

Basic Tree/Leaf ID

Grades 7-8 (Adapt as Needed)

Prepared by the Lumber Heritage Region Educators

OVERVIEW & PURPOSE

This lesson introduces students to tree identification, focusing on observable characteristics, especially leaves, as a beginner-friendly approach. Students will learn about the 10 major tree attributes used for identification and practice classifying leaves with a simple key. The lesson also highlights the historical uses of different trees and promotes a connection with nature; encouraging students to recognize the importance of trees in their community. The goal is to inspire stewardship and awareness of the ecological and historical significance of forests/trees.

ACADEMIC STANDARDS

Humans & the Environment: Identify items used in daily life that come from natural resources.

Science and Technology and Engineering Education:

- Demonstrate how scientists use classification systems to group organisms.
- Use appropriate tools and techniques to gather, analyze, and interpret data.
- Describe characteristics of living things.

History: Understand the importance of historical contributions to Pennsylvania, including natural resource use.

OBJECTIVES

1. Identify and consider the 10 major tree attributes useful for identification; focus on leaves as a starting point for tree ID.
2. Explain how a dichotomous key works and how it can be used as an ID tool.
3. Apply observation skills to classify leaves using a simple dichotomous key.
4. Explore the historical and modern uses of selected tree species.

MATERIALS NEEDED

1. Visual chart/display of the **10 major tree attributes** (poster, slide, or handout).
2. Basic tree leaf ID guide OR dichotomous key with corresponding samples.
3. Sample leaves (real, printed, or laminated) showcasing various types (simple vs. compound; broad/flat vs. needle/scale-like).
<https://docs.google.com/presentation/d/18sr4zzVn4eNG6tyxsQwH7XS90VDglRszZYDJ1Fn7jSQ/edit?usp=sharing>
4. Worksheet with a simple tree leaf key for group activity.
5. Magnifying glasses (optional).
6. Visuals or small objects representing tree uses (e.g., a maple syrup bottle, oak wood sample, pinecones, clothespins, matches, sports equipment, leather).

SUPPLEMENTAL RESOURCES - Tree ID guides / quizzes / games / videos -

PSU Tree ID Program (PDF): https://www.envirothonpa.org/pdfs/1-3_PSU%20TreeID%20Program.pdf

Show Me Trees – Leaf ID Guide (Missouri): <https://mdc.mo.gov/sites/default/files/2023-10/Show%20Me%20Trees%20F00018.pdf>

Identifying PA Trees: PA Forest Stewardship Program (DCNR) -

<https://elibrary.dcnr.pa.gov/PDFProvider.ashx?action=PDFStream&docID=1737092&revision=0&docName=sf-PSU+TreeID+Program&nativeExt=pdf&PromptToSave=False&Size=3869446&ViewerMode=2&overlay=0>

A Key to Some Common Trees of PA (DCNR) -

<https://elibrary.dcnr.pa.gov/PDFProvider.ashx?action=PDFStream&docID=1737093&revision=0&docName=sf-SummerTreeKey&nativeExt=pdf&PromptToSave=False&Size=571159&ViewerMode=2&overlay=0>

Common Trees of PA Booklet (DCNR) - https://elibrary.dcnr.pa.gov/GetDocument?docId=1742149&DocName=sf-CommonTrees2014_online.pdf

EVEN MORE:

https://www.envirothonpa.org/wp-content/uploads/2018/11/1-6_Key-to-Some-Common-Trees-of-PA.pdf

https://studio.learn.extension.psu.edu/asset-v1:PSUExtension+RNR_FOR101+SalesforceID+type@asset+block/Tree_Identification_Key_for_Understanding_Forest_Ecosystems.pdf

https://www.envirothonpa.org/pdfs/1-3_PSU%20TreeID%20Program.pdf

ACTIVITY/ASSESSMENT

1. Introduction (5 minutes)

Begin by asking students if there are different kinds of trees, and if so, how can they tell the difference between them?

Introduce the 10 key attributes used in tree identification:

Leaves, flowers, fruits, bark, twigs, smells, tastes, tree size, tree shape, and tree location.

Discuss:

Some traits—like leaves, fruits, and flowers—are only visible during certain seasons, so they aren't always reliable.

Foresters often rely on bark as their go-to tool for year-round identification.

For beginners, leaves are the most accessible and easiest place to start.

Encourage students to think of identification as problem-solving—noticing small differences to narrow down possibilities.

2. Deep Dive: Leaves and Tree Uses (15 minutes)

Explore several foundational ID concepts through real or visual examples:

Leaf Types:

Broad/Flat vs. Needle or Scale-like – Discuss structural differences and connect them to tree types (deciduous vs coniferous).

Simple vs. Compound Leaves – Show how leaflets can be arranged in different ways (introduce palmately and pinnately compound).

Margins & Arrangements: Serrated vs lobed vs entire edges; alternate, opposite, or whorled arrangements.

Tree Uses & Value:

Trees are not only diverse in structure, but also in what they can be used for. While some species are preferred for specific products, most trees can serve many purposes—just with different levels of quality, performance, or appearance.

Use examples to illustrate:

Sugar Maple – Broad leaves; used for furniture, baseball bats, and syrup production.

Oak (Red/White groups) – Lobed leaves; high-quality wood for barrels, furniture, and durable flooring.

