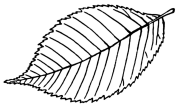
ATLANTA BOTANICAL GARDEN

# At Home Science!
# In“Tree”guing Plant Identification

Students will learn how to use keys and other resources to identify local trees in their communities.

## Terms to Know:

**BROADLEAF**

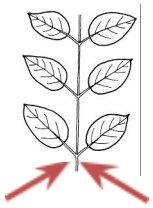


Trees with leaves that are thin, wide and flat

**CONIFER**

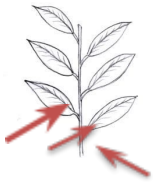
Trees that bear cones and have needle or scale-like leaves.

**OPPOSITE**



Two leaves are arranged directly adjacent at each node

**ALTERNATE**



Leaves do not share a node on stem. Only one leaf is at each node.

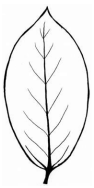
**LOBED**

Leaves have distinct indentions and finger-like projections like a glove

**NON-LOBED**

Leaves have no indentions and no fingers, more like a mitten.

**SMOOTH**



Edges of leaf are not serrated and are generally smooth.

**JAGGED**

Edges of leaf are serrated or jagged like the blade of a knife

## Classification and Taxonomy

Classification is the grouping of things into separate categories based on their similarities and differences. Scientists use classification to group living things based on their physical and genetic features. Organisms in the same groups are more closely related that organisms in different groups. Taxonomy is the science of classifying organisms. Taxonomists are in charge of naming, describing, and organizing living things according to their similarities. Modern taxonomy orders organisms into seven hierarchical categories that include Kingdom, Phylum, Class, Order, Family, Genus, Species. Organisms in the same kingdom have less in common that organisms in the same genus.

### Scientific Naming

Common names for living things can vary from place to place, even if people share the same language. Sometimes two different organisms share the same common name. To prevent confusion, scientists use a scientific naming system to refer to specific types of organisms. The genus and species of an organism is used to identify each living thing. When written the name always appears in italics with the name of the genus capitalized and the name of the species in lower case letters.

For example: (common name) human= (scientific name) *Homo sapien*
(common name) southern red oak = (scientific name ) *Quercus falcata*

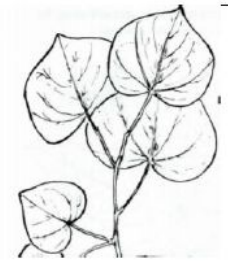
### Tree Identification

There are thousands of different types of tree species on Earth. Scientists classify them based on their vascular systems, flower structure, leaf shape, and other characteristics. You will be looking primarily at leaf structure to determine tree identities. Use the key of terms to know on this page to help you understand what tree leaf arrangements to look for.

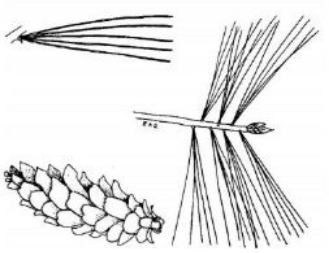
# Georgia Botanical Illustration ID

**Use the dichotomous key and terms to know to discover the common and scientific names for each of the trees illustrated below.**

Botanical illustrators are both artists and scientists. They must create images of plants that convey accurate scientific descriptions and are visually appealing. Use the dichotomous key below to identify the plants depicted in these eleven botanical illustrations.



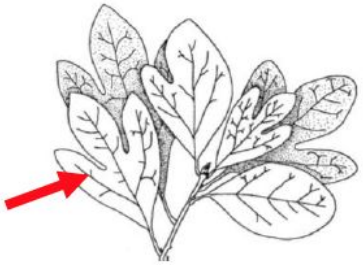
A._____



B._____

C._____

D._____



E._____

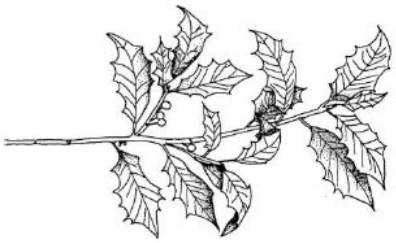
F._____

G._____

H._____

I._____

J._____



K._____

Answers: A.20, B.5, C.9, D. 22, E. 18, F. 6, G. 14, H. 11, I. 21, J. 4, K. 23

# Georgia Tree ID Dichotomous Key

**Directions: Examine the images of leaves above and use the dichotomous key to identify which trees the leaves came from. For each sample, start at #1, read both statements, and follow the directions next to the statement that is true for each leaf. Refer to the "Terms to Know" key on the first page for images to help you answer the questions. Continue to do so until the name of the tree is discovered. Each leaf sample is from a different tree.**

