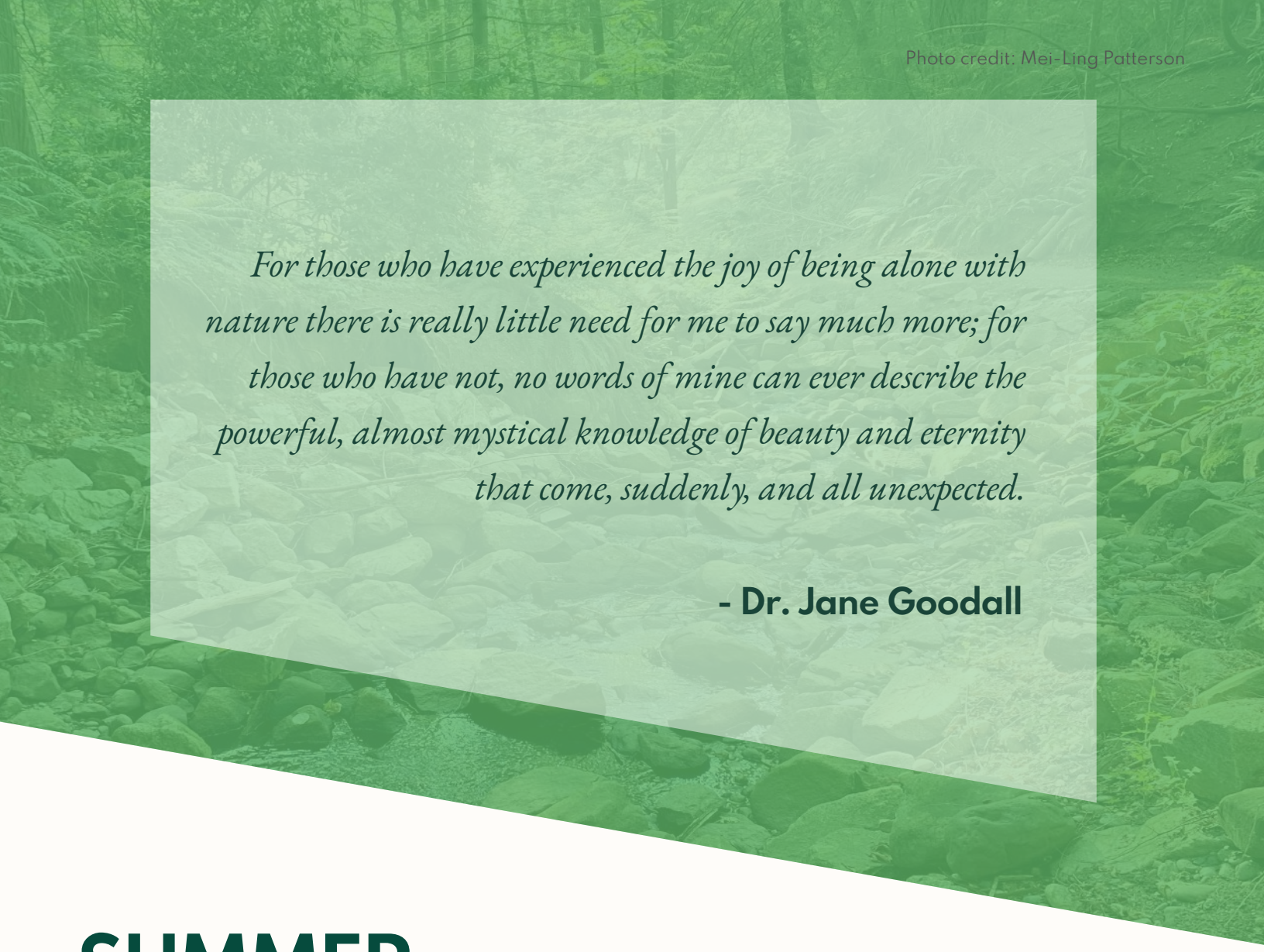

Photo credit: Mei-Ling Patterson

For those who have experienced the joy of being alone with nature there is really little need for me to say much more; for those who have not, no words of mine can ever describe the powerful, almost mystical knowledge of beauty and eternity that come, suddenly, and all unexpected.

- Dr. Jane Goodall

SUMMER

New seasons bring new beginnings! During summer we encourage you to take advantage of the warmer weather and longer days by getting outside and connecting with your natural surroundings. Most importantly, we encourage you to rest, love, and take care of yourself. We know that the school year can be long and strenuous, filled with days of studying and working. In this section you will explore a set of summer activities have been curated for you based on community science, art and nature, and a wellness reflection. Feel free to try them during other times of the year as well, and note how your interpretation and practice of them may be different depending on the season.

Summer's Energy in Relation to Primary Productivity and Consequent Food Web Interactions & iNaturalist

When you picture summer, don't you picture everything outside being bright green? At the grocery store, you may find there are lots of fresh produce grown locally or within Canada. Outside, you may run into more wildlife, and hear more birds chirping and insects humming, compared to other seasons. Have you ever asked yourself, why is that?

In mid-latitude regions like Canada, seasons are largely determined by the amount of sunlight that reaches the Earth's surface. As Earth revolves around the sun on a tilted axis, there is an unequal intensity of sunlight hitting Canada during the year (Rutledge et al., 2022). During Canada's summer, our Northern Hemisphere, or the half of the Earth above the equator, is tilted towards the sun. This means it receives solar rays with more energy than the Southern Hemisphere at that time. Remember that for the Southern Hemisphere, our summer is their winter! The sun's tilted axis also gives summer its longer daylight duration (Hurley, 2021).

But why does that affect plant growth and how active we find nature? Because every living thing requires energy to grow! The sun is how Earth receives most of its energy (Kren et al., 2017), which gets distributed among living organisms including humans. Some organisms can use sunlight's energy and convert it into their food. These are called "primary producers", and may include species like plants, algae, and bacteria (Primary Producers, 2007). You may also see these organisms sometimes referred to as "autotrophs" since they produce their own food.

Then there are also "consumers," and these are organisms that cannot produce their food so they eat another organism to get their energy. Consumers are called "heterotrophs". Autotrophs receive sunlight in their bodies, trap that energy, and bind it to materials they pick up from the environment to create food through photosynthesis. Photosynthetic organisms are often green since that is the chemical used to grab solar rays. Since heterotrophs cannot use energy directly from the sun, they then consume autotrophs to utilise their energy. This means all heterotrophs, including us humans, are dependent on how much energy autotrophs produce.

