Tree-mendous Trees of BC

Program Resource for All Units

British Columbia Council, BC Program Committee

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Introduction

Welcome to Tree-mendous Trees of BC, a resource developed by the BC Program Committee for all branches levels to use in their unit programming. This theme encourages units to get active and visible in the community, as well as familiar in nature - identifying trees, learning what roles they play in our ecosystem, and maybe even try their hand at making paper!

This theme combines several program areas, including physical activity, STEM, environmental awareness, exploring local community, and more. Our committee has worked together to design an easy-to-use enrichment resource for Guiders that can be easily applied to unit meetings (or day camps) with content that is relevant across all units in BC covering a subject that many may not have tackled before.

Feel free to try as many activities as you would like and to keep this booklet as a resource for future activities!

Requirements

In order to complete this program, you will need to:

1. Read and talk about a minimum of eight (8) tree facts.
2. Learn about the different parts of a tree, their functions, and how to identify at least two (2) types of deciduous trees and two (2) types of coniferous trees.
3. Complete one (1) science activity, one (1) game and one (1) craft activity for Sparks, Embers, and Guides.
4. Complete two (2) science activities, one (1) game and/or one (1) craft activity for Pathfinders and Rangers.
5. Go on a hike in your community, find and identify local trees.

Tree Resource

Fun Facts

- Canada has the second largest forest area in the world (after Russia). BC is 95 million hectares (235 million acres) in size. About 64% of BC – about 60 million hectares (149 million acres) – is forested. In eight years, BC has doubled its protected areas to 14% of the province, which is one of the highest percentages in North America.
- British Columbia has about 40 native tree species, but you won't find all of them everywhere you go. Some trees, like lodgepole pine, grow throughout the province, while others grow in specific places where they are adapted to the local climate and other environmental features.
- The lodgepole pine is the most abundant tree in BC.
- Elder, maple, and birch are the most common deciduous trees in BC.
- BC's oldest tree is a yellow cedar (now a stump). It is 1,835 years old and found in the Caren Range on the Sunshine Coast.
- Cheewhat Giant, also known as the Cheewhat Lake Cedar, is a large western red cedar (Thuja plicata) located in Pacific Rim National Park Reserve on Vancouver Island. It is the largest living Western red cedar, the largest known tree in Canada, and one of the largest in the world.
- 200 million trees are planted annually in BC – about three seedlings for every tree cut. If three seedlings are planted for every one cut, this means approximately 66 million trees are cut down annually in BC.
- Trees compete for light and space to grow. Some species compete by trying to grow faster than their neighbours. Others compete by creating chemicals that poison the soil around them, preventing other trees from growing nearby. This process is called allelopathy.
- After a major disturbance, like a wildfire, the first trees are known as pioneers. These species need full sunlight and cannot grow in a forest. Common pioneer trees in BC include Douglas fir and lodgepole pine. After pioneers start to grow, other trees like hemlock and spruce will happily grow in their shade.
- Can you imagine eating ice cream that has wood in it? Guess what – most ice cream does have wood in it! A chemical called hemicellulose is extracted from wood and used in all commercial ice creams. It keeps ice cream creamier; without hemicellulose, the water in cream freezes – making crunchy ice crystals. Don't worry – wood chemicals have no flavour and are safe to eat.
- Other common products that contain cellulose include toothpaste and pancake syrup. Cellulose is included on many product labels with names like xylitol and xanthan gum. These high viscosity (thick), non-toxic compounds make frothy toothpaste, thicker syrup, soothing eye drops, and longer-lasting chewing gum. Even paint and washing detergent contains some wood cellulose.
- Trees are the source of potential medicines. Aspirin (acetylsalicylic acid) originally came from willow trees – and was used as a headache cure by ancient Egyptians more than 3,000 years ago. Taxol, made from the Pacific yew, can stop the growth of some cancer tumors. Other useful chemicals may be found in other trees.
- Trees help combat climate change. Forests help clean the air by removing pollutants, absorbing carbon dioxide, and releasing oxygen. When trees use carbon dioxide, which is a greenhouse gas,

this removes it from the atmosphere and converts it into a long-term storage material (wood). When we build with wood, this carbon stays locked in the wood. If you live in a wood-frame building, your house stores carbon equal to the amount of CO2 produced by driving a car for five years.

- Wood has a lower density than water, so it floats. Trees move water and sap through tiny channels (pores) in their wood. Some trees have bigger pores, making their wood less dense and more buoyant. In forestry, harvested logs may be bundled into rafts which are floated along rivers from the forest to sawmills. Log booms are inexpensive transportation.
- Not all wood is the same, and it is stronger along the grain than across it. Plywood is a stronger wood product that takes advantage of this directional property. Mills stack thin sheets of wood in layers, setting each layer perpendicular to the last and crisscrossing the grain. This creates equal strength in both directions across the board. Ancient Egyptians discovered this principle more than 3,500 years ago. Modern engineered wood products combine smaller pieces of wood to eliminate weak points and create a more durable and valuable product.
- Are your clothes made of wood? They might be. Wood fibres are made from cellulose, and more than 100 years ago a French chemist discovered a way to dissolve lignin (wood glue); the resulting cellulose can be spun into threads to weave fabric. "Artificial silk" was the first man-made fibre and is still sold today – as rayon, viscose, and acetate. Once a slow, expensive, and dangerous process, modern engineering technology has made it safe and efficient. These fabrics are soft and luxurious, as well as renewable and biodegradable—because they're made from wood.
- Bioplastic is made from wood, but it looks and feels like plastic. The process removes lignin (tree glue) and spins the lignin with natural resins to create an eco-friendly material called bioplastic or liquid wood. It can be injected into molds to make cutlery, pens, bicycle helmets, and ping-pong balls. Using biodegradable and renewable materials reduces the pressure on local landfills.

Coniferous vs. Deciduous Trees

Conifers are also called evergreen or softwood trees. They are distinguished by growing cones instead of flowers, and many have needles year-round. These adaptations help conifers survive in areas that are very cold or dry. Some common conifers include spruces, pines, firs, and cedars. Where wildfires are common, trees like lodgepole pine have cones that are glued shut. These cones only open and release their seeds when they are heated. This adaptation allows forests to grow back after a fire.

Deciduous trees are also called broadleaf or hardwood trees. They grow flat leaves and typically shed these leaves in autumn. Deciduous trees are dormant in the winter and grow new leaves when the weather gets warmer. The word deciduous means 'to fall off' and describes this cycle of growth, dormancy, and renewal. Deciduous trees reproduce through flowers. Common deciduous trees include maples, oaks, and aspens.

Source: https://treecanada.ca/resources/trees-of-canada/

What are the Parts of a Tree?

Trees have three main parts: leaves, trunk, and roots.

The upper part of the tree with the branches is called the crown.

- **Needles or leaves** are the part of the tree that make sugars from air and water. They do this through a chemical process called photosynthesis in which energy from the sun, carbon dioxide from the air, and water recombine to form sugars and oxygen.
- **Stomates** are tiny holes that control the amount of air that enters and exits each leaf.
- **Chlorophyll** is a chemical that makes leaves look green. It is found inside chloroplasts in the plant's cells. Chlorophyll uses the sun's energy for photosynthesis.

The tree trunk has several layers.

- The **outer bark** protects the tree from fire or insects and insulates it from extreme heat and cold.
- The **phloem** is a layer of cells that forms a pipeline, carrying sugars from the leaves to the rest of the tree. As these cells die, they become part of the outer bark.
- The **cambium** is the growing part of the trunk. Each year the cambium produces new phloem and sapwood. These cells grow more slowly in the winter and this slower growth produces the tree's annual rings. Tree rings can help us find the age of a tree. The oldest part of the tree is always on the inside.
- The **sapwood** acts like a pipeline to carries water and nutrients from the roots up to the leaves. AS new layers develop, the inner layers die and become heartwood.
- **Heartwood** is dead wood in the centre of the tree. It gives the tree its strength.

Roots have two jobs: to anchor the tree to the earth, and to absorb water and nutrients from the soil. Trees have fungi that live in and on the root cells and help them absorb water and nutrients. In return, the fungi obtain food from the tree.

Trees suck up water from their roots, like drinking through a straw. On a hot day some tree species, such as red alder (Alnus rubra), suck up water so hard that you can hear them hiss if you make a small cut in the bark. This process by which trees obtain water from the soil is called transpiration.

