

PRE-EVENT SURVEY



Please take a 3-minute survey before the workshop begins, to help us shape the future of this series:

GO TO:

<https://10ktrees.a2gov.org/pre-event-survey>

OR





TREE IDENTIFICATION

TREEducation Series

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BACKGROUND



Trees and the A²ZERO Plan



WHY TREE ID?

- **To care for your trees -- needs can depend on species**
- **To learn -- there are over 100 tree species found in Michigan alone!**
- **For fun -- it can deepen your connection to nature**



WHAT IS A TREE?

To answer this question, we need to consider the different types of plants.

Think about similarities and differences between the two species pictured below:



**Photo credits: Dr.
Alexey Yakovlev and
Brighter Bloom**

WOODY OR HERBACEOUS?

Herbaceous Plants

- Non-woody stems
- Seasonal above-ground growth
- Mostly below ground in the winter



Woody Plants

- Hard, woody stems
- Large portion of the plant remains above-ground all year



Keep in mind this distinction is arbitrary and is not based on evolutionary history. For example, black cherry trees are in the rose family and are more closely related to strawberries than they are to oak and hickory trees!

TREE OR SHRUB?

The distinction between tree and shrub is also arbitrary - usually, a woody plant that is taller than 10 feet (also arbitrary!) at maturity is considered a tree.

Often, trees are also considered to be single-stemmed while shrubs are multi-stemmed.



Photo credit: Joshua G. Cohen

CLASSIFYING TREES

- In taxonomy, a clade is a group of organisms that all share a single common ancestor.
- For example, Fabaceae is a taxonomic family that includes all pea plants. All plants in this family originated from one common ancestor.
- Clades are useful for classifying trees and understanding how they are related to each other.
- Remember that “tree” is not a clade!

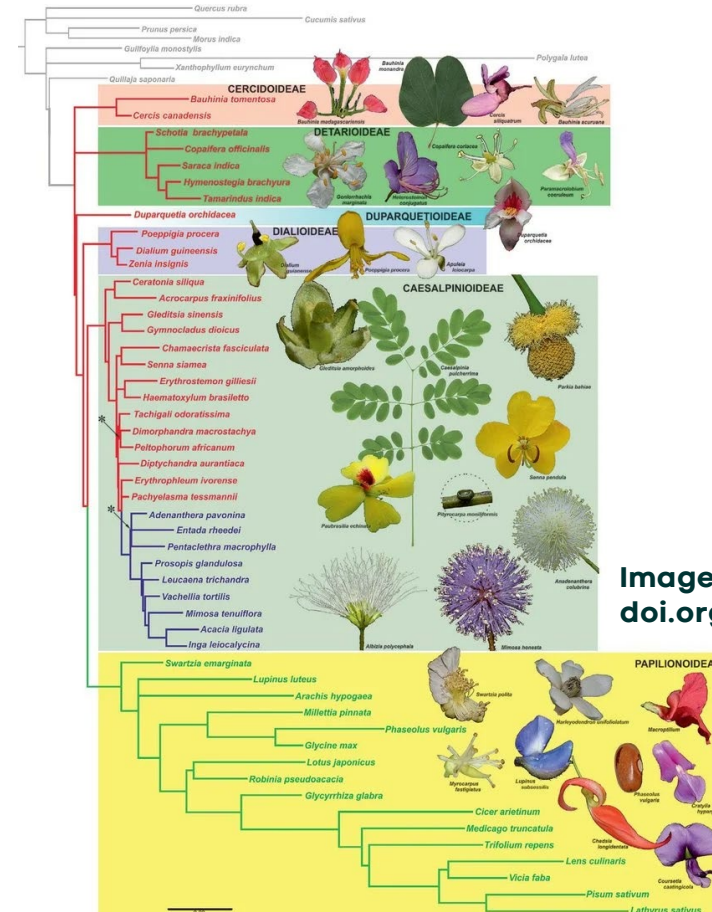


Image credit:
doi.org/10.12705/661.3

CLASSIFYING TREES

Angiosperms

- Produce flowers and fruit
- Includes most deciduous trees and herbaceous plants
- By far the most diverse clade of plants