Photo credit: Hannah Anderson

Summer - Community Science

Most of us have learned that plants need certain requirements to grow – light, temperature, water, and the right nutrients. Different types of plants are adapted to different amounts of each requirement. Plant productivity, or the amount of food a plant produces through photosynthesis, is often limited by sunlight. Since the summer gives Canada stronger solar rays and for a longer duration of the day compared to other seasons, the primary productivity of our ecosystems is greater in the summer! Because of this, other heterotrophs that eat plants also have more energy available to them. This has cascading effects on the organisms that may eat that heterotroph!

For example, in the summer, a dandelion (or autotroph) grows well because it is receiving lots of sunlight in its preferred environment. The Carolina grasshopper, our first heterotroph, or primary consumer, is born from an egg in the spring so that it can feed on large amounts of dandelions. This population of grasshoppers has enough energy to support an Eastern bluebird, another heterotroph but a secondary consumer because it eats a primary heterotroph to acquire energy. Where they are found in Canada, Eastern bluebirds are a migratory species that move south for the winter since fewer insects are available as food during this time (Planas, 2018). We see here that the primary productivity, limited by energy input via the sun, determines the populations and composition of other organisms, like our heterotrophs, through food web interactions (Gough, 2011).

If you want to begin to appreciate these species in your area, try an app called iNaturalist! iNaturalist is a citizen science project created by the California Academy of Sciences and the National Geographic Society (iNaturalist, 2019). It allows people with electronics to record an organism, where it is seen, and when, and then submit that to an international database with other entries. These entries can be viewed by other people so that they may be identified by the community, and then that data can be used by scientists. iNaturalist also uses artificial intelligence to help identify the species to help identify the species of plant, animal, insect, bird, and even mushroom, that you submit a photo of! We recommend using iNaturalist most during the summer when there is lots of wildlife that is active and growing because there are many key identification features and extra insects to see.

To try iNaturalist, download the app on your electronic device that has a camera with which to submit photos. You can also visit their website, www.inaturalist.org, and use the "Explore" tab to see what observations other people are making in your community. This has helped me to find great places to look for wildlife and appreciate what I can find around me. Happy searching!

Photo credit: Pete Nuij, unsplash.com

Summer - Art and Nature

Drawing Nature

Summer is a season of life, growth, and maturity. In this activity, we use drawing to connect with the life around us. Head outside and enjoy this simple timed drawing practice.

Step 1. Engage with the outside in a way you are comfortable.

You can look through a window, sit on your doorstep, go for a walk, or head to a park.

Step 2. Find a single form to draw.

This could be a single leaf, a single flower, or a single bird. Try to notice something alive or part of nature.

Step 3. Spend time drawing that single thing how you want.

The goal is to sit with the thing you identify and understand it in your way.

Step 4. If you want to challenge your-self, try setting a timer to see what parts you can capture in a short time.

This can help you see what parts of the single thing are most interesting to you.

In summer, many different parts of nature come more alive and obvious to us. Drawing outside lets us get to know who is around us in the summer. It might even help you recognize them later, too!

Summer - Wellness

How to Stay Cool-Headed in the Heat

Sometimes, our emotions get the best of us. Our conversations get heated, we get hot-headed, and our calmness goes out the window. Maybe, you feel concerned about climate change and the world around us. Unfortunately, climate change is well underway and has impacted many of our summer plans.

Perhaps, you are lucky enough to live somewhere which has been made resilient to climate change but for many of us, this is not the case and oftentimes summer can harbour some of the most devastating impacts on our communities. Experiencing challenging heat waves, wildfires, and air pollution can weigh heavy on us and sometimes prevent us from enjoying the present season of life.

Here are some helpful ways to keep cool in the heat:

1. Find a quiet place to meditate or to be by yourself. This could be your bedroom, a park, the beach, or wherever you're most comfortable.
2. Enjoy a cool drink. A cold glass of water, or making homemade lemonade and drinking it outside can be a relaxing way to calm down.
3. Head to a local body of water or beach. Bodies of water can have a cooling effect on the surrounding area. Take a moment to listen to the water as it runs, and let the waves of calm wash over you.

Photo credit: Mei-Ling Patterson

Summer - Reflection

Reflecting on Summer Adventures

Summer is a time often of adventure, activity, and sun. It can also be a time of transformation. If you had a summer vacation, you might have noticed that you have changed over the summer through your adventures and all that you have learned and experienced. Change can be good, and it is good to keep that in mind as we move forward onto fall.

1. What changes have you noticed in yourself over the summer?
2. What has stayed the same about you?
3. What adventures have you had during the summer? What emotions do you feel while thinking about them?

Summer also can be a time for rest and relaxation from school and other aspects of life.

4. How did you rest and recharge this summer?
5. What is one moment that you felt relaxed this summer?
6. How can you rest and recharge during the colder seasons ahead?