Trees need nitrogen to grow. When soil nitrogen is low, some trees can convert nitrogen from the air (air is 79% nitrogen) into a useful form. Red alder has nitrogen-fixing bacteria that live in nodules (lumps) on their roots. Alder trees share sugars made through photosynthesis with the bacteria; in return, the bacteria take nitrogen from air pockets in soil and convert it into a form the alder can use to grow.

How to Identify Trees

Go out into your community – visit a local park or walk in the forest – to identify different types of trees. You can borrow a tree field guide from the library, or find some useful resources online such as the following:

- BC Tree book: https://www.for.gov.bc.ca/hfd/library/documents/treebook/treebook.pdf
- BC Tree posters: https://www.bcnfw.ca/bc-tree-posters/
- E-Flora resource: https://ibis.geog.ubc.ca/biodiversity/eflora/E-FloraTreesofBritishColumbia.html

You can also download apps to help you identify trees from their leaves, needles, bark, cones, and other characteristics. Consider iNaturalist, LeafSnap, PictureThis, PlantNet, NatureID, or other tools.

Identifying Trees with Needles

FEATURE TO LOOK FOR	TREE SPECIES
Needles in bundles of 2	Lodgepole Pine
Needles in bundles of 3	Ponderosa Pine or Yellow Pine
Needles in bundles of 5 with small cones up high on the tree	Whitebark Pine
Needles in bundles of 5 with large cones up high on the tree	Limber Pine
Needles in bundles of 5 with large cones throughout the tree	Western White Pine
Bundles of 15-30 needles in Southern BC	Western Larch
Bundles of 15-25 needles in Northern BC	Tamarack Tree
Bundles of 30-40 needles in Subalpine Areas	Alpine Larch

SPRUCE TREES *have needles with 4 sides*

Needles are sharp and stiff, cones have rounded scales	White Spruce
Grows at higher elevations, cones have ragged scales	Engelmann Spruce
Grows in coastal areas, needles are flattened	Sitka Spruce
Grows in Northern BC, clumps of branches at the top of tree	Black Spruce

FIR TREES *have needles that are flat with a notch at the end*

Needles are on the upper side of branch and point sideways	Grand Fir

Needles are on the upper side of branch and point upwards	Amabilis Fir
Needles are all pointing upwards	Subalpine Fir
Cones with three-forked bract, berry like red fruit	Douglas Fir

HEMLOCK

Needles are different lengths, top branches droop	Western Hemlock
Needles are all the same length and grow upwards	Mountain Hemlock

Identifying Trees with Broad Leaves

FEATURE TO LOOK FOR	TREE SPECIES
LEAVES *in Opposite Pairs*	
No lobes on leaves, veins parallel, white flowers	Pacific Dogwood
Very large leaves with 5 lobes	Big Leaf Maple
Leaves with 3-5 lobes, leaves are coarsely toothed	Douglas Maple
Leaves with 7-9 lobes, leaves are almost circular	Vine Maple
LEAVES *Alternating*	
Leaves are evergreen, red bark that peels	Arbutus
Oval leaves, branches have thorns	Black Hawthorn
Oblong leaves, veins are parallel	Cascara
Leaves with rounded lobes, acorns	Garry Oak
FRUIT-Bearing Trees	
Egg shaped leaves, small red apples	Pacific Crab Apple
Long cluster of dark purple berries	Choke Cherry
Flat topped cluster of bright red berries	Pin Cherry
Loose cluster of dark red berries	Bitter Cherry

Identifying Trees with Catkins (slim, cylindrical flower clusters)

FEATURE TO LOOK FOR	TREE SPECIES
Leaves with rounded edges and edges that roll over	Red Alder
Leaf edges are double toothed, small tree or shrub	Mountain Alder
Triangle shaped leaves, bark peels easily	Paper Birch
Oval shaped leaves, bark is dark and shiny	Water Birch
Fluffy catkins that blow in the wind	Balsam Poplar
Catkins have white seeds	Black Cottonwood
Tiny catkins, smooth white bark, leaves "tremble" in the wind	Trembling Aspen

Cedar Trees in BC

Cedar trees are integral to coastal First Nations, their spiritual beliefs, and ceremonial life. These trees are also a key natural resource used to make many products. BC has two species: yellow cedar and Western red cedar (as shown in picture). Yellow cedars grow to 20–40 metres tall with bushier branches. Red cedars grow up to 70 metres tall and live up to 1,000 years.

Red cedar has lightweight and rot-resistant wood, and is used for construction (e.g., longhouses, house poles) and transportation (e.g., canoes). The bark has many different uses, including cloth and other household items like mats and baskets. Bark harvesting is done carefully to ensure trees survive, while strips of bark are removed – leaving distinctive marks. Women harvest bark, holding the necessary skills and knowledge about damage. Men are traditionally responsible for cutting down trees, a process that involves chiseling and using hot stones to weaken the wood. Before the tree is harvested, the woodcutter speaks a prayer and gives gratitude to the tree's spirit. Cedar is also valued for traditional medicines.

Source: UBC Decolonizing Teaching Indigenizing Learning
https://indigenizinglearning.educ.ubc.ca/content/teachings-of-cedar-tree/

Art & Crafts

Four-Season Tree

This simple four-season tree craft is perfect for any time of the year and is a great way to learn about the different seasons.

You Will Need:

- Cardstock
- Paint: green, white, blue, pink, red, yellow, brown, orange
- Paintbrushes
- Q-tip or pencil with eraser

What to Do:

1. Print the four seasons template on white cardstock OR have your unit draw four similar-looking trees on a piece of cardstock.
2. Optional: you can paint the background.
3. Pour a little of each paint colour onto a plate or palette.
4. Using a Q-tip or an eraser (on the back of a pencil) start painting your trees. Spring trees have green leaves and white/pink blossoms. Summer trees are all green (and some may have fruit). Fall trees have autumn colours. Winter trees can be brown or blue; you could opt to paint white snow on the branches.

Resources:

- Tree template https://www.craftsonsea.co.uk/four-seasons-tree-template/
- Detailed instructions https://www.craftsonsea.co.uk/four-seasons-tree-craft/

Egg Carton Tree

This is a great craft to tie in with recycling and clean-ups in your community.

You Will Need:

- Clean, empty egg carton – one per tree craft
- Large white canvas
- Green and brown paint
- Paintbrushes
- Scissors
- Hot glue gun and glue sticks

What to Do:

1. With scissors, trim each individual section of the egg carton.
2. Paint the egg carton pieces green.
3. Set them aside to dry completely.
4. Paint the trunk of the tree on the canvas.
5. Using hot glue, attach the green egg carton pieces to the canvas, making it look like a tree.
6. Discard any extra pieces.
7. Add any other embellishments you like, such as apples, birds or cherry blossoms, etc.

Resource:
https://www.gluedtomycraftsblog.com/2014/04/egg-carton-tree-kids-earth-day-craft.html

Quilling Tree

Learn the art of paper quilling with this fun activity.

You Will Need:

- White cardstock
- Watercolour paint or acrylic paint
- Paintbrushes
- Coloured cardstock (or construction paper OR quilling strips)
- Paper cutter (optional but much easier when cutting your own strips)
- Chopstick or pencil
- Glue

What to Do:

1. Paint the background in a cheerful colour (example used blue).
2. Draw a tree. Paint it using a thinner paintbrush for smaller branches.
3. Cut out 1 cm (½ inch) paper strips from cardstock or construction paper. The example used pink and purple for blossoms and two shades of green for leaves. For the blossoms, cut the paper in half to make shorter strips – this makes a nice blossom size.

4. While you wait for the tree to dry, start making the paper coils. Youth members can either make all their paper quills and then glue them down or make one quill at a time and glue it down.
5. This project uses two different paper quill shapes. One is a basic coil, the other is a leaf shape. To make the coil: wrap a paper strip around a chopstick or pencil. You could also experiment using a bamboo skewer. Wrap the paper strip all the way around the chopstick or pencil and slide it off. Don't worry about the coil unwrapping a bit, it adds to the design.
6. To make the leaf shape: pinch your coil shape at both ends (see photo).
7. Dip one paper quill into a small dish of white glue, then glue it on the tree. Keep gluing down your blossom and leaf shapes until you are finished. You can also add some paper quills to the bottom of the tree.

Resource: https://www.projectswithkids.com/spring-tree-craft/

Button Tree

Craft a tree to show off your assortment of beautiful buttons.