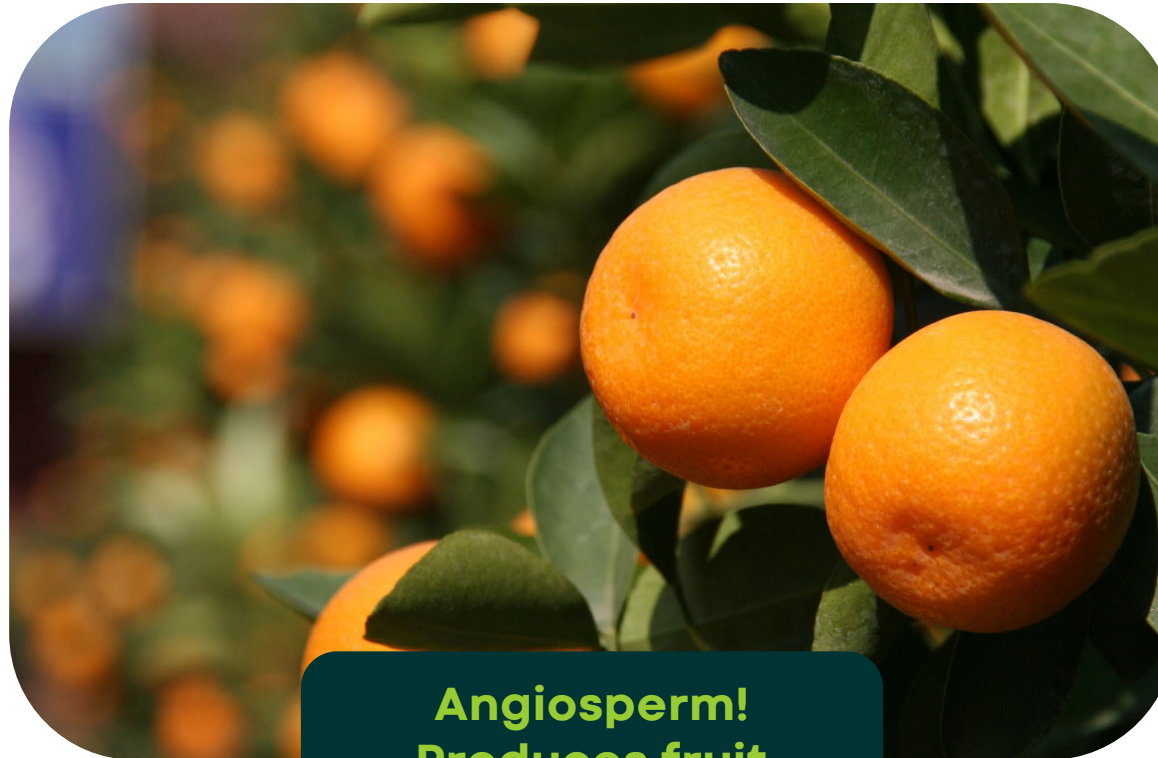


Gymnosperms

- Do not produce flowers or fruit
- Includes pines, ginkgoes, yews, and cypresses
- Much less diversity than is seen with angiosperms



NAME THAT CLADE!



**Angiosperm!
Produces fruit
(oranges)**

NAME THAT CLADE!

Photo credit: R.W. Smith



Gymnosperm!
Conifer with no fruit
- the "cone" holds
the seeds

NAME THAT CLADE!

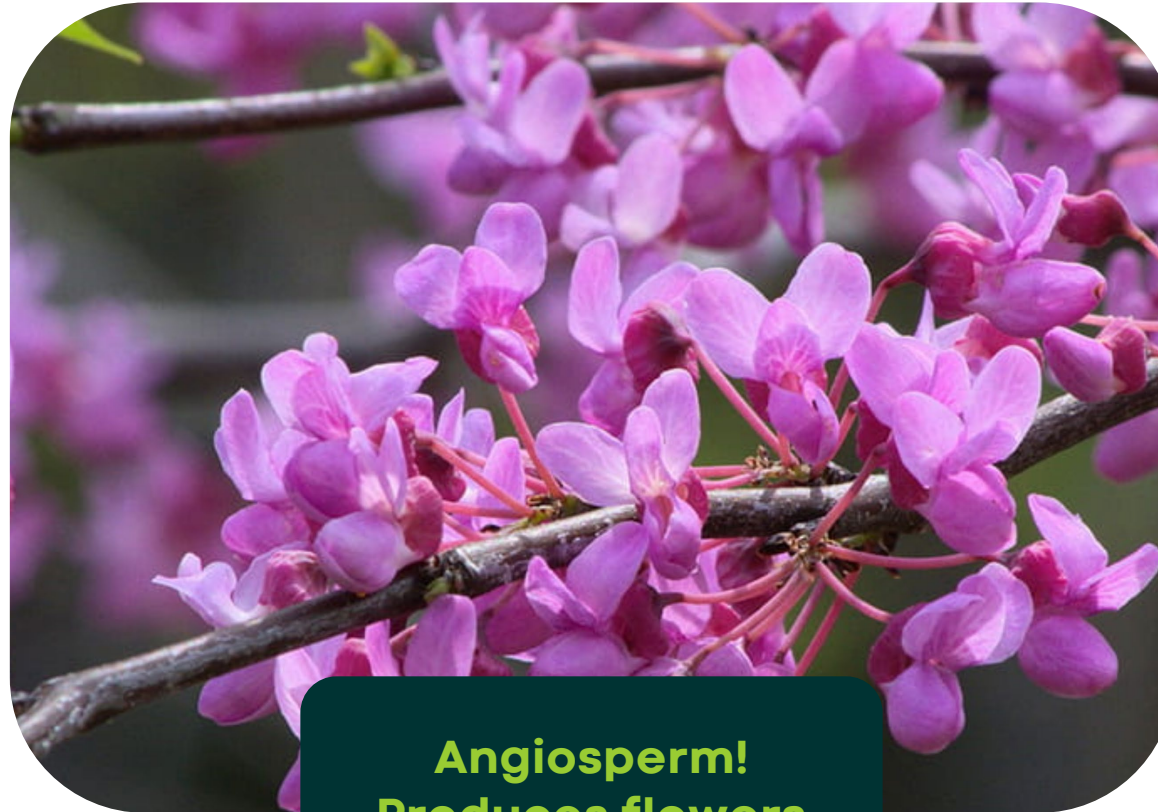
Photo credit: Peter M. Dziuk



Angiosperm!
Produces fruit
(acorns)

NAME THAT CLADE!