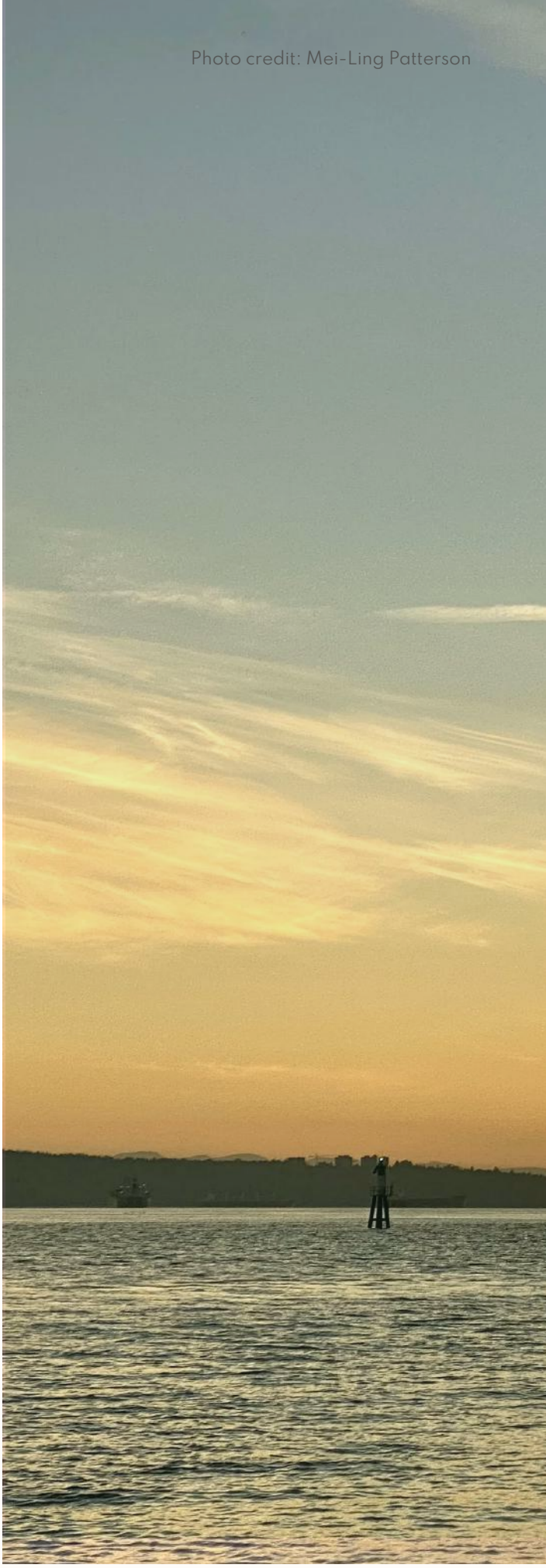

Photo credit: Mei-Ling Patterson

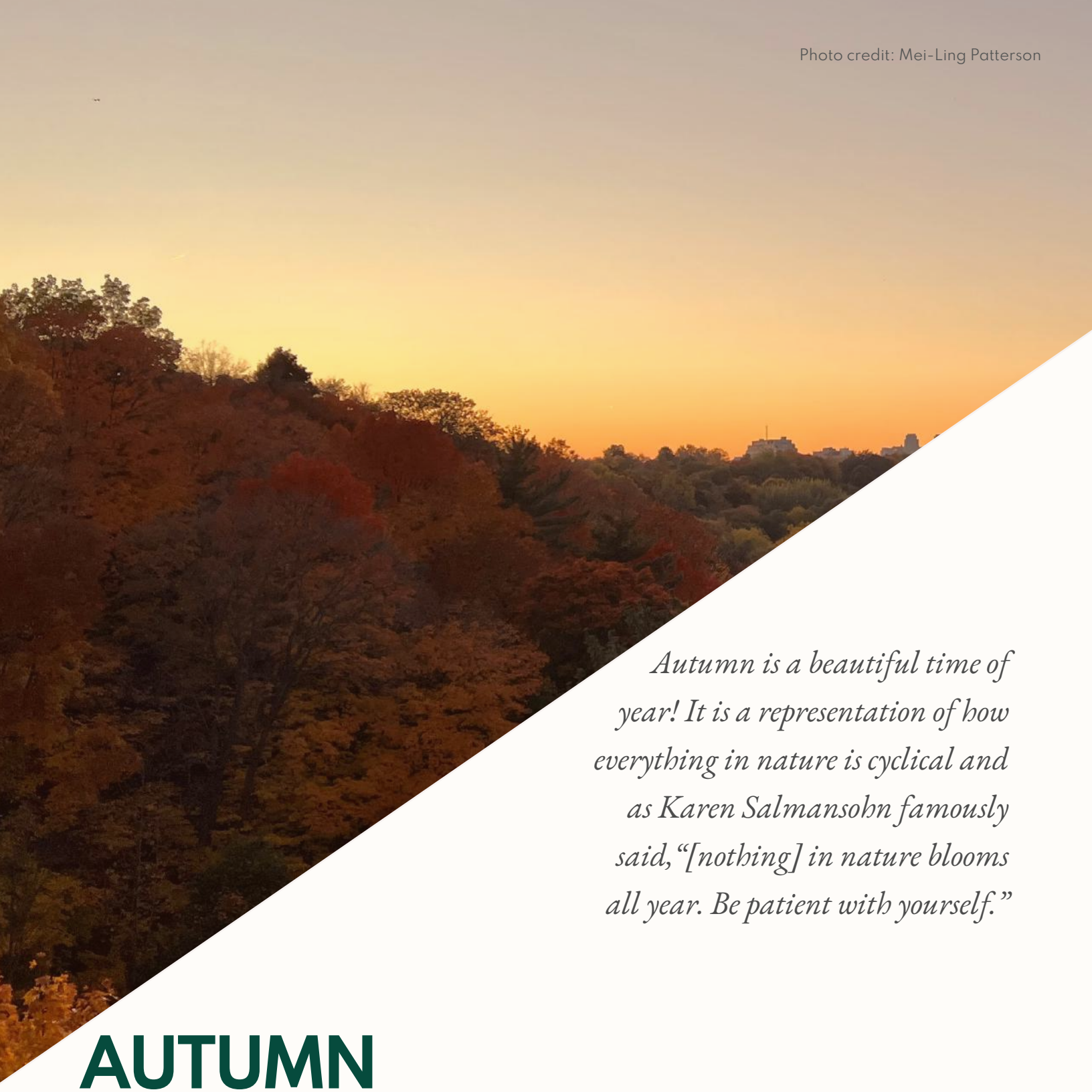

Photo credit: Mei-Ling Patterson

Autumn is a beautiful time of year! It is a representation of how everything in nature is cyclical and as Karen Salmansohn famously said, "[nothing] in nature blooms all year. Be patient with yourself."

AUTUMN

This season often comes with many different changes including the beginning of a new school year, shorter days, and a return to cooler temperatures. We know that so many sudden changes in a season all at once can sometimes feel overwhelming – so remember that important quote above! We're constantly taught about the importance of being kind to others, but it's just as important to be kind to your mind and body. And to help with that, we have designed a few different activities for you to put into practice.

