# EVERGREEN CONIFER TREES

*Evergreen trees build rich forest communities where many species of plants and animals thrive. They offer many gifts including shade, shelter, food, medicine, beauty and a place of refuge, and are powerful players in our environment through creating wind and rain, holding groundwater and keeping streams flowing.*

Evergreen conifers define our Pacific Northwest landscape. From a bird's-eye view, they resemble a green blanket covering much of the land from the alpine slopes of the Cascade Mountains to the beaches of the Pacific Ocean. Evergreen conifers keep their leaves all year long, have cones, and are commonly found in the far Northern hemisphere all the way into southern South America.

## MODELS OF RESILIENCE

Evergreen conifer trees have been on our planet for 300 million years! They were the main source of food for plant-eating dinosaurs. It is a wonder that they have survived through so many drastic changes in our environment. Ice ages have come and gone, land has formed and receded, many species have developed and gone extinct, yet conifers have remained. They continue to thrive in some of the world's harshest environments including the wind-beaten coast, the snow-laden mountains, burned areas, and in the wake of glaciers. We can learn how RESILIENT evergreen trees are through studying their qualities, including:

- Year-Round Food Production: Trees make food (sugars) in their leaves from sunlight, water, carbon dioxide, and nutrients through a process called photosynthesis. Deciduous trees lose their leaves in the cold season and stop making food. Evergreen conifers keep their leaves all year long and can photosynthesize anytime if there is sunshine and it is warm enough. Some evergreen conifers photosynthesize in temperatures as low as 19° F or minus 7° C. While they photosynthesize more slowly than deciduous trees, they make up for it with year-round production.
- Structure: The shape of evergreen conifers helps them to survive in harsh weather. Most are pointed at the top in a triangular shape so they can shed heavy snow. Trees with small needle-like leaves like spruce, fir, and hemlock are more stable because the wind can blow through them, whereas trees with large leaves like maple are likely to fall over when they catch the force of wind or the weight of snow. Evergreen tree leaves have a waxy waterproof surface that conserves water. The breathing cells (stomata) are also sunk into the leaf, versus being on the surface like many other plant leaves. This helps them to conserve water better. You can see bands of stomata as white lines on the underside of many conifer leaves.
- Leaf Lifecycle: Deciduous trees must grow new leaves each year, and this requires a lot of energy and nutrients from the soil. Evergreen conifers have leaves that can live as long as eight years, allowing them to thrive in poorer soil conditions. While conifers photosynthesize more slowly and release fewer nutrients into the soil than deciduous trees, they can grow just about anywhere.

- Cold Hardiness: Evergreen conifers can survive very cold winter temperatures. They do this through a process called supercooling where the water inside the cells stays a liquid instead of forming ice crystals. By not having any minute particles inside the cell or having any rough surfaces on the cell walls, ice is not able to crystallize because there is nothing to adhere to.
- Making Medicine: Trees must be self-sufficient and produce their own food and medicine. When a tree is injured, it makes and releases pitch (also called resin) to cover its wound. Pitch is full of medicine that wards off diseases and repels species that might attack it. Over time, the tree usually heals.
- Building Community: Evergreen trees in a forest can communicate with each other by making scents that are carried through the air. These scents can warn neighboring trees of invading insects or diseases. They can even attract animals (predators) to eat the insects that are attacking them. Trees also connect through underground root and fungal networks and can share food and medicine with trees that need help. Working together makes the community of trees stronger and more resilient.

## EVERGREEN CONIFER REPRODUCTION

All conifers have two kinds of cones: female seed-bearing cones and male pollen-bearing cones. They may look similar when they are very young, but they quickly develop distinctive characteristics. Male and female cones are usually on the same tree except for yew and some junipers, which have separate male and female trees.

Pollen cones are small and short-lived. They are noticeable in spring when they are fully developed, giving the tree a golden appearance. The air may take on a golden hue as clouds of pollen soar and cover your car or surfaces of water with fine dust. If you look close at each pollen cone, you will notice a central axis covered in stamens with pollen sacs on the tip. Each grain of pollen is engineered for wind travel and for being swept into the female cone. Once the pollen is shed, the cones wither and fall from the tree. Some pine trees keep their withered pollen cones through early winter, but they will easily fall off if you touch them.

***Palynologists*** *are scientists who study both living and fossilized pollen. Each type of pollen is unique and can be seen under the highest power of a dissecting microscope or with a scanning electron microscope. Some pollen has wings, bladders, or a bowl shape to help it fly. The surface can be smooth or coarse. Pollen is indestructible and can remain recognizable for millions of years! Paleobotanists learn about ancient climates and the plants that grew long ago through studying pollen.*

Seed cones have scales arranged in spirals around a central axis. Trees have ingeniously engineered them so that no scale falls on top of the other, and the whole cone can be sealed up with wax and resin to shed water when it is wet in springtime and to hold water when it is dry in summer. The scales often become woody, and open up when seeds are fully ripe. Seeds are shaped to fly a distance from the mother tree on the wind or to attract hungry birds or other animals that will carry them away.

Conifers developed their fertilization techniques before there were flying insects on Earth to assist them, and this wind-based travel has served them well. Here is how

fertilization happens: conifer seed cones contain ovules, each with an egg that can become a seed if it is fertilized by pollen. Conifers are known as gymnosperms (Greek for naked seeds) because pollen lands directly on the ovules, which are not enclosed in ovaries like most other plants. Male pollen cones release their pollen in the wind, hopefully landing on female cones, which are newly formed, small, and difficult to see at this point. If pollen lands on the liquid between the cone scales, it is drawn down into the crevices until it comes to rest on the ovules attached to the bottom of each scale. The scales then thicken and close as the cone grows to full size. Seed cones usually become woody when they are mature, except for juniper and yew, which stay berry-like. Once the seeds are fully developed, the scales open and the seeds are released. Some pine tree cones persist on the tree for as long as 50 years and only open during the heat of a fire!

Evergreen trees produce an extra abundance of cones in interval years. This may be every three, four, five or even 10 years, and is called the mast year. You may notice that some Douglas fir trees produce a huge number of cones one year and very few the next year. Weather conditions and stress affect cone production, but scientists also believe that this is a designed strategy to control species that forage on seeds. For example, if birds or squirrels rely on pine seeds for food and eat all of them, pine trees are not able to successfully reproduce. In mast years, the tree produces more seeds than can be consumed, thereby ensuring enough seeds to start the next generation of trees.

Evergreen tree seeds can lie dormant on the ground for years until soil and light conditions are optimal for growth. Each seed contains what it needs to get a good start on life, including an embryonic root, stem, a few leaves, and food to nourish first growth. Only a tiny percentage of seeds find the right conditions to germinate and grow into trees, so it is worth the tree's effort to produce a vast number of seeds!

## EDIBLE CONIFERS

In late spring, tiny buds at the tips of evergreen tree branches swell and open into tender lime-green needles that some people call "forest candy." This citrusy-tasting new growth is rich in nutrients, such as Vitamin C, minerals, electrolytes, and chlorophyll, that can give you energy and help support your immune system. True firs (several species under the genus *Abies*), Douglas fir (not a true fir), hemlock, redwood, and spruce all have edible tips. The young shoots of cedar and juniper are too strong tasting and are not eaten. Yew needles are toxic and should never be eaten.

**Evergreen Tree Tip Tea**

Harvest young tree tips when they are limey-green and tender, usually in April through June. They can be eaten straight as a trail snack, put into salads, or brewed for tea. Tips can be preserved in the refrigerator for several days, or in the freezer for up to a year. Older needles can also be dried and made into tea. Use a basket or a food dehydrator to dry them.

- Sun Tea: Add a large handful of evergreen tree tips for each quart of water to a glass container with a lid. Cover and let it sit in the sun for several hours to overnight. Strain and serve chilled.
- Hot Tea: Use the same amount of tips as with sun tea, but pour boiled water over them in a pot, cover with a lid and let them steep for 15 minutes. Strain and serve hot. This tea will taste stronger than the sun tea.
- Tree Tip Lemonade: Add 1–2 cups of tips in a large jar or pitcher with 6 cups of water. Cover and let steep in the sun or a warm place for 4–6 hours. Strain out tips. Add the juice of 3 lemons or about ¼ cup of lemon juice and 2–3 tablespoons of honey (dissolved in hot water). Mix and serve over ice.
- Evergreen Tree Tea: Mix equal parts dried Douglas fir (or other edible tree needles) with rose hips. Steep 10–15 minutes. This tea is a winter favorite and helps to fight colds.

**Conifer Pollen**

Conifer pollen is also edible and has a rich flavor like bee pollen. It is generally high in vitamins, minerals, amino acids, and antioxidants (cell protecting substances). In China, pine pollen has been valued as a food and medicine for thousands of years. Harvesters gather pollen cones when the cones are just beginning to open. The pollen can be sifted and stored in the freezer or preserved by placing the entire cone in honey. You can also add pollen to smoothies or baked goods.

## EVERGREEN TREE MEDICINE

Evergreen conifers are often rich in volatile oils that act as antimicrobials. Take cedar for example: scratch the leaves or peel the bark and you will release essential oils. Cedar makes these oils to survive in cool wet forests where fungi and molds thrive. These oils are cedar's medicine to repel insects, molds, fungi, bacteria, and viruses. Our ancestors discovered this long ago and used tree medicine in and on their own bodies to ward off disease. Tree needles are generally antimicrobial and immune stimulating. Many people find that the smell is uplifting and invigorating. *See the tree essential oil apothecary at the end of this handout for more information.*

People have used evergreen conifer pitch to heal wounds since time immemorial. If you get a cut, scrape or insect bite, you can dab a little sap on it to speed the healing process. Put a little soft leaf or a band-aid on top so the sap stays on your wound and does not rub off on your clothes. You can also add pitch to salves and other medicines.

