

Section 2 • Lesson 2 • Student Page 2.1
Parts of a Tree

Now that you have read this booklet, go outside, find some trees, and observe all of the different characteristics that you have learned about. By understanding these differences, you will be able to identify tree species.

Text adapted from:
Moore, Marcia. "Tree Identification – Parts of a Tree."
Butler University's Friesner Herbarium.
<http://www.butler.edu/herbarium/treeid/treeparts.html>.

Instructions:

Read this booklet about the parts of a tree. Use the vocabulary terms and concepts to complete the "Tree Crossword Puzzle."

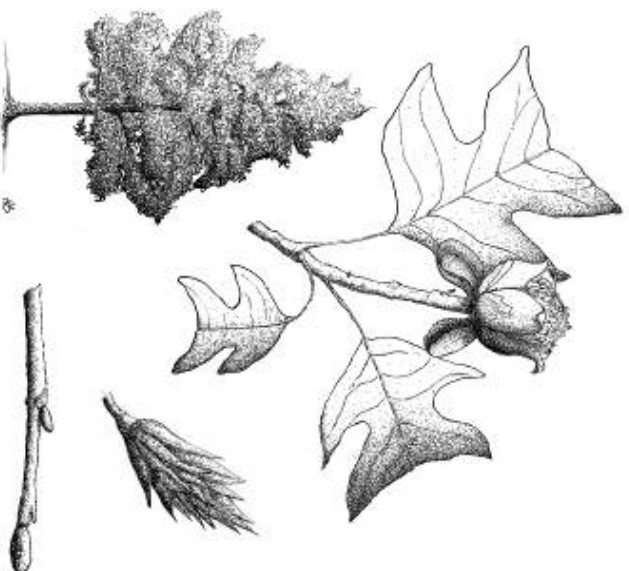


Illustration by Hans Baumann

About this booklet

While identifying trees can be tricky, if you look closely, you will observe characteristics that distinguish different species.

To identify a species, you need to look at the entire tree: its form, branching pattern, buds, leaf shape, flowers, and fruits.

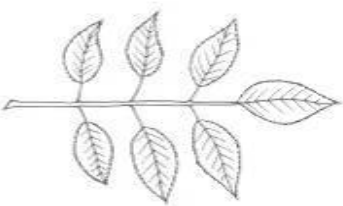
This tree booklet will begin your journey of learning about trees, but you can use other tree identification and dichotomous keys books to learn more.



Illustration by Hans Baumann

Leaf Arrangement

Compound leaves may be **palmate** or **pinnate**. In palmate leaves, the leaflets are arranged around a single point, like fingers on the palm of a hand. In a pinnate leaf, leaflets are joined on both sides of the stalk, like the veins of a feather.



Pinnately compound



Doubly compound



Palmately compound

Illustration by Tim Williamson.

Leaf Margins

The edges of a leaf, called its **margin**, have different shapes depending on the species. Margin shapes include entire, single-toothed, double-toothed, or lobed.

Simple Leaves - Margin Structure



Entire Single-toothed Double-toothed Lobe

Tree Characteristics

Trees come in different forms. The form of a tree is determined by the way the branches extend from the base of its trunk, and by the shape and size of its leaves. Unlike a tree in an open field, a tree in a forest may not be able to reach its full form if it is in close proximity to other trees.

Some trees, like bald cypresses, are narrow with flat tops and feathery leaves. Others, such as white ash, have a full oval shape. A pin oak's top branches point up, the middle branches extend straight out, and the lower branches point down.