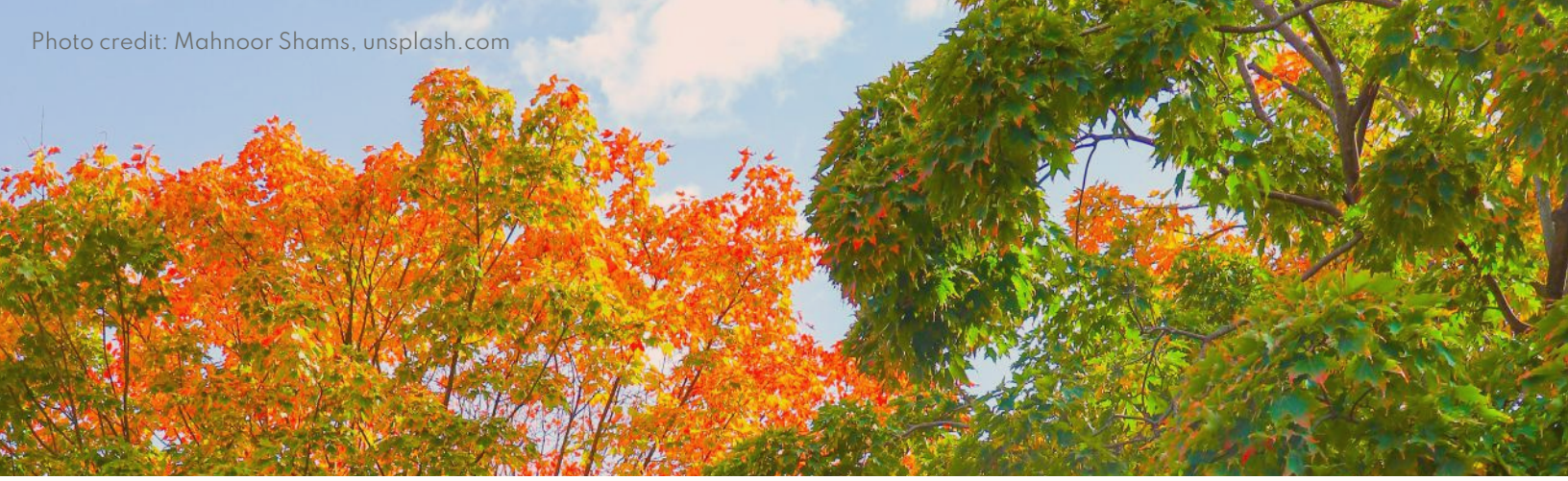

Photo credit: Mahnoor Shams, unsplash.com

Fall - Community Science

The Science Behind Fall Colours

Every year, tourists come from across the globe to admire Canada's fall colours. Our country is one of a few regions on Earth that see such an array of beautiful fall colours because of our deciduous trees. Deciduous forests cover pieces of all the continents except Antarctica and those who live there experience all four seasons. To survive the winters, trees' leaves change their colours, fall off and grow back in the spring. Throughout the winter, trees fall into what is known as a dormant period. Deciduous forests include broadleaf trees, like maple trees and oak trees.

As we have learned in this guide, leaves are green during spring and summer, because chlorophyll, a pigment that helps plants with photosynthesis, produces energy from sunlight. Come fall, plants stop producing chlorophyll), and break down the chlorophyll in their leaves.

In North America and East Asia, you might have seen fiery red hues, but in Europe, the autumn leaves are mostly yellow. The yellow and orange colours come from pigments called "carotenoids" (which also make carrots orange!), which plants make year-round, but only are visible when the chlorophyll disappears. Red tones come from "anthocyanins," which plants make in the fall from their leaves' sugars. Anthocyanins protect the tree from harmful radiation and too much light, like sunscreen for the tree. Anthocyanins can protect leaves from freezing as easily too (Thompson, 2009).

Colours change because trees are sensitive to many factors, like soil moisture, sunlight, and weather. Warm and dry weather can mean duller colours, while enough rain and lower temperatures bring beautiful, lively colours. Climate change presents a threat to the colours we know since it results in high temperatures, and different cloud cover and rain patterns. These higher temperatures can confuse trees dimming the colours and causing them to change colours randomly). Cloud cover and rain would mean lower photosynthesis – without photosynthesis, leaves make less sugar to make anthocyanins, meaning less vibrant red and purple leaves (Why do leaves change colour?, 2022). In North America, sugar maple trees are getting less brilliant and less vibrant in the fall (Ogliore, 2022).

Fall - Community Science

The Science Behind Fall Colours

Leaving your fallen leaves in your garden can come with different benefits to you and the wildlife around you. Leaves can be used by wildlife species, like chipmunks, frogs, earthworms and turtles. Butterflies and moths can spend the winter in the leaf layer, as eggs or adults. When it comes to moth species, 94 per cent depend on the leaves to finish their life cycle, and without leaves, moths and other pollinators will lose critical habitat. Without the insects around, birds, like robins and sparrows, have less food for their babies in the spring and summer! So keep your leaves nearby – as leaves are great fertilizers for your garden's soil, maintaining moisture and returning nutrients (Mizejewski, 2022). And, if you have to get rid of leaves, make sure to compost them!

Enjoying Canada's purple and yellow fall leaves is a unique experience that few people experience globally. Take a moment this season to search through photos of deciduous trees, on resources like Natural Resources Canada's Identify a broad leaf tree (tidcf.nrcan.gc.ca/en/trees/identification/broadleaf), to find out which trees are bringing colour to your life in your local community.

Photo credit: Jeremy Hynes (@hyneseyes), unsplash.com

Fall - Art and Nature

Leaves Art

Step 1. Take a walk in nature with a camera.

Write down the colours you see and where else you have seen those colours. Have you seen those reds, purples or oranges in your house? In your room? In your closet?

Take photos of leaves that you like.

Step 2. Take a moment to colour some of the leaves below with colours you saw on your walk today.

If you want, draw some of the shapes of the leaves you saw and colour those in too.