# THE CEDAR OR CYPRESS FAMILY

Trees from the cypress family, including cedars and junipers, have scale-like leaves. Male and female cones generally grow on the same tree, and the seed cones are leathery or woody. Cedars and junipers create an abundance of aromatic oils that protect them from diseases and insect invasions. They are valued for their strong and long-lasting wood, medicinal properties and fragrance.

**Western Red Cedar** – *Thuja plicata*

Cedar is a tall evergreen tree with a wide, buttressing base and a fibrous, fluted trunk with gray to cinnamon-red bark. It's greenish-yellow leaves are flat with opposite scales. Branches often swoop upward at the tip in a J shape. Simple round pollen cones bloom in spring or summer and give the tree a golden appearance. Cedar seed cones have 8–12 scales, are about ½ inch long, and are shaped like rosebuds. The largest cedar trees are up to 19 feet in diameter and 200 feet tall. Some of the oldest trees are thought to be over 1,000 years old. Cedar thrives in moist soils along bottoms, flats, and mountain slopes. It prefers wet, misty forests and is very common on the west side of the Cascade Mountains from Northern California up into Southeast Alaska.

Traditional Uses: In one Salish story, a young woman asked to be the most beautiful thing in the world and was transformed into a cedar tree. Salish names for Western red cedar include "Long Life Giver," "Tree of Life" and "Grandmother." Grand longhouses, swift and rot-resistant canoes, clothing, baskets, cordage, tools, art, medicine, and many other things are artfully fashioned from cedar. Cedar provides for people from birth to death.

All parts of cedar are useful and highly valued, including the wood, bark, roots, branches, and leaves. Cedar inner bark is prized for its durability, flexibility, and water resistance. It is peeled from trees with straight trunks by making a single horizontal cut in the bark and pulling upward. Peeled trunk bark can be as long as 30 feet and is carefully separated into layers. Soft fibers have been used for clothing, mats, napkins, and towels. Native weavers create beautiful and ornate baskets and hats from narrow strands of cedar bark. Outer cedar roots are dug and used in basket making. Branches were traditionally made into rope, fish traps, binding material, and baskets. Protocols for when and where to harvest as well as honoring the tree are actively practiced. If done correctly, the tree continues to thrive. You might notice missing strips of bark that may be new or very old when you are walking in the woods. Note that harvesting cedar bark is an important cultural practice reserved solely for Indigenous communities.

Cedar leaf has long been a popular internal and external medicine. Because it is generally antimicrobial and immune stimulating, it can be useful in many situations.

- Oil: The leaves are infused in oil and are used as an ointment for healing skin wounds and fighting topical infections. The oil is also made into salve or cream.
- Baths: Dried cedar leaf is a medicinal and fragrant addition to bath tea or salts. You can also soak your feet in cedar tea by steeping a cup of dried cedar leaves in about 10 cups of hot water. Let the tea steep until it is warm, pour it in a bowl or basin large enough for your feet, and soak for 10–15 minutes.
- Respiratory Steam: The leaves are used in a respiratory steam for fighting off coughs and sinus infections (see recipes for directions).
- Incense: Cedar is bundled and dried to make purifying incense that smells like the heart of the forest. It is also mixed with other aromatic herbs and burned on hot coals.
- Tea: The tea is used for cough medicine, immune support, and lowering fevers. You can prepare cedar tea by steeping a tablespoon of fresh finely chopped or dried cedar leaf per cup of cold water. Let steep several hours or overnight. Drink ¼ to ½ cup twice a day.

The leaves can be harvested any time of year but seem strongest in late summer or early fall when the weather is warm and aromatic oil content is highest. To harvest cedar leaves, carefully prune small fan-like branches here and there on the tree so you do not leave a visible impact. You can also look for fallen branches after a windstorm. The leaves can be used fresh or dried. To dry the leaves, bundle several small branches with a rubber band then hang them, or put them in baskets in a dry room with good ventilation. Keep them whole to retain the fragrant oils and then crush them just before you use them. Store in a paper bag or glass jar.

CAUTION: Cedar is strong medicine and should be used internally with care –the dosage is usually low and it is not used for long periods of time. Do not use it during pregnancy, breastfeeding, or with kidney weakness.

**Yellow Cedar** – *Callitropsis nootkatensis*

While Western red cedar thrives in the coastal lowlands, yellow cedar thrives in the mountains between 2,500– 6,000 feet above sea level. It grows in forest areas and along rocky precipices. Yellow cedar has grayish soft bark that comes off in strips like Western red cedar. The wood is a beautiful yellow color. Branches are long and drooping, making the tree look like a fancy dancer with long fringe. The top droops on younger trees. Sharp spreading tips are prickly when you run your hand up them, unlike the smooth leaves of Western red cedar. Leaf tips look like crab claws where the pollen cones fall off. Cones are round and 1/3 inch in diameter. They are green and berry-like the first year, and then separate into 4 to 6 shield-shaped scales with a knob on top. Yellow cedar can live to be 1,500 years old and grow over 160 feet tall! The flexible branches remain strong in snow or intense mountain wind.

Traditional Uses: Yellow cedar is used medicinally in many of the same ways as Western red cedar. The wood is harder, lighter, and stronger with a fine, even grain. It is prized for making canoe paddles, baskets, dishes, tools, clothing, and many other things.

**Port Orford Cedar** – *Chamaecyparis lawsoniana*

Wild Port Orford cedar only grows along the coast of southern Oregon and northern California, but there are over 200 horticultural varieties that are commonly found in yards, parks, and public spaces. Fine blue-green scale-like leaves are 1/16 of an inch long. The underside of the leaves has a distinct white X pattern. Branches are feathery looking and flat. Cones are round and similar in appearance to yellow cedar. Branches extend to the ground.

Traditional Uses: Port Orford cedar wood is highly prized because of its strength and resistance to rot and insects. It has been used for boatbuilding and many other purposes. Overharvesting and a root rot fungus that was introduced from nursery stock have made the wild tree rare. You can use horticultural varieties in a similar way to other cedars.

**Seaside Juniper** – *Juniperus maritima*

Seaside juniper is a small, gnarled tree with scale-like leaves and shaggy bark. It thrives in dry soil along cliffs around the Salish Sea. Unlike other cypress family trees, male and female cones grow on separate trees. Male pollen cones are small and golden. The female cones are small, round, blue-green, and waxy. The leaves and the female cones have a strong, spicy smell when crushed. Seaside juniper was recently classified as a unique species instead of its previous classification as Rocky Mountain juniper.

Traditional Uses: Juniper berries are very aromatic and are used as a seasoning for game and other dishes. The dried leaves and berries are burned as a cleansing and disinfecting incense. Juniper berries are a popular remedy for urinary tract infections but they can irritate the kidneys if used long term. Juniper is not recommended internally for pregnant women or those with kidney weakness.

## THE PINACEAE FAMILY

Members of the pine or Pinaceae family include pines, spruces, hemlocks, true firs (several species under the genus *Abies*) and Douglas fir (not a true fir). One easy way to know if a native tree is a member of this family is that all of these trees have needles (as opposed to scales, like the western red cedar), and dry, scaly cones. Larch is also in the pine family and has needle-like leaves, but it loses them in winter and is not an evergreen tree.

## PINES

The word "Pinus" stems from the Latin word meaning 'resin.' There is nothing like the smell of pine resin incense –or the piney scent of Ponderosa in the high desert after rain. If you are lucky, you may find a tree that is dripping golden pitch–a substance that has been sought after for ages. Pines can live to be ancient. There is a pine tree in California that is 4,600 years old!

One of the easiest ways to identify different types of pines is by looking at their needle-like leaves. The needles emerge from a brown base right off the stem and grow in clusters of two to five. You can narrow down

the type of pine by the number of needles in the cluster. For instances, lodgepole and shore pine have two needles per bundle, while western white pine has five needles per bundle.

Many pine trees are dependent on fire for reproduction. Cones take two years to reach maturity and can stay tightly closed on a tree for many years until the heat from a fire causes them to open. Even if a tree is killed, the cones on the top branches will open and seeds will land on the ashes, which creates an ideal condition for them to grow in. You may notice dense forests of pine growing in the years following a forest fire.

**Western White Pine** – *Pinus monticola*

White pine is a majestic tree with a sparse crown that grows between sea level and 5,000 feet. Look for it in fir or hemlock forests in areas where there has been a disturbance like fire or logging, or along the edges of bogs or prairies. The branches grow in whorls around the trunk. Feathery long needles are a distinctive blue-grey-green color. Western white pine has checkered bark and can grow up to 200 feet tall.

White pine was once very common in wet forests, but many obstacles, including bark beetles, white pine fungal disease, logging, and wildfires have made it rare. White pine blister rust was introduced in Vancouver, B.C. in 1910 and quickly spread east, devastating vast pine forests throughout the greater Northwest. Because currant and gooseberry bushes are also hosts to white pine blister rust, the federal forestry agencies waged war on them, believing that if you killed alternate hosts, you would save the trees. From the 1930s to the 1960s thousands of people were hired to poison bushes. Tragically, this strategy did not save the pine trees and resulted in diminished populations of currants and gooseberries. Efforts are now focused on finding pine trees that are naturally resistant.