You Will Need:

- Buttons (second-hand stores often have bags of buttons)
- Canvases
- Acrylic paint
- Paintbrushes
- 3-D Paint (optional)
- Pencils
- Hot glue gun (or glue that is used for canvas)

What to Do:

1. Start with a 'wash' background. Water down your paint and use a large sponge or brush to blend some colours. The example used blue at the bottom, moving to purple, and pink at the top. (Optional: use a blow dryer to dry the background before continuing.)
2. Some youth members may prefer to draw their tree with a pencil first. Sketch lightly, starting with a few larger branches and adding smaller branches. When you are happy with your tree, paint it using a finer paintbrush for smaller branches
3. If you want 3-D paint, add lines along the trunk and on some branches (see photo).
4. Place buttons on the tree before gluing them. Leave the smallest buttons for the outer edges of the tree.

Resource: https://craftsbyamanda.com/vibrant-button-tree-on-canvas-a-giveaway/

Wire Tree

A wire tree sculpture can be simple or intricate – you decide! Just make sure you place it somewhere you can look at it every day.

You Will Need:

- 25 feet (7.6m) of 22-gauge wire (craft stores generally carry this)
- Wire cutters
- Beads
- Container (e.g., terra cotta pot, small decorative bowl)
- Pebbles or marbles
- Hot glue gun and glue sticks
- Optional: paint and paintbrushes

What to Do:

Part One: Create the branches

1. Using wire cutters, cut the wire into 10 strips. Each strip should be 2½ feet (76 cm) long. Set the wires off to the side. Use caution – wire cutters are sharp.
2. String a bead onto your first wire. Bring it down to the centre of the wire. Bend the wire around the bead until the ends meet. Twist the wire tightly, moving down from the bead about ¾ inch (19 mm). You will be left with two ends on either side of the twist.

3. Place a bead on one of the ends of this wire. Bend and twist the wire around the bead like you did in the last step. You will have about ¾ inch (19 mm) of wire below the bead. With a new bead, repeat this step on the remaining end of the wire.

4. You now have three beads on the wire in a "t" shape. Secure the beads by twisting the remaining wire together below the "t". Twist these two wires together about ¾ inch (19 mm).

5. Repeat this process with the remaining nine wires. Add three beads to each wire. You will end up with 10 "t" shaped wires with three beads on each wire.

Part Two: Twist the wire into a tree

6. Cross two branches over each other and twist them together below the beads. Repeat with each of the branches – you should have five pairs.

7. To create the tree, take two pairs of branches and cross them over each other. Start twisting them together. Then add another pair and twist, and another, until you have added all of the pairs. Continue twisting the wires together to create the tree trunk. Make a thick, wide trunk by twisting the branch wires on top of each other. Make a thin, swirling trunk by stretching out the branch wires as you twist them together.

8. Near the bottom of the wires, twist the wire around itself to create a ball. This ball will help stabilize the tree in its container.

Part Three: Securing the tree in a container

9. Take the container and, with a glue gun, add a good quantity of glue to the bottom. Push the ball of the tree into the hot glue. Hold the tree in place while the glue dries.

10. While the glue is still hot, add a layer of pebbles to the container. All the pebbles should fit into the glue, surrounding the tree trunk. They will provide more support to the tree once the glue is dry. Continue holding the tree while adding pebbles. If necessary, prop up the tree with something to prevent it from falling over. Work quickly as your glue will dry within 1-2 minutes.

11. Add another layer of glue on top of the first layer of pebbles. Place a second layer of pebbles in the glue. Repeat this process several times until you reach the top of the container.

12. Once the glue is dry, adjust your tree branches. Bend the wires so that the tree takes your desired shape. For example,

bend the branches down to create a weeping willow. Splay the branches out and bend them up slightly to resemble a maple or oak.

Resource: https://www.wikihow.com/Make-a-Wire-Tree-Sculpture

Jackson Pollock-inspired splatter trees

Jackson Pollock is best known for his paintings created by splattering, throwing, layering, and dripping paint onto oversized canvases. He called his style of painting 'action art' because of the way he moved around while creating. The paintings are filled with movement and rhythm as his way of expressing himself through art.

You Will Need:

- White cardstock OR canvas
- Acrylic paint in several colours
- Paintbrushes
- Paint palette
- Pencils
- Aprons (optional)
- Plastic tablecloths (alternatively, paint inside a cardboard box or outside)

What to Do:

1. On cardstock or canvas, draw a large tree that takes up about 80% of the surface. Paint it with brown or black paint. Let it dry completely. (You can discuss who Jackson Pollock was OR do another Tree Activity and return to the painting when you are ready.)
2. If the acrylic paint is too thick, add a small amount of water to make it easier to splatter.
3. Place complimentary colours in paint palettes and use several paint brushes for each colour.
4. Start with your lightest colour. Have unit members dip a medium-sized paintbrush in the paint and splatter the colour on their trees. There are several methods to splatter the paint.
    a. Use your first two fingers, hold the paintbrush above the paper, and tap it to splatter paint onto your paper.
    b. Tap the paintbrush onto your first two fingers.

5. You can see these techniques in the photos. Both techniques work great! Remind kids that they are layering a few colours on each tree, so they shouldn't try to cover the tree with the first colour. Think about splattering towards the top of the tree where the leaves are – this will create a tree shape. Leave the bottom part of the paper mostly empty, with just the tree trunk.

Resource: https://www.projectswithkids.com/pollock-inspired-splatter-painting-for-kids/

Leaf or Pinecone Prints

Customize your own leaf or pinecone stamps by using potatoes.

You Will Need:

- Potatoes
- Knife
- Paint
- Tray or paper plates
- Paper

What to Do:

1. Cut a potato in half. Use a sharp knife to carve stamp shapes – this can be done by adults or Guides and up.

2. Leaf: cut one end into a triangular point. Then carefully cut a line down the centre of the potato half with two or three lines branching out on both sides.

3. Pour some paint onto a tray or paper plate. Press the potato in the paint and then stamp onto paper. Create multi-coloured leaves with stripes of paint.

4. To make pinecones, use a sharp knife to carefully cut a series of small triangles along the edge of the potato half.

5. Cut a few more triangles into the middle. Now carefully cut groves to join the triangles and form the pinecone scales.

6. Dip the potato half in paint on a tray or paper plate. Print on paper or another surface.

This is an opportunity to talk about how and why leaves change colours with the seasons. Leaves are green because of chlorophyll in the cells which turns sunlight into food for the tree. In autumn the leaves stop producing chlorophyll, so leaves change from green to yellow, orange, red, or brown as the chlorophyll disappears.

Try printing on different surfaces and textures, like paper, fabric, foil, and wood.

Resource: https://childsplayabc.wordpress.com/2020/06/25/exploring-trees-and-woods-activities-and-ideas/

Wooden Whisk

Whisks are traditionally made from wood. Handmade wooden whisks are surprisingly quick and simple to make – and they look and feel beautiful.

What to Do:

1. Start with a pine or fir branch. The branches of these trees contain a resin that is a thermoplastic material. This means that they will soften when heated and harden again when they cool. You can heat the branch, shape and bend it; when it cools, the wood will hold the shape you created.
2. Make sure you have permission to harvest branches. You will need a pine or fir branch with 4 to 6 small branches radiating from a central stem. When you cut the main branch, ensure the stem is long enough to form the whisk handle. Cut off any extra lower branches that you don't need.

3. Tip: Watch out for sticky resin that may seep out cut parts of the branch. It can be difficult to get off surfaces, hands, and clothes.
4. Once you cut the branch to an appropriate length, carefully bend the smaller branches upwards. This forms the 'balloon' of the whisk. Tie the branches securely together with string. Don't worry if it's not balloon-shaped. The wood will be more pliable after boiling, and you can bend them into shape.
5. In a large pot, bring some water to boil. You need enough water to cover the width of the whisk balloon. Your pot does not need to fit the whole whisk length – you can work on one end at a time.

6. Boil the branch for 10 minutes and then carefully remove it from the water. The needles and bark should be softened and easy to remove. Peel off the needles and bark when the branch is cool enough; use your fingers and nails to scrape off any inner peel.
7. You can use sandpaper to remove the last bark and smooth any rough wood or knots, if you like. If you are confident and trained in woodcarving, carefully carve the wood and shape the whisk.