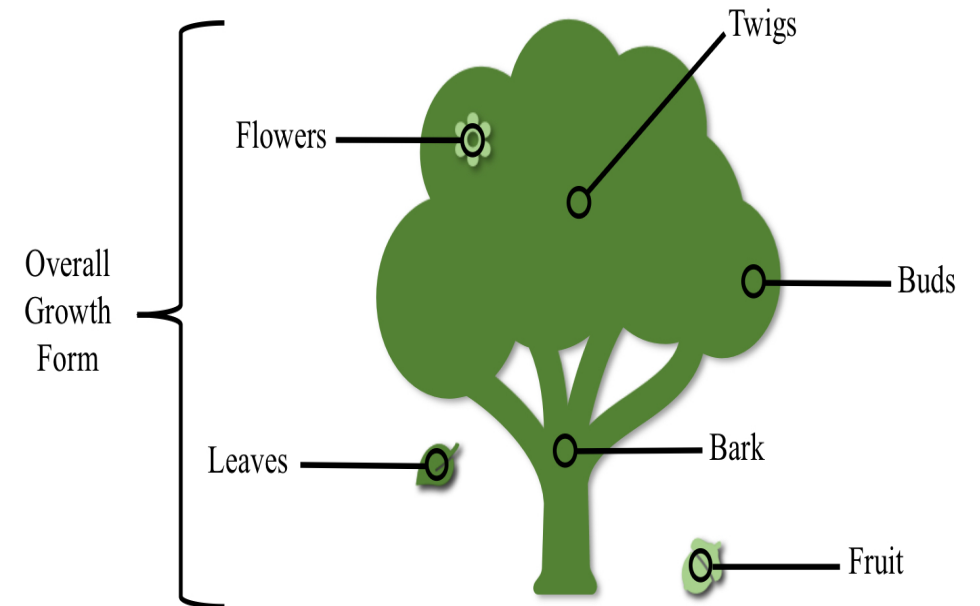
Photo credit: Michigan DNR



Angiosperm!
Produces flowers

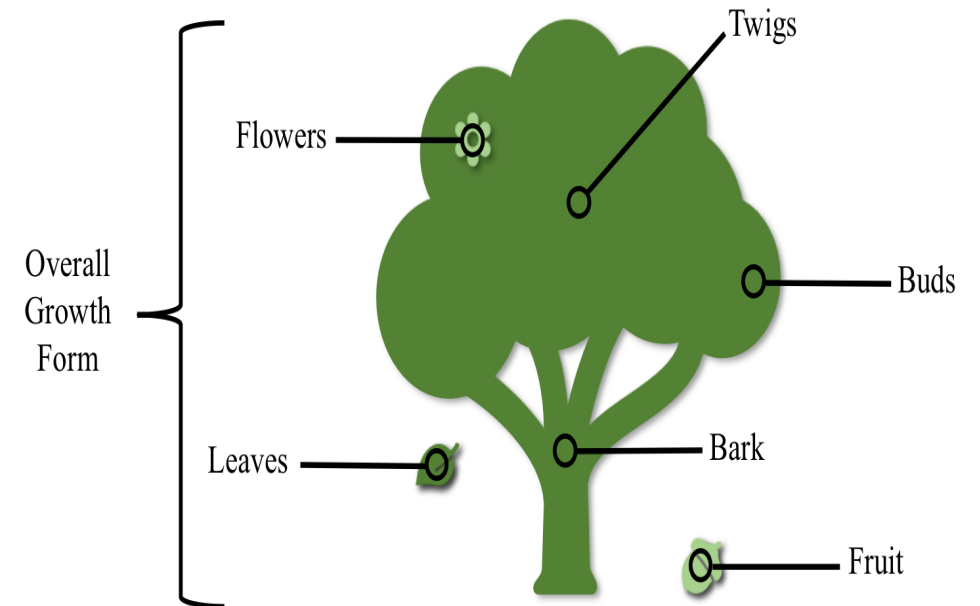
LET'S ID TREES!

- There are over 75 species of trees in Michigan alone— it would take a lot longer than the time we have today to learn to ID them all!
- Learning key botanical terms and basic tree anatomy can establish a good baseline for reading dichotomous keys and observing traits that botanists use to identify species.



LET'S ID TREES!

- Like people, individual trees can vary a lot, even within the same species. That's why it's important to learn to recognize multiple ID features for each species.



DESCRIBING GROWTH FORM

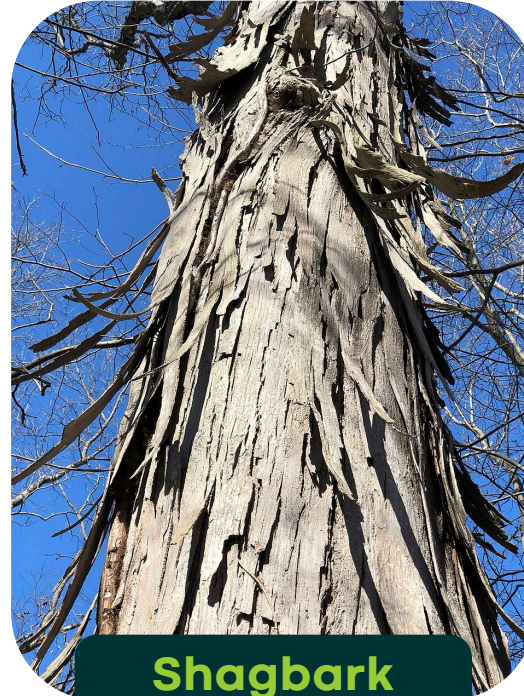
- Most species have a distinct shape when viewed as a whole (e.g., flat, rounded, or pointed; narrow or broad)
- However, this is frequently dependent on age and environment



Image credits: Edward A. Hedborn, Jr. and
Deborah J.G. Brown

DESCRIBING BARK

- Bark is a protective woody layer that often cracks, peels, or otherwise forms a distinctive pattern
- However, bark patterns are also frequently dependent on age and environment



**Shagbark
Hickory**



**Musclewood
(Hornbeam)**

Image credits: Famartin and Illinois Wildflowers

IMPORTANT VOCABULARY!