Traditional Uses: White pine is prized as a medicine for opening congested lungs, fighting infections, and stimulating immune function. The resin, bark, and leaves are all rich in healing aromatic oils and resins. Native Americans have chewed the pitch as a gum or sucked it to alleviate coughing. The pitch can be diluted in oil or salve, and used as a chest rub. Young needles can be used fresh or dried as a steam inhalation. Young leaves and dried bark are also boiled to make tea and cough syrup. Try pouring the tea over hot rocks in a sauna or sweat lodge. Aromatic oils in white pine stimulate the kidneys and act as a diuretic to rid the body of excess fluid. White pine is also traditionally used for stomachaches, probably because it fights microbes.

**Shore Pine and Lodgepole Pine** – *Pinus contorta*

Shore pine and lodgepole pine are two forms of the same species. They can be difficult to tell apart, but lodgepole pine (*Pinus contorta* subspecies *latifolia*) tends to grow inland, in the mountains, and in dry prairie areas, whereas shore pine (*Pinus contorta* subspecies *contorta*) thrives in the harsh conditions along the coast including sandy bluffs, rocky cliffs, and boggy areas with infertile soil. Molded by harsh winds and terrain, it may look like a huge bonsai tree with heavy limbs and a rounded top, or all the branches may be bent away from the prevailing winds.

Both trees have short stiff needles (about 1½ –2 inches) bundled in pairs. The seed cones are also about two inches. They are curved at the base, prickly, and point away from the tip of the branch. Mature cones can stay on the tree for 20 years or more and are most likely to open during the heat of a fire. Pollen cones appear reddish and grow in clusters.

Traditional Uses: Native Americans on the east side of the Cascade Mountains have long used lodgepole pine to make houses and tipis because it is slender, straight, and lightweight. Shore pine tends to make a lot of pitch, which is prized as a chewing gum and for healing wounds and fighting infections.

**Ponderosa Pine** – *Pinus ponderosa*

Ponderosa pine thrives in the high desert just east of the Cascade Mountains. The name "ponderosa" means "massive." Old trees are easy to identify with their tall straight trunks and orange-red bark, which looks like puzzle pieces or a topographic map. Ponderosa pine lives over 500 years and develops a broad crown growing over 130 feet tall. Needles are five to ten inches long and are generally in clusters of three. Seed cones are three to five inches and egg shaped. The back of each scale on the cone has a sharp prickle that sticks out. Ponderosa pine's thick bark and deep roots are ideally suited for surviving intense heat, drought and fire.

Traditional Uses: Some tribes use ponderosa pine for building materials, firewood, pitch for healing wounds, and as a gum, and needles for tea to treat coughs and colds. The seeds and soft inner bark can also be eaten. Needles make beautiful baskets, along with the fine roots. The trunks are large enough to be made into a canoe.

## HEMLOCKS

Common varieties of hemlock include Western hemlock, which grows at low elevations, and mountain hemlock.

**Western Hemlock** – *Tsuga heterophylla*

Hemlock is known as a "climax tree" in Northwest forests because it grows in full shade and outlives other trees that are dependent on sunlight. If untouched by humans or natural disasters, our forests would be dark woodlands of giant hemlock. Hemlock bark is silvery brown and furrowed, but not as deeply furrowed as Douglas fir. It has a distinctive drooping top and feathery drooping branches. Cones are only a few centimeters long. Hemlock is great at reproducing. Seeds have

a wing that can fly half a mile on the wind. Leaves are different lengths and are arranged randomly along branches. Many people think the hemlock tree is poisonous, but this is because it is confused with "poison hemlock," an entirely different plant in the carrot family.
*See the story on how hemlock got a drooped top and small cones at the end of this document.*

Traditional Uses: Hemlock spring tips are tender and delicious. Coast Salish Peoples have boiled the leaves and bark for tuberculosis, rheumatic fever, and hemorrhage. The inner bark has been used in springtime as food called "bark bread" that is high in sugars, starches, and immune stimulating properties. The bark is used to create a reddish-brown dye that makes fishnets invisible to fish. Hemlock branches are traditionally used to collect herring eggs.

## SPRUCES

The easiest way to identify a spruce is by touching the needles. If they are sharp, you know it is a spruce! Twigs are warty where old leaves have fallen off. Cones feel papery. The trunk bark has loose scales or plates that are shaped like potato chips. Sitka spruce is common toward the Pacifi coast while Engelman spruce is more common in the mountains. White spruce and black spruce are prevalent in Alaska. Blue spruce grows in the Rocky Mountains.

**Sitka Spruce** – *Picea sitchensis*
Sitka spruce trees grace wet coastal forests from Oregon to Alaska. Along the rocky coastline, they take the form of contorted, bending sculptures molded by the wind and rain. They seldom venture to higher elevations or dry climates. The leaves are pointed at the tip but are flat and do not roll in your fingers like other spruce leaves.

Traditional Uses: Salish weavers have long gathered pliable straight spruce roots, split them, and woven them into intricate watertight baskets and rain hats. Roots have also been heated, pounded, and made into cordage. The pitch is called "spruce gum" and is used for sore throats and coughs. It has also been used as a glue, sealer, and waterproofing substance. Spruce wood is light, stiff, and very strong. It was used for making airplanes in World War I and World War II. It is also highly resonant and is used to make musical instruments.

## OTHER PINE FAMILY TREES

Douglas fir and larch are also in the pine family. Larch, also known as tamarack, is unique among conifers because it loses its leaves in winter. You may notice its bright yellow leaves if you are passing through the mountains in autumn. Their needles on older twigs grow in clusters from woody pegs.

## DOUGLAS FIR – *Pseudotsuga menziesii*

Douglas fir is one of the most common and iconic trees in the Pacific Northwest. It is the second tallest tree in the world after the California redwood and can grow to be over 1,000 years old! The older bark is cinnamon-brown colored and becomes deeply furrowed, making it the "grooviest tree in the forest." The bark can grow as thick as 12 inches and is hearty enough to survive most wildfires. The leaves are all the same length and are pointed at the tip but are not sharp. They are spirally arranged all around the branch like a bottlebrush. Limbs near the treetop sweep upward like arms reaching up toward the sky with the top pointing straight up. Seed cones are about two to three inches long and have three-pronged bracts that stick out beyond the scales, resembling the back feet and tail of a mouse.

Traditional Uses: Douglas fir needles have a pleasant fragrance that smells like pine and citrus. The young spring tips can be eaten straight or made into a refreshing tea for promoting energy and warding off hunger and thirst. Some people call the tea "Nature's Gatorade." Older needles are too tough to eat but can be dried and made into tea. The needles can also be finely chopped and infused in oil that can be made into body oil, lotion, lip balm, or salve and used in baths. Douglas fir needles are used on the skin because they contain vitamins and other nutrients that promote skin health and wound healing.

Douglas fir makes a lot of pitch. You will see it where the trees have been injured from lightning, losing branches, being scraped, or being attacked by insects. It has the consistency of honey at first but becomes very hard as it ages. The liquid pitch can be placed directly on wounds or insect bites to speed up healing. Pitch is also used as a fire starter, incense, and for waterproofing.

### "False Hemlock" or Douglas fir

***What is in a botanical name?*** *–by Joyce LeCompte*

Names tell us something about a plant. In the Lushootseed language spoken by Coast Salish people of the Puget Sound basin, Douglas fir trees are called čχalc, or sčəbidac. čχalc means "easy to split." Every known plant in the world has been assigned a formal scientific name. Each plant's botanical name is unique and consists of two parts. The first part is the Genus, and the second half of the name is the species. Douglas fir's botanical name is genus: Pseudotsuga, species: menziesii. In Latin, Pseudo means "false." The second half of the Genus name is tsuga, which refers to the Genus hemlock. So, the word Pseudotsuga means "false hemlock" presumably because it was mistaken for hemlock at some point in time in the past. However, Douglas fir's common name is also misleading, as Douglas-fir is not considered to be a fir at all. "True" firs are members of the fenus Abies. Menziesii is the species and it is named after the surgeon/naturalist Archibald Menzies, who explored the Salish Sea in 1791 on Captain Vancouver's expedition around Vancouver Island.

## TRUE FIRS

True firs have several characteristics that help us identify them. Cones point upward like birds perched on branches and grow toward the top of mature trees. Bark on younger trees is often smooth with blisters that contain pitch. Cones don't fall off the trees intact–the scales come apart once the seeds ripen. Look for scales under the tree instead of whole cones. Fir branch sprays (single small parts of branches) often appear flat. Leaves on different firs grow in distinctive patterns:

- Grand fir: flat needles grow in horizonal rows
- Noble fir: needles are shaped like hockey sticks, point upward, have white lines above and below
- Pacific silver fir: flat needles grow flat with top needles pointing toward the tip of the branch
- Subalpine fir: needles curve upward and have white lines above and below

Grand fir is common in lower elevation forests while noble fir, Pacific silver fir, and subalpine fir are more common in the mountains. All true firs are valued for similar purposes including being skin-regenerating, immune-stimulating, and anti-microbial.

**Grand Fir** – *Abies grandis*

Grand fir is a beautiful low to mid-elevation forest tree with branches that grow in regular whorls. Needles are flat, grow in two distinct horizontal rows, are shiny deep green on top, and have two white lines on the underside. If you look closely, you can see a notch on the tip of the leaf. Young bark has resin blisters, but older bark becomes brownish-grey and ridged. The bark is purple when sliced and is used by Coast Salish Peoples to make a purple dye. Upward pointing cones grow at the top of the tree and are about four inches tall with green to reddish smooth scales.

Traditional Uses: Native Americans use grand fir bark and pitch for healing the skin and clearing lung infections. The pitch also makes an excellent waterproof finish for canoe paddles and wooden tools. The branches grow flat and were used by Coast Salish Peoples for bedding and floor mats that could be changed every few days. The whole tree forms a nice shelter from rain. The wood is soft and is made into paper.