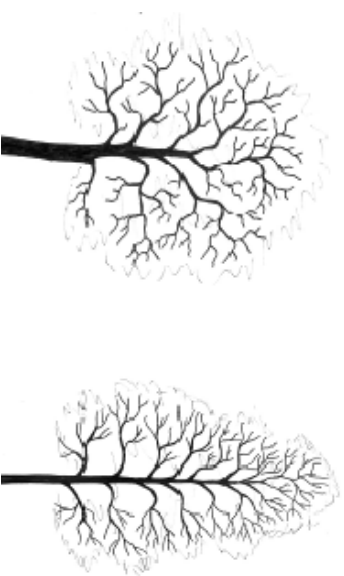


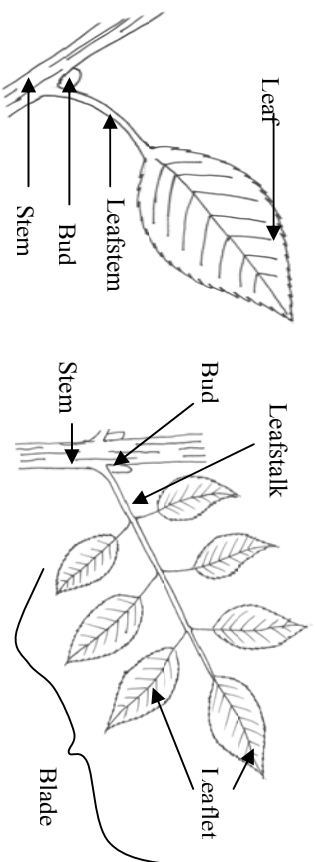
Illustration by Eileen Doughy

Leaves

Leaves are where both **photosynthesis** and **transpiration** take place. Leaves also “breathe” for trees, absorbing oxygen and giving off carbon dioxide and energy.

There are three main parts to a leaf. The **base** is the point at which the leaf is joined to the stem. The **petiole** is the thin section that joins the base to the leaf blade. The **leaf blade** is the wide part of the leaf.

Leaves are many different shapes, but can usually be categorized as either **simple** or **compound**. Simple leaves have a single leaf blade with a bud at the base of the **leaf stem**. **Compound** leaves have more than one blade, but all of the blades attach to a single leaf stem. Where the leaf stem attaches to the twig, there is a bud.



Simple Leaf

Compound leaf

Illustration by Tim Williamson.

Deciduous Versus Evergreen Trees

Deciduous trees (e.g. oaks) shed their leaves every year. **Evergreen** trees (e.g. pines) hold onto their leaves throughout the year.

Conifers (pine and fir trees) make their seeds in cones.

Some trees may be both deciduous and conifers. Bald cypress is an example. It has cone seeds and scale-like leaves, but sheds its leaves every winter.

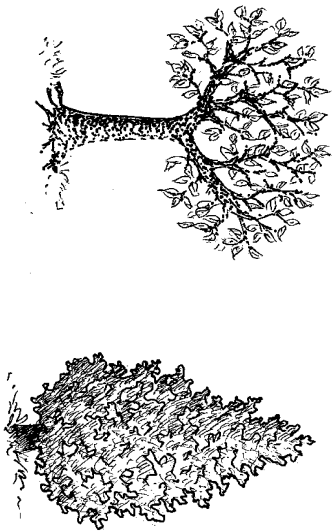


Illustration by Heather Montgomery

Seeds

Different trees produce different kinds of seeds. Tree seeds vary greatly in size. Some of the largest trees have the smallest seeds.

Some trees produce seeds in a fleshy covering, such as a **fruit** or **berry**. Others produce seeds tucked into the folds of **cones** or **catkins**, or inside of **nuts** or **Pods**. Still other trees produce seeds with wings.

These various forms of seeds are dispersed differently. Animals eat seeds that are wrapped within fleshy fruits, and later excrete them in their droppings. Wind spreads winged fruits. To better understand how wind carries winged seeds, try this: throw a maple seed in the air and watch it spiral down like a helicopter.

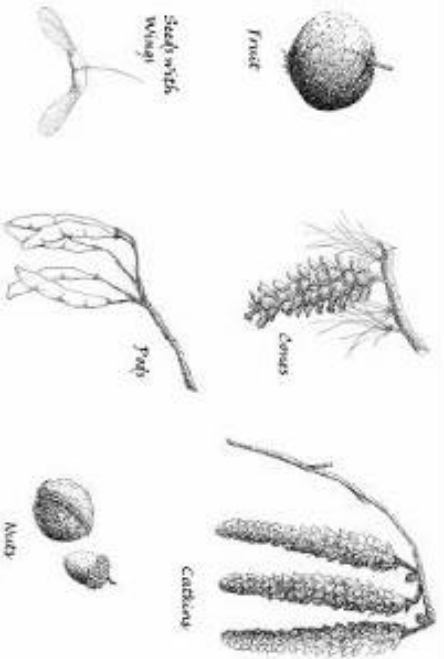


Illustration by Hans Baumann

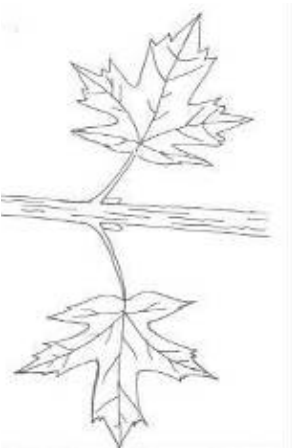
Branching Pattern

Trees usually have one of two branching patterns: opposite or alternate. Leaves can also be opposite or alternate.