Black Cherry – Finely serrated leaves; valued for its rich color in furniture and cabinetry.

Eastern Hemlock – Evergreen needles; used in paper/pulp, and historically important for leather tanning due to its bark.

White Pine – Needles in bundles of 5; important in construction and paper production due to fast growth and straight grain.

Black Walnut: Pinnately compound leaves; wood in furniture and flooring, edible walnuts

Black Birch: Serrated simple leaves, broken twigs smell minty; essential oils, flavoring

Others as desired - there are many native and non-native trees & uses in PA to explore.

Discussion Tip: Ask students why certain trees might be better suited for specific products. Connect structure to function.

3. Group Activity: Using the Leaf Key (15 minutes)

Divide students into small groups and provide each with:

- A leaf identification key.
- Leaf samples or images representing native Pennsylvania trees (make sure species is included in this key or provide alternative key)

Instructions:

Explain how to utilize a dichotomous key. Work through an example. Instruct students to use the key to identify their leaf samples.

4. Wrap-Up & Reflection (5–10 minutes)

Class Review:

Go over answers together and explain the key identifiers. Celebrate teamwork and accurate observations.

Discussion Question:

“Why do you think it’s important to be able to identify trees?” *Prompt ideas about environmental awareness, forest products, wildlife habitats, climate change, and cultural uses.*

Extension Options

Take it Outside:

Go on a tree walk around the school or nearby green space. Encourage students to note the types of trees or clues like bark, location, twigs, leaves, etc. Observe how trees support the ecosystem.

Art in Nature: Leaf Rubbing How-To / Leaf Printing with Paint / Nature Art with Leaves

Dichotomous Key for Tree Identification (7-8th Grade)

Glossary of Terms

Opposite leaves: Leaves are *directly* across from each other on the stem.

Alternate leaves: Leaves are *staggered*, not directly across from each other.

Simple leaf: A single, undivided leaf blade.

Compound leaf: A leaf made up of multiple leaflets.

Pinnately Compound: Leaflets arranged along both sides of a central stem (*like a feather*).

Palmately Compound: Leaflets spread out from one central point (*like the fingers of a hand from the palm*).

Lobed: Leaf has distinct rounded or pointed projections.

Serrated: Leaf edge has small, tooth-like notches.

Entire margin: Smooth-edged leaf with no teeth or lobes.

Broad/flat leaves: Wide, flat leaves that are usually thin and soft—not needle-like. Most trees with these leaves drop them in autumn.

Needle-like leaves: Thin, pointed leaves found on conifers.

Scale-like leaves: Overlapping small leaves that appear scale-like.

Dichotomous Key:

1a. Leaves are needle-like or scale-like → **Go to 2**

1b. Leaves are broad and flat → **Go to 5**

2a. Needles grow in bundles → **Go to 3**

2b. Needles not in bundles of 5 → **Go to 4**

3a. Long flexible needles, grow in bundles of 5 → **Eastern White Pine**

Used mainly for construction lumber; historic ship masts

3b. Long stiff needles, grow in bundles of 2 → **Red Pine**

Used mainly for construction lumber

4a. Scale-like leaves, aromatic wood → **Eastern Redcedar**

→ Used for fence posts, cedar chests

4b. Soft, short, flat needles, grow in flat sprays → **Eastern Hemlock**

→ PA State Tree, used for bark tanning, lumber, and shade helps keep water cool for native fish.

5a. Leaves are compound (made of multiple leaflets) → **Go to 6**

5b. Leaves are simple (a single leaf blade) → **Go to 9**

6a. 11–23 leaflets; strong scent when crushed → **Black Walnut**

High-value lumber and edible nuts

6b. 5–11 leaflets; no strong scent → **Go to 7**

7a. 5–7 leaflets; Bark peels in long strips → **Shagbark Hickory**

Used for tool handles and firewood

7b. 7–11 leaflets; Bark is gray and ridged → **White Ash**

Used for baseball bats, now severely threatened by Emerald Ash Borer - nearing functional extinction

9a. Leaves are arranged opposite on the stem → **Go to 10**

9b. Leaves are arranged alternately on the stem → **Go to 12**

10a. Leaf has 3–5 lobes → **Maple** (various types of Maple in more complex key - ex Sugar, Red, Black)

Used for furniture, flooring, syrup, and baseball bats

10b. Leaf is heart-shaped with smooth edges → **Eastern Redbud**

Ornamental tree; early spring flowers, moderate size, relatively shallow roots, and clay soil tolerance make it an ideal and common choice among human designed spaces.

12a. Leaf is lobed → **Go to 13**

12b. Leaf is not lobed → **Go to 15**

13a. Lobes are rounded or pointed → **Go to 14**

13b. Lobes are squared and notched at the top; shaped similar to a tulip or cat's face → **Tulip Poplar**

Used for plywood, fast-growing lumber

14a. Lobes are rounded → **White Oak group**

Used for flooring, barrels, and furniture

14b. Lobes are pointed → **Red Oak group**

Durable wood; used for furniture and cabinetry

15a. Leaf is shiny with small serrations; dark-colored → **Black Cherry**

Fine furniture wood; fruit supports wildlife

15b. Leaf has sharp teeth and straight, parallel veins → **American Beech**

Used for clothespins as wood does not stain damp material; produces nuts for wildlife