**Noble Fir** – *Abies procera*

Noble fir is a favorite Christmas tree with silvery leaves and sparse strong branches. The trunk is gray and smooth with distinct resin blisters, and becomes furrowed as it gets old. Dense strong needles point upward like a hairbrush. If you look closely, you will see two silver bands on the top and on the bottom of the needles, giving them a silvery appearance. The upward facing cones are four to eight inches tall and barrel shaped on fully-grown trees. They have bracts between each scale.

Traditional Uses: Like other firs, noble fir needles, bark, and resin are used to build immunity, fight infection, and heal wounds. The dried needles make a tasty tea and are also great for adding to bath teas.

## TAXACEAE FAMILY

**Pacific Yew** – *Taxus brevifolia*

Yew is a shrubby little evergreen tree growing up to 50 feet tall in the understory of deep forests. The bark is shaggy, comes off in strips, and is often several colors including gray, brown, and orange. Deep green needles grow horizontally in two opposite rows. They are pointed at the tip but are not sharp like spruce. New twigs remain bright green for a whole year. The female seed resembles red huckleberry in shape, color, and size. Birds and other animals relish them. Female and male cones grow on separate trees.

Traditional Uses: Yew grows slowly and the wood is very dense, yet pliable. It is called "bow plant" in many Native American languages and has been made into fishhooks, paddles, digging sticks, spoons, and many other things. Native Americans have sustainably harvested and used yew for medicine for many generations. In the 1990s, scientists discovered that yew contains a powerful compound called Taxol, which can inhibit the growth of breast and ovarian cancer cells. Drug companies bought and claimed the rights to all the yew trees in national forests and used them to create cancer drugs. People from Warm Springs were actually jailed for harvesting yew in their traditional territory. By the year 2000, pharmaceutical companies discovered how to synthesize the drug–releasing pressure off this powerful little tree. It will take decades for yew trees to return to their former population.



**CAUTION**: Yew berries, bark, and branches are toxic and should not be eaten or drunk as tea. Only experienced gatherers should harvest the bark.

# A TREE ESSENTIAL OIL APOTHECARY

Plants produce and store essential oils in their leaves, flowers, stems, bark, and roots. These oils serve many purposes including attracting pollinators, warding off insects, killing diseases, and acting as messengers to neighboring plants. People have used aromatic plants for medicine, incense, insecticide, and perfume since ancient times.

Essential oils are valuable remedies for helping us to stay healthy. They can improve circulation, combat infections, lighten fatigue, and ease depression. People with coughs and colds may find essential oils helpful for stimulating lung tissue, thinning mucus, increasing expectoration, combating inflammation, opening respiratory passages, and easing headaches.

Essential oils are very potent and are always used in small amounts. Try using an essential oil vaporizer or diffuser in the room of someone who is sick. You can also put a couple drops of essential oil in the bath. If you are taking a shower, try putting a washcloth with 10 drops of essential oil in the bottom of the shower. As it heats up you will inhale the scent and create your own wet sauna. Some of our favorite wintertime essential oils include:

**Cedarwood:** The common cedar essential oil that you find is made from *Cedrus atlantica,* or Atlas cedar. It is native to Morocco and Algeria and has been used since biblical times. Cedar is used as a strengthening oil to counter fatigue and poor circulation. It is also decongesting, anti-microbial, and immune stimulating. It can be useful for acne, dandruff, and skin infections.

**Douglas Fir:** This oil has a lemony, uplifting fragrance that combines well with other oils. It opens respiratory passages, stimulates immunity, and promotes circulation. It is useful for colds, coughs, muscle aches, and to help diminish stress.

**Pine:** Several types of pine essential oil are available. Scotch pine, or *Pinus sylvestris,* is one of the most common. It can be useful to relieve congestion and open respiratory passages. Like other conifers, it is used in massage oils to ease sore muscles and stimulate circulation. Pine is said to be uplifting, strengthening, and refreshing.

**Spruce:** Like other evergreen needle oils, spruce is uplifting and invigorating. The molecules in black spruce are similar to adrenal hormones in humans so it is useful for combating exhaustion. Many people with long-term stress or menopause have found that spruce helps to lift their energy and improve their spirits. 1–2 drops can be applied over the adrenals in the morning.

## TREE HARVEST SAFETY AND ETHICS

Before you harvest trees for food or medicine, make sure you consider these guidelines:

- Make sure you have positively identified the tree! A few trees like yew are toxic.
- Avoid harvesting from roadsides, industrial areas, or other places that might have been sprayed with herbicides or pesticides. These can make you sick.
- When possible, harvest tree parts that have recently fallen. If you are taking parts from the tree, leave enough for the tree to stay healthy and reproduce, and for others who rely on the tree for food, like pollinators, birds, and mammals.
- What can you give back? Some people leave a gift, a song, or a prayer as thanks for the gift they have received. Others may pick up garbage or remove invasive plant species around the tree.

# TREE RECIPES

**Evergreen Tree Tip Tea**

In late spring, tiny, brown buds at the tips of evergreen tree branches swell and open into tender limey-green needles. Edible tree tips including Douglas fir, grand fir, hemlock, and spruce have a refreshing lemony flavor and are high in Vitamin C. They are also high in electrolytes and are sometimes called Nature's Gatorade. Harvest young tips when they are limey-green and tender, usually April-June. They can be eaten straight as a trail snack, put into salads, or brewed for tea. Tips can be preserved in the refrigerator for several days or in the freezer for several months. You can also dry them in a basket or a food dehydrator. If you missed harvesting the spring tips, dry the older needles and make a tea from them. They are tasty, refreshing, and have a slightly more astringent flavor. They are delicious mixed with rosehips!

- Sun Tea: Add a large handful of evergreen tree tips per each quart of water to a glass container with a lid. Cover and let sit in the sun several hours to overnight. Strain and serve chilled.
- Hot Tea: Use the same amount of tips as with sun tea, but pour boiled water over them in a pot, cover with a lid and let them steep for 15 minutes. Strain and serve hot. This tea tastes stronger and is more astringent than sun tea.
- Tree Tip Lemonade: Place 1–2 cups of tips in a large jar or pitcher with 6 cups of water. Cover and let steep in the sun or a warm place for 4–6 hours. Strain out tips. Add the juice of 3 lemons or about ¼ cup of lemon juice and 2–3 tablespoons of honey (dissolved in hot water). Mix and serve over ice.
- Christmas Tree Tea: Mix equal parts dried Douglas fir needles with rose hips. You can harvest the Douglas fir needles any time of year. Spruce and true fir needles will also work. Steep 10–15 minutes. This tea is a favorite around the holidays and helps to fight colds.

## Evergreen Tree Oil and Lip Balm

You will need: fresh evergreen tree leaves (also called needles), extra virgin olive oil, scissors, a blender or food processor, a double boiler and burner, and muslin cloth. For lip balm you will need a Pyrex measuring cup (8 or 16 oz.), a 1-pound scale that measures ounces, essential oil, lip balm or salve tins, and labels.

To make the oil: Evergreen leaves are rich in aromatic oils and nutrients that support skin health. You can infuse many tree leaves including cedar, fir, and spruce into oil. Extra virgin olive oil is inexpensive, great for skin health, and high in Vitamin E, which acts as a healing agent and a natural preservative. Other oils including grapeseed oil, apricot kernel oil, and sunflower oil can also be used.

1. Harvest healthy looking branches from evergreen trees.
2. Pull apart leaves or pull needles off branches. Either finely cut the leaves, or place them in a food processor or blender to finely chop them. This will help open cell walls in the plant and extract the scent and medicine more readily.
3. Place the chopped leaves in a double boiler. Cover with oil so the oil is about ¼ to ½ inch over the plant material. Heat very gently to hasten extraction and help remove water from the plant material. Keep the temperature low so it does not boil. You can turn the double boiler on and off as needed. The oil should take on a green color and strong smell. Allow the oil to infuse for several hours. You can leave it for several days, occasionally bringing the oil to a warm temperature and stirring it.
4. Strain the oil with muslin cloth and allow it to sit for an hour or more. If there is sediment or water remaining in the oil, it will fall to the bottom.
5. Pour the oil into a glass storage container, leaving water and sediment behind. Label and store in a cool dark place for up to a year.

To make lip balm: Use one part beeswax by weight to 4 parts of infused tree oil by volume. One ounce of beeswax and 4 oz. (half cup) of oil will make about 25, 1/16 ounce roll up tubes. Gently heat the oil and beeswax in a double boiler until the beeswax is just melted. Turn off heat, add 10–15 drops of pure essential oil (nice options include Douglas fir, fir needle, grapefruit, sweet orange, and lavender). Pour the lip balm into the tubes and allow it to cool before placing the caps on. Address labels work well for lip balm tubes if you cut off about 25% of the length of the label.

## Evergreen Tree Facial Steam

You can use dried herbs or essential oil and will need a medium-sized bowl and a towel. Place one handful of chopped leaves in the bowl. Cedar is a good medicine for coughs and colds because it helps to fight infection, increases circulation in the lungs, and stimulates your immune system. Add 1–2 drops of essential oil if desired. Pour boiled water over the leaves until the bowl is about half full. Put your face over the steaming leaves at a comfortable distance and cover your head with a towel. Breath deep! Try to steam for at least five minutes. Pour more hot water in if necessary. For severe coughs or sinus congestion, do several steams a day.