8. If your whisk didn't completely fit in the saucepan the first time, you now need to boil the other end for 10 minutes. Repeat the process of removing the bark and needles from the other end.
9. Once the whole branch has been boiled and stripped of bark, carefully reshape, and retie the end of the whisk to make it more rounded and balloon shaped. Boil the reshaped whisk end for another 5-10 minutes to help fix the shape and remove any last remaining peel.
10. When the whisk is cool, untie the string. Carefully push a thin nail into the top of the branch to make a small hole. Carefully bend the tips of the branches into the end of the whisk, cutting them to length before pushing each branch carefully but firmly into the hole.
11. Your whisk is ready to use! Treat it with food-safe oil before use or use as is. Remember to wash it thoroughly after use and keep in a cool dry place.

Resource:
https://childsplayabc.wordpress.com/2020/06/25/exploring-trees-and-woods-activities-and-ideas/

Activities

How to Make Paper (using recycled paper)

You Will Need:

- Used paper (magazines, newspapers, notebooks, etc.)
- Scissors
- Piece of plastic net
- Cloth (preferably cotton)
- Non-sticky surface (e.g., plastic sheet)
- Large bowl

What to Do:

1. Tear paper into small bits, about 1 cm x 1 cm. You can use scissors to cut them into small pieces. Smaller pieces work best.
2. Soak the paper bits in a bowl of water. Leave for 1 or more days. With your hands, mix the paper and water and blend as much as possible. Leave the paper to soak for another hour. For a quicker process, soak the paper for 2-3 hours and then blend in a blender.

3. Use a sheet of plastic netting (or a papermaking frame if you have one). Carefully, place one side of the net into the water, gradually submersing it from top to bottom.
4. Slowly flatten the net under the water. You will see the paper gathering on top of it. Allow the paper to collect as evenly as possible on top of the net.
5. Holding the net flat, lift it straight out of the water. Use your fingers to make the sides of the paper straight.
6. Place a sheet of plastic (or other smooth material) on a flat surface. Put the paper side of the netting straight down on the plastic. Use cotton cloth to soak up as much water as possible from the top surface of the netting.
7. Once you've soaked enough water, carefully remove the net. The paper should remain flat on the plastic surface.
8. Allow the flattened paper to dry overnight. Optional: place it somewhere warm and dry place to speed up drying.
9. Check if the paper is completely dry. Now you can use it!

Tips:

- ✓ Extend your learning with some additional steps. Put additional ingredients, like flower petals or grass, in the paper mixture to make your paper more interesting. Start with different types of paper, such as newspaper, manila envelopes, or tissues to see what makes the strongest paper.
- ✓ Can you think of ways that paper is used in your community and in the world. Who might use handmade paper? How do other cultures make paper (i.e., Japanese rice paper)?
- ✓ What's the role of recycling in conservation? Are there any drawbacks to recycling? For instance, trucks pollute while collecting blue boxes, recycling factories, etc. How does the production of paper affect animal habitat?

Resources: https://www.thecraftaholicwitch.com/how-to-make-paper/
https://www.foredbc.org/paper-making-activity

Butterfly Clipboards

Use your tree resources wisely by making inexpensive and practical clipboards.

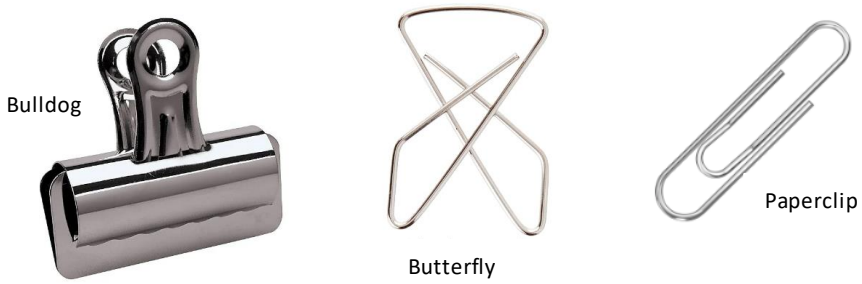
You Will Need:

- Clean used cardboard, such as cereal boxes or old binder covers
- Scissors
- Duct tape
- Clips: bulldog, butterfly, or paper clips
- Clear plastic sheets, such as transparency sheets, page protectors, etc.

What to Do:

1. Cut out rectangles of clean used cardboard. Make sure the rectangles are slightly larger than a sheet of paper.

2. Seal the edges with duct tape.
3. Attach paper to the board using a large bulldog clip, butterfly clip fastener, or two big paper clips.
4. Add a piece of clear plastic on top to keep things dry.



Resource: http://www.metrovancouver.org/events/school-programs/K12publications/GetOutdoors.pdf

Stump Sleuths

What to Do:

1. Find a local site with decaying stumps. Bring some field guides for reference and/or use the iNaturalist app to submit photos and get identification. Divide into small groups of 4-5. Each group should find a stump.
2. Take a good look at the size and shape of the stump. How big might the tree have been? What might have happened to it? Even though it's not a living tree, many living things can be found there. New trees can grow out of stumps, called nurse logs, to help protect the young trees from predators and provide nutrients.
3. Your mission? Be detectives – how many different living things can you find in, on, and around the stump?
4. Remind the unit to disturb the stump as little as possible. Leaders can help identify the discoveries. Each group can record their finds in a notebook. Optional: hand out nature journals to draw in.
5. Look for seedlings, ferns, mosses, fungi, and lichens. Huckleberry bushes grow on top of many stumps. Can you spot slugs, snails, or salamanders. Look under the bark, in cracks and hollows, to see insects and other crawly creatures such as sowbugs and larvae. Animal visitors can leave signs like feathers, droppings, holes, and half--eaten cones.
6. Use magnifying glasses to investigate mosses, lichens, and fungi up close. Compare how things look with and without magnifiers. If you have bug boxes, you can temporarily hold insects and other invertebrates for up-close investigation. Make sure to return these creatures to the exact spot they were found.
7. Share the discoveries as a group. Which ones were a surprise? Discuss the importance of protecting our natural environment.
8. ** Picking up insects? Make insect collectors or "pooters".
    a. You will need large bubble tea-type straws, smaller straws, and some nylon tights.

b. Cut each straw in half to make two shorter straws.

c. Slide a small square of nylon over the end of the smaller straw, then fit this whole thing into the larger straw.

d. The nylon mesh prevents things from being swallowed.

e. Practice sucking up small bits of paper and gently blowing or "pooting" them into a clear collecting jar.

f. Now try your pooting skills on insects. Always remember to release every creature where you found it.

Resources: https://www.foredbc.org/stump-sleuths-activity
http://www.metrovancouver.org/events/school-programs/K12publications/GetOutdoors.pdf

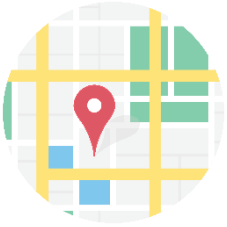
Tree Appreciators

What to Do:

1. Go outside and find a place with a variety of trees – it could be a garden, park, or forest.
2. Each person chooses a tree to explore.
3. Take a close look to see what kind of animals would live in this tree.
4. Lie on your back and look up to observe the tree canopy.
5. Notice the pattern of the branches and leaves, the light that shines through, and the texture of the bark.
6. Where is the tree is growing? What can you see about the habitat?
7. Sketch the tree with as much detail as possible.
8. As a unit, share your tree findings.

Resource: https://treecanada.ca/wp-content/uploads/2019/09/National-Tree-Day-Educational-Toolkit-EN.pdf

Map Your Trees



You Will Need:

- Paper
- Clipboards for each group
- Pencils and erasers
- Identification sheets or field guides

What to Do:

1. Go to a public space like a park, school, city hall, or other location with trees.

2. Break up into groups of 3-5. Each group should have a clipboard, some paper, pencils and erasers.
3. Each group will walk around the site and make a map, including buildings and trees. Are there any signs of animals? Webs, holes, and distinctive smells are all signs of wildlife.
4. Identify as many tree species as you can.
5. As a unit, discuss their findings: What trees were most common? Were they surprised by their findings?
6. Now challenge each group to spend 10-15 minutes creating their plan to add shaded areas without losing useful space. How could you increase plant and wildlife diversity? What plants would be best to add, based on local soil and climate?

Resource: https://treecanada.ca/wp-content/uploads/2019/09/National-Tree-Day-Educational-Toolkit-EN.pdf

Snappy Wood

Wood is made from long fibres of cellulose, fused together by a 'glue' called lignin. Billions of fibres line up – side-by-side and end-to-end – to make lightweight, strong, and flexible wood. To stay upright, wood is stronger up and down, with flexibility to bend in the wind. This feature of being stronger in one direction is known as anisotropy.