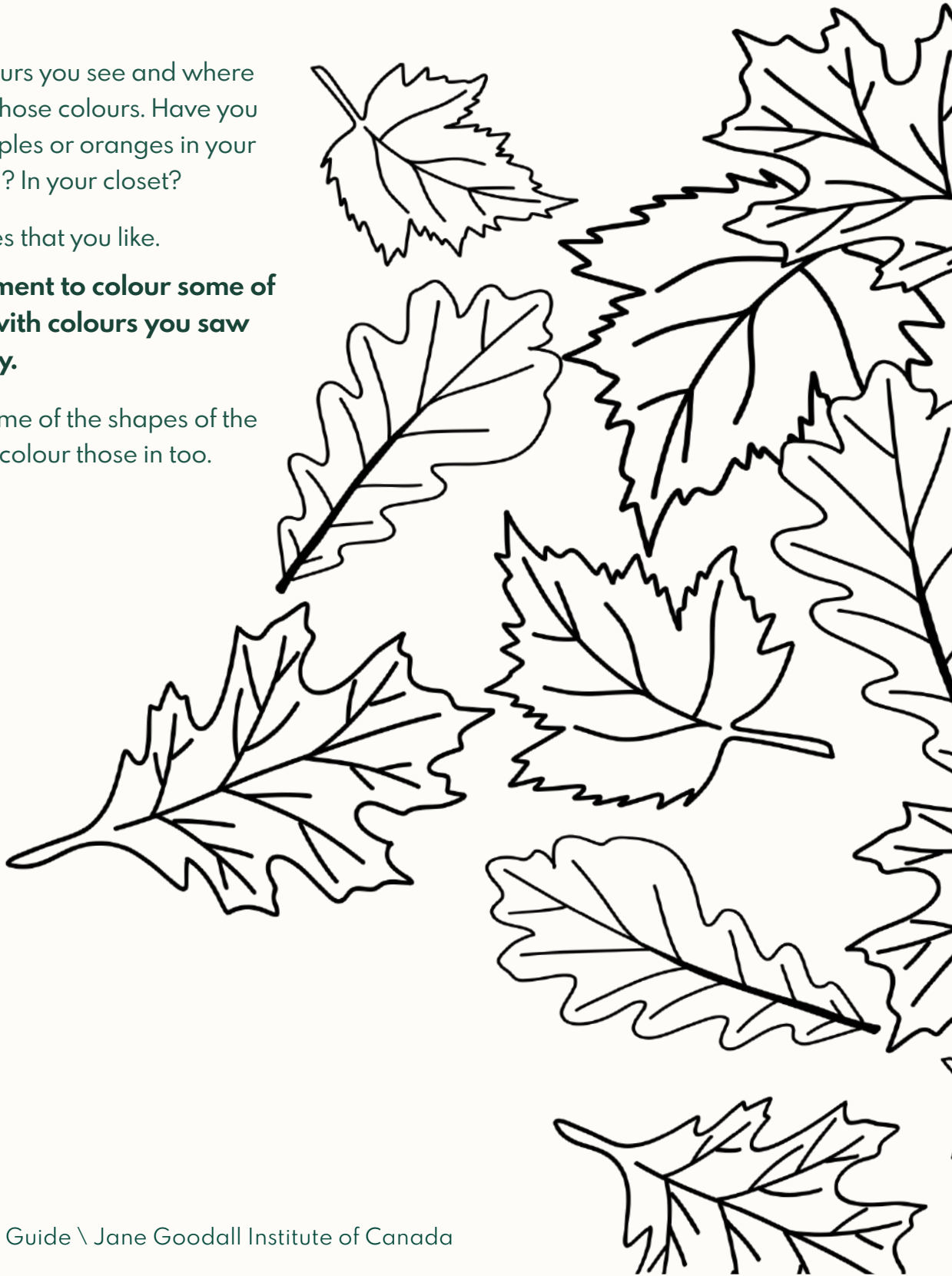

Illustration: Rae Landriau

Fall - Wellness

Autumn Mindful Nature Walk

Fall is a brilliantly beautiful time of year when deciduous trees and their bright red and orange hues colour our neighbourhoods, forests, and parks. Not only does fall provide a beautiful sight, but it also is rich in sounds, textures, smells, and experiences distinctive to the season. A mindful nature walk is an opportunity to slow down and pay attention to the changing seasons while boosting our well-being.

Activity

1. Bundle up and visit an outdoor space near to you (a park, forest, or your neighborhood)

2. Take a few deep breaths before you begin. Bring yourself into this present moment by being aware of your inhalation and exhalation. What does it feel like to be breathing in the crisp autumn air? Giving yourself this time to simply be present in nature.

3. Begin your walk and pay close attention to what you experience by being aware of your five senses; sight, sound, touch, smell, and taste.

Touch: Can you feel the texture of the fallen leaves?

Hear: Can you hear the sound of leaves crunching underneath you or leaves rustling as they gently descend to the soil?

Smell: Can you smell the sweet fragrance of autumn (thanks to fungi and soil decomposing leaves)?

See: Can you see the various hues of colours on the trees painting the trees, or the golden hour light glistening on the bark?

Taste: Can you sip your warm comforting drink slowly, paying attention to the taste and warmth it brings you?

When we practice nature walks throughout the changing seasons, it is an invitation to come back into the present moment. Each season is fleeting and has its unique beauty. Spending time in the natural world to observe these changes reminds us that everything is ebbing and flowing, just like in our own lives, and that there is often so much beauty right at this moment, sometimes we just have to slow down a little to notice.

Photo credit: Andy Holmes, unsplash.com

Fall - Reflection

What Brings Colour to Your Life?

What brings colour to your life?

As we wind down after the busy and warm summer months, to begin our journey into the colder seasons, it is an excellent time to reflect on what brings colour to your life.

1. Ask yourself, what are you grateful for . . .
    - About nature? Why?
    - About your family? Why?
    - About your friends? Why?
    - Are there certain feelings that come up when you think about these aspects of your life?
2. What makes you smile?
3. What is one memory that you made this Fall season that you are thankful for? How does your body feel mentally and physically when you think about this memory?
4. Give back! You know the best way to show appreciation for something or someone which you are grateful for but here are a few ideas, including:
    - Visiting a favourite outdoor area and do a clean-up!
    - Sharing in conversation about thoughts with someone.

Oftentimes, when we do kind things for others and the world around us, we feel happier too. So now, not only have you shown love for others, you have effectively cared for yourself and your community in the process.

Fall is a great time to reflect on what we choose to keep in our lives, and what we choose to let go of to make room for more growth in the future – much like how trees lose their leaves in the fall, only to grow more in the spring. Take a few moments to reflect on what brings colour to your life and what you want to keep in it, especially as we go through the next season of healing, hibernation and rest.

Photo credit: Mei-Ling Patterson

WINTER

Winter days on Turtle Island are marked by significantly shorter days with the sun quickly rising and setting. Many animals are hibernating, and many plants are now in a dormant state. However, the Winter Solstice falls in the middle of this season and is considered by many a time for celebration and festivities. Winter is a season to welcome the New Year and re-center our values and intentions for the new year ahead. It is an opportunity to bundle up, trek outdoors and seek out the living creatures scurrying under the snow or finding shelter in a snow-covered tree.