**Forest Bathing Salts**

Dry the evergreen tree leaves at least a week in advance, as they are waxy, thick, and slow to dehydrate. Gather fallen branches or prune branches from trees of your choice. Cedar, Douglas fir, true fir, hemlock, and spruce are favorites. Spruce is a little tricky for children to work with because the needles are sharp. Dry branches in baskets or paper bags. You can speed the process by using a food dehydrator. Once dry, the leaves will come off more easily. Salts can be purchased in bulk at the grocery store. Pacific sea salt and New Zealand salt are commonly available. Some salts like Dead Sea salts and Hawaiian salts can be very expensive and are usually used for food or fancy body care products. Epsom salts are especially helpful for sore muscles and are available at most pharmacies. Essential oils are available at many health food stores, herb stores, and online. Make sure to purchase pure essential oils, not synthetic fragrance oils.

1 part dried leaves or needles from evergreen conifers
1 part sea salts or Epsom salts
Baking soda (1 T. per cup combined leaves and salts)
Pure essential oils (about 10 drops total per cup of mixed leaves and salts)

Mix all ingredients in a bowl. Place about ½ to ⅔ cup in a muslin or organza bag. 4 inch by 6 inch bags are a good size for bath teas. Place your filled cloth bag in a plastic bag to preserve the fragrance. Place the entire cloth bag in the bath and squeeze to dissolve salts. You can use the bag as a scrub or loofah on your skin.

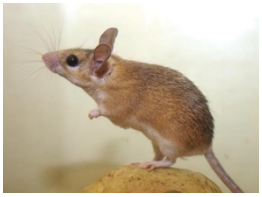
**Cedar Oat Bath**


This simple recipe is especially soothing for irritated skin. Oats soothe itchy, dry skin while cedar stimulates immunity and fights infection.

1 part dried cedar leaf
1 part oat flour or powdered rolled oats
Essential oil of cedar, spruce, pine or fir (10- 15 drops per cup mixed cedar oat blend)

Cut or crumble dried cedar leaves so that the pieces are ½ inch or smaller. In a bowl, mix half dried cedar and half oat flour. Add 10–15 drops of essential oil per cup of mix and stir well. Place ½ cup of mix into a muslin bag and tie. Place in a glass jar or plastic bag to retain scent. Place the whole bag in the bath and squeeze the bag to release the oat flour. The bath water will become "milky" and the cedar will infuse into the hot water. You can rub the bag on your skin like a loofah.

# EVERGREEN CONIFER STORIES



### How Mice Got Stuck in Douglas Fir Cones

This common Salish story is told by many Native people in the Pacific Northwest. It teaches us that Douglas fir has a special ability to survive forest fires. Once you see the little mice in the cones, you will never forget how to identify the tree!

*A long time ago there was a great forest fire that swept through this area. All of the animals were running to escape. The poor little mice could not run fast enough so they asked the strong and tall Douglas fir for help. Douglas fir invited the mice to climb up its trunk and hide in its cones. Douglas fir has thick bark, and it was able to survive the heat of the flames. The mice are still in the cones. Can you see their little hind feet and tails sticking out from beneath the scales?*

https://www.wnps.org/education/resources/documents/K-5_Q&E/2nd_grade/2-2b.pdf
https://heartofthewestcoast.com/2012/01/26/douglas-fir-trees/

### Why Hemlock has a Bent Top

This common Salish story has many versions. Teachers and parents often modify hemlock's poor behavior based on what young people need to learn! In one version of the story, hemlock pushes to the front of the line and says that he should get the biggest cone because he is big and tall! The Creator reprimands his bullying behavior by telling him to go to the back of the line, and gives him the smallest cone.

*A long time ago the Creator was giving out cones to all the evergreen conifer trees with needles. The pines, true firs, hemlocks, and Douglas fir were all there, and they were told to line up. Western hemlock was not paying attention; he was playing off on his own. By the time he realized it was time to line up, he was last in line, and he got the smallest cones. He learned a powerful lesson that day. See the bent top? He still hangs his head with humility.*

### Grandmother Cedar Tree

A Samish Story as told by Roger Fernandes, Lower Elwha S'Klallam Storyteller. https://vimeo.com/216042916

*A long time ago there was a Grandma Cedar Tree. She was very big and very old.*

*One day a little tree began to grow next to her. It was her grandson. He was growing right next to her and she was very happy. The little tree grew and grew.*

*One day a big windstorm came and the wind blew very hard. The wind was blowing on the little tree and he could not stand up to it. It was going to snap him and he would die. But Grandma Cedar Tree placed her arms - her branches - between him and the wind. She blocked the wind and protected her little grandson. And he grew some more.*

*One summer day, the sun was very hot. It beat down upon the little tree and it was so hot it hurt him. He was drying out. But Grandma Cedar Tree put her branches over him and made shade. She protected him. He grew some more.*

*One night deer came to the little tree. The deer liked to eat the fresh green branches of a growing little tree. But Grandma waved her arms at them and chased them away! She protected him from the deer. He grew even more.*

*Sometimes the little tree was sad because there were no other little trees around to visit with. He was sometimes very lonely. Grandma used her spirit power to call the birds to the little tree. The birds flew around him and sat in his branches and sang and talked with him. So he did not feel so lonely.*

*So he grew and grew. And soon he was bigger than his grandma. He was a big cedar tree and he was taller than her.*

*Grandma was getting very old. She was very old now.*

*One day a windstorm came and began to push old Grandma Cedar Tree with its great wind power. She was too old to fight back and the wind was so strong it was going to break her and she would die. But Grandson Cedar Tree put his arm branches between her and the wind. He protected her from the strong wind.*

*One day during the summer, the hot sun beat down upon old Grandma. She was miserable in the heat and was too old to stand it anymore. Her grandson put his arms over her and made shade, protecting her from the hot sun.*

*One night the deer came. They wanted to nibble the green branches of the old tree. But her grandson waved his arms at them and chased them away. He protected her from the deer.*

*Grandma was very old and all her old friends were gone. They had died many years before and she felt alone. Grandson used his power to call the birds to Grandma. They flew to her and landed in her branches and sang and talked to her. She did not feel so lonely.*

*She said, "Grandson, don't worry about me. I am old now. Take care of yourself. Do not worry about me anymore."*

*But he said, "Grandma, when I was little you protected me. When the strong wind blew upon me, you blocked the wind with your arms. When it was so hot in the summertime, you made shade with your arms and protected me. When the deer came at night to eat my branches, you chased them away with your arms. And when I was lonely, you called the birds to me so I would not be alone. Grandma, you did all these things for me, and now I will do them for you."*

*And so Grandson Cedar Tree took care of his beloved Grandmother Cedar Tree.*

*And that is all.*

## Additional Resources

http://nwconifers.com/info/overview.htm
http://www.conifers.org
Coloring pages: http://www.supercoloring.com/coloring-pages/trees-leaves/fir-tree
Forest Fast Breaks – short videos on forest management, tree biology, wildlife, wood products, etc.
https://www.youtube.com/playlist?list=PLS8kydnMHQ9k8teSRSMGqLYn3fOqZjV_8
Recipes on cooking and medicine making with conifers: https://www.growforagecookferment.com/conifer-needle-recipes/

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# EVERGREEN CONIFER TREES - I

**Time:** 45 minutes
**Season:** Any
**Age:** Grades K–5
**Setting:** Indoors

**Overview:** Through viewing a slideshow, students learn about two to five local evergreen conifer trees including identification and common uses. In a hands-on activity, students make or sample something made out of trees. At the end, students test their identification knowledge through playing a matching game.

**Student Wondering:** *How do I identify and use evergreen conifer trees that grow around me? What is resilience, and how are evergreen trees resilient?*

| Learning Objectives | |
|---|---|
| **Understandings**<br>*Student will understand that…* | **Knowledge and Skills**<br>*Student will be able to…* |
| • resilience is the ability to recover from difficulty<br>• a tree's structure, function, and ability to communicate and form partnerships with other species help it to be resilient.<br>• many of the qualities that make trees resilient also help people to be more resilient. | • identify two to four local evergreen conifer trees through looking at their overall shape, bark, leaves, and cones.<br>• identify some of the nutritional, medicinal and cultural significance of two to four conifer trees.<br>• make and use one product from a tree. |

**NGS Standards: Performance Expectations**

- 3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

| Scientific and Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
|---|---|---|
| • Developing and Using Models | • LS1.B: Growth and Development of Organisms | • Patterns |

**Vocabulary:** Evergreen, conifer, climate, resilience, pitch, resin, collaboration, resin, predators

**Materials:**

- Evergreen Conifer Tree Powerpoint, projector and screen. (If a projector is not available, print slides.)

- Samples of tree products: Leaves and cones from each type of tree you are covering plus any additional tree products you can share. Examples include a bark basket, carved artwork, wooden utensils, body care products, etc.
- Hands-on activity: See *Evergreen Conifer Tree Overview* for recipes and supplies.
- Matching game: Print and cut out matching cards for the trees you introduce. If possible, also bring real samples including a small twig with leaves, cones, and pieces of bark. If you break the class into groups for this game, print and gather enough sets for each group.

**Preparation:** Review the *Evergreen Conifer Tree Overview*. Choose two to five trees that students commonly encounter. Options include Western red cedar, Douglas fir, hemlock, grand fir, and spruce. Gather tree samples including small branches with leaves and cones for each tree you cover so that students can easily see, smell, and touch them.

Choose one hands-on activity that fits the season, the amount of time you have, and the interest and learning level of your students. For example, spring is a great time for making tree tip tea and it is an easy activity for younger children. Lip balm takes longer and is best for 3rd graders and older. It can be made in any season as long as you prepare the tree infused oil ahead of time.

Tree matching game: Consider breaking the class into small groups of 3–5 students. Print and cut out the cards of each tree you are covering, creating enough sets for each group. If possible, include a cone and small branch from each type of tree in each set.