You Will Need:

- Wooden craft sticks

What to Do:

1. Hold a wooden popsicle stick horizontally, like a bridge, and try to snap it. Instead of breaking, the wood fibres bend.
2. Now hold the stick and try snapping it in half lengthwise (vertically). That should be easier, with the wood breaking in an almost perfect straight line.
3. Why? When you try to break the stick across its length, the strong up-down fibres resist. When you snap the stick lengthwise, it severs the weaker bonds along the length of the fibres.

Resource:
https://www.canadianwomenintimber.com/_files/ugd/c0e42a_667c0e67f71d49259c1071ee83b331bb.pdf

Every Tree for Itself

Explore how trees compete with each other for nutrients, sunlight, space, and water.

You Will Need:

- Paper or white paper plates
- 4–6 colours of poker chips, or construction paper

- Large sheet of paper to record group results

What to Do:

1. Gather 4–6 colours of poker chips. Each person will need 2 chips of each colour. Keep the colours separate to start. As an alternative, cut 3-inch (7.5 cm) squares from different colours of construction paper.
2. Ask the unit what trees need to grow. They may list water, sunlight, air, or nutrients. Point out that most of a tree's mass is made of carbon, which comes from the air. Ask: What do you think would happen if a tree doesn't get all the things it needs?
3. To explore what happens when a tree doesn't get everything it needs, have everyone spread out about 3 feet (1 m) apart. They stand or sit on a piece of paper (or paper plate). Each person is a tree and the goal is to collect as many 'needs' as possible. They must stay planted on their paper without sliding it along the floor or stepping off.
4. Now place the tree resources (poker chips or paper squares) evenly around all the trees. The resources should be 1–2 feet (30–60 cm) apart. Each colour represents a tree need (e.g., blue = water, yellow = sunlight, white = carbon from the air, and green = nutrient such as nitrogen or phosphorus).
5. Give a signal to start. The "trees" reach to gather the resources they need. Remember – they must stay planted on their paper without sliding along the floor or stepping off.
6. Use the following numbers to determine how many trees are growing well or poorly: 3+ of each resource is superior growth, two of each resource is average growth, and 0-1 of each resource is poor growth.
7. Discuss: What might happen to a real tree that can't meet one or more of its needs? It might grow slowly or eventually die. Different species of trees have different needs; some tree species might need more water than others, for example.
8. Try some additional rounds, using one or more of the following conditions:
    a. Trees stand or sit closer together on their papers (more competition)
    b. Put out fewer water resources (drought)
    c. Put out fewer sunlight resources (overcrowding for young trees)
    d. Put out fewer nutrient resources (poor-quality soil)
    e. Add a new colour to represent fire (red) or an insect infestation (black), such as bark beetles or gypsy moths. How might this new element affect the trees? Discuss that some trees may not be affected, for example, longleaf pine may be relatively unaffected by fire.

Resource: https://www.plt.org/learn-forests/every-tree-for-itself/

Trees in Trouble

When a person is ill, we look for symptoms to help identify what is wrong. Trees also show symptoms that help identify the cause of a problem. Loss of vigour, discoloured or misshapen leaves, insect bore holes, and wounds are all signs that something is wrong.

You Will Need:

- Worksheets
- Pencils
- Camera (optional)

What to Do:

1. Meet in an outdoor area with trees.
2. What are the signs of a healthy tree? Think about new growth, full branches, strong bark, and lots of healthy leaves. What do trees need to stay healthy? What could affect tree health?
3. Look at different trees to assess their health indicators. You can show some examples onsite or use photos.
4. Take time to examine the trees. Encourage the unit to make sketches or take pictures of their evidence, such as broken branches, unusual leaf colours or shapes, holes, hollows in the trunk, trunks damaged from scratches, carvings, or graffiti, or uprooted, fallen trees that still seem to be alive.
5. What might have caused the damage? What evidence was found?
6. Urban foresters plant and manage city trees, monitoring them to make sure they are healthy. Can you list ways the unit could help protect the trees in their community?

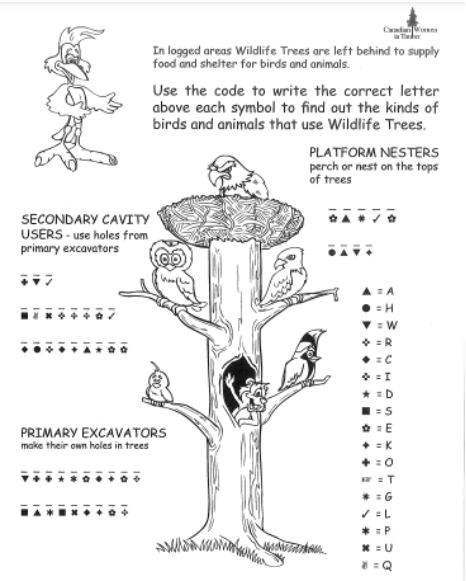
Resource: https://www.plt.org/learn-forests/trees-in-trouble/

Tree disease resources:

https://d1ied5g1xfgpx8.cloudfront.net/pdfs/4633.pdf

https://tidcf.nrcan.gc.ca/en/diseases

Forestry Code



What to Do:

Navigate to the following website and download and print the following forestry code puzzle for your unit to complete.

Resource: https://www.mission.ca/wp-content/uploads/coded-puzzle.pdf

Forest Bathing

Forest bathing (or shinrin yoku) is the Japanese practice of being calm and quiet among trees, while breathing deeply and observing the natural world around you.

What to Do:

1. Find a comfortable place to sit or stand in a place with trees. Each person should have their own space.
2. Guiders can quietly provide prompts:
    a. Close your eyes; take a few deep breaths; listen to your heartbeat.
    b. Slowly tune into the environment around you by focusing on one sense at a time: feel the air on your skin and the grass or ground beneath you; listen to the sounds – rustling leaves, running water; can you smell the trees and plants.
    c. Take a few more deep breaths and open your eyes. Look at the colours, patterns, and textures around you. Can you see any insects, birds, or signs of movement? What shapes are the clouds?
    d. Find a tree and explore the different textures of bark or leaves. Engage all your senses.
    e. You should feel calm, relaxed, and grounded after this activity.

Resource: https://childsplayabc.wordpress.com/2020/06/25/exploring-trees-and-woods-activities-and-ideas/

Nature Art Frames

A simple activity to take out on your tree walk – create some wonderful images.

You Will Need:

- Used cardboard
- Markers
- Scissors
- Camera (optional)

What to Do:

1. Draw a simple shape or picture onto a piece of cardboard. Your shape should have at least 1- 2 sections that you can look through (for example, a butterfly, beetle, or other nature shape).
2. Cut out the see-through panels of your frame.
3. Go on a walk. Hold up your frame against interesting natural objects, textures, patterns and shapes you see.
4. The picture you create with the frame changes as you move around. See how different patterns and colours bring your picture to life. You can take photos of the nature frame to capture the images it creates.

Resource: https://childsplayabc.wordpress.com/2020/06/25/exploring-trees-and-woods-activities-and-ideas/

Den Building

This activity is a great way to develop problem-solving, communication, teamwork and fine motor skills.

You Will Need:

- Long tree branches
- Optional: old blankets or sheets

What to Do:

1. Use long branches to create a lean-to or den structure.
2. Talk about how to make a shelter.
3. Depending on the branch, your unit may want to play in the den or make a pretend campfire using sticks and twigs.
4. Remember to take the campfire and den apart when you are done.