Opposite Arrangement

Branches, twigs, buds, or leaves are arranged in pairs, with one on either side of the junction.



Alternate Arrangement

Branches, twigs, buds, or leaves are arranged singly, alternating which side of the main branch they emerge from.



M A D HORSE
A S O CHESTNUTS
P H G
L E W
E S O
S O
D
S

**Photo credits: Will Cook
& Prairie Restorations**

DESCRIBING TWIGS & BRANCHES

- **Twigs are the growth of the current or most recent growing season.**
- **The habit of both twigs and branches can be important in identifying trees.**
- **Sometimes, twigs have a different color or texture from branches.**



Photo credit: Gene Sturla

DESCRIBING BUDS

- Buds form during the summer growing season and hold the leaves and/or flowers that will emerge the next spring
- The size and shape of the buds, as well as the arrangement and color of the bud scales protecting each bud, are useful in identification
- Often the terminal bud looks different from the other buds

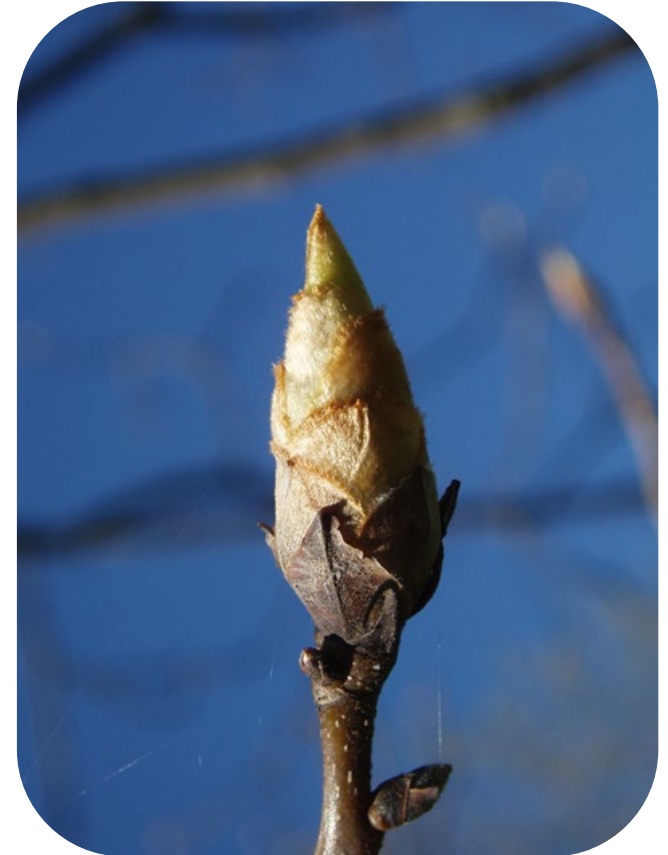


Photo credit: Julie Makin

DESCRIBING LEAVES

- Leaves are the organs that perform photosynthesis.
- Many trees have a variety of different-looking leaves on one individual, in order to maximize sunlight exposure.