*Teaching tip: Beware of sticky sap!* If students get sap on their hands, it can be easily cleaned with antibacterial gel or alcohol wipes. You can also dissolve sap with oil and then wash hands with soap.

# LESSON: EVERGREEN CONIFER TREES

*SLIDESHOW* 20 MINUTES (PART I) – 20 MINUTES (PART II)

Slide 1 – Introduction

(Choose information that will fit the knowledge level of your students.)

**Share:** Today we are going to explore common evergreen conifers that grow around us. If you fly in an airplane, you can see how common evergreen conifer trees are in our region. They look like a blanket of green covering land from the high mountains to the Pacific Ocean.

Slide 2 – Deciduous or Evergreen

First off, let's make sure we know what evergreen conifers are? Does anyone know what the word deciduous means? Yes, a tree that loses its leaves in the fall. And what do we mean when we say 'evergreen'? That's right? A tree or plant that is green year-round. What do we think the tree on the left is? Left is Sitka spruce, an evergreen tree. Right is black cottonwood, a deciduous tree.

Slide 3 – Deciduous or Evergreen Part II

And now, what does conifer mean? A tree that reproduces using cones. Left is bigleaf maple – a deciduous hardwood. Right is hemlock, an evergreen conifer.

Slide 4 – Evergreen Conifers are Resilient

Evergreen conifers have been on our planet for 300 million years! They were the main source of food for plant eating dinosaurs. Evergreen trees have survived through many changes in our environment including the **climate** and the species that live around them. Although many species have become extinct through these changes, evergreen conifers are still thriving today! We call this **RESILIENCE**. *Say it with me, Resilience*.

**Ask:** *Does anyone know what resilience means?* Give students a chance to respond.

**Share:** Resilience is the ability to recover from difficulty. For example: when you fall down, you get back up. When someone is mean to you, you hold your head up and keep going. Gesture a fist pounding into the palm of your other hand and then open and lift your fisted hand as you say, *It's hard, but I keep growing.* Have students repeat the gesture and say it with you: *Resilience. It's hard, but I keep growing.*

Trees are resilient for many reasons. These trees are growing high in the mountains very close to the tree line where weather conditions are harsh. It is hot and dry in the summertime, and cold, snowy, and windy in the winter. There are many things that make them resilient enough to survive all seasons.

The shape of evergreen conifers helps them to survive in snow, rain, and harsh weather. Many are pointed at the top to prevent snow from building up. (Form your arms into a triangle to show the pointed top of an evergreen conifer.) Their small needles allow rain and wind to move right through them. In addition, needles are waxy and don't dry out easily in hot dry weather.

Evergreen conifers also have a superpower that allows them to not freeze when everything around them has. It's called supercooling.

Slide 5 – Medicine Makers

Trees have to get everything they need while staying in one place. If they get injured, they can't go to the doctor like we can. They need to make their own medicine and band-aids.

**Ask***: How does a tree do this?* Tree **pitch** or **resin** is full of medicine that wards off diseases and repels animals that might attack it. If a tree is injured, it covers its wound with pitch. This is like our blood forming a scab. Over time, the tree usually heals.

For thousands of years, people have mimicked the wisdom of trees and used pitch to heal themselves. If you get a cut, scrape or insect bite, you can dab a little sap on it to speed the healing process. Put a little soft leaf or a band-aid on top so the sap stays on your wound and does not rub off on your clothes. Pitch is also used for waterproofing and for starting fires.

Slide 6 – Community Builders

We might see trees as individuals, but they are actually collaborating or working together. Trees in a forest can communicate with other trees by making scents that are carried through the air. They can warn their neighbors of invading insects or diseases and encourage them to increase their defenses by making more insect repellent or medicine. They can even call **predators** to eat the insects that are attacking them. This is similar to your parent or family member calling you to the kitchen by baking your favorite cookies. When you smell them, you know there is a treat waiting for you.

Trees also connect through underground root networks and can share food and medicine with other trees that need help. Working together makes the community of trees stronger and more resilient. Gesture and say together, *Resilience. It's hard, but I keep growing.*

Story Connection: Think Pair Share

**Share:** We've learned that trees are resilient because of their shape, their leaves, their ability to make their own medicine, and their teamwork. Now let's think about how each of us is resilient.

Choose a question, have each student share with a partner for one minute:

- Option 1*: Share a story from your life when an experience was really hard (like getting a shot or learning to swim) but you were able to get through it and learn something new.*
- Option 2: *Share an experience where you were injured and your body was resilient and healed.*

Whole group discussion: Take a few minutes to recap students' stories about resilience.

**Share:** We are going to use all of our senses and look at the color, texture, shape, and smell of tree parts. This will help us to identify them. (Pass around or hold up samples of plants as you are sharing).

Slide 8 – Leaves

Some evergreen conifers have scale-like leaves. Scales lay flat and are strong like the scaly skin of a lizard. Cedar is an example. Other evergreen conifers have needle-like leaves. The needles can be short or long, pointed or dull at the tip, and have different colors on the top and bottom. They can grow flat along the branch or all around the branch in a circular fashion. Each leaf has a distinct smell. Try scratching them to open up the leaf structure and release the scent.

Slide 9 – Leaves in Clusters

Some evergreen conifers have needles that grow individually on the branch and some, like all pines, have needles that grow in groups or clusters. The length of the needle and the number per cluster helps you identify the type of pine.

Slide 10 – Cones

Hold up an example of a conifer cone. **Ask:** *Why do evergreen trees make cones? Think about what might be inside a cone.* **Share:** Cones contain many little seeds that can grow into new trees. Birds, squirrels, and chipmunks like to eat the seeds. People eat the seeds from some cones, like pine nuts! Cones come in many

shapes and sizes. Most are green when they are young and then become woody as they get older. The size and shape of a cone can help us to identify trees.

Slide 11 – Cones Pointing Upward or Downward
Some cones like those of noble fir (right) point up, while others like Douglas fir (left) and hemlock hang down.

Slide 12 – Bark
Tree bark is like skin–it protects trees from losing water, getting diseases, and being attacked by insects. Young bark is smooth like your skin, while older bark develops distinct lines like the faces of our elders. Each type of evergreen tree bark develops a characteristic color and texture.

SLIDESHOW PART II – Individual Tree Species

Slide 13 – Western Red Cedar
Western red cedar thrives in wet forests. Salish names for cedar include "Tree of Life," "Grandmother" and "Long Life Maker" because it is so valued. Every part of cedar is useful. *Optional*: Tell the story of Grandmother Cedar from the *Evergreen Tree Overview*.

- Leaves are made of flat scales and are greenish-yellow. They have a strong scent and are used for incense and for medicine for fighting infections.
- Cones are small and are shaped like rosebuds. They are bright green when they are young and turn woody brown as they age and release their seeds.
- Bark is reddish-brown and has soft, long fibers. Northwest Native People peel the bark in long straight strips and separate the inner bark to make clothing, mats, baskets and hats.
- Wood is strong, durable, and beautiful. It is used by Native People to make longhouses, canoes, bentwood boxes, paddles, and many other things.

Slide 14 – Salish Woman on Seattle Waterfront
Longhouses are built from cedar wood along with canoes, utensils, and art.

Slide 15 – Cedar Tree with Peeled Bark
Cedar inner bark is used to make baskets, hats and clothing. The outer bark can also be bent into baskets.

Slide 16 – Cooking in Cedar Bent Wood Box
Cedar is important for cooking technologies. Bentwood boxes are made from cedar wood, tightly woven boiling baskets are made of split cedar roots. Round volcanic rocks are heated in a fire and then placed inside the cedar container filled with water.

Slide 17 – Cedar Medicine
Cedar Leaves are made of flat scales and are greenish yellow. They have a strong scent and are used for medicine and for incense. You can chop cedar leaves and do a steam to help ease coughs and sinus congestion. Cedar leaves are also made into oil, salve and cream to heal skin.

Slide 18 – Douglas Fir

Douglas fir is the second tallest tree in the world after the California redwood. It can grow to be over 1,000 years old. The top of the tree or the "lead" points straight upward and the branches swoop up toward the sky.

- Needles are all the same length, are pointed at the tip (but are not sharp) and are spirally arranged all around the branch like a bottlebrush. They have two white lines on the underside.
- Bark is cinnamon-brown colored and deeply grooved, making them the "grooviest tree in the forest."
- Wood - Douglas fir wood is strong and light, and is used to construct houses and many other things. It is the number one forest product tree in the Pacific Northwest, and is grown around the world.
- Pitch is used as a fire starter and for healing wounds.

Slide 19 – Cone and Mice

- **Story connection:** *A long time ago there was a great forest fire that swept through this area. All of the animals were running to escape. The poor little mice could not run fast enough so they asked the strong and tall Douglas fir for help. Douglas fir invited the mice to climb up its trunk and hide in its cones. Douglas fir has thick bark, and it was able to survive the heat of the flames. The mice are still in the cones. Can you see their little hind feet and tails sticking out from beneath the scales?*
- Douglas fir squirrels love to eat Douglas fir seeds and stash them in caches (secret hiding places) to munch on through winter.

Slide 20 – Western Hemlock

Western hemlock has a distinctive drooping top and a beautiful appearance. It thrives in shade more than any other conifer and will outlive other trees that need sunshine to grow.

- Needles are short, are different lengths and are arranged randomly along the branch. Drooping branches look very lacy. In springtime, the young tips are eaten and can be made into tea. They are high in Vitamin C and other nutrients, and are energizing.
- Cones are small. **Story connection***: A long time ago, the Creator was giving out cones to all the evergreen conifer trees with needles. The pines, true firs, hemlocks and Douglas fir were all there, and they were told to line up. Western hemlock was not paying attention, he was playing off on his own. By the time he realized it was time to line up, he was last in line, and he got the smallest cones. See the bent top? He still hangs his head with humility.*
- Bark is deep gray and furrowed, but not as much as Douglas fir. Native People ate the inner bark in winter and early spring. The bark has also been used to make a dye for fish nets and lines that makes them invisible to fish.
- Wood is used to make flooring, poles, pilings, and railroad ties. It is also used to make paper and cellulose fiber for the production of plastics.