1. Is your tree a…
    a. BROADLEAF tree (trees with leaves that are thin, wide and flat)? If so, GO TO # 7
    b. CONIFER (tree that bears cones and has needle-like or scale- like leaves)? If so, GO TO # 2
2. Are the trees EVERGREEN with...
    a. needles arranged in clusters of 3 – 5? GO TO # 3
    b. needles arranged singly? GO TO # 6
3. Are the needles clustered in groups of...
    a. three? If so, GO TO # 4
    b. five? If so, GO TO # 5
4. You have a LOBLOLLY PINE TREE (*Pinus taeda)*
5. You have an EASTERN WHITE PINE TREE (*Pinus strobus)*
6. You have an EASTERN HEMLOCK (*Tsuga canadensis)*
7. Do the leaves have an…
    a. OPPOSITE arrangement (leaves located directly across from each other on the same twig)? If so, GO TO # 8
    b. ALTERNATE arrangement (leaves that are staggered, not located directly across from each other on the same twig)? If so, GO TO # 12
8. Are the opposite leaves…
    a. LOBED and shaped like a hand? If so, GO TO # 9
    b. NOT LOBED and not shaped like a hand? If so, GO TO # 10
9. You have a MAPLE TREE. A common Maple Tree in Georgia is the Red Maple also called *Acer rubrum*.
10. Does the simple, opposite, non-lobed leaf have
    a. smooth edges? If so, GO TO # 11
    b. jagged edges (like a saw)? If so, GO TO # 24
11. You have a DOGWOOD TREE. A common Dogwood Tree in Georgia is the Flowering Dogwood also called *Cornus florida.*
12. Are the alternate leaves
    a. LOBED? If so, GO TO # 13
    b. NOT LOBED? If so, GO # 15
13. Do the alternate leaves…
    a. have 3 rounded lobes? If so, GO TO # 18
    b. Have a somewhat flattened top, with 2 pointed LOBES on either side of the central vein and looks like a cat or fox face? If so, GO TO # 14
14. You have a TULIP-POPLAR TREE (*Liriodendron tulipifera).*
15. Do the alternate, non-lobed leaves...
    *a.* have smooth edges? If so, GO TO # 16
    *b.* have jagged edges (like a saw) or hard points? If so, GO TO # 17
16. Are the leaves…
    a. heart-shaped with a smooth edge? If so, GO TO # 20
    b. oval shaped with a smooth edge and fuzzy underside? If so, GO TO # 21
17. Are the leaves…
    a. dark green, stiff, leathery, and tipped with hard pointed spines? If so, GO TO #23
    b. yellow green or green in color and not stiff, leathery, and tipped with hard pointy spines? If so, GO TO # 22
18. You have a SASSAFRAS TREE (*Sassafras albidum)*. In the wild the Sassafras tree has three types of leaves: 3-lobed, non-lobed and mitten shaped.
19. You have a SWEETGUM TREE (*Liquidambar styraciflua*).
20. You have an EASTERN REDBUD TREE *(Cercis canadensis)*, which has fuschia spring blossoms
21. You have a MAGNOLIA TREE. A common Magnolia tree in Georgia is the Southern Magnolia also called *Magnolia grandiflora* and has fragrant white flowers in the springtime.
22. You have an AMERICAN BEECH *(Fagus grandifolia).*
23. You have an AMERICAN HOLLY *(Ilex opaca).* Hollies in the wintertime can have beautiful red, inedible berries
24. Whoops! Please start again.

# Georgia Tree ID Guide Scavenger Hunt

## Use this guide to identify native Georgia trees you encounter in your environment.

**American Beech**
**(*Fagus grandifolia*)**

**Leaves:** oblong, green, deciduous in fall, pointed end, serrated edges, alternate arrangement
**Bark:** smooth, thin, light colored bark
**Seed:** shiny light brown nut enclosed in shell covered with long hair
**Flower:** yellow green flower in clusters

**Eastern Redbud**
**(*Cercis canadensis*)**

**Leaves:** broad, heart shaped with smooth margins, turn yellow in fall
**Bark:** red-brown and smooth
**Seed:** long pod, pink or rose color
**Flower:** bright pink-purple colored in clusters

**Tulip Poplar**
**(*Liriodendron tulipifera*)**

**Leaves:** 4 rounded lobes, smooth edges
**Bark**: gray and closely ridged, vein like appearance
**Seed:** Narrow, upright “cone” with yellow tip
**Flower:** cup shaped, greenish yellow with orange band