Resource: https://childsplayabc.wordpress.com/2020/06/25/exploring-trees-and-woods-activities-and-ideas/

Name that Shape

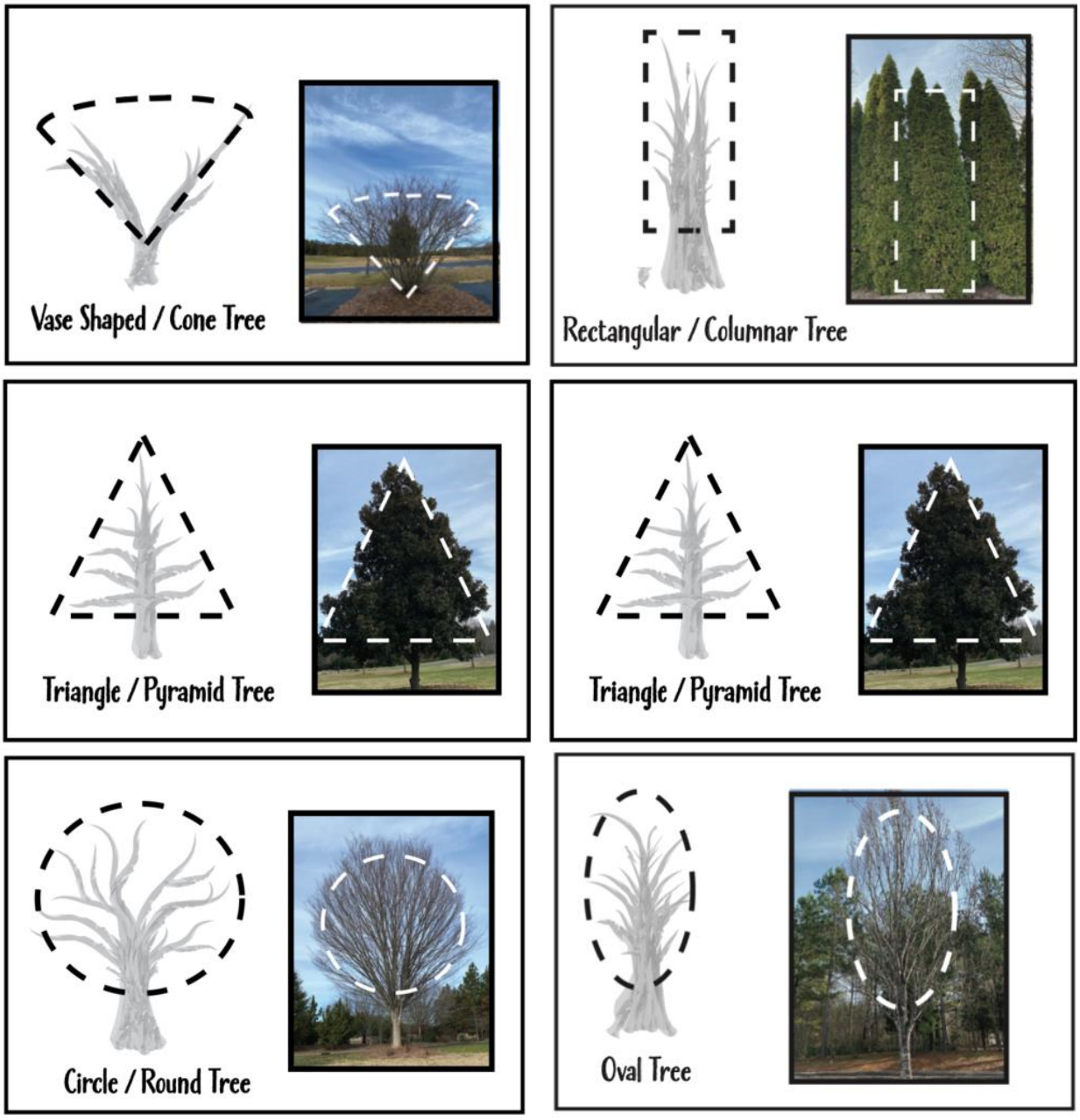
Most of the year, leaves hide the basic shape (skeleton) of a tree. In winter and early spring, when most deciduous leaves are gone, the tree shape is fully visible. Look for these different tree shapes in your yard or local park.

Tree shapes you might find:

- **Vase or Cone-shaped:** these trees have branches that grow at sharp upward angles. The tree looks like an upside-down triangle. Examples include elm, boxelder, and Japanese maple.
- **Columnar or Rectangular**: these trees have branches that are mostly the same length from the top to the bottom. The tree is shaped like a column, cylinder, or rectangle. Examples include red maple, tulip trees, yew, and cypress.
- **Pyramid or Triangular-shaped**: these trees are wide at the base and get narrower at the top, making a shape like a triangle or pyramid. Examples include fir trees, holly, gingko, and many conifers.
- **Round or Circular-shaped**: trees that are round and full, shaped like a sphere, are called round or globe trees. They often make good shade trees. Examples include red oak and white ash.

- **Oval-shaped**: oval trees are like round trees but with a more elongated shape. They also are strong shade trees. Examples include ash, Norway maple, and birch trees.

Here are some basic tree shapes to look for:



Resource: https://learningwithoutdoors.com/learningactivities/tree-shapes

Games

Five Trees

Similar to hide-and-seek, Five Trees should be played in a space with at least five large trees. Each tree is given a number from one to five. The person who is 'it' stands with their back to the trees and counts to 20. Each player hides behind a tree so they cannot be seen. 'It' turns around and shouts out the number of a tree. Anyone hiding behind that tree is now 'out' – and everyone else is safe. The person who is 'it' turns around and counts to 20 again, while those still playing run and hide behind a different tree. Continue until only one hider is left.

Hug a Tree

Play this game in a space with plenty of trees. Players get into pairs, and one person in each pair is blindfolded. The partner leads them to a tree. The blindfolded 'tree-hugger' uses their senses to explore the tree, trying to remember the shape, texture, and smell of the tree. The partner takes them back to the starting point, then removes the blindfold. Now try and identify the tree! Switch roles, so the partner is now blindfolded.

Nature Sounds

Go outside and have your unit lie down on their backs with both fists in the air. Every time they hear a new bird song, animal sound, or any other sound from nature, they raise one finger. When they reach the count of 10, they can sit up. Girls choose the sounds/numbers they will listen for. You can talk about animals that make the forests and trees their homes. Which animals eat the trees? Which animals live in the trees? Which animals eat the insects that might be in the trees? Which animals relay on making their nests in the trees.

The Lorax

Set up hula hoops (pieces of paper or any type of marker that your unit can step on/in will work as well) in a large area. Make up a story about how a couple move to an area and want to build a home. All the animals (the youth members) are very happy to live with the people as they all had their own spaces. Then tell your unit to go and find a hula hoop/tree to live in. There should be enough "trees" at this point even if some members need to share. As the story evolves (the couple needs a grocery store, a school, a gym etc.) and the trees begin to disappear for their buildings. Guiders will pick up the papers or the hula hoops leaving your unit less and less places to "live". Eventually you will have many members trying to fit into one hula hoop. This game is to demonstrate how important it is to replant our trees and keep them healthy. (This game would be a great one to play after the nature sounds game so that youth members can understand the importance of reforestation).

One of a Kind

Have each girl select a leaf (leaves should be from the same kind of tree). Direct the girls to examine their leaves carefully, look at it, feel it, hold it at different angles. Gather up all the leaves, add a few the girls haven't seen, then put them in a pile and have the girls find their leaf. After they all have chosen a leaf, have them share why each leaf is special or unique.

Leaf Litter

When dead leaves collect under a tree, they form what is known as leaf litter. Find out what lives in the leaf litter or soil beneath your tree. Here are some creatures you might find: Millipedes, spiders, wood lice, daddy-longlegs, springtails. They help to decompose the leaves and twigs that fall off your tree.

Science

Count Tree Rings

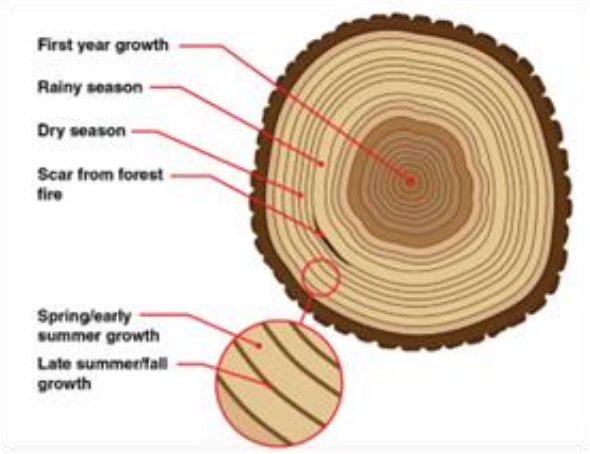
Find a tree stump with a relatively fresh and flat cross-section. Look closely to see separate concentric rings. Tree rings are added each year, so the number of rings tells you the age of the tree.

As a tree grows, it adds new wood just under the bark. The oldest rings are smaller and near the centre, while new rings are bigger and around the outside. In BC, like other mid- to high-latitude regions, trees form distinct two-part rings with light and dark sections. One tree ring, representing one year, consists of two layers:

- A light-coloured layer made in spring and early summer. It's usually thicker because the tree is growing.
- A dark-coloured layer made in late summer and autumn. It tends to be thinner due to slower tree growth.