Slide 22 – Grand fir

Grand fir is a beautiful tree that grows to over 250 feet tall and has a lifespan of around 300 years. It is a popular Christmas tree because it has such a nice shape and smell.

- Needles are flat, notched on the end, and grow in two distinct horizontal rows. They are shiny, deep-green on top and have two white lines on the underside. When crushed, they smell like grapefruit.
- Cones grow at the top of the tree and point upward. They have green to reddish smooth scales and fall apart on the tree, so you will see scales versus whole cones at the base of the tree. Seeds are nestled between the scales of the cones and are a favorite food of squirrels, birds, and other small creatures.

Slide 23 – Youth Bark has Resin Blisters

- Bark is smooth and grey with blisters that are full of sap. You can pop the blister with your fingernail and put a little sap on a wound or mosquito bite to help it heal faster. Once the bark gets older, it becomes grayish-brown and furrowed.
- Wood is soft and is made into paper.

Slide 24 – Sitka Spruce

Spruce trees grow fast and get very wide at the base. There are many types of spruce. Sitka spruce trees thrive in coastal forests from Oregon to Alaska. Along the rocky coastline, they take the form of sideways-bending sculptures molded by wind and rain. They seldom venture to higher elevations or dry climates.

Slide 25 – Leaves are Sharp!

- Needles are pointed and sharp. Be careful when you touch them!
- Cones feel papery and are wavy at the tip.
- Bark falls off in plates that look like potato chips.

Slide 26 – Uses of Spruce

- Leaves are dried and made into tea.
- Wood is light, stiff, and very strong. It was used for building airplanes in WWI and WWII. It is also highly resonant and is used to make musical instruments.
- Roots: Salish weavers gather pliable straight spruce roots, split them, and weave them into amazing watertight baskets and rain hats. The roots can also be heated, pounded, and made into cordage.
- Pitch: Spruce pitch has been called "spruce gum" and can be used for fighting sore throats and coughs. It is also used as a glue, sealer, and waterproofing substance.

Slide 27 – Western Yew

Yew is a shrubby little evergreen tree growing up to 50 feet tall in the understory of deep forests. The bark is shaggy, comes off in strips, and is often several colors including gray, brown, and orange. Deep green needles grow horizontally in two opposite rows. The female seed resembles red huckleberry in shape, color, and size. Birds and other animals relish them.

Native Americans have sustainably harvested and used yew for medicine for many generations. In the 1990s, scientists discovered that yew contains a powerful compound called Taxol, which can inhibit the growth of breast and ovarian cancer cells. Drug companies bought and claimed the rights to all the yew trees in national forests and used them to create cancer drugs. By the year 2000, pharmaceutical companies discovered how to

synthesize the drug–releasing pressure off this powerful little tree. It will take decades for yew trees to return to their former population.

**CAUTION**: Yew berries, bark, and branches are toxic and should not be eaten or drunk as tea. Only experienced gatherers should harvest the bark.

Slide 28 – How Can You Care for Trees?

**Ask:** *What are ways we can care for trees and forests?*

*HANDS-ON ACTIVITIES (choose one)* 10–30 minutes

Tree Prints

20–30 MINUTES

Flat leaves, including cedar and grand fir, work well for this activity.

- Pour green tempera paint in a bowl.
- Place a piece of scrap paper on the table and hold the leaf sample on it.
- Use a medium sized brush to apply a thin and consistent layer of paint on the leaf sample.
- Pick up the painted leaf and place it on another piece of scrap paper.
- If you would like to add additional designs, you can cover yarn or other natural materials with paint, gently remove excess with your pinched fingers and then apply it to the scrap paper around the leaf. Place your clean piece of paper over the leaf, paint side up.
- Gently rub it with your hand, being careful to hold the leaf steady, then remove the piece of paper and look at your print.
- You can add embellishments to the print including stamps, writing or drawing.

Tree-Shaped Leaf Rubbing Cards

15–20 MINUTES

Have each student make leaf rubbings by placing the top of a sword fern or a large salal leaf under a piece of paper, holding it stationary and using a peeled or large round crayon to make an imprint. Cut card-sized pieces of paper for this. Once students have made their rubbings or prints, have them glue them on blank cards and embellish them with stamps, glitter glue or small stickers to make tree-themed greeting cards.

Tree Tip Tea

10–20 MINUTES

See *Evergreen Tree Overview* for recipe and *Evergreen Conifers II* for teaching tips

Forest Bathing Salts

20–25 MINUTES

See *Evergreen Tree Overview* for recipe and *Evergreen Conifers II* for teaching tips

Evergreen Tree Lip Balm

SEVERAL HOURS to make oil, 30 MINUTES to make lip balm

See *Evergreen Tree Overview* for recipe and *Evergreen Conifers II* for teaching tips

## *TYING IT TOGETHER* 10 MINUTES

Tree Matching Game: Split the class in groups of three to six students. Give each group a matching game (includes cards and samples of trees). Have students match cards and samples together with the title card. *Challenge*: If some groups finish early, have them close their eyes and see if they can identify the tree leaves by smell and touch.

Closing: Do a quick closing by asking students to share one thing about evergreen conifers that will stick with them (besides the sap!). You can do this popcorn style where any student offers their comment at random, or go in a circle and have everyone comment.

## *DIGGING DEEPER*

Teachings of the Tree People: Video on the life and teachings of Skokomish elder, Bruce Miller. 20-minute and 1-hour versions available. https://vimeo.com/64099709

Cone Activity: http://parentingchaos.com/why-do-pine-cones-open-and-close/

Play the song *C is for Conifers* by They Might be Giants or play this Youtube music video: https://www.youtube.com/watch?v=FijQbZeTGNc

# EVERGREEN CONIFER TREES - II

**Time:** 50 minutes to 1 hour
**Season:** Any
**Age:** Grades 6–12
**Setting:** Indoor or Outdoor

**Overview:** Students learn to identify several evergreen conifer trees through looking at samples of leaves, cones, and bark, and using a basic botanical key to identify them. They also learn ways that people value these trees for food, medicine, building materials, and other uses. In a hands-on activity, students make or sample something made out of trees.

**Student Wondering:** *How do I identify and use evergreen trees that grow around me?*

| Learning Objectives | |
|---|---|
| **Understandings**<br>*Student will understand that…* | **Knowledge and Skills**<br>*Student will be able to…* |
| • a tree's structure, function, and ability to communicate and form partnerships with other species help it to be resilient.<br>• many of the qualities that make trees resilient also help people to be more resilient. | • identify several evergreen conifer trees through looking at their leaves, cones, and bark.<br>• identify nutritional, medicinal, and cultural significance of conifer trees.<br>• make and use one product from a tree. |

**NGS Standards: Performance Expectations**

- 3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.
- 1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

| Scientific and Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
|---|---|---|
| • Developing and Using Models | • LS1.B: Growth and Development of Organisms<br>• LS1.D: Information Processing | • Patterns<br>• Structure and Function |

**Vocabulary:** Evergreen, deciduous, conifer, resilience, photosynthesis, botanical key, characteristics

## Materials

- Enough samples of the trees you are covering for each group including small branches, cones, and bark

- A tree key and a piece of white paper for each group
- Supplies for hands-on activity (see *Evergreen Conifer Tree Overview* for recipes and supplies)

**Preparation:** Review the *Evergreen Conifer Tree Overview*. Plan to break students into groups of four to six people. Gather tree parts ahead of time and break into sets so that each group has a sample of each type of tree and a botanical key. For the hands-on activity, choose one of the recommended activities that fits the season, the amount of time you have, and the interest and learning level of your students. For example, spring is a great time for making tree tip tea. Lip balm takes a bit longer but can be made in any season as long as you pre-prepare tree infused oil.
*Teaching tip: Beware of sticky sap!* If students get sap on their hands, it can be easily cleaned with antibacterial gel or alcohol wipes. You can also dissolve sap with oil and then wash hands with soap.

# LESSON: EVERGREEN CONIFER TREES 2

*INTRODUCTION* 10 MINUTES

**Ask:** *What does "**evergreen**" mean? What does "**conifer**" mean?*

**Share:** Evergreen means that plants keep their leaves all year long. Conifer trees have cones. So evergreen conifers keep their leaves all year long and have cones.

Evergreen conifer trees define our Northwest landscape. From an airplane, they look like a blanket of green covering much of the land from the high mountains to the Pacific Ocean. They are common all over the Northern part of our planet and grow all the way into Southern South America.

Evergreen conifer trees have been on our planet for 300 million years! They were the main source of food for plant eating dinosaurs. They have survived through many changes in our environment including the climate and the species that live around them. Although many species have become extinct through these changes, evergreen conifers are still thriving today! We call this **RESILIENCE**.