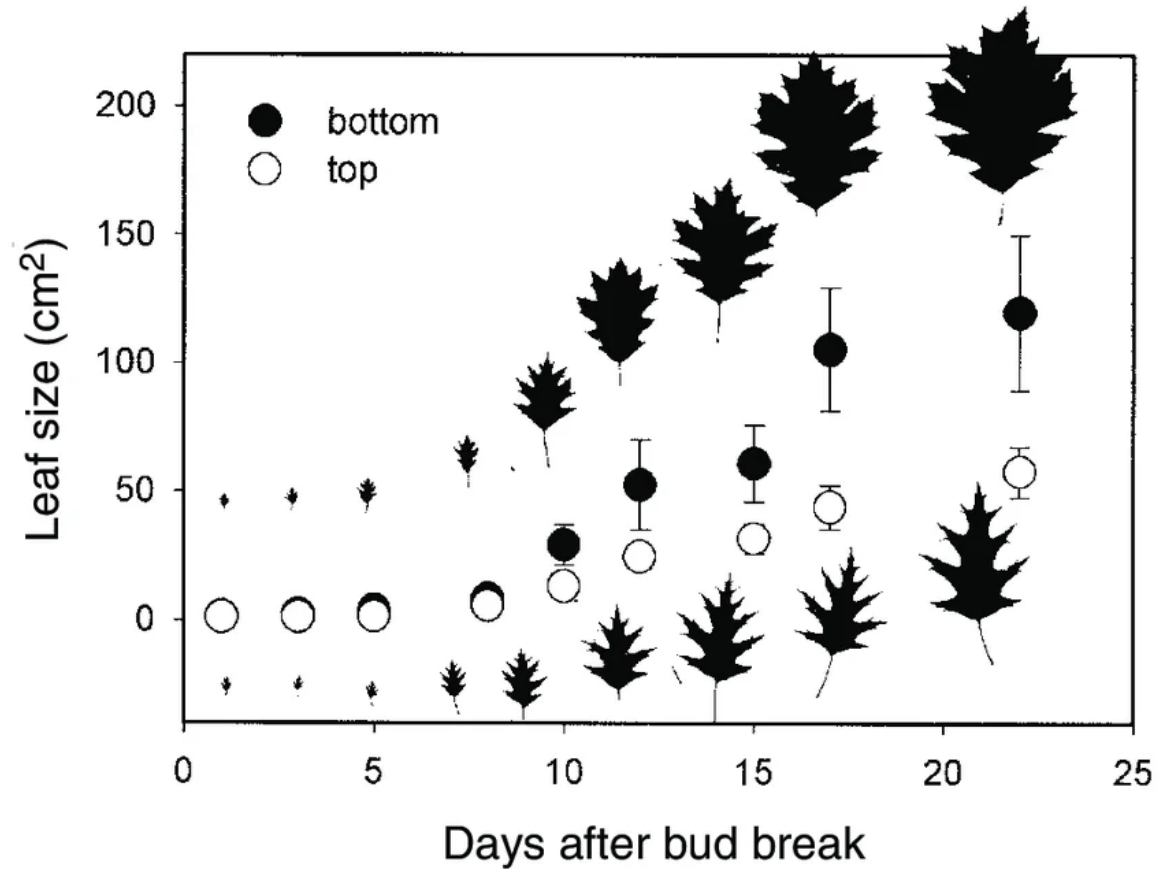


Image credit: doi.org/10.1111/j.1365-3040.2003.01153.x

DESCRIBING LEAVES

Deciduous

- Have seasonal leaves that drop every winter
- Includes maples, apples, most oaks, and tamarack.



Evergreen

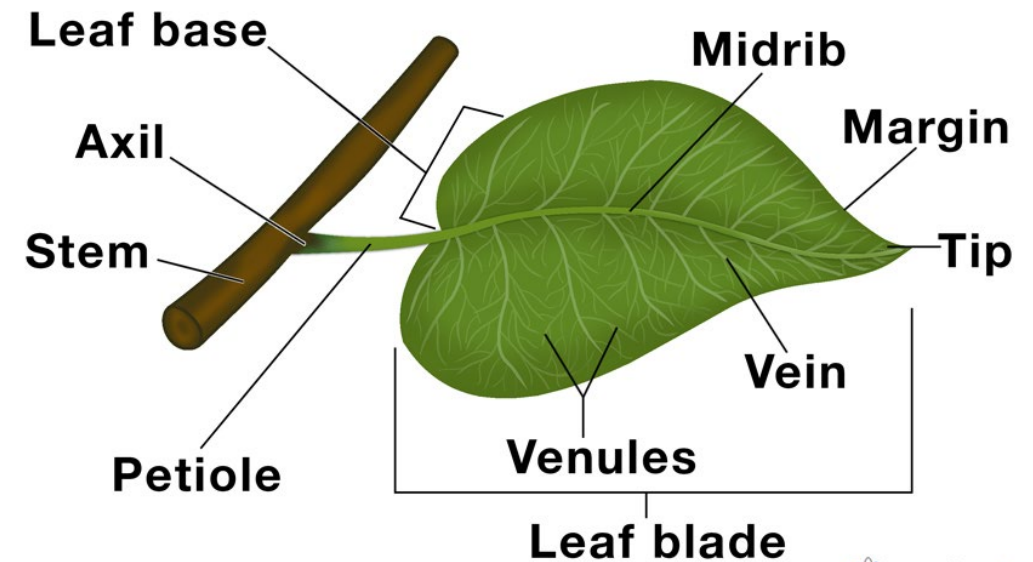
- Keep their leaves year-round
- Includes some oaks and most conifers. Pine needles are leaves!



DESCRIBING LEAVES

- The veins are the linear structures that carry water and minerals to and from the leaf.
 - The midrib is the central vein of the leaf, off of which the other veins branch in alternate or opposite arrangement
- The blade is the flat part of the leaf that supports the veins.
- The margin is the outer edge of the leaf blade.
- The petiole connects the leaf to the stem of the plant.

Parts of a Leaf



LEAF SHAPES

Botanists have come up with a lot of words to describe leaf shape! Here are some general rules to help us get a handle.

- Most words begin with a shape word and end in the suffix '-ate' or '-iform'. So, a cordate leaf is "heart-shaped"
- The prefix 'ob-' means that the directionality of the shape is reversed. For example, ovate and obovate leaves are both egg-shaped, but with the directionality reversed.