The colour, width, and other attributes of tree rings can tell us about past environmental conditions. Tree growth depends on local conditions, so water availability, sunlight, and temperature all make a difference. The rings also preserve information about disruptive events like droughts, fires, and insect infestations. Dendrochronology is the study of tree ring growth. Dendroclimatology looks at the relationship between tree growth and climate conditions to understand past climates.

Thick tree rings reflect good growth with enough water and sunlight for a long growing season. Cold weather, limited water, and/or less sunshine limit the growing season and cause narrow tree rings. When rings are a consistent width throughout a tree, that shows a consistent climate over the tree's life.



Tree ring data is used in temperate latitudes. In these regions, trees have seasonal growth spurts alternating with a period of winter dormancy, creating distinctive light and dark bands. In the warm tropics, trees grow all year and do not make tree rings.

Now that you know what to look for, starting from the centre of the tree, count the number of rings. Roughly how old is this tree? Now find out what has happened in history since this tree started growing. Compare it with other nearby trees.

Resource: https://climate.nasa.gov/news/2540/tree-rings-provide-snapshots-of-earths-past-climate/

Tree Collection

Take a walk to look at all the different trees in your community or go on a nature walk to a local park or forest trail. Take a guidebook with you, use a phone app, or check the internet to identify all the trees you see. Create bark and leaf rubbings to track all the trees you encounter.

You Will Need:

- Plain white paper
- Clipboards or another hard surface
- Crayons with no paper wrappers

What to Do:

1. Find a part of the tree with no branches; this may be easier on a bigger tree. Place the paper flat against the bark. Using the long side of the crayon, rub on top of the paper until the bark pattern becomes visible. Keep the crayon flat for best results.
2. If you have permission, take a leaf or needles from the tree. Put the leaf on a hard, smooth surface (like your clipboard), place the same piece paper on top, and rub over the leaf with the side of your crayon. The leaf print will appear. Now you should have both the bark and leaf from the same tree. Write down the name of the tree on the paper.
3. Move to a new tree and make bark and leaf/needle rubbings on a new piece of paper.
4. Back at your meeting space, create your own unit display of local trees. Group the same trees together to see the similarities and differences. Pathfinders and Rangers can go one step further and identify the scientific name of each tree as well as any commercial use or environmental threat in BC.

How Water Travels Through Leaves Experiment

You Will Need:

- Plain white paper
- Leaves
- Scissors
- Clear cups
- Water
- Red food colour
- Magnifying glass (optional)
- Observation sheet: https://drive.google.com/file/d/0B-cVjZBMBNNXMXBxUFZFdC1EaHc/edit?resourcekey=0-Xe316QrjR68cKvKSC5sRKQ

What to Do:

1. Take a walk in your community to collect different leaves.
2. Back at your meeting place, use scissors to trim the bottom of each leaf stem.

3. Add water so glass is about 1/3 full. Add red food colour.
4. Place each leaf in a glass.
5. Observe the leaves closely. You can use your magnifying glass. Record your observations of how they look on Day 1 of the experiment.
6. Observe them for the next few days. Record your observations on your observation sheet.

Explanation:

You should notice the red colour move slowly through the leaf. It moves through the xylem tubes of the leaf. Xylem transports water and minerals from the roots through the entire plant. Xylem's thick walls also provide support for the plant

Resource: https://buggyandbuddy.com/science-kids-exploring-leaves/

Magic Crystal Tree

Create a tree out of salt crystals, cardboard, and other household items. Within a day, a colourful, 'snow'-covered tree seems to magically sprout. This is a fun indoor experiment that takes 10-12 hours, so could be done at camp or sequential weekly meetings.

You Will Need:

- Thin cardboard
- Food colouring
- Scissors
- Pie plate or wide bowl
- Water
- Salt
- Liquid bluing laundry soap
- Household ammonia

What to Do:

1. On a piece of cardboard, trace two spruce tree shapes. Cut them out. Thin cardboard works best for this experiment.
2. With scissors, cut a slot down the middle of one cardboard tree. Start at the top and stop in the middle of the shape. Make sure the slot is straight.
3. In the other tree shape, cut another slot down the middle. For this tree, start at the bottom and cut to the middle. Make sure the slot is straight.

4. Place the two trees together by aligning along the slots. This will create a 3-dimensional tree that can stand on its own.
5. Add a few drops of food colouring to the edges of the cardboard. Let the food colouring soak in. Set the tree aside.
6. Using a wide bowl or a pie plate, mix the following ingredients together:
    a. 1 tablespoon water
    b. 1 tablespoon salt
    c. 1 tablespoon bluing
    d. ½ tablespoon household ammonia
7. Stand your tree in the middle of the bowl/plate with the solution. Over the next 10 to 12 hours, your tree will continue to grow. Watch crystals form and expand into clusters of 'snow'.

Explanation:

The main principles in this growing experiment are capillary action, evaporation, crystallization, and saturation.

Capillary action is the process that enables trees to absorb water and nutrients from the soil through their trunks and into their leaves, branches, flowers, and fruit. The cardboard tree uses the same process to draw up the solution until it is entirely soaked. After the solution has been pulled throughout the tree by capillary action, the solution begins to evaporate. The process is accelerated by ammonia, which evaporates more quickly than water. As the solution evaporates off the tree, crystals are left behind on the cardboard. The rapid evaporation helps the crystals form their unique shape. The crystals are a combination of the bluing and salt. Bluing is a colloid of water with many tiny particles suspended in it – a lot like a shaken snow globe, except particles of bluing are much smaller. As the bluing and salt water travel up the tree, the water begins evaporating. With less water to support the bluing particles and dissolved salt, they begin to crystallize.

Resource: https://www.orientaltrading.com/diy-kaleidoscopes-12-pc--a2-57_6109.fltr?keyword=Kaleidoscopes+&searchTarget=category

Tree Transpiration

Transpiration is the process that moves water out of trees and other plants. Almost twice as much water goes into the atmosphere from plants compared to the surface of the oceans.

You Will Need:

- Thin cardboard
- A tree with branches you can reach
- Clear plastic bags (small) – 1 per person
- Pipe cleaners or twist ties – 1 per person
- Optional: extra bags and pipe cleaners/twist ties to compare branches on different parts of the tree or branches on different types of tree.

What to Do:

1. You will see the best results on a hot, sunny day.
2. Place the bag over the tip of a branch so it contains at least one leaf. Use the pipe cleaner or twist tie to close the bag around the branch. Make a prediction about what will happen.
3. Wait for 15–20 minutes and check the bag. See anything? Try again after another 10–15 minutes.
4. The bag should fill with moisture and condensation. Each leaf has tiny holes called stomata. Moisture exits the holes to cool the tree (like sweat does for us), and to help move materials up from the roots.
5. Were there any differences between different parts of the tree or different kinds of trees? What do you think would happen if you did the same experiment at night?
6. You can also perform this experiment indoors. Place a cut tree branch (make sure you have permission to remove a branch) in a water-filled vase. Put the branch in a sunny window or under a bright lamp to encourage water movement into the plastic bag.

Resource: https://blog.growingwithscience.com/2013/06/exploring-the-importance-of-water-to-living-things/plant-transpiration/

Measure a Tree

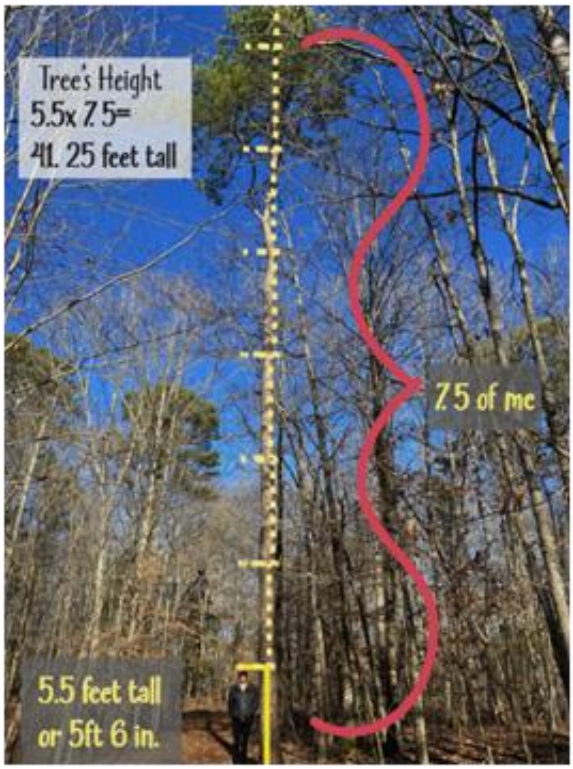
Some tree species tend to be tall like fir trees, while others never grow very tall, like Japanese maples. It all has to do with habitat and different ways to get resources. The tallest tree in the world is a redwood in California; this tree has been named Hyperion and is 115.7 metres tall (379.7 feet). It's estimated to be between 600 and 800 years old.