Photo credit: Genessa Panainte, unsplash.com

Winter - Community Science

Different Adaptations to the Cold:
Bird Canada & Audubon's Christmas Bird Count

In many parts of Canada, winter is a cold season that may reach below freezing. Temperature changes have significant impacts on the environment, and organisms have a variety of ways to cope with the harshest season. One of these coping methods is avoiding it, like when a plant lives only one year (called an annual plant) and produces seeds so it can grow again next spring. And some animals migrate to warmer places, like monarch butterflies flying to Mexico. For other species, another strategy is to have adaptations to withstand cold temperatures.

An "adaptation" is a trait of an organism that helps it to be well-suited to its environment and is genetically heritable (National Geographic Society, 2022). Adaptations in organisms come from a long process of that species being found in its environment and does not include short-term or reversible changes. This adaptation is something that the organism lives with its entire life and can pass on to its offspring.

One big way living things are adapted to the cold is through their body. "Morphology" is a word describing the body structure, size and shape of an organism. Plants, unlike animals, are rooted to where they're placed so they cannot migrate to escape the cold if they live for more than one year. Plants that live for multiple years are called "perennials," like trees or tulips. Perennial plants usually go dormant during the winter, and will store energy in their bodies so that they can grow again in the spring. Carrots, as an example, live for two years storing all of their energy in the edible part of the carrot, which is a root underground so that it can grow again next spring (Bufler, 2013).

The bodies of animals that live through the winter also have certain morphological features to keep them warm. The wood frog, found all over Canada, is a special amphibian that can freeze its entire body for up to seven months (Crowley, 2022)! The frogs body produces a special antifreeze so that ice forms only outside of its cells, and not inside where it could cause damage. Other animals found in colder climates,often they have thicker feathers/fur and larger bodies with short limbs and tails to slow down heat loss (Elishcer, 2015).

Winter - Community Science

Different Adaptations to the Cold:
Bird Canada & Audubon's Christmas Bird Count

Want to explore how heat loss is slower for these cold-climate animals? Why not try this experiment! Next time it is cold and windy outside and you're dressed warm enough, take both of your hands out of your pockets/mittens. Open your right hand and spread out your fingers. Keep your left hand out, but hold it in a tight fist. Now take a moment to examine which hand gets colder first. The right hand should get colder first because it is losing heat faster than the left. The left is more compact, just like the build of animals with adaptations to the cold.

When it comes to birds most migrate to an environment where their body is adapted too. That means that during the winter, some birds will leave where you live to move to the climate they prefer, while some birds may even fly to you because they like your Winter! This is an example of a behavioural adaptation that allows an animal to stay within the environment it likes.

Knowing where birds are going during the cold is important because it tells us what they're up to, what environments they can live in, and where we can find them. This is especially important because climate change is affecting lots of living things across the world in different ways, and we want to know what's going on. Some birds are well-adapted to the cold and maybe losing habitat as the environment changes.

Ever heard of the Christmas Bird Count? It is a citizen science project across North America that has created one of the biggest collections of wildlife survey data on the planet (Birds Canada, n.d.). Each year, one day is selected between December 14 and January 5 by a regional organizer for volunteers to conduct a bird count out in the field, or at a bird feeder. You can participate in a feeder watch by having access to a feeder, some free time, and access to a guide that can help you identify birds (your brain, a website or phone app, a bird ID book, or whatever else you may have). Want to learn more about how to participate, or view the past data summaries, visit: birdscanada.org/bird-science/christmas-bird-count.

Photo credit: Brian Taylor, unsplash.com

Winter - Art and Nature

Celebrating Winter

During the winter months, the landscape around us looks vastly different. Take a moment to look out your window and identify and write down the colours, textures, smells, animals, and plants which have changed since the summer and fall. Ask yourself, how does this environment make you feel?

Consider how celebrations and festivals might look different during the winter season. Cold weather provides artists with a material that is not available or easy to maintain year-round – ice! Are there ice carving artists in your community? Are there winter festivals in your local community or city? These could be great opportunities to bring your students, classmates, or friends together to learn about these forms of art and the cultures influencing them.

Some Activities to Do:

- Take pictures to create a photo album to share with your school and send to JGI Canada.
- Write a reflection about how Winter landscapes and artwork inspire you
- Go on a winter nature walk and draw a landscape that changes throughout the seasons.
- Reflect on how the winter landscapes have changed over the years. How has climate change affected your community?