**Hickory**
**(*Carya*)**

**Leaves:** compound with 5-9 leaflets
**Bark:** light gray, thick plates
**Seed:** smooth spherical nut with thick husk

**White Oak**
**(*Quercus alba*)**

**Leaves:** 5-9 rounded lobes, simple, green
**Bark:** light gray, ridged or flat
**Seed:** Acorns with shallow cap

**Red Oak**
**(*Quercus rubra*)**

**Leaves:** 6-11 short bristle-tipped lobes
**Bark:** dark brownish gray, vertical streaks
**Seed:** egg shaped acorn with wide cap
**Flower:** drooping pollen clusters

**Southern Magnolia**
**(*Magnolia grandiflora*)**

**Leaves:** bright green, elliptical, glossy, smooth and leathery
**Bark:** gray to brown, smooth on upper trunk
**Seed:** Egg-shaped cone, with red seeds
**Flower:** white and fragrant

**Sycamore**
**(*Platanus occidentalis*)**

**Leaves:** very large with 3-5 lobes, serrated edges (4-8 in long) fuzzy bottoms
**Bark:** brown scales, peels in pieces
**Seed:** round hairy brown ball

**Southern Sugar Maple**
**(Acer saccharum)**

**Leaves:** simple, 3-5 lobed, whitish underneath and hairy, turn yellow-orange in fall, opposite arrangement
**Bark:** pale gray and shaggy in older trees
**Seed:** winged and papery

## Diving Deeper:

**Make a Classification Key of Your Own-**

Gather a group of items and observe their similarities and differences. Practice making a dichotomous key with these items. Start by separating the group into two groupings based on the most obvious features. Write down the characteristic that you chose and the two choices for the grouping. For example: “Size” Choice 1: over 10 cm long, Choice 2: not over 10 cm long. Continue to divide the groups into smaller and smaller piles using more specific features until each item is in a group by itself. Remember at each division there should be no more than two choices. Test out your key by having another person see if they can identify your items.

**Leaf Rubbings**

Collect leaves that you find on the ground. Place them onto a hard surface, with the veiny side of the leaf facing up. Cover the leaf with a piece of paper and tape down. Use the long side of a crayon or piece of chalk, gently rub the paper in the area that you placed the leaf. Watch as you color, the outline of the leaf and its veins appear. Once you’ve created one leaf rubbing, you can lift the tape and move the leaf around to create another. Use different kinds of leaves and colors to add interest. Don’t see any leaves on the ground? Tape the paper to a tree and create a rubbing of its bark instead!

**How Old is that Tree?**

We can guess the relative ages of trees by comparing the circumference of their trunks. Usually trees that have a larger circumference, are older than other trees with a smaller circumference. Where are the oldest trees in your neighborhood? Where are the youngest trees?

Some scientists estimate that many healthy trees with their needs met grow around an inch each year. See how old a tree could be by wrapping a piece of string around the trunk of the tree to get it’s circumference. Measure the length of your string. Based on this estimate, your tree should be around the same age as length of the string. Note that this measurement does not tend to be as accurate for young saplings or trees like poplars or chestnuts.

### Additional Resources

**Atlanta Botanical Garden Video-Atlanta Tree ID with Miss Lorin**
**Measuring the Height of Trees**
**The Lorax by Dr. Seuss**
**How do leaves breathe?**
**More Tree ID**
**Poetree by Shauna Lavoy Reynolds**
**The Great Kapok Tree by Lynne Cherry**
**Tree and Light Experiment**

## Standards covered

SKL1. Obtain, evaluate, and communicate information about how organisms (alive and not alive) and non-living objects are grouped.
b. Develop a model to represent how a set of organisms and nonliving objects are sorted into groups based on their attributes.
SKL2. Obtain, evaluate, and communicate information to compare the similarities and differences in groups of organisms.
b. Construct an argument supported by evidence for how plants can be grouped according to their features.
S1L1. Obtain, evaluate, and communicate information about the basic needs of plants and animals.
a. Develop models to identify the parts of a plant—root, stem, leaf, and flower.
S3L1. Obtain, evaluate, and communicate information about the similarities and differences between plants, animals, and habitats found within geographic regions (Blue Ridge Mountains, Piedmont, Coastal Plains, Valley and Ridge, and Appalachian Plateau) of Georgia.
a. Ask questions to differentiate between plants, animals, and habitats found within Georgia's geographic regions.
S5L1. Obtain, evaluate, and communicate information to group organisms using scientific classification procedures.
b. Develop a model that illustrates how plants are sorted into groups (seed producers, non-seed producers) using data from multiple sources.
S7L1. Obtain, evaluate, and communicate information to investigate the diversity of living organisms and how they can be compared scientifically.
a. Develop and defend a model that categorizes organisms based on common characteristics.