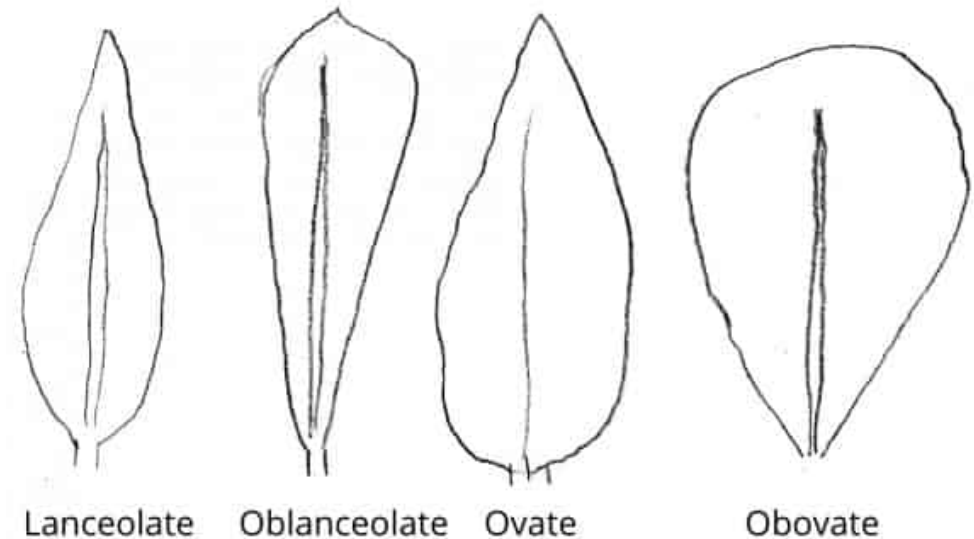
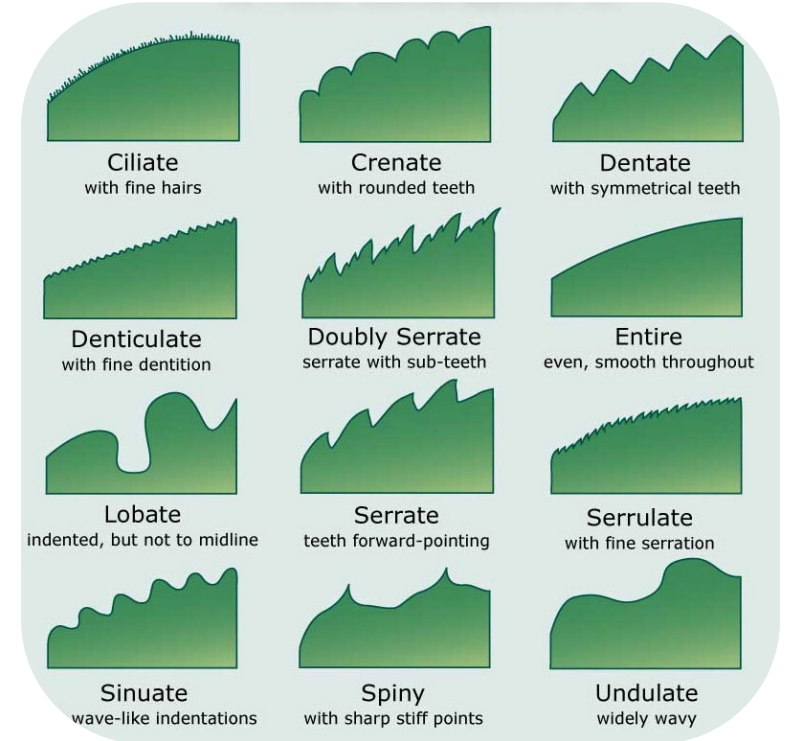


Image credit: growitbuildit.com

LEAF MARGINS

- There are also a lot of words to describe the appearance of leaf margins
- Remember that the margin of a leaf is the outer edge of the blade
- Margin terms:
 - Tend to end in '-ate'
 - The suffix '-ulate' tends to mean that the features are small and fine. For example, dentate means the margin is toothed. Denticulate means the margin is finely toothed.



LOBES & COMPOUND LEAVES

- A leaf is lobed if its margin repeatedly curves inward toward the midrib.
- Over time, some lobed leaves have evolved to the point where the leaf blade is no longer continuous, forming a compound leaf with leaflets. This is still one leaf!
- Pinnately lobed/compound leaves have a midrib with the other veins branching off of it.
- Palmately lobed/compound leaves have prominent veins radiating from a single point on the leaf.