Challenge your unit to find the tallest tree in the park, neighbourhood, or school grounds. Use different methods to measure and see which one is the tallest. Kids will problem solve, measure, count, and estimate.

Here are some fun methods for measuring trees. Experiment with them and see which works best for you.

What to Do:

1. *Estimate using YOU as a measurement tool*
    a. With a partner, use a measuring tool (metre stick, measuring tape) to measure your height. Round off to the nearest number (e.g., 120 cm).
    b. Stand next to the tree you want to measure.
    c. Your partner observes where the top of your head is relative to the tree.
    d. With your partner, look at the height of the tree. Estimate how many 'yous' it would take to reach the top, if you could stack yourself one on top of another.
    e. Multiply your height by how many of you it would take to reach the top of the tree. For example, you are 120 cm tall and you estimate it would take 5 of you to reach the top, the tree is 5x120 cm or 6 metres tall.
    f. If you want, take a photo and check the mental math using a ruler, pencil, and paper afterwards.



2. *Under the legs peek method*
    a. Choose a tree on level ground with no obstacles in the way.
    b. Start with your back to the tree. Walk away from the tree, stopping occasionally to bend over and peek through your legs at the tree. Check if you can see the top of the tree. If you can't see the top, keep walking away and check again.
    c. Once you can see the top of the tree through your legs, stop. Mark where you are when the top of the tree is visible, by placing a backpack or other item on that spot.
    d. Now measure the distance from your marked spot to the base of the tree. Use a

measuring tape, metre stick, or the stride method (below).

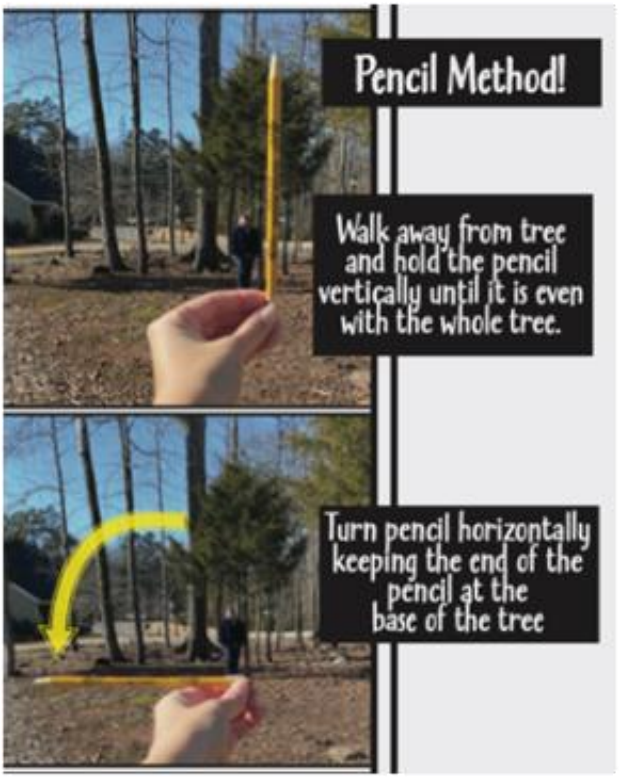
e. The distance from the tree should be the same as the approximate height of the tree.

3. *Stride Method*

a. The stride method is great for measuring long distances. To start, you need to find out your average stride length.
b. With a measuring tool, mark off a length of 10 metres.
c. Walk this length several times and count your steps each time.
d. What is the average number of steps you took to walk 10 metres? Divide this number by 10 to get your stride measurement. For example, if you count about 20 steps (18–22 steps each time), then 2 is the average number of steps per metre. The stride is 10 metres divided by 20 steps, so the stride is 0.5 metres (50 cm).
e. Now walk the length from the tree. Multiply the number of steps by your stride. If you walked 30 steps from the marked space to the base of the tree (above), the tree is about 30 x 0.5 or 15 metres tall.

4. *Pencil partner method*

a. You need a partner, a pencil, and a measurement tool OR know your stride measurement (above).
b. Your partner stands right next to the tree while you walk away from it.
c. Look back occasionally as you walk away. When you look back, hold the pencil vertically at arms-length, lining it up with the tree. You want the tree to match the pencil from top to bottom.
d. Keep walking away and checking, until the base of the tree is level with the bottom of the pencil and the top of the tree is level with the point of the pencil.
e. Stop in this spot. Turn the pencil sideways (horizontally), keeping the bottom of the pencil at the base of the tree.



f. Now have your partner walk away from the tree slowly.
g. Shout 'stop' when you see your partner at the tip of the pencil. Your partner places an object to mark the spot where they stopped.
h. The distance from your partner to the base of the tree is the height of the tree. Measure this distance with a measuring tool or use the stride method (above).

Resource: https://learningwithoutdoors.com/learningactivities/tree-measure

Food

Tree Snack

You Will Need:

- Pretzels, in different shapes
- Grapes
- Wax paper
- Butter or plastic knives

What to Do:

1. On a table, lay a piece of wax paper in front of each person.
2. Give each person a handful of grapes and different shapes of pretzels.
3. With a knife, cut the grapes in half.
4. Explore making trees of different shapes with pretzels and grapes.
5. Eat your tree design!

Resource: https://www.fantasticfunandlearning.com/easy-tree-snack-for-kids.html

Leaf-Themed Cheese Snack Cracker

You Will Need:

- 3/4 cup all-purpose flour
- 1 ½ cups shredded cheddar cheese
- 4 tablespoons butter
- Baking sheets
- Parchment paper
- Food processor
- Leaf-shaped cookie cutters

What to Do:

1. Preheat the oven to 350º F. Line baking sheets with parchment paper.
2. Place the flour, cheese, and butter in the food processor. Pulse until mixed and able to form into dough (about 30 seconds). Alternatively, use a wooden spoon and blend thoroughly.
3. With your hands, press the mixture into a few balls.
4. Chill in the refrigerator for about 30 minutes.
5. After chilling, roll one ball at a time – to about 1/4 inch thick.
6. Use mini cookie cutters to cut out shapes. Place on lined baking sheets.
7. Bake about 12-14 minutes. Place on a cooling rack. Enjoy!

Resource: https://buggyandbuddy.com/whole-wheat-cheese-snack-crackers/

Edible Trees

You Will Need:

- Pretzel rods
- Pretzel sticks
- Fruit roll-up, 1 piece per person
- White frosting
- Paper

What to Do:

1. On a table, lay a piece paper in front of each person.
2. Give each person different shapes of pretzels. Design your tree.
3. Use the frosting to stick the pretzels onto the paper.
4. Break fruit roll-up into small pieces to form leaves.
5. Use frosting to stick the fruit roll-ups onto the paper.
6. Eat your tree!

Resource: https://www.naturalbeachliving.com/fall-snacks-kids-love-to-make/

Additional Resources

Some facts: https://www.canadianwomenintimber.com/_files/ugd/c0e42a_0a91c8e584ab4b109788986200261052.pdf

BC Tree book: https://www.for.gov.bc.ca/hfd/library/documents/treebook/treebook.pdf

BC Tree posters: https://www.bcnfw.ca/bc-tree-posters/

E-Flora resource: https://ibis.geog.ubc.ca/biodiversity/eflora/E-FloraTreesofBritishColumbia.html

https://treecanada.ca/resources/trees-of-canada/

Tree rings: https://scied.ucar.edu/learning-zone/how-climate-works/tree-rings-and-climate

https://www.kidspot.com.au/parenting/things-to-do/fun-games-to-play-with-trees/news-story/b44e5f05fad6d9694127ca89aa323921

Tree Games: https://www.candk.asn.au/love-and-learn/4-ways-have-fun-trees#:~:text=Similar%20to%20hide%2Dand%2Dseek,that%20they%20cannot%20be%20seen.