**Ask:** *What does resilience mean?* Give students a chance to respond.

**Share:** Resilience is the ability to recover from difficulty. Trees are resilient for many reasons. (Choose information that fits your students' knowledge level. You may want to write each topic on a board)

1. Year-round Food Production: Trees make food (sugars) in their leaves from sunlight, water, and nutrients through a process called photosynthesis. **Deciduous** trees lose their leaves in the cold season and must stop making food. Evergreen conifers keep their needles all year long and can photosynthesize during any season if it is warm enough. Some evergreen conifers can photosynthesize in temperatures as low as 19° F or minus 7° C. While they photosynthesize more slowly than deciduous trees, they make up for it with year-round production. *Optional: Think, Pair, Share*: *Turn to*

*your elbow partner and tell them the difference between deciduous and evergreen trees. Name a few examples.*

2. Structure: The shape of evergreen conifers helps them to survive in harsh weather. Most are pointed at the top in a triangular shape so they can shed heavy snow. Trees with small needle-like leaves are more stable because the wind can blow through them, whereas trees with large leaves are likely to fall over when they catch the force of wind or the weight of snow. Evergreen tree leaves have a waxy waterproof surface that conserves water.

3. Leaf Lifecycle: Tough, small evergreen leaves can survive as long as eight years. Deciduous trees must grow new leaves each year, which requires a lot of energy and nutrients from the soil. Because evergreen conifers do not make so many new leaves each year, they can grow in poor soil conditions. While evergreen conifers photosynthesize more slowly and release fewer nutrients into the soil, they can grow just about anywhere.

4. Cold Hardiness: Evergreen conifers can survive very cold winter temperatures. They do this by a process called supercooling where the liquid inside the cells stays liquid instead of forming ice crystals. Ice is not able to crystallize because there are no particles or rough surfaces to adhere to in the tree cells.

5. Making Medicine: Trees must be self-sufficient and produce their own food and medicine. When a tree is injured, it makes pitch (also called resin), which is full of medicine that wards off diseases and repels species that might attack it. If a tree is injured, it covers the wound with pitch. Over time, the tree usually heals. People have used pitch for thousands of years to heal wounds. If you get a cut, scrape or insect bite, you can dab a little sap on it to speed the healing process. Put a little soft leaf or a band-aid on top so the sap stays on your wound and does not rub off on your clothes. Pitch is also used for waterproofing tools and for starting fires.

6. Building Community: Evergreen trees in a forest can communicate with each other by making scents that are carried through the air. They can warn their neighbors of invading insects or diseases. They can even call animals (predators) to eat the insects that are attaching them. Trees also connect through underground root networks and can share food and medicine with trees that need help. Working together makes the community of trees stronger and more resilient.

Group Discussion: **Ask:** *If you reflect on ways in which trees are resilient, what can we learn to help us be more resilient?*

## *TREE IDENTIFICATION ACTIVITY* 20 MINUTES

**Share:** We are going to dive into the details of how to identify common evergreen trees. Here are some things to pay attention to before we break into groups:

1. Leaves: Hold up a tree sample with needle-shaped leaves and another with scale-shaped leaves. **Ask:** *What do you notice about the ways in which these tree leaves differ from each other?* Give students a minute to reflect and respond. **Share:** Some evergreen conifers have scale-like leaves. Cedar is an example. Think of snakeskin. Others have needle-like leaves like Douglas fir. The needles can be short or long, pointed or dull at the tip, and different colors on the top and bottom. They can grow flat along the branch or all around the branch in a circular fashion. Some have clustered leaves that are bundled at the base of the branch. The number of needles in a cluster will help you identify the tree.

2. Cones: Evergreen conifers have two types of cones. In spring through summer, little male cones appear like flowers all over the trees and release pollen. This pollen travels on the wind to the female cones and fertilizes them so that they can grow seeds. Seed cones come in many shapes and sizes. Most are green when they are young and become woody and brown as they get older. The size and shape can help us identify trees. Birds, squirrels, and chipmunks eat the seeds. **Ask:** *Have you ever eaten pine nuts?* People eat seeds from several types of conifers! When you are looking at cones, try to find the seeds and notice their size and shape.

3. Bark: Tree bark is like skin–it protects trees from losing water, from getting diseases and from being attacked by insects. Young bark is smooth like your skin, while older bark develops distinct lines like the faces of our elders. Each type of evergreen tree develops bark that has a characteristic color and texture.

Group Work: Break the class into groups of three to six students. Give each student a tree key and samples of multiple trees including small branches, cones, and bark. Group each tree type together; for example, a spruce branch, cone, and bark plate. Explain how to use a botanical key by making decisions and following a path of plant characteristics. Encourage them to smell, touch and closely look at samples. Ask them to identify as many samples as possible. Have them tear off a piece of white paper and mark each sample they identify. Walk around and help groups as needed.

## *HANDS-ON ACTIVITIES*

Choose one activity below based on the amount of time you have, materials, and student interest.

### Evergreen Conifer Walk

Go outside to visit evergreen conifer trees that were a part of the identification game. Ask students to identify trees based on what they learned. Point out key characteristics including the leaves, bark, cones, overall shape, pitch, and distinctive smell when you scratch and sniff the leaves. Share stories, ecological relationships, and traditional uses from the *Evergreen Conifer Tree Overview* as time permits.

### Evergreen Conifer Speed Research 30 MINUTES

Bring several books on evergreen conifer trees or use computers. Break students into groups and ask each group to research a different tree for 15-20 minutes. *What is special about the tree? How is it valued by people*

*and other animals? Does it have any special qualities or ecological relationships?* Once time is up, have each group share what they learned with the whole class.

Evergreen Facial Steams (See *Evergreen Conifer Overview* for recipe) 20 MINUTES

Teaching Tips: You will need cedar leaf or other evergreen leaves, bowls (pairs of students can share a bowl), scissors, towels (enough for each student), and hot water (2-3 cups per bowl). Share that evergreen trees are generally antimicrobial and immune stimulating. Facial steams can be great for supporting skin health, clearing acne, and fighting respiratory infections including coughs and sinus infections.

- Pass out cedar, scissors and bowls.
- Each bowl will need about ¼ to ½ cup chopped cedar.
- Demonstrate how to cut the cedar into very small pieces. If you do not have enough scissors, students can finely tear the leaf into the bowl.
- Once they are done, pour boiled water over the cedar until the bowl is half full.
- Have them place their face over the steam at a comfortable distance and cover their head with a towel.
- Tell them to breathe deep! Share that it is most effective to steam for at least three to five minutes. Pour more hot water in if necessary.
- For chronic coughs or sinus congestion, it is most effective to steam three times a day.

*Variations:* Other herbs including fir needle, pine needle, eucalyptus leaf, rosemary, peppermint, yarrow or lavender can also be added. You can add 1–2 drops of essential oil if desired. Most essential oils are antimicrobial. Eucalyptus helps to thin mucus, peppermint is anti-inflammatory, rosemary stimulates circulation and promotes memory, and lavender has immune stimulating and relaxing properties.

Tree Tip Tea (See *Evergreen Conifer Overview* for recipe) 10–20 MINUTES

Teaching tips: Materials include fresh or dried edible tree needles, a pot or jar with water, a strainer and cups.

- During springtime, you can gather green branch tips from spruce, Douglas fir, hemlock or any of the true firs. For sun tea, rinse the tips to remove any dirt or insects, and place in a large jar to make tree tip flavored water. Let the tips infuse in the water for several hours to overnight. You can show students the tea infusing and strain it out with them so they can see the whole process.
- You can gather mature needles in any season and make a hot tea by using about 1 tablespoon of crushed needles per cup of hot water and steeping it for 15 minutes. If you are short on time, you can make the tea ahead of time and serve students.

Forest Bathing Salts (See *Evergreen Tree Overview* for recipe) 20–25 MINUTES

Teaching tips: A teaching assistant is vital for the success of this activity because you will be passing out salts for each student to mix. Materials include a large mixing bowl, small paper bowls, and spoons for each student, salts, baking soda, essential oils, dried tree leaves, muslin or organza bags, plastic bags, labels.

- Break students into small groups and have them strip dried needles or cut cedar leaves from branches into medium sized bowls. Once finished, consolidate them into one bowl.
- Introduce several types of essential oils, have students smell them, and choose 1–2 oils they would like to add to their salts.

- Mix salts and baking soda in a large bowl.
- Ask students to come up in groups. Hand them a bowl with about ¼ to ½ cup each of salts and dried tree leaves, and a spoon. Ask what type of oil or oils they would like and add 5–8 drops total. Hand them a muslin or organza cloth bag and a plastic bag.
- Have students return to their desks or tables to mix their salts, place them in their cloth bag and tie it. Place the cloth bag in a plastic bag.
- Pass out labels (students can make their own or you can pre-print them) and use tape or ribbon to seal the plastic bag.
- Explain that the whole cloth bag goes into the bath like a tea bag. Squeeze the bag to release the salts. The tree leaves will infuse into the hot water and it will smell like the forest!

Evergreen Tree Lip Balm SEVERAL HOURS to make oil, 30 MINUTES to make lip balm

Teaching tips: This is a two-part activity. You can make the tree infused oil ahead of time and have students strain it, or make the oil in class one day and then follow up by turning it into lip balm another day. Have students participate in as much of the process as possible. For example, they can chop the tree leaves, press out the oil, stir, and pour the lip balm, and make their own labels. See *Evergreen Tree Overview* for ingredients, supplies, and directions.

## *TYING IT TOGETHER*

Bring the group together for a closing. **Ask:** *What helps evergreen trees to be resilient? How can they help us to be more resilient?* Students answer and pass it to the person next to them, or answer popcorn style where each person responds as they are ready.

## *DIGGING DEEPER*

Grandmother Cedar Tree Story: A Samish Story as told by Roger Fernandes, Lower Elwha S'Klallam Storyteller. https://vimeo.com/216042916

Teachings of the Tree People: 28 minute video on the life and teachings of Skokomish elder, Bruce Miller. https://vimeo.com/64099709. A one-hour version is also available.

Play the song *C is for Conifers* by the band They Might be Giants. https://www.youtube.com/watch?v=FijQbZeTGNc