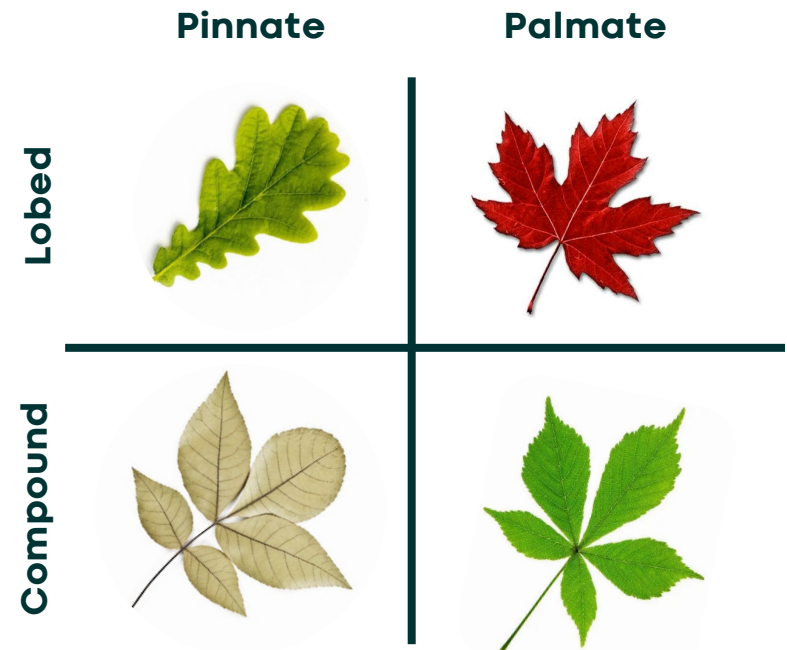
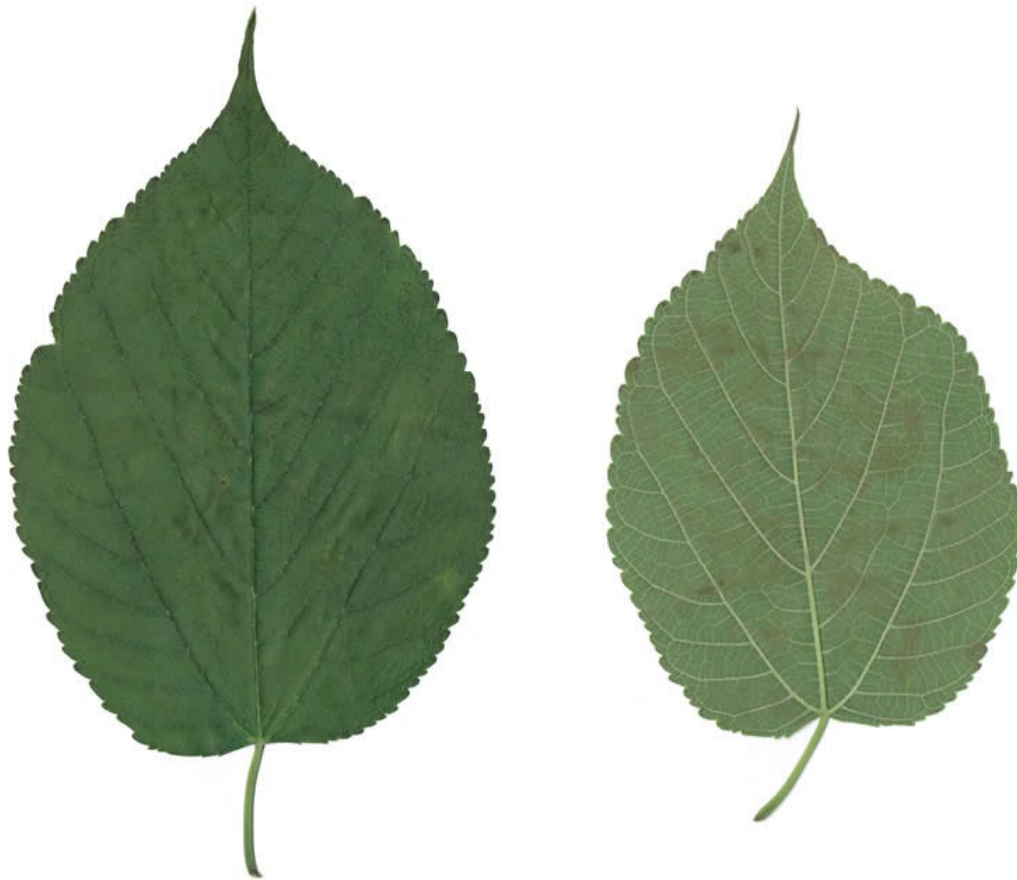