Photo credit: Ivars Krutainis, unsplash.com

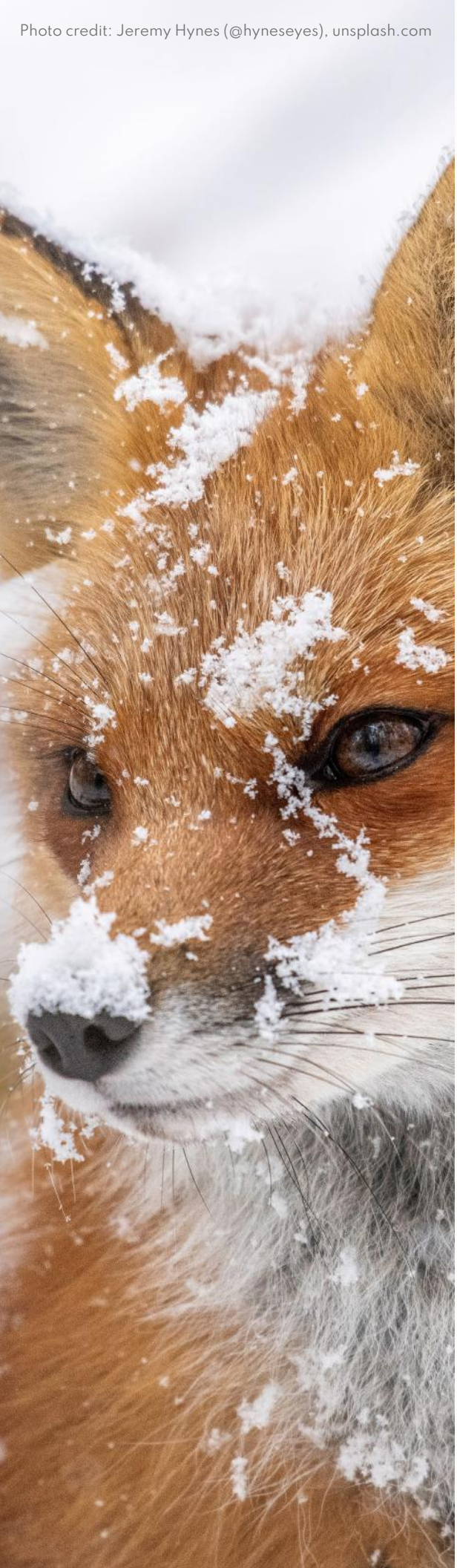

Photo credit: Jeremy Hynes (@hyneseyes), unsplash.com

Winter - Wellness

Rest and Hibernation

Winter sits in the middle of fall and spring, seasons of release and renewal. This period acts as a pause for nature, and as we are a part of nature, for us too. The winter season invites us to go a little slower – reflect, meditate, and nourish what we may have pushed aside in the busyness of our everyday lives. During winter, it's a good time to reflect on what elements of hibernation and care you can bring into your life, just as the natural world does.

To help celebrate the season, here are some journaling prompts to try:

- How can I care for my mind, body, and spirit this season?Perhaps you want to prioritize more sleep, or time spent reading, or maybe healthier foods? Write some ideas down.
- How can you incorporate more rest into your life during this winter season?
- How will you still connect with nature even in the dark and cold of this season? Perhaps you'll spend some time by a window every day to observe a tree or park, or you'll bring some nature in by adding more plants into your space, or maybe you'll try bundling up a few times a week to get some crisp fresh air.

Winter is challenging for many, with short and dark days, but it can be helpful to find a shift in perspective and see it as a time for you to practice self-care before seasons with more light and activity arrive. Just because the natural world is rather bare and still this time of year, it doesn't mean it isn't doing anything. Quite the opposite actually, this time of slowness and pause acts as preparation for the productive growing times of spring and summer. So, perhaps allow yourself to add a bit more to your cup and prioritize rest and renewal, so you too can be well and nourished for seasons ahead.

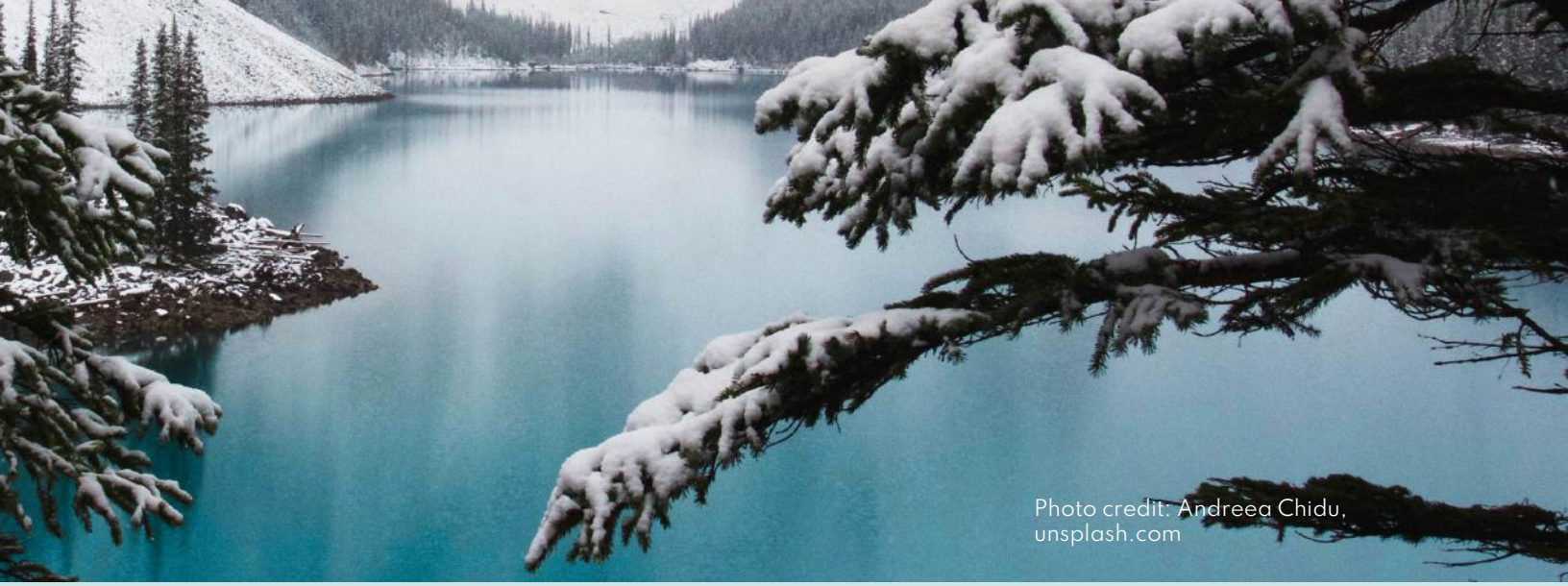

Photo credit: Andreea Chidu, unsplash.com

Winter - Reflection

Avoiding the Frost

It may feel more difficult or even uncomfortable to connect with nature during the winter given the freezing temperatures and extreme weather that it often comes with, but it's now more important than ever to remember that as humans, we are not separate from the ecosystems which surround us. As such, we encourage you to consider the following questions and maybe even try some of the corresponding activities:

1. **Have your views on Winter weather changed throughout your life? If so, why?**
    - It's not necessarily a negative or positive thing if it has! However, many of us as children would think about these changes in weather like snow with excitement but as we get older, our views may tend to harden. If you used to enjoy certain Winter activities like making snow angels or snow people, maybe try doing so again and consider the reasons why you might have stopped.
2. **What is your favourite part about the winter season?**
    - Perhaps, it's the holiday season and getting to reconnect with your loved ones and rest.
    - Maybe you practice a winter sport (like skiing or snowboarding) that you miss during the other times of year?
3. **Is there something about this season in particular that is difficult for you?**

Recognizing what challenges you and what you may struggle with is an incredibly brave and powerful thing to do! Once we recognize this, we can begin to overcome and care for ourselves better. When you're faced with this, think of a self-care action plan that you can do to help yourself best recover. Maybe, it includes taking a warm long bath or visiting your favourite park.