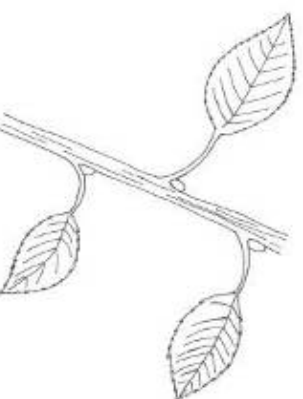
Trees that have an opposite branching pattern have twigs that extend directly across from each other on the same branch. To better understand opposite branching, try this: stick both of your arms straight out. Your arms are opposite from each other like trees with opposite branches.

In an alternate branching pattern, twigs alternate down a main branch. Now, stick out your right arm and then stick out your left leg. Your arm and leg are similar to twigs in an alternate branching pattern.

Most trees have alternate branching patterns. The most common trees that have opposite branching patterns are maple, ash, dogwood, and horse chestnut trees. You can remember these with the acronym “MAD HORSE.”



Opposite Branching



Alternate Branching

Illustration by Tim Williamson

Bark

Different trees have different textures of bark. For example, beech trees have smooth, gray bark; white oaks have blocky, flaky bark; and paper birches have bark that is like smooth sheets of paper peeling away from the trunk. Bark serves as a protective layer for the tree trunk, and it forms differently depending on the environmental factors of the area where the tree is growing.

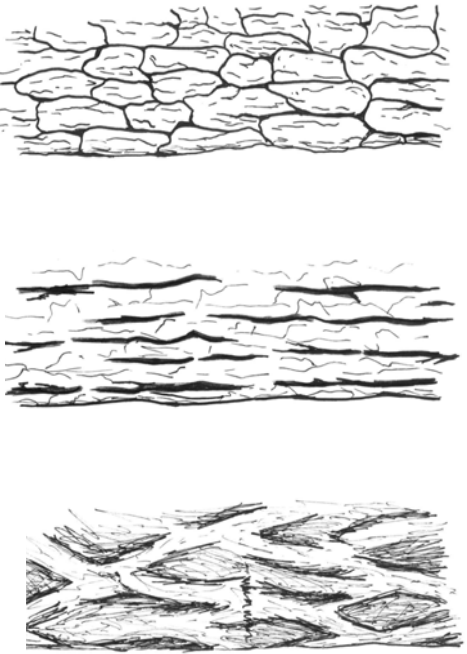


Illustration by Eileen Doughy

Twigs and Buds

Like a branch, a twig's job is to transport nutrients and to provide support. Twigs support the leaves, holding them as high as possible so that they can collect sunlight for **photosynthesis**. Using tiny tubes, twigs also transport water to the leaves, and sugars from the leaves.

Buds contain undeveloped shoots, leaves, or flowers, and can be found on a tree's branches. Buds at the tip of a branch are called terminal buds, while buds on the side of a branch are called lateral buds. Buds are shaped differently depending on the tree species. For instance, American beech tree buds are long and slender, while white oak buds are blunt and in clusters.

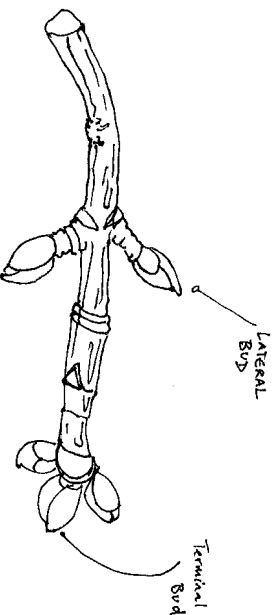


Illustration by Tim Williamson.