

NORTHWEST NATIVE TREES

Among Northwest Native Peoples, trees are honored as teachers. Trees demonstrate how to be resilient, including adapting to changes, collaborating with others, being flexible yet strong, and practicing generosity. Each tree has a unique gift that contributes to the health of the forest community.



Trees enrich our world in so many ways. They provide oxygen, shade, food, medicine, and materials to build shelter, make tools, and create art. Trees shape the weather by creating humidity and rain, buffering heat, and softening harsh wind. They also offer beauty, refuge, and a place to play. When we walk through a home, read a book, warm ourselves by a fire, rest in the shade, or eat tree nuts, we are indebted to the gifts of trees.

TREE WORDS TO KNOW

These useful vocabulary words are in bold green in the text below:

Broad-leaved or Hardwood: Trees that have large, flat leaves. Most broad-leaved trees are deciduous and have hard, dense wood.

Conifer: Trees that have cones.

Deciduous: Trees that lose their leaves every autumn.

Evergreen: Trees that keep their leaves all year long.

Forest Succession: The cyclical process of changing plant communities that occurs naturally as a forest ages or after a disturbance such as fire, flooding, or clearcutting as the forest re-establishes itself.

Mutualism: A symbiotic relationship in which both organisms benefit.

Mycelia: The part of fungi that is underground or growing in some other substance like a nurse log. It is made of tiny hyphae, which look like threads, and digests nutrients.

Mycorrhiza: A symbiotic relationship between a fungus and the roots of a plant.

Nurse log: A fallen tree that decays and offers a home to young trees, plants, animals, and insects.

Phenology: The study of seasonal cycles in plant and animal communities.

Photosynthesis: The process plants use to make sugary food from sunlight, water, carbon dioxide, and nutrients.

Pitch: A sticky, thick substance that trees make to protect themselves from wounds, disease, and insects.

Phloem: The part of a plant where plant foods that are made during photosynthesis are transported from the leaves to roots and other storage areas, like seeds and fruits.

Sap: A liquid that flows through trees. It is made of mostly water with sugars, minerals, and hormones that a tree needs to grow. Maple and birch sap can be boiled down to make syrup.

Snag: A dead or dying tree can provide important habitat for birds and mammals.

Stomata: A small slit, like a little mouth, in the stem or leaf of a plant that allows movement of gases.

Symbiosis: A close relationship between two different kinds of living things.

LEARNING ABOUT TREES

Trees thrive in their environment by making the most of nature's elemental forces. They use sunlight, air, water, and minerals from the soil to build huge and complex forms—a seemingly miraculous feat. Each tree species has evolved to thrive in its environment. Exploring physical characteristics can help us understand how trees function. Here are a few things to notice:

*Is the tree **evergreen** or **deciduous**?*

Evergreen trees keep their leaves all year long. Most evergreen trees are conifers, but not all. Madrone, holly, and laurel are broad-leaved evergreen trees with flowers and fruits instead of cones. Deciduous trees lose their leaves in autumn. Examples include, alder, maple, oak, and willow.

*Is the tree a **conifer**?*

These trees that have cones. Most conifers are evergreen with needle-like or scale-like leaves and light, soft wood. Examples include cedar, fir, hemlock, pine, and spruce. An exception is larch—a conifer that loses its needles each fall.

*Is the tree a **broad-leaved hardwood**?*

These trees that have large, flat leaves. Most broad-leaved trees are deciduous and have hard, dense wood.

Overall Shape: While each tree is unique in its shape, trees of a particular species have common characteristics. For example, hawthorns tend to be shorter trees with a roundish top and densely growing branches. Evergreen trees have a conical shape to help repel snow. Many deciduous trees have upward reaching branches so rain can funnel down to the trunk and roots. Look to see if the tree has a single straight trunk, like alder, or multiple branching trunks, like bigleaf maple. Is the tree very tall and upward reaching, like cottonwood, or medium-sized and often growing in a community, like alder? These characteristics can be helpful in identifying trees.

AMAZING TREE FACTS

Trees Breathe: Every tree breathes in carbon dioxide and breathes out oxygen, which people need to breathe.

Trees Cool the Air: Have you ever noticed how much cooler it is in the woods than in the open? Trees cool the air where they grow, in the woods as well as in cities, and they help create rain by exhaling moisture into the air.