Image credits: Gustoimages, Cold Stream Farm and Forest Healing

IDENTIFYING LEAVES

**Describe
the shape of
this leaf**

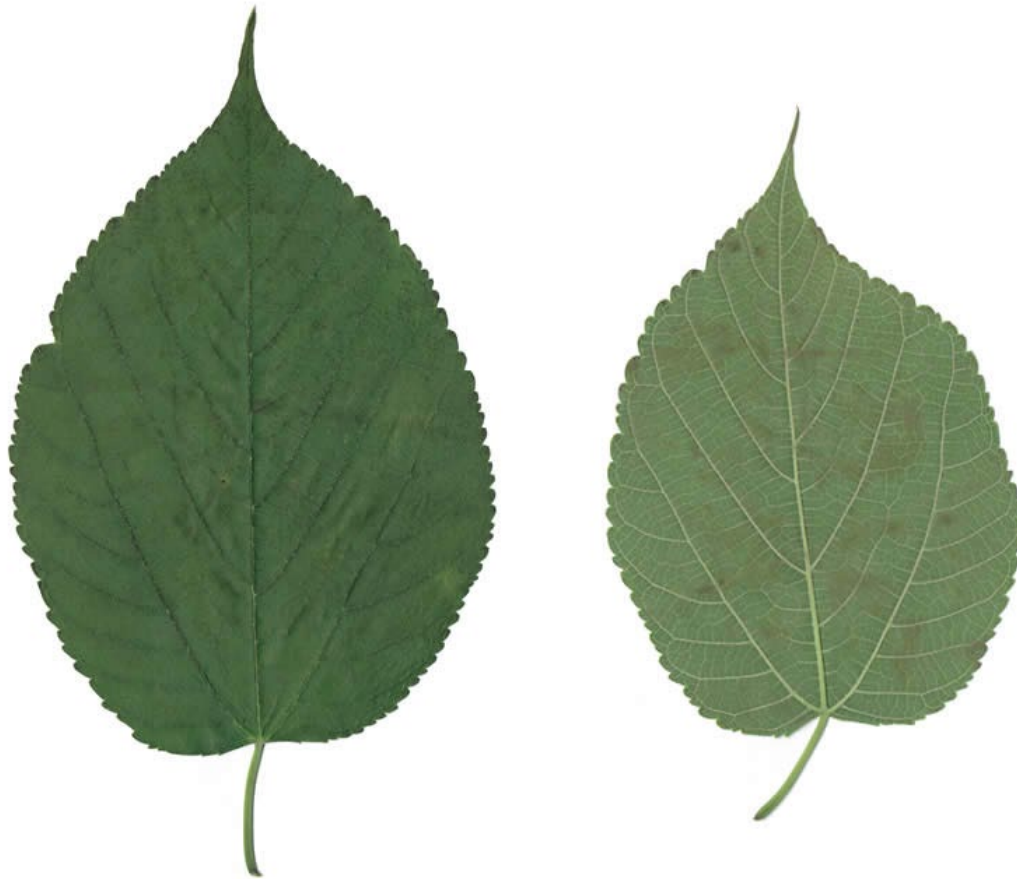


MWI, Katy Chayka

**Hint: the shape term for
this leaf means “egg-
like”!**

IDENTIFYING LEAVES

**Describe
the margins
of this leaf**



MWI, Katy Chayka

**Hint: the teeth on these
margins point toward
the tip of the leaf**

IDENTIFYING LEAVES

**Describe
the shape of
this leaf**



**Hint: the tip of the leaf
is rounded and wide
like a spoon!**

IDENTIFYING LEAVES

**Describe
the margins
of this leaf**



**Hint: this leaf is lobed;
focus on the texture of
the margins, not the
overall shape**

FLOWERS AND FRUIT

- Remember that only angiosperms have flowers and fruit. If you see cones on a tree, you are looking at a gymnosperm!
- Flowers and fruit are often the most difficult ID features to find on a tree: they are only around for a small portion of the year, and they are often too high up to see. However, dropped fruit on the ground can help determine which kinds of trees are around!



Photo credit: Peter M.
Dziuk

FLOWERS AND FRUIT

- Flowers can be described by their color, size, shape, and whether or not they are in an inflorescence (a group of flowers coming from the same stem).



Photo credits: John Hagstrom, Peter M. Dziuk

CHARACTERISTIC FRUITS

- Many common Michigan trees have distinctive, characteristic fruits useful for ID
- Maples have bilateral, winged “helicopter” fruit called samaras
- Oaks have capped nuts called acorns
- Walnuts have large nuts encased in a thick green husk



Photo credits: Peter M. Dziuk

LET'S PRACTICE!

- Leaves compound

- Leaves simple ☒



Image credit: Peter M. Dziuk

LET'S PRACTICE!

- Leaves opposite

- Leaves alternate



Image credit: Peter M. Dziuk

LET'S PRACTICE!

- Flowers yellow

- Flowers white ☒



Image credit: Peter M. Dziuk

LET'S PRACTICE!

- Leaves unlobed



- Leaves lobed



Image credit: Peter M. Dziuk

LET'S PRACTICE!

- >12 flowers per inflorescence
- <12 flowers per inflorescence



Image credit: Peter M. Dziuk

LET'S PRACTICE!

- Leaves lanceolate ☒

- Leaves obovate



Image credit: Peter M. Dziuk

PRUNUS SEROTINA!

Image credits:
Peter M. Dziuk
and NetPS
Plant Finder



© Peter M. Dziuk

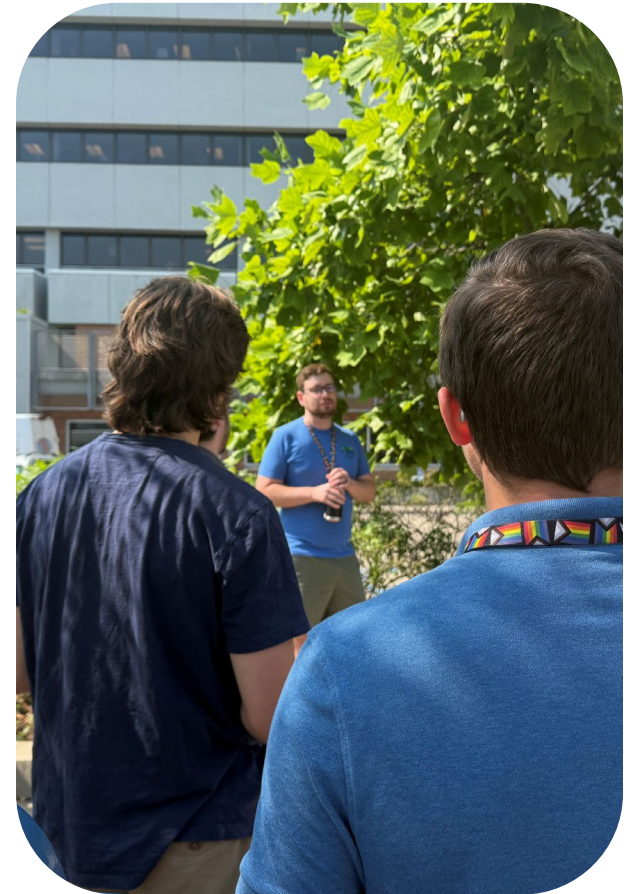


THANK YOU!

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UPCOMING EVENTS

- **September | History of Trees in Ann Arbor**
 - 9/25, 6-7:30pm, LSNC
- **October | Threats to Trees + Fall Colors**
 - 10/23, 6-7:30pm, LSNC
- **November | Trees & Art**
 - 11/20, 6-7:30pm, LSNC



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Please take a 5-minute survey to help us shape the future of this series:

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