Closing Words

Our 2022-2023 YAC has invested its time and care into creating this seasonal Nature Walks Guide as a helpful community resource to emphasize the importance of connecting with not only yourself, but also our home planet.

Inspired by Dr. Jane Goodall's message of hope, this guide and its various activities demonstrate the many ways in which we can all continue to show appreciation for our people, animals, and the environment. We encourage you to share this resource with others to inspire their connection to the seasons. When individuals can form connections with nature, it often leads to positive approaches in which others begin to grow more passionate about protecting our one and only Mother Earth.

Additional Resources

Searching for more accessible and inclusive nature-based and outdoor resources to help guide you on your wellness, self and community-care journey? Here are some personal favourites of our 2022-2023 YAC.

- **Groups Promoting Equity-Deserving Peoples**' Access to Nature & Outdoor Activities/Skills: This list is compiled by Shake Up The Establishment for our Rest, Recovery and Resistance (3RS) program, proudly funded by Patagonia Toronto and Arc'teryx. It is designed to connect individuals to groups across what is currently Canada who specialize in promoting access to nature and outdoor skills/adventures/activities for Indigenous, racialized, gender-diverse, neurodiverse, (dis)abled, and other equity-deserving communities.
- **Circularity Community**: This is a multimedia platform providing accessible mental health resources for anyone struggling with eco-anxiety. It was created by working with researchers in the field to create educational resources, meditative reflections, and community events that not only help reduce eco-anxiety symptoms but also empower climate action.
- **Patagonia Stories**: Working Knowledge is a new series of stories grounded in wild places and activism from around the world and close to home. Hear from a wide variety of people and perspectives, for we all have much to teach and much to learn.
- **AllTrails**: Search over 300,000 trails with trail info, maps, detailed reviews, and photos curated by millions of hikers, campers, and nature lovers like you.

Photo credit: Gabe, unsplash.com

References

Birds Canada. (n.d.). Christmas Bird Count [Review of Christmas Bird Count]. Birds Canada; Birds Canada. https://www.birdscanada.org/bird-science/christmas-bird-count

Bufler, G. (2013). Accumulation and degradation of starch in carrot roots. Scientia Horticulturae, 150, 251–258. https://doi.org/10.1016/j.scienta.2012.11.022

Crowley, J. (2022, October 14). Wood Frog [Review of Wood Frog]. The Canadian Encyclopedia;

Elischer, M. (2015, December 10). Animal adaptations for winter [Review of Animal adaptations for winter]. MSU Extension; Michigan State University. https://www.canr.msu.edu/news/animal_adaptations_for_winter

Gough, C. M. (2011) Terrestrial Primary Production: Fuel for Life. Nature Education Knowledge 3(10):28

Halton, M. (2018, July 27). Why does rain smell so good? BBC News. https://www.bbc.com/news/science-environment-44904298

Hurley, S. (2015, August 24). How the length of a day changes over the year. Explaining Science. https://explainingscience.org/2015/08/24/september-18-the-shortest-day/

iNaturalist. (2019). iNaturalist.org. INaturalist.org. https://www.inaturalist.org/

Kren, A. C., Pilewskie, P., & Coddington, O. (2017). Where does Earth's atmosphere get its energy? Journal of Space Weather and Space Climate, 7, A10. https://doi.org/10.1051/swsc/2017007

Magazine, S., & Fox, A. (n.d.). How Rain Evolved Its Distinct Scent—and Why Animals and Humans Love It. Smithsonian Magazine. Retrieved March 5, 2023, from https://www.smithsonianmag.com/smart-news/smell-rain-explained-180974692/

Mizejewski, D. (2022, October 25). What to do with fallen leaves. The National Wildlife Federation Blog. Retrieved March 5, 2023, from https://blog.nwf.org/2014/11/what-to-do-with-fallen-leaves/

NASA Goddard Space Flight Center. (n.d.). Temperate Deciduous Forest: Mission: Biomes. NASA - Earth Observatory. Retrieved March 5, 2023, from https://earthobservatory.nasa.gov/biome/biotemperate.php

National Geographic Society. (2022, July 14). Adaptation [Review of Adaptation]. National Geographic; National Geographic Society. https://education.nationalgeographic.org/resource/adaptation/

[NOAA] National Oceanic and Atmospheric Administration. (2023, January 20). Are there oceans on other planets? National Ocean Services. https://oceanservice.noaa.gov/facts/et-oceans.html

Ogliore, T. (2022, September 23). No, autumn leaves are not changing color later because of climate change. Phys.org. Retrieved March 5, 2023, from https://phys.org/news/2022-09-autumn-climate.html

Planas, G. (2018, March 22). Eastern Bluebirds: The Little Blue Bomber. Nature Canada. https://naturecanada.ca/news/blog/eastern-bluebirds/#:~:text=Found%20in%20eastern%20North%20America

Primary producers. (2007). Stream Ecology, 105–134. https://doi.org/10.1007/978-1-4020-5583-6_6

Rutledge, K., McDaniel, M., Teng, S., Hall, H., Ramroop, T., Sprout, E., Hunt, J., Boudreau, D., & Costa, H. (2022, May 20). Seasons (J. Evers, Emdash Editing, & K. West, Eds.) [Review of Seasons]. National Geographic; National Geographic Society. https://education.nationalgeographic.org/resource/season/

Sargen, M. (2019, September 26). Biological Roles of Water: Why is water necessary for life? Science in the News; Harvard University. https://sitn.hms.harvard.edu/uncategorized/2019/biological-roles-of-water-why-is-water-necessary-for-life/

The Canadian Encyclopedia. https://www.thecanadianencyclopedia.ca/en/article/wood-frog

The Canadian Press. (2022, October 19). Loving the fall colours? Here's why they're especially stunning this year | CBC News. CBCnews. Retrieved March 5, 2023, from https://www.cbc.ca/news/canada/toronto/fall-colours-2022-1.6620256

Thompson, A. (2009, September 22). Why fall colors are different in U.S. and Europe. LiveScience. Retrieved March 5, 2023, from https://www.livescience.com/5749-fall-colors-europe.html

Tree Canada. (2022, October 24). Why do leaves change colour? Tree Canada. Retrieved March 5, 2023, from https://treecanada.ca/article/why-do-leaves-change-colour/

Jane Goodall Institute
Canada

563 Spadina Cres.
Toronto, ON M5S 1C1
c/o UofT Mailroom

@JaneGoodallCAN