Some Trees are Edible: Bigleaf maple blossoms are tasty, and spring Douglas fir, spruce, and hemlock tips are energizing snacks. Hazelnuts and acorns are edible.

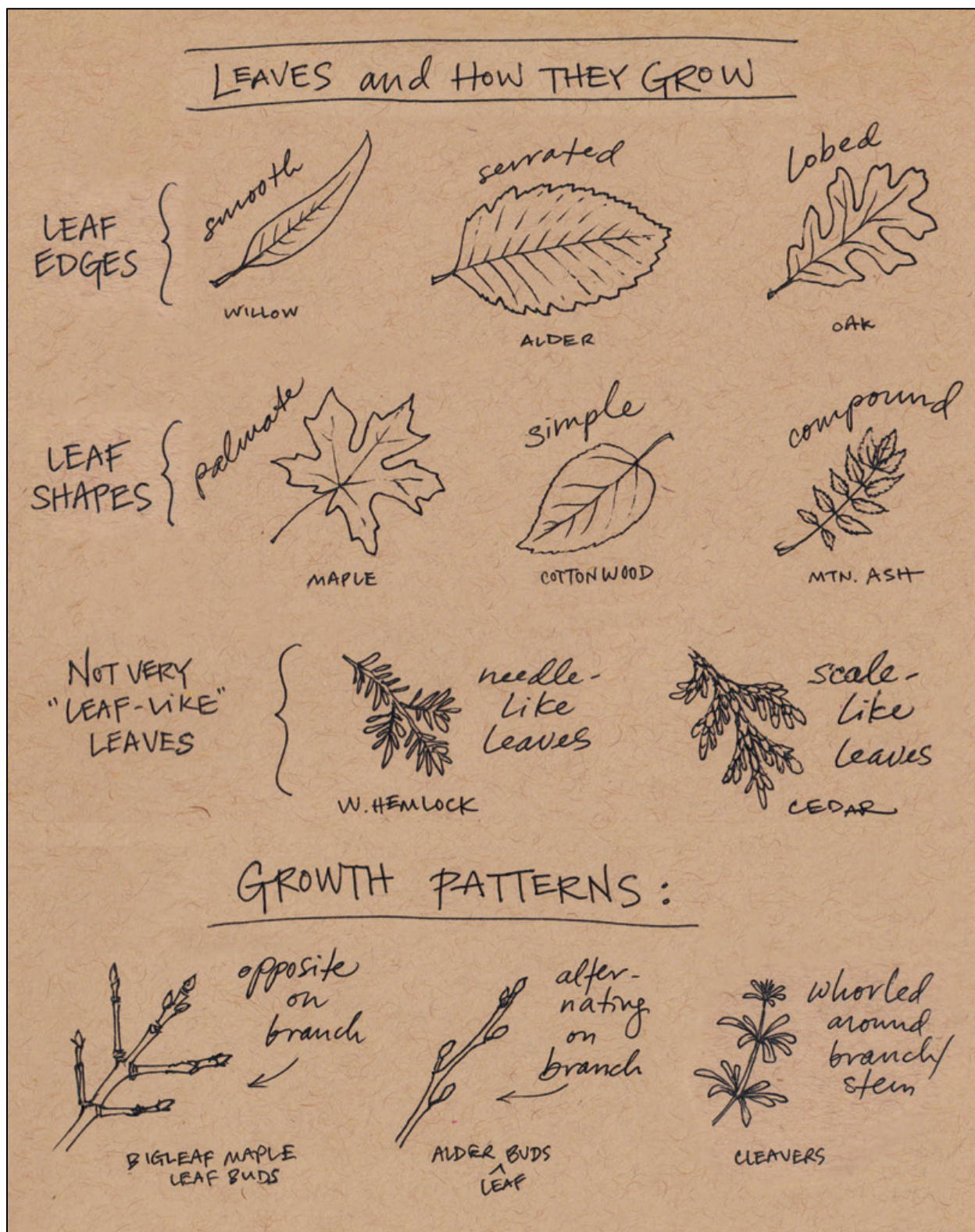
Trees Heal: Researchers in hospitals have discovered that people recover from sickness faster if they just look at a tree! Many trees are medicinal. You can use some **pitch** from conifers to heal wounds. Willow bark helps reduce pain.

Trees Prevent Erosion: When raindrops hit tree leaves, they split into smaller drops and land softly. These drops are more easily absorbed into the ground and prevent mud from entering streams and rivers, which, in turn, helps salmon and other aquatic species. Tree roots also hold banks in place so they won't slide or wash away.



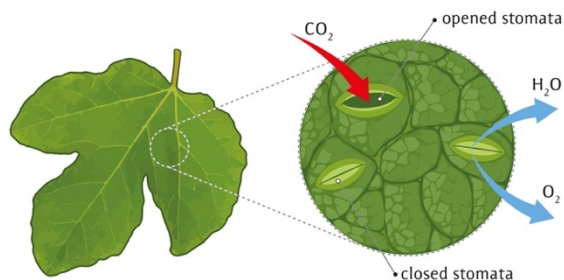
Douglas fir drawing by Lucy Buikema, 5th grade

Leaves: Leaves come in so many sizes, shapes, textures, and colors! Use all of your senses to notice details. Close your eyes and feel a leaf. Is it smooth, fuzzy, or waxy? Crush the leaves and notice their smell. Notice how many shades of green you can find.



A Closer Look!

Trees breathe through their leaves. The undersides of leaves contain thousands of stomata that open and close like tiny mouths. You can see them with a magnifying lens or microscope. During the day stomata breathe in carbon dioxide from the air and breathe out oxygen and water vapor. When we stand by a tree, we share breath with it—giving and receiving the gases we each need to survive. If it gets hot, trees close their stomata so they do not lose moisture and get dehydrated.



Seeds: Trees form seeds as a part of reproduction. There are two types of seed plants: non-flowering (gymnosperms) and flowering (angiosperms).

Non-flowering Seed Plants: Conifers like Douglas fir (pictured) and cedar are gymnosperms. Gymnosperms do not have flowers, and instead, reproduce with male cones full of pollen that travel by wind to land on female cones. These germinate and form seeds.



Flowering Seed Plants: Many broadleaf trees like oak and maple are flowering seed plants, or angiosperms. Flowers are the reproductive organs, and when pollinated, turn into fruit. Northwest native tree flowers tend to be small. They have distinct arrangements like the catkins of alder and willow. Fruits form from flowers after pollination and are the seed-bearing organs of plants. Angiosperms produce seeds that are “clothed.” Think back to summertime and eating a fresh plum. The part of the plum that you eat is “clothing” the seed at the hard center. Examples of flowering tree seeds include fleshy fruits like hawthorn (pictured), nuts like acorns and hazelnuts, and the winged fruit of maple.



Stems and Trunks: Tree stems and trunks are like straws, carrying water and minerals up from the roots to the leaves, and sugar down from the leaves to the roots. This is similar to our cardiovascular system, but instead of blood a tree has **sap**—a liquid made of mostly water with minerals, hormones, and sugars the tree needs to grow.

Are Trees Like People?

Trees are not so different from people. They have a skeleton (heartwood), blood vessels that carry nutrients and waste products (inner bark), and skin (outer bark). They breathe, drink water, and communicate with other plants and animals. Unlike people, trees spend their entire life rooted in one place. Imagine if we could get everything we needed while standing still! Also, trees sleep at night like we do, turning off their production of oxygen and sugars. In the morning their drooping branches perk up and they turn their leaves toward the light.

Outer Bark: The outer bark is like the skin of a tree. It protects the inner bark, or cambium, from dehydration and damage. . If the outer bark is damaged, the tree can make pitch, which helps protect the tree from diseases. Bark changes as trees get older, just as our skin changes as we age. Each tree has distinctive bark characteristics that can help us identify it including:

- Plates: Spruce, ponderosa pine, Garry oak (pictured far left)
- Grooves or furrows: Hemlock, Douglas fir (pictured center left)
- Blisters: True firs, including grand fir (pictured center right)
- Peeling or grows in strips: Cedar, madrone, yew (pictured far right)

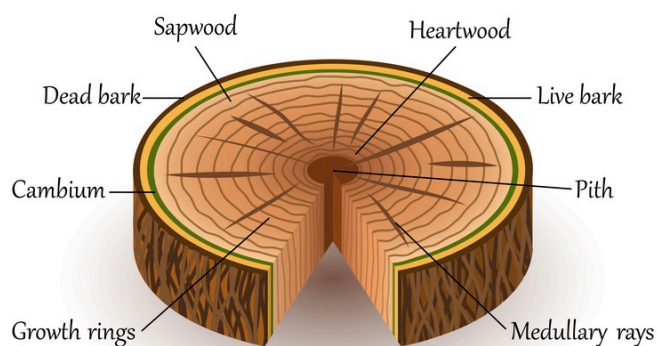


Inner Bark: The **cambium** is the inner bark of the tree, and contains cells that build new bark and new wood. In the warm season, trees grow fast and produce “earlywood” that is light colored. In the cold season, trees grow more slowly and produce “laterwood” that is dark and dense. This alternating pattern of light and dark color creates growth rings. The cambium also includes the **phloem**, where plant foods, like sugar created from photosynthesis and other nutrients, are transported from the leaves to the roots and other storage vessels.

Sapwood: The layer next to the cambium is the sapwood, or **xylem**. It imparts strength and transports water and minerals upward from the roots to the branches and leaves in tiny tubes called vessels. Saying the word “sky-lum” will help you remember that it carries the sap up toward the sky. Scientists still don’t understand how trees get water all the way to the crown, or the top of the tree!

Heartwood: This is the strong, inner part of the tree. Even though it is not living tissue, it remains strong when protected by the outer layers of the tree.

TREE TRUNK STRUCTURE



Wood is strong, light, flexible, nontoxic and weather resistant; thousands of years of human civilization have yet to produce a better multipurpose building material. Inch for inch, a wooden beam is as strong as one made from cast iron but is ten times more flexible and one tenth as heavy. Even in this age of high-tech man-made objects, our preferred construction material for housing remains lumber hewn from trees. In the United States alone, the total length of the wooden planks used during the last twenty years was more than enough to build a footbridge from the planet Earth to the planet Mars.

—from Lab Girl by Hope Jahren

Discover A Tree's Story

You can learn a lot about the life story of a tree when you look at a cross section of its trunk. Count the growth rings to determine the tree's age. Rings are thicker when there are optimal growing conditions and thinner when conditions are dark, cold, or dry. When a tree is consistently exposed to wind or other forces, the growth ring is narrower on that side of the tree and wider on the side that needs extra strength to hold it up. You might also see old scars from fire or insect damage. Scientists use a tool called an increment borer to take tiny cross sections of trees without hurting them much. With this tool, they can discover big events in a tree's life. Researching tree stories helps us to understand climate change.



Roots: Roots anchor trees so they can grow tall and withstand wind and other environmental disturbances. Some tree roots can be as deep as the tree is tall, while others spread over the surface of the soil like a web. Tree roots drink water and gather nutrients from the soil.

Fungi are important in building soil. Mushrooms are simply the exposed fruiting body of fungi, while the vast underground network of fungal roots are called **mycelia**. These mycelia are made of tiny hair-like filaments which release enzymes that break down soil and create a nutrient-rich broth fungi and plants can



absorb. Fungi increase the nutrient intake of trees by connecting to the tree roots and growing cottony threads so they can absorb more water and minerals. Fungi can also guide roots to find the best places for nutritious soil and water. In exchange, the tree shares its sugars with fungi, which cannot photosynthesize. The union of roots and fungi is called **mycorrhiza**. This is an example of a **symbiotic relationship** called **mutualism** in which both organisms benefit from the relationship.

FOREST COMMUNITIES

Forests cover about 30 percent of the land on Earth. This document explores common trees that grow in forests in the Pacific Northwest, a region from Alaska to central California, and from the shore of the Pacific Ocean to the crest of the Coast Mountains of British Columbia and the Cascade Range.

Conifer forests are made of mainly tall evergreen trees that grow closely together. Though little light reaches the forest floor, many creatures find food and shelter there. The most magnificent conifer forests in the world grow in the Pacific Northwest, reaching their maximum size and age. Conifers are well adapted for extreme cold, heat, and drought.

Hardwood forests are made of broad-leaved deciduous trees, including alder, cottonwood, and willow. These trees are generally more short-lived than conifers and tend to grow in changing landscapes like along rivers, floodplains, or in the wake of fires, slides, and clear cuts. Oaks can withstand fires and drought, and live to be very old. Mixed Forests contain both evergreen conifers and broad-leaved deciduous trees.

Forest edges are places of transition where two or more ecosystems meet. Trees thin and meet rivers, meadows, and open prairies. These places attract and support many different kinds of plants and animals. Berries, nuts, and other native foods are often most productive in forest edges because they get more light.

When you look at a forest, trees come in a variety of sizes and shapes. Some are tall and seek out sunlight, whereas others are smaller and love shade from taller trees. The diversity of tree shapes and sizes creates different levels within a forest. These levels include:

The canopy is the highest layer and contains all of the leaves and branches of the tallest trees. Trees that reach the canopy get more light and share food they make with young and struggling trees. Gardens of mosses, lichens, liverworts, and ferns may grow on tree branches, drawing their nutrients from the atmosphere, rain, and fog drip. They contribute these nutrients back to the forest ecosystem. The canopy provides nesting sites, homes, and highways for many types of insects, birds, and mammals.

The understory is formed by smaller trees, shrubs, and snags. These plants need to be able to survive in partial shade, and often grow where there is an opening in the canopy. Understory trees benefit from the photosynthesis of larger trees in the canopy above them through mycelial networks.

The forest floor covers the soil and includes grasses, ferns, and herbs that provide food (nectar, berries, and seeds) to insects, birds, and mammals, including mice, bear, and deer.

The subfloor of the forest includes the soil, roots, fungi, rocks, and tiny creatures that live or move down there. Fungi help trees to grow better and cycle nutrients back into the soil from dead wood and plant matter.



Old Growth Forests: Trees in an old-growth forest are part of a complex, natural functioning ecosystem with minimal human disturbance. Indigenous Peoples have stewarded old-growth forests for many thousands of years in the Pacific Northwest. It takes 175–250 years for old-growth characteristics to begin to appear in forest stands, and most old-growth trees are 350–750 years old. Some can live thousands of years. All the generations of trees are present. Adult trees stand like pillars and create shade on the forest floor, while young ones grow slowly until there is an opening in the canopy. As much as 20% of a forest's biomass is made of dead trees. Soon after a tree dies, insects including bark beetles, wood borers, termites, and ants, as well as fungi and bacteria begin to decompose the tree. **Snags** are standing dead trees that provide wildlife habitat including nesting sites and a source of food for insects and birds.



Fallen trees are called **nurse logs** because they act as nurseries for forest seedlings that have a difficult time getting started on the mossy and densely covered forest floor. You might notice hemlock, cedar, and red huckleberries growing on nurse logs and stumps. An old-growth cedar nurse log can take 1,000 years to break down completely! Nurse logs are important to old-growth forests because they release nutrients into the soil and provide food, living space, hiding places, and travel routes for many animals from millipedes, to salamanders, to squirrels.

Animals like spotted owls, marbled murrelets, fishers, and martens are dependent on old-growth forests and will perish without them. At least 20 amphibians, 30 small mammals, and 70 species of birds are known to be associated with old-growth forests. Old-growth ecosystems have adapted to dramatic shifts in climate and weather patterns over millions of years, and can also recover from natural disasters including wildfire. They may prove to be a refuge for species in the face of climate change, but only if they are protected from logging and other human development.

Forest Disturbance: Disturbances can be both natural and human caused and contribute to what we call forest succession. **Forest succession** is the change in plant species over time that leads toward a stable forest. In Western Washington a stable, or "climax" forest is made of shade-loving hemlock, Sitka spruce, and western red cedar. Disturbance, including fire, storms, and flooding, is the nature of life. While some people often think of naturally occurring fire as destructive, ground fires improve soil by transforming leaf litter into mineral ash, thus increasing soil fertility. Cooler fires may also remove dead and diseased trees, keeping parasites and insect pests in check. Douglas fir, lodgepole pine, fireweed, huckleberries, and many other plants need sunlight to grow and thrive after fires.

In the wake of flooding, wind-borne seeds of alder, willow, and cottonwood grow quickly. These "nursery trees" create a habitat where many species of plants and animals can thrive. These young forests are eventually replaced by evergreen conifers until the next disturbance. And the cycle continues on and on.

Forest Relationships: While forests are defined by their trees, “forest ecosystems” describe the communities of plants, animals, microbes, and all of the other organisms that are functioning together in a complex web of relationships. The organisms involved in a forest ecosystem are **interdependent**, meaning that they depend on one another for survival. **Symbiosis**—a close and interactive relationship between two organisms—exists everywhere in forests. **Mutualism** is a type of symbiosis where both species benefit. Examples of forest mutualism include:



- Lungwort lichens grow on bigleaf maple branches and other trees in the forest canopy. They fix nitrogen from the air and fertilize the soil when they fall, thus supporting the trees and plants. Lungwort is an important nutritious winter food for deer and elk.
- Woodpeckers feed on insects in snags. They excavate roosting and nesting cavities. These roomy dry cavities are later used by Douglas squirrels and flying squirrels, chipmunks, owls, wood ducks, bats, fishers, and martens. Thirty-five to forty percent of bird species common to Northwest forests may use them for nest sites.
- Salmon spawn up streams, and bears, eagles, and river otters carry the salmon into the forest to eat them. The leftovers become food for many animals and eventually decay, fertilizing the soil. Decomposing salmon in streams feed baby salmon.

CARING FOR TREES

Trees help solve some of our toughest environmental problems, including air pollution and global warming. People are cutting down trees faster than they are planting them. Seasonal fires on the West Coast have burned vast areas of forest. What can we do to help trees?

- Reuse bags when you go shopping and use less paper. Paper is made of trees. Also bring a reusable cup with you so you don't have to use paper cups.
- Recycle paper products including your old homework, and buy recycled paper products.
- Plant a tree – pick species that grow naturally in your area as they will be more likely to survive. It will also provide food and shelter for local wildlife.
- Remove invasive species like ivy and/or holly and replant native plants and trees.
- Get involved with a local environmental organization and/or help maintain a local nature trail or park. Build a relationship with a local forest or a particular tree.



TREE ACTIVITIES

Get to Know Trees with Your Senses

The truth is, you don't need to know a tree's Latin or common name to properly introduce yourself. Using your five (or six) senses, you can experience and learn from a tree directly.

With Your Eyes: What is the general shape of the tree? What shades of green or brown or gray is the trunk and branches? What animals and insects are in the tree? Is the tree by itself or surrounded by other plants?

With Your Ears: Close your eyes. What sounds is the tree making? Is there creaking as the wind moves the tree or its leaves? Are there animals making sounds in its branches? Water running nearby?

With Your Nose: Close your eyes. As you bring your face closer to the tree trunk, what do you smell? Does the smell remind you of anything in particular or bring back memories from your past? Now, find some leaves/needles and rub them between your fingers. What do you smell now? What adjectives would you use to describe it to someone else?

With Your Hands: Gently run your hands down the trunk? Is it rough, smooth, sticky, groovy? Is the tree warm, cold, or the same temperature as you? Now, feel the leaves. Are they prickly, soft, round, angular, short, long, flat? Can you wrap your arms all the way around your tree?

With Your Taste Buds: Safe trees to taste include alder, bigleaf maple, cottonwood, hawthorn, willow, Douglas fir, true firs, hemlock, madrone, pine, and spruce. Take a small piece of leaf/needle/flower and put in your mouth. What flavors are there? Is it pungent, lemony, sharp, sweet, sour, bitter? CAUTION: yew is toxic and should not be eaten.

With Your Mind's Eye: As you experience the tree, are there thoughts, images, feelings, or memories that show up? Is there a general impression that you get from the tree? Is there a thought or message that you want to share with the tree?

Make Tree Rubbings

Leaf Rubbings: Have each student make leaf rubbings by placing a leaf under a piece of paper, holding it stationary, and using a peeled or large round crayon to make an imprint. This is easier for younger children if they partner with someone. You can make greeting cards by cutting 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.

Bark Rubbings: Make bark rubbings by placing paper over the trunk and using a peeled crayon or charcoal to get an imprint. Medium to heavyweight paper works best.



MEET SOME TREES: DECIDUOUS HARDWOODS

The following are brief descriptions of common Northwest trees. Get to know trees more in-depth with additional resources including reading books, asking knowledgeable people, or browsing websites. Consider these guidelines if you are gathering trees for food or medicine:

- 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.

ALDER – *Alnus rubra*

Red alders grow in groves, often in wet woodlands or near rivers and streams. Young trees have smooth, silvery-brown bark while older bark is often spotted with white lichen, moss, and dark patches. Leaves are dark green on top and dull grey-green below with toothed edges and sharply pointed tips. In early spring, red and yellow male flowers, called catkins, hang from leafless branches like fancy tassels and give the treetops a reddish flush. Female flowers grow on the same tree. They mature from green nubs into dark brown small cones.



Alder bark, buds, and immature catkins are used as medicine for fighting infections and supporting digestive health. The inner bark turns a brilliant reddish-orange when cut and is used as a dye. Alder wood is used in woodworking to make many things including utensils, carvings, and furniture.

Alder is called the **community builder** because it creates a place where both plants and animals can thrive. Alder is the first to grow in places that have been devastated by landslides, fires, and clear cuts. It creates a partnership with bacteria in the soil. The bacteria gets a place to live and food from the alder in exchange for fixing nitrogen (a plant food) in the soil. This is an example of mutualism—a relationship where two species benefit from working together.

BIGLEAF MAPLE – *Acer macrophyllum*

Bigleaf maple thrives in wet forests and open fields. Young bark is green and smooth, while mature bark becomes furrowed and gray-brown in color. Older trees are often covered in mosses, lichens, and licorice ferns. Massive leaves have five tips like a hand and can grow over a foot in diameter. Flowers bloom in March through April before leaves emerge. They are greenish-yellow and hang in clusters. Each flower is bowl-shaped, cupping many pistils with a downy fur at their base, resembling a tiny bird nest. Fruits are shaped like wings attached in a V-shape.



They emerge from the flowers looking like bunny ears popping out of a hole. Once fully developed in late summer, they travel like helicopters in the wind.

Bigleaf maple flowers are edible. You can snack on them straight, use them as a garnish on salads or soups, or add them to baked goods like pancakes. Bigleaf maple is called “paddle tree” by many Northwest tribes and has been used for basketry, house construction, cradleboards, bowls, spoons, and other implements.

Bigleaf maple is a reminder of **willingness**. It invites a community to grow on its trunk and branches—demonstrating how to be with others in an open and generous way. We can also “try on” new experiences and perspectives with an open mind. Bigleaf maple also teaches us to be willing to let go—as it releases little helicoptering seeds and then leaves in autumn, which blanket the forest floor. In winter, the leaves decompose and release nutrients into the soil. This process feeds the next growth of leaves and buds in spring.

COTTONWOOD – *Populus trichocarpa*

Cottonwood grows along rivers and wetlands, towering above alder and willow trees. Grey bark becomes deeply furrowed with age. Winter buds are full of fragrant yellow-to-red resin. Leaves are shiny and dark green above and silvery below. They have rounded to heart-shaped bases and finely-toothed edges. Male and female flowers grow on separate trees. Male catkins are reddish. Female catkins have light green capsules that release seeds with white, fluffy down. Cottonwood fluff flies great distances on the wind and looks like snow falling in summertime.



Cottonwood spring buds have a strong smell and are infused in oil to make a healing oil, salve, or balm that reduces inflammation and speeds healing. Cottonwood bark tea is used to reduce fever and ease pain and inflammation. The wood is soft and lightweight when dry, and is grown in plantations to make pulp for paper because trees grow so fast.

Cottonwood is a **wellspring** of water. A single tree has miles of roots that anchor deep in the earth, drawing massive amounts of water up to the surface. It can hold this water in its trunk and breathe it out through its leaves, thus helping to generate rain. In many cultures around the world, water is associated with our inner emotions and our spirit. Like cottonwood, we are connected to a greater source of strength.

GARRY OAK – *Quercus garryana*

Garry oak, or Oregon white oak, is a heavy-limbed deciduous tree with branches that are often twisted and gnarled. The bark is light gray with thick furrows and ridges. Oval-shaped leaves are shiny green on top and paler green and hairy underneath, have deep lobes, and grow alternately on stems. Garry oak grows up to 75 feet tall and often lives 200 to 500 years. They can be found in sunny locations from southern British Columbia to central California. When growing in dry, rocky slopes and coastal shores, it takes on a stunted and gnarled form. When in wetter areas like valleys, it grows into a stately tall tree with a rounded top and a large trunk.



Male and female flowers grow on the same tree. Tiny female flowers develop into acorns, or nuts 2–3 cm long protected by a hard cup with a warty cap. Acorns are buried and dispersed by birds and squirrels, thus aiding in the reproduction of oak trees. Acorns provide a nutritious meal for many animals as well as humans and contain carbohydrates, fat, protein, and minerals. Acorns also contain tannins, which are bitter-tasting and astringent, and must be removed from the nut meat. This is done by soaking the nut meat in water or running water through it for an extended period of time. The Chinook People of the lower Columbia River bury whole acorns in artesian springs and leave them to leach out the tannins for an entire winter. Acorns continue to be an important traditional food for Native Americans and can be ground for flour and roasted to make tea.

Unlike other trees that sprint toward the sunlight, oaks grow slowly, creating deep roots, thick bark, hard wood, tough leaves, and nutritious nuts. These patient efforts help oak to thrive in many habitats, to survive harsh conditions, to live a long life, and to support a diverse community of plants and animals. Oak's **patience** is a skill that can help us to endure difficult situations and to make decisions that will help us achieve long-term goals. When we get frustrated, angry, or annoyed, instead of immediately reacting with strong emotions, we can slow down and think about our long-term goals.

HAWTHORN – *Crataegus* spp.

Hawthorn is a medium-sized tree that grows around the world. Branches are armored with large thorns. Leaves are toothed and medium to dark-green colored. Flowers are small and pinkish-white and bloom in thick clusters. They smell fishy and attract pollinators including bees and flies. Berries have large seeds like cherries. The native black river hawthorn has deep green leaves and blue-black berries. European hawthorn has small, deeply-lobed leaves and red berries. Black hawthorn grows along rivers and forest edges, while European hawthorn is found in fields, forest areas, and city landscapes.



Hawthorn has many gifts. Flowers provide sweet nectar to pollinators and animals eat the nutritious berries. Large thorns protect the tree from grazing animals and offer a safe haven for small birds and other creatures to nest and hide. People value hawthorn as medicine for strengthening the heart and blood vessels. It eases pressure on the heart and can be protective in times of physical and emotional stress. Hawthorn tea has a nice flavor and can be drunk on a regular basis for general wellness.

Hawthorn medicine can soothe, strengthen, and bring **courage** when we need it. It reminds us to listen to and tend our hearts, particularly in times of distress when we might feel afraid to take another step, or to show up as we really are, not as others would like us to be. Hawthorn reminds us we are not alone and that we can listen to the kind wisdom of the heart.

WILLOW – *Salix* spp.

Willow trees are often bushy with many stems, and a few are larger, multi-trunked trees. They are easy to miss until very early spring when new growth paints bright green and yellow hues on the winter landscape. Spring

shoots tend to be straight and flexible. Buds hug the stem and grow alternate to each other. Willow leaves are simple shaped with smooth or finely toothed edges. Flowers have an upright catkin shape. Female flowers may look like pussy willow buds and mature into fuzzy seeds that are carried on the wind. Willow shoots contain a rooting hormone, allowing them to take root in wet soil.

Willows are important in water ecosystems because they stabilize stream banks and provide shade, keeping the water cool and clear for salmon and other species to thrive. Deer, elk, and moose enthusiastically graze on willow as a food source, and beavers use it for building material. Willow flowers produce pollen and nectar that bees and other insects eat.



Willow is called "nature's Aspirin" and is valued as an anti-inflammatory, pain reliever, fever reducer, and bitter tonic. Its use was documented in 4,000-year-old tablets from ancient Sumeria, and was perhaps the most important of 700 medicines mentioned in the Ebers Papyrus from Egypt in 1534 BCE. It continues to be a popular remedy around the world. Willow is prepared in several ways. For tea, the bitter-tasting bark is generally boiled or the leaves are steeped for 10-15 minutes.

Also, Native Americans throughout the Pacific Northwest have made cordage from the inner bark of willow because it is strong and **flexible**. When gathered in spring, it is pulled apart and then twisted to make rope for fishing lines, nets, and trump lines. Stems are made into baskets. Willow is good medicine when we are feeling stuck. It reminds us that we can be flexible during difficult times when we are resisting change. Just as willow branches bend but do not break, we can be open to new perspectives or experiences and also remain true to ourselves.

Photos

All photos from Elise Krohn or noted in text except:

Increment Boarer: Stephanie Cowherd, courtesy San Carlos Apache Natural Resources Department and Youth Practicum